MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT

DOCKET #02-23

COMPANY: Gray & Son, Inc. – Rosedale Plant

LOCATION: 619 Batavia Farm Road / 600 Todds Lane, Rosedale, MD 21237

APPLICATION: One (1) new demolition material processing operation consisting of three (3) 100 ton per hour crushers, two (2) 100 ton per hour screeners, three (3) 100 ton per hour stackers, and one (1) 150 ton per hour trommel each powered by a diesel-fired engine with a combined power rating of 1776 horsepower to be located at an existing hot mix asphalt and crushing and screening facility.

ITEM	DESCRIPTION
1	Notice of Application and Opportunity to Request an Informational Meeting
2	Environmental Justice (EJ) Information - EJ Fact Sheet and MDE Score and Screening Report
3	Permit to Construct Application Forms – Form 5, Form 5T, Form 5 EP, Form 6, Form 44, emission calculations, and vendor information
4	Evidence of Zoning Approval

DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF APPLICATION AND OPPORTUNITY TO REQUEST AN INFORMATIONAL MEETING

The Maryland Department of the Environment, Air and Radiation Administration (ARA) received a permit-to-construct application from Gray & Son, Inc. – Rosedale Plant, on January 26, 2023, for one (1) new demolition material processing operation consisting of three (3) 100 ton per hour crushers, two (2) 100 ton per hour screeners, three (3) 100 ton per hour stackers, and one (1) 150 ton per hour trommel each powered by a diesel-fired engine with a combined power rating of 1776 horsepower to be located at an existing hot mix asphalt and crushing and screening facility. The proposed installation will be located at 619 Batavia Farm Road / 600 Todds Lane, Rosedale, Maryland, 21237.

In accordance with HB 1200/Ch. 588 of 2022, the applicant provided an environmental justice (EJ) Score for the census tract in which the project is located using the Maryland EJ mapping tool. The EJ Score, expressed as a statewide percentile, was shown to be 23.54 which the Department has verified. This score considers three demographic indicators – minority population above 50%, poverty rate above 25% and limited English proficiency above 15%.

Copies of the application, the EJ mapping tool screening report (which includes the score), and other supporting documents are available for public inspection on the Department's website at https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx (click on Docket Number 02-23). Any applicant-provided information regarding a description of the environmental and socioeconomic indicators contributing to that EJ score can also be found at the listed website. Such information has not yet been reviewed by the Department. A review of the submitted information will be conducted when the Department undertakes its technical review of all documents included in the application.

Pursuant to the Environment Article, Section 1-603, Annotated Code of Maryland, the Department will hold an informational meeting to discuss the application and the permit review process if the Department receives a written request for a meeting within 10 working days from the date of the second publication of this notice. A requested informational meeting will be held virtually using teleconference or internet-based conferencing technology unless a specific request for an in-person informational meeting is received. All requests for an informational meeting should be directed to the attention of Ms. Shannon Heafey, Air Quality Permits Program, Air and Radiation Administration, 1800 Washington Boulevard, Baltimore, Maryland 21230.

Further information may be obtained by calling Ms. Shannon Heafey at 410-537-4433.

Christopher R. Hoagland, Director
Air and Radiation Administration

Maryland Department of the Environment

The Applicant's Guide to Environmental Justice and Permitting

What You Need to Know

This fact sheet is designed to provide guidance to applicants on incorporating environmental justice screening requirements pursuant to House Bill 1200, effective October 1, 2022.

What is Environmental Justice?

The concept behind the term environmental justice (EJ) is that regardless of race, color, national origin, or income, all Maryland residents and communities should have an equal opportunity to enjoy an enhanced quality of life. How to assess whether equal protection is being applied is the challenge.

Communities surrounded by a disproportionate number of polluting facilities puts residents at a higher risk for health problems from environmental exposures. It is important that residents who may be adversely affected by a proposed source be aware of the current environmental issues in their community in order to have meaningful involvement in the permitting process. Resources may be available from government and private entities to ensure that community health is not negatively impacted by a new source located in the community.

Extensive research has documented that health disparities exist between demographic groups in the United States, such as differences in mortality and morbidity associated with factors that include race/ethnicity, income, and educational attainment. House Bill 1200 adds to MDE's work incorporating diversity, equity and inclusion into our mission to help overburdened and underserved communities with environmental issues.

What is House Bill 1200 and what does it require?

Effective October 1, 2022, House Bill 1200 requires a person applying for a permit from the Department under §1-601 of the Environment Article of the Annotated Code of Maryland or any permit requiring public notice and participation to include in the application an EJ Score for the census tract where the applicant is seeking the permit; requiring the Department, on receiving a certain permit application to review the EJ Score; and requiring notices to include information related to EJ Scores and generally relating to environmental permits and environmental justice screenings.

What is a "Maryland EJ Tool"?

The term "Maryland EJ Tool" means a publicly available state mapping tool that allows users to: (1) explore layers of environmental justice concern; (2) determine an overall EJ score for census tracts in the state; and (3) view additional context layers relevant to an area.

Maryland Department of the Environment

The Applicant's Guide to Environmental Justice and Permitting

What You Need to Know

What is an "EJ Score"?

The term "EJ Score" means an overall evaluation of an area's environment and environmental justice indicators, as defined by MDE in regulation, including: (1) pollution burden exposure; (2) pollution burden environmental effects; (3) sensitive populations; and (4) socioeconomic factors.

The Maryland EJ Screening Tool uses three demographic indicators – minority population above 50%, poverty rate above 25% and percent of the population having limited English proficiency above 15% - to calculate a score that can be used as an indicator of susceptibility to environmental exposure. It is that score, linked to the census tract where the project is to be located, that needs to be reported to MDE as part of your permit application.

What does the application require?

The link for the Maryland EJ Tool is located on the Department's website, www.mde.maryland.gov, under Quick Links as EJ Screening Tool. At the top right, please click the first button for the MDE Screening Report. Input the address of the proposed installation in the address bar. Click on the Report button. Once the report has been generated select the print icon.

The applicant needs to include the MDE Screening Report with the EJ Score from the Maryland EJ Tool as part of the permit application upon submission. An application will not be considered complete without the report.

The applicant is encouraged to provide the Department with a discussion about the environmental exposures in the community. This will provide pertinent information about how the applicant should proceed with engaging with the community. Residents of a community with a high indicator score and a high degree of environmental exposure should be afforded broader opportunities to participate in the permit process and understand the impacts a project seeking permit approval may have on them.

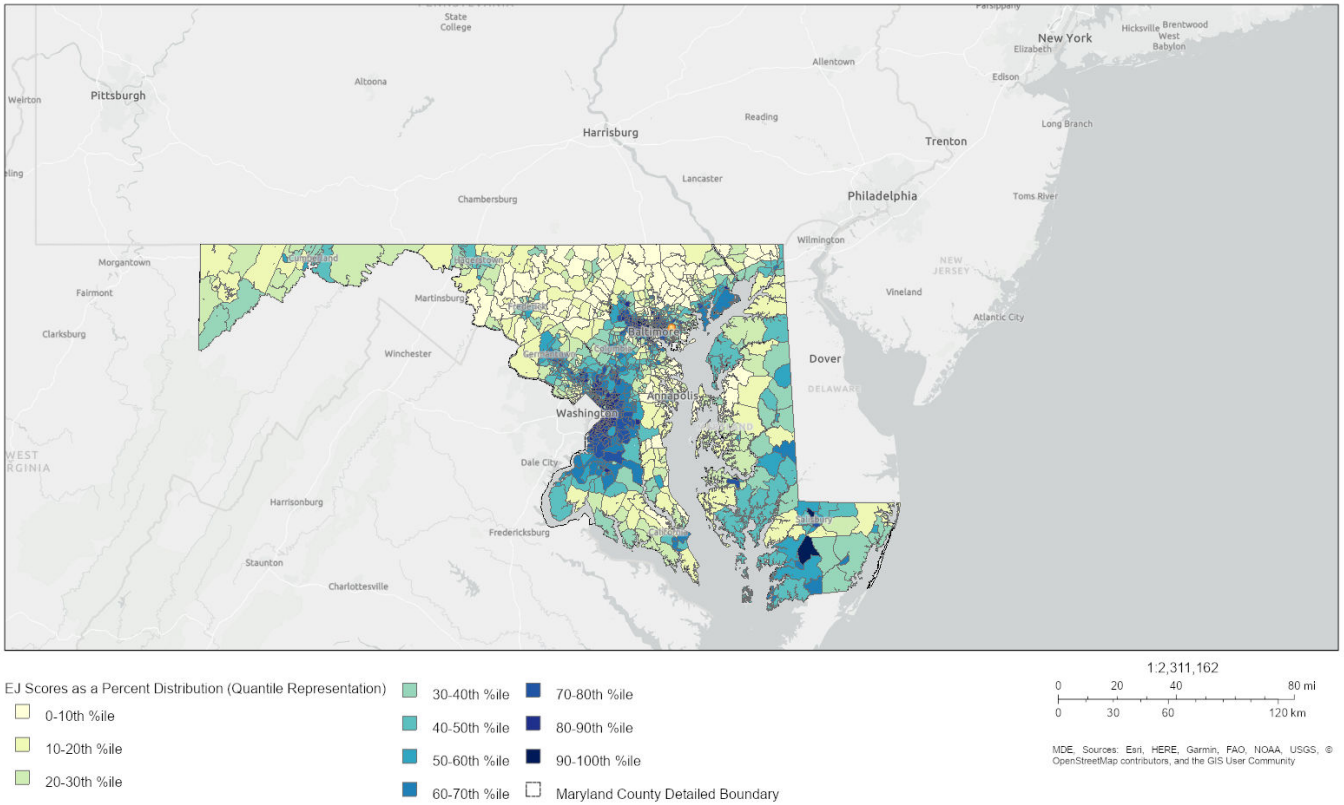
Questions

For air quality permits, please call 410-537-3230.
For water permits, please call 410-537-4145.
For land permits pertaining to Solid Waste, please call 410-537-3098.
For land permits pertaining to Oil Control, please call 410-537-3483.
For land permits pertaining to Animal Feeding Operations, please call 410-537-4423.
For land permits pertaining to Biosolids, please call 410-537-3403.

