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INTERIM REMEDIAL MEASURES WORK PLAN – EASTERN BERMS

**Huntley Power South Parcel
Tonawanda, New York
NYSDEC BCP Site Number C915337**

June 23, 2025

File No. 21.0056855.20



PREPARED FOR:

HUNTLEY POWER LLC

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Interim Remedial Measures Work Plan
Huntley Power South Parcel, Town of Tonawanda, New York

JUNE 2025

CERTIFICATION STATEMENT

I, BART A. KLETTKE, P.E., certify that I am currently a NYS registered professional engineer, as defined in 6 NYCRR Part 375, and that this Interim Remedial Measures Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Bart A. Klettke

BART A. KLETTKE, P.E.

JUNE 23, 2025

DATE





TABLE OF CONTENTS

Page

1.0	INTRODUCTION	1
1.1	PURPOSE AND OBJECTIVE	1
1.2	PROJECT BACKGROUND	1
1.3	PROJECT DESCRIPTION	1
1.4	PROJECT MANAGEMENT AND ORGANIZATION	2
1.4.1	Personnel.....	2
1.4.2	Specific Tasks and Services	2
2.0	DESCRIPTION OF IRM FIELD ACTIVITIES.....	3
2.1	GENERAL FIELD ACTIVITIES.....	3
2.1.1	Site Meeting	3
2.1.2	Mobilization.....	3
2.1.3	Health and Safety	3
2.2	COMMUNITY AIR MONITORING PLAN	3
2.3	SOIL BERM LOADING AND OFF-SITE TRANSPORT	4
3.0	DATA DOCUMENTATION.....	4
4.0	CONSTRUCTION COMPLETION REPORT.....	5
5.0	HEALTH AND SAFETY PROTOCOLS	5
6.0	SCHEDULE.....	5

FIGURES

FIGURE 1 LOCUS PLAN

FIGURE 2 SITE PLAN

APPENDICES

APPENDIX A PROJECT HEALTH AND SAFETY PLAN

APPENDIX B NEW YORK STATE DEPARTMENT OF HEALTH GENERIC COMMUNITY AIR MONITORING PLAN

APPENDIX C ST MARYS' CEMENT COAL COMBUSTION RESIDUALS ACCEPTABILITY DOCUMENTATION



1.0 INTRODUCTION

1.1 PURPOSE AND OBJECTIVE

This Interim Remedial Measures (IRMs) Work Plan is associated with the Huntley Power South Parcel Brownfield Cleanup Program (BCP; Site Number C915337) in the Town of Tonawanda, Erie County, New York. The 34.80-acre BCP Site and primary features are shown on **Figures 1 and 2**. The work described in this IRM Work Plan is being completed under a New York State Department of Environmental Conservation (NYSDEC) BCP Agreement. This IRM Work Plan presents the project scope, objectives, planned activities, sampling procedures and reporting requirements.

The objective of this IRM Work Plan is to remove the berms located on the eastern portion of the BCP Site, which consist of assumed coal combustion residuals.

1.2 PROJECT BACKGROUND

The Huntley Power South Parcel, BCP Site No. C915337, is located at 3500 River Road in the Town of Tonawanda, Erie County, New York (Site, see **Figure 1**). The Project Site is approximately 34.80 acres in size and is identified as tax parcel 064.16-1-1.2. A Site Plan is provided as **Figure 2**.

The Site is located in an industrial area of Tonawanda and is zoned General Industrial District. The area surrounding the Site to the north, south, and east is occupied by commercial, residential, and industrial properties.

The northerly adjoining property is occupied by the inactive Huntley Plant, an electrical substation, transmission power lines, and portions of the Mid River Marina. Publicly accessible areas are located at the marina/boat launch, which are not immediately contiguous to the BCP Site boundary and are located approximately 2,000 feet northwest of the northern BCP Site boundary. A National Grid staging area adjoins the BCP Site to the north, which is not accessible to the public. A bike path and River Road adjoins the Site to the northeast, beyond which is Sumitomo Rubber (tire manufacturer), and Evonik Industries. The southerly adjoining property is occupied by the Erie County Water Authority. Staff foot traffic is anticipated to be associated with this occupant. The Site is adjoined to the west by the Niagara River.

The electric power generation plant, originally known as the River Station, later renamed the "Charles R. Huntley Station" was initially constructed in 1916. Buffalo General Electric Company with Stone & Webster Engineering designed and started the construction of the coal fired generating station in January 1916 with the first 20-megawatt (MWe) unit of 25 cycle power and started commercial operation on November 26, 1916. After the first unit went online, construction on three additional units continued. The fourth generating unit started commercial operation on December 19, 1919. The total capacity of the four-unit station was 95 MWe. The final two 25 cycle units were constructed and placed into commercial operation on August 14, 1930, bringing the Station's total output to 305 MWe. On May 12, 2006, Units 63 and 64 were retired from service. Units 65 and 66 were retired in 2007, and Units 67 and 68 were retired in 2016 at which time the facility ceased all electrical generation activities.

1.3 PROJECT DESCRIPTION

The IRM activities will include removal and segregation of the berm clean cover and loading of the assumed coal combustion residual berm materials for off-site transport to a cement production facility located outside of New



York State. The material will be transported and utilized to manufacture Portland cement clinker at St. Marys Cement located in St. Marys, Ontario, Canada. The segregated and stockpiled berm clean cover soils will be used for backfill/grading at the BCP Site.

Soil Berm:

The soil berm is located on the eastern portion of the BCP Site and is oriented in a general north-south direction. The berm has a flat top, is approximately 8 feet high, and has a one-foot-thick vegetated clean soil cover. The berm is bisected by an emergency access road. A 2016 survey of the berm determined an estimated volume of the berm at approximately 12,000 cy (including cover materials).

The berm was constructed to provide a visual barrier between the BCP Site and an exterior bike path/pedestrian walkway along River Road, east of the BCP Site boundary. The berm was constructed using materials generated during a baghouse construction project at the Huntley Plant and off the BCP-Site. The berm was covered with clean soil and seeded to form a complete grass cover per the Beneficial Use Determination (BUD) issued by NYSDEC in 2007.

1.4 PROJECT MANAGEMENT AND ORGANIZATION

1.4.1 Personnel

The general responsibilities of key project personnel are listed below.

NYSDEC Project Manager – Benjamin McPherson, P.E., will be responsible for regulatory oversight of work associated with BCP Site Number C915337.

GZA Principal-In-Charge – Bart A. Klettke, P.E. will have overall responsibility of GZA's work and serve as Professional Engineer of Record.

GZA Project Manager – Thomas Bohlen, P.G., will be responsible for management and implementation of BCP remedial activities. The Project Manager is responsible for technical quality control and project oversight.

GZA Quality Assurance (QA) Officer – Daniel Troy, P.E., will report to the Project Manager and will be responsible for ensuring that QA/QC procedures are being followed. The QA Officer will be responsible for review of field and laboratory data. The QA Officer will monitor the performance of the laboratory to verify Data Quality Objectives for the project are met.

GZA Field QA Officer – Ernest Thalhamer, M.S., will be responsible for field operations and will report directly to the Project Manager

1.4.2 Specific Tasks and Services

NRG with the assistance of GZA will procure contractors to conduct above grade soil removal for off-site transport in coordination with the cement kiln facility. Contractor bids and selection will be determined prior to mobilization.



2.0 DESCRIPTION OF IRM FIELD ACTIVITIES

2.1 GENERAL FIELD ACTIVITIES

General field activities include site meetings, mobilization, implementing the health and safety plan, and soil loading/off-site transport.

2.1.1 Site Meeting

A Site “kick-off” meeting will be held with Huntley, GZA, and the remedial subcontractor(s) prior to initiating field work. The purpose of the meeting will be to familiarize field team members, Huntley staff, and subcontractors with the Site, project personnel and responsibilities, background, scope of work, health and safety requirements, site-specific security and safety protocols, emergency contingencies, and other field considerations. NYSDEC staff will be notified at least seven days in advance of the meeting.

2.1.2 Mobilization

If excavation below surface grade is necessary the selected remedial contractor will contact UDig NY (1-800-962-7962) to locate subsurface utilities that may be present in the work areas and/or at property lines prior to mobilization. UDig NY requires three-day notification to conduct utility clearance/location. GZA and the subcontractor will also consult with the Site owner regarding clearance of subsurface work.

2.1.3 Health and Safety

It is anticipated Level D Personal Protective Equipment (PPE) will be required during IRM work. Should health and safety monitoring during field activities warrant an upgrade to level C protection, work will stop and Site conditions will be re-evaluated prior to further remedial activities. See **Section 6.0** and **Appendix A** for additional information on Health and Safety.

2.2 COMMUNITY AIR MONITORING PLAN

The intent of a Community Air Monitoring Plan (CAMP) is to provide a measure of protection for the downwind community. During active IRM work, air surveillance screening for total volatile organics and particulate levels will be performed at the perimeter of the work area for health and safety concerns in accordance with New York State Department of Health (NYSDOH) CAMP requirements, **Appendix B**. Organic vapors will be monitored with a portable organic vapor meter (OVM) equipped with a photoionization detector (PID) using a 10.6 electron volt (eV) bulb. Particulates will be monitored using equipment that is capable of measuring particle size in the 10-micrometer range (PM-10) and can integrate measurements over 15-minute intervals. See VOC Monitoring/Particulate Monitoring, Response Levels and Actions sections in **Appendix B** for additional information on action levels regarding VOCs, particulates, dust, and odors. The equipment will also have an audible and/or visual alarm indicating an exceedance of the action level. Regular CAMP data will be logged and uploaded via telemetry. NYSDEC and NYSDOH will be provided real-time access to the project CAMP data during active remedial activities. Notification of CAMP exceedances and corrective actions will be provided to NYSDOH and NYSDEC within 24-hours via email.



Monitoring for visible dust and odors will be conducted outside of the immediate active work area. If visible dust and/or odors are observed outside of the immediate work area, work will stop and the contractor shall apply water as required.

2.3 SOIL BERM LOADING AND OFF-SITE TRANSPORT

The eastern soil berm material will be directly loaded for off-site transport and use as kiln feed at St. Marys' cement production facility/kiln. The soil berm material will be loaded until visual evidence of assumed coal combustion residuals is not observed. The soil berm is covered by a one-foot-thick layer of clean soil, which will be stripped and stockpiled proximate to the soil berms or within the coal pile area as practical. Material will be properly secured to mitigate for stormwater runoff and dust migration. Following removal of the coal combustion residual berm material, the previously removed clean cover soil will be utilized for grading/backfill within the soil berm footprint. Excess material, if generated, will be used elsewhere or temporarily stockpiled on the BCP Site, as appropriate. Areas will then be seeded to establish grass cover.

Berm material will be transported to VCNA St. Marys Cement Plant (St. Marys) located at 585 Water Street South in St. Marys, Ontario, N0M 2G0, Canada. The berm material has been laboratory tested by St. Marys and has been accepted as a raw material for portland cement manufacturing. The minerals in the material contribute necessary elements to the chemistry of portland cement, replacing other natural materials.

The material shipped to St. Marys must have a combined concentration of aluminum oxide, iron oxide and silicon dioxide that exceeds 50% and a calcium oxide less than 18% consistent with Class F ASTM 618 material. Sizing, other organics and moisture content are also a consideration, but do not prevent the material's use. Testing has confirmed the properties of the material are generally suitable for use in this application. Correspondence pertaining to St. Marys' acceptability of the coal combustion residuals is included in **Appendix C**.

Additionally, St. Marys requested material to conduct a trial burn to manufacture Portland cement clinker. Huntley provided a total of 917.7 tons of material to St. Marys in March and April 2025. St. Marys indicated the trial use was successful and the material will provide a viable alternative in their manufacturing process. St. Marys conducted chemical analysis via x-ray fluorescence (XRF) screening. St. Marys acceptability letter and screening results are included in **Appendix C**.

The transporter has a current Part 364 permit which will be provided to the NYSDEC prior to commencement of material shipment.

3.0 DATA DOCUMENTATION

Field notes will be kept during the IRM work, in addition to daily field summaries that will be generated summarizing the field work and become part of the project file. The daily field summaries will be submitted to the NYSDEC within 24 hours of completion and will include the following daily information for the IRM activities:

- Date;
- Meteorological conditions (temperature, wind, precipitation);
- Site conditions (e.g., dry, damp, dusty, etc.);
- Identification of crew members (GZA and NRG contractor present) and other personnel (e.g., agency or site owner) present;



- Description of field activities;
- Location(s) where work is performed;
- Problems encountered and corrective actions taken;
- Records of field measurements or descriptions recorded; and
- Notice of modifications to the scope of work.

IRM activities will be photo documented. Pertinent photographs will be included in the Construction Completion Report (CCR).

4.0 CONSTRUCTION COMPLETION REPORT

A CCR will be prepared summarizing the work conducted in accordance with DER-10 Section 5.8. The report will include the following:

- Provide a summary of the activities completed as part of the IRM Work;
- Provide figures showing the size and location of remedial excavations;
- Provide completed daily field summaries and community air monitoring program data for the duration of the IRM activities;
- Provide pertinent photographic documentation of the activities completed; and
- Present the findings, conclusions and recommendations resulting from the IRM work. The report will be submitted to NYSDEC for review.
- The CCR will include figures showing the surveyed extent of remedial excavations. Measurements will be made to document the elevation/depth of the excavations. Figures will be stamped and certified by the professional engineer of record.

5.0 HEALTH AND SAFETY PROTOCOLS

The health and safety protocols to be used for the Huntley Power South Parcel IRM activities are in the “Health and Safety Plan” dated July 2020 (**Appendix A**). The Health and Safety Plan (HASP) presents the specific health and safety protocols associated with the activities planned for the BCP Site.

6.0 SCHEDULE

The anticipated schedule for the IRM field activities and CCR Report preparation is as follows:

Milestone:	Anticipated Date:
Submit IRM Work Plan	June 2025
Berm IRM Implementation	August 2025 through October 2025
Construction Completion Report	Within 90 days of completion of IRM activities



FIGURES



© 2024 - GZA GeoEnvironmental, Inc. K:\21\PROJECTS\56855.20 Huntley Power R\GIS\Figures\IRM Work Plan - Soil Berm\Fig 2.mxd, 9/6/2024, 1:28:27 PM, ernest.thalhammer



LEGEND

- NEW MONITORING WELL
- EXISTING GROUNDWATER MONITORING WELLS
- BCP SITE BOUNDARY

SOURCE

1) THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED NOVEMBER 25, 2013 BY ESRI ARCGIS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.

2) THE BASE MAP FEATURES WERE LOCATED FROM A "PRELIMINARY" UNTITLED ELECTRONIC CAD FILE PREPARED BY WENDEL COMPANIES, RECEIVED VIA EMAIL ON 07-01-2018, FILE: 419418-BOUNDARY.DWG, AND FROM A PDF PREPARED BY WENDELL COMPANIES ENTITLED "180816 HUNTLEY BCP PARCEL - SIGNED.PDF", DATED: 06-04-2018, ORIGINAL SCALE: 1" = 100 FEET, PROJECT NUMBER: 419418.

3) THE HISTORICAL UTILITY DATA WAS REFERENCED FROM ELECTRONIC FILES PROVIDED BY HUNTLEY POWER LLC., RECEIVED VIA EMAIL ON 09-06-2019, FILES: 34735SH01.CIT, 34736SH02.CIT, 34737SH03.CIT, 34738SH04.CIT, 34739SH05.CIT, 34740SH06.CIT, 34741SH07.CIT, 34742SH08.CIT AND FROM A PDF PREPARED BY NIAGRA MOHAWK POWER CORPORATION ENTITLED "STATION SITE PLAN, ENLARGED COMPOSITE OF STRUCTURES, AND YARD PIPING" DATED: 03-23-1977, ORIGINAL SCALE: 1" = 20 FEET.

4) THE ADDITIONAL UTILITY DATA AND SITE EASEMENTS WERE REFERENCED FROM ELECTRONIC FILES PROVIDED BY HUNTLEY POWER LLC., RECEIVED VIA EMAIL ON 09-17-2019, FILE: NRG HUNTLEY - EASEMENT FIGURE - STANDARD.ZIP

5) LOCATIONS OF MONITORING WELLS WERE REFERENCED FROM MONITORING WELL AS-BUILTS SURVEYED BY WENDEL ON NOVEMBER 18TH 2020. ALL OTHER SITE FEATURES ARE APPROXIMATE PENDING RECEIPT OF FINAL AS-BUILTS.

HUNTLEY POWER SOUTH PARCEL

3500 RIVER ROAD
TONAWANDA, NEW YORK

SITE PLAN

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		NRG HUNTLEY POWER, LLC	
PROJ MGR: TB	REVIEWED BY: DJT	CHECKED BY: BK	FIGURE 2
DESIGNED BY: EJT	DRAWN BY: EJT	SCALE: 1" = 150 FEET	
DATE: 09/06/2024	PROJECT NO. 21.0056855.20	REVISION NO.	



