**REPORT**

# Best Management Practices Plan for the Control of Fugitive Dust

Proposed Caledon Pit / Quarry

Submitted to:

**CBM Aggregates (CBM), a Division of St Marys Cement Inc. (Canada)**

Submitted by:

**WSP Canada Inc.**

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# Distribution List

1 e-copy: CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

1 e-copy: WSP Canada Inc.

# Document Version Control

This Fugitive Dust Best Management Practices Plan (BMPP) has been prepared for CBM Aggregates (CBM), a Division of St Marys Cement Inc. (Canada) to manage fugitive dust associated with the proposed Caledon Pit / Quarry in Caledon, Ontario (the Pit / Quarry). The BMPP should be reviewed periodically and updated if required. Therefore, it is necessary to have appropriate version control. This version control will allow facility personnel and compliance auditors to track and monitor changes to the BMPP over time.

| Version | Date | Revision Description | Prepared By | Reviewed By (Facility Contact) |
|---|---|---|---|---|
| 1.0 | December 2022 (Revised July 2023) | Original document to support Aggregate resources Act Application | Golder Associates Ltd. | D.H. |
| 1.1 | Revised April 2024 | Document updated in response to a request from the Town of Caledon to be included on complaint notifications | WSP Canada Inc. | D.H. |
| 1.2 | Revised March 2025 | Document updated to include commitment to dust monitoring during operations | WSP Canada Inc. | D.H. |
| 1.3 | Revised May 2025 | Document updated to reference the Air Quality Monitoring Plan as appended | WSP Canada Inc. | M.L. |

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**TABLES**

## FIGURES



## APPENDICES

# 1 INTRODUCTION

This Best Management Practices Plan for Fugitive Dust (the Plan) has been prepared to manage the fugitive dust associated with the proposed Caledon Pit / Quarry located in the vicinity of Charleston Sideroad and Main Street/Regional Road 136 in Caledon, Ontario (the Site).

This Plan follows the Plan, Do, Check, and Act cycle described in the "*Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources*" (updated April 26, 2019) guidance (Fugitive Dust Guidance Document) published by the Ministry of the Environment, Conservation and Parks (the Ministry). The "Plan" section includes a review of facility processes and operations, and identification and characterization of the anticipated fugitive dust sources at the Facility. The "Do" section includes the BMPs that are currently in place at the Facility, as well as those to be implemented, complaints protocols, and administrative controls such as training. The "Check" section includes a description of monitoring procedures, a record keeping system, and accountability. The "Act" section includes guidelines for periodic review of the BMPs to promote continuous improvement of this Plan.

In preparing this Plan, WSP has relied on information provided by CBM Aggregates (CBM), a Division of St Marys Cement Inc. (Canada), the Ministry and information on standard best practices for fugitive dust generating activities.

# 2 REQUIREMENTS OF A BMPP FOR FUGITIVE DUST

Table 1 lists the suggested content and requirements for a BMPP for Fugitive Dust as per the Fugitive Dust Guidance Document and the corresponding section of this Plan that addresses each requirement.

**Table 1: Requirements of BMPP for Fugitive Dust**

| Requirement/Suggested Content | Section of This Plan |
|---|---|
| Identify and characterize the sources of fugitive dust emissions within the facility. | s.3.3, Table 3 |
| Identify nearby potential receptors that may be impacted by dust emissions. | s.3.1, Figure 1 |
| Develop a site map and/or figures to identify the locations of fugitive dust sources (such as storage piles and roadways) and potential receptors. | s.3.1, Figure 1 |
| Characterize applicable fugitive dust monitoring parameters such as silt loading, silt content, moisture content, metal content, dust fall, etc. | s.3.4 |
| Review the composition and particle size distribution of fugitive dust generated by each significant fugitive dust source where available. | s.3.4 |
| Identify the contributing factors for each significant source that favour the generation of fugitive dust emissions (e.g. predominant wind direction, location of storage pile, frequency of activity, process operating parameters, control efficiency, etc.). | s.3.3, Table 3 |
| Prioritize the use of resources based on the relative contributions of fugitive dust sources. | s.3.3, Table 5 |
| Describe how fugitive dust will be controlled from each significant source (e.g. the application of dust suppressants such as water or chemical suppressants). | s.3.3, Table 4 |
| Document how the control measures will be implemented with timelines (e.g. frequency of road cleaning or water application, etc.). | s.3.3, Table 4 |

| Requirement/Suggested Content | Section of This Plan |
|---|---|
| Describe proper operating, monitoring, sampling, record-keeping and best practice procedures of control and monitoring equipment (e.g. how to minimize drop height, etc.). | s.3.3, Table 4, s.5.1, s.5.2 |
| Include a program for site-wide training for facility personnel and contractors. | s.4.3 |
| Implement a regular inspection, maintenance and calibration program (e.g. visual inspections of storage piles, maintenance of water sprays, etc.). | s.5.1 |
| Describe methods of reviewing information collected from inspections, monitoring, sampling and record-keeping to verify, and document ongoing implementation of the plan and to determine when to take additional action, if needed. | s.5.1, s.5.2 |
| Periodically review the effectiveness of control measures using available data from site inspections, silt loading and silt content analysis, dust fall jars, etc. on a regular basis to identify opportunities for continuous improvement. | s.6.0 |
| Update the BMP plan as required. | s.6.0 |

# 3 PLAN

## 3.1 Facility Description

The Site will be located in Caledon, Ontario. The Site is approximately 261 hectares (ha) and is composed of three pit / quarry areas: Main Area, Northern Area and the Southern Area. The intent is to extract, process and transport 2.5 million tonnes of aggregate annually from the Site. The proposed extraction at the Site will be undertaken in seven phases and involves the initial excavation in the Main Area and subsequently the advance of workings in a counter-clockwise direction. Works will progress to the Northern Area in the initial operation phases and the Southern Area towards the latter phases. Further detail of each operational phase is provided below. As part of the overburden removal, sand and gravel will also be extracted from the site.

- **Phase 1** – Operations will commence north of Charleston Sideroad and an entrance to the Main Area satisfying sightline and access spacing requirements will be installed. This entrance will be located on a designated haul route and may be signalised for additional safety.

  Topsoil and overburden will be stripped from the operational areas for access to the underlying aggregate resource. All topsoil and overburden on site will be stripped and stockpiled separately in berms or stockpiles and replaced as quickly as possible in the progressive rehabilitation process. Berms will be constructed on the southern, eastern and northern boundaries of the Main Area to attenuate noise and provide visual screening. Surplus overburden materials will be stored in a designated storage area to the south of the Main Area which provides a short haul distance from the initial stripping in Phase 1.

  Controlled blasting will be undertaken in order to extract material from extraction faces. Following each blast it may also be necessary to break down the blast rock further using an excavator with a hydraulic rock breaking attachment. Rock form blast piles will then be transported to a temporary mobile crushing and processing plant. Processed materials will be stockpiled for off site transportation.

A permanent processing facility will be installed north of Charleston Sideroad and adjacent to the entrance once workings have progressed to the final quarry floor level in this area.

The permanent processing plant will include screening and crushing operations, capable of processing up to 2,000 tonnes of material per hour. A wash plant will also be used to clean and sort material.

- **Phase 2A** – Extraction operations will continue in a counter-clockwise direction in the Main Area. Controlled blasting and hydraulic breaking of blast rock will be undertaken at each active face. Rock form blast piles will then be transported to the permanent processing facility north of Charleston Sideroad. In-quarry backfilling will be carried out at appropriate quarried faces where extraction is complete.
- **Phase 2B** – The Northern Area will be accessed with a tunnel under Main Street. The area will be stripped and topsoil will be used for perimeter berms, while glacial in this area will be placed in the Main Area as in-quarry backfill. Extraction activities will be the same as that carried out in the Main Area with the extracted materials being transported to the permanent processing facility. Once extraction in the Northern Area is complete, overburden from the Main Area will be used to finish rehabilitation.
- **Phase 3, 4 and 5** – Extraction operations will continue in a counter-clockwise direction in the Main Area. In-quarry backfilling will be carried out at appropriate quarried faces where extraction is complete.
- **Phase 6** – The Southern Area will be accessed with a tunnel under Charleston Sideroad. The area will be stripped and topsoil will be used for perimeter berms, while glacial till will be placed in the Main Area as in-quarry backfill. Extraction operations will proceed southwards and materials will be transported to the permanent processing facility in the Main Area.
- **Phase 7** – Extraction operations will continue in a southward direction in the Southern Area and materials will be transported to the permanent processing facility in the Main Area. Once extraction has been completed, overburden will be deposited to rehabilitate the quarried faces.