MDE EJ Screening Report

Area of Interest (AOI) Information

Feb 9 2023 13:45:16 Eastern Standard Time



EJ Scores as a Percent Distribution (Quantile Representation)

- 0-10th %ile
- 10-20th %ile
- 20-30th %ile
- 30-40th %ile
- 40-50th %ile
- 50-60th %ile
- 60-70th %ile
- 70-80th %ile
- 80-90th %ile
- 90-100th %ile
- Maryland County Detailed Boundary

1:2,311,162

0 20 40 80 mi

0 30 60 120 km

MDE, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Summary

Name	Count	Area(ft²)	Length(ft)
EJ Scores as a Percent Distribution (Quantile Representation)	1	N/A	N/A
Active High Air Emission Facilities	0	N/A	N/A
LRP Facilities	0	N/A	N/A
Maryland Dam Locations	0	N/A	N/A
Maryland Pond Locations	0	N/A	N/A
Wastewater Discharge Facilities	0	N/A	N/A
Historic Mine Locations	0	N/A	N/A
Significant Wastewater Treatment Plants	0	N/A	N/A
Point Source Discharges	0	N/A	N/A
All Permitted Solid Waste Acceptance Facilities	0	N/A	N/A
Municipal Solid Waste Acceptance Facilities	0	N/A	N/A

EJ Scores as a Percent Distribution (Quantile Representation)

#	Geographic Area Name	Percent Minority	Percent Poverty	Percent_Limited_English_Proficiency	SocioScore Percent Tract Only	Socio Percentile (All MD)	Socio Percentile (All MD) %	Area(ft²)
1	Census Tract 4501, Baltimore County, Maryland	6.90	24.19	1.00	10.70	23.54	23.542%	N/A

© MDE

GRAY & SON

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June 7, 2022

Suna Yi Sariscak, Manager
Air Quality Permits Program
Air & Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Request for Permit to Construct Approval of Gray & Son, Inc. Material Processing Operation in Rosedale, Maryland

Dear Ms. Sariscak:

Gray & Son, Inc. (GSI) is proposing to construct a new demolition material processing operation at 600 Todds Lane in Rosedale, Maryland ("GSI-Todds Lane Material Processing Operation"). The proposed operation will employ various equipment – crushers (3), screeners (2), stackers (3), and trommel (1) – to process/recycle demolition materials. Demolition materials to be processed at the GSI-Todds Lane Material Processing Operation for beneficial re-use include concrete, brick, asphalt, and soil.

In accordance with COMAR 26.11.02.09.A., GSI is submitting this Permit to Construct (PTC) application package, including all required Maryland Department of the Environment PTC application forms (i.e., Form 5, Form 5EP, Form 5T, Form 6, Form 44, and PTC Application Checklist) for the proposed GSI-Todds Lane Material Processing Operation and its emissions generating equipment. The application package is comprised of the following attachments:

- Attachment A: Application Checklist
- Attachment B: Location Map and Site Plan
- Attachment C: Process Flow Diagram
- Attachment D: Application Forms
- Attachment E: Emissions Calculations
- Attachment F: Safety Data Sheets
- Attachment G: Evidence of Workman's Compensation Coverage.

Included with the application forms are the equipment manufacturer's literature and engine manufacturer's emissions data sheets and Certificate of Conformity for the associated engine.

Thank you for your consideration of this submittal. If you have any questions on the application package provided, please feel free to contact me at 410-771-4311 or bbonanno@graynson.com.

Sincerely,

Brandon Bonanno
General Manager – Demolition/Material Resources

Enclosure

cc: Lou Corio, POWER Engineers

June 7, 2022

GRAY & SONS, INC.

GSI-Todds Lane Material Processing Operation

Air Quality Permit to Construct Application

PROJECT NUMBER:
178479.01.01

PROJECT CONTACT:
Lou Corio
EMAIL:
lou.corio@powereng.com
PHONE:
410-312-7912

POWER ENGINEERS

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Air Quality Permit to Construct Application

PREPARED FOR: *GRAY & SONS, INC.*
430 WEST PADONIA ROAD
TIMONIUM, MARYLAND 21093

PREPARED BY: *LOU CORIO*
410-312-7912
LOU.CORIO@POWERENG.COM

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TABLE OF CONTENTS

PROJECT DESCRIPTION **1**

1.0 INTRODUCTION **1**

2.0 OPERATION AND EQUIPMENT DESCRIPTION **1**

3.0 EMISSIONS CALCULATIONS **2**

4.0 TAP COMPLIANCE DEMONSTRATION **3**

4.1 TAP EMISSIONS 3
4.2 SCREENING ANALYSIS 3
4.2.1 MDE AER Methodology 3
4.2.2 SCREEN3 Modeling Analysis 4

TABLES:

TABLE 1 INITIAL TAP SCREENING ANALYSIS USING THE AER METHODOLOGY 4

ATTACHMENTS:

ATTACHMENT A APPLICATION CHECKLIST
ATTACHMENT B LOCATION MAP AND SITE PLAN
ATTACHMENT C PROCESS FLOW DIAGRAM
ATTACHMENT D APPLICATION FORMS
ATTACHMENT E EMISSIONS CALCULATIONS
ATTACHMENT F SAFETY DATA SHEETS
ATTACHMENT G EVIDENCE OF WORKMAN'S COMPENSATION COVERAGE

ACRONYMS AND ABBREVIATIONS

AER	Allowable Emission Rate
bhp	brake-horsepower
GSI	Gray & Sons, Inc.
MDE	Maryland Department of the Environment
PTC	Permit-to-Construct
SDS	safety data sheet
TAP	Toxic Air Pollutant
tph	ton per hour
USEPA	United States Environmental Protection Agency

PROJECT DESCRIPTION

1.0 INTRODUCTION

Gray & Sons, Inc. (GSI) is proposing to construct a demolition material processing operation at 600 Todds Lane in Rosedale, Maryland ("GSI-Todds Lane Material Processing Operation"). This operation will employ various equipment – crushers (3), screeners (2), stackers (3), and trommel (1) – to process the demolition material for recycling/beneficial re-use. The site of the operation is zoned for Heavy Manufacturing.

In accordance with COMAR 26.11.02.09.A., GSI is submitting this air quality Permit-to-Construct (PTC) application package, including all required Maryland Department of the Environment (MDE) PTC application forms (i.e., Form 5, Form 5EP, Form 5T, Form 6, Form 44, and PTC Application Checklist) for the proposed GSI-Todds Lane Material Processing Operation and its emissions generating equipment. The application package is comprised of the following attachments:

- Attachment A: Application Checklist
- Attachment B: Location Map and Site Plan
- Attachment C: Process Flow Diagram
- Attachment D: Application Forms
- Attachment E: Emissions Calculations
- Attachment F: Safety Data Sheets
- Attachment G: Evidence of Workman's Compensation Coverage.

2.0 OPERATION AND EQUIPMENT DESCRIPTION

The materials to be processed for recycling at the GSI-Todds Lane Material Processing Operation are GSI-generated demolition debris, namely concrete, brick, and asphalt.

Demolition debris will be brought to the site by truck and placed into stockpiles. An excavator with a pulverizer attachment will be used to break up the debris into smaller pieces for crushing and then screening, although some material may be processed directly by a screener.

The types of crushers proposed for use by GSI are as follows:

- A 100-ton per hour (tph) jaw crusher, powered by a diesel-fired, 350-brake-horsepower (bhp) engine
- A 100-tph cone crusher, powered by a diesel-fired, 440-bhp engine
- A 100-tph impact crusher, powered by a diesel-fired, 375-bhp engine.

The three crushers will be equipped with water spray systems to minimize dust generation. Also, GSI will deploy a water truck as back-up to these systems and to spray material storage piles and roads on an as-needed basis (to reduce dust generated by wind erosion and vehicle traffic, respectively).

Working in tandem with the three crushers will be the following equipment:

- Two (2) 100-tph screeners, one powered by a diesel-fired, 148-bhp engine and the other powered by a diesel-fired 131-bhp engine
- Three (3) 100-tph stackers, each powered by either a diesel-fired 52.7-bhp engine or a diesel-fired, 48.9-bhp engine (to be determined).

The stackers will be used to create stockpiles of the three types of debris materials processed through the above-described equipment at the site. Note that the cone crusher will process only waste concrete and the impact crusher will process only waste asphalt.

GSI also is proposing to use a trommel at the site for processing soil. The 150-tph trommel will be powered by a diesel-fired, 174-bhp engine.

All engines powering the crushers, screeners, stackers, and trommel are certified to meet United States Environmental Protection Agency (USEPA) Tier 4F category emission standards.

The jaw and impact crushers, main screener, and stackers are projected to operate no more than 260 days a year. The cone crusher, trommel, and second screener are projected to operate no more than 180 days a year.

3.0 EMISSIONS CALCULATIONS

AP-42, Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing, emission factors were used to calculate fugitive, particulate (PM, PM_{10}, and $PM_{2.5}$) pollutant emissions from demolition material processing and handling. The emission sources include crushing, screening, conveyor transfer, hopper loading, and stacking of materials.

Criteria pollutant emissions from integrated diesel engines associated with the crushers, screeners, stackers, and trommel were calculated based on manufacturer provided emission factors or USEPA Tier 4F emission factors, as appropriate for the engine manufacture date, and AP-42. Criteria pollutant emissions calculations are included in Attachment E.

As shown on the summary page of Attachment E, the premises-wide regulated pollutant emissions are well below major New Source Review (NSR) thresholds; therefore, the processing operation is categorized as minor source requiring a PTC.

Representative safety data sheets (SDS) for the concrete, brick and asphalt debris materials processed by GSI are included in the Attachment F – Safety Data Sheets. The SDSs were used to determine the component TAP emissions as a weight percentage of PM_{10} emissions from the processing and handling. A TAP component summary sheet (showing median weight percentages where ranges are given on the SDS) is included as the last page of Attachment E.

On an annual average basis, GSI plans to process mostly concrete debris (70%), as well as brick debris (20%) and asphalt debris (10%) through the equipment, except the second screener. For the second screener, GSI plans to process mostly soil (50%), as well as concrete (30%), brick (10%), and asphalt (10%).

The summary of premises-wide TAP emissions is provided in MDE Form 5T (see Attachment D-7). The TAP emissions calculations are included in Attachment E.

4.0 TAP COMPLIANCE DEMONSTRATION

COMAR 26.11.15.06 A requires a demonstration that TAP emissions will not unreasonably endanger human health. GSI is demonstrating compliance with this ambient impact requirement using a screening analysis as specified under COMAR 26.11.15.07. According to COMAR 26.11.16.02 A, compliance is demonstrated by showing that TAP emissions from the premises will not cause increases in ambient levels that exceed the applicable TLV-based screening level for a Class II TAP.

4.1 TAP Emissions

Class II TAP emissions are fugitive fine dust emissions from the various equipment and handling/processing operations at the proposed facility, and include the following:

- Aluminum silicate (CAS No. 1302-76-7)
- Calcium hydroxide (CAS No. 1305-62-0)
- Calcium compounds (as calcium oxide) (CAS No. 1305-78-8)
- Chromium compounds (as chromium) (CAS No. 7440-47-3)
- Iron compounds (as iron) (CAS No. 7439-89-6)
- Manganese (as manganese) (CAS No. 7439-96-5)
- Asphalt cement (CAS No. 8052-42-4)
- Crystalline silica (CAS No. 14808-60-7)
- Portland cement (CAS No. 65997-15-1).

As previously mentioned, TAP emissions, derived from on PM_{10} emissions, including short-term (lb/hr) emissions, for each piece of equipment are found Attachment - Toxics Emissions Calculations. The TAP emissions are presented for the operation as a whole, with all proposed equipment operating concurrently.