APPENDIX A
PROJECT HEALTH AND SAFETY PLAN

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

1. CLIENT/SITE/PROJECT INFORMATION		
Client: Huntley Power LLC		
Site Address: 3500 River Road, Tonawanda, New York		
Site Description (be sure to list pertinent site features, chemicals used at the facility, and other potential hazard sources: Inactive coal power plant; former coal pile, coal ash fill, and settling pond. Known elevated arsenic in soil/fill and LNAPL in former coal pile		
Work Environment (active manufacturing, office, vacant site, undeveloped property, etc.): Inactive coal storage, and coal ash management area of the power plant property, no buildings present on the Site.		
Job/Project #: 21.0056855.20	Estimated Start Date: 8/14/2024	Estimated Finish Date: 8/14/2025
Your locationSite is Covered by the Following Regulations:	OSHA HAZWOPER Standard ☒	Mine Safety and Health Administration ☐
	OSHA Construction Regulations ☒	

2. EMERGENCY INFORMATION		
Hospital Name: Kenmore Mercy Hospital		Hospital Phone: 716-694-4500
Hospital Address: 2950 Elmwood Avenue		Directions and Street Map Attached: ☒ Yes
Local Fire #: 911	Local Ambulance #: 911	Local Police #: 911
WorkCare Incident Intervention Services:	For non-emergencies, if an employee becomes hurt or sick call 888-449-7787	
Other Emergency Contact(s): George Streit of Huntley and Bart Klettke of GZA	Phone #'s: George Streit of Huntley: 716-200-2797 Bart Klettke of GZA: 716-570-2093	
Site-Specific Emergency Preparedness/Response Procedures/Concerns: Conduct pre-job site briefing with project members, including subcontractors and client representatives (as applicable) to review emergency procedures and responsibilities prior to start of each day's work. Review emergency contact information, locations of emergency equipment (e.g. first aid kits, fire extinguishers, evacuation routes), review of emergency procedures, and current location and access to hospital. Ensure that cell phones are charged daily and have vehicle phone chargers on hand. Possible emergencies on site include physical injuries. Personnel on site will have current first aid and will be able to respond to minor injuries while emergency response personnel are contacted for assistance.		

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN



 LIFTING Get help lifting or carrying anything over 50 pounds	 SITE RECON Walk your site before starting work to find and mark slips/trips/falls and insect nests	 DRIVING Don't use your mobile phone while driving	 ERGONOMICS Take a 5-minute break for every hour you work, whether it's in the office or the field
 CUTS Wear cut-resistant gloves when using knives or other sharp objects	 PPE At a minimum, always wear safety glasses and protective footwear in the field	 HASP Develop a HASP and have it with you in the field	 WORKCARE Without delay, call WorkCare immediately for any minor injury or illness at 888-449-7787

- All EHS Events must be reported immediately to the Project Manager and to the GZA People-Based Safety mobile app.
- In the event of a chemical release greater than 5 gallons, site personnel will evacuate the affected area and relocate to an upwind location. The GZA Field Safety Officer and client site representative shall be contacted immediately.
- Site work shall not be conducted during severe weather, including high winds and lightning. In the event of severe weather, stop work, lower any equipment (drill rigs), and evacuate the affected area.

3. SCOPE OF WORK

General project description, and phase(s) or work to which this H&S Plan applies ¹ .	GZA will observe remedial measures conducted by subs including: excavation and off-site disposal of impacted soil, including sample collection, equipment decontamination and handling of waste.
Specific Tasks Performed by GZA:	GZA will observe remedial measures conducted by subs including: excavation and off-site disposal of petroleum impacted soil, screen soil for VOCs, and collect confirmation and characterization soil samples.
Concurrent Tasks to be Performed by GZA-hired Subcontractors (List Subcontractors by Name):	Contractor to conduct excavation work.
Concurrent Tasks to be Performed by Others:	None.

Any OSHA PERMIT-REQUIRED CONFINED SPACE entry? ☐ YES ☒ NO IF YES, ADD CONFINED SPACE ENTRY PERMIT FOR THAT PORTION OF THE WORK	Any INDOOR fieldwork? ☐ YES ☒ NO IF YES, EXPLAIN:
--	---

4. SUB-SURFACE WORK, UNDERGROUND UTILITY LOCATION

Will subsurface explorations be conducted as part of this work (drilling or excavation)?	☒ Yes ☐ No
Have GZA project files been scoured for existing private utility drawings?	☐ Yes ☐ No ☐ N/A
Has GZA requested utility drawings from our Client, property owner, and others?	☐ Yes ☐ No ☐ N/A

¹ Copy from or reference proposal or applicable design plan as appropriate.

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

Have existing drawings been reviewed for possible conflicts with planned work?		☐ Yes ☐ No ☐	
Will GZA personnel be required to use a hand-auger as part of this work?		☐ Yes ☒ No	
Site property ownership where underground explorations will be conducted on: 3500 River Road, Tonawanda, NY		Public Access Property ☐ Yes ☒ No Private Property ☒ Yes ☐ No	
Have Necessary Underground Utility Notifications for Subsurface Work Been Made?		☒ Yes ☐ Yet to be conducted	
Specify Clearance Date & Time, Dig Safe Clearance I.D. #, And Other Relevant Information: NY Dig Safe; Ticket: 06050-547-037-00.			
IMPORTANT! For subsurface work, prior to the initiation of ground penetrating activities, GZA personnel to assess whether the underground utility clearance (UUC) process has been completed in a manner that appears acceptable, based on participation/ confirmation by other responsible parties (utility companies, subcontractor, client, owner, etc.), for the following:			
Electric:	☐ Yes	☐ No	☐ NA ☐ Other i.e. 345kV overhead transmission main located on north side of power plant
Fuel (gas, petroleum, steam):	☐ Yes	☐ No	☐ NA
Communication:	☐ Yes	☐ No	☐ NA
Water:	☐ Yes	☐ No	☐ NA
Sewer:	☐ Yes	☐ No	☐ NA
Other: _____	☐ Yes	☐ No	☐ NA
			☐ Other _____
			☐ Other _____
			☐ Other _____
			☐ Other _____
Comments:			

5. HAZARD ASSESSMENT (CHECK ALL THAT APPLY AND ADDRESS EACH HAZARD IN SECTION 6)

A. GENERAL FIELDWORK HAZARDS

☐ Confined Space Entry (Add Confined Space Entry Permit)	☒ Overhead Hazards (i.e. falling objects, overhead power lines)
☐ Abandoned or vacant building/Enclosed Spaces	☒ Portable Hand Tools or Power Tools
☒ Significant Slip/Trip/Fall Hazards	☐ Significant Lifting or Ergonomic Hazards
☐ Unsanitary/Infectious Hazards	☒ Electrical Hazards (i.e. Equipment 120 Volts or Greater, Work Inside Electrical Panels, or Maintenance of Electrical Equipment)
☐ Poisonous Plants	☐ Other Stored energy Hazards (i.e. Equipment with High Pressure or Stored Chemicals)
☒ Biting/Stinging Insects	☐ Fire and/or Explosion Hazard
☐ Feral Animal Hazards	☒ Elevated Noise Levels
☐ Water/Wetlands Hazards	☒ Excavations/Test Pits
☐ Remote Locations/Navigation/Orientation hazards	☐ Explosives or Unexploded Ordinance/MEC
☐ Heavy Traffic or Work Alongside a Roadway	☐ Long Distance or Overnight Travel
☒ Weather-Related Hazards	☐ Personal Security or High Crime Area Hazards
☒ Motor vehicle operation Hazards	☐ Working Alone
☒ Heavy Equipment Hazards	☐ Ionizing Radiation or Non-Ionizing Radiation
☐ Structural Hazards (i.e. unsafe floors/stairways/roof)	☒ Chemical/Exposure Hazards (See Part B for Details)
☐ Demolition/Renovation	☐ Other:
☐ Presence of Pedestrians or the General Public	

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

B. CHEMICAL/EXPOSURE HAZARDS (CONTAMINANTS ARE CONTAINED IN X SOIL, X VAPOR, X GROUNDWATER)

☐ No chemical hazards anticipated	☐ Methane
☐ Hydrogen Sulfide (H ₂ S)	☐ Chemicals Subject to OSHA Hazard Communication (attach Safety Data Sheet for each chemical GZA brings to the site)
☐ Cyanides, Hydrogen Cyanide (HCN)	☐ Containerized Waste, Chemicals in Piping & Process Equipment
☐ Carbon Monoxide	☒ Emissions from Gasoline-, Diesel-, Propane-fired Engine, Heater, Similar Equipment
☐ Herbicides, Pesticide, Fungicide, Animal Poisons	☒ General Work Site Airborne Dust Hazards
☒ Metals, Metal Compounds:	☒ Volatile Organic Compounds (VOCs), BTEX
☐ Corrosives, Acids, Caustics, Strong Irritants	☐ Chlorinated Organic Compounds
☒ Polychlorinated Biphenyls (PCBs)	☒ Fuel Oil, Gasoline, Petroleum Products, Waste Oil
☒ Polycyclic Aromatic Hydrocarbons (PAHs)	☐ Asbestos
☐ Compressed Gases	☐ Oxygen Deficiency, Asphyxiation Hazards
☐ Flammable/Combustible Liquids	☐ Other:
☐ Radiation Hazards (i.e. radioactive sealed/open source, x-rays, ultra violet, infrared, radio-frequency, etc.)	

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

6. SITE-SPECIFIC OVERVIEW OF H&S HAZARDS/MITIGATIONS (NOTE: Based on Hazard Assessment, Section 5)	
Describe the major hazards expected to be present at the jobsite, and describe the safety measures to be implemented for worker protection (refer to items checked in Section 5 above). Use brief abstract statements or more detailed narrative as may be appropriate.	
ON-SITE HAZARDS:	HAZARD MITIGATIONS:
Task Hazard Analyses	(list task hazard analysis applicable to the project and attach to this HASP)
Owning Zero	Ensure all GZA personnel on-site have downloaded the People-Based Safety app to their mobile phones and are familiar with using it to report safety events. Prior to work each day, review Owning Zero rules with all on-site (including subcontractors representatives) during the morning safety meeting. Hold daily tailgate meetings with all on-site (including subcontractors) to review planned work tasks, equipment operation, recent near misses or incidents, weather, and personnel changes.
Significant Slip/Trip/Fall Hazards	Inspect work area prior to starting work. Mark out or remove any potential hazards. Inspect area for uneven or sloped terrain, and uneven footing around soil borings. Wear steel toed-boots with ankle support and good tread. Site is an active commercial business, and ground surface is level and paved; Watch out for surface sinkholes (potholes), uneven asphalt/concrete, and keep work areas clean of debris and tooling. Maintain one free hand to break falls. Watch for equipment on ground and slippery surfaces. Keep work area clean, no running, be mindful of changing weather conditions that may change footing conditions. Maintain safe distance from open borings and cover borings upon completion.
Weather-Related Hazards	Weather conditions will be assessed prior to on-site work and forecast examined for anticipated period of work. If weather permits fieldwork, then workers will dress appropriately. Should inclement weather be encountered, the project scope may be reduced or rescheduled. Breaks will be taken to reduce exposure to the elements. If conditions change and lightning or thunder is observed, work will be suspended immediately, and workers will seek shelter. Work may resume if thunder and/or lightning cease for 30 minutes. In the case of cold weather, proper warm gear should be worn to minimize cold exposure. Hand warmers (e.g. "Hot Hands") should be used when appropriate to keep extremities warm and multiple breaks within a warm area (vehicle with heat) should be taken. Review the signs of heat stress and dehydration before the start of fieldwork. Water, sunscreen, hardhat, tinted safety sunglasses, rain gear (if necessary) and periodic breaks should all be planned for. Be sure to consume plenty of liquids on hot summer days and stay out of direct sunlight for extended periods of time to the extent possible. Use protective ointments such as sunscreen and chap stick, and consult the OSHA Heat Safety App daily.
Motor Vehicle Operation Hazards	Ensure vehicle is operating properly prior to leaving office. Review directions and check air pressure in vehicle tires prior to departure. Plan to take periodic breaks while driving long distances. Do not use cell phone (handheld or hands-free) while vehicle motor is running. While driving, be observant of other drivers and potential for severe weather conditions. Maintain appropriate speeds for the road conditions.
Heavy Equipment Hazards	Prior to mobilization to the project site, all underground utilities will be located and properly marked. All personnel working in proximity to heavy equipment will be familiarized with the location and operation of emergency kill switches prior to equipment start-up. A first aid kit and fire extinguisher (10 # class B/C, minimum) will be available at all times. Watch for moving vehicles and equipment. Stay out of equipment swing radius while excavation is in progress. Maintain visibility and eye contact with operators when walking around excavator and trucks. Wear reflective vest to enhance visibility. Keep excavation equipment at least 25 feet from all overhead power lines; use spotters to assist operator in to positioning equipment when overhead power lines or other obstructions are near. All excavations will be adequately

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

	covered and/or barricaded if left unattended for any period of time to prevent injury. When excavation activities encounter the presence of gas, the crew shall immediately curtail excavation activity, shut down the excavation equipment and contact the Project Manager. The Site Safety and Health Officer shall contact the Project Manager/Project Safety and Health Officer and request analysis with an organic vapor detector and combustible gas indicator. These instruments will provide on-site analysis and approximate concentration of the contaminant gas. If organic vapors or gasses deemed to be a health hazard are detected, a site-specific safety and health plan addendum will be prepared in accordance with OSHA regulations (29 CFR 1910.120). Only those personnel enrolled in both the medical surveillance and hazardous waste site training program will be permitted to remain on the job site. See attached job hazard analyses –task 04.04a excavation and trenching.
Observation of Drill Rig Mobilization	Before drilling begins, confirm that drill rig has been parked properly and securely by the drilling contractor. Wear high visibility vests. Make sure that the driver can see you and is aware of your location at all times. Inform the driller if it is observed that the rig is being moved with the mast raised and/or tools and other equipment on the rig are not secured and can fall over and potentially hurt personnel.
Observation of Drilling	Do not wear loose fitting clothing. All GZA personnel working in proximity to a drill rig will be familiarized with the location and operation of emergency kill switches prior to equipment start-up. Maintain safe distance from rotating auger, drill casing, rods and cathead at all times. Observe operations from a safe distance. Persons shall not pass under or over a moving stem or auger. Check that “kill” switches are present and working. Confirm with driller that daily inspection of rig has been performed prior to commencing work and no conditions were noted with the rig that would affect its proper operation. Do not touch or operate or assist with any rig operations and maintenance work. Make eye contact with operator before approaching equipment. Be alert and take proper precautions regarding slippery ground surfaces and similar hazards near rotating auger. Do not engage the driller or helper when drill is in operation. Work out prearranged signals to get their attention before approaching them. Confirm prior to drilling operations that driller and helper communicate and coordinate their actions and movements. GZA personnel are not allowed to be on the drill rig or operate a rig. Wear steel toed boots, hearing protection, hardhat and side-shielding safety glasses/goggles.
Overhead Hazards (i.e. falling objects, overhead power lines)	Prior to start of work, inspect work area for potential overhead hazards. Wear steel toed boots, hardhat and safety glasses with side shields. Stand clear of stacked drill rods. If stack appears unstable, inform driller. Do not stand directly in immediate vicinity of equipment in case malfunction occurs. Never stand under elevated loads or equipment. Keep equipment at least 10 feet from overhead utilities and other potential overhead hazards.
Portable Hand Tools or Power Tools	Be familiar with tool’s operating instructions and specific hazards before beginning work; wear leather gloves when appropriate. Contractor will cut acetate liners.
Elevated Noise Levels	Wear the appropriate hearing protection when heavy equipment is in operation. Wear appropriate hearing protection as necessary, either ear canal inserts and

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

	earmuffs. Do not stand with back to operating equipment or active travel lanes as hearing protection can minimize warning sounds.
Soil and Water Sampling Hazards	Proper PPE hard hat, safety glasses with side shields, steel-toed boots, gloves and boot covers will be used while working in contamination zone area. When drilling/excavating activities encounter the presence of gas, the drill crew shall immediately curtail drilling activity, shut down the drill rig and contact the Project Manager. The Field Safety and Health Officer shall contact the Project Manager/Project Safety and Health Officer and request analysis with an organic vapor detector and combustible gas indicator. These instruments will provide on-site analysis and approximate concentration of the contaminant gas. If organic vapors or gasses deemed to be a health hazard are detected, a site-specific safety and health plan addendum will be prepared in accordance with OSHA regulations (29 CFR 1910.120). Only those personnel enrolled in both the medical surveillance and hazardous waste site training program will be permitted to remain on the job site. Potential contaminants in soil are present both as an inhalation and ingestion hazard to workers within the project area. Project specific action levels, PPE, decontamination, and access control procedures have been established to minimize hazards that exist at the site. Protective measures to minimize contact with contaminated soils are addressed elsewhere in this plan. In the work area, food, beverages and tobacco products shall not be present or used, and cosmetics are not to be applied. Upon exiting the work area project staff shall properly decontaminate, including washing hands, forearms and face with soap and water prior to entering vehicle, eating, drinking, smoking or applying cosmetics. See attached JHA Task 11.01 - Hazardous Materials Survey and Remediation.
Polycyclic Aromatic Hydrocarbons (PAHs)	Due to the relatively low vapor pressure of PAH compounds, vapor hazards at ambient temperatures are not expected to occur. However, if site conditions are dry, the generation of contaminated dusts may pose a potential inhalation hazard. Therefore dust levels should be controlled with wetting if necessary. Repeated contact with certain PAH compounds have been associated with the development of skin cancer. Contact of PAH compounds with the skin may cause photosensitization of the skin, producing skin burns after subsequent exposure to ultraviolet radiation. The major routes of exposure of PAHs during work activities to be conducted at this Site is through direct contact and inhalation. Exposure through direct contact will be addressed via the use of PPE as prescribed herein. Inhalation of PAHs may occur when the soil is disturbed causing respirable and nuisance dust particles. Dust monitoring will be performed to address potential inhalation exposure.
Volatile Organic Compounds (VOCs), BTEX	The major route of exposure of VOCs during work activities to be conducted at this Site is through direct contact. Exposure is most likely when handling soil, and groundwater samples. Exposure through direct contact is possible and will be minimized through the use of PPE. Personnel are advised to approach monitoring wells from the upwind side, remove the cap, and allow the well to vent momentarily prior to sampling. Keep breathing zone to the upwind side of wells during sampling activities. If suspicious odors are noted, workers should move upwind of the drilling operations, notify the PM, and begin air monitoring with a PID. Field staff will wear level D PPE to prevent skin or eye contact with potential contaminants Utilize PID to alert to presence of elevated VOC concentrations to indicate possible exposure. Evacuate area as needed based on readings (refer to Section 7 for action levels). Maintain proper working distance to avoid fuel emissions and other air contaminants as practice.