In each phase, overburden and topsoil stripping, sand and gravel extraction activities will precede drilling, blasting and rock extraction activities.

Figure 1 shows the Site location, nearby receptors and a wind rose from the Environment and Climate Change Canada Meteorological Station located in Mono, Ontario illustrating the predominant wind directions for the area. Table 2 presents general information about the Facility relevant to this Plan.

**Table 2: Facility Description**

| | |
|---|---|
| **Legal Name of Company and Site** | CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada)<br>Caledon Pit / Quarry |
| **Location** | Caledon, Ontario |
| **Address** | Located in the vicinity of Charleston Sideroad and Main Street/Regional Road 136 in Caledon, Ontario |
| **Main Activities** | Drilling and blasting to extract material, material handling and haulage, crushing and screening of extracted material. |
| **Hours of Operation** | The CBM Caledon Pit / Quarry is proposed to operate (extraction, processing and drilling) 7:00 am to 7:00 pm Monday to Saturday, excluding statutory holidays and shipping is proposed from 6:00 am to 7:00 pm Monday to Saturday consistent with other mineral aggregate operations in Caledon. CBM is also proposing to permit limited shipping in the evening (7:00 pm to 6:00 am) to support public authority contracts that require the delivery of aggregates during these hours to complete public infrastructure projects. These activities will be limited to only highway trucks and |

| | |
|---|---|
| **Legal Name of Company and Site** | CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada)<br>Caledon Pit / Quarry |
| | shipping loaders and no other operations will be permitted during evening hours. Site preparation and rehabilitation is proposed to be permitted 7:00 am to 7:00 pm Monday to Friday. |
| **Predominant wind direction** | From the west southwest (Figure 1) |
| **Nearest receptor** | The individual residences closest to the Pit / Quarry in all directions are illustrated on Figure 1. The town of Cataract is also highlighted, which contains numerous residences. |

## 3.2 Responsibilities

The following identifies the responsibilities held by each of the employment levels at the Facility as they pertain to this Plan.

### 3.2.1 Owner

The Owner is responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility and assessing the need for improvements;
- ensuring the training of site personnel and contractors on the Plan and the best management practices to be implemented;
- ensuring the required resources are in place to execute the Plan;
- reviewing the dust control inspections to ensure adequate measures were taken to address issues;
- scheduling and coordinating the implementation of fugitive dust control measures;
- completing the Dust Control Inspection Form and Dust Control Activity Log (i.e. sweeping) as required;
- maintaining documentation of schedules and logs;
- ensuring dust control logs are transferred to the Facility’s on-site filing system; and,
- receiving and handling complaints.

### 3.2.2 Site Personnel and Contractors

All Site Personnel and Contractors are responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility and reporting issues to the Shift Supervisor; and,
- following the dust control procedures that are currently in place.

## 3.3 Identification of Fugitive Dust Emission Sources and Factors Affecting Dust Emissions

Fugitive dust emissions are a result of mechanical disturbances of granular materials exposed to the air. Dust generated from these open sources is termed “fugitive” because it is not discharged to the atmosphere in a confined flow stream, such as emissions from an exhaust pipe or a stack (USEPA 1995).

The mechanical disturbance may result from equipment movement, the wind, or both. Therefore, some fugitive dust emissions occur and/or are intensified by equipment use, while others (i.e., wind erosion emissions) are independent of equipment use.

The main factors affecting the amount of fugitive dust emitted from a source include characteristics of the granular material being disturbed (i.e., particulate size distribution, density and moisture) and intensity and frequency of the mechanical disturbance (i.e., wind conditions and/or equipment use conditions). Precipitation and evaporation conditions can affect the moisture of the granular material being disturbed and, therefore, have an indirect effect on the amount of fugitive dust emitted.

Once dust is emitted, its travelling distance from the source is affected by climatic conditions, specifically wind speed, wind direction, precipitation, and particle size distribution. Higher wind speeds increase the distance travelled while precipitation can accelerate its deposition. Finer particulates can travel further before settling and, therefore, deserve greater attention.

Table 3 provides a list of the main sources of fugitive dust at the Facility.

**Table 3: Sources of Fugitive Dust Emissions at the Facility**

| Source Category | Source Description | Source Location | Potential Causes for High Emissions and Opacity from Each Source (Parameter/Condition) |
|---|---|---|---|
| Unpaved Areas | Vehicles will travel between the working face and the processing plant and/or from the processing plant off-site | Pit floor | Number of vehicles/large<br>Weight of vehicles/large<br>Silt content/high<br>Wind speed/high |
| Material Handling/Storage | Loading to haul trucks | Working Face | Moisture content/dry<br>Silt content of the material/high<br>Material size/fine<br>Material transfer rate/high<br>Material drop height/high<br>Wind speed/high |
| | Loading/unloading at Processing plant | Processing Plant | |
| | Stockpiling | Stockpiles – various | |
| Extraction | Drilling and blasting | Working Face | Moisture content/dry<br>Material size/fine<br>Material transfer rate/high<br>Wind speed/high<br>Blast zone area/high |
| Processing | Crushing and screening of extracted material | Processing Plant | Moisture content/dry<br>Material size/fine<br>Material transfer rate/high<br>Material drop height/high<br>Wind speed/high |

Control measures to reduce fugitive dust emissions should take into account the sources of the dust emission, the dispersion conditions and the location of sensitive areas. Control measures are in place to minimize one or more factors leading to the generation and/or dispersion of fugitive dust emissions. These control measures can be classified as follows:

- **Preventative Procedures**: Measures pertaining to the design and installation of structures and the operating procedures which are implemented on a regular basis in order to prevent the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.
- **Reactive Control Measures**: Measures which are implemented in the event of unexpected circumstances which can lead to the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.

Table 4 lists preventative procedures and reactive control measure for fugitive dust emissions that are associated with the Facility.

**Table 4: Preventative Procedures and Control Measures for Fugitive Dust Emissions at the Facility**

| Emission Source | Preventative Procedures/ Control Measure | Description | Frequency |
|---|---|---|---|
| Unpaved Areas | Watering | Water shall be applied as a dust suppressant during non-freezing conditions. | At least 2 litres/$m^2$/hour |
| | Application of Chemical Dust Suppressants | Chemical dust suppressants shall be applied during freezing conditions (temperatures less than 4ºC) | As required, during winter season |
| | Speed Limits | Speed limits of less than 25 km/hour shall reduce speed and dust production. | Permanent control |
| | Re-grading | Applying coarser material to surface of roadways. | Annually in Spring and whenever necessary as determined through visual monitoring |
| Material Handling and Stockpiles | Stockpile Placement | Stockpiles shall be placed below grade where possible to minimize wind erosion. | Continual |
| | Maintain Minimum Drop Height | Material shall be dropped from the shortest possible distance<br>If material is on the ground, it shall be pushed up with a loader to prevent the material from being dropped. | Continual |
| | Good Housekeeping | Minimize dust accumulation in material handling areas, reducing the probability of re-entrainment and generation of fugitive dust emissions. | Continual |
| | Cease Activity | Material handling activities shall be stopped in high wind conditions. | When sustained winds are greater than 40 km/hr |
| | Progressive Rehabilitation | Stockpiles shall be developed in stages and the pit / quarry progressively closed off (i.e., capped) to minimize the area susceptible to wind erosion. | Continual |
| Extraction | Location | Blasting shall be completed below grade reducing the susceptibility of emitting fugitive dust. | Continual |
| | Procedure | Drills equipped with dust suppression systems shall be used at all times. | Continual |
| | Cease Activity | Drilling and blasting activities shall be stopped in high wind conditions. | When sustained winds are greater than 40 km/hr |

| Emission Source | Preventative Procedures/ Control Measure | Description | Frequency |
|---|---|---|---|
| Material Processing | Equipment placement | Permanent equipment shall be located below grade as early as possible to reduce the susceptibility to wind erosion. | Continual |
| | Maintain Minimum Drop Height | Material shall be dropped from the shortest possible distance. | Continual |
| | Spray bars | Crushers and screens shall be equipped with spray bars to reduce fugitive dust generation | Continual |
| | Good Housekeeping | Dust accumulation on equipment and in material processing areas shall be minimized, reducing the probability of re-entrainment and generation of fugitive dust emissions. | Continual |
| | Cease Activity | Material processing activities shall be stopped in high wind conditions. | When sustained winds are greater than 40 km/hr |