4.2 Screening Analysis

The screening analysis is performed in two phases: first, the projected premise-wide emission rate for each TAP is compared against the very conservative Maryland Department of the Environment (MDE) Allowable Emission Rate (AER) consistent with the Table provided under COMAR 26.11.16.02 A.(4) ("MDE AER"). Then, if compliance is not demonstrated using that very conservative approach, the predicted impacts due to the TAP emissions, calculated using the SCREEN3 air quality model, are compared to the applicable TAP-specific Screening Levels. The screening air quality modeling performed is consistent with COMAR 26.11.16.02 A.(3) [and COMAR 26.11.16.02 C.(1)]. Note that Portland cement is classified as nuisance particulate and therefore not included in this screening analysis.

4.2.1 MDE AER Methodology

The AERs given in the Table under COMAR 26.11.16.02 (4), for non-stack or downwash sources, can be generalized as follows:

Short-term (8-hr) AER (lb/hr) = SL / 279

where SL is the applicable Screening Level ($\mu g/m^3$).

This is based on discussions in "An Example of Demonstrating Compliance with Ambient Impact Requirement. (COMAR 26.11.15.06) – Fact Sheet" on MDE's website.

Table 1 compares the premise-wide TAP emissions (lb/hr) with the applicable MDE AERs. All the identified TAPs for this analysis have 8-hour associated screening levels only. The conservative AER methodology demonstrates compliance for aluminum silicate, calcium hydroxide, calcium oxide, chromium compounds, iron compounds, manganese compounds, and asphalt cement. Because the premises-wide emission rate of crystalline silica exceeds the associated AER, further analysis is required for this TAP to demonstrate compliance.

TABLE 1 INITIAL TAP SCREENING ANALYSIS USING THE AER METHODOLOGY

MDE TOXIC AIR POLLUTANT	CAS NO.	MDE AER (8-HOUR) (lb/hr)	PREMISE-WIDE EMISSION RATE (lb/hr)	EMISSION RATE EXCEEDS AER?
Aluminum silicate	1302-76-7	0.036	0.026	No
Calcium hydroxide	1305-62-0	0.179	0.054	No
Calcium compounds (as calcium oxide)	1305-78-8	0.072	0.0005	No
Chromium compounds (as chromium)	7440-47-3	0.018	0.001	No
Iron compounds (as iron)	7439-89-6	4.403	0.001	No
Manganese compounds (as manganese)	7439-96-5	0.007	0.001	No
Asphalt cement	8052-42-4	0.179	0.035	No
Crystalline silica	14808-60-7	0.004	0.010	Yes

4.2.2 SCREEN3 Modeling Analysis

In this follow-up phase of the screening analysis, the SCREEN3 air quality model is used to estimate the impact of any TAP(s) that did not pass the initial compliance test using the conservative MDE AER methodology. As demonstrated by the initial analysis, only crystalline silica emissions need to be included in this follow-up phase of the screening analysis.

The following is assumed for the SCREEN3 model run:

- The fugitive emissions from the processing equipment dispersed around the processing area are treated as an area source for the modeling analysis
- A unit emission rate of 1 lb/hr (0.126 g/s) is used for the area source to yield normalized impact predictions from SCREEN3
- "Urban" site characterization
- Simple terrain
- Full set of meteorology considered.

The area source characteristics input to SCREEN3 are as follows:

- Height: 6.1 m
- Length: 115 m

- Width: 70 m
- Emission rate (based on 1 lb/hr): 1.57×10^{-5} g/(s-m^2).

The minimum downwind distance to the GSI property line used in this modeling analysis is 24.4 m (80 ft).

The maximum off-site SCREEN3-predicted 1-hour concentration (129.9 µg/m^3) based on the normalized emission rate is multiplied by the USEPA-recommended factor of 0.7 to derive the maximum 8-hour concentration (90.9 µg/m^3). The normalized SCREEN3-predicted 8-hour concentration is then multiplied by the estimated premises-wide emission rate for crystalline silica, with the resulting concentration (µg/m^3) compared against the screening level of 1 µg/m^3.

Based on this approach, the maximum 8-hour concentration is 0.88 µg/m^3, which is below the screening level of 1 µg/m^3. Therefore, the SCREEN3 modeling analysis demonstrates that the proposed premise-wide emissions of crystalline silica comply with the MDE screening level for this TAP.

ATTACHMENT A APPLICATION CHECKLIST

AIR QUALITY PERMIT TO CONSTRUCT APPLICATION CHECKLIST

OWNER OF EQUIPMENT/PROCESS	
COMPANY NAME:	Gray & Son, Inc.
COMPANY ADDRESS:	430 West Padonia Road, Timonium, Maryland, 21093
LOCATION OF EQUIPMENT/PROCESS	
PREMISES NAME:	GSI-Todds Lane Material Processing Operation
PREMISES ADDRESS:	600 Todds Lane, Rosedale, Maryland, 21237
CONTACT INFORMATION FOR THIS PERMIT APPLICATION	
CONTACT NAME:	Brandon Bonanno
JOB TITLE:	General Manager - Demolition/Material Resources
PHONE NUMBER:	410-771-4311
EMAIL ADDRESS:	bbonanno@grayson.com
DESCRIPTION OF EQUIPMENT OR PROCESS	
Crushing, screening, and stacking of concrete, brick, and asphalt demolition materials for recycling	

Application is hereby made to the Department of the Environment for a Permit to Construct for the following equipment or process as required by the State of Maryland Air Quality Regulation, COMAR 26.11.02.09.

Check each item that you have submitted as part of your application package.

☒ Application package cover letter describing the proposed project

☒ Complete application forms (Note the number of forms included or NA if not applicable.)

No. 9 Form 5
No. 1 Form 5T
No. 9 Form 5EP
No. 7 Form 6
No. NA Form 10
No. NA Form 11
No. NA Form 41
No. NA Form 42
No. 6 Form 44

☒ Vendor/manufacturer specifications/guarantees

☒ Evidence of Workman's Compensation Insurance

☒ Process flow diagrams with emission points

☒ Site plan including the location of the proposed source and property boundary

☒ Material balance data and all emissions calculations

☒ Material Safety Data Sheets (MSDS) or equivalent information for materials processed and manufactured.

☐ Certificate of Public Convenience and Necessity (CPCN) waiver documentation from the Public Service Commission (1)

☐ Documentation that the proposed installation complies with local zoning and land use requirements (2)

(1) Required for emergency and non-emergency generators installed on or after October 1, 2001 and rated at 2001 kW or more.

(2) Required for applications subject to Expanded Public Participation Requirements.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ▪ Air Quality Permits Program
1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

APPLICATION FOR FUEL BURNING EQUIPMENT

Information Regarding Public Outreach

For Air Quality Permit to Construct applications subject to public review, applicants should consider the following information in the initial stages of preparing a permit application.

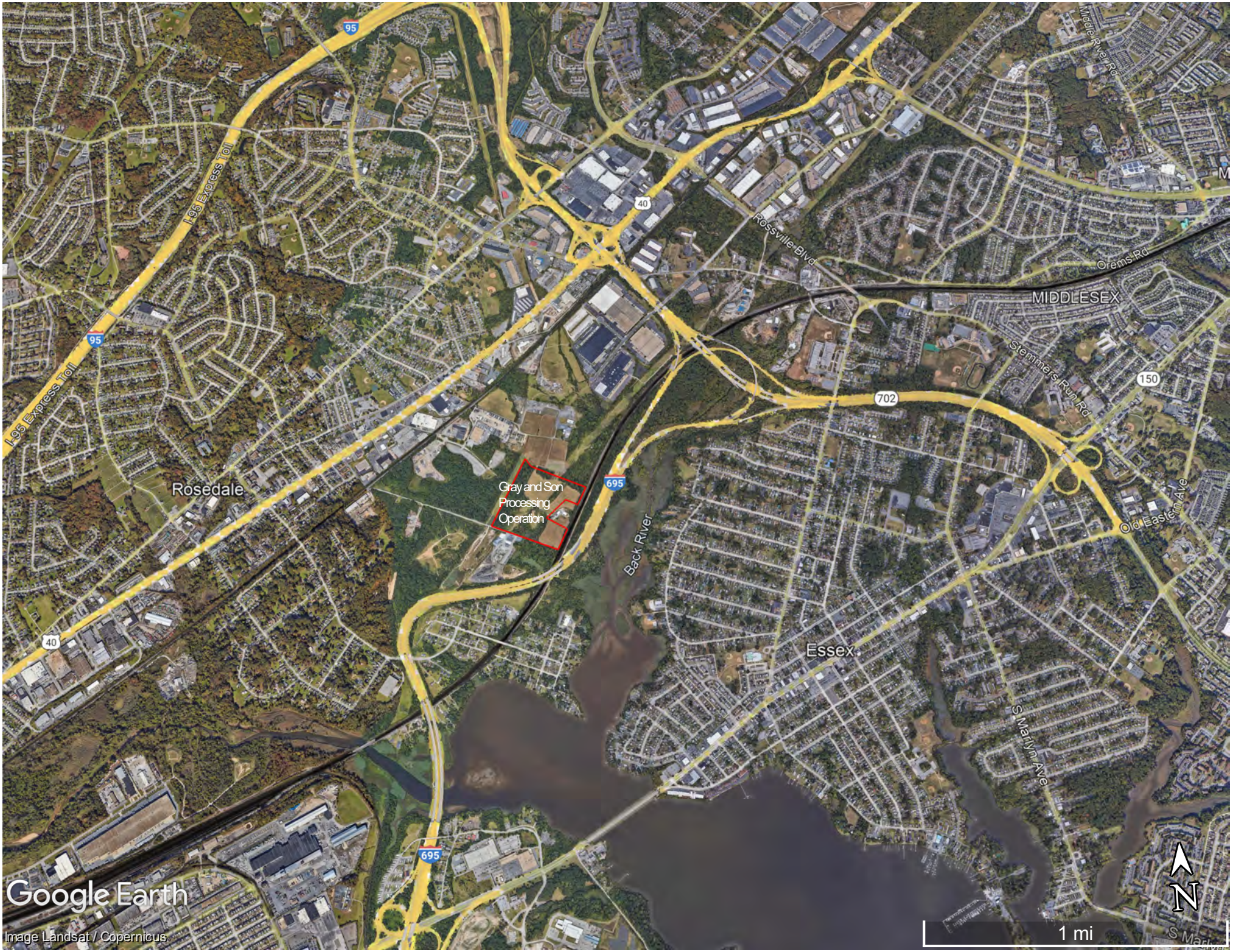
If you are not sure at the time you are applying for a permit whether public review of your application is required or for information on steps you can take to engage the surrounding community where your planned project will be located, please contact the Air Quality Permits Program at 410-537-3225 and seek their advice.

Communicating and engaging the local community as early as possible in your planning and development process is an important aspect of your project and should be considered a priority. Environmental Justice or "EJ" is a movement to inform, involve, and engage communities impacted by potential and planned environmental projects by affording citizens opportunities to learn about projects and discuss any concerns regarding impacts.