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

	Wash hands prior to eating and drinking. Wear nitrile gloves when handling soil samples. Eating within confined spaces or exclusion zones is prohibited.
Hazardous Contaminants including Silica	To reduce exposure of respirable crystalline silica, GZA will implement the following safety protocols at the Site: 1) Follow the provisions of Table 1 of the silica standard (https://www.osha.gov/silica/Table1sect1926.1153.pdf); 2) Identify the tasks that involved exposure and methods used to protect workers; 3) Designate a Competent Person to implement the HASP; 4) Restrict housekeeping practices that expose workers to respirable crystalline silica; and 5) Train workers (https://gza-totara.moonami.com/course/view.php?id=153) There may be opportunities for dust generation during the excavation of soils or dumping of soils collected. Soils may contain silica which impacts the respiratory system. Contractor should follow the OSHA construction regulations for silica dust, especially while operating excavation equipment or dumping collected soils. Table 1 of the regulations covers this operation and as long as those controls are in place no air monitoring is required, but other parts of the standard (training, medical surveillance, task-specific controls) may. GZA employees should be aware of visible dust being generated and maintain a safe distance and not breathe in the dust. If respiratory protection is required due to site conditions generating significant dust, GZA employee must follow the OSHA respiratory protection standard and all its required elements before wearing a respirator.
Excavation Hazards	Maintain safe distance from test pits. Stand at safest location in relation to test pit, at corner in full view of the excavator operator (corner unobscured by excavator arm). Secure and screen samples from excavator bucket away from excavation. Monitor excavation for stability and collapses. Stay clear of equipment while operating, and do not approach operating heavy equipment until eye contact is made with operator and equipment operation is stopped. Operators must be aware of your position on the site at all times. Consult with contractor to properly maintain Site access roads to assure vehicles can safely leave and enter the Site. Be especially aware of and clear of the swing radius of all heavy equipment. Stay aware of surroundings and wear proper PPE such as safety glasses, hard hats, high visibility vests, and steel toe boots. Stay alert for potential overhead hazards (utilities lines, tree limbs) and other overhead objects that may pose hazards or may dislodge and fall during excavation operations or while equipment is moving. Heed back up alarms of all equipment. Do not work under raised loads. Always first attempt to collect soil/water samples from the securely placed bucket of the excavator on the surface of the ground at a safe distance from the excavation. Use proper communication with operator when sampling from the bucket of the excavator. Only enter excavations if there is no alternative method to perform the work and it is safe to do so as determined by the designated Competent Person. DO NOT stand near edges of excavations, maintain 2' distance. Approach a test pit for logging from the sloped end. Never stand above vertical wall of excavation. A means of egress (stairways, ladders or ramps) from trench excavations greater than 4 feet in depth must be positioned so that no more than 25 feet of lateral travel is required. If needed to enter excavations consult with onsite Competent Person to assess if it is safe to do so. Never ride inside the bucket to observe the inside of the test pit excavation. Make sure the excavation area is barricaded to keep unauthorized workers out of the work zone. Keep materials at least three feet from the edge of the excavation. Test the atmosphere of excavations of 4 feet or greater before workers enter the excavation when it is anticipated that there may be an oxygen deficient atmosphere or a hazardous atmosphere is present. At five feet in depth, protective systems such as shielding, sloping, or shoring must be used. Excavations shall be inspected by the Competent Person every shift or as conditions change such as rain events.

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

	Test pits are to backfilled soon after excavation and are not to be left open overnight unless appropriate precautions have been implemented to secure the excavation and the site. Excavation should never be left open unless absolutely necessary, and then only with proper barricading and controls to prevent accidental injury. Follow provisions of the OSHA trenching and excavation standard (29 CFR 1926.650-652) and GZA's Trench and Excavation Safety and CSE Program as appropriate during excavation activities. This includes test pit excavation and sampling activities.
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7. AIR MONITORING ACTION LEVELS – Make sure air monitoring instruments are in working order, calibrated before use, and 'bump-checked' periodically throughout the day and/or over multiple days of use

Is air monitoring to be performed for this project? Yes ☒ No ☐

ACTION LEVELS FOR OXYGEN DEFICIENCY AND EXPLOSIVE ATMOSPHERIC HAZARDS (Action levels apply to occupied work space in general work area)

☐ Applicable, See Below. ☒ Not Applicable

Parameter	Response Actions for Elevated Airborne Hazards
Oxygen	At 19.5% or below – Exit area, provide adequate ventilation, or proceed to Level B, or discontinue activities Verify presence of adequate oxygen (approx. 12% or more) before taking readings with LEL meter. Note: If oxygen levels are below 12%, LEL meter readings are not valid.
LEL	Less than 10% LEL – Continue working, continue to monitor LEL levels Greater than or Equal to 10% LEL – Discontinue work operations and immediately withdraw from area. Resume work activities ONLY after LEL readings have been reduced to less than 10% through passive dissipation, or through active vapor control measures.

ACTION LEVELS FOR INHALATION OF TOXIC/HAZARDOUS SUBSTANCES (Action levels are for sustained breathing zone concentrations)

☒ Applicable, See Below. ☐ Not Applicable

Air Quality Parameters (Check all that apply)	Remain in Level D or Modified D	Response Actions for Elevated Airborne Hazards
☒ VOCs	0 to 5 ppm	Above 5 ppm continuously for 5 minutes in the breathing zone; discontinue activities, ventilate, retest. If levels persist contact EHS team for directions.
☐ Carbon Monoxide	0 to 35 ppm	At greater than 35 ppm, exit area, provide adequate ventilation, proceed to Level B, or discontinue activities.
☐ Hydrogen Sulfide	0 to 10 ppm	At greater than 10 ppm, exit area, provide adequate ventilation, proceed to Level B, or discontinue activities
☐ Dust	0 to mg/m ³	
☐	0 to	

SPECIAL INSTRUCTIONS/COMMENTS REGARDING AIR MONITORING (IF APPLICABLE)

8. HEALTH AND SAFETY EQUIPMENT AND CONTROLS

AIR MONITORING INSTRUMENTS

☒ PID Type: Lamp Energy: 10.6 eV
☐ FID Type:

PERSONAL PROTECTIVE EQUIPMENT

☐ Respirator – Type
☐ Respirator - Cartridge Type:

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

☐ Carbon Monoxide Meter ☐ Hydrogen Sulfide Meter ☐ O ₂ /LEL Meter ☐ Particulate (Dust) Meter ☒ Calibration Gas Type Isobutylene ☐ Others:	☒ Hardhat ☒ Outer Gloves Type: Nitrile ☒ Inner Gloves Type: Outer cut resistant unless nitrile (task dep.) ☒ Steel-toed boots/shoes ☐ Coveralls – Type ☐ Outer Boots – Type ☒ Eye Protection with side shields ☐ Face Shield ☒ Traffic Vest ☐ Personal Flotation Device (PFD) ☐ Fire Retardant Clothing ☐ EH (Electrical Hazard) Rated Boots, Gloves, etc. ☒ Noise/Hearing Protection ☐ Others:
OTHER H&S EQUIPMENT & GEAR ☐ Fire Extinguisher ☒ Caution Tape ☒ Traffic Cones or Stanchions ☐ Warning Signs or Placards ☒ Decon Buckets, Brushes, etc. ☐ Portable Ground Fault Interrupter (GFI) ☐ Lockout/Tagout Equipment ☐ Ventilation Equipment ☒ Others: First Aid Kit, Soap & Water, Hand Sanitizer	
Discuss/Clarify, as Appropriate:	

9. H&S TRAINING/QUALIFICATIONS FOR FIELD PERSONNEL

- | | |
|---|---|
| ☒ Project-Specific H&S Orientation (Required for All Projects/Staff)
☒ OSHA 40-Hour HAZWOPER/8 Hour Refreshers
☐ Hazard Communication (for project-specific chemical products)
☒ First Aid/CPR (required for HAZWOPER for at least one individual on site)
☒ Current Medical Clearance Letter (required for HAZWOPER)
☐ OSHA 10-hour Construction Safety Training
☐ Fall Protection Training
☒ Trenching & Excavation | ☐ Lockout/Tagout Training
☐ Electrical Safety Training
☒ Bloodborne Pathogen Training
☐
☐
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☐ |
|---|---|

Discuss/Clarify, as needed:

10. PERSONNEL AND EQUIPMENT DECONTAMINATION (SECTION ONLY REQUIRED FOR HAZWOPER SITES)

Describe personnel decontamination procedures for the project site, including “dry decon” (simple removal of PPE)	Equipment will be decontaminated, as needed, with high pressure hot water and/or Alconox and water. GZA personnel will utilize nitrile gloves when possibly contacting impacted materials. Used gloves will be disposed and “dry decon” will be used for clothing and shoes, as necessary. Frequently clean hands with hand sanitizer, and periodically wash hands using soap and water throughout the workday. Refrain from touching face.
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GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

11. PROJECT PERSONNEL - ROLES AND RESPONSIBILITIES		
GZA ON-SITE PERSONNEL:		
Name(s)	Project Title/Assigned Role	Telephone Numbers
Thomas Bohlen	Site Supervisor	Work: Cell: 716-570-5983
Thomas Bohlen	Field Safety Officer	Work: Cell: 716-570-5983
Thomas Bohlen	First Aid Personnel	Work: Cell: 716-570-5983
Ernest Thalhamer Mike Kress Morgan Brown	GZA Project Team Members	Cell: 716-316-1477 Cell: 716-570-2129 Cell: 716-803-5717
Site Supervisors and Project Managers (SS/PM): Responsibility for compliance with GZA Health and Safety programs, policies, procedures and applicable laws and regulations is shared by all GZA management and supervisory personnel. This includes the need for effective oversight and supervision of project staff necessary to control the Health and Safety aspects of GZA on-site activities. Field Safety Officer (FSO): The FSO is responsible for implementation of the Site Specific Health and Safety Plan. First Aid Personnel: At least one individual designated by GZA who has current training and certification in basic first aid and cardiopulmonary resuscitation (CPR) must be present during on-site activities involving multiple GZA personnel at HAZWOPER sites. GZA Project Team: Follow instructions relayed by the HASP and GZA manager on-site.		
OTHER PROJECT PERSONNEL:		
Name	Project Title/Assigned Role	Telephone Numbers
Bart Klettke	Principal-in-Charge	Work: 716-844-7035 Cell: 716-570-2093
Thomas Bohlen	Project Manager	Work: Cell: 716-570-5983
Michael Kress	Health and Safety Coordinator (HSC)	Work: Cell: 716-570-2129
Richard Ecord	GZA EHS Director	Work: 781-278-3809 Cell: 404-234-2834
Principal-in-Charge: Responsible of overall project oversight, including responsibility for Health and Safety. Project Manager: Responsible for day-to-day project management, including Health and Safety. Health and Safety Coordinator: General Health and Safety guidance and assistance. GZA EHS Director: H&S technical and regulatory guidance, assistance regarding GZA H&S policies and procedures.		

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

12. PLAN ACKNOWLEDGEMENT AND APPROVALS

GZA Project Site Worker Plan Acknowledgement

I have read, understood, and agree to abide by the information set forth in this Safety and Accident Prevention Plan. I will follow guidance in this plan and in the GZA Health and Safety Program Manual. I understand the training and medical monitoring requirements covered by the work outlined in this plan and have met those requirements.

GZA Employee Name	GZA Employee Signature	Date

Subcontractor Site Worker Plan Acknowledgement

GZA has prepared this plan solely for the purpose of protecting the health and safety of GZA employees. Subcontractors, visitors, and others at the site must refer to their organization's health and safety program or site-specific HASP for their protection. Subcontractor employees may use this plan for general informational purposes only. Subcontractor firms are obligated to comply with safety regulations applicable to their work, and understand this plan covers GZA activities only.

Subcontractor Employee Name	Subcontractor Employee Signatures	Date

GZA HASP Approval Signatures

The following individuals indicate their acknowledgement and/or approval of the contents of this Site Specific H&S Plan based on their understanding of project work activities, associated hazards and the appropriateness of health and safety measures to be implemented. A signed copy of this document must be present at the project site at all times work is being performed.

GZA Author/Reviewer Role	Signature	Date
HASP Preparer – Morgan Brown		8/14/2024
EHS Reviewer – Todd Bown		8/14/2024
Principal in Charge – Bart Klettke		8/14/2024

PORTA GAS

Material Safety Data Sheet

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION CHEMICAL NAME; CLASS: **NONFLAMMABLE GAS MIXTURE** Containing One or More of the Following Components in a Nitrogen Balance Gas: Oxygen 0-23.5%; Isobutylene, 0.0005-0.9% **SYNONYMS:** Not Applicable **CHEMICAL FAMILY NAME:** Not Applicable **FORMULA:** Not Applicable **PRODUCT USE:** Calibration of Monitoring and Research Equipment **Document Number:** MSDS1069 **Note:** The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

SUPPLIER/MANUFACTURER'S NAME: Portagas **ADDRESS:** 6717-B Polk Street, Houston, TX 77011 **BUSINESS PHONE:** General MSDS Info: (713) 928-6477 **EMERGENCY PHONE:** INFOTRAC: (800) 535-5053

2. COMPOSITION AND INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR				
			ACGIH-TLV		OSHA-PEL		NIOSH
			TWA	STEL	TWA	STEL	IDLH
			ppm	ppm	ppm	ppm	ppm
Isobutylene	115-11-7	0.0005-0.9%	There are no specific exposure limits for Isobutylene.				
Oxygen	7782-44-7	0-23.5%	There are no specific exposure limits for Oxygen.				
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.				

NE = Not Established. See Section 16 for Definitions of Terms Used. NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This gas mixture has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This is a colorless, odorless gas mixture. Releases of this gas mixture may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated. Isobutylene, a component of this gas mixture, may cause drowsiness and other central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this gas mixture is by inhalation. **INHALATION:** Due to the small size of an individual cylinder of this gas mixture, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. The chief health hazard associated with this gas mixture is when this gas mixture contains less than 19.5% Oxygen and is released in a small, poorly-ventilated area (i.e. an enclosed or confined space). Under this circumstance, an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN

12-16% Oxygen:

10-14% Oxygen:

6-10% Oxygen:

Below 6%:

OBSERVED EFFECT

Breathing and pulse rate increase, muscular coordination slightly disturbed.

Emotional upset, abnormal fatigue, disturbed respiration.

Nausea, vomiting, collapse, or loss of consciousness.

Convulsive movements, possible respiratory collapse, and death.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this gas mixture, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. The most significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color. Additionally, Isobutylene, a component of this gas mixture, may cause drowsiness or central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur. **CHRONIC:** Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may affect the heart and nervous system. **TARGET ORGANS:** ACUTE: Respiratory system, eyes. CHRONIC: Heart, cardiovascular system, central nervous system.

4. FIRST-AID MEASURES RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS MIXTURE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. No unusual health effects are anticipated after exposure to this gas mixture, due to the small cylinder size. If any adverse symptom develops after over-exposure to this gas mixture, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s). **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Acute or chronic respiratory conditions may be aggravated by over-exposure to this gas mixture. **RECOMMENDATIONS TO PHYSICIANS:** Administer oxygen, if necessary; treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES FLASH POINT: Not applicable. **AUTOIGNITION TEMPERATURE:** Not applicable. **FLAMMABLE LIMITS (in air by volume, %):** Lower (LEL): Not applicable. Upper (UEL): Not applicable. **FIRE EXTINGUISHING MATERIALS:** Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire. **UNUSUAL FIRE AND EXPLOSION HAZARDS:** This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire. **Explosion Sensitivity to Mechanical Impact:** Not sensitive. **Explosion Sensitivity to Static Discharge:** Not sensitive. **SPECIAL FIRE-FIGHTING PROCEDURES:** Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this gas mixture presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen. Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area. If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING AND USE WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify the cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. **STORAGE AND HANDLING PRACTICES:** Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C [70°F]). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage. Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.** **SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS:** **WARNING!** Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure. **PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this gas mixture in well-ventilated areas. If this gas mixture is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Nitrous Oxide and Oxygen.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection when oxygen levels are below 19.5%, or during emergency response to a release of this gas mixture. During an emergency situation, before entering the area, check the concentration of Methane and Oxygen. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). **EYE PROTECTION:** Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards. **HAND PROTECTION:** Wear leather gloves when handling cylinders. Chemically resistant gloves should be worn when using this gas mixture. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada. **BODY PROTECTION:** No special protection is needed under normal circumstances of use. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

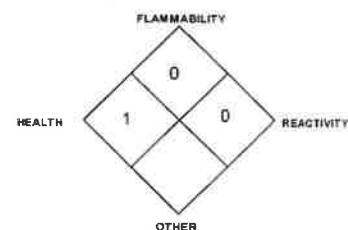
9. PHYSICAL AND CHEMICAL PROPERTIES The following information is for Nitrogen, a main component of this gas mixture. **GAS DENSITY @ 32°F (0°C) and 1 atm:** 0.072 lbs/ft³ (1.153 kg/m³) **BOILING POINT:** -195.8°C (-320.4°F) **FREEZING/MELTING POINT @ 10 psig:** -210°C (-345.8°F) **SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C):** 0.906 **pH:** Not applicable. **SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm:** 0.023 **MOLECULAR WEIGHT:** 28.01 **EVAPORATION RATE (nBuAc = 1):** Not applicable. **EXPANSION RATIO:** Not applicable. **ODOR THRESHOLD:** Not applicable. **SPECIFIC VOLUME (ft³/lb):** 13.8 **VAPOR PRESSURE @ 70°F (21.1°C) psig:** Not applicable. **COEFFICIENT WATER/OIL DISTRIBUTION:** Not applicable. The following information is for Oxygen, a main component of this gas mixture. **GAS DENSITY @ 32°F (0°C) and 1 atm:** 0.083 lb/cu ft (1.326 kg/m³) **FREEZING/MELTING POINT @ 10 psig:** -218.8°C (-361.8°F) **BOILING POINT:** -183.0°C (-297.4°F) **SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C):** 1.105 **pH:** Not applicable. **SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm:** 0.04.91 **MOLECULAR WEIGHT:** 32.00 **EVAPORATION RATE (nBuAc = 1):** Not applicable. **EXPANSION RATIO:** Not applicable. **ODOR THRESHOLD:** Not applicable. **VOLUME (ft³/lb):** 12.1 **VAPOR PRESSURE @ 70°F (21.1°C) psig:** Not applicable. **COEFFICIENT WATER/OIL DISTRIBUTION:** Not applicable. The following information is for the gas mixture. **APPEARANCE AND COLOR:** This is a colorless, odorless gas mixture. **HOW TO DETECT THIS SUBSTANCE (warning properties):** There are no unusual warning properties associated with a release of this gas mixture. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