* 1 - ChemInfo, 2005

Each fugitive dust source at the Facility was assessed using the risk management tool described in the Centre for Excellence in Mining Innovation guidance document “Guide to the Preparation of a Best Management Practices Plan for the Control of Fugitive Dust for the Ontario Mining Section, Version 1.0” (CEMI 2010) to assess if the BMPs that are in place adequately manage the risk associated with each source. See Appendix A for the risk factors used in the ranking process. As the Working Face will move over the lifetime of the Site, the worst case has been assumed, where it is closest to residences. Table 5 identifies the fugitive dust sources with their respective relative risk score for the Facility.

**Table 5: Fugitive Dust Sources and Associated Relative Risk Scores**

| Source Description | Relative Risk Score | Relative Risk Level |
|---|---|---|
| Unpaved Areas | 45 | Low |
| Material Handling – Working Face | 25 | Low |
| Material Handling – Processing Plant | 11 | Low |
| Stockpiles | 22 | Low |
| Extraction | 27 | Low |
| Processing | 18 | Low |

There are no sources that are considered to be “high” risk after the implementation of the BMPs, therefore it is reasonable to assume that the BMPs in place adequately manage the risk associated with each fugitive dust source.

## 3.4 Fugitive Dust Characterization

Particle sizes can be divided into the following categories:

- Fine: < 30 µm in diameter;
- Medium: 30 to 100 µm in diameter; and,

- Coarse: > 100 µm in diameter.

As the majority of fugitive dust from the Pit / Quarry results from mechanical disturbances from vehicles travelling on unpaved roads, the diameter of the dust particles can be categorized as medium (30 to 100 µm in diameter).

# 4 DO

## 4.1 BMPs for Sources of Fugitive Dust Emissions

The BMPs listed in Table 5 will be implemented at the Facility when activities commence, therefore no implementation schedule has been specified.

Dust generating work performed at the Facility, whether it is completed by CBM or under contractual agreements, must conform to the requirements of this Plan.

## 4.2 Procedures for Handling Complaints

The Facility has procedures in place to address complaints related to fugitive dust. All workers should be familiar with how to direct a complaint to the Owner who is responsible for receiving complaints (see section 3.2) should the need arise. The following steps should be taken by the Owner if a complaint is received:

- Complete copy of dust complaint form (Appendix C) and ask the complainant for the information required on the form (contact information, time of occurrence, etc.).
- Notify the Ministry of complaint (Spills Action Centre, 416-325-3000).
- Notify the Town of Caledon of complaint.
- Conduct a Facility inspection and, if needed, off-site inspection to determine the source of the dust and whether the dust is still causing an issue.
- Carry out fugitive dust mitigation procedures, if needed, and summarize the measures that were taken in the complaint record.

## 4.3 Training

Site personnel and contractors will be informed about the requirements of this Plan. The Senior Management Representative will administer training prior to working on the property, so that staff have reviewed this document and activities on site are carried out in such a way to minimize dust. Training records specific to this Plan will be kept with all other training records. Appendix D contains information sheets that can be displayed around the site identifying the relevant controls associated with different activities.

# 5 CHECK

## 5.1 Maintenance Procedures and Inspections

As per section 3.2.2, all Site Personnel and/or Contractors should monitor the Facility for dust emissions/generation on a daily basis. Records of dust observations shall be noted on the Dust Control Inspection Form in Appendix B. If Site Personnel and/or Contractors observe high dust emissions/generation, the following steps will be taken:

- notify owner of high dust emissions/generation;
- owner to complete entry in Non-Conformance Log (Appendix B);

- owner to determine and implement the necessary corrective action.

In addition to the schedule in procedure above with respect to dust observations, a weekly inspection will be conducted by the Owner using the Dust Control Inspection Form in Appendix B. If the Owner observes a non-conformance, the following steps will be taken:

- owner to complete entry in Non-Conformance Log (Appendix B);
- owner to determine and implement the necessary corrective action.

## 5.2 Record Keeping Practices

The Facility retains copies of maintenance and inspection records in the onsite filing system. Examples of the dust control logs can be found in Appendix B.

The records should be stored in the Facility's on-site filing system.

## 5.3 Monitoring

An air quality monitoring plan (Appendix E) has been developed for the Site, which includes both upwind and downwind monitoring of dust concentrations during operations.

# 6 ACT

The following will trigger reviews and updates, if needed, of this Plan:

- When there are significant changes in the Facility processes or equipment that introduce potential dust emission sources.
- When there are verified repetitive complaints associated with dust emissions from the Facility.
- When there are noticeable dust emissions occurring and/or an increased dust level (excluding seasonal conditions).

# 7 LIMITATIONS

In preparing this fugitive dust BMPP, WSP has relied on information provided by CBM regarding proposed Pit / Quarry procedures, as well as information on proposed Pit / Quarry operations and equipment.

**Standard of Care**: WSP Canada inc. (WSP) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

**Basis and Use of the Report**: This fugitive dust BMPP was prepared for the exclusive use of CBM. The BMPP is based on discussions with CBM about Facility practices, fugitive dust sources and review of information provided by CBM. This BMPP cannot account for changes in Facility conditions and operational practices completed after it has been finalized.

The information, recommendations and opinions expressed in this report are for the sole benefit of CBM, subject to the limitations and purposes described herein. Use of or reliance on this report by others is prohibited and is without responsibility to WSP. The report, all plans, data, drawings and other documents as well as all electronic media prepared by WSP are considered its professional work product and shall remain the copyright property of WSP. If CBM gives, lend, sell, or otherwise make available the report or any portion thereof to any other party, it

does so at its own risk and liability. CBM acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore CBM cannot rely upon the electronic media versions of WSP's report or other work products.

When evaluating the Facility and developing this report, WSP has relied on information provided by CBM, the regulatory authorities, and others. WSP has acted in good faith and accepts no responsibility for any deficiencies, misstatements, or inaccuracies contained in this report resulting from omissions, misinterpretations or falsifications by those who provided WSP with information.

Physical sampling of atmospheric emission sources was not completed as part of the scope of work.