Although some permit applications are subject to a formal public review process prescribed by statute, the Department strongly encourages you to engage neighboring communities separate from and well ahead of the formal permitting process. Sharing your plans by way of community meetings, informational outreach at local gatherings or through local faith-based organizations can initiate a rewarding and productive dialogue that will reduce anxiety and establish a permanent link with your neighbors in the community.

All parties benefit when there is good communication. The Department can assist applicants in developing an outreach plan that fits the needs of both the company and the public.

ATTACHMENT B LOCATION MAP AND SITE PLAN


Gray and Son
Processing
Operation
Rosedale
Essex
MIDDLESEX
Back River
I-95 Express Toll
Rossville Blvd
Orems Rd
Middle River Rd
Stemmers Run Rd
Old Eastern Ave
S Marilyn Ave
95
40
702
150
695
N
1 mi
Google Earth
Image Landsat / Copernicus

USABLE AREAS
9.34 ACRES OUTSIDE RIGHT OF WAY AND CRITICAL AREA
2.29 ACRES WITHIN CRITICAL AREA
2.24 ACRES WITHIN RIGHT OF WAY

SURVEY NOTES:

THE PROPERTY OUTLINES SHOWN HEREON ARE BASED ON THE ALTA/NSPS LAND TITLE SURVEY PERFORMED BY BOWMAN CONSULTING, DATED OCTOBER 2018.

2. THE CONTOURS, BUILDINGS AND ROADWAYS SHOWN HEREON ARE IMPORTED FROM THE BALTIMORE COUNTY GIS DATA PORTAL.

KCI TECHNOLOGIES
Engineers
Planners
Scientists
Construction Managers
936 Ridgebrook Road
Sparks, Maryland 21152
Telephone (410) 316-7800
Fax (410) 316-7818

REVISIONS

NO.	DATE	DESCRIPTION	BY

DATE 09/07/2022
SCALE 1"=100'
DESIGNED BY
DRAWN BY MAM

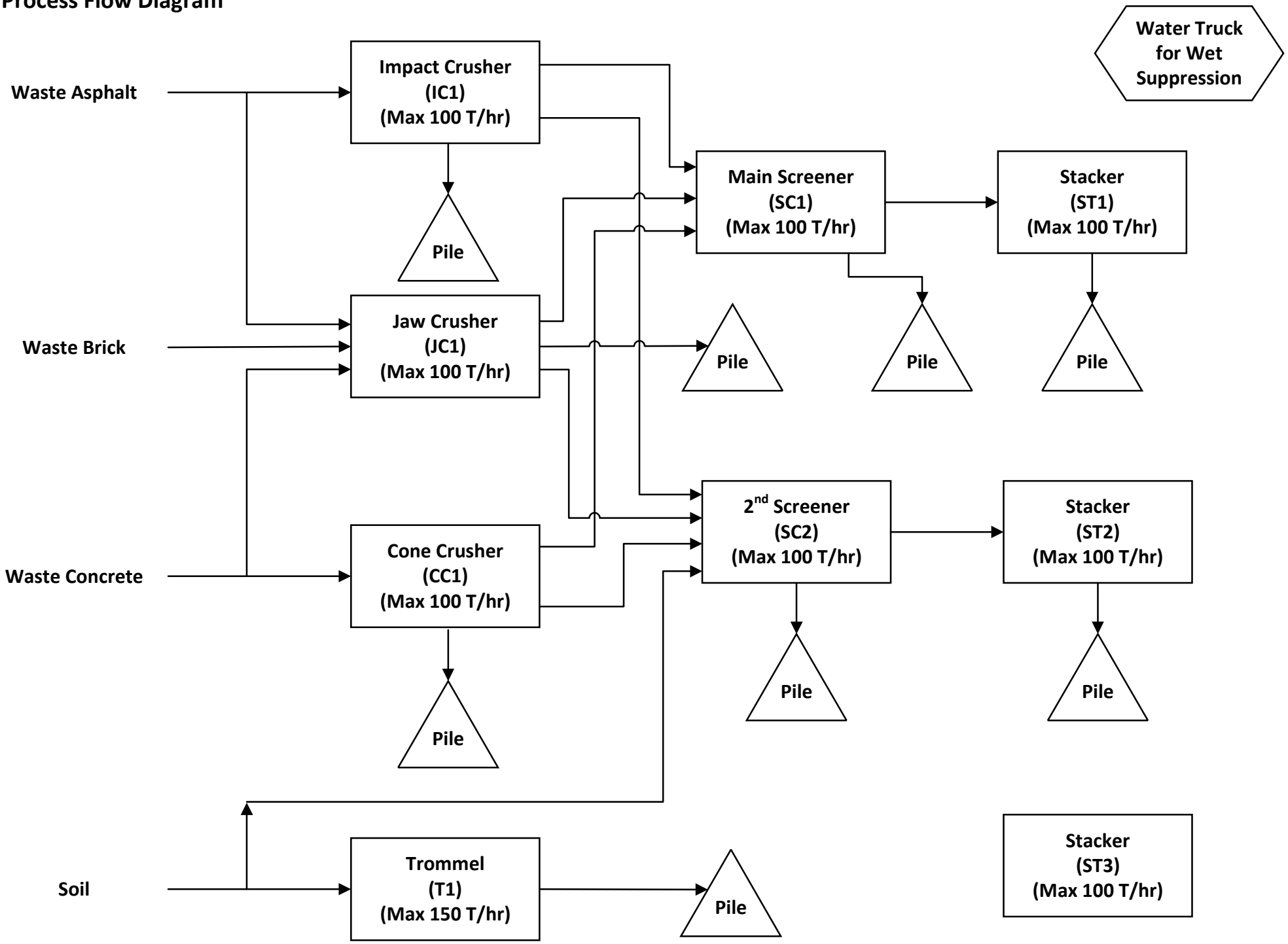
BGE SITE PLAN EXHIBIT
TODDS LANE, INC.

TAX MAP: 89, GRID: 24, PARCELS: 668 & 705
TAX MAP: 90, GRID: 19, PARCELS: 54, 75, 889, 840 & 1941
13TH ELECTION DISTRICT BALTIMORE COUNTY, MD

DRAWING NO.
SHEET 1 OF
KCI JOB NUMBER
272-06289

ATTACHMENT C PROCESS FLOW DIAGRAM

Process Flow Diagram



ATTACHMENT D APPLICATION FORMS

ATTACHMENT D-1

CONE CRUSHER:

- **FORM 5**
- **FORM 5EP**
- **FORM 6**
- **FORM 44**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium | Maryland | 21093
City | State | Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources — 6/10/2022
Print Name and Title — Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale | Maryland | 21237 | (410) 771 - 4311
City/Town | State | Zip | Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey C44 Cone crusher (CC1), 100 tons per hour

5. Workmen's Compensation Coverage WC038108906 (Binder/Policy Number) July 2022 (Expiration Date)

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition concrete debris handling and processing

9. Control Devices Associated with this Equipment

None [ ] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[X] Describe Water spray

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS Diesel (Specify Type) [X] 66-1 ANNUAL AMOUNT CONSUMED 31,824 gal (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) [ ] 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	1 8 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	144,000	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	144,000	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.009	7.216	1.358
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0.035	0.053	0.009
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
1.184	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.506
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

COMMONWEALTH EQUIPMENT
CRUSHING & SCREENING
877-217-4474
info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

McCloskey INTERNATIONAL

C44 HIGH PERFORMANCE CONE CRUSHER

Continuing with McCloskey's focus on quality components, durability and reliability, the C44 Cone Crusher adds to McCloskey's reputation for proven performance with its 44" cone and CAT C13 430hp power unit. Offering high material capacity and throughput, large stockpile capacity, and customer focused features, the C44 Cone Crusher puts McCloskey to the fore of mobile crushing plants and pushes the boundaries of industry performance.

The C44 provides a high degree of control over the final product, making it the ideal portable secondary crusher.

Feeder
Heavy duty Hardox® steel hopper with adjustable feed via control panel, remote control or fully automatic regulation with feedback from the cone.

Crusher
Built to be reliable in the toughest operating conditions, producing material ranging from 3/8" (10 mm) to 8" (203mm)

Power Unit
CAT C13 430hp (320kw) engine with roomy access for maintenance. Innovative hydraulic system provides significant improvements in fuel economy.

Metal Detector
A standard feature, the metal detector automatically stops the feeder when metal is detected as a way to prevent damage to the cone.

Dynamic Adjustable Closed Side Setting (CSS)
Dynamic adjust-closed side setting (CSS) can be changed while operating, minimizing downtime.

C44	
	Engine: 430 hp (320 kw) CAT C13 Diesel
	Transport Height: 11' 2" (3.4m)
	Transport Length: 53' 7" (16.33m)
	Transport Width: 9' 6" (2.9m)
	Stockpile Height: 13' 10" (4210mm)
	Weight: 97,444 lbs (44,200 kg)

C44 HIGH PERFORMANCE CONE CRUSHER

www.mccloskeyinternational.com

McCloskey International reserves the right to make changes to the information and design of the machines on this brochure without reservation and notification to the users. Information at time of print considered accurate – McCloskey International assumes no liability resulting from errors or omissions in this document.

HARDOX is a registered trademark of SSAB Oxelösund AB.

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Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
CC1 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph cone crusher equipped with water spray, powered by 440-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	8	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☒ Dust Suppression System No. 1
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.064	0.064	0.514	0.046
Particulate Matter (filterable as PM2.5)	0.014	0.014	0.110	0.010
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.007	0.007	0.053	0.005
Oxides of Sulfur (SOx)	0.902	0.902	7.216	0.649
Oxides of Nitrogen (NOx)	0.170	0.170	1.358	0.122
Carbon Monoxide (CO)	0.004	0.004	0.035	0.003
Lead (Pb)	NA			
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Acetaldehyde	0.002	0.002	0.019	0.002
Acrolein	0.0003	0.0003	0.002	0.0002
Benzene	0.003	0.003	0.023	0.002
1,3-Butadiene	0.0001	0.0001	0.001	0.0001
Formaldehyde	0.004	0.004	0.029	0.003
Toluene	0.001	0.001	0.010	0.001
Xylenes	0.001	0.001	0.007	0.001
PAHs	0.001	0.001	0.004	0.0004

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation Gray & Son, Inc.	**Telephone No.** (410) 771-4311		**Date of Application** June __, 2022
2. Mailing Address 430 West Padonia Road	**City** Timonium	**Zip Code** 21093	**County** Baltimore
3. Equipment Location 600 Todds Lane	**City/Town or P.O.** Rosedale		**County** Baltimore
4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno

5. Application Type: **Alteration** ☐ **New Construction** ☒

6. Date Construction is to Start: July 2022 **Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Water spray (type)

8. Gas Cleaning Equipment Manufacturer **Model No.** **Collection Efficiency (Design Criteria)**

N/A

9. Type of Equipment which Control Equipment is to Service:

Integrated water spray on cone crusher (CC1) will be used to provide wet suppression of dust generation from crushing of demolition debris.

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

Form number: 6
Revision date: 0/2000
TTY Users 1-800-735-2258

Recycled Paper

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.

PRESSURE DROP _____

Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content OR	_____	%	_____	%
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See process flow diagram included with the PTC application package for this project.