MSDS1069

March 2007

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM	
HEALTH HAZARD (BLUE)	1
FLAMMABILITY HAZARD (RED)	0
PHYSICAL HAZARD (YELLOW)	0
PROTECTIVE EQUIPMENT	
EYES	RESPIRATORY
HANDS	BODY
See Section 8	
For Routine Industrial Use and Handling Applications	

NFPA RATING



1 of 2

Rev. 1

PORTAGAS

Material Safety Data Sheet

10. STABILITY and REACTIVITY STABILITY: Normally stable in gaseous state. **DECOMPOSITION PRODUCTS:** The thermal decomposition products of Isobutylene include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire. **MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Titanium will burn in the Nitrogen component of this gas mixture. Lithium reacts slowly with Nitrogen at ambient temperatures. The Isobutylene component of this gas mixture is also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride). **HAZARDOUS POLYMERIZATION:** Will not occur. **CONDITIONS TO AVOID:** Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION TOXICITY DATA: The following toxicology data are available for the components of this gas mixture: **ISOBUTYLENE:** LC₅₀ (inhalation, rat) = 620,000 mg/kg/4 hours LC₅₀ (inhalation, mouse) = 415,000 mg/kg **NITROGEN:** There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment. **SUSPECTED CANCER AGENT:** The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies. **IRRITANCY OF PRODUCT:** Contact with rapidly expanding gases can be irritating to exposed skin and eyes. **SENSITIZATION TO THE PRODUCT:** The components of this gas mixture are not known to cause human skin or respiratory sensitization. **REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this gas mixture and its components on the human reproductive system. **Mutagenicity:** No mutagenicity effects have been described for the components in this gas mixture. **Embryotoxicity:** No embryotoxic effects have been described for the components in this gas mixture. **Teratogenicity:** No teratogenicity effects have been described for the components in this gas mixture. **Reproductive Toxicity:** No reproductive toxicity effects have been described for the components in gas mixture. *A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.* **BIOLOGICAL EXPOSURE INDICES (BEIs):** Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

12. ECOLOGICAL INFORMATION ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this gas mixture. **OXYGEN:** Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log K_{ow} = -0.65 **NITROGEN:** Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C. **EFFECT OF MATERIAL ON PLANTS or ANIMALS:** No evidence is currently available on the effects of this gas mixture on plant and animal life. **EFFECT OF CHEMICAL ON AQUATIC LIFE:** No evidence is currently available on the effects of this gas mixture on aquatic life.

13. DISPOSAL CONSIDERATIONS PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION. PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen. **HAZARD CLASS NUMBER and DESCRIPTION:** 2.2 (Non-Flammable Gas) **UN IDENTIFICATION NUMBER:** UN 1956 **PACKING GROUP:** Not applicable. **DOT LABEL(S) REQUIRED:** Class 2.2 (Non-Flammable Gas) **NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):** 126 **MARINE POLLUTANT:** The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B). **SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation. **Note:** DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas is considered as Dangerous Goods, per regulations of Transport Canada. **PROPER SHIPPING NAME:** Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen. **HAZARD CLASS NUMBER and DESCRIPTION:** 2.2 (Non-Flammable Gas) **UN IDENTIFICATION NUMBER:** UN 1956 **PACKING GROUP:** Not Applicable **HAZARD LABEL:** Class 2.2 (Non-Flammable Gas) **SPECIAL PROVISIONS:** None **EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX:** 0.12 **ERAP INDEX:** None **PASSENGER CARRYING SHIP INDEX:** None **PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX:** 75 **NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):** 126 **NOTE:** Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION ADDITIONAL U.S. REGULATIONS: U.S. SARA REPORTING REQUIREMENTS: The components of this gas mixture are not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act. **U.S. SARA THRESHOLD PLANNING QUANTITY:** There are no specific Threshold Planning Quantities for this gas mixture. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20. **U.S. TSCA INVENTORY STATUS:** The components of this gas mixture are listed on the TSCA Inventory. **U.S. CERCLA REPORTABLE QUANTITY (RQ):** Not applicable. **OTHER U.S. FEDERAL REGULATIONS:** No component of this gas mixture is subject to the requirements of CFR 29 1910.1000 (under the 1989 PELs). Isobutylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds. The regulations of the Process Safety Management of Highly Hazardous Chemicals are not applicable (29 CFR 1910.119). This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Isobutylene is listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,554 kg) or greater. **U.S. STATE REGULATORY INFORMATION:** The components of this gas mixture are covered under the following specific State regulations: **Alaska - Designated Toxic and Hazardous Substances:** No. **California - Permissible Exposure Limits for Chemical Contaminants:** Nitrogen. **Florida - Substance List:** Oxygen, Isobutylene. **Illinois - Toxic Substance List:** No. **Kansas - Section 302/313 List:** No. **Massachusetts - Substance List:** Oxygen, Isobutylene. **Michigan - Critical Materials Register:** No. **Minnesota - List of Hazardous Substances:** No. **Missouri - Employer Information/Toxic Substance List:** No. **New Jersey - Right to Know Hazardous Substance List:** Oxygen, Nitrogen, Isobutylene. **North Dakota - List of Hazardous Chemicals, Reportable Quantities:** No. **Pennsylvania - Hazardous Substance List:** Oxygen, Nitrogen, Isobutylene. **Rhode Island - Hazardous Substance List:** Oxygen, Nitrogen. **Texas - Hazardous Substance List:** No. **West Virginia - Hazardous Substance List:** No. **Wisconsin - Toxic and Hazardous Substances:** : No. **CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** No component of this gas mixture is on the California Proposition 65 lists. **ADDITIONAL CANADIAN REGULATIONS: CANADIAN DSL/NDSL INVENTORY STATUS:** The components of this gas mixture are listed on the DSL Inventory. **CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** The components of this gas mixture are not on the CEPA Priorities Substances Lists. **CANADIAN WHMIS REGULATIONS:** This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

16. OTHER INFORMATION INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures. For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. **MIXTURES:** When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death. **Disclaimer:** To the best of Portagas's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type either express or implied are provided. The information contained herein relates only to this specific product. Data may be changed from time to time. Be sure to consult the latest edition.



GZA GEOENVIRONMENTAL, INC.

JOB HAZARD ANALYSIS WORKSHEET

Job: General Outdoor Field Work

Analysis By: Anthony Zemba,
CHMM

Reviewed By: Guy Dalton

Approved By: Jayanti Chatterjee, CIH

Date: June 25, 2012

Date: June 25, 2012

Date: July 12, 2012

Task 21.1

General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Pre-work preparation	Overlooking of potential hazards	Become familiar with project area and job site by reviewing available on-line mapping (USGS Topographic, NWI Wetland, NRCS Soil, etc.; and aerial photographs before visiting site. Understand related hazards through review of this and other Task Hazard Analyses and participate in daily safety tailgate meetings (where applicable).
		Communicate Task Hazard Analysis and Lessons Learned information to operator(s) prior to initiating work and throughout the project as needed.
Driving to site	Vehicle accidents/collisions/injuries	Perform pre-operation check of vehicle, verifying service brakes, parking brake, steering, lights, tires, horn, wipers mirrors and glass are in good condition. verify that the rig is roadworthy.
		Wear seat belts always when driving even on site.
		Secure loose materials in cab or bed of vehicle.
Working within transportation corridors or active construction sites	Collisions injuries	Keep windshields, windows and lights cleans.
		Abide by safe driving procedures.
		Backing collisions
		If possible avoid backing by using a route that allows you to pull through.
		If backing up from a parked area do a quality 360 walker.
		Wear high visibility safety vest on site when out of personal or GZA vehicle.
		Park vehicle in designated parking locations, or select off-road area that is firm, and without hazards. Directly inspect parking location on foot if necessary.
		Use emergency flashers or other appropriate vehicle warning system as appropriate to local conditions when parking vehicle.
		Use emergency flashers or other appropriate vehicle warning system when parking outside of standard parking spaces, or to stop in right-of-
		Be alert at all times; never step outside traffic cones.



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Task 21.1

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HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Stand clear of moving heavy equipment and away from any overhead utility lines until equipment is safely in position and parked properly and securely by the contractor.
		Do not wear headphones or earbuds, or listen to music or talk on the phone, which may distract from work hazards.
	Crossing Automobile traffic lanes	Wear high visibility safety vests at all times when out of vehicle and working within or adjacent to the roadway.
	Crossing Airport Movement Areas (e.g., Runways, taxiways, approaches)	Learn, know, and conform to project site Airport's, Airfield's, or Airbase's protocol for crossing movement areas (whether on foot or in vehicle).
		Work within airport movement areas or safety zones must be coordinated with the Air Traffic Control Tower.
		Vehicles to have blinking or flashing lights or beacons; pedestrians to wear high visibility safety vests.
		Using protocol, maintain communication with airport security and air traffic controllers.
	Crossing Railways	Work within active railroad ROWs requires railroad safety training. No work can be done within the railroad traffic envelope without the permission of a railroad flagman.
		No equipment or vehicles can cross without the permission of a railroad flagman.
		Expect any train on any track coming from either direction at any time.
Working in Natural or Remote Areas	Slips, trips, fall	Be aware of loose ground materials such as talus, unconsolidated rock, soil, sediment, ice and other media that could cause slips, trips or falls.
		Be careful when walking in heavily vegetated areas. Mind tangles of vines, thorny branches, and slippery logs and rock surfaces. Dense vegetation and especially entangled vines present trip hazards, or can mask voids, sharp objects, or other hazards beneath.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: General Outdoor Field Work

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Date: June 25, 2012

Date: June 25, 2012

Date: July 12, 2012

Task 21.1 General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Be vigilant for signs of cracking, shifting, fracturing, and evidence of past movement.
		Use wood mats or other stabilizing materials for equipment if soft ground conditions are present.
		Use walking stick, auger, or ski poles to steady yourself when traversing loose material or slopes.



GZA GEOENVIRONMENTAL, INC.

JOB HAZARD ANALYSIS WORKSHEET

Job: General Outdoor Field Work

Analysis By: Anthony Zemba, CHMM	Reviewed By: Guy Dalton	Approved By: Jayanti Chatterjee , CIH
Date: June 25, 2012	Date: June 25, 2012	Date: July 12, 2012

Task 21.1

General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Wear proper footwear for conditions.
		Store tools in their proper storage location when not in use.
		Provide adequate lighting when necessary.
	Falls into excavations/ voids	Stand away from edges of excavations and voids. Do not attempt access without proper equipment / training. Remember that some excavations or voids may constitute a confined space and may present structural stability issues.
	Cave-ins and engulfment	DO NOT enter caves, sinkholes, excavations, and other voids or concavities that are not sloped or shored properly and have not been evaluated by a competent person to be safe.
		Stand away from edges of excavations, cliffs, dug wells, and other voids.
		Watch for cracks/fissures in the ground surface in the immediate vicinity of a pit or void, which indicate imminent sidewall failure/cave-in.
		Assess if confined space entry procedures need to be implemented.
Working among hazardous biota	Plant toxins Incidental contact	Before entering void (if required to do so and with proper training) be aware of any hazards at the surface (boulders, equipment) which may fall into the void.
		Know the appearance of poison ivy and poison sumac in all seasons, and if sensitive to these toxins, carry and use special cleaning soaps/solutions when thought to be exposed. Stock first aid kit with poison ivy/sumac cleaning soaps/solutions.
		Ticks carry risk of Lyme's and other Diseases. Tick season is basically any field day above 40 degrees F.
		Tuck pants into long socks.
	Ticks	The application of DEET (or permethrin pre-treatment) to clothing in season to control exposure to ticks is recommended.
		Check clothing for ticks frequently.



GZA GEOENVIRONMENTAL, INC.

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Date: June 25, 2012

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Task 21.1

General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Check whole body immediately upon returning from field and shower.
	Mosquitoes	Be aware of intermittent seasonal reports of mosquito borne diseases, such as West Nile disease and Eastern Equine Encephalitis (EEE), and their locations relative to your field site. Use of DEET or other mosquito repellant is recommended.
	Stinging bees and wasps	Be aware of potential cavity, suspended or ground nesting bee/wasp/hornet nests. Avoid undue disturbance or approach with appropriate safety clothing, protection and netting.
		Take appropriate precautions if allergic to bees. Carry at least two epi-pens in first aid kit as well as anti-histamines (oral and inhalers).
		Avoid areas of heavy bee activity if allergic. Avoid perfumed soaps, shampoos, deodorants, colognes, etc. that may attract bees.
	Poisonous Snakes	Be aware of terrain likelihood of harboring poisonous snakes in your work zone. Avoid reaching or stepping into hidden areas (such as into wood pile, rock pile, debris pile, stone wall, etc.) without pre-inspection.
		Coordinate with local hospitals to verify they have proper anti-venom in stock.
		Learn first aid procedures in case of poisonous snake bite.
	Wild Animals	Devise an action plan and include in the site-specific HASP.
		Do NOT handle wildlife unless properly trained to do so.
		Beware of any wild animal that shows no sign of wariness of humans.
		Do NOT attempt to feed wild animals or to help apparently injured wild animals.
		Be aware of domestic animals that may also pose a threat such as dogs off leash, bulls out to pasture, etc.



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Date: June 25, 2012

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Task 21.1

General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Working in Adverse Weather Conditions	Heat / cold stress and other weather related hazards	Assess weather conditions prior to on-site work and examine forecast for anticipated period of work. Dress appropriately for weather conditions (e.g., precipitation, temperature ranges over anticipated duration of field work). Include clothing and the presence / absence of shade when calculating a heat index. Schedule work day to avoid working during hottest or coldest parts of the day, to the extent practicable. Keep exposed skin covered in extremely cold weather. Recognize signs of frostbite; use warming packs and layer clothing to maintain warmth. Use a wicking layer of clothing against your body to keep moisture away from skin. Wool clothing will continue to keep you warm after it becomes wet; cotton will not. Use protective ointments such as sunscreen and chap stick, as appropriate to the field conditions. Stay hydrated in hot weather; drink fluids regularly throughout the day, even if not thirsty. Recognize signs of heat stress; take frequent breaks in shade when working in direct sunlight for prolonged periods. Be familiar with Heat index chart - add 20 degrees to chart if fully clothed and if working in direct sunlight. NOTE: Unacceptable field work conditions are not precise, but may include site specific conditions, general location, extreme weather conditions (e.g., icing, lightning, excessive cold or wind), travel conditions, and other factors. Professional judgment is required, and personal assessment of safety must always be individually assessed.
	Working on Ice	Assess relative load bearing capacity of ice on lakes, ponds and other waterways. If unsure do not venture onto the ice.



GZA GEOENVIRONMENTAL, INC.

JOB HAZARD ANALYSIS WORKSHEET

Job: General Outdoor Field Work

Analysis By: Anthony Zemba, CHMM

Reviewed By: Guy Dalton

Approved By: Jayanti Chatterjee, CIH

Date: June 25, 2012

Date: June 25, 2012

Date: July 12, 2012

Task 21.1

General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Wear proper footwear modified for traction on ice.
	Electrical storms	If lightning is observed during drilling activities, work shall be suspended immediately and employees shall find suitable shelter (building or vehicle at minimum). Work will commence no sooner than 30 minutes after the last indications of lightning have been observed
		Seek shelter inside a walled building or your vehicle.
		Open picnic pavilions and under trees are not adequate shelters.
		Assess vulnerability to lightning strikes as soon as thunder is heard on the horizon. Open areas and higher elevations are more susceptible to strikes.
		Tall objects such as metal towers and flag poles may attract lightning.
Working in areas without sanitary facilities	High Winds	Consult internet weather radar tracking devices to learn of impending storm patterns proximal to your work area.
		Avoid working at high elevations, elevated platforms, and other exposed areas during high wind conditions.
		Assess work area for equipment that may be blown down, over, or carried aloft by high winds.
	Hygiene related hazards	Provide hand washing kits (e.g., baby wipes, hand sanitizers, paper towels, bottled water, etc.) to be used prior to eating and drinking.
		Have garbage bags handy to collect trash.
Working in remote areas	Emergency Conditions	Be familiar with onsite emergency procedures and route to nearest hospital.
		Have a first aid kit available; know its contents and how to use them.
	Disorientation	Carry a cell phone during all field work for emergency purposes, and confirm the nearest location of cell phone signal on site prior to start of worksite.
		Plan your route and anticipated progress prior to field work.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: General Outdoor Field Work

Analysis By: Anthony Zemba,
CHMM

Reviewed By: Guy Dalton

Approved By: Jayanti Chatterjee , CIH

Date: June 25, 2012

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Task 21.1 General Outdoor Field Work

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Have multiple navigation aids (e.g., USGS Map, compass, GPS, etc.) and know how to use them before entering field. Remember to have charged batteries and battery back-ups for electronic devices.
		Share your progress plan with office staff prior to entering the field.
		Check in with office personnel periodically to update progress.
		Review and comply with GZA's Working Alone Policy 03-1009 in advance of working alone on a project site.
	Hunting	Be familiar with the various game hunting seasons. Follow rules and guidelines for remaining visible to hunters. Try to plan work around active hunting seasons or daily peak hunting hours as warranted.

