Operation and Maintenance Plan

St. Marys Cement U.S. LLC

Charlevoix, Michigan

Project No. 180985
December 2018




Fishbeck, Thompson, Carr & Huber, Inc.
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As Required by the National Emission Standards for Hazardous Air Pollutants for the
Portland Cement Manufacturing Industry
40 CFR Part 63, Subpart LLL
(PC MACT)

Prepared For:
St Marys Cement U.S. LLC
Charlevoix, Michigan

December 2018
Project No. 180985

39500 MacKenzie Drive, Suite 100
Novi, Michigan 48377
248.324.2090
www.ftch.com
Fishbeck, Thompson, Carr & Huber, Inc.
engineers I scientists I architects I constructors

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List of Abbreviations/Acronyms

AQD	Air Quality Division of the MDEQ
$CaCO_3$	calcium carbonate
CaO	calcium oxide
$Ca(OH)_2$	calcium hydroxide
$CaSO_3$	calcium sulfite
$CaSO_4$	calcium sulfate
CO_2	carbon dioxide
CO	carbon monoxide
CFR	Code of Federal Regulations
COMS	continuous opacity monitoring system
CEMS	continuous emissions monitoring system
CMPS	continuous parameter monitoring system
CKD	cement kiln dust
DAA	dry absorbent addition
°C	degrees Celsius
°F	degrees Fahrenheit
FG	Flexible Group
FGD	flue gas desulfurization
FTCH	Fishbeck, Thompson, Carr & Huber, Inc.
gpm	gallon(s) per minute
HAP	hazardous air pollutant
KG	Kiln Group
MACT	Maximum Achievable Control Technology
MAP	Malfunction Abatement Plan
MDEQ	Michigan Department of Environmental Quality
MMBtu/hr	million British thermal units per hour
NESHAP	National Emissions Standard for Hazardous Air Pollutants
NO_X	nitrogen oxides
OMP	Operations and Maintenance Plan
PC	Portland cement
PM	particulate matter
PM_{10}	fine particulate matter less than 10 microns
$PM_{2.5}$	fine particulate matter less than 2.5 microns
PTI	Permit to Install
QC/QC	Quality Assurance/Quality Control (Plan)
ROP	Renewable Operating Permit
SMC	St. Marys Cement U.S. LLC
SNCR	selective non-catalytic reduction
SO_2	sulfur dioxide
SOP	Standard Operating Procedure
SSM	Startup, Shutdown, Malfunction (Plan)
TAC	toxic air contaminant
VE	visible emission(s)
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 Introduction

The air quality regulatory requirements applicable to St Marys Cement U.S. LLC (SMC) are consolidated in ROP No. MI-ROP-B1559-YEAR and PTI Nos. 140-15 and 115-15 issued by the MDEQ-AQD and include the NESHAP for the Portland Cement Manufacturing Industry (PC MACT) and other applicable requirements. Emission units subject to the PC MACT must develop an OM Plan, including:

- Preventive Maintenance for each control device
- Corrective Action Procedures for the CPMS associated with control devices on the clinker cooler
- Corrective Actions associated with excess opacity identified when performing Method 9 readings
- Fugitive Dust Control Measures associated with the storage of clinker in outdoor piles

This Plan applies to control devices associated with the emission units included in:

- Raw Material Feed
- In-Line Kiln/Raw Mill System
- Storage Equipment for Raw Material, Clinker, & Finished Product
- Clinker Handling Systems
- Clinker Cooler
- Finish Grind System
- Conveying System Transfer Points (Including Coal Handling)
- Truck and Ship Bulk Load-Out Systems

In accordance with Michigan Air Pollution Control Rules 910 and 911, MAP information has also been included in this document, as the requirements of these Rules overlap with PC MACT OM Plan requirements. Additional operating requirements intended to limit emissions during startups and shutdowns are also included. It should be noted that, as described in 40 CFR 63.1348(d), SMC has a responsibility to minimize emissions during the operation of all emission units and corresponding air pollution control and monitoring equipment. In following the plant's SOPs, SMC will ensure compliance with its air permit.

2.0 Process Description

2.1 Source Ownership and Permitting

Facility Name: St. Marys Cement U.S. LLC

Facility Address: 16000 Bells Bay Road
Charlevoix, Michigan 49720

Permitting: ROP: MI-ROP-B1559-YEAR
PTIs: 140-15 and 115-15
SRN: B1559

2.2 Plant Description

SMC operates a Portland cement manufacturing facility located in Charlevoix, Michigan. This site covers approximately 1,370 acres and has been in operation since 1966. The plant operates on dry process rotary kiln, which typically operates 24 hours per day, 7 days a week. The kiln is rated at 6,000 tons of clinker per day or 1.927 million tons per year. The fuel for the kiln is a combination of coal, petroleum coke, alternative fuels and propane. Raw materials, including various materials from onsite and offsite sources, are ground and mixed to

produce the final product. The majority of raw materials are obtained from SMC onsite quarrying operations; all offsite materials are brought to the site by trucks and ships/barges.

The site includes: the quarry operations, conveying and storage systems for raw materials, systems for grinding and blending the raw materials, a preheater tower, a kiln, a clinker cooler, clinker conveying, storage, and grinding, cement storage systems, and shipping facilities.

Particulate from the kiln process is controlled by baghouses on both the main and bypass exhaust systems. Dust collectors, engineered controls, and/or dust suppression systems have been installed at various locations throughout the facility to control particulate matter from other processes. An SNCR system is used to control NO_X emissions from the in-line kiln.

3.0 Visible Emissions and Opacity Monitoring

Several emission units are subject to VE and opacity monitoring as described in 40 CFR 63.1350(f); an excerpt from this rule is included as Appendix 1. The PC MACT requires opacity monitoring using a combination of USEPA Reference Method 22 and Method 9 for emission units that are not using COMS to demonstrate compliance with the applicable opacity standard. A list of emission units subject to this opacity monitoring, along with the frequency of monitoring required for each is included as Appendix 2. A copy Method 22 is included as Appendix 3, though a non-certified reading simply involves observing the emission source and noting whether VEs are present (yes/no). The monthly VE readings are performed by the Environmental Manager or their designee.

3.1 Monthly Method 22 Visible Emissions Readings

Monthly VE readings, using the USEPA Method 22, of 40 CFR Part 60, Appendix A, are required for affected sources with limitations on opacity under 40 CFR 63.1350. SMC performs the required monthly VE readings to determine if there are VEs present. Example Method 22 forms used by SMC for these monthly visible emission readings are included as Appendix 4.

The affected sources at SMC are:

- Each raw material, clinker, or finished product storage bin
- Each conveying system transfer point
- Each bagging system
- Each bulk loading or unloading system
- Each existing raw material dryer

The monthly VE readings must be 10 minutes in duration. The PC MACT allows for reducing the frequency of observations from an affected source from monthly to semiannually if no VEs are observed for 6 consecutive monthly tests. The frequency of observation can be further reduced from semiannually to annually if no VEs are observed during the semiannual test for the affected source. If VEs are observed during any of the semiannual or annual observations, the SMC must resume monthly observations until no VEs are observed for six consecutive monthly tests.

In addition, for any affected source for which VEs are observed, SMC must initiate corrective action(s) within one hour, as specified in the SMC SOPs.

3.2 Follow-Up Method 9 Visible Emissions Readings

When VEs are observed during any of the required readings, an additional Method 9 reading must be taken within 1-hour of the VE observation, unless the system is taken out of service. A Method 9 Observation Form must be completed by a certified reader; an example of this Form is included as Appendix 5.

3.3 Raw Mill or Finish Mill Visible Emission Readings

Daily VE readings, using Method 22, are required for the raw mill and finish mills. Specifically, this applies to the mill sweep and air separator particulate matter control device of these affected sources. The mill sweep and air separator must be operating at their representative performance conditions. The readings must be six minutes in duration. If the shift supervisor sees VE more than 10% opacity at the discharge of the finish mill dust collector, they will initiate the corrective action of shutting down the source of the discharge and generating a Work Order to have Maintenance inspect and repair the offending dust collector. If the opacity is less than 10%, the finish mill may continue to operate; however, a Work Order will be generated to have Maintenance investigate the cause of the opacity at the next available routine maintenance down day. Under no condition, other than safety, will the mill be allowed to operate if the opacity exceeds 10% opacity. These SOPs meet and exceed the requirements set forth in 40 CFR 63.1350(a)(2).

If VE are detected, then the following will be performed by SMC:

- Within one hour the corrective actions specified in the SMC SOPs will be initiated.
- Within 24 hours after the end of a Method 22 test in which VE were detected, a follow-up Method 22 reading will be performed. If there are VEs detected during this subsequent reading, a follow-up Method 9 reading will be performed.