Date Received: **Local** _____ _____ **State** _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ **Date** _____

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Management Administration / Air Quality Permits Program
1800 Washington Boulevard, STE 720 Baltimore, MD 21230-1720
(410) 537-3230 ●1-800-633-6101 ● www.mde.state.md.us

Mail application to
MDE/ARMA
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Don't forget to:
✓Sign the application
✓Include vendor literature

Air Quality Permit to Construct & Registration Application for

INTERNAL COMBUSTION ENGINES

(Electrical Power Generators, Power Equipment, Fire Protection Pumps)

1) Applicability

You must check off one the following items to use this application form

☐ Electrical power generation (off grid, base load, peak, load shaving,, etc)
- Use MDE Form 42 for emergency use only generators

☒ Power equipment (hydraulic, mechanical, etc)
☐ Fire protection pump

***For electrical power generators only**, you must check off one the following items to use this application form*

☐ I have a CPCN Exemption from the Public Service Commission for this generator (contact the Public Service Commision at 410.767.8131)
☐ This generator was installed before October 1, 2001 and I do not need a CPCN Exemption

2) Business/Institution/Facility where the engine will be located ☐ Check if this is a federal facility

Name: GSI-Todds Lane Material Processing Operation Phone: (410) 771-4311

Street Address: 600 Todds Lane

City: Rosedale State: MD Zip Code: 21237 County: Baltimore

3) Owner/Operator of the engine (if different than above)

Name: Gray & Son, Inc. Phone: (410) 771-4311

Mailing Address: 430 West Padonia Road

City: Timonium State: MD Zip Code: 21093

4) Installer ☐ Check if installer is applying for permit. If checked, complete the following:

Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

5) Engine Information

Installation Date	Engine Manufacturer & Model	Horsepower	Manufacture Date	Fuel Type
July 2022	Caterpillar C13	440	2/1/2016	Diesel

6) Operating Information

Intended use description: (Examples, "a portable generator at a construction site" or "peak shaving with the emergency generator", etc)

Engine used to power cone crusher (CC1) at material processing operation

8 Hours per day

1,140 Hours per year

7) Required Attachments

(Check that they are attached)

☒ Vendor literature

☐ CPCN Exemption from the Public Service Commission

- Electrical generators only
- Not needed for generators installed before October 1, 2001

8) Workers Compensation (Environmental article §1-202)

Workers insurance policy or binder number: WC038108906 (Zurich)

☐ Check if self employed or otherwise exempt from this requirement

"I CERTIFY UNDER PENALTY OF LAW THAT THE INFORMATION SUBMITTED IN THIS REQUEST FOR COVERAGE IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

Owners Signature	Printed Name & Title	Date
	Brandon Burdsall / Kim Dean	6/10/2022

LEAVE BLANK, MDE use only

☐ Permit

☐ Registration (Less than 1,000 brake horsepower & installed prior to 11/24/03)

Permit/Registration Number: _____ - ____ - _____ - _____

AI: _____

	SOx	Nox	CO	VOC	PM	PM-10
Emissions Stack						
Fugitive						

Engine Emissions Data

For Emissio s / Certification fee back and questions, please submit a ticket via our ER Request P rtal

This emission data is Caterpillar's best estimate f r this rating. If actual emissions are required then an emission test ee s t be ru on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**N3F01896**
Sales Model	C13
Regulatory Build Date	01-FEB-2016

I terlock Code Progression	From Interlock	To Interlock	Software PN
	121	176	5660203-00

Engine ReRated	
Engine Arrangement Number	3857717
Certification Arrangeme t	3611820
Test Spec Number	3717452
Regulatory Status	EPA / ARB / EU / R120 / MLIT / S. Korea
Labeled Model Year	2016
EPA Family Code	GCPXL12.5HTF
EPA Emissions Level	EPA TIER 4f
EU Emissions Level	EU STAGE IV
Japan Emissions Level	STEP 4 FINAL
EU Type Approval	e11*97/68QA*2012/46*2580*04
Korea Type Approval	C13(CE13C8)//15EN*CA*02
UN R120 Type Approval	120R-011014
As-Shipped Flash File	4779323
Flash File Progression	Re-rated
CORR FL Power at RPM	443 HP (330.0 KW)2100 RPM
Advertised Power	440 HP 2,100RPM
Total Displacement	12.5 L

Disclaimer: The information provided has been compiled from thir party sources and is accurate to the best of Caterpillar's k owledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable f r any errors or omissio s contained therein. All i formation provided shoul be independently verified and co firmed, including by examini g the emissions label located on the engi e.

Need emission replacement label? Click here!

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PERFORMANCE DATA[EM0282]

June 8, 2021

Performance Number: EM0282 **Change Level: 03**

SALES MODEL:	C13	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	2,100
ENGINE POWER (BHP):	440	**PEAK TORQUE SPEED (RPM):**	1,400
PEAK TORQUE (FT-LB):	1,485.4	**TORQUE RISE (%):**	35
COMPRESSION RATIO:	17	**ASPIRATION:**	TA
RATING LEVEL:	INDUSTRIAL C - INTERMITTENT	**AFTERCOOLER TYPE:**	ATAAC
PUMP QUANTITY:	1	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
FUEL TYPE:	DIESEL	**INLET MANIFOLD AIR TEMP (F):**	122
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	192.2
GOVERNOR TYPE:	ELEC	**TURBO CONFIGURATION:**	SINGLE
ELECTRONICS TYPE:	ADEM4	**TURBO QUANTITY:**	1
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	GTB4594 T256C .84 A/R 70/30
IGNITION TYPE:	CI	**CERTIFICATION YEAR:**	2013
INJECTOR TYPE:	EUI	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,163.4
REF EXH STACK DIAMETER (IN):	4		
MAX OPERATING ALTITUDE (FT):	10,200		

INDUSTRY	SUBINDUSTRY	APPLICATION
INDUSTRIAL	GENERAL INDUSTRIAL	INDUSTRIAL
INDUSTRIAL	CONSTRUCTION	INDUSTRIAL
INDUSTRIAL	MATERIAL HANDLING	INDUSTRIAL
INDUSTRIAL	AGRICULTURE	INDUSTRIAL
OIL AND GAS	WELL SERVICING	INDUSTRIAL
OIL AND GAS	LAND PRODUCTION	INDUSTRIAL
INDUSTRIAL	FORESTRY	INDUSTRIAL

General Performance Data

INLET MANIFOLD AIR TEMPERATURE ("INLET MFLD TEMP") FOR THIS CONFIGURATION IS MEASURED AT THE OUTLET OF THE AFTERCOOLER.

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	GAL/HR
2,100	440	1,100	217	0.356	22.1
2,000	440	1,155	228	0.350	21.7
1,900	440	1,216	240	0.344	21.3
1,800	440	1,283	254	0.339	21.0
1,700	436	1,346	266	0.336	20.7
1,600	426	1,400	277	0.337	20.3
1,500	413	1,446	286	0.337	19.6
1,400	396	1,484	293	0.338	18.8
1,300	357	1,441	285	0.338	17.0
1,200	319	1,397	276	0.344	15.5
1,100	276	1,319	261	0.349	13.6
1,000	231	1,211	239	0.356	11.6
900	189	1,103	218	0.358	9.5
800	150	986	195	0.365	7.7
700	110	825	163	0.370	5.7
600	75.1	657	130	0.366	3.9

ENGINE SPEED	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
RPM	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
2,100	440	51.7	122.0	1,100.2	68.4	851.5	55	342.6
2,000	440	51.9	122.0	1,099.6	65.8	856.0	55	338.9
1,900	440	52.3	122.0	1,105.9	62.2	868.0	55	336.0
1,800	440	52.3	122.0	1,118.7	58.6	888.1	55	333.0
1,700	436	52.0	122.0	1,131.3	56.1	905.6	54	330.7
1,600	426	52.2	122.0	1,164.1	55.2	926.7	54	332.3
1,500	413	51.1	122.0	1,189.5	51.9	949.5	53	330.4
1,400	396	49.6	122.0	1,213.0	48.7	971.9	52	328.4
1,300	357	44.7	122.0	1,219.8	42.6	987.8	46	313.3
1,200	319	39.6	122.0	1,235.9	36.6	1,018.0	41	293.5
1,100	276	33.1	122.0	1,245.1	29.4	1,047.3	34	270.4
1,000	231	27.4	122.0	1,238.5	24.1	1,056.3	28	245.1
900	189	21.7	122.0	1,198.0	19.5	1,036.3	22	215.9
800	150	13.9	122.0	1,165.0	12.5	1,027.7	15	178.7

700	110	8.0	122.0	1,074.7	7.7	965.2	8	139.4
600	75.1	4.2	122.0	920.8	4.7	840.2	5	114.0

General Performance Data (Continued)

ENGINE SPEED	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,100	440	812.1	1,524.6	3,554.5	3,711.1	571.7	516.8
2,000	440	793.0	1,498.7	3,458.6	3,612.4	560.0	505.9
1,900	440	765.2	1,467.4	3,319.9	3,471.3	543.4	489.8
1,800	440	735.7	1,446.1	3,176.0	3,325.2	527.6	474.0
1,700	436	712.1	1,429.7	3,061.2	3,207.8	514.9	462.1
1,600	426	672.2	1,410.7	2,884.5	3,028.2	500.3	447.5
1,500	413	637.4	1,374.9	2,725.6	2,864.8	479.7	428.1
1,400	396	603.7	1,341.6	2,573.6	2,707.0	460.8	410.7
1,300	357	544.4	1,254.7	2,311.9	2,432.3	426.2	379.6
1,200	319	488.7	1,150.0	2,045.4	2,155.3	382.7	339.5
1,100	276	416.5	1,026.7	1,732.6	1,829.1	335.0	296.0
1,000	231	361.6	909.1	1,497.5	1,579.6	294.9	261.0
900	189	312.9	786.3	1,292.3	1,360.0	258.4	229.7
800	150	234.0	603.2	965.3	1,020.1	199.4	175.8
700	110	174.4	441.0	721.6	762.3	152.2	134.3
600	75.1	133.7	310.8	553.6	581.1	117.5	105.1

Heat Rejection Data

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,100	440	11,565	2,354	15,095	7,924	2,456	3,326	18,653	48,036	51,171
2,000	440	11,102	2,261	14,970	7,789	2,411	3,165	18,653	47,159	50,236
1,900	440	10,880	2,226	14,639	7,676	2,374	2,967	18,653	46,427	49,456
1,800	440	10,626	2,145	14,428	7,660	2,340	2,778	18,653	45,758	48,744
1,700	436	10,388	2,106	14,121	7,645	2,298	2,633	18,482	44,937	47,869
1,600	426	10,231	2,065	13,892	7,517	2,300	2,534	18,084	44,058	46,933
1,500	413	9,964	2,047	13,467	7,413	2,275	2,366	17,516	42,709	45,496
1,400	396	9,154	1,874	13,469	7,283	2,136	2,223	16,776	40,919	43,589
1,300	357	8,102	1,652	12,625	6,721	1,966	1,849	15,127	36,921	39,330
1,200	319	7,214	1,472	11,988	6,260	1,830	1,507	13,535	33,693	35,892
1,100	276	6,268	1,260	10,930	5,568	1,638	1,134	11,715	29,568	31,498
1,000	231	5,199	1,045	9,781	4,868	1,447	831	9,781	25,155	26,797
900	189	4,402	885	8,317	4,059	1,283	487	8,019	20,764	22,119
800	150	3,742	752	6,750	3,017	1,110	215	6,369	16,808	17,905
700	110	2,935	598	4,953	2,037	876	40	4,663	12,465	13,279
600	75.1	2,065	422	3,304	1,219	611	-27	3,185	8,429	8,979

Sound Data

SOUND DATA REPRESENTATIVE OF NOISE PRODUCED BY THE ENGINE AND AFTERTREATMENT.