GZA GEOENVIRONMENTAL, INC.
JOB HAZARD ANALYSIS WORKSHEET

Job: Field Sampling

Analysis By: Christie Wagner	Reviewed By: Jayanti Chatterjee, CIH	Approved By: Jayanti Chatterjee, CIH
Date: November 4, 2011 Revised: July 12, 2012	Date: July 12, 2012	Date: July 12, 2012

Task 20.11
Field Sampling

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Review Related THA's – 21.1 General Outdoor Field Work		
Pre work task for site visit	Adverse Weather Conditions	Assess weather conditions prior to on-site work and examine forecast for anticipated period of work. Dress appropriately for weather conditions (e.g., precipitation, temperature ranges over anticipated duration of field work). Use protective ointments such as sunscreen and chap stick, as appropriate to the field conditions. Be aware of the anticipated weather conditions prior to mobilization to the site. Unacceptable field work conditions are not precise, but may include site specific conditions, general location, extreme weather conditions (e.g., icing, lightening, excessive cold or wind), travel conditions, and other factors. Professional judgment is required, and personal assessment of safety must always be individually assessed.
Conduct visual inspection of site	Dangerous Terrain	Be aware of the site terrain, watch for holes and rocks that can be tripping hazards Learn to identify and watch for plants such as thorn bushes and poison ivy that can either scratch you or give you a rash.
Collecting sample	Muscle strain from lifting heavy objects	Use proper lifting techniques. Use appropriate mechanical assistance and tools when possible. Wear work gloves and steel toed boots.
	Exposure to unknown sample	Be sure to treat effluent samples as unknowns and wear the proper PPE. If there are any unusual odors/fumes coming from a sample, especially those that cause reactions in the eyes or nose, leave the area and inform a supervisor immediately.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: Excavation and Trenching (Heavy Equipment)

Analysis By: Andrew Whitsitt

Reviewed By: Guy Dalton

Approved By: Jayanti Chatterjee , CIH

Date: September 30, 2011

Date: June 21, 2012

Date: June 26, 2012

Revised: June 21, 2012

Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
<u>Review Related THA's –</u> 21.1 – General Outdoor Field Work		
Pre-Planning	Overlooking hazards	Review and become familiar with the requirements of GZA Policy 03-3006, <i>Excavation Safety Policy and Procedures</i> .
Observation of Deployment of Traffic Protection Equipment and Mobilizing Equipment by contractor	Collisions, struck by injuries	Wear high visibility vest at all times when out of personal or GZA vehicle.
		Park personal or GZA vehicle in designated parking locations, or select off-road area that is firm, and without hazards. Directly inspect parking location on foot if necessary.
		If parking outside of a designated parking area, demarcate vehicle with traffic cones or equivalent.
		Use emergency flashers or other appropriate vehicle warning system as appropriate to local conditions when parking personal or GZA vehicle.
		Observe if police detail or other required traffic control system (if necessary) is in place.
		Stay within the confines of the work area and do not venture outside of the demarcated work area into traffic.
		If you observe that contractor may back into structures, vehicles, fences, etc., notify contractor immediately with pre-determined signals. Do not cross the path of the heavy equipment.
		Stand clear of moving heavy equipment.
	Overhead electrical lines	Look overhead to assess if any utilities are present and confirm with the GZA subcontractor that they are aware of the overhead utility location and to take appropriate actions to prevent contact with the overhead utilities and to minimize any arc flash hazards. Review GZA's Electrical Safe Work Practices Program 03-3003
		Stand clear of overhead lines while equipment is being mobilized.
		If the equipment contacts an overhead power line, inform any occupant and/or operator to remain in/on the rig until the line is de-energized. Summon help immediately.
Unloading equipment and materials	Strains and sprains	Use proper lifting techniques when lifting equipment. Seek assistance with heavy loads.

Job Hazard Analysis
Task 4.4A - Excavation and Trenching (Heavy Equipment)



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Date: September 30, 2011

Date: June 21, 2012

Date: June 26, 2012

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Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		GZA personnel are not to assist contractor with contractor's work .
		Use work gloves where appropriate to prevent hand injuries.
		Wear steel toed boots.
		Use equipment whenever possible to avoid heavy lifting.
	Slips, Trip and Fall Hazards	Inspect site for uneven terrain or tripping hazards; plan travel route to avoid these areas or improve the site to eliminate the hazard.
		Clear brush from work area and clear vegetation that could cause trip hazards, eye injury or obstruct sight lines.
	Unstable equipment	Trailers must be counter weighted properly before unloading equipment.
Excavation operations	Struck by	Stay clear of equipment at all times.
		Operators must be aware of your position on the site at all times.
		Wear high visibility reflective vests at all times while on site.
		Heed back up alarms of all equipment.
		Do not approach operating heavy equipment until eye contact is made with operator and equipment operation is stopped.
		Consult with contractor to properly maintain Site access roads to assure vehicles can safely leave and enter the Site.
		Confirm with contractor that excavating equipment are properly staged and stabilized to avoid roll overs and accidents.
		Be especially aware of and clear of the swing radius of all heavy equipment.
		Equipment buckets cannot be used to transport personnel from/into excavation.
	Underground utilities; above ground piping and appurtenances	Confirm that underground utility clearance procedures have been completed in accordance with GZA Policy # 04-0301 Responsibility for Utility Clearance of Exploration Locations for clearing utility locations prior to breaking ground.
		Confirm with contractor that safe distance from utilities, above ground piping and equipment are being maintained.

Job Hazard Analysis

Task 4.4A - Excavation and Trenching (Heavy Equipment)



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

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Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Have contractor hand excavate where required to expose utilities.
		Where possible have contractor lockout and purge active utilities.
		If excavation exposes utilities, have the contractor assure that lines are properly supported.
		Require the contractor to use non-sparking tools around active gas lines and implement safe work practices.
		If any damage is caused by GZA's subcontractor during excavation to utility lines, notify utility owner. If the contractor isn't working for GZA, either the contractor or its client should contact the utility owner.
		Notify utility owner if cathodic protection (coatings, groundbeds, etc.) has been exposed.
	Collisions with workers using shovels and hand tools	GZA employees must communicate and coordinate their actions and movements.
	Falling objects, debris	Wear hardhat and safety glasses/goggles.
		Do not work under raised loads
	Falls into Open Excavation	Secure work zone using barricades, caution tape, etc.
		DO NOT stand near edges of excavations, maintain 2' distance.
		Keep non-essential personnel away from the work zone.
	Hazardous Liquid Spills	Confirm with GZA sub contractor that spill control kit, including sorbents, pad booms and shovels are available on site if needed..
		Have GZA subcontractor line waste loading areas with polyethylene sheeting.
		Immediately report any spill to the project manager.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

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Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
	Exposure to Hazardous Substances	Be alert for hazardous site contaminants (as indicated by odor, visual characteristics, location, and site history). Assess whether procedures and contingencies are in place for characterizing hazards and protecting workers by use of appropriate air monitoring, personal protective clothing and respiratory protection, as needed. If contamination is identified at the Site only personnel trained and medically qualified to work on hazardous sites will be permitted to proceed with the work. Notify project manager if such conditions are encountered.
		Become familiar with hazards associated with hazardous commercial products used in construction (fuels, silica sand, grout, cement, etc.). Review Safety Data Sheets (SDSs) for such products and participate in daily safety tailgate meetings.
	Noise	Wear appropriate hearing protection.
	Cave-In Hazards	Excavation must be monitored by a Competent Person.
		Confirm with contractors that operators are properly trained for excavating.
		The proper sloping/shoring for the soil type must be used.
		There should be no standing water in the excavation.
		Place Spoils away from the edge of excavation as appropriate for the soil type.
		Excavations greater than 20 feet in depth must be designed by a registered professional engineer.
		Evaluate excavations at the beginning of each shift and following rain events
		DO NOT enter excavations unless absolutely necessary. The excavation must be safe to enter before entering. A means of egress (stairways, ladders or ramps) from trench excavations greater than 4 feet in depth must be positioned so that no more than 25 feet of lateral travel is required.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

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Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		If needed to enter excavations consult with onsite Competent Person to assess if it is safe to do so. If you are the Competent Person assess if it is safe to enter excavation before doing so.
	Hazardous Atmosphere	Identify possible contaminants.
		Set action levels for exposure.
		Monitor air quality.
		Air monitoring equipment must be properly calibrated.
		Refer to the site specific Health and Safety Plan for the use of proper personal protective equipment (PPE) and respiratory protection.
Soil Loading and Transport	Roadway/traffic hazards	Be alert at all times; never step outside traffic cones.
		Wear high visibility vests at all times.
		Be familiar with escape routes at each location. Stand clear of soil loading area and always make sure the equipment operator and truck drivers know your location.
		Follow project Traffic Control Plan. Be alert at all times and never step outside the traffic cones.
		Use a Police detail when necessary.
	Hazardous Material Contamination	Materials should be properly covered, including use of tarps on trucks. Stockpiled material awaiting transport should be placed on an impervious barrier such as polyethylene sheeting.
		Equipment and truck wheels, running boards, etc. must be free of loose materials before leaving Site.
Handling Flammable Liquids	Fire Hazards	Use only approved fuel containers for fuel, heavy duty metal cans with stable base and self closing nozzle is recommended.
		Store flammable liquids in appropriate flammable storage cabinet and containers.
		Be familiar with emergency procedures and where fire extinguishers are present on site.
		Inform GZA subcontractor if you observe improper storage of used rags and unsafe storage of flammable/combustible liquids brought on site.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

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Date: September 30, 2011

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Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Confirm with GZA subcontractor that fire extinguishers are present with heavy equipment and will be available at all times and that inspection tags are not expired. If GZA subcontractor is welding or cutting on site confirm there are no flammables or combustible materials near the vicinity of welding machines or torches (such as debris, fuels, grass/weeds, etc.). Review Site requirements for obtaining "Hot Work Permit". Stand well clear of welding/cutting/burning areas. When GZA project related subsurface activities encounter the presence of gas or electric, the operations shall immediately cease, shut down the equipment when possible and contact the Project Manager.
Tool Operation	Cuts, bruises, shocks, lacerations, sprains and strains	Do not use electrical tools with damaged cords or other electrical components. Use GFCI with all cords. Observe proper electrical safety practices. Tools must be properly maintained; do not use damaged tools. Wear proper Personal Protective Equipment Store and carry tools correctly. Use the correct tool for the job. Support the work piece (using clamps, vise, sawhorse, or other device). Do not hold the work piece with your hand. Unplug tools or remove batteries when servicing or changing bit, blades, abrasive wheels or other components. Protect your "off hand" from gouges, hammer blows, cutting tools, etc. Position your "off hand" to prevent injury in case of slip of the tool.
General site work	Slips, trips and falls	Maintain clean and sanitary work area free of tripping/slipping hazards. Store hand tools in their proper storage location when not in use. Provide adequate space for each to work safely with sound footing.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

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Analysis By: Andrew Whitsitt

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Task 4.4A

Excavation and Trenching (Heavy Equipment)

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Do not perform work if adequate lighting is not available.
		Maintain an exit pathway away around equipment and work areas at all times.
Soil Sampling	Cave-ins, slips, trips and falls, exposure to hazardous contamination, struck by, caught by, slips, trips and falls	Unless absolutely necessary DO NOT enter excavations to sample. Work with the contractor's equipment operator to obtain sample from the excavation and sample soil from the bucket of the excavator.
		See above for controls for other physical hazards.
	Exposure to chemicals	Refer to the site specific HASP for chemical hazards and the necessary precautions required for sampling.
		Understand potential hazards associated with handling sample collection preservatives.
		Review and have SDSs available for chemicals being brought on site, including that of sample preservatives.
Securing Site	Fall into excavations	Wear appropriate PPE identified in the HASP
		Wash hands before eating and drinking. Eating and drinking are prohibited in areas of soil contamination/work area.
		Make sure excavation is secured and properly marked with caution signs.
		If excavation is to be open over night have subcontractor erect a fence or properly cover excavations to keep public out of the area and away from the excavation and the removed tank.



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: Hazardous Materials Survey and Remediation

Analysis By: Benjamin Sallemi, Ph.D.

Reviewed By: Jayanti Chatterjee, CIH

Approved By: Jayanti Chatterjee, CIH

Date: September 30, 2011
Revised: July 2, 2012

Date: July 2, 2012

Date: July 2, 2012

Task 11

Hazardous Materials Survey and Remediation

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Review Related THA's – 21.1 Outdoor Field Work		
Hazardous Material Survey	Hazards associated with Asbestos, Lead-Based Paint, PCBs, etc.	Only GZA personnel trained and appropriately licensed/certified may perform these surveys. NOTE: Licensing and certification requirements may differ for States and municipalities. Be sure to check on the requirements.
	Working Alone	Review GZA's Working Alone Policy. Sign out or call into the office to leave site specific information where you are working, the anticipated duration/hours of work on site. Do this for each site if multiple in one day. Review GZA's Working Alone policy. Call office or the person identified as the emergency contact in the HASP when off site.
	Exposure to other building-related Toxic/Hazardous Substances	Wear appropriate safety equipment as required by the Site Specific Health and Safety Plan (HASP). Wear specific PPE and respiratory protection as required Become familiar with hazards associated with building-related components or materials (e.g., ACM, deteriorated lead-based paint, broken or damaged fluorescent light tubes/ballasts, visible mold, etc.). Review the HASP for details. Be alert for hazardous site contaminants (as indicated by odor, visual characteristics, location, and site history). Assess procedures and contingencies for characterizing hazards and protecting workers by use of appropriate personal protective clothing and respiratory protection, as needed.
	Vacant Buildings / Unsound Structures	Determine that the site building(s) is not inhabited by vagabonds or squatters. Determine that the site building(s) is not inhabited by wild animals. It is recommended that GZA employees in the field notify the local police prior to entering into a vacant building / property. GZA shall not enter into structurally damaged or unsound buildings, or buildings suspected of being unsound.



GZA GEOENVIRONMENTAL, INC.

JOB HAZARD ANALYSIS WORKSHEET

Job: Hazardous Materials Survey and Remediation

Analysis By: Benjamin Sallemi, Ph.D.

Reviewed By: Jayanti Chatterjee, CIH

Approved By: Jayanti Chatterjee, CIH

Date: September 30, 2011
Revised: July 2, 2012

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Task 11

Hazardous Materials Survey and Remediation

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
	Slips, Trips, and Falls	Become familiar with physical site specifics to reduce or eliminate slips, trips and falls due to uneven surfaces, onsite equipment, discarded materials, or working at height. Review GZA's Fall Protection Program 03-3001 and use the appropriate fall protection equipment when necessary. Use the proper ladder for the work area and follow ladder safety work practices. If operating manlifts/scissor lifts review the proper use of the equipment and conduct an inspection of the equipment prior to operating. Use proper fall protection when using manlifts/scissor lifts.
	Electrical Hazards	Review GZA's Electrical Safety Work Practices Program 03-3003. Power tools, sampling equipment, lighting, and any electrical power requirements must be GFCI protected. All survey personnel must determine that electrical equipment (e.g. panels) that may need to be accessed for sampling are properly de-energized and locked/tagged out prior to suspect material sampling. No sampling shall take place unless it is safe to do so. Do not use damaged electrical cords or tools with damaged cords. Cords and tools with grounding tab removed or with damage shall be labeled damaged and removed from service.
	Manual lifting, equipment handling	Use proper lifting techniques when lifting / moving objects or equipment to gain access into survey areas. Seek assistance with heavy loads. Use work gloves where appropriate to prevent hand injuries. Wear steel-toed work shoes.
	Cuts, scrapes, bruises, lacerations from use of tools	Maintain tools properly; do not use damaged tools. Use the right tool for the work. Wear gloves when appropriate. Wear eye protection; especially during sample collection.
Hazardous Materials Abatement Monitoring / Oversight by GZA	Hazards associated with Asbestos, Lead-Based Paint, PCBs, etc.	Review hazards associated with the materials being abated and follow work practices identified in the HASP.

Job Hazard Analysis

Task 11 - Hazardous Materials Survey and Remediation

Page 2 of 3



GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

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Reviewed By: Jayanti Chatterjee, CIH

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Revised: July 2, 2012**

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Task 11

Hazardous Materials Survey and Remediation

HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Use PPE identified in the HASP. Follow proper decontamination procedures.
	Physical Hazards inside abatement work areas – Slips, trips and falls, tools and debris falling on head	Abatement work areas can be slippery due to the use of amended water or other chemicals to reduce dust. Be mindful of the work area and step carefully with sure footing. When performing overhead inspections assess the need for fall protection. Climb scaffolds and ladders with care always using the three point contact. If operating manlifts/scissor lifts review the proper use of the equipment and conduct an inspection of the equipment prior to operating.
		Workers working overhead with tools may accidentally drop tools or materials being removed could drop below. Wear hard hats and avoid standing directly underneath active abatement areas.
	Exposure to chemicals used for abatement operations	Review Safety Data Sheets (SDS) for chemicals and use the proper PPE identified in the HASP. Stay away from the work area where chemicals are being used if not needed to be there.
	Fire hazards	Contractors may use heat guns, torches, etc. or may conduct cutting operations that can generate heat and spark. Always evaluate the work area for the presence of flammable/combustible materials in the vicinity of "hot work" and notify the contractor if observed. Confirm with the contractor that appropriate fire extinguishers are available and know their locations. Stay away from cutting and hot work operations and observe safety protocols that are put in place by the contractor to prevent fires.
	Working Alone	See above.