3.4 In-Line Kiln System Visible Emissions Monitoring

Both the main stack and bypass stack each have a certified COMS. The VE limit for the in-line kiln system is 10%. If there is a reading above this limit, SMC will implement corrective actions in accordance with their SOPs.

4.0 In-Line Kiln Combustion System Inspection

4.1 Combustion System Overview

The in-line kiln combustion system consists of one burner for the rotary kiln and two injection ports for the pre-calciner. The calciner also preheats the raw feed prior to its entering the rotating kiln. The calciner provides longer internal retention time to use lower volatility fuels, such as pet coke, and an increased rate of alternative fuels. The increased residence time will also allow the operation to consume the fuels in a lower oxygenated state, thus minimizing the formation of NO_X. The burners are capable of burning multiple fuels, which consist of propane (used for an initial cold start of the kiln system for preheating), fuel oil, recycled used oil, pet coke, and coal, as well as alternative fuels. Each fuel has a delivery system for transporting the fuel from onsite storage to the kiln and pre-calciner. Propane is stored in pressurized tank(s); fuel oil and recycled used oil are stored in dedicated tanks; pet coke and coal are stored outside in separate piles. The propane and fuel oils have their own piping and delivery systems in which these fuels are delivered directly to the in-line kiln system's burners. The pet coke and coal are transported via loaders to conveying systems, pulverized, and then transported to the solid fuel storage silos. The solid fuels are then swept from the storage silos into piping that feeds to the in-line kiln system burners.

The burner systems include fuel injection into the kiln and pre-calciner, with combustion air added to ensure proper combustion of the fuels.

When work has been performed on the refractory for the typical in-line kiln system, the startup sequence begins with firing propane gas, followed by oil firing, and then, when the system approaches normal operating temperature, solid fuels begin to be fired. If there has been no work done on the in-line kiln system, the typical startup procedure begins with oil firing, and then proceeds directly to solid fuel firing when the system approaches normal operating temperature.

4.2 Burner Descriptions

The rotary kiln is equipped with an indirect firing system for solid fuels. With the indirect firing system, the solid fuels are first pulverized, transferred to a storage silo, from which the pulverized solid fuel is metered into the kiln combustion burner at a controlled rate. This eliminates the extra air that was conventionally blown in and reduces the amount fuel required per ton of clinker production.

The pre-calciner burner system also incorporates an indirect firing system for solid fuels, similar to the rotary kiln. The calciner provides adequate residence time to burn lower volatile fuels. Calcination removes the carbon and most of the oxygen from the limestone (the molecular formula for limestone [or calcium carbonate] is $CaCO_3$) that results in CaO with CO_2 driven off through the in-line kiln system exhaust gas system.

4.3 Burner Inspection Procedures

Table 1 describes the process that SMC uses to inspect the kiln system's combustion system each year. This is required by 40 CFR 63.1347(a)(3).

Table 1 – Annual Inspection of Kiln Combustion System

Item	Inspection Method
Solid Fuel-Firing Systems	Trained technicians will inspect system and replace excessively worn parts as needed.
Fueling Nozzles	Trained technicians check for wear and replace as needed.
Infiltration (pre-heater/ calciner systems)	Inspect ports, flanges, and expansion joints for fresh air infiltration in the pre-heater/calciner tower.

5.0 OM Plan Requirements

SMC emission units subject to the PC MACT are subject to the OM Plan requirements as outlined in 40 CFR 63.1347; an excerpt from this rule is included in Appendix 6. SMC is required to establish procedures to ensure proper operation of the affected emission sources and associated air pollution control equipment as well as corrective actions, including fugitive dust control measures for open clinker piles. Specific procedures are included in plant SOPs, the MAP, and the SSM Plan.

Corrective Actions to be taken when VE is observed are described in Section 3.0 – *Visible Emissions and Opacity Observations*.

Procedures to be used during an inspection of the components of the combustion system of the in-line kiln raw mill are described in Section 4.0 - *In-Line Kiln Combustion System Inspection*.

Operation and maintenance of the continuous emissions monitoring systems are described in the CEMS QA/QC Plan.

The following sections describe proper operation and maintenance of the affected source and air pollution control devices required to meet the emissions operating limits, including periods of startup and shutdown.

6.0 Maintenance of Affected Emission Units and Associated Emission Control Systems

SMC operates emission units and their associated air pollution control devices in the following areas that are regulated under the PC MACT:

- Raw Material Feed
- In-Line Kiln/Raw Mill System
- Storage Equipment for Raw Material, Clinker, & Finished Product
- Clinker Handling Systems
- Clinker Gravity Cooler
- Finish Grind System
- Conveying System Transfer Points (Including Coal Handling)
- Truck and Ship Bulk Load-Out Systems

SMC has developed SOPs to ensure proper operation of these systems and compliance with applicable emission limits. These SOPs explain proper emission unit operation and are used for job-specific training. Copies of these procedures are available to plant operators. In addition, copies of these procedures are available in the plant's Environmental Department.

A separate plan has been developed that addresses all startup, shutdown, and malfunction events (the SSM Plan), which is incorporated by reference into this OM Plan.

Proper maintenance of affected equipment is also essential to achieving compliance with the applicable emission limits. All maintenance activities, included maintenance required on air pollution control equipment, is scheduled through Route Orders issued via the facility's electronic Maintenance Management System for scheduling and recording routine maintenance tasks. Upon completion of the Route Order, the paperwork is returned to the Maintenance Clerk and the Work Order is closed out as part of the maintenance process. An example of a Route Order is attached as Appendix 7.

Table 2 describes emission units, controls, and monitoring used by SMC.

Table 2 – Emission Units, Controls, and Monitoring

Emission Unit/Flexible Group	Controls	Pollutant	Emission Limit	Monitoring
EUSOLIDFUELSYSTEM: Solid fuel processing mill to allow for a higher throughput for processing properly sized solid fuels due to increased production capacity. The processed fuel will then be transported to the existing two solid fuel storage silos	Fabric filter baghouse	Opacity PM PM_{10} $PM_{2.5}$	0% 0.010 gr/dscf 3.93 pph 1.86 pph	BLDS
EUINLINEKILN: The in-line raw mill kiln system uses a proportioning system for grinding and mixing sources of iron, silica, calcium, and alumina. These raw materials are added to the raw mill where the material is ground, and heated creating a kiln feed mixture, which is conveyed to EUBLENDSILO for blending and storage. Kiln Feed is transferred from EUBLENDSILO via the kiln feed belt scale, elevator, and fed to upper stages of the pre-heating tower. The kiln feed is calcined in the preheater tower; the source of heat for this reaction is generated in both the calciner and kiln, the kiln is the location where the feed is heated to a point where the calcined feed is melted and then cooled to start the formation of clinker. A tertiary duct transfers hot exhaust gases from the clinker cooler to the calciner portion of the preheater tower. Control equipment associated with in-line kiln system includes conditioning towers prior to downstream equipment (for modulating temperatures), SNCR, the main stack baghouse, bypass stack baghouse, and other smaller baghouses. The calciner and kiln have been designed to use traditional solid and liquid fuels and various alternative fuels including asphalt flakes, plastic and small quantities of cellulose fibers.	Conditioning towers prior to downstream equipment (for modulating temperatures), SNCR, the main stack baghouse, bypass stack baghouse and other smaller baghouses	Opacity PM PM_{10} $PM_{2.5}$ NO_X SO_2 Hg D/F HCl THC (OHAP)	10% 0.25 lb/1,000 lb exhaust gas 0.07 lb/ton Clinker 57.5 pph 57.5 pph 700 pph 2.8 lb/ton clinker (30-day) 2.4 lb/ton clinker (annual) 1,175 pph 106 lb/yr 0.2 ng/dscm (TEQ) corrected to 7 percent oxygen 3 ppm dry @ 7% O2 24 ppm dry @ 7% O2 (12 ppm dry @ 7% O2)	COMs, CPMS NO_X FTIR CEMS, SO_2 FTIR CEMS, Hg Sorbent Trap System, Temperature Monitoring System FTIR CEMs FID CEMS