# Signature Page

**WSP Canada Inc.**

Bonnie Field, BSc, BASc, PEng
*Senior Air Quality Engineer*

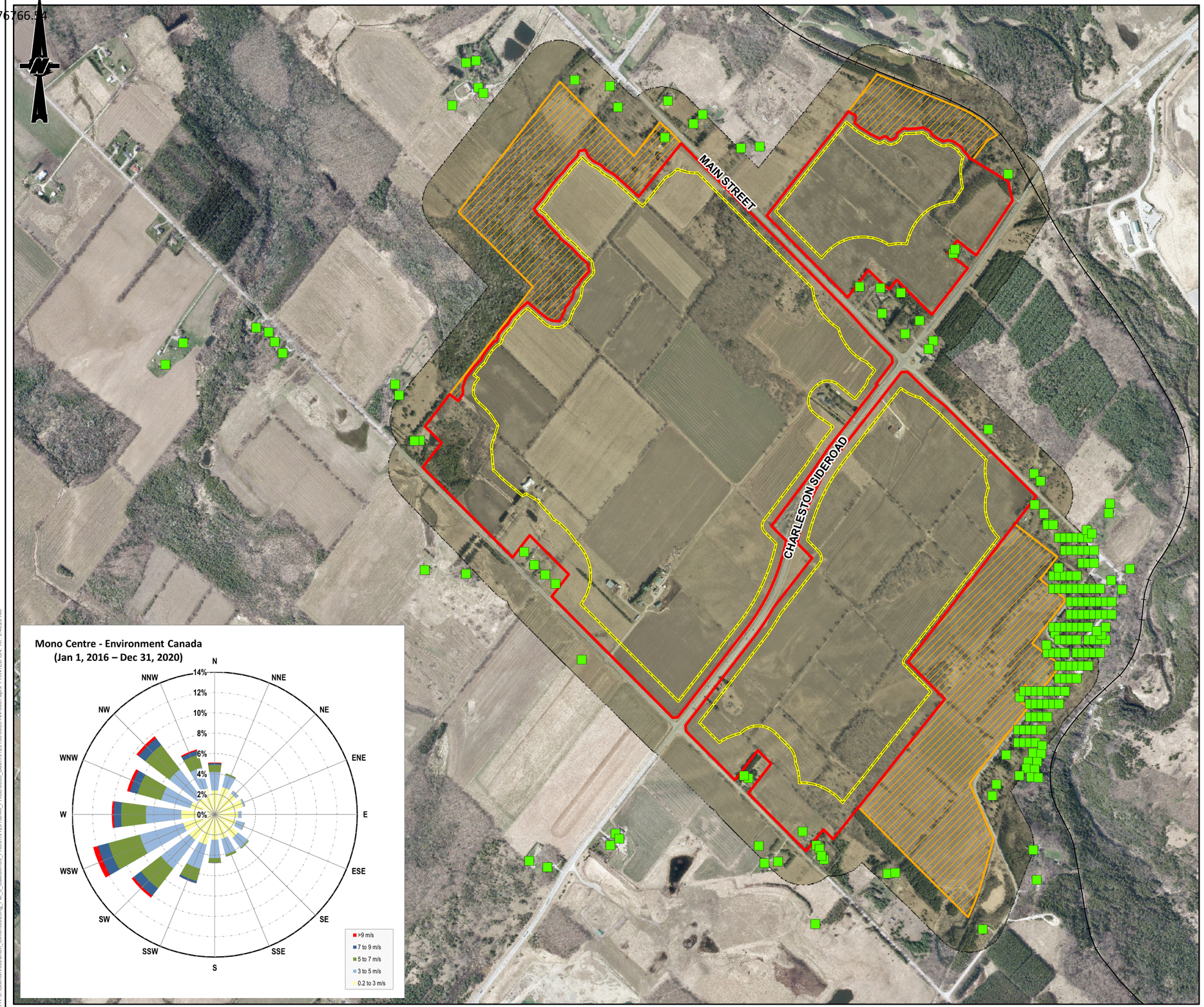
Katie Armstrong, BSC, MSc
*Associate Director, Air Quality*

SLC/BF/KSA/sg/mp

https://wsponline.sharepoint.com/sites/gld-114392/project files/6 deliverables/ph 3200-air quality/bmpp/2025 update/02 may 2025/19129150-r-rev1-vcna caledon dust bmpp-27may2025.docx

# FIGURES

576766.54







**LEGEND**

- RECEPTOR LOCATION
- LIMIT OF EXTRACTION
- MEASUREMENT LOCATION
- POINTS OF RECEPTION
- LICENCE BOUNDARY
- ADDITIONAL LANDS OWNED / CONTROLLED BY CBM

0 500 1,000

1:12,500 METRES

**REFERENCE(S)**

1. BASE DATA MNRF LIO OBTAINED 2020
2. IMAGERY FIRSTBASE SOLUTIONS SPRING 2021, SPRING 2019 (15CM RESOLUTION) AND WORLD TOPOGRAPHIC MAP: CITY OF BRAMPTON, REGION OF PEEL, PROVINCE OF ONTARIO, ONTARIO MNR, ESRI CANADA, ESRI, HERE, GARMIN, USGS, NGA, EPA, USDA, NPS, AAFC, NRCAN
   WORLD IMAGERY: DUFFERIN COUNTY, PEEL REGION, MAXAR
3. LICENSE AND EXTRACTION LIMIT PROVIDED BY MHBC IN JUNE 2023.
4. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA).

PROJECT
CALEDON PIT / QUARRY

TITLE
**SITE LOCATION PLAN AND WIND ROSE**

CONSULTANT

wsp

| | |
|---|---|
| YYYY-MM-DD | 2024-07-16 |
| DESIGNED | CGE |
| PREPARED | CGE |
| REVIEWED | KA |
| APPROVED | HM |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 19129150 | 0035 | 0.0 | 1 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: S:\Clients\Votorantim_Cimentos\Long_Par_5_Caledon\99_PRO\19129150\40_PROD\0035_Dust\19129150-0035-RN-0001.aprx PRINTED ON: AT: 9:48:20 AM

**APPENDIX A**

# Fugitive Dust Risk Management Tool

| Description of the structure / equipment | Category | 1<br>Frequency of process / activity that generates fugitive dust: | 2<br>Position of the source related to sensitive areas (e.g.: communities, working areas): | 3<br>Predominant wind direction is from the source to the closest sensible area? | 4<br>Relative amount of visible dust generated in the process / activity: | 5<br>Dust composition | 6<br>Dust size range (higher mass percentage) | 7<br>Is there some wind barrier (e.g.: trees, buldings, landscape) which can prevent the emissions from this source to reach the closest sensitive area? | 8<br>Is there some measure applied on regular basis to prevent dust emission from this source (preventative)? | 9<br>Is there some measure applied to this source to reduce dust emission once it occur (reactive)? | 10<br>Is there some monitoring procedure applied to this source related to fugitive dust control? | 11<br>Monitoring data / information trigger some control measure? | Risk<br>Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worst Case Scenario | Unpaved road / area | Continuous | Close | Yes | High | No metals | Fine | No | No | No | No | No | 100 |
| Unpaved Areas | Unpaved road / area | Continuous | Medium | Yes | Medium | No metals | Medium | Yes | Yes | Yes | Yes | Yes | 45 |
| Material Handling - Working Face | Material transfer (drop | Intermitent | Medium | Yes | Medium | No metals | Medium | Yes | Yes | No | Yes | Yes | 25 |
| Material Handling - Processing Plant | Material transfer (drop | Intermitent | Medium | No | Medium | No metals | Medium | Yes | Yes | No | Yes | Yes | 11 |
| Stockpiles | Material stockpile | Continuous | Medium | No | Medium | No metals | Medium | Yes | Yes | No | Yes | Yes | 22 |
| Extraction | Process | Sporadic | Close | No | High | No metals | Medium | No | No | No | Yes | Yes | 27 |
| Processing | Process | Intermitent | Medium | No | Medium | No metals | Fine | Yes | Yes | No | Yes | Yes | 18 |

**APPENDIX B**

# Sample Dust Control Logs

## Dust Control Inspection Form

**Date:**

**Inspector Name:**

***Weekly Inspection***

| **Unpaved Roadways** | | | | |
|---|---|---|---|---|
| **Inspection Items** | **Response** | **Requirement** | **Conformance (Y or N)** | **Description of Non-Conformance** |
| Is visible dust observed from any section of roadway? | | N | | |
| Are appropriate load sizes maintained on haul vehicles? | | Y | | |
| Are roadways well maintained? (ie good housekeeping) | | Y | | |
| Has the watering log been maintained? | | Y | | |
| Has the non-conformance log been maintained? | | Y | | |
| Have previous non-conformances been rectified? | | Y | | |

| **Material Handling / Storage** | | | | |
|---|---|---|---|---|
| Please list all areas that were inspected: | | | | |
| Indicate which areas were not inspected, if any, and the reason why an inspection was not completed. | | | | |
| **Inspection Items** | **Response** | **Requirement** | **Conformance (Y or N)** | **Description of Non-Conformance** |
| Is visible dust observed from any material handling location? | | N | | |
| Are low drop heights maintained? | | Y | | |
| Are material handling locations well maintained? (i.e. good housekeeping) | | Y | | |
| Has the activity log been maintained? | | Y | | |
| Has the non-conformance log been maintained? | | Y | | |
| Have previous non-conformances been rectified? | | Y | | |