EXHAUST: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,100	440	92.7	71.6	66.9	75.5	77.9	80.9	81.4	82.6	83.0	81.8	82.2
2,000	440	92.8	70.4	67.2	74.7	77.7	82.5	81.6	82.5	83.2	81.9	82.3
1,900	440	91.3	72.9	68.3	74.2	77.0	80.0	80.2	81.3	81.8	80.6	80.8
1,800	440	91.4	75.7	72.9	76.1	82.0	79.8	79.9	80.9	81.4	80.0	80.0
1,700	436	90.2	68.2	74.8	77.2	78.2	78.8	79.0	79.7	80.3	78.7	78.7
1,600	426	89.2	62.1	74.5	78.9	75.6	77.7	78.1	78.7	79.4	77.6	77.5
1,500	413	88.9	65.4	69.3	75.9	82.6	77.8	77.5	78.1	78.6	76.7	76.3

1,400	396	86.9	66.3	71.3	73.6	74.5	75.4	76.6	77.4	77.7	75.9	75.3
1,300	357	85.6	68.6	75.9	73.4	72.0	74.7	74.8	75.3	75.1	73.3	73.2
1,200	319	85.3	71.6	80.2	73.8	73.1	75.0	73.4	73.2	72.6	71.0	71.2
1,100	276	82.3	72.0	76.2	70.0	69.8	72.3	70.9	69.6	68.9	67.9	67.7
1,000	231	77.3	67.6	64.7	65.9	63.5	67.9	66.4	65.1	64.8	64.2	63.9
900	189	72.1	56.9	51.4	69.1	57.4	61.5	60.1	60.5	60.9	60.7	60.6

EXHAUST: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,100	440	82.4	82.4	81.4	81.5	77.5	76.6	74.0	72.5	70.7	68.0	64.9
2,000	440	82.3	82.2	81.3	81.6	77.2	76.3	73.9	72.3	70.8	68.1	65.1
1,900	440	80.8	80.9	79.9	78.4	75.8	74.8	72.3	70.7	68.7	66.1	63.0
1,800	440	80.0	80.3	80.5	77.2	75.2	74.5	71.7	70.3	68.5	65.7	62.4
1,700	436	79.1	79.0	80.5	75.6	73.7	73.0	70.5	68.8	66.9	64.1	60.7
1,600	426	77.9	77.7	79.6	74.1	72.1	71.4	69.1	67.3	65.3	62.6	59.1
1,500	413	76.6	76.5	77.2	72.7	70.9	70.3	67.8	66.0	63.9	60.9	57.2
1,400	396	76.1	75.8	75.0	71.6	70.0	69.5	67.1	65.1	62.9	59.9	56.2
1,300	357	73.7	73.0	72.6	69.4	67.8	67.3	64.5	62.3	59.9	56.6	52.6
1,200	319	71.1	70.3	71.1	67.8	65.9	65.4	62.1	59.8	57.2	53.7	49.3
1,100	276	68.0	67.3	68.6	66.0	64.0	63.9	59.1	56.9	54.0	50.5	45.8
1,000	231	65.3	64.3	65.5	64.2	62.3	62.9	56.1	54.3	51.2	48.1	43.3
900	189	63.5	61.9	60.6	62.3	60.0	62.3	53.3	51.5	48.9	47.0	41.9

Sound Data (Continued)

MECHANICAL: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,100	440	116.8	73.4	79.2	85.8	96.4	92.2	96.1	96.9	98.6	101.0	104.7
2,000	440	116.2	67.7	77.9	87.3	92.9	92.2	91.6	96.7	98.0	103.0	103.7
1,900	440	115.3	71.0	85.8	92.6	92.2	88.8	93.5	93.7	98.5	100.5	101.5
1,800	440	114.7	74.6	89.9	88.1	94.0	88.5	91.1	93.5	100.0	102.8	101.3
1,700	436	113.8	70.4	88.6	86.7	90.9	88.6	89.6	92.7	98.3	100.3	100.3
1,600	426	112.6	64.9	85.1	85.9	86.4	87.6	87.9	90.7	95.7	97.8	98.5
1,500	413	111.5	64.6	80.7	84.0	84.4	85.9	87.3	88.9	94.5	98.1	96.5
1,400	396	110.0	65.9	79.7	82.3	85.3	84.4	85.2	89.6	92.3	95.4	95.0
1,300	357	108.7	64.6	77.3	80.3	83.5	82.6	83.5	88.1	91.2	95.5	93.9
1,200	319	107.5	63.9	74.9	78.5	81.2	80.8	82.3	86.8	90.6	95.9	93.1
1,100	276	106.4	64.5	73.1	76.2	80.5	79.6	81.2	85.5	90.0	93.5	92.1
1,000	231	105.5	64.4	71.2	72.8	80.6	79.4	80.0	84.5	88.0	90.7	91.1
900	189	104.9	64.9	69.8	69.1	81.6	80.1	79.9	83.8	86.2	89.1	91.9

MECHANICAL: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,100	440	105.3	107.6	108.9	109.9	107.2	107.1	102.8	99.8	99.3	94.3	90.7
2,000	440	104.9	106.3	108.4	109.9	106.6	106.2	101.9	98.8	98.6	93.7	90.1
1,900	440	103.9	106.1	107.3	108.8	106.1	105.2	100.6	98.0	96.7	93.3	89.7
1,800	440	103.5	104.6	107.2	106.9	105.8	104.7	100.2	97.7	96.5	93.2	89.8
1,700	436	102.9	103.9	107.8	104.9	104.8	103.8	99.0	96.7	95.4	92.5	89.5
1,600	426	102.1	103.3	106.9	103.1	103.5	102.5	97.4	95.5	94.0	91.6	89.0
1,500	413	101.3	102.3	105.9	101.9	101.9	101.4	95.9	94.3	93.2	91.4	89.1
1,400	396	100.1	101.5	102.9	100.0	101.4	100.9	95.0	93.6	92.3	91.3	89.6
1,300	357	98.9	100.1	100.9	99.3	100.1	99.4	94.2	92.6	91.3	90.2	88.6
1,200	319	97.5	98.4	99.5	98.5	98.7	97.8	93.2	91.4	90.2	88.9	87.3
1,100	276	96.2	96.5	98.4	97.6	98.0	97.2	91.8	90.3	89.3	87.9	86.5
1,000	231	95.8	95.0	97.4	96.6	97.5	97.1	90.8	89.5	88.5	87.4	86.3
900	189	96.7	94.1	96.4	96.1	96.7	96.1	90.4	89.2	87.6	87.5	86.7

Emissions Data

PERFORMANCE DATA[EM0282]

June 8, 2021

DIESEL

RATED SPEED NOMINAL DATA: 2100 RPM

ENGINE POWER		BHP	440	330	220	110	44.0
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	77	30	7	20	71
TOTAL CO		G/HR	2	1	1	1	1
TOTAL HC		G/HR	3	2	1	2	3
TOTAL CO2		KG/HR	228	175	125	80	52
PART MATTER		G/HR	0.5	0.4	0.4	0.3	0.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	77.7	40.3	13.3	55.9	329.5
TOTAL CO	(CORR 5% O2)	MG/NM3	2.0	1.1	1.0	1.7	2.7
TOTAL HC	(CORR 5% O2)	MG/NM3	3.0	2.5	1.7	4.3	13.3
PART MATTER	(CORR 5% O2)	MG/NM3	0.4	0.4	0.6	0.8	1.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	38	20	6	27	161
TOTAL CO	(CORR 5% O2)	PPM	2	1	1	1	2
TOTAL HC	(CORR 5% O2)	PPM	6	5	3	8	25
TOTAL NOX (AS NO2)		G/HP-HR	0.18	0.09	0.03	0.18	1.63
TOTAL CO		G/HP-HR	0.00	0.00	0.00	0.01	0.01
TOTAL HC		G/HP-HR	0.01	0.01	0.00	0.02	0.08
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.00	0.01
TOTAL NOX (AS NO2)		LB/HR	0.17	0.07	0.02	0.04	0.16
TOTAL CO		LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL HC		LB/HR	0.01	0.00	0.00	0.00	0.01
TOTAL CO2		LB/HR	503	386	276	176	115
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	7.8	8.9	10.8	14.6	16.6

SECONDARY SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER		BHP	440	330	220	110	44.0
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	52	26	5	10	52
TOTAL CO		G/HR	2	1	0	1	1
TOTAL HC		G/HR	3	2	1	1	2
TOTAL CO2		KG/HR	219	167	116	68	41
PART MATTER		G/HR	0.6	0.3	0.2	0.1	0.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	55.1	35.9	10.0	37.9	297.5
TOTAL CO	(CORR 5% O2)	MG/NM3	1.6	0.9	0.9	2.7	3.1
TOTAL HC	(CORR 5% O2)	MG/NM3	2.8	1.9	1.5	4.4	10.8
PART MATTER	(CORR 5% O2)	MG/NM3	0.5	0.3	0.3	0.4	1.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	27	18	5	18	145
TOTAL CO	(CORR 5% O2)	PPM	1	1	1	2	2
TOTAL HC	(CORR 5% O2)	PPM	5	4	3	8	20
TOTAL NOX (AS NO2)		G/HP-HR	0.12	0.08	0.02	0.09	1.20
TOTAL CO		G/HP-HR	0.00	0.00	0.00	0.01	0.01
TOTAL HC		G/HP-HR	0.01	0.00	0.00	0.01	0.05
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.00	0.01
TOTAL NOX (AS NO2)		LB/HR	0.12	0.06	0.01	0.02	0.12
TOTAL CO		LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL HC		LB/HR	0.01	0.00	0.00	0.00	0.00
TOTAL CO2		LB/HR	483	368	255	151	90
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	6.5	7.6	9.0	12.5	16.5

Regulatory Information

EPA TIER 4 FINAL		2014 - ----		
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1039 SUBPART F AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 4 FINAL	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.02

EU STAGE IV	2014 - ----
GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 2010/26/EU, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.	