Table 2 – Emission Units, Controls, and Monitoring

Emission Unit/Flexible Group	Controls	Pollutant	Emission Limit	Monitoring
EUCLINKERCOOL: The new clinker cooler consists of equipment associated with the cooling of clinker and the treatment of the cooler gases, including: clinker cooler, clinker heat exchanger, and baghouse.	Fabric filter baghouse	Opacity PM PM_{10} $PM_{2.5}$	10% 0.02 lb/ton clinker 5.0 pph 5.0 pph	VE CPMS
FGFINISHMILLS (1-3): This Flexible Group deals with pulverizing the clinker after it has left the kiln and cooling area. The clinker is ground in the mills, which are horizontal steel tubes filled with steel balls. As the tubes rotate, the steel balls tumble and crush the clinker into a superfine gray powder known as Portland cement. A small amount of gypsum is added during the final grinding to control the set upon use of the cement.	Fabric filter baghouses	Opacity	10%	VE
EUFINISHMILL4: Horizontal finish mill used to grind clinker with gypsum and other additives to produce cement products.	Fabric filter baghouse	Opacity PM PM_{10} $PM_{2.5}$	10% 0.25 lb/1,000 lb exhaust gas 6.24 pph 6.24 pph	VE
FGNONKILNFACILITY: This flexible group covers handling the materials, gases, fuels, and dust associated with the production of cement. Included are limestone, bottom ash, fly ash, sand, clinker cooler gases, coal, pet coke, and the finished cement product.	Fabric filter baghouses	Opacity PM $PM_{10}/PM_{2.5}$	10% 0.15 lb/1,000 lb exhaust gas Baghouse dependent	VE

7.0 Maintenance

SMC has prepared a MAP. The MAP satisfies the maintenance requirements of 40 CFR 63.1347(a) for the affected sources subject to the requirements of the PC MACT at SMC. The MAP is incorporated by reference into this OM Plan.

8.0 Startup Shutdown Plan

SMC has prepared a SSM Plan. The SSM Plan satisfies the maintenance requirements of 40 CFR 63.1347(a)(1) for the affected sources subject to the requirements of the PC MACT at SMC. The SSM Plan is incorporated by reference into this OM Plan.

9.0 Record Keeping/Reporting

9.1 Record Keeping

Monitoring, burner inspections, and VE observation records will be maintained for a period of five years, with the most recent two years to be kept onsite. The remaining three years may be kept offsite.

9.2 Reporting

SMC will report any instances where they have failed to comply with this OM Plan in their semiannual reporting, as required by 40 CFR 63.1354(9)(v).

Furthermore, 40 CFR 63.10(d)(3) requires reporting the results of any opacity or VE observations within 30 days following the observation.

10.0 Outdoor Storage of Clinker

The PC MACT requires that this OM Plan address the outdoor open storage of clinker, in particular:

- Fugitive dust emission control measures for open clinker storage piles
- Location of current and future clinker storage piles

In general, SMC has not, stored clinker in outdoor open clinker storage piles and has no intention of doing so in the future. Clinker is stored indoors within the Clinker Storage Domes. It should be noted that storage of uncovered clinker outdoors for up to three days and then covered is considered *temporary storage* and would not trigger the requirements of this Plan.

In the event that SMC needs to store clinker outside for brief periods due to lack of space in the Clinker Storage Domes because of shipping delays caused by weather conditions, SMC will take the following measures to ensure minimize fugitive emissions:

Location. Clinker will be stored on the ground in an area that provides the best protection from wind; it will be covered within the three days after the pile is created. When reclaiming this pile, the cover may be removed over parts of the pile that are actively being reclaimed.

Transportation. Clinker will generally be loaded into trucks inside the Clinker Storage domes but may be loaded outside when loading in domes is not feasible.

Staging Area. At times the clinker will be staged on the ground near the Clinker Domes to facilitate transfer to silos and to minimize transportation and handling.

Dust Suppression. Dust suppressants around the clinker storage area and on the roads will be used as needed.

During transportation and storage of clinker, SMC takes every reasonable precaution to ensure that fugitive emissions are minimized. Qualified observers are available to oversee the movement of clinker and any activity that causes excess emissions will be stopped immediately. The importance of proper dust control will be stressed to the qualified observers and all plant staff involved in the project.

11.0 Periodic Review and Update of This Plan

The Environmental Manager (or a designated representative) will review this document once every five years for adequacy and to ensure it remains current. Documentation of any Review or Update will be retained in Environmental Department files for 5years in accordance with the ROP. The Environmental Manager (or a designated representative) will update this Plan if deficiencies are identified. A copy of this plan will be submitted with each ROP Renewal Application.

12.0 Combined OM MAP Revision History

	Revision	Date	Purpose
0.	Original Document	2009	Required by ROP
1.	Complete Revision/New Formatting	2018	Plant Upgrades

Figures

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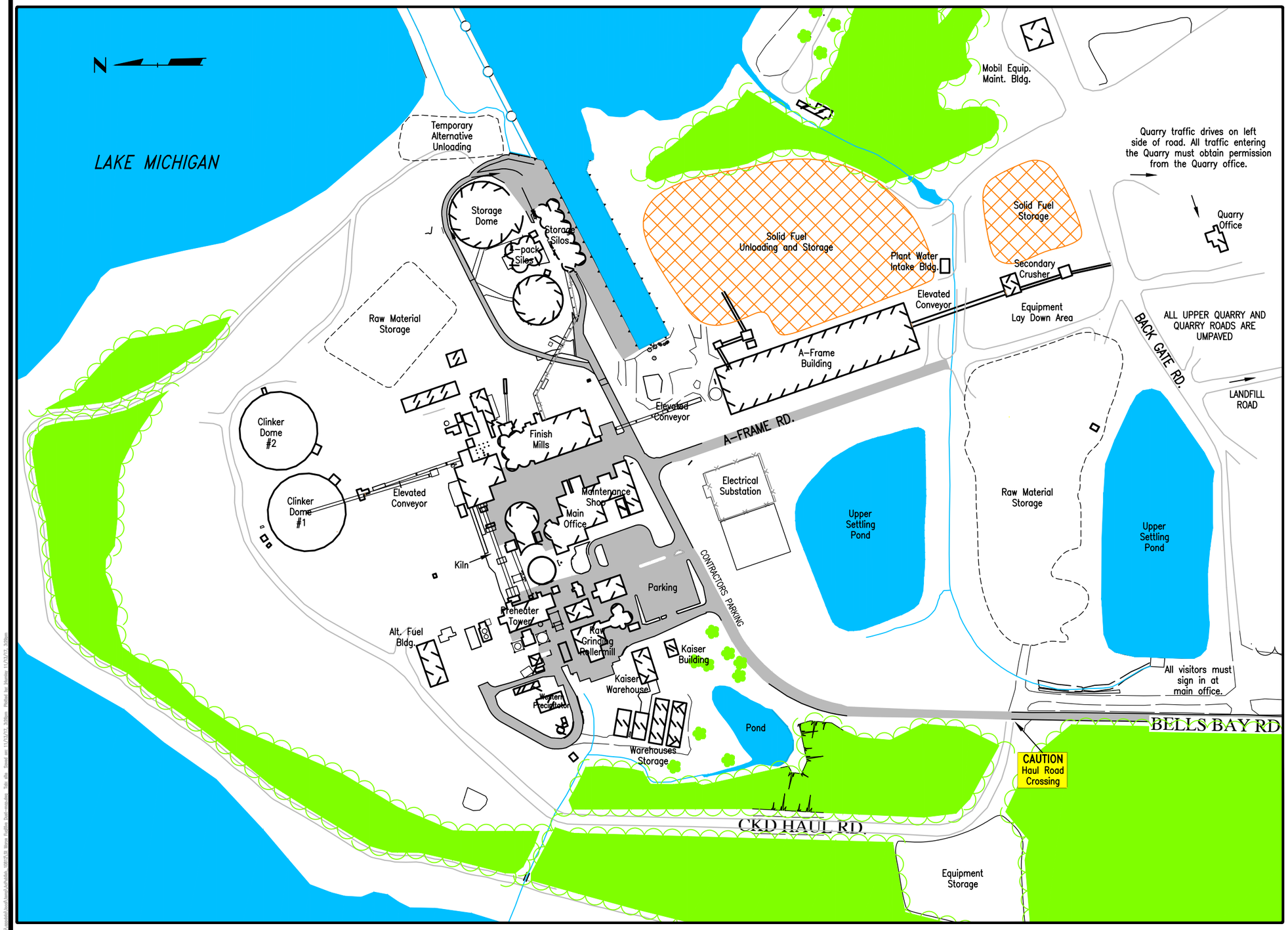
CHARLEVOIX PLANT FUGITIVE DUST PLAN SITE MAP