APPENDIX B
NEW YORK STATE DEPARTMENT OF HEALTH GENERIC COMMUNITY AIR MONITORING PLAN

Appendix 1A

New York State Department of Health Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009



APPENDIX C
ST MARYS' CEMENT COAL COMBUSTION RESIDUALS ACCEPTABILITY DOCUMENTATION

From: [Daniel Baker](#)
To: [Thomas Bohlen](#)
Cc: [Streit, George](#)
Subject: [EXTERNAL] Huntley Generating Site , DEC
Date: Friday, January 17, 2025 10:58:47 AM



Thomas Bohlen

Re: Huntley Generating Site , DEC

Received the following from St Mary's Cement

St Marys Plant Environmental Compliance Approval ECA#6394-D78PR2 notes the facility is approved to accept Industrial Byproduct materials which are defined as “ industrial by-product materials such as but not limited to iron slag from smelting industry, fly ash from coal fired generating plants, ash from waste water treatment plants and foundry and used in casting processes, wholly used at the Facility as substitute raw material sources of calcium oxide, silica, iron oxide and alumina required for the ongoing cement manufacturing process and which do not serve as fuel for the Cement Kiln.

The analytical results of the material proposed by Huntley Towananda meets the specifications of the ECA meaning the facility is able to accept the ash.

Trusting this is as requested.

Pleased to hear

Dan Baker
PBCo LLC

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 6394-D78PR2
Issue Date: November 11, 2024

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

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

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

Description Section

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

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

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

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

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

Government website;

2. "Acceptable Point of Impingement Concentration" means a concentration accepted by the Ministry as not likely to cause an adverse effect for a Compound of Concern that,
 - a. is not identified in the ACB list, or
 - b. is identified in the ACB list as belonging to the category "Benchmark 2" and has a concentration at a Point of Impingement that exceeds the concentration set out for the contaminant in that document.

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

3. "Acoustic Assessment Report" means the report, prepared in accordance with Publication NPC-233 and Appendix A of the Basic Comprehensive User Guide, by Petr Chocensky of HGC Engineering and dated August 31, 2023 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility, as updated in accordance with Condition 5 of this Approval;
4. "Acoustic Assessment Summary Table" means a table prepared in accordance with the Basic Comprehensive User Guide summarising the results of the Acoustic Assessment Report, as updated in accordance with Condition 5 of this Approval;
5. "Acoustic Audit" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the Facility, assessed to determine compliance with the Performance Limits for the Facility regarding noise emissions, completed in accordance with the procedures set in Publication NPC-103 and reported in accordance with Publication NPC-233;
6. "Acoustic Audit Report" means a report presenting the results of an Acoustic Audit, prepared in accordance with Publication NPC-233;
7. "Acoustical Consultant" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;
8. "Agricultural Waste" has the same meaning as defined in O. Reg. 347;
9. "Alternative Low-Carbon Fuels" means a fuel as defined in O. Reg. 79/15 and includes the materials approved under Condition 7 of this Approval;

10. "Approval" means this entire Environmental Compliance Approval and any Schedules to it;
11. "Basic Comprehensive User Guide" means the Ministry document titled "Basic Comprehensive Certificates of Approval (Air) User Guide" dated March 2011, as amended;
12. "Best Management Practices Plan" means the document titled "Best Management Practices Plan for the Control of Fugitive Dust Emissions - St. Mary's Cement Plant" Revision 8, dated February 2022, as amended;
13. "CAEAL" means the Canadian Association for Environmental Analytical Laboratories;
14. "Carbon Dioxide Emission Intensity" has the same meaning as defined under O. Reg. 79/15;
15. "Cement Kiln" means the cement kiln, firing Conventional Fuels, Alternative Low-Carbon Fuels, hydrogen and oxygen generated from the Electrolysis System, and Fuel Adjunct Material, described in the ESDM Report, this Approval, and in the supporting documentation referred to herein;
16. "CEM System" means the continuous monitoring and recording system used to measure the emissions from the Cement Kiln stack;
17. "CPM System" means the continuous monitoring and recording system used to measure the operational parameters of the Cement Kiln;
18. "Company" means St. Mary's Cement Inc. (Canada) that is responsible for the construction or operation of the Facility and includes any successors and assigns in accordance with section 19 of the EPA;
19. "Compound of Concern" means a contaminant described in paragraph 4 subsection 26 (1) of O. Reg. 419/05, namely, a contaminant that is discharged from the Facility in an amount that is not negligible;
20. "Conventional Fuels" means solid fuels including petroleum coke and coal for regular firing and also includes diesel, propane and natural gas for preheating during start-up;
21. "Demonstration Project" means a project that:
 - a. involves the combustion of Alternative Low-Carbon Fuel, introduced through the back-end firing system of the Cement Kiln, for the purpose of manufacturing cement, at the Facility, and
 - b. is carried out for the primary purpose of assisting in the design or assessing the merits of, or substantiating and showing the merits of a technology for the combustion described in definition 21.a.;
22. "Description Section" means the section on page one of this Approval describing the Company's operations and the Equipment located at the Facility and specifying the Facility Production Limit for

the Facility;

23. "Director" means a person appointed for the purpose of section 20.3 of the EPA by the Minister pursuant to section 5 of the EPA;
24. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located;
25. "Electrolysis System" means the Ultimate Cell Continuous Combustion (UC3) System described in the Original ESDM Report, or an equivalent system, where up to 30 normal cubic metres per hour of hydrogen and up to 15 normal cubic metres per hour of oxygen are generated and introduced into the fuel injection port of the cement kiln;
26. "Emission Summary Table" means a table described in paragraph 14 of subsection 26 (1) of O. Reg. 419/05;
27. "Environmental Assessment Act" means the *Environmental Assessment Act*, R.S.O. 1990, c.E.18;
28. "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E.19;
29. "Equipment" means equipment or processes described in the ESDM Report, this Approval and in the Schedules referred to herein and any other equipment or processes;
30. "Equipment with Specific Operational Limits" means the Cement Kiln (except the fuel feed system feeding Alternative Low-Carbon Fuels, Conventional Fuels and Hydrogen to the Cement Kiln), and any other Equipment related to the thermal oxidation of waste or waste derived fuels, fume incinerators or any other Equipment that is specifically referenced in any published Ministry document that outlines specific operational guidance that must be considered by the Director in issuing an Approval;
31. "ESDM Report" means the most current Emission Summary and Dispersion Modelling Report that describes the Facility. The ESDM Report is based on the Original ESDM Report and is updated after the issuance of this Approval in accordance with section 26 of O. Reg. 419/05 and the Procedure Document;
32. "Facility" means the entire operation belonging to the Company's cement manufacturing facility located on the Property where the Equipment is located;
33. "Facility Production Limit" means the production limit placed by the Director on the main product(s) or raw materials used by the Facility;
34. "Fuel Adjunct Materials" means solid fuel, wholly used at the Facility, as supplementary fuels to coal and petroleum coke for firing the Cement Kiln, such as but not limited to carbon dust, metallurgical coke and carbon black, but which does not include Alternative Low-Carbon Fuels;

35. "Highest Ranking Person" means the highest ranking person regularly present at the Facility who has management responsibilities relating to the Facility;
36. "Independent Acoustical Consultant" means an Acoustical Consultant who is not representing the Company and was not involved in preparing the Acoustic Assessment Report or the design/implementation of Noise Control Measures for the Facility and/or Equipment. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment or the design/implementation of Noise Control Measures for the Facility and/or Equipment;
37. "Industrial By-Product Materials" means industrial by-product materials such as but not limited to iron slag from smelting industry, fly ash from coal fired generating plants, ash from waste water treatment plants and foundry sand used in casting processes, wholly used at the Facility as substitute raw material sources of calcium oxide, silica, iron oxide and alumina required for the ongoing cement manufacturing process and which do not serve as fuel for the Cement Kiln;
38. "Log" means a document that contains a record of each change that is required to be made to the ESDM Report and Acoustic Assessment Report, including the date on which the change occurred. For example, a record would have to be made of a more accurate emission rate for a source of contaminant, more accurate meteorological data, a more accurate value of a parameter that is related to a source of contaminant, a change to a Point of Impingement and all changes to information associated with a Modification to the Facility that satisfies Condition 2;
39. "Manager" means the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, as those duties relate to the conditions of this Approval;
40. "Minister" means the Minister of the Environment, Conservation and Parks or such other member of the Executive Council as may be assigned the administration of the EPA under the Executive Council Act;
41. "Ministry" means the ministry of the Minister;
42. "Modification" means any construction, alteration, extension or replacement of any plant, structure, equipment, apparatus, mechanism or thing, or alteration of a process or rate of production at the Facility that may discharge or alter the rate or manner of discharge of a Compound of Concern to the air or discharge or alter noise or vibration emissions from the Facility;
43. "Noise Abatement Action Plan" means the noise abatement program developed by the Company, submitted to the Director and District Manager and approved by the Director, designed to achieve compliance with the sound level limits set in Publication NPC-300, as applicable. It also means the Noise Abatement Action Plan outlined in the Acoustic Assessment Report;
44. "Noise Control Measures" means measures to reduce the noise emissions from the Facility and/or

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

45. "O. Reg. 79/15" means Ontario Regulation 79/15: Alternative Low-Carbon Fuels; as amended;
46. "O. Reg. 347" means Ontario Regulation 347: General – Waste Management; as amended;
47. "O. Reg. 419/05" means Ontario Regulation 419/05: Air Pollution – Local Air Quality, made under the EPA;
48. "Original ESDM Report" means the Emission Summary and Dispersion Modelling Report which was prepared in accordance with section 26 of O. Reg. 419/05 and the Procedure Document by BCX Environmental Consulting and dated June 2024 submitted in support of the application, and includes any changes to the report made up to the date of issuance of this Approval;
49. "Point of Impingement" has the same meaning as in section 2 of O. Reg. 419/05;
50. "Point of Reception" means Point of Reception as defined by Publication NPC-300;
51. "Pre-Test Plan" means a plan for the Source Testing including the information required in Section 5 of the Source Testing Code;
52. "Procedure Document" means Ministry guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2018, as amended;
53. "Processes with Significant Environmental Aspects" means the Equipment which, during regular operation, would discharge one or more contaminants into the air in an amount which is not considered as negligible in accordance with section 26 (1) 4 of O. Reg. 419/05 and the Procedure Document;
54. "Property" means the single property jointly occupied by St. Marys Cement Inc. (Canada) cement manufacturing facility, the high calcium dried limestone manufacturing facility operated by Canada Building Material Co., and the dual-fuel fired truck heating system operated by Laidlaw Carriers Bulk, as described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;
55. "Publication NPC-207" means the Ministry draft technical publication "Impulse Vibration in Residential Buildings", November 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, published by the Ministry, August 1978, as amended;
56. "Publication NPC-233" means the Ministry Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995, as amended;
57. "Publication NPC-300" means the Ministry Publication NPC-300, "Environmental Noise Guideline,

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

58. "Report EPS1/PG/7" means means the document published by Environment Canada entitled “Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Power Generation”;
59. "Schedules" means the following schedules attached to this Approval and forming part of this Approval namely:
- Schedule A - Supporting Documentation
 - Schedule B - Performance Requirements - In-Stack Emission Limits
 - Schedule C - Emission Control Equipment Operational Requirements
 - Schedule D - Material Analysis Contaminants
 - Schedule E - Continuous Monitoring System Requirements
 - Schedule F - Alternative Low-Carbon Fuels Operational Requirements
 - Schedule G - Procedure for Source Testing
 - Schedule H - Test Sources and Test Contaminants
60. "Source Testing" means sampling and testing to measure emissions resulting from operating the test sources under conditions which yield the worst case emissions within the approved operating range of the test sources which satisfies paragraph 1 of subsection 11(1) of O. Reg. 419/05;
61. "Source Testing Code" means the Ontario Source Testing Code, dated June 2010, prepared by the Ministry, as amended;
62. "Toxicologist" means a qualified professional currently active in the field of risk assessment and toxicology that has a combination of formal university education, training and experience necessary to assess contaminants;
63. "Woodwaste" has the same meaning as defined in O. Reg 347; and
64. "Written Summary Form" means the electronic questionnaire form, available on the Ministry website, that documents whether Modifications were undertaken at the Facility and compliance with the Approval, in the previous calendar year.

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

TERMS AND CONDITIONS

1. GENERAL

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

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

- Schedule A - Supporting Documentation
 - Schedule B - Performance Requirements - In-Stack Emission Limits
 - Schedule C - Emission Control Equipment Operational Requirements
 - Schedule D - Material Analysis Contaminants
 - Schedule E - Continuous Monitoring System Requirements
 - Schedule F - Alternative Low-Carbon Fuels Operational Requirements
 - Schedule G - Procedure for Source Testing
 - Schedule H - Test Sources and Test Contaminants
2. The use of Alternative Low-Carbon Fuels is approved at the Facility under the requirements of O. Reg. 79/15, and pursuant to Section 3 of O. Reg. 79/15, section 27 of the EPA does not apply to the Facility.

2. LIMITED OPERATIONAL FLEXIBILITY

1. Pursuant to section 20.6 (1) of the EPA and subject to Conditions 2.2 and 2.3 of this Approval, future construction, alterations, extensions or replacements are approved in this Approval if the future construction, alterations, extensions or replacements are Modifications to the Facility that:
- a. are within the scope of the operations of the Facility as described in the Description Section of this Approval;
 - b. do not result in an increase of the Facility Production Limit above the level specified in the Description Section of this Approval; and
 - c. result in compliance with the performance limits as specified in Condition 4.
2. Condition 2.1 does not apply to,
- a. the addition of any new Equipment with Specific Operational Limits or to the Modification of any existing Equipment with Specific Operational Limits at the Facility;
 - b. alteration of the Alternative Low-Carbon Fuels and the increase in the quantity of Alternative Low-Carbon Fuels specified in Condition 7 of this Approval; and
 - c. Modifications to the Facility that would be subject to the Environmental Assessment Act.
3. Condition 2.1 of this Approval shall expire ten (10) years from the date of this Approval, unless this Approval is revoked prior to the expiry date. The Company may apply for renewal of Condition 2.1 of this Approval by including an ESDM Report and an Acoustic Assessment Report that describes the Facility as of the date of the renewal application.

3. REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION

1. Prior to making a Modification to the Facility that satisfies Condition 2.1.a. and 2.1.b., the Company shall prepare a proposed update to the ESDM Report to reflect the proposed Modification.
2. The Company shall request approval of an Acceptable Point of Impingement Concentration for a Compound of Concern if the Compound of Concern is not identified in the ACB list as belonging to the category “Benchmark 1” and a proposed update to an ESDM Report indicates that one of the following changes with respect to the concentration of the Compound of Concern may occur:
 - a. The Compound of Concern was not a Compound of Concern in the previous version of the ESDM Report and
 - i. the concentration of the Compound of Concern exceeds the concentration set out for the contaminant in the ACB list; or
 - ii. the Compound of Concern is not identified in the ACB list; or
 - b. The concentration of the Compound of Concern in the updated ESDM Report exceeds the higher of,
 - i. the most recent Acceptable Point of Impingement Concentration, and
 - ii. the concentration set out for the contaminant in the ACB list, if the contaminant is identified in that document.
3. The request required by Condition 3.2 shall propose a concentration for the Compound of Concern and shall contain an assessment, performed by a Toxicologist, of the likelihood of the proposed concentration causing an adverse effect at Points of Impingement.
4. If the request required by Condition 3.2 is a result of a proposed Modification described in Condition 3.1, the Company shall submit the request, in writing, to the Director at least 30 days prior to commencing to make the Modification. The Director shall provide written confirmation of receipt of this request to the Company.
5. If a request is required to be made under Condition 3.2 in respect of a proposed Modification described in Condition 3.1, the Company shall not make the Modification mentioned in Condition 3.1 unless the request is approved in writing by the Director.
6. If the Director notifies the Company in writing that the Director does not approve the request, the Company shall,

- a. revise and resubmit the request; or
 - b. notify the Director that it will not be making the Modification.
7. The re-submission mentioned in Condition 3.6 shall be deemed a new submission under Condition 3.2.
8. If the Director approves the request, the Company shall update the ESDM Report to reflect the Modification.
9. Condition 3 does not apply if Condition 2.1 has expired.

4. PERFORMANCE LIMITS

1. Subject to Condition 4.2, the Company shall not discharge or cause or permit the discharge of a Compound of Concern into the air if,
- a. the Compound of Concern is identified in the ACB list as belonging to the category "Benchmark 1" and the discharge results in the concentration at a Point of Impingement exceeding the Benchmark 1 concentration; or
 - b. the Compound of Concern is not identified in the ACB list as belonging to the category "Benchmark 1" and the discharge results in the concentration at a Point of Impingement exceeding the higher of,
 - i. if an Acceptable Point of Impingement Concentration exists, the most recent Acceptable Point of Impingement Concentration, and
 - ii. the concentration set out for the contaminant in the ACB list, if the contaminant is identified in that document.
2. Condition 4.1 does not apply if the benchmark set out in the ACB list has a 10-minute averaging period and no ambient monitor indicates an exceedance at a Point of Impingement where human activities regularly occur at a time when those activities regularly occur.
3. The Company shall:
- a. fully implement the Noise Control Measures as outlined in the Noise Abatement Action Plan by no later than August 31, 2027;
 - b. ensure subsequent to the completion of the Noise Abatement Action Plan that the noise emissions from the Facility comply with the limits in Ministry Publication NPC-300;

- c. ensure that the Noise Control Measures are properly maintained and continue to provide the acoustic performance outlined in the Acoustic Assessment Report; and
 - d. ensure that any and all operations at the Facility are done so in accordance with the information presented in Table 1 of the Acoustic Assessment Report.
4. The Company shall ensure that the vibration emissions from the Facility comply with the limits set out in Ministry Publication NPC-207.
 5. The Company shall operate any Equipment with Specific Operational Limits approved by this Approval in accordance with the Original ESDM Report.
 6. The Company shall ensure that at all times when Alternative Low-Carbon Fuels are co-fired with Conventional Fuels in the Cement Kiln, the discharge from the Cement Kiln complies with the performance requirements specified in Schedule B of this Approval.