PERFORMANCE DATA[EM0282]

June 8, 2021

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
EUROPE	EU	NON-ROAD	STAGE IV	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.025

EU STAGE V		2019 - ----		
GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 2010/26/EU, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
EUROPE	EU	NON-ROAD	STAGE V	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.015

Altitude Derate Data

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)											
0	440	440	440	440	437	434	431	428	425	422	440
1,000	440	440	440	438	435	432	429	426	423	420	439
2,000	440	440	438	435	433	430	427	424	421	418	438
3,000	440	438	435	433	430	427	424	421	418	415	436
4,000	437	435	433	430	427	425	422	419	416	413	434
5,000	434	432	430	428	425	422	419	416	413	410	432
6,000	431	429	427	425	422	419	416	413	410	398	430
7,000	427	425	423	421	418	416	413	405	394	384	427
8,000	424	422	420	418	415	412	402	392	381	371	424
9,000	420	418	416	414	411	401	391	380	369	359	421
10,000	416	414	412	405	398	388	378	367	355	341	418
11,000	411	405	398	391	384	374	361	347	337	329	415
12,000	394	388	383	377	369	356	342	333	323	315	403
13,000	378	373	367	361	351	339	329	320	311	303	388
14,000	359	354	349	343	336	327	318	309	299	288	371
15,000	336	331	326	321	314	306	296	286	276	266	354

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
3717452	PP6927	3857717	EE125	-	N3F00001	
4581415	PP7718	5099217	EE528	-	PP400001	
4581419	PP7724	5135947	EE369	-	JR900001	
4581451	PP7756	5157554	EE528	-	PP400001	
3717452	PP6927	5603131	EE125	-	N3F00001	
4581451	PP7756	5603137	EE528	-	PP400001	
4581415	PP7718	5603138	EE528	-	PP400001	

Supplementary Data

Type	Classification	Performance Number
AMBIENT TEMP	50C (122F)	EM0689

This performance data is supplementary data for:
EM0689

Performance Parameter Reference

Parameters Reference:DM9600-12

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600
APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.
PERFORMANCE PARAMETER TOLERANCE FACTORS:
Power +/- 3%
Torque +/- 3%
Exhaust stack temperature +/- 8%
Inlet airflow +/- 5%
Intake manifold pressure-gage +/- 10%
Exhaust flow +/- 6%
Specific fuel consumption +/- 3%
Fuel rate +/- 5%
Specific DEF consumption +/- 3%
DEF rate +/- 5%
Heat rejection +/- 5%
Heat rejection exhaust only +/- 10%
Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.
C280/3600 HEAT REJECTION TOLERANCE FACTORS:
Heat rejection +/- 10%
Heat rejection to Atmosphere +/- 50%
Heat rejection to Lube Oil +/- 20%
Heat rejection to Aftercooler +/- 5%
TEST CELL TRANSDUCER TOLERANCE FACTORS:
Torque +/- 0.5%
Speed +/- 0.2%
Fuel flow +/- 1.0%
Temperature +/- 2.0 C degrees
Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.
REFERENCE ATMOSPHERIC INLET AIR
FOR 3500 ENGINES AND SMALLER
SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES
Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.
MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE
Location for air temperature measurement air cleaner inlet at stabilized operating conditions.
REFERENCE EXHAUST STACK DIAMETER
The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.
REFERENCE FUEL
DIESEL
Reference fuel is #2 distillate diesel with a 35API gravity;
A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).
GAS
Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.
ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD
Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel)

load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY

Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.

Standard temperature values versus altitude could be seen on TM2001.

When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.

Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.

Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE

TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.

Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS:

Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

EMISSIONS DEFINITIONS:

Emissions : DM1176

EMISSION CYCLE DEFINITIONS

1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets
test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS:

Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS:

3500: EM1500

RATING DEFINITIONS:

Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080
Date Released : 07/10/19

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2016 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Caterpillar Inc. (U.S. Manufacturer or Importer) **Certificate Number: GCPXL12.5HTF-015**	**Effective Date:** **10/13/2015** **Expiration Date:** **12/31/2016**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **10/13/2015** **Revision Date:** **N/A**

Model Year: 2016 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** GCPXL12.5HTF	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 130<kW<=560 **Fuel Type:** Diesel **After Treatment Devices:** CTOX-DPF-Passive, Diesel Oxidation Catalyst, PTOX-DPF-Active, Ammonia Slip Catalyst, Selective Catalytic Reduction **Non-after Treatment Devices:** Electronic Control, Engine Design Modification, Electronic/Electric EGR - Cooled **FELs:** PM 0.01 g/kW-hr

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

This certificate of conformity is conditional upon compliance of said manufacturer with the averaging, banking and trading provisions of 40 CFR Part 1039, Subpart H. Failure to comply with these provisions may render this certificate void *ab initio*.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.

California Environmental Protection Agency **Air Resources Board**	CATERPILLAR INC.	**EXECUTIVE ORDER U-R-001-0512** New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2016	GCPXL12.5HTF	12.5	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Oxidation Catalyst, Engine Control Module, Exhaust Gas Recirculation, Periodic Trap Oxidizer, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst	Loader, Tractor, Agricultural Combine, Scraper, Excavator, Motor Grader

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
130 ≤ kW ≤ 560	Tier 4 Final	STD	0.19	0.40	N/A	3.5	0.02	N/A	N/A	N/A
		FEL	N/A	N/A	–	N/A	0.01	N/A	N/A	N/A
		CERT	0.05	0.26	–	0.02	0.01	--	--	--

Certified Emissions Data

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 14 day of September 2015.

Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

ATTACHMENT 1 OF 1

Engine Model Summary Template

U-R-001-0512
8/27/2015

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
GCPXL12.5HTF	Cert Test 3	C13	519@2100	263	186	1752@1400	338	159	DFI,TC,ECM,CAC,EGR,PTC, OC,SCR-U,AMOX
GCPXL12.5HTF	1	C13	527@1870	289.2	181.9	1750@1400	335.5	158.0	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	2	C13	479@1870	258.3	162.5	1635@1400	314.2	148.0	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	3	C13	421@1870	232.1	146.0	1434@1400	277.1	130.5	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	4	C13	375@2000	196.9	132.5	1575@1300	302.3	132.2	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	5	C13	384@2100	192.6	136.1	1297@1400	245.7	115.7	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	6	C13	414@2100	207.4	146.5	1398@1400	267.5	126.0	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	7	C13	439@2100	219.2	154.9	1482@1400	280.9	132.3	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	8	C13	473@2100	239.1	168.9	1601@1400	308.6	145.3	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	9	C13	519@2100	262.7	185.6	1752@1400	338.2	159.3	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	10	C13	355@2050	184.4	127.2	1564@1200	301.9	121.9	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	11	C13	425@1800	245.0	148.4	1338@1650	2588	143.7	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	11a	C13	425@1800	245.0	148.4	1338@1650	2588	143.7	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	12	C13	416@2100	216.4	152.9	1612@1200	310.3	125.2	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	13	C13	429@2100	229.6	162.2	1612@1200	313.0	126.3	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	14	C13	527@1870	289.2	181.9	1750@1400	335.5	158.0	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	15	C13	479@1870	258.3	162.5	1635@1400	314.2	148.0	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	16	C13	421@1870	232.1	146.0	1434@1400	277.1	130.5	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
GCPXL12.5HTF	17	C13	363@2000	190.1	127.9	1351@1000	268.4	90.3	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX

ATTACHMENT D-2

IMPACT CRUSHER:

- **FORM 5**
- **FORM 5EP**
- **FORM 6**
- **FORM 44**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium | Maryland | 21093
City | State | Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources
Print Name and Title

6/10/2022
Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale | Maryland | 21237 | (410) 771 - 4311
City/Town | State | Zip | Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey I44v3 Impact crusher (IC1), 100 tons per hour

5. Workmen's Compensation Coverage WC038108906 (Binder/Policy Number) July 2022 (Expiration Date)

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition asphalt debris handling and processing

9. Control Devices Associated with this Equipment

None [ ] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[X] Describe Water spray

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS Diesel (Specify Type) [X] 66-1 ANNUAL AMOUNT CONSUMED 38,480 gal (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) [ ] 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Asphalt		100	tons	208,000	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed asphalt		100	tons	208,000	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.018	6.150	1.190
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0.397	0.066	0.018
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
1.184	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.506
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

I44v3

High Performance Impact Crusher

The new I44v3 Impactor continues to bring high quality and high production capacity to McCloskey™mobile impactor applications.

Efficiency is boosted with the I44v3 crusher design, particularly in the material flow path. Each sectional component is wider than the last to allow an unrestricted flow without funneling or narrowing, eliminating material bridging. The direct drive crusher rotor is also a new feature on the I44v3, bringing more power, along with lower fuel costs.

The redesigned open chassis allows for better access, and a magnet contributes to easier operation of the crusher.The I44v3's versatility and upgraded design makes it ideal for some of the toughest applications worldwide, including aggregates,asphalt recycling, concrete recycling, mining, construction and demolition.

Features

- 1050mm (41.3") diameter x 1125mm (44.3") wide Impactor
- 360Hp (268kW) Volvo D11 T4 Final engine
- Integrated hydraulic folding hopper
- I-beam plate fabricated chassis construction
- Open chassis design for ease of maintenance
- Fast setup time
- Track or Track c\w Wheel bogie.
- Integrated hydraulic folding stockpiling conveyors.
- Vibrating feeder under crusher discharge

COMMONWEALTH EQUIPMENT
877-217-4474
info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

McCloskey INTERNATIONAL

Material Flow Path

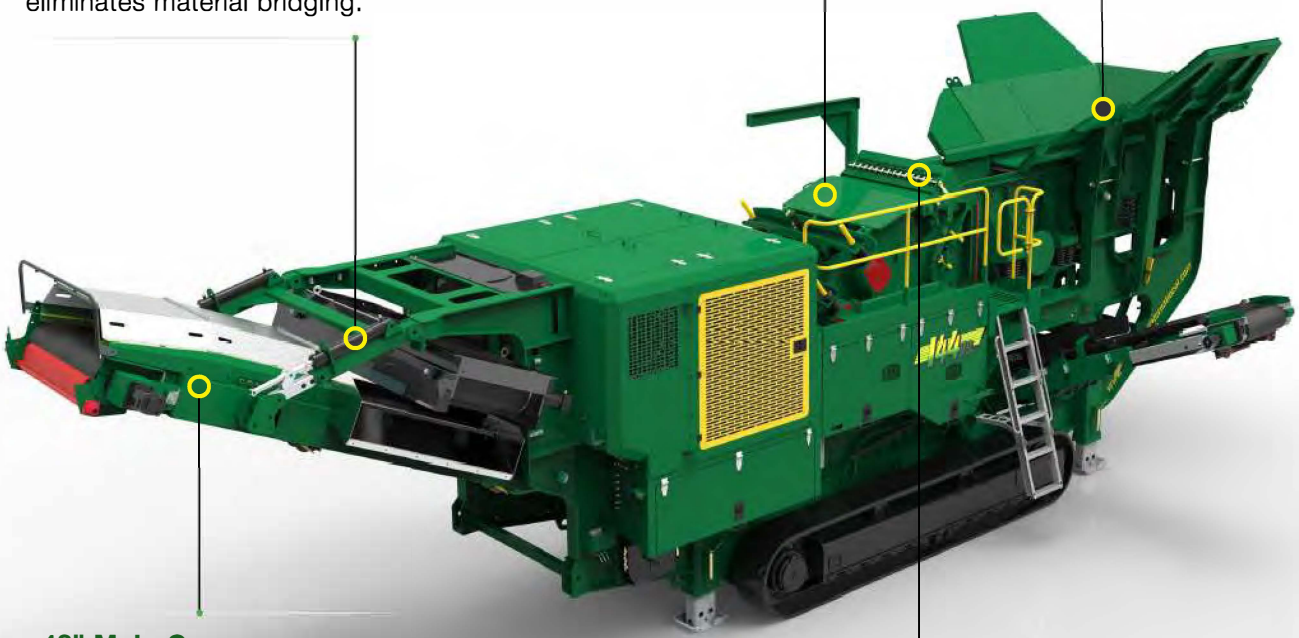
Each sectional component is wider than the last to allow an unrestricted flow of material without narrowing. Allows for reduced wear and eliminates material bridging.