GENERAL LEGEND

- STRUCTURES
- WATER
- TREES / WOODED
- PAVED SURFACE
- UNPAVED SURFACE
- FUEL STORAGE

REVISED: 11/13/2017

Appendix 1

APPENDIX 1
Visible Emissions and Opacity Requirements Included in the PC MACT

***63.1350(f) Opacity monitoring requirements**. If you are subject to a limitation on opacity under §63.1345, you must conduct required opacity monitoring in accordance with the provisions of paragraphs (f)(1)(i) through (vii) of this section and in accordance with your monitoring plan developed under §63.1350(p). You must also develop an opacity monitoring plan in accordance with paragraphs (p)(1) through (4) and paragraph (o)(5), if applicable, of this section.*

(1)

- *(i) You must conduct a monthly 10-minute visible emissions test of each affected source in accordance with Method 22 of appendix A-7 to part 60 of this chapter. The performance test must be conducted while the affected source is in operation.*
- *(ii) If no visible emissions are observed in six consecutive monthly tests for any affected source, the owner or operator may decrease the frequency of performance testing from monthly to semi-annually for that affected source. If visible emissions are observed during any semi-annual test, you must resume performance testing of that affected source on a monthly basis and maintain that schedule until no visible emissions are observed in six consecutive monthly tests.*
- *(iii) If no visible emissions are observed during the semi-annual test for any affected source, you may decrease the frequency of performance testing from semi-annually to annually for that affected source. If visible emissions are observed during any annual performance test, the owner or operator must resume performance testing of that affected source on a monthly basis and maintain that schedule until no visible emissions are observed in six consecutive monthly tests.*
- *(iv) If visible emissions are observed during any Method 22 performance test, of appendix A-7 to part 60 of this chapter, you must conduct 30 minutes of opacity observations, recorded at 15-second intervals, in accordance with Method 9 of appendix A-4 to part 60 of this chapter. The Method 9 performance test, of appendix A-4 to part 60 of this chapter, must begin within 1 hour of any observation of visible emissions.*
- *(v) Any totally enclosed conveying system transfer point, regardless of the location of the transfer point is not required to conduct Method 22 visible emissions monitoring under this paragraph. The enclosures for these transfer points must be operated and maintained as total enclosures on a continuing basis in accordance with the facility operations and maintenance plan.*
- *(vi) If any partially enclosed or unenclosed conveying system transfer point is located in a building, you must conduct a Method 22 performance test, of appendix A-7 to part 60 of this chapter, according to the requirements of paragraphs (f)(1)(i) through (iv) of this section for each such conveying system transfer point located within the building, or for the building itself, according to paragraph (f)(1)(vii) of this section.*
- *(vii) If visible emissions from a building are monitored, the requirements of paragraphs (f)(1)(i) through (f)(1)(iv) of this section apply to the monitoring of the building, and you must also test visible emissions from each side, roof, and vent of the building for at least 10 minutes.*

(2)

- *(i) For a raw mill or finish mill, you must monitor opacity by conducting daily visible emissions observations of the mill sweep and air separator PM control devices (PMCD) of these affected sources in accordance with the procedures of Method 22 of appendix A-7 to part 60 of this chapter. The duration of the Method 22 performance test must be 6 minutes.*

(ii) Within 24 hours of the end of the Method 22 performance test in which visible emissions were observed, the owner or operator must conduct a follow up Method 22 performance test of each stack from which visible emissions were observed during the previous Method 22 performance test.

(iii) If visible emissions are observed during the follow-up Method 22 performance test required by paragraph (f)(2)(ii) of this section from any stack from which visible emissions were observed during the previous Method 22 performance test required by paragraph (f)(2)(i) of the section, you must then conduct an opacity test of each stack from which emissions were observed during the follow up Method 22 performance test in accordance with Method 9 of appendix A-4 to part 60 of this chapter. The duration of the Method 9 test must be 30 minutes.

(3) If visible emissions are observed during any Method 22 visible emissions test conducted under paragraphs (f)(1) or (2) of this section, you must initiate, within one-hour, the corrective actions specified in your operation and maintenance plan as required in §63.1347.

(4) The requirements under paragraph (f)(2) of this section to conduct daily Method 22 testing do not apply to any specific raw mill or finish mill equipped with a COMS or BLDS.

(i) If the owner or operator chooses to install a COMS in lieu of conducting the daily visible emissions testing required under paragraph (f)(2) of this section, then the COMS must be installed at the outlet of the PM control device of the raw mill or finish mill and the COMS must be installed, maintained, calibrated, and operated as required by the general provisions in subpart A of this part and according to PS-1 of appendix B to part 60 of this chapter.

(ii) If you choose to install a BLDS in lieu of conducting the daily visible emissions testing required under paragraph (f)(2) of this section, the requirements in paragraphs (m)(1) through (m)(4), (m)(10) and (m)(11) of this section apply.

Appendix 2

APPENDIX 2

List of Emission Units and Monitoring Frequency

Check Is Source Operating? (Y/N)	Month / Year: **Sept/2018** Emission Point Name	Initial upon Completion	Length of Method 22 reading	Max Opacity	Length of Method 9 reading	Within X hours
	Quarry (road / piles)		1 min	5%	6 min	1
	Rock Hammer (Primary)		1 min	15%	6 min	1
	Secondary Crusher		1 min/30min	20%	6 min	1
	North SPL Tank BV		10 min	10%	30 min	1
	Roller Mill Bldg - West Side		10 min	10%	30 min	1
	Roller Mill Bldg - South Side		10 min	10%	30 min	1
	Roller Mill Bldg - East Side		10 min	10%	30 min	1
	Roller Mill Bldg - North Side		10 min	10%	30 min	1
	~ Roller Mill Bldg - Roof		10 min	10%	30 min	1
	RM transfer cartridge DC		10 min	10%	30 min	1
	Raw Meal Elev DC (shorter)		10 min	10%	30 min	1
	RM Elev to Elev transfer Cart. DC		10 min	10%	30 min	1
	Top of Blend Silo DC		10 min	10%	30 min	1
	Bottom of Blend Silo DC		10 min	10%	30 min	1
	2nd Floor Preheater DC		10 min	10%	30 min	1
	9th Floor Preheater DC		10 min	10%	30 min	1
	FF Coal Mill Bin Vent		10 min	10%	30 min	1
	IDF Coal Mill Bin Vent		10 min	10%	30 min	1
	Clinker Cooler DC		10 min	10%	30 min	1
	Clinker Apron Conv DC		10 min	10%	30 min	1
	Clinker Transfer lower DC		10 min	10%	30 min	1
	Clinker Transfer Upper DC		10 min	10%	30 min	1
	Dome #1 DC		10 min	10%	30 min	1
	Dome #2 DC		10 min	10%	30 min	1
	Old M3 DC (north)		10 min	10%	30 min	1
	New M3 DC (south)		10 min	10%	30 min	1
	* ^ Finish Mill Bldg - North Side		10 min	10%	30 min	1
	* % Finish Mill Bldg - West Side		10 min	10%	30 min	1
	* Finish Mill Bldg - South Side		10 min	10%	30 min	1
	* ! Finish Mill Bldg - East Side		10 min	10%	30 min	1
	* ~ Finish Mill Bldg - Roof		10 min	10%	30 min	1
	#1 12 pk Silo DC		10 min	10%	30 min	1
	#2 12 pk Silo DC		10 min	10%	30 min	1
	#3 12 pk Silo DC		10 min	10%	30 min	1
	1120 Elev DC		10 min	10%	30 min	1
	NEW 4 pk Silo DC		10 min	10%	30 min	1
	Old Cement Dome 100K DC		10 min	10%	30 min	1
	New Cement Dome 75K DC		10 min	10%	30 min	1
	12 Pack E & W Door -Shp Loading		10 min	10%	30 min	1
	12 Pack E & W Door -Trk Loading		10 min	10%	30 min	1

* All these DC/transfers are monitored via Finish Mill Bldg observation

% 40 belt to 315 belt transfer
! Clinker Silos 855B (discharge E)
%Clinker Silos 855C (west M40)
^Clinker Silos 855D (discharg N)
^FM #1 Clinker Feed DC
! FM #2 Clinker Feed DC - N
! FM #2 Clinker Feed DC - S
%FM #3 Clinker Feed DC - N
%FM #3 Clinker Feed DC - S

~ You must be in a position when doing the sides and roof to see all the vents.

Appendix 3

Method 22 - Visual Determination of Fugitive Emissions From Material Sources and Smoke Emissions From Flares

Note: This method is not inclusive with respect to observer certification. Some material is incorporated by reference from Method 9.

1.0 Scope and Application

This method is applicable for the determination of the frequency of fugitive emissions from stationary sources, only as specified in an applicable subpart of the regulations. This method also is applicable for the determination of the frequency of visible smoke emissions from flares.

2.0 Summary of Method

2.1 Fugitive emissions produced during material processing, handling, and transfer operations or smoke emissions from flares are visually determined by an observer without the aid of instruments.