## Dust Control Inspection Form

**Date:**

**Inspector Name:**

***Weekly Inspection***

| **Processing Plant** | | | | |
|---|---|---|---|---|
| Please list all areas that were inspected: | | | | |
| Indicate which areas were not inspected, if any, and the reason why an inspection was not completed. | | | | |
| **Inspection Items** | **Response** | **Requirement** | **Conformance (Y or N)** | **Description of Non-Conformance** |
| Is visible dust observed from the processing plant? | | N | | |
| Are the spray bars operational on the crushers and screens? | | Y | | |
| Is the processing equipment/area well maintained? (i.e. good housekeeping) | | Y | | |
| Has the activity log been maintained? | | Y | | |
| Has the non-conformance log been maintained? | | Y | | |
| Have previous non-conformances been rectified? | | Y | | |

*All non-conformances must be documented in the Non-Conformance Log*

**Inspector Sign Off:** _____

# Material Handling and Storage
# Dust Control Activity Log

| Site Area | Date | Description of Activity | Start Time | End Time | Employee Name | Employee Signature |
|---|---|---|---|---|---|---|
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# Unpaved Roads
# Watering Log

| Section of Roadway (Source ID) | Date | Description of Watering (Equipment used, amount of water applied) | Start Time | End Time | Operator Name & Company | Company Sign Off |
|---|---|---|---|---|---|---|
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# Non - Conformance Log

| Date | Time | Inspector Name | Potential or Actual Non-Conformance | | Cause | Action | Recommendation | Corrective Action Sign Off |
|---|---|---|---|---|---|---|---|---|
| | | | Location / Source ID | Activity / Process / Condition | | | | |
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**APPENDIX C**

# Complaint Response Form

# Dust Complaint Form

**Date:**

**Time:**

| **Complainant Information** | |
|---|---|
| Name | |
| Address | |
| Contact Number | |
| Callback completed (if required) | |

| **Complaint Details** | |
|---|---|
| Date and time of dust event | |
| Description of dust event<br>(describe where dust was detected, amount of dust, wind direction and any other items to help characterize the event) | |
| Summary of measures taken to address complaint: | |

**APPENDIX D**

# Information Sheets

# DUST CONTROL MEASURES AND PREVENTATIVE PROCEDURES - UNPAVED AREAS

| Preventative Procedures / Control Measure | Description | Frequency |
|---|---|---|
| Watering | Water shall be applied as a dust suppressant during non-freezing conditions. | At least 2 litres/$m^2$/hour |
| Application of Chemical Dust Suppressants | Chemical dust suppressants shall be applied during freezing conditions (temperatures less than 4ºC) | As required, during winter season |
| Speed Limits | Speed limits of less than 25 km/hour shall reduce speed and dust production. | Permanent control |
| Re-grading | Applying coarser material to surface of roadways. | Annually in Spring and whenever necessary as determined through visual monitoring |

# DUST CONTROL MEASURES AND PREVENTATIVE PROCEDURES - MATERIAL HANDLING AND STOCKPILES

| Preventative Procedures / Control Measure | Description | Frequency |
|---|---|---|
| Stockpile Placement | Stockpiles shall be placed below grade where possible to minimize wind erosion. | Continual |
| Maintain Minimum Drop Height | Material shall be dropped from the shortest possible distance<br>If material is on the ground, it shall be pushed up with a loader to prevent the material from being dropped. | Continual |
| Good Housekeeping | Minimize dust accumulation in material handling areas, reducing the probability of re-entrainment and generation of fugitive dust emissions. | Continual |
| Cease Activity | Material handling activities shall be stopped in high wind conditions. | When sustained winds are greater than 40 km/hr |
| Progressive Rehabilitation | Stockpiles shall be developed in stages and the pit / quarry progressively closed off (i.e., capped) to minimize the area susceptible to wind erosion. | Continual |

# DUST CONTROL MEASURES AND PREVENTATIVE PROCEDURES - EXTRACTION

| Preventative Procedures / Control Measure | Description | Frequency |
|---|---|---|
| Location | Blasting shall be completed below grade reducing the susceptibility of emitting fugitive dust. | Continual |
| Procedure | Drills equipped with dust suppression systems shall be used at all times. | Continual |
| Cease Activity | Drilling and blasting activities shall be stopped in high wind conditions. | When sustained winds are greater than 40 km/hr |

# DUST CONTROL MEASURES AND PREVENTATIVE PROCEDURES - MATERIAL PROCESSING

| Preventative Procedures / Control Measure | Description | Frequency |
|---|---|---|
| Equipment placement | Permanent equipment shall be located below grade as early as possible to reduce the susceptibility to wind erosion. | Continual |
| Maintain Minimum Drop Height | Material shall be dropped from the shortest possible distance. | Continual |
| Spray bars | Crushers and screens shall be equipped with spray bars to reduce fugitive dust generation | Continual |
| Good Housekeeping | Dust accumulation on equipment and in material processing areas shall be minimized, reducing the probability of re-entrainment and generation of fugitive dust emissions. | Continual |
| Cease Activity | Material processing activities shall be stopped in high wind conditions. | When sustained winds are greater than 40 km/hr |

**APPENDIX E**

# Air Quality Monitoring Plan

**REPORT**

# Air Quality Monitoring Plan

Proposed Caledon Pit / Quarry

Submitted to:

**CBM Aggregates (CBM), a Division of St Marys Cement Inc. (Canada)**

55 Industrial Steet, Toronto, ON, M4G 3W9

Submitted by:

**WSP Canada Inc.**

6925 Century Avenue, Suite #600, Mississauga, L5N 7K2

+ 1-905-567-4444

CA0037598.7018

May 2025

# Distribution List

1 e-copy: CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

1 e-copy: WSP Canada Inc.

# Document Version Control

This Air Quality Monitoring Plan (AQMP) has been prepared for CBM Aggregates (CBM), a Division of St Marys Cement Inc. (Canada) to describe the monitoring program to be implemented for the proposed Caledon Pit / Quarry operations in Caledon, Ontario (the Pit / Quarry). The AQMP should be reviewed periodically and updated if required. Therefore, it is necessary to have appropriate version control. This version control will allow facility personnel and compliance auditors to track and monitor changes to the AQMP over time.

| Version | Date | Revision Description | Prepared By | Reviewed By (Facility Contact) |
|---|---|---|---|---|
| 1.0 | May 2025 | Original document | WSP Canada Inc. | M. L |
| | | | | |
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# Table of Contents

## TABLES



## FIGURES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AAQC | Ontario Ambient Air Quality Criteria |
| AQMP | Air Quality Monitoring Plan |
| AQMS | Canada-Wide Air Quality Management System |
| CAAQS | Canadian Ambient Air Quality Standards |
| CCME | Canadian Council of Ministers of the Environment |
| ECCC | Environment and Climate Change Canada |
| L/min | Litres Per Minute |
| MECP | Ontario Ministry of the Environment, Conservation and Parks |
| NIST | National Institute of Standards and Technology |
| $PM_{10}$ | Particulate Matter less than 10 micrometres in diameter |
| $PM_{2.5}$ | Particulate Matter less than 2.5 micrometres in diameter |
| QA / QC | Quality Assurance / Quality Control |
| SPM | Suspended Particulate Matter |
| TSP | Total Suspended Particulate |
| US EPA | United States Environmental Protection Agency |
| $\mu g/m^3$ | Microgram per Cubic Metre |

# 1 INTRODUCTION AND OBJECTIVE

This Air Quality Monitoring Plan (AQMP) has been prepared to describe the dust monitoring program in support of the proposed Caledon Pit / Quarry operations (including development) located in the vicinity of Charleston Sideroad and Main Street / Regional Road 136 in Caledon, Ontario (the Site).

CBM Aggregates, a Division of St Marys Cement Inc. (CBM) submitted an application under the *Planning Act* and *Aggregate Resources Act* for a new pit/quarry operation at the Site. As part of this application, and since late 2021, continuous particulate monitoring has been undertaken at the proposed Site to establish existing conditions.

The objective of the dust monitoring program outlined in this AQMP is to establish air concentrations of particulate during pit / quarry operations. This program will add a downwind monitor at the Site in addition to using the existing monitor currently installed at the Site (as an upwind location), for a total of two monitors at the Site.