5. DOCUMENTATION REQUIREMENTS

1. The Company shall maintain an up-to-date Log.
2. No later than June 30 of each year, the Company shall update the Acoustic Assessment Report and shall update the ESDM Report in accordance with section 26 of O. Reg. 419/05 so that the information in the reports is accurate as of December 31 in the previous year.
3. The Company shall make the Emission Summary Table (see section 27 of O. Reg. 419/05) and Acoustic Assessment Summary Table available for examination by any person, without charge, by posting it on the Internet or by making it available during regular business hours at the Facility.
4. The Company shall, within three (3) months after the expiry of Condition 2.1 of this Approval, update the ESDM Report and the Acoustic Assessment Report such that the information in the reports is accurate as of the date that Condition 2.1 of this Approval expired.
5. Conditions 5.1 and 5.2 do not apply if Condition 2.1 has expired.

6. WRITTEN SUMMARY FORM

1. Subject to Condition 6.2, the Company shall prepare, and make available to the Ministry upon request, no later than August 31 of each year, a Written Summary Form signed by the Highest Ranking Person.
2. Condition 6.1 does not apply if:
 - a. Condition 2.1 has expired; and

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

7. APPROVED ALTERNATIVE LOW-CARBON FUELS

1. The following Alternative Low-Carbon Fuels are approved for use as a fuel in the Cement Kiln at the Facility:
 - a. Material that is biomass fuel derived from harvested plant and forest sources, end of life agricultural sources, Woodwaste or Agricultural Waste, and includes but is not limited to sawdust, wood chips, wood, miscanthus grass, millet, sorghum, hemp, switch grass, and maize;
 - b. Material that is comprised of non-recyclable plastics, including but not limited to manufacturing rejects, material resource recovery facility rejects, plastics bags and packaging;
 - c. Material that is comprised of construction, renovation & demolition waste, including but not limited to scrap wood, treated lumber, carpets, textiles, sawdust, floor laminates and asphalt shingles;
 - d. Material that is comprised of non-recyclable paper fiber/wood/plastic composites, including but not limited to single-serve coffee pods, printed papers, paper towels, rejects and trimmings from paper recycling facilities such as ragger tails (residue including plastic trimmings, staples, paper fibre and metal wire), end rolls and cores; and
 - e. Material that is comprised of rubber (non-tire derived), including but not limited to shredded conveyor belt rubber.
2. Notwithstanding Condition 7.1 of this Approval, the Company shall ensure that the Alternative Low-Carbon Fuels are not derived from or composed of any material set out in Schedule 1 of O. Reg. 79/15.
3. The combined amount of Alternative Low-Carbon Fuels approved under Condition 7.1 of this Approval, subjected to thermal processing in the Cement Kiln (including for the purposes of the Demonstration Project) shall not exceed 175 tonnes per day.

8. OPERATION AND MAINTENANCE

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

- b. procedures to prevent upset conditions;
 - c. procedures to minimize all fugitive emissions;
 - d. procedures to prevent and/or minimize odorous emissions;
 - e. procedures to prevent and/or minimize noise emissions;
 - f. procedures for record keeping activities relating to the operation and maintenance programs;
 - g. acceptable range of the static pressure drop for the process dust control equipment listed in Schedule C of this Approval;
 - h. program to continuously monitor and record the pressure differential across each baghouse dust collector and the applicable operational parameters of the electrostatic precipitator specified as Primary Equipment in Schedule C of this Approval, including procedures to investigate and correct the cause of any anomalous measurements of the operational parameter;
 - i. program to periodically monitor and record the pressure differential across each baghouse dust collector specified as Secondary Equipment in Schedule C of this Approval, including procedures to investigate and correct the cause of any anomalous measurements;
 - j. list of management and supervisory personnel responsible for the operation and maintenance of the emission control equipment specified in Schedule C of this Approval.
2. The Company shall maintain and update to keep current, a list of all process dust control equipment, including the following details:
- Source identification; Production building/area served; Process/location served; Stack gas flow rate; Filter area (as applicable); Stack diameter and Stack height above grade.
3. The Company shall ensure that all Processes with Significant Environmental Aspects are operated and maintained in accordance with this Approval, the operating procedures and maintenance programs.
4. The Company shall prepare, update as necessary and implement, not later than three (3) months prior to the implementation of Alternative Low-Carbon Fuels operation at the Facility, procedures for the handling, processing and combustion in the Cement Kiln of Alternative Low-Carbon Fuels, including but not limited to:
- a. operating and maintenance procedures in accordance with good engineering practices and as recommended by the equipment suppliers;

- b. start-up, shut-down and emergency measures;
 - c. procedures for handling, storage, maintenance and conveyance of Alternative Low-Carbon Fuels and the inspection of such facilities in accordance with the requirements set out in O. Reg. 79/15;
 - d. procedures for record keeping activities, including but not limited to the record keeping requirements for Alternative Low-Carbon Fuels facility inspection, and Alternative Low-Carbon Fuels use and transport, in accordance with the requirements set out in O. Reg. 79/15;
5. The Company shall ensure that the Facility/Equipment is properly designed and operated at all times while firing Alternative Low-Carbon Fuels and comply with the operational requirements set out in Schedule F of this Approval.
6. Alternative Low-Carbon Fuels shall be fired in accordance with the operating procedures and shall only be fired once the Cement Kiln has achieved normal operation, temperatures and production and shall be introduced directly into the Cement Kiln to maintain the requirements set out in Schedule F of this Approval.
7. The introduction of Alternative Low-Carbon Fuels in the Cement Kiln shall be stopped (following appropriate procedures) if:
- a. the temperature, residual oxygen or pressure as measured by the CPM System do not meet the operational requirements outlined in Schedule F of this Approval for more than four (4) consecutive hours; or
 - b. the CPM System for one or more of the parameters specified in condition 8.7 (a) are down or malfunctioning for more than four (4) consecutive hours.
8. The Company shall comply with the following Alternative Low-Carbon Fuels storage requirements:
- a. the Alternative Low-Carbon Fuels shall be stored indoors or in enclosed containers, and the storage location shall be secure;
 - b. the maximum amount of Alternative Low-Carbon Fuels stored and the maximum time periods for which the Alternative Low-Carbon Fuels can be stored shall be in accordance with the requirements set out in O. Reg. 79/15; and
 - c. the Alternative Low-Carbon Fuels stored shall be combusted in the Cement Kiln.
9. The Company shall record the following data during Cement Kiln operation:

- a. daily combined raw feed in the Cement Kiln in tonnes per day;
 - b. daily Alternative Low-Carbon Fuels fired in the Cement Kiln in tonnes per day, for each category of Alternative Low-Carbon Fuels approved under Condition 7 of this Approval;
 - c. daily Conventional Fuels fired in the Cement Kiln in tonnes per day;
 - d. hours of operation of each of the Electrolysis System units in hours per day and the amount of hydrogen and oxygen produced by each Electrolysis System units and introduced in the cement kiln in normal cubic metres per hour;
 - e. daily Fuel Adjunct Material and Industrial By-Product Material in tonnes per day used in the Cement Kiln;
 - f. daily clinker production in tonnes per day;
 - g. records of any incidents specified in Condition 8.7 of this Approval, and
 - h. any start-up, shut-down and malfunction incidents.
10. The Company shall not engage in the Demonstration Project:
- a. at any time after three (3) years from the date that Alternative Low-Carbon Fuel is first combusted for the purposes of the Demonstration Project;
 - b. for more than a total of ninety (90) days in any twelve (12) month period; and,
 - c. for more than thirty (30) consecutive days.
11. The Company shall within two (2) weeks notify the Director and the District Manager in writing of:
- a. the date when Alternative Low-Carbon Fuel is first combusted at the Facility for the purposes of the Demonstration Project.

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

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

- a. A protocol for Alternative Low-Carbon Fuels vendor screening, sampling and analysis shall be immediately implemented in accordance with the document "Alternative Low-Carbon Fuel Handling Procedures and Testing Manual, St. Mary's Cement Inc. (Canada)- St. Mary's Cement Plant, Version 1.0- March, 2022 revision, as amended. At a minimum, the Alternative Low-Carbon Fuels analysis parameters shall comply with the criteria specified in Table 1, Table 2 and Table 3 of this document. Any change in the criteria specified in Table 1, Table 2 and Table 3 shall be finalized in consultation with the District Manager.
 - b. If the analysis results of the Alternative Low-Carbon Fuels indicate that the emission rates of contaminants from the Cement Kiln are higher than the maximum emission rates identified in the maximum emission scenario outlined in the ESDM Report, the Company shall update the ESDM Report with the emission rates derived from this analysis in accordance with the document "Alternative Low-Carbon Fuel Handling Procedures and Testing Manual, St. Mary's Cement Inc. (Canada)- St. Mary's Cement Plant, Version 1.0- March, 2022, as amended.
2. The Company shall ensure that the following material analysis program to measure and record the concentration of contaminants for Industrial By-Product Material and Fuel Adjunct Material is implemented as follows:
 - a. For each material used as Fuel Adjunct Materials, the Company shall obtain a metals/metal hydrides scan, including at a minimum the contaminants listed in Schedule D on a quarterly or Lot basis, as applicable. The Company shall ensure that the standard sampling methods outlined in the document "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, Ontario Ministry of the Environment and Energy, Standards Development Branch, December, 1996" are used, and that the samples are submitted to a CAEAL certified laboratory for analysis.
 - b. For each material used as Industrial By-Product Materials, the Company shall obtain a metals/metal hydrides scan, including at a minimum the contaminants listed in Schedule D, on a quarterly or Lot basis, as applicable. The Company shall ensure that the standard sampling methods outlined in the document "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, Ontario Ministry of the Environment and Energy, Standards Development Branch, December, 1996" are used, and that the samples are submitted to a CAEAL certified laboratory for analysis.
 - c. At any time, should the Company either independently or through other sources reasonably expect other metal/metal hydrides not outlined under Schedule D to be present in any material at greater than the trace concentrations, the Company shall obtain the appropriate analysis forthwith.
 - d. Upon receipt of the analysis, the Company shall ensure that the Point of Impingement concentrations of metal/metal hydrides do not exceed the respective performance limits based on the maximum emissions scenario outlined in the ESDM Report.

- e. The Company shall limit the accumulation of Industrial By-Product Materials and other raw materials in exterior storage piles to amounts which may reasonably be expected to be necessary for use in the cement manufacturing processes.
- f. The Company shall ensure that any Industrial By-Product Material stored at the Facility which the Company determines cannot be utilized in ongoing cement manufacturing processes, is managed in accordance with applicable waste management regulations, and, where an Industrial By-Product Material becomes unusable, the Company shall advise the District Manager in writing, of the type and quantity of such material, the reasons why it cannot be used and the specific manner in which the material is to be managed as a waste.
- g. The Company shall continue to prepare an annual summary report documenting the use of Industrial By-Product Materials and Fuel Adjunct Materials received at the Facility for the preceding calendar year. This summary report shall be submitted to the District Manager within sixty (60) days following the close of each calendar year and shall include a summary of the information set out in Condition No. 9.1 of this Approval.

10. CONTINUOUS MONITORING

1. Continuous Emissions Monitoring in the Kiln Stack

- a. The Company shall ensure that the CEM System continuously monitors the following parameters in the exhaust gas stream from the Cement Kiln stack:
 - i. Nitrogen Oxides
 - ii. Sulphur Dioxide, and
 - iii. Opacity
- b. The CEM System for nitrogen oxides and sulphur dioxide shall be installed, operated, maintained and quality assurance conducted and reported in accordance with the requirements set out in Report EPS1/PG/7. The annual Relative Accuracy Test Audit (RATA) report, including the required production data during the testing shall be submitted to the Manager and District Manager by June 30 of each year, for the previous calendar year. The quarterly cylinder gas audit reports shall be made available to the Ministry upon request.
- c. The CEM System for monitoring opacity shall comply with the requirements outlined in Schedule E.

2. Continuous Monitoring of Process Conditions

- a. The Company shall install, operate and maintain a CPM System to continuously monitor:
 - i. residual oxygen at locations specified in Schedule F;
 - ii. carbon monoxide in the preheater tower;

- iii. temperature of gases in the preheater tower, as specified in Schedule F and correspond with a retention time of not less than 10 seconds;
 - iv. pressure at locations specified in Schedule F; and,
 - v. Total Hydrocarbon (as methane) in the gases leaving the Cement Kiln stack.
- b. The CPM System specified in condition 10.2.a shall be designed, operated and maintained in accordance with an approved continuous monitoring plan, complete with specifications based on manufacturer's specifications and manuals. In this regard, the continuous monitoring plan shall be revised to assure proper calibration, maintenance and operation of the CPM System, in order to establish its performance on a continuous basis. The revised continuous monitoring plan shall be provided to the Manager for approval three (3) months prior to the implementation of the Alternative Low-Carbon Fuels operation at the Facility.

3. Continuous Monitoring Documentation

- a. The Company shall prepare and retain on site monthly reports of the data monitored during the preceding month by the CEM System and CPM System, summarizing the following as a minimum:
- i. the daily minimum, maximum and average readings for the parameters specified in condition 10 of this Approval on a monthly basis;
 - ii. the percent availability of the CEM System and CPM System for the parameters specified in condition 10 of this Approval on a monthly basis; and
 - iii. daily operational status (on/off) of the raw mill and the fuel mill on a monthly basis.
- b. After one (1) month of the date of commencement of operation of the Electrolysis System, the Company shall prepare monthly reports by the end of the following month, including the data monitored during the preceding month, for the following parameters as a minimum:
- i. the hourly average readings for the parameters specified in Conditions 10.1, 10.2 and 8.9.d. of this Approval, maintained electronically in a spreadsheet format;
 - ii. the parameters specified in Conditions 8.9.a, 8.9.b, 8.9.c, 8.9.e, and 8.9.f of this Approval.
- c. The Company shall retain the monthly reports included in Conditions 10.3.a and 10.3.b of this Approval at the Facility, and when requested provide these to the District Manager and the Manager within 15 days of the date of the request.
- d. The District Manager may relax the frequency and/or scope of the reports required under Condition 10.3 of this Approval, if the data is observed to be within the performance requirements of the Approval on a consistent basis.

- e. The Company shall establish the normal operating concentration range for total hydrocarbon for baseline conditions (operating conditions which include the use of Conventional Fuel, Fuel Adjunct Materials and Industrial By-Product Materials in the Cement Kiln) based on CPM System data. The Company shall, at a minimum on a quarterly basis, review the CPM System data and identify and investigate any anomalous total hydrocarbon concentrations when using Alternative Low-Carbon Fuels. An investigations report shall be prepared and retained on site.
- f. The Company shall retain on site, all raw data generated by the CEM System and CPM System for a minimum of five (5) years from the date of their creation.

11. SOURCE TESTING

1. REGULAR ALCF USE (Main Burner)

- a. The Company shall perform Source Testing in accordance with the procedure in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H. Source Testing shall be conducted not later than twelve (12) months from the date of commencement of operation of the Alternative Low-Carbon Fuels feed equipment which permits the use of Alternative Low-Carbon Fuels up to 175 tonnes per day, or within a time frame as directed or agreed to in writing by the District Manager.
- b. The Company shall notify the District Manager in writing of the details of the installed equipment, date of installation and date of commencement of operation of the Alternative Low-Carbon Fuels feed equipment which permits the use of Alternative Low-Carbon Fuels up to 175 tonnes per day within two (2) weeks of the installation and the commencement of operation.
- c. In addition to Source Testing required under Conditions 11.1.a of this Approval, Source Testing shall be repeated once every calendar year in accordance with the procedure in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H. Annual Source Testing is not required to be conducted in the year in which Source Testing required under Condition 11.1 was conducted.

- d. The Source Testing required under Conditions 11.1.a and 11.1.c of this Approval shall include, as a minimum, the rates of emissions of the test contaminants from the Cement Kiln stack, when the Cement Kiln is co-fired with Conventional Fuels and Alternative Low-Carbon Fuels, at an Alternative Low-Carbon Fuels maximum approved firing rate of 175 tonnes per day, or at a firing rate agreed to in writing by the Manager, subject to the condition that operational checks of the Cement Kiln are accepted by the Company. The Alternative Low-Carbon Fuels used during the Source Testing shall contain a representative blend of the Alternative Low-Carbon Fuels approved under Condition 7 of this Approval, with considerations of the market availability of Alternative Low-Carbon Fuels types and quantities at the time of Source Testing. The blend (s) of Alternative Low-Carbon Fuels and quantity proposed to be used for the Source Testing shall be submitted along with the Pre-Test Plan to the Manager and the Director for approval, along with the details regarding the process for selection of the Alternative Low-Carbon Fuels blend (s) and quantity for Source Testing.
- e. The Company shall perform Source Testing in accordance with the procedures in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H during the regular operation of the Electrolysis System. Source Testing shall be conducted not later than six (6) months from the date of commencement of operation of the Electrolysis System and shall be conducted while Conventional Fuels and Alternative Low-Carbon Fuels are used as required for Source Testing in Condition 11.1.d of this Approval.
- f. The Company shall notify the District Manager in writing of the date of installation and the date of commencement of operation of the Electrolysis System within two (2) weeks of the installation and the commencement of operation.
- g. The District Manager may relax the frequency and/or scope of the annual Source Testing required under Condition 11.1.c of this Approval, if the results of the annual Source Testing program indicate that the emissions and Point of Impingement concentrations of Compounds of Concern are consistently recorded as insignificant when substituting a portion of Conventional Fuels with Alternative Low-Carbon Fuels.