2.2 This method is used also to determine visible smoke emissions from flares used for combustion of waste process materials.

2.3 This method determines the amount of time that visible emissions occur during the observation period (*i.e.*, the accumulated emission time). This method does not require that the opacity of emissions be determined. Since this procedure requires only the determination of whether visible emissions occur and does not require the determination of opacity levels, observer certification according to the procedures of Method 9 is not required. However, it is necessary that the observer is knowledgeable with respect to the general procedures for determining the presence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training is to be obtained from written materials found in References 1 and 2 or from the lecture portion of the Method 9 certification course.

3.0 Definitions

3.1 *Emission frequency* means the percentage of time that emissions are visible during the observation period.

3.2 *Emission time* means the accumulated amount of time that emissions are visible during the observation period.

3.3 *Fugitive emissions* means emissions generated by an affected facility which is not collected by a capture system and is released to the atmosphere. This includes emissions that (1) escape capture by process equipment exhaust hoods; (2) are emitted during material transfer; (3) are emitted from buildings housing material processing or handling equipment; or (4) are emitted directly from process equipment.

3.4 *Observation period* means the accumulated time period during which observations are conducted, not to be less than the period specified in the applicable regulation.

3.5 *Smoke emissions* means a pollutant generated by combustion in a flare and occurring immediately downstream of the flame. Smoke occurring within the flame, but not downstream of the flame, is not considered a smoke emission.

4.0 Interferences

4.1 Occasionally, fugitive emissions from sources other than the affected facility (*e.g.*, road dust) may prevent a clear view of the affected facility. This may particularly be a problem during periods of high wind. If the view of the potential emission points is obscured to such a degree that the observer questions the validity of continuing observations, then the observations shall be terminated, and the observer shall clearly note this fact on the data form.

5.0 Safety

5.1 Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all of the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to performing this test method.

6.0 Equipment

6.1 Stopwatches (two). Accumulative type with unit divisions of at least 0.5 seconds.

6.2 Light Meter. Light meter capable of measuring illuminance in the 50 to 200 lux range, required for indoor observations only.

7.0 Reagents and Supplies[Reserved]

8.0 Sample Collection, Preservation, Storage, and Transfer[Reserved]

9.0 Quality Control[Reserved]

10.0 Calibration and Standardization[Reserved]

11.0 Analytical Procedure

11.1 Selection of Observation Location. Survey the affected facility, or the building or structure housing the process to be observed, and determine the locations of potential emissions. If the affected facility is located inside a building, determine an observation location that is consistent with the requirements of the applicable regulation (*i.e.*, outside observation of emissions escaping the building/structure or inside observation of emissions directly emitted from the affected facility process unit). Then select a position that enables a clear view of the potential emission point(s) of the affected facility or of the building or structure housing the affected facility, as appropriate for the applicable subpart. A position at least 4.6 m (15 feet), but not more than 400 m (0.25 miles), from the emission source is recommended. For outdoor locations, select a position where the sunlight is not shining directly in the observer's eyes.

11.2 Field Records.

11.2.1 Outdoor Location. Record the following information on the field data sheet (Figure 22–1): Company name, industry, process unit, observer's name, observer's affiliation, and date. Record also the estimated wind speed, wind direction, and sky condition. Sketch the process unit being observed, and note the observer location relative to the source and the sun. Indicate the potential and actual emission points on the sketch.

11.2.2 Indoor Location. Record the following information on the field data sheet (Figure 22–2): Company name, industry, process unit, observer's name, observer's affiliation, and date. Record as appropriate the type, location, and intensity of lighting on the data sheet. Sketch the process unit being observed, and note the observer location relative to the source. Indicate the potential and actual fugitive emission points on the sketch.

11.3 Indoor Lighting Requirements. For indoor locations, use a light meter to measure the level of illumination at a location as close to the emission source(s) as is feasible. An illumination of greater than 100 lux (10 foot candles) is considered necessary for proper application of this method.

11.4 Observations.

11.4.1 Procedure. Record the clock time when observations begin. Use one stopwatch to monitor the duration of the observation period. Start this stopwatch when the observation period begins. If the observation period is divided into two or more segments by process shutdowns or observer rest breaks (see Section 11.4.3), stop the stopwatch when a break begins and restart the stopwatch without resetting it when the break ends. Stop the stopwatch at the end of the observation period. The accumulated time indicated by this stopwatch is the duration of observation period. When the observation period is completed, record the clock time. During the observation period, continuously watch the emission source. Upon observing an emission (condensed water vapor is not considered an emission), start the second accumulative stopwatch; stop the watch when the emission stops. Continue this procedure for the entire observation period. The accumulated elapsed time on this stopwatch is the total time emissions were visible during the observation period (*i.e.,* the emission time.)

11.4.2 Observation Period. Choose an observation period of sufficient length to meet the requirements for determining compliance with the emission standard in the applicable subpart of the regulations. When the length of the observation period is specifically stated in the applicable subpart, it may not be necessary to observe the source for this entire period if the emission time required to indicate noncompliance (based on the specified observation period) is observed in a shorter time period. In other words, if the regulation prohibits emissions for more than 6 minutes in any hour, then observations may (optional) be stopped after an emission time of 6 minutes is exceeded. Similarly, when the regulation is expressed as an emission frequency and the regulation prohibits emissions for greater than 10 percent of the time in any hour, then observations may (optional) be terminated after 6 minutes of emission are observed since 6 minutes is 10 percent of an hour. In any case, the observation period shall not be less than 6 minutes in duration. In some cases, the process operation may be intermittent or cyclic. In such cases, it may be convenient for the observation period to coincide with the length of the process cycle.

11.4.3 Observer Rest Breaks. Do not observe emissions continuously for a period of more than 15 to 20 minutes without taking a rest break. For sources requiring observation periods of greater than 20 minutes, the observer shall take a break of not less than 5 minutes and not more than 10 minutes after every 15 to 20 minutes of observation. If continuous observations are desired for extended time periods, two observers can alternate between making observations and taking breaks.

11.5 Recording Observations. Record the accumulated time of the observation period on the data sheet as the observation period duration. Record the accumulated time emissions were observed on the data sheet as the emission time. Record the clock time the observation period began and ended, as well as the clock time any observer breaks began and ended.

12.0 Data Analysis and Calculations

If the applicable subpart requires that the emission rate be expressed as an emission frequency (in percent), determine this value as follows: Divide the accumulated emission time (in seconds) by the duration of the observation period (in seconds) or by any minimum observation period required in the applicable subpart, if the actual observation period is less than the required period, and multiply this quotient by 100.

13.0 Method Performance[Reserved]

14.0 Pollution Prevention[Reserved]

15.0 Waste Management[Reserved]

16.0 References

1. Missan, R., and A. Stein. Guidelines for Evaluation of Visible Emissions Certification, Field Procedures, Legal Aspects, and Background Material. EPA Publication No. EPA–340/1–75–007. April 1975.

2. Wohlschlegel, P., and D.E. Wagoner. Guideline for Development of a Quality Assurance Program: Volume IX—Visual Determination of Opacity Emissions from Stationary Sources. EPA Publication No. EPA–650/4–74–005i. November 1975.

17.0 Tables, Diagrams, Flowcharts, and Validation Data

FUGITIVE OR SMOKE EMISSION INSPECTION
OUTDOOR LOCATION

Company Location Company Rep.	Observer Affiliation Date
Sky Conditions Precipitation	Wind Direction Wind Speed
Industry	Process Unit

Sketch process unit: indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS	Clock Time	Observation period duration, min:sec	Accumulated emission time, min:sec
Begin Observation			
End Observation			

Figure 22-1

FUGITIVE OR SMOKE EMISSION INSPECTION
INDOOR LOCATION

Company Location Company Rep.	Observer Affiliation Date
Industry	Process Unit

Light type (fluorescent, incandescent, natural)
Light location (overhead, behind observer, etc.)
Illuminance (lux or footcandles)
Sketch process unit: indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS	Clock Time	Observation period duration, min:sec	Accumulated emission time, min:sec
Begin			
End Observation			

Figure 22-2

Appendix 4

APPENDIX 4
Method 22 Forms

St Marys Cement Inc., Charlevoix Plant Method 22 Visual Emission Observations				
Initials:				
Stack Name:				
Date & Time:				
Wind Speed and Direction:				
Sky Condition:				
	0	15	30	45
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Did Stack Pass YES NO				

Make a Sketch, note your location to the source and the sun, make note of any emission points.