# 2 SCOPE AND CONTENT

The Ministry of the Environment, Conservation, and Parks (MECP) Operations Manual for Air Quality Monitoring in Ontario last updated in November 2023 (hereafter referred to as the MECP Operations Manual) is the accepted guidance for establishing and operating an ambient air quality network.

The following are the required elements of the AQMP:

- Purpose or objectives of the monitoring program;
- Expected duration of the monitoring program;
- Identified and suspected air emission sources;
- Identified and suspected receptors;
- Number and location of monitoring sites (including meteorological sites);
- Air quality parameters to be monitored and the monitoring frequency;
- Monitoring methods / instruments to be used;
- Analytical methods / procedures and laboratory services support to be used;
- Quality assurance / quality control (QA / QC) plan; and
- Data reporting procedures.

# 3 EXPECTED DURATION OF AIR MONITORING PROGRAM

The monitoring will commence at the start of the pit/quarry operations (including Site development) and continue through operations unless otherwise warranted.

# 4 AIR EMISSION SOURCES

Ambient air quality at the proposed Site is influenced by natural and anthropogenic sources at the local and regional scales. Natural sources would include, but not be limited to, pollen from vegetation during spring and summer months. Anthropogenic sources include road traffic along nearby roads, building heating, wind-blown particulate from exposed area sources, air emissions from regional industrial facilities, and contributions from

transboundary or long-range transport of air contaminants. Local sources would mainly be other mineral aggregate operations and agricultural operations with potential for fugitive dusts.

The Site operations are expected to include site preparation, extraction, processing, rehabilitation and offsite transport of aggregate. Drilling and blasting will be used to extract material, and the extracted material will be transported from the extraction face by haul trucks to a crushing plant. Initially a mobile crushing plant will be used at grade until there is sufficient space below grade for a permanent plant. Processed material will be stored in various stockpiles before being shipped off-site. These operations all have the potential to generate fugitive dusts.

# 5 POTENTIAL RECEPTORS

# 6 SENSITIVE RECEPTORS NEAR THE SITE INCLUDE RURAL RESIDENCES AS SHOWN IN FIGURE 3FIGURE 3. LOCAL METEOROLOGY

Data from Environment and Climate Change Canada's Mono Centre Station (ID: 6157000; 23 km to the north) has been summarized in Figure 1.

Also provided as Figure 2 is a wind rose with the June to September winds depicted as the late spring and summer are generally associated with higher fugitive dust emissions. Winds are most frequent coming from the northwest to the southwest with a similar trend during June to September, although winds are typically weaker in the summer.

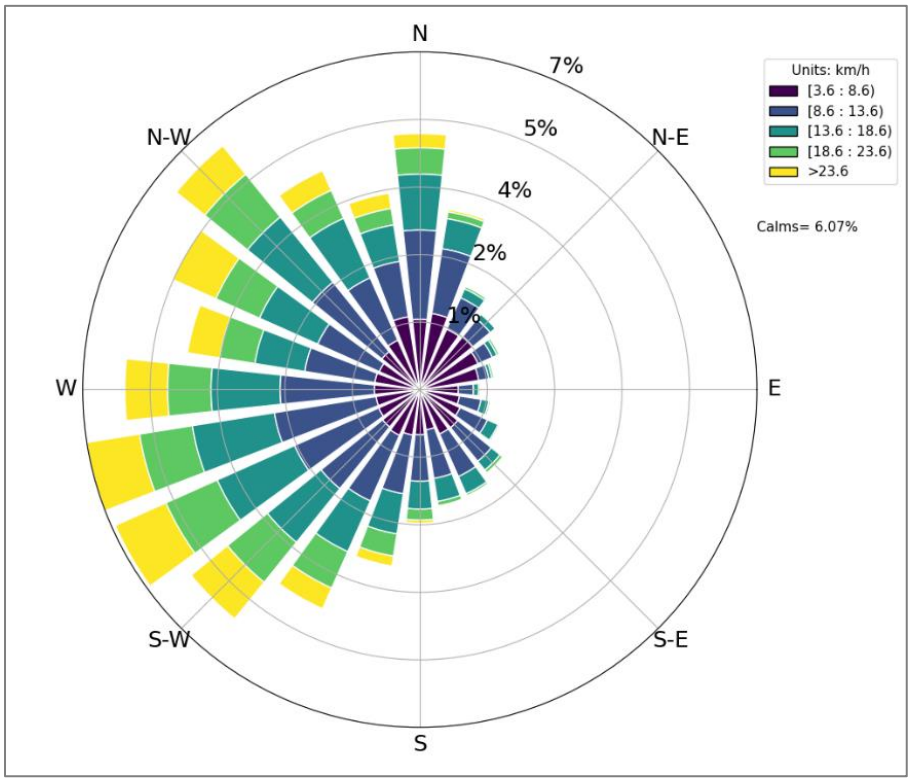



**Figure 1: Wind Rose (MONO CENTRE; 2019-2023)**

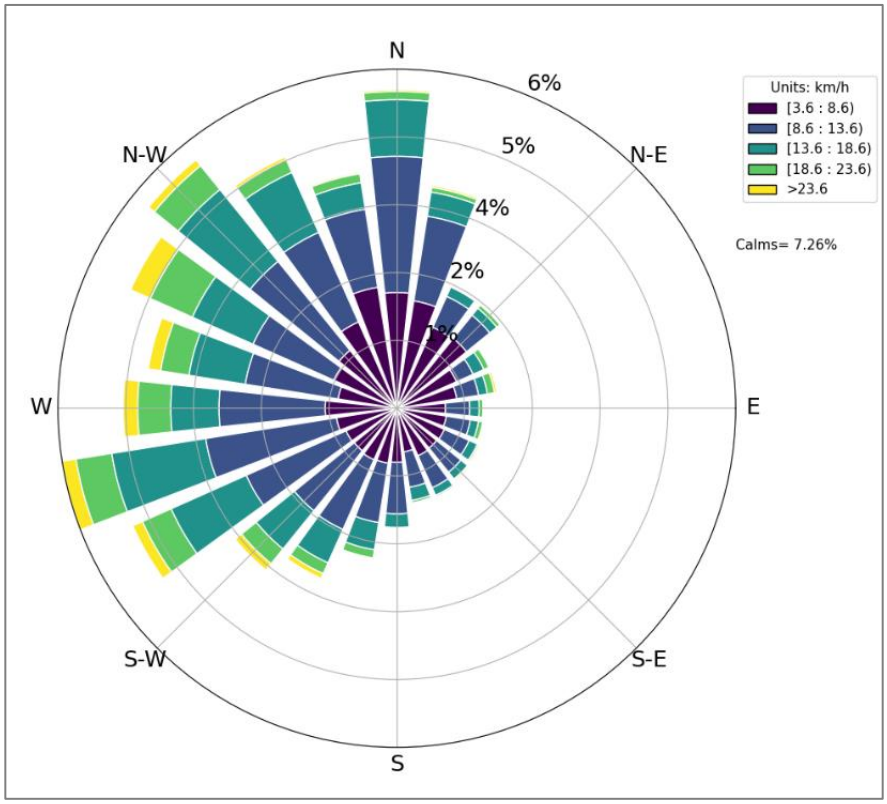



**Figure 2: Wind Rose (MONO CENTRE; 2019-2023) - June 1st to September 30th**

# 7 TARGET CONTAMINANTS AND MONITORING

The following relevant air contaminants are expected from the Project and will be measured as part of this monitoring program:

- Suspended Particulate Matter (SPM);
- Particulate Matter less than 2.5 micrometres in diameter ($PM_{2.5}$); and
- Particulate Matter less than 10 micrometres in diameter ($PM_{10}$).

## 7.1 Suspended Particulate Matter

SPM is particulate in the atmosphere comprised of either solid particles or fine liquid droplets (aerosols). Included in this group are aerosols, smoke, fumes, dust, fly ash and pollen. SPM aerosols may include nitrates, sulphates, elemental carbon, organic carbon compounds, acid aerosols, trace metals and other components. Some of the aerosols are formed in the atmosphere from gaseous combustion by-products such as volatile organic compounds (VOCs), oxides of sulphur ($SO_X$) and oxides of nitrogen ($NO_X$).