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

- a. The Company shall conduct Source Testing in accordance with the procedure in Schedule G, to determine the rates of emissions of the Test Contaminants from the sources specified in Schedule H. The Source Testing shall be conducted not later than one (1) year from the date of the first use of Alternative Low-Carbon Fuel in the Cement Kiln for the purposes of the Demonstration Project. As a minimum, the Source Testing shall include the following scenarios:
 - i. Baseline Conditions: the rates of emissions of the Test Contaminants from the Cement Kiln exhaust stack when it is co-fired with Conventional Fuel and Alternative Low-Carbon Fuel introduced through the Main Burner.

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

12. CARBON DIOXIDE EMISSION INTENSITY TESTING

1. The Company shall perform Carbon-Dioxide Emission Intensity testing of the representative samples of the Alternative Low-Carbon Fuels and Conventional Fuels at all times when Source Testing is carried out under Condition 11 of this Approval. Representative samples of the Alternative Low-Carbon Fuels and Conventional Fuels used during the Source Testing events shall be used for performing Carbon-Dioxide Emission Intensity testing. The Carbon-Dioxide Emission Intensity testing shall be carried out in accordance with the requirements set out in O. Reg. 79/15.
2. The Company shall prepare a Carbon-Dioxide Emission Intensity report in respect of the Alternative Low-Carbon Fuels combusted at the site, in accordance with the requirements set out in O. Reg. 79/15, that includes a statement that the Carbon-Dioxide Emission Intensity of the Alternative Low-carbon Fuels are less than the Carbon Dioxide Emission Intensity of the Conventional Fuels in the place of which the Alternative Low-Carbon Fuels are proposed to be combusted.
3. The Company shall submit the Carbon-Dioxide Emission Intensity report along with the Source Testing report to the District Manager.

13. FUGITIVE EMISSIONS CONTROL

1. The Company shall update as necessary and implement the Best Management Practices Plan for the control of fugitive dust emissions.
2. The Company shall:
 - a. review and evaluate the Best Management Practices Plan on an annual basis;
 - b. record the results of each annual review and update as required the Best Management Practices Plan within two (2) months of the completion of the annual review;
 - c. maintain the updated Best Management Practices Plan at the Facility;
 - d. implement, at all times, the most recent version of the Best Management Practices Plan.
3. The Company shall record and retain such records, each time a specific preventative and control measure described in the Best Management Practices Plans is implemented. The Company shall record, as a minimum:

- a. the date when each emission control measure is implemented, including a description of the control measure;
- b. the date when each new preventative measure or operating procedure to minimize emissions is implemented, including a description of the preventative measure or operating procedure; and
- c. the date, time of commencement, and time of completion of each periodic activity conducted to minimize emissions, including a description of the preventative measure/procedure and the name of the individual performing the periodic activity.

14. ODOUR ABATEMENT PLAN

- 1. The Company shall implement the currently approved Odour Abatement Plan. The Company shall implement operating procedures including inspection, maintenance and monitoring initiatives to prevent or minimize odour emissions from the Facility.
- 2. The Company shall submit to the District Manager, during the implementation of the Odour Abatement Plan, annual odour progress report in hard copy and electronic format by March 31 of each year which shall include at a minimum:
 - a. applicable monitoring and assessment information for the previous year;
 - b. status of implementation of the Odour Abatement Plan; and
 - c. effectiveness/progress/results of the odour abatement measures implemented during the previous year.

15. COMMUNITY ENGAGEMENT

- 1. The Company shall continue to participate in a Community Liaison Committee (CLC). The objectives of the CLC shall include:
 - a. keeping the community informed about the operations of the Facility in relation to the potential impacts on the community;
 - b. keeping the Company informed of any community concerns about the operations of the Facility;
 - c. to serve as a forum for the Company to disseminate and exchange information with the community related to operations of the Facility; and,
 - d. to monitor the Company's complaint response program and make recommendations to the Company with respect to this program.
- 2. The CLC shall not exercise any supervisory, regulatory, approval, legal or other decision making

role with respect to the operations of the Facility.

16. COMPLAINTS RECORDING AND REPORTING

1. If at any time, the Company receives an environmental complaint from the public regarding the operation of the Equipment approved by this Approval, the Company shall take the following steps:
 - a. Record and number each complaint, either electronically or in a log book. The record shall include the following information: the time and date of the complaint and incident to which the complaint relates, the nature of the complaint, wind direction at the time and date of the incident to which the complaint relates and, if known, the address of the complainant.
 - b. Notify the District Manager of the complaint within two (2) business days after the complaint is received, or in a manner acceptable to the District Manager.
 - c. Initiate appropriate steps to determine all possible causes of the complaint, and take the necessary actions to appropriately deal with the cause of the subject matter of the complaint.
 - d. Complete and retain on-site a report written within five (5) business days of the complaint date. The report shall list the actions taken to appropriately deal with the cause of the complaint and set out steps to be taken to avoid the recurrence of similar incidents.

17. RECORD KEEPING REQUIREMENTS

1. Any information requested by any employee in or agent of the Ministry concerning the Facility and its operation under this Approval, including, but not limited to, any records required to be kept by this Approval, shall be provided to the employee in or agent of the Ministry, upon request, in a timely manner.
2. Unless otherwise specified in this Approval, the Company shall retain, for a minimum of five (5) years from the date of their creation all reports, records and information described in this Approval, including,
 - a. a copy of the Original ESDM Report and each updated version;
 - b. a copy of each version of the Acoustic Assessment Report;
 - c. supporting information used in the emission rate calculations performed in the ESDM Reports and Acoustic Assessment Reports;
 - d. the records in the Log;
 - e. copies of each Written Summary Form prepared under Condition 6.1 of this Approval;

- f. records of maintenance, repair and inspection of Equipment related to all Processes with Significant Environmental Aspects;
- g. all records related to environmental complaints made by the public as required by Condition 16 of this Approval;
- h. records related to Source Testing events, as required by Condition 11 of this Approval;
- i. records related to the operation of the CEM System and CPM System, as required by Condition 10 of this Approval;
- j. records related to the preventative and control measures implemented, as required by Condition 13 of this Approval;
- k. records related to sampling and analysis, as required by Conditions 8 and 9 of this Approval;
- l. records related to the Odour Abatement Plan specified under Condition 14 of this Approval;
and
- m. records related to Carbon Dioxide Emission Intensity testing, as required by Condition 12 of this Approval.

18. COMPLIANCE REPORTING

1. The Company shall prepare and submit by June 30 of each year to the District Manager, an Annual Report summarizing the operation of the Facility, covering the previous calendar year. The Annual Report shall include, as a minimum, the following information:
 - a. a statement of whether the Facility was in compliance with this Approval, including compliance with the Performance Limits;
 - b. the Emission Summary Table and Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;
 - c. clinker and cement production in tonnes per year;
 - d. maximum daily feed rate and average daily feed rate of Alternative Low-Carbon Fuels and Conventional Fuels in the Cement Kiln for each month of the preceding calendar year, and the weight percentage of each category of Alternative Low-Carbon Fuels approved under Condition 7 of this Approval, of the total monthly Alternative Low-Carbon Fuel used;
 - e. maximum and average percent thermal replacement of Conventional Fuels by combined Alternative Low-Carbon Fuels for each month;

- f. a summary of data from CEM System, CPM System, Source Testing and Carbon Dioxide Emission Intensity testing described under Conditions 10.3(a) and (b), 11 and 12 of this Approval, and a description of the status of compliance with the Performance Limits, Alternative Low-Carbon Fuel definition under this Approval and Alternative Low-Carbon Fuels operational requirements described in Schedule F of this Approval;
 - g. a summary of dates, duration and reasons for any operational events including but not limited to events described in Condition 8.7 of this Approval that may have negatively impacted the quality of the environment and corrective measures taken to address these impacts;
 - h. details of environmental complaints including a summary of complaints received, causes of complaints and action taken to avoid the recurrence of similar incidents, as described in Condition 16 of this Approval.
2. The Company shall make the Annual Report available for examination by any person by posting it on a Company website and making it available without charge during regular business hours at the Facility, immediately after it is submitted to the Ministry.

19. ACOUSTIC AUDIT

1. The Company shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Company;
- a. shall carry out Acoustic Audit measurements in accordance with the procedures in Ministry Publication NPC-103; and,
 - b. shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of Ministry Publication NPC-233, to the District Manager and the Director not later than six (6) months after the completion of the Noise Abatement Action Plan.
2. The Director;
- a. may not accept the results of the Acoustic Audit if the requirements of Ministry Publication NPC-233 were not followed; and,
 - b. may require the Company to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

20. REVOCATION OF PREVIOUS APPROVALS

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

SCHEDULE A

Supporting Documentation

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

SCHEDULE B

PERFORMANCE REQUIREMENTS - IN-STACK EMISSION LIMITS

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

Notes:

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

SCHEDULE C

Emission Control Equipment Operational Requirements

1. Process Dust Control Equipment Operational Requirements

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

a. Primary Equipment

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

i. Dust Collector

Operating parameters mean the following parameters of a fabric filter dust collector:

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

ii. Electrostatic Precipitator

Operating Parameters means the following parameters of the electrostatic precipitator:

1. the condition of the electrostatic precipitator, the ducts leading to and from the electrostatic precipitator, the ducts connecting the components of the electrostatic precipitator and the electrical system;
2. the inlet temperature of the electrostatic precipitator;
3. the secondary voltages and current of the electrostatic precipitator; and
4. the presence or absence of clean side deposits in the electrostatic precipitator.

b. Secondary Equipment

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

i. Dust Collector

Operating parameters mean the following operating parameters of a fabric filter dust collector:

1. the condition of the dust collector filter bags, the ducts leading to and from the dust collector and connecting the components of the dust collector;
2. the static pressure drop across the dust collector filter bag compartments;
3. the air reservoir pressure;
4. the presence or absence of clean side deposits;
5. the frequency of cleaning; and

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

2. Other Emission Control Equipment

Including but not limited to Selective Noncatalytic Reduction (SNCR) equipment.

SCHEDULE D

MATERIAL ANALYSIS CONTAMINANTS

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

SCHEDULE E

Continuous Monitoring System Requirements

PARAMETER: Opacity

INSTALLATION:

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

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

PERFORMANCE:

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

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

CALIBRATION:

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

DATA RECORDER:

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

RELIABILITY:

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

SCHEDULE F

ALTERNATIVE LOW-CARBON FUELS OPERATIONAL REQUIREMENTS

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

SCHEDULE G

PROCEDURE FOR SOURCE TESTING

1. The Company shall submit, not later than three (3) months prior to the Source Testing required under Conditions 11.1.a, 11.1.e, and 11.2.a of this Approval, a Pre-Test Plan for the Source Testing required under this Approval to the Manager and the Director. In addition to the required information, the Pre-Test plan shall also include information on the blend (s) of Alternative Low-Carbon Fuels and quantity proposed to be used for the Source Testing, along with details regarding the process for selection of the Alternative Low-Carbon Fuels blend (s) and quantity for Source Testing. The Company shall finalize the Pre-Test Plan in consultation with the Manager and the Director.
2. The Company shall not commence the Source Testing until the Manager has accepted the Pre-Test Plan.
3. For subsequent Source Testing under Condition 11.1.c of this Approval:
 1. The Company shall submit either a written notification of intent to use a previously approved Pre-Test Plan (with version reference if there were more than one (1) previously approved Pre-Test Plan), or a new Pre-Test Plan, to the Manager and Director not later than three (3) months of the planned date of the Source Testing for approval. The written notification or the new Pre-Test Plan shall also include information on the blend (s) of Alternative Low-Carbon Fuel and the quantity proposed to be used for the Source Testing, along with details regarding the process for selection of the blend (s) for Source Testing for its finalization in consultation with the Manager and the Director.
 2. If the Company submitted a written notification of intent to use a previously approved Pre-Test Plan, the Manager may either accept the use of a previously approved Pre-Test Plan, or request the submission of a new Pre-Test Plan for approval. The Company shall submit the requested new Pre-Test Plan within two (2) months after the Manager requested the submission.
 3. The Company shall complete the subsequent Source Testing no later than three (3) months after the Manager has either agreed with the written notification or approved the new Pre-Test Plan.
4. The Company shall notify the District Manager, the Manager and the Director in writing of the location, date and time of any impending Source Testing required by this Approval, at least fifteen (15) days prior to the Source Testing.
5. The Company shall submit a report (hardcopy and electronic format) on the Source Testing to the Manager and the District Manager not later than four (4) months after completing the Source Testing, or not later than a time frame agreed in writing with the Manager. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:
 1. an executive summary;
 2. results of Source Testing, including the emission rate, emission concentration and relevant emission factor of the Test Contaminants;

3. records of operating conditions at the time of Source Testing and other information including but not limited to:
 - a. an executive summary
 - b. a summary of the results of the fuel analysis program specified in Condition 8.9 of this Approval;
 - c. a summary of records specified in condition 8.11 of this Approval and records of operating conditions at the time of Source Testing, including but not limited to:
 - i. Clinker production rate in tonnes/hour
 - ii. Conventional Fuels fired in the Cement Kiln in tonnes/hour
 - iii. Each category of the Alternative Low-Carbon Fuels described in condition 7.1 of the Approval fired in the Cement Kiln in tonnes/day;
 - iv. Fuel Adjunct Material and Industrial By-Product Material input into the Cement Kiln in tonnes/day;
 - d. any other records that may affect the Source Testing results.
4. A summary of all records of the CEM System and CPM System for the parameters specified in Condition 10 of this Approval at the time of Source Testing;
5. A summary table that compares the Source Testing results to the emission estimates described in the Company's application, the ESDM Report and the Performance Limits;
6. The Director may not accept the results of the Source Testing if:
 1. the Source Testing Code or the requirements of the Manager were not followed;
 2. the Company did not notify the District Manager, the Manager and the Director of the Source Testing; or
 3. the Company failed to provide a complete report on the Source Testing.
7. If the Director does not accept the results of the Source Testing, the Director may require re-testing. If re-testing is required, the Pre-Test Plan strategies need to be revised and submitted to the Manager for approval. The actions taken to minimize the possibility of the Source Testing results not being accepted by the Director must be noted in the revision.
8. If the Source Testing results are higher than the emission estimates in the Company's ESDM Report, the Company shall update their ESDM Report in accordance with Section 26 of O. Reg. 419/05 with the results from the Source Testing report and make these records available for review by staff of the Ministry upon request. The updated Emission Summary Table from the updated ESDM Report shall be submitted with the report on the Source Testing.
9. The Company shall ensure that the above mentioned Source Testing report is made available and easily accessible for review by the public at the Facility immediately after the document is submitted to the Ministry.

SCHEDULE H

TEST CONTAMINANTS AND SOURCES

TEST SOURCES: Cement Kiln Stack

TEST CONTAMINANTS

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

List of Metals:

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

SCHEDULE H

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

SCHEDULE H

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

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

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

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

SCHEDULE H

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

SCHEDULE H

NOTE:

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

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

1. GENERAL

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

2. LIMITED OPERATIONAL FLEXIBILITY, REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION AND PERFORMANCE LIMITS

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

3. DOCUMENTATION REQUIREMENTS

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

4. WRITTEN SUMMARY FORM

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

5. APPROVED ALTERNATIVE LOW-CARBON FUELS

Condition No. 7 is included to define Alternative Low-Carbon Fuels in this Approval.

6. OPERATION AND MAINTENANCE

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

7. MONITORING AND TESTING

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

8. FUGITIVE EMISSIONS CONTROL AND ODOUR ABATEMENT PLAN

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

9. COMMUNITY ENGAGEMENT

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

10. COMPLAINTS RECORDING AND REPORTING

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

11. RECORD KEEPING REQUIREMENTS

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

12. COMPLIANCE REPORTING

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

13. ACOUSTIC AUDIT

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

14. REVOCATION OF PREVIOUS APPROVALS

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

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

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

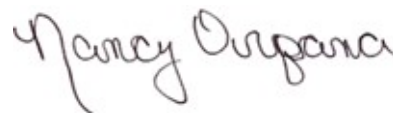
and

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

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

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

DATED AT TORONTO this 11th day of November, 2024



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

AB/

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

Date: May 23, 2025

Subject: St. Marys use of NRG Huntley CCR's

To Whom it May Concern,

Fly ash that was removed from the NRG Huntley site and delivered to the St Marys Cement Plant site was utilized in the manufacturing of Portland cement clinker. As of today, there is no material remaining on our site. The trial use of this material was successful, as it provided the ability for the plant to obtain the proper chemistry for our product.

Regarding the use of fly ash in the manufacturing of portland cement clinker, the primary benefit is the amount of alumina and iron in the material, which are key ingredients in creating clinker. The usage of this fly ash allows us to replace natural resources in our production, which is positive for the environment.

This fly ash will provide a viable alternative in our manufacturing process.

Nicholas Palermo, EIT (he/him/his)

Manager, Quality Control

St Marys Plant



St. Marys Cement - Sample Report



Sample: Tonawanda Fly Ash

Supplier: _____

Date: 5/8/2025

Tested By: K. Beazley

XRF Chemical Analysis	
Constituent	Results
LOI	15.5
SiO ₂	43.27
Fe ₂ O ₃	12.75
Al ₂ O ₃	19.58
CaO	4.11
MgO	1.18
SO ₃	0.3
K ₂ O	1.72
Na ₂ O	0.03
TiO ₂	0.95
P ₂ O ₅	0.204
Mn ₂ O ₃	0.066
Cl	0
F	0.123
ZnO	0.028
Total	99.8

C3S	-461.89
C3A	30.31
Silica Ratio	1.34
EqNa2O	1.16

Moisture Analysis	
Samples	% Moisture Content (w/w)
Sample 1	9.64

Note: Moisture content of samples was measured using a moisture analyzer

CO ₂ Analysis	
Samples	CO ₂ Results (%)
Sample 1	5.12

Note: CO₂ testing was completed using a Thermogravimetric Analyser



GZA GeoEnvironmental of New York