St Marys Cement Inc., Charlevoix Plant Method 22 Visual Emission Observations				
Initials:				
Stack Name:				
Date & Time:				
Wind Speed and Direction:				
Sky Condition:				
	0	15	30	45
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Did Stack Pass YES NO				

Make a Sketch, note your location to the source and the sun, make note of any emission points.

Monthly 10-minute visible emissions observations using USEPA Method 22 shall be conducted on each emission point of FGNONKILNFACILITY while operating. If visible emissions are observed, 30 minutes of opacity observations, recorded at 15-second intervals must be conducted in accordance with USEPA Method 9. The USEPA Method 9 test shall begin within one hour of any observation of VE.

APPENDIX 4
Method 22 Forms

St Marys Cement Inc., Charlevoix Plant Method 22 Visual Emission Observations				
Initials:				
Stack Name:				
Date & Time:				
Wind Speed and Direction:				
Sky Condition:				
	0	15	30	45
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Did Stack Pass YES NO				

Make a Sketch, note your location to the source and the sun, make note of any emission points.

St Marys Cement Inc., Charlevoix Plant Method 22 Visual Emission Observations				
Initials:				
Stack Name:				
Date & Time:				
Wind Speed and Direction:				
Sky Condition:				
	0	15	30	45
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Did Stack Pass YES NO				

Make a Sketch, note your location to the source and the sun, make note of any emission points.

Monthly 10-minute visible emissions observations using USEPA Method 22 shall be conducted on each emission point of FGNONKILNFACILITY while operating. If visible emissions are observed, 30 minutes of opacity observations, recorded at 15-second intervals must be conducted in accordance with USEPA Method 9. The USEPA Method 9 test shall begin within one hour of any observation of VE.

Appendix 5

EPA
VISIBLE EMISSION OBSERVATION FORM 1

Form Number							Page	Of
Continued on VEO Form Number								

Method Used (Circle One)
Method 9 203A 203B Other: _____

Company Name		
Facility Name		
Street Address		
City	State	Zip

Process	Unit #	Operating Mode
Control Equipment		Operating Mode

Describe Emission Point	
Height of Emiss. Pt. Start End	Height of Emiss. Pt. Rel. to Observer Start End
Distance to Emiss. Pt. Start End	Direction to Emiss. Pt. (Degrees) Start End

Vertical Angle to Obs. Pt. Start End	Direction to Obs. Pt. (Degrees) Start End
Distance and Direction to Observation Point from Emission Point Start End	

Describe Emissions Start End	
Emission Color Start End	Water Droplet Plume Attached ☐ Detached ☐ None ☐

Describe Plume Background Start End		
Background Color Start End	Sky Conditions Start End	
Wind Speed Start End	Wind Direction Start End	
Ambient Temp. Start End	Wet Bulb Temp.	RH Percent

Source Layout Sketch

Draw North Arrow
☐ TN ☐ MN

X Observation Point

Observer's Position

140°

Sun Location Line

FEET

FEET

Side View

Stack With Plume

Sun

Wind

Longitude	Latitude	Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time

Sec / Min	0	15	30	45	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Observer's Name (Print)	
Observer's Signature	Date
Organization	
Certified By	Date

VEOF1.1

Appendix 6

APPENDIX 6
§63.1347 Operation and Maintenance Plan Requirements[1]

(a) You must prepare, for each affected source subject to the provisions of this subpart, a written operations and maintenance plan. The plan must be submitted to the Administrator for review and approval as part of the application for a part 70 permit and must include the following information:

(1) Procedures for proper operation and maintenance of the affected source and air pollution control devices in order to meet the emissions limits and operating limits, including Your operations and maintenance plan must address periods of startup and shutdown.

(2) Corrective actions to be taken when required by paragraph §63.1350(f)(3);

(3) Procedures to be used during an inspection of the components of the combustion system of each kiln and each in-line kiln raw mill located at the facility at least once per year.

(b) Failure to comply with any provision of the operations and maintenance plan developed in accordance with this section is a violation of the standard.

[1] 75 FR 55054, Sept. 9, 2010, as amended at 78 FR 10040, Feb. 12, 2013; 80 FR 44781, July 27, 2015

Appendix 7

Votorantim Cimentos

Route Order

Plant: 4606 **Risk:** C3

Order:145544695

Order Description: INSP-FM DC ROUTE-2 (CYCLE 1-TUES) **Revision Code:** **Order Type:** RT01

Priority: Normal Within 15 D **M. Plan:** 285512 **Activity Type:** Visual inspection

Inventory N°: 4606 **Downtime Required:** 4606

Equipment:

Functional Location: 4606 CHARLEVOIX CEMENT PLANT

Superior Functional Location:

Location:

CC: 2AK210 **Status:** -

Object Link Code	Linked To	Linked Object Description

Scheduled Start Date: 05/22/2018 00:00:00 **Schedule Finish Date:** 05/22/2018 **24:00:00** **Planner Group:** VC1

Work Center: MM-GEN

Activity
INSP-FM DC ROUTE-2 (CYCLE 1-TUES) DC ROUTE - WEEK 1, TUESDAY

Op.	Work Center	Person Responsible	Planned Duration

Operation	Production Resource	PRT Description	PRT Quantity	Actual Quantity

Votorantim Cimentos

Route Order

Plant: 4606 **Risk:** C3

Order:145544695

Operation: 0010 DUST COLLECTOR, 1 FM MAIN, PLENUM PULSE **ABCInd.:**

Functional Location: 4606-06-FIM1-Z1P01 DUST COLLECTOR, 1 FM MAIN

Superior Functional Location: 4606-06-FIM1 #1 FINISH MILL

Equipment:

Measuring Point	Measuring Point Description	Target Value	Lower Range Limit	Upper Range Limit	Measurement
1923591	Z1P01DUST COLLECTOR, 1 FM MAINEM-PRD-R0002-0260	0	0	0	

Item OK?	Any Action Taken?	Follow-up Notification M4 Required?	Priority
(___)OK (___)Not OK (___)Not Executed	(___)Yes (___) No	(___)Yes (___)No	(_____)

Operation	Operation Description
0010	DUST COLLECTOR, 1 FM MAIN, PLENUM PULSE

DUST COLLECTOR, 1 FM MAIN, PLENUM PULSE
DC ROUTE - WEEK 1, MONDAY
10-SAFETY - WEAR PROPER PPE
20-DISCONNECT DP TUBING FROM PRESSURE GAUGE AND BLOW OUT TUBING TO DC WITH COMPRESSED AIR
30-CHECK AIR PRESSURE, SHOULD BE BETWEEN 60 AND 90 PSIG. IF OUT OF THIS RANGE OPEN A NOTIFICATION TO REPAIR
40-CHECK DIFFERENTIAL PRESSURE: DP IN H20 - IT OPERATES BETWEEN 3-6IN W.C. FOR FABRIC FILTER BAGS AND BETWEEN 2-4 IN W.C. FOR CARTRIDGES. IF DP IS OUT OF THIS RANGE OPEN A NOTIFICATION FOR REPAIR
50-INSPECT COMPRESSED AIR PULSING SYSTEM AS FOLLOWS:
60-A. INSPECT PILOT TUBING, DIAPHRAGM VALVES, AND AIR MANIFOLD FOR LEAKS
70-B. VERIFY THAT SYSTEM CYCLES CORRECTLY AND THAT ALL PULSERS ARE FIRING
80-C. VERIFY THAT AIR IS NOT LEAKING BY DIAPHRAGM VALVES WHEN NOT PULSING
90-D. INSPECT AND DRAIN AIR WATER FILTER
100-INSPECT FAN DUCTWORK FOR CORROSION, HOLES, OR OTHER EXTERNAL DAMAGE
110-INSPECT FAN DISCHARGE FOR VISIBLE EMISSIONS
120-INSPECT FAN, FAN HOUSING, BEARINGS, DRIVE BELTS FOR DAMAGE OR ABNORMALITIES:
130-A. INSPECT FAN BASE BOLTS FOR TIGHTNESS
140-B. INSPECT FAN FOR EXCESSIVE VIBRATION
150-C. IF FAN INBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
160-D. FAN OUTBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
170-INSPECT FAN MOTOR FOR EXCESSIVE VIBRATION, NOISE OR TEMPERATURE
180-INSPECT DUST COLLECTOR HOUSING, HOPPER, AND ACCESS DOORS FOR DAMAGE, CRACKS, OR AIR LEAKS
190-INSPECT DUST DISCHARGE SYSTEM, AIRSLIDES, TIPPING VALVES, SCREWS, FEEDERS, AND COMPONENTS
200-INSPECT ALL EQUIPMENT GUARDS TO INSURE THAT THEY ARE IN PLACE AND FREE FROM DAMAGE
210-INSPECT DUST COLLECTION PICK-UP POINTS FOR PROPER FUNCTIONING
220-NOTIFY SUPERVISOR OF CONDITIONS REQUIRING A NOTIFICATION