For the Site, natural sources such as pollen, and anthropogenic sources such as road dust and other activities associated with construction may contribute to SPM concentrations.

Real-time measurements of total suspended particulate matter (TSP; a surrogate for SPM) concentrations will be carried out. An Aeroqual Dust Sentry Pro will be used for continuous monitoring of TSP which uses an optical particle counter. The Dust Sentry Pro samples at a rate of 1 litre per minute (L/min) at a height of about 2 metres. The sampler records data every ten minutes and is automatically upload via cellular modem to a data server.

## 7.2 Particulate Matter <10 Micrometres

$PM_{10}$ is defined as particulate less than 10 µm and is also called “inhalable particulate”. In addition to nuisance effects, there are possible health effects that may be attributed to $PM_{10}$ and the MECP’s interim AAQC is based upon these potential health effects.

The main source of $PM_{10}$ on-Site is fugitive dusts generated from open sources that are susceptible to air dispersion. Sources of fugitive dust include unpaved roadways, aggregate storage piles, and quarrying activities.

Real-time measurements of $PM_{10}$ concentration will be carried out. An Aeroqual Dust Sentry Pro will be used for continuous monitoring of $PM_{10}$ which uses an optical particle counter. The Dust Sentry Pro samples at a rate of 1 L/min at a height of about 2 metres. The sampler records data every ten minutes and is automatically upload via cellular modem to a data server.

### 7.2.1 Co-location

Discrete measurements using a collocated sampler will act as a quality assurance / control measure for the “near-reference” real time monitor.

The discrete $PM_{10}$ concentrations will be measured using a BGI PQ200, as per a method cited on the US EPA List of Designated Reference and Equivalent Methods (US EPA 2024) and approved for use by the MECP in the Operations Manual (MECP 2023). This method uses gravimetric analysis to quantify the $PM_{10}$ collected on a filter that is located downstream of a size-selective inlet.

The $PM_{10}$ sampler is fitted with a Teflon™ filter, the detection limit of this method is approximately 1.2 µg/m³ which is more than a factor of 10 lower than the CAAQS of 27 µg/m$^3$.

## 7.3 Particulate Matter <2.5 Micrometres

$PM_{2.5}$ is defined as particulate less than 2.5 µm. Due to the small particle size, $PM_{2.5}$ acts similar to a gas, can transport long distances and have regional impacts. Sources include power generation, industrial processes, and other combustion activities. $PM_{2.5}$ can also be formed in the atmosphere through secondary reactions involving $NO_X$, sulphur dioxide ($SO_2$), VOCs, and other atmospheric constituents.

Real-time measurements of $PM_{2.5}$ concentration will be carried out. An Aeroqual Dust Sentry Pro will be used for continuous monitoring of $PM_{2.5}$ which uses an optical particle counter. The Dust Sentry Pro samples at a rate of 1 L/min at a height of about 2 metres. The sampler records data every ten minutes and is automatically uploaded via cellular modem to a data server.

# 8 REGULATORY CRITERIA AND GUIDELINES

Ontario Ambient Air Quality Criteria (AAQCs) are used to assess general (ambient) air quality resulting from sources of a contaminant to air. AAQCs are most commonly used in environmental assessments, special studies using ambient air monitoring data, assessment of general air quality in a community, annual reporting on air quality across the province, and are the most appropriate criteria for this program. AAQC are not regulatory values but are protective against adverse effects on health and/or the environment.

In addition to provincial legislation, the Canadian Council of Ministers of the Environment (CCME) implemented the Canada-Wide Air Quality Management System (AQMS) in 2013 which has been supported by the Ontario government. Through the AQMS, Canadian Ambient Air Quality Standards (CAAQS) have been set for $PM_{2.5}$ and Ontario defaults to the CAAQS for $PM_{2.5}$ as the applicable Ambient Air Quality Criteria.

The relevant ambient air quality criteria are presented in Table 1 for each contaminant.

**Table 1: Summary of Ambient Air Quality Monitoring Program Criteria and Methods**

| Parameter | Ambient Air Quality Criteria (µg/m³) | Averaging Time | Method |
|---|---|---|---|
| SPM | 120 | 24-hour | ▪ “Near-reference” real-time monitor |
| | 60 | Annual (Geometric Mean) | ▪ “Near-reference” real-time monitor |
| $PM_{10}$[(1)] | 50 | 24-hour | ▪ “Near-reference” real-time monitor<br>▪ PQ200 discrete reference monitor |
| $PM_{2.5}$ | 27 | 24-hour | ▪ “Near-reference” real-time monitor |
| | 8.8 | Annual | ▪ “Near-reference” real-time monitor |

Notes: [1] Interim AAQC

# 9 MONITORING STATION LOCATIONS

The preferred locations of the air monitoring stations will be selected:

- To meet the requirements of the MECP Operations Manual where possible;
- Where consistent and safe access is available;
- To approximate the upwind and downwind directions; and
- In consideration of the findings of the Air Quality Impact Assessment (WSP, 2023).

Figure 3 provides a general location for the proposed upwind and downwind locations based on the early phases (approximately Years 1 to 10) of pit / quarry development and operations with Year 1 being initial stripping of topsoil.

Figure 3 shows the Site licence boundary (red line), limit of extraction (yellow line), and sensitive receptors (green squares). Based on siting requirements, two areas are delineated for an upwind (existing) and downwind monitor. Specific locations shall be specified closer to the commencement of monitoring with a preference of siting the

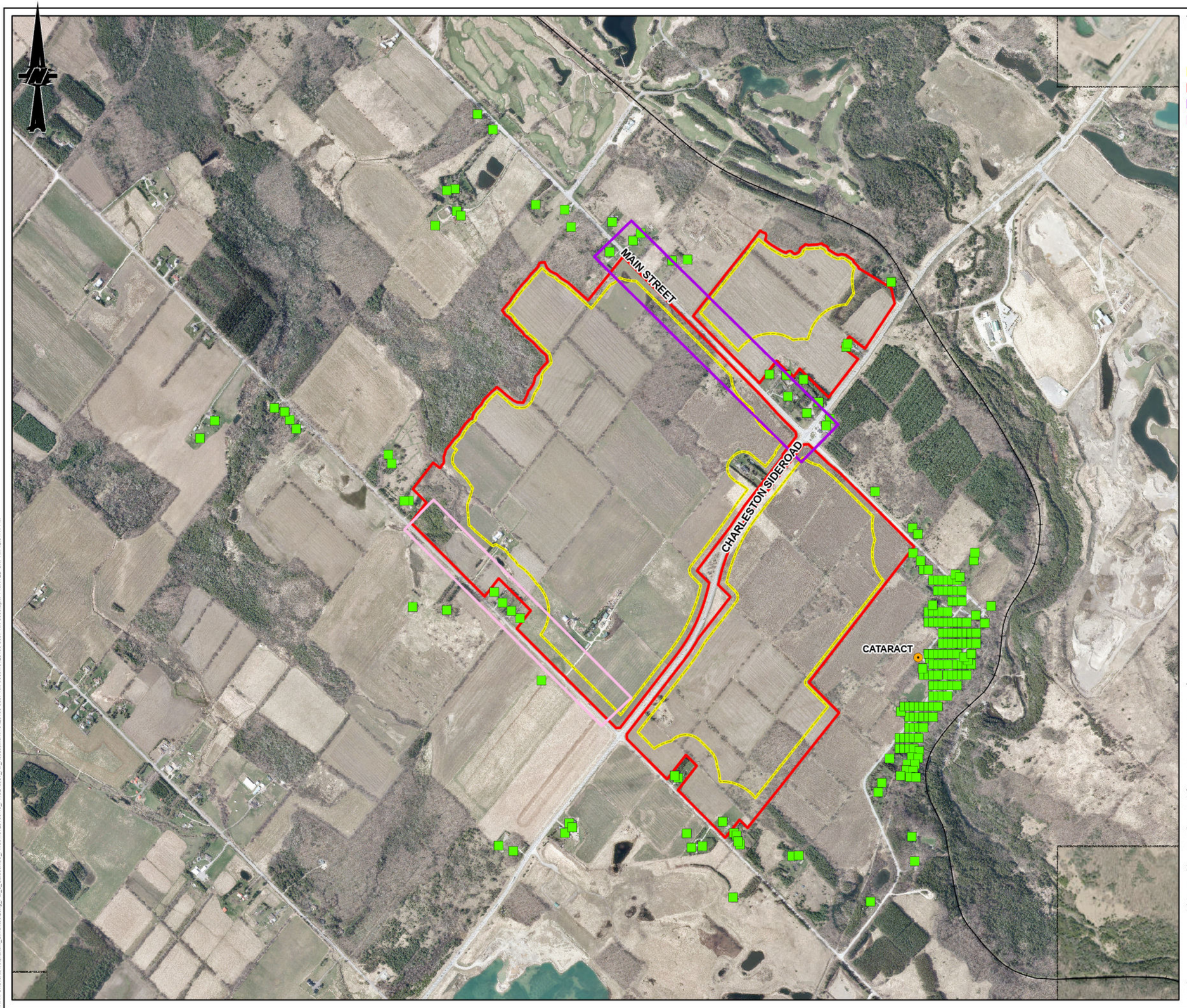
downwind location near 18722, 18659, or 18473 Regional Road 136 where highest concentrations were generally predicted by the Air Quality Impact Assessment (WSP, 2023).