Votorantim Cimentos

Route Order

Plant: 4606 **Risk:** C3

Order:145544695

Operation: 0020 DUST COLLECTOR, 14 FEEDER, PULSE JET **ABCInd.:**

Functional Location: 4606-06-FIM1-Z1P11 DUST COLLECTOR, 14 FEEDER

Superior Functional Location: 4606-06-FIM1 #1 FINISH MILL

Equipment:

Measuring Point	Measuring Point Description	Target Value	Lower Range Limit	Upper Range Limit	Measurement
1923714	Z1P11DUST COLLECTOR, 14 FEEDERMM-INS-R0002-0390	0	0	0	

Item OK?	Any Action Taken?	Follow-up Notification M4 Required?	Priority
(___)OK (___)Not OK (___)Not Executed	(___)Yes (___) No	(___)Yes (___)No	(_____)

Operation	Operation Description
0020	DUST COLLECTOR, 14 FEEDER, PULSE JET

DUST COLLECTOR, 14 FEEDER, PULSE JET
DC ROUTE - WEEK 1, MONDAY
10-SAFETY - WEAR PROPER PPE
20-DISCONNECT DP TUBING FROM PRESSURE GAUGE AND BLOW OUT TUBING TO DC WITH COMPRESSED AIR
30-CHECK AIR PRESSURE, SHOULD BE BETWEEN 60 AND 90 PSIG. IF OUT OF THIS RANGE OPEN A NOTIFICATION TO REPAIR
40-CHECK DIFFERENTIAL PRESSURE: DP IN H20 - IT OPERATES BETWEEN 3-6IN W.C. FOR FABRIC FILTER BAGS AND BETWEEN 2-4 IN W.C. FOR CARTRIDGES. IF DP IS OUT OF THIS RANGE OPEN A NOTIFICATION FOR REPAIR
50-INSPECT COMPRESSED AIR PULSING SYSTEM AS FOLLOWS:
60-A. INSPECT PILOT TUBING, DIAPHRAGM VALVES, AND AIR MANIFOLD FOR LEAKS
70-B. VERIFY THAT SYSTEM CYCLES CORRECTLY AND THAT ALL PULSERS ARE FIRING
80-C. VERIFY THAT AIR IS NOT LEAKING BY DIAPHRAGM VALVES WHEN NOT PULSING
90-D. INSPECT AND DRAIN AIR WATER FILTER
100-INSPECT FAN DUCTWORK FOR CORROSION, HOLES, OR OTHER EXTERNAL DAMAGE
110-INSPECT FAN DISCHARGE FOR VISIBLE EMISSIONS
120-INSPECT FAN, FAN HOUSING, BEARINGS, DRIVE BELTS FOR DAMAGE OR ABNORMALITIES:
130-A. INSPECT FAN BASE BOLTS FOR TIGHTNESS
140-B. INSPECT FAN FOR EXCESSIVE VIBRATION
150-C. IF FAN INBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
160-D. FAN OUTBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
170-INSPECT FAN MOTOR FOR EXCESSIVE VIBRATION, NOISE OR TEMPERATURE
180-INSPECT DUST COLLECTOR HOUSING, HOPPER, AND ACCESS DOORS FOR DAMAGE, CRACKS, OR AIR LEAKS

Votorantim Cimentos

Route Order

Plant: 4606 **Risk:** C3

Order:145544695

190-INSPECT DUST DISCHARGE SYSTEM, AIRSLIDES, TIPPING VALVES, SCREWS, FEEDERS, AND COMPONENTS
200-INSPECT ALL EQUIPMENT GUARDS TO INSURE THAT THEY ARE IN PLACE AND FREE FROM DAMAGE
210-INSPECT DUST COLLECTION PICK-UP POINTS FOR PROPER FUNCTIONING
220-NOTIFY SUPERVISOR OF CONDITIONS REQUIRING A NOTIFICATION

Operation: 0030 UST COLLECTOR, 19 FEEDER, PULSE JET **ABCInd.:**

Functional Location: 4606-06-FIM1-Z1P21 DUST COLLECTOR, 19 FEEDER

Superior Functional Location: 4606-06-FIM1 #1 FINISH MILL

Equipment:

Measuring Point	Measuring Point Description	Target Value	Lower Range Limit	Upper Range Limit	Measurement
1923715	Z1P21DUST COLLECTOR, 19 FEEDERMM-INS-R0002-0391	0	0	0	

Item OK?	Any Action Taken?	Follow-up Notification M4 Required?	Priority
(___)OK (___)Not OK (___)Not Executed	(___)Yes (___) No	(___)Yes (___)No	(_____)

Operation	Operation Description
0030	UST COLLECTOR, 19 FEEDER, PULSE JET

UST COLLECTOR, 19 FEEDER, PULSE JET
DC ROUTE - WEEK 1, MONDAY
10-SAFETY - WEAR PROPER PPE
20-DISCONNECT DP TUBING FROM PRESSURE GAUGE AND BLOW OUT TUBING TO DC WITH COMPRESSED AIR
30-CHECK AIR PRESSURE, SHOULD BE BETWEEN 60 AND 90 PSIG. IF OUT OF THIS RANGE OPEN A NOTIFICATION TO REPAIR
40-CHECK DIFFERENTIAL PRESSURE: DP IN H20 - IT OPERATES BETWEEN 3-6IN W.C. FOR FABRIC FILTER BAGS AND BETWEEN 2-4 IN W.C. FOR CARTRIDGES. IF DP IS OUT OF THIS RANGE OPEN A NOTIFICATION FOR REPAIR
50-INSPECT COMPRESSED AIR PULSING SYSTEM AS FOLLOWS:
60-A. INSPECT PILOT TUBING, DIAPHRAGM VALVES, AND AIR MANIFOLD FOR LEAKS
70-B. VERIFY THAT SYSTEM CYCLES CORRECTLY AND THAT ALL PULSERS ARE FIRING
80-C. VERIFY THAT AIR IS NOT LEAKING BY DIAPHRAGM VALVES WHEN NOT PULSING
90-D. INSPECT AND DRAIN AIR WATER FILTER
100-INSPECT FAN DUCTWORK FOR CORROSION, HOLES, OR OTHER EXTERNAL DAMAGE
110-INSPECT FAN DISCHARGE FOR VISIBLE EMISSIONS
120-INSPECT FAN, FAN HOUSING, BEARINGS, DRIVE BELTS FOR DAMAGE OR ABNORMALITIES:
130-A. INSPECT FAN BASE BOLTS FOR TIGHTNESS
140-B. INSPECT FAN FOR EXCESSIVE VIBRATION
150-C. IF FAN INBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO

Votorantim Cimentos

Route Order

Plant: 4606 **Risk:** C3

Order:145544695

ADD AIR TO BEARING OR TO REPAIR
160-D. FAN OUTBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
170-INSPECT FAN MOTOR FOR EXCESSIVE VIBRATION, NOISE OR TEMPERATURE
180-INSPECT DUST COLLECTOR HOUSING, HOPPER, AND ACCESS DOORS FOR DAMAGE, CRACKS, OR AIR LEAKS
190-INSPECT DUST DISCHARGE SYSTEM, AIRSLIDES, TIPPING VALVES, SCREWS, FEEDERS, AND COMPONENTS
200-INSPECT ALL EQUIPMENT GUARDS TO INSURE THAT THEY ARE IN PLACE AND FREE FROM DAMAGE
210-INSPECT DUST COLLECTION PICK-UP POINTS FOR PROPER FUNCTIONING
220-NOTIFY SUPERVISOR OF CONDITIONS REQUIRING A NOTIFICATION

Operation: 0040 DUST COLLECTOR, 2 FM MAIN, PLENUM PULSE **ABCInd.:**

Functional Location: 4606-06-FIM2-Z2P01 DUST COLLECTOR, 2 FM MAIN

Superior Functional Location: 4606-06-FIM2 #2 FINISH MILL

Equipment:

Measuring Point	Measuring Point Description	Target Value	Lower Range Limit	Upper Range Limit	Measurement
1923593	Z2P01DUST COLLECTOR, 2 FM MAINEM-PRD-R0003-0262	0	0	0	

Item OK?	Any Action Taken?	Follow-up Notification M4 Required?	Priority
(___)OK (___)Not OK (___)Not Executed	(___)Yes (___) No	(___)Yes (___)No	(_____)