The upwind monitoring location should be at the location where the existing air quality monitor is installed at the Site, or, if it needs relocation to accommodate Project operations, the upward monitoring location should be at a location north of Regional Road 24 on the northeast side of Mississauga Road (Figure 3).

The suggested number and location of monitors are based on the earlier phases of the quarry operations and locations should be updated periodically to adequately cover the operations.

**Table 2: Location of Monitoring Stations and Monitoring Contaminants**

| Station | UTM Coordinates NAD83, Zone 17T | | Parameters to be Measured |
|---|---|---|---|
| | N (m) | E (m) | |
| Station 1 (Upwind) | TO BE DETERMINED CLOSER TO WORKS | TO BE DETERMINED CLOSER TO WORKS | SPM, $PM_{10}$, $PM_{2.5}$ |
| Station 2 (Downwind) | TO BE DETERMINED CLOSER TO WORKS | TO BE DETERMINED CLOSER TO WORKS | SPM, $PM_{10}$, $PM_{2.5}$ |




**LEGEND**

- TOWN/VILLAGE
- RECEPTOR LOCATION
- LIMIT OF EXTRACTION
- LICENCE BOUNDARY
- PROPOSED SITING FOR AIR QUALITY MONITOR - DOWNWIND
- PROPOSED SITING FOR AIR QUALITY MONITOR - UPWIND

0 500 1,000

1:15,000 METRES

**REFERENCE(S)**

1. BASE DATA MNRF LIO OBTAINED 2020
2. IMAGERY FIRSTBASE SOLUTIONS SPRING 2021, SPRING 2019 (15CM RESOLUTION) AND WORLD TOPOGRAPHIC MAP: CITY OF BRAMPTON, REGION OF PEEL, ONTARIO BASE MAP, PROVINCE OF ONTARIO, ONTARIO MNR, ESRI CANADA, ESRI, © OPENSTREETMAP CONTRIBUTORS, HERE, GARMIN, USGS, NGA, EPA, USDA, NPS, AAFC, NRCAN WORLD IMAGERY: DUFFERIN COUNTY, PEEL REGION, MAXAR
3. SITE TOPOGRAPHIC DATA - SPRING 2021, FIRSTBASE SOLUTIONS, 2021
4. LICENSE AND EXTRACTION LIMIT PROVIDED BY MHBC IN JUNE 2023.
5. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA).

PROJECT

CALEDON PIT / QUARRY

TITLE

**LOCATION OF PROPOSED MONITORING STATIONS AND SENSITIVE RECEPTORS**

CONSULTANT

wsp

| | |
|---|---|
| YYYY-MM-DD | 2025-05-27 |
| DESIGNED | CGE |
| PREPARED | CGE |
| REVIEWED | SC |
| APPROVED | HM |

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# 10 AIR SAMPLING EQUIPMENT AND MONITORING PROGRAM

## 10.1 Particulate Matter

A “near-reference” Optical Particle Counter, demonstrating good precision and accuracy in the field when calibrated against reference methods, will be used to collect real-time SPM, $PM_{10,}$ and $PM_{2.5}$ data at Stations 1 and 2. The unit operates as a sampling rate of 1.0 L/min. The operation, service and maintenance procedures detailed in the manual provided by the equipment manufacturer will be followed.

See Figure 4 for a depiction of similar sampling equipment.

### 10.1.1 Correlation Factor

Field calibration of Aeroqual instruments with particulate matter monitoring modules is recommended for applications that have very high data quality needs.

Discrete measurements of $PM_{10}$ using a collocated PQ200 sampler at each station will be undertaken. The PQ200 samples at a flow rate of 16.7 L/min.

A correlation factor will be calculated and applied to the Dust Sentry Pro instrument Gain.

## 10.2 Meteorological Station

One of the Dust Sentry Pro Stations will be fitted with a Vaisala weather sensor to provide local wind speed, wind direction, and temperature data. A summary of the ambient air quality sampling methods is provided in Table 1.

**Figure 4: PQ200 and Aeroqual Monitor**

# 11 DATA MANAGEMENT AND REPORTING

## 11.1 Data Validation

### Discrete Samplers

Data validation for the discrete samples ($PM_{10}$) will be carried out when the results are reported by the laboratory, and will include, at minimum, verification that the sample volume collected is within 10% of the target sample volume (24 actual $m^3$), that the Laboratory Certificate of Analysis and Chain of Custody forms are in agreement, there are no signs of sample spoiling (i.e., missing filter pieces, droppings, etc.), and the data are reasonable (e.g. investigate and verify extreme values).

### Real-time Samplers

Data validation for the “near-reference” real-time sampler will include validation against a reference or equivalent method. Regular monitoring of concentrations and investigations into suspect data will be undertaken as applicable. Maintenance schedules, as provided by the manufacturer, will be followed.

## 11.2 Data Reporting

Quarterly reports summarizing the monitoring data and meteorological data will be issued to CBM.

# 12 LABORATORY SERVICES

The laboratory that will conduct sample analyses has not yet been selected. The certifications and accreditations will be confirmed prior to commencing the monitoring program to ensure that the laboratory is appropriately accredited, and this Plan will be subsequently updated.

# 13 QA/QC PROTOCOLS

The ambient AQMP will be carried out in accordance with defined QA / QC protocols in order to adhere to the basic elements outlined in the MECP Operations Manual, which include:

- Strategic site selection to minimize interferences and obstacles that may affect airflow;
- Sampling system requirements;
- Site and analyzer operation;
- Frequency of PQ200 flow checks and equipment calibrations;
- Performance and system audits;
- Field calibration of real-time samplers as required;
- Data validation, editing, and reporting;
- Documentation of field notes; and
- Personnel training.

One blank 47 mm filter will be submitted to the laboratory for analysis with the PQ200 samples.

# 14 REFERENCES

Canadian Council of Ministers of the Environment (CCME). 2014. State of the Air Report. http://airquality-qualitedelair.ccme.ca/en/ (Accessed March, 2021)

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2023. Operations Manual for Air Quality Monitoring in Ontario.

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2024. Standards Development Branch, Ontario's Ambient Air Quality Criteria, Updated May 2020. (ISBN: 978-1-4868-4498-2)

United Station Environmental Protection Agency (EPA). 2024. List of Designated Reference and Equivalent Methods.

WSP Canada Inc (WSP). 2023. Air Quality Impact Assessment – Proposed Caledon Pit / Quarry (Revised July 2023)

# Signature Page

**WSP Canada Inc.**

Caleb Vandenberg, PEng
*Senior Air Quality Engineer*

Ryan Fletcher, PEng
*Senior Air Quality Engineer*

CV/RF/mp

https://wsponline.sharepoint.com/sites/gld-114392/project files/6 deliverables/ph 3200-air quality/aqmp/ca0037598.7018_cbm_draft aqmp_20may2025.docx

wsp.com