Operation	Operation Description
0040	DUST COLLECTOR, 2 FM MAIN, PLENUM PULSE

DUST COLLECTOR, 2 FM MAIN, PLENUM PULSE
DC ROUTE - WEEK 1, MONDAY
10-SAFETY - WEAR PROPER PPE
20-DISCONNECT DP TUBING FROM PRESSURE GAUGE AND BLOW OUT TUBING TO DC WITH COMPRESSED AIR
30-CHECK AIR PRESSURE, SHOULD BE BETWEEN 60 AND 90 PSIG. IF OUT OF THIS RANGE OPEN A NOTIFICATION TO REPAIR
40-CHECK DIFFERENTIAL PRESSURE: DP IN H20 - IT OPERATES BETWEEN 3-6IN W.C. FOR FABRIC FILTER BAGS AND BETWEEN 2-4 IN W.C. FOR CARTRIDGES. IF DP IS OUT OF THIS RANGE OPEN A NOTIFICATION FOR REPAIR
50-INSPECT COMPRESSED AIR PULSING SYSTEM AS FOLLOWS:
60-A. INSPECT PILOT TUBING, DIAPHRAGM VALVES, AND AIR MANIFOLD FOR LEAKS
70-B. VERIFY THAT SYSTEM CYCLES CORRECTLY AND THAT ALL PULSERS ARE FIRING
80-C. VERIFY THAT AIR IS NOT LEAKING BY DIAPHRAGM VALVES WHEN NOT PULSING
90-D. INSPECT AND DRAIN AIR WATER FILTER
100-INSPECT FAN DUCTWORK FOR CORROSION, HOLES, OR OTHER EXTERNAL DAMAGE

110-INSPECT FAN DISCHARGE FOR VISIBLE EMISSIONS
120-INSPECT FAN, FAN HOUSING, BEARINGS, DRIVE BELTS FOR DAMAGE OR ABNORMALITIES:
130-A. INSPECT FAN BASE BOLTS FOR TIGHTNESS
140-B. INSPECT FAN FOR EXCESSIVE VIBRATION
150-C. IF FAN INBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
160-D. FAN OUTBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
170-INSPECT FAN MOTOR FOR EXCESSIVE VIBRATION, NOISE OR TEMPERATURE
180-INSPECT DUST COLLECTOR HOUSING, HOPPER, AND ACCESS DOORS FOR DAMAGE, CRACKS, OR AIR LEAKS
190-INSPECT DUST DISCHARGE SYSTEM, AIRSLIDES, TIPPING VALVES, SCREWS, FEEDERS, AND COMPONENTS
200-INSPECT ALL EQUIPMENT GUARDS TO INSURE THAT THEY ARE IN PLACE AND FREE FROM DAMAGE
210-INSPECT DUST COLLECTION PICK-UP POINTS FOR PROPER FUNCTIONING
220-NOTIFY SUPERVISOR OF CONDITIONS REQUIRING A NOTIFICATION

Operation: 0050 DUST COLLECTOR, 3 FM MAIN , PLENUM PULSE **ABCInd.:**

Functional Location: 4606-06-FIM3-Z3P01 DUST COLLECTOR, 3 FM MAIN M910

Superior Functional Location: 4606-06-FIM3 #3 FINISH MILL

Equipment:

Measuring Point	Measuring Point Description	Target Value	Lower Range Limit	Upper Range Limit	Measurement
1923595	Z3P01DUST COLLECTOR, 3 FM MAIN M910EM-PRD-R0004-0264	0	0	0	

Item OK?	Any Action Taken?	Follow-up Notification M4 Required?	Priority
(___)OK (___)Not OK (___)Not Executed	(___)Yes (___) No	(___)Yes (___)No	(_____)

Operation	Operation Description
0050	DUST COLLECTOR, 3 FM MAIN , PLENUM PULSE

DUST COLLECTOR, 3 FM MAIN , PLENUM PULSE
DC ROUTE - WEEK 1, MONDAY
10-SAFETY - WEAR PROPER PPE
20-DISCONNECT DP TUBING FROM PRESSURE GAUGE AND BLOW OUT TUBING TO DC WITH COMPRESSED AIR
30-CHECK AIR PRESSURE, SHOULD BE BETWEEN 60 AND 90 PSIG. IF OUT OF THIS RANGE OPEN A NOTIFICATION TO REPAIR
40-CHECK DIFFERENTIAL PRESSURE: DP IN H20 - IT OPERATES BETWEEN 3-6IN W.C. FOR FABRIC FILTER BAGS AND BETWEEN 2-4 IN W.C. FOR CARTRIDGES. IF DP IS OUT OF THIS RANGE OPEN A NOTIFICATION FOR REPAIR
50-INSPECT COMPRESSED AIR PULSING SYSTEM AS FOLLOWS:

60-A. INSPECT PILOT TUBING, DIAPHRAGM VALVES, AND AIR MANIFOLD FOR LEAKS
70-B. VERIFY THAT SYSTEM CYCLES CORRECTLY AND THAT ALL PULSERS ARE FIRING
80-C. VERIFY THAT AIR IS NOT LEAKING BY DIAPHRAGM VALVES WHEN NOT PULSING
90-D. INSPECT AND DRAIN AIR WATER FILTER
100-INSPECT FAN DUCTWORK FOR CORROSION, HOLES, OR OTHER EXTERNAL DAMAGE
110-INSPECT FAN DISCHARGE FOR VISIBLE EMISSIONS
120-INSPECT FAN, FAN HOUSING, BEARINGS, DRIVE BELTS FOR DAMAGE OR ABNORMALITIES:
130-A. INSPECT FAN BASE BOLTS FOR TIGHTNESS
140-B. INSPECT FAN FOR EXCESSIVE VIBRATION
150-C. IF FAN INBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
160-D. FAN OUTBOARD BEARING TEMP IS ABOVE 180F WRITE A NOTIFICATOIN TO ADD AIR TO BEARING OR TO REPAIR
170-INSPECT FAN MOTOR FOR EXCESSIVE VIBRATION, NOISE OR TEMPERATURE
180-INSPECT DUST COLLECTOR HOUSING, HOPPER, AND ACCESS DOORS FOR DAMAGE, CRACKS, OR AIR LEAKS
190-INSPECT DUST DISCHARGE SYSTEM, AIRSLIDES, TIPPING VALVES, SCREWS, FEEDERS, AND COMPONENTS
200-INSPECT ALL EQUIPMENT GUARDS TO INSURE THAT THEY ARE IN PLACE AND FREE FROM DAMAGE
210-INSPECT DUST COLLECTION PICK-UP POINTS FOR PROPER FUNCTIONING
220-NOTIFY SUPERVISOR OF CONDITIONS REQUIRING A NOTIFICATION

Votorantim Cimentos

Route Order

Plant: 4606 **Risk:** C3

Order:

Confirmation

Op.	Personnel no.	Start Date	Finish Date	Start Time	Finish Time	Activity Type

Maintenance Plan Revision Required: (___)No (___)Yes, Report on notes

Notes:

Responsible for Execution
Personnel no.:_____
Signature:_____
Date:____/_____/_____

Maintenance Approval
Personnel no.:_____
Signature:_____
Date:_____/_____/_____

Requested by Approval
Personnel no.:_____
Signature:_____
Date:_____/_____/_____

ST. MARYS CEMENT

ST MARYS

CHARLEVOIX PLANT
FUGITIVE DUST PLAN
SITE MAP

LAKE MICHIGAN

Storage Dome
Storage Silos
4-pack Silos
One-way Traffic
Solid Fuel Unloading and Storage
Solid Fuel Storage
Quarry traffic drives on left side of road. All traffic entering the Quarry must obtain permission from the Quarry office.
Quarry Office
Secondary Crusher
Elevated Conveyor
A-Frame Building
ALL QUARRY ROADS ARE GRAVEL COVERED.
Main Substation
Elevated Conveyor
G-Cooler
Clinker Dome #2
First Aid [2nd Floor]
Gravel Beds
Finish Mills
Burner Building
Elevated Conveyor
Clinker Dome #1
Coal System
Electrical Shop
Maintenance Shop
Main Office
Electrical Substation
Kiln
Coal Flash Furnace Bldg.
Sub-station 7
Health & Safety Office
Preheater Tower
Raw Grinding Rollermill
Sub-station 4
Kaiser Building
Kaiser Warehouse
Western Precipitator
Alternative Fuel Storage Area
All visitors must sign in at main office.
CAUTION Haul Road Crossing
New Haul Road

GENERAL LEGEND

- STRUCTURES
- WATER
- TREES / WOODED
- PAVED SURFACE
- GRAVEL SURFACE
- FUEL STORAGE

REVISED: 05/11/2011