Crushing Chamber

A 41.3” x 44.3” (1050mm x 1125mm), four bar impactor rotor with a 45.2” x 27.9” (1149mm x 708mm) feed opening.

Hopper

7.8 yd3 (6m^3) hopper features liners, hydraulic locking wedges, and side locking wedges that are easily operated from the ground.



48” Main Conveyor

New wider 48” (1200mm) main conveyor, giving large stockpile capacity. Conveyor lowers and raises hydraulically.

Crusher Rotor

Direct drive crusher rotor via clutch which boasts maximum power transmission with a low fuel cost.

COMMONWEALTH EQUIPMENT
CRUSHING & SCREENING
877-217-4474
info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

SPECIFICATION DATA

Dimensions and Capacities

Engine	**360 Hp (268 kW) Volvo D11 Tier 4 Final or Tier 3**
Transport Height	**11’ 1.8” (3.40m)**
Transport Length	**51’ 4.9” (15.668m)**
Transport Width	**9’ 1.5” (2.78m)**
Weight - w/ magnet & dirt conveyor	**92,594 lb (42,000kg)**
Impact Rotor	**41.3” diameter x 44.3” wide**
Stockpile Height Fines Conveyor	**13’ 7.1” (4.142m)**
Stockpile Height Side Conveyor	**8’ 2” (2.48m)**

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MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
IC1 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph impact crusher equipped with water spray, powered by 375-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	8	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☒ Dust Suppression System No. 1
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.065	0.065	0.523	0.068
Particulate Matter (filterable as PM2.5)	0.015	0.015	0.118	0.015
Particulate Matter (condensables)				
Volatile Organic Compounds (VOC)	0.008	0.008	0.066	0.009
Oxides of Sulfur (SOx)	0.769	0.769	6.150	0.800
Oxides of Nitrogen (NOx)	0.149	0.149	1.190	0.155
Carbon Monoxide (CO)	0.050	0.050	0.397	0.052
Lead (Pb)	NA			

Greenhouse Gases (GHG)	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				

List individual federal Hazardous Air Pollutants (HAP) below:	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
1,3-Butadiene	0.0001	0.0001	0.001	0.0001
Acetaldehyde	0.00201	0.00201	0.016	0.002
Acrolein	0.00024	0.00024	0.002	0.0003
Benzene	0.0024	0.0024	0.020	0.003
Formaldehyde	0.0031	0.0031	0.025	0.003
Toluene	0.00107	0.00107	0.009	0.001
Xylenes	0.00075	0.00075	0.006	0.001
PAHs	0.00044	0.00044	0.004	0.0005

(Attach additional sheets as necessary.)

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation Gray & Son, Inc.	**Telephone No.** (410) 771-4311		**Date of Application** June __, 2022
2. Mailing Address 430 West Padonia Road	**City** Timonium	**Zip Code** 21093	**County** Baltimore
3. Equipment Location 600 Todds Lane	**City/Town or P.O.** Rosedale		**County** Baltimore
4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno

5. Application Type: **Alteration** ☐ **New Construction** ☒

6. Date Construction is to Start: July 2022 **Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scubber ☐ _____ (type) **Other** ☒ Water spray (type)

8. Gas Cleaning Equipment Manufacturer **Model No.** **Collection Efficiency (Design Criteria)**

N/A

9. Type of Equipment which Control Equipment is to Service:

Integrated water spray on impact crusher (IC1) will be used to provide wet suppression of dust generation from crushing of demolition debris.

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

Form number: 6
Revision date: 0/2000
TTY Users 1-800-735-2258

Recycled Paper

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.

PRESSURE DROP _____

Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content OR	_____	%	_____	%
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See process flow diagram included with the PTC application package for this project.

Date Received: **Local** _____ _____ **State** _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ **Date** _____

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Mail application to
MDE/ARMA
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Don't forget to:
✓Sign the application
✓Include vendor literature

Air Quality Permit to Construct & Registration Application for

INTERNAL COMBUSTION ENGINES

(Electrical Power Generators, Power Equipment, Fire Protection Pumps)

1) Applicability

You must check off one the following items to use this application form

☐ Electrical power generation (off grid, base load, peak, load shaving,, etc)
- Use MDE Form 42 for emergency use only generators

☒ Power equipment (hydraulic, mechanical, etc)
☐ Fire protection pump

***For electrical power generators only**, you must check off one the following items to use this application form*

☐ I have a CPCN Exemption from the Public Service Commission for this generator (contact the Public Service Commision at 410.767.8131)
☐ This generator was installed before October 1, 2001 and I do not need a CPCN Exemption

2) Business/Institution/Facility where the engine will be located ☐ Check if this is a federal facility

Name: GSI-Todds Lane Material Processing Operation Phone: (410) 771-4311

Street Address: 600 Todds Lane

City: Rosedale State: MD Zip Code: 21237 County: Baltimore

3) Owner/Operator of the engine (if different than above)

Name: Gray & Son, Inc. Phone: (410) 771-4311

Mailing Address: 430 West Padonia Road

City: Timonium State: MD Zip Code: 21093

4) Installer ☐ Check if installer is applying for permit. If checked, complete the following:

Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

5) Engine Information

Installation Date	Engine Manufacturer & Model	Horsepower	Manufacture Date	Fuel Type
July 2022	Caterpillar C9.3B	375	5/7/2020	Diesel

6) Operating Information

Intended use description: (Examples, "a portable generator at a construction site" or "peak shaving with the emergency generator", etc)

Engine used to power impact crusher (IC1) at material processing operation

Hours per day	Hours per year
8	2,080

7) Required Attachments

(Check that they are attached)

☒ Vendor literature

☐ CPCN Exemption from the Public Service Commission

- Electrical generators only
- Not needed for generators installed before October 1, 2001

8) Workers Compensation (Environmental article §1-202)

Workers insurance policy or binder number: WC038108906 (Zurich)

☐ Check if self employed or otherwise exempt from this requirement

"I CERTIFY UNDER PENALTY OF LAW THAT THE INFORMATION SUBMITTED IN THIS REQUEST FOR COVERAGE IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

Owners Signature	Printed Name & Title	Date
	Brandon Burgess / GM Demo	6/10/22

LEAVE BLANK, MDE use only

☐ Permit

☐ Registration (Less than 1,000 brake horsepower & installed prior to 11/24/03)

Permit/Registration Number: _____-____-_____-_____

AI: _____

	SOx	Nox	CO	VOC	PM	PM-10
Emissions Stack						
Fugitive						

CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**NGH01900**
Sales Model	C9.3B
Regulatory Build Date	07-MAY-2020
As Shipped Data	
Engine Arrangement Number	5062314
Certification Arrangement	3611820
Test Spec Number	5526639
Regulatory Status	EPA / ARB / EU / R120 / MLIT / Korea
Labeled Model Year	2020
EPA Family Code	LCPXL09.3NTF
EPA Emissions Level	EPA TIER 4f
EU Emissions Level	EU STAGE V
EU Type Approval	e24*2016/1628*2018/989EV6/D*0014
Korea Type Approval	C9.3B(CE9.3D4)//18EN*CA*01
UN R120 Type Approval	120R-000006
As-Shipped Flash File	5964557
CORR FL Power at RPM	381 HP (284.0 KW)2200 RPM
Advertised Power	375 HP 2,200RPM
Total Displacement	9.3 L

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

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PERFORMANCE DATA [NGH01900]

(NGH01900)-ENGINE (CZS209528A)-CEM (PET140932M)-PETU

MARCH 05, 2021

For Help Desk Phone Numbers Click here

Perf No: EM2776 **Change Level:** 01

General | Heat Rejection | Sound | Emissions | Regulatory | Altitude Derate | Cross Reference | Perf Param Ref

View PDF

SALES MODEL:	C9.3B	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	2,200
ENGINE POWER (BHP):	375	**PEAK TORQUE SPEED (RPM):**	1,400
PEAK TORQUE (FT-LB):	1,269.3	**TORQUE RISE (%):**	41
COMPRESSION RATIO:	17	**ASPIRATION:**	TA
RATING LEVEL:	B-RATING	**AFTERCOOLER TYPE:**	ATAAC
PUMP QUANTITY:	1	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
FUEL TYPE:	DIESEL	**INLET MANIFOLD AIR TEMP (F):**	122
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	192.2
GOVERNOR TYPE:	ELEC	**TURBO CONFIGURATION:**	SINGLE
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	1
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	GTB4088/0.84 - A/R
INJECTOR TYPE:	CR	**CERTIFICATION YEAR:**	2017
REF EXH STACK DIAMETER (IN):	4	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,150.9
MAX OPERATING ALTITUDE (FT):	8,461		

INDUSTRY	SUB INDUSTRY	APPLICATION
INDUSTRIAL	GENERAL INDUSTRIAL	INDUSTRIAL
INDUSTRIAL	CONSTRUCTION	INDUSTRIAL
INDUSTRIAL	MATERIAL HANDLING	INDUSTRIAL
INDUSTRIAL	AGRICULTURE	INDUSTRIAL
OIL AND GAS	WELL SERVICING	INDUSTRIAL
INDUSTRIAL	INDUSTRIAL POWER UNIT	INDUSTRIAL
OIL AND GAS	LAND PRODUCTION	INDUSTRIAL
INDUSTRIAL	FORESTRY	INDUSTRIAL

General Performance Data Top

Note(s)

INLET MANIFOLD AIR TEMPERATURE ("INLET MFLD TEMP") FOR THIS CONFIGURATION IS MEASURED AT THE OUTLET OF THE AFTERCOOLER.

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BHP	LB-FT	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,200	375	896	239	0.350	18.5	59.6	123.2	1,086.0	96.8	768.4
2,100	375	939	250	0.343	18.2	61.1	123.4	1,076.3	92.3	764.7
2,000	375	986	262	0.335	17.7	61.9	122.7	1,069.6	87.4	764.1
1,900	375	1,038	276	0.329	17.4	62.5	122.8	1,072.1	82.3	771.2
1,800	375	1,096	292	0.325	17.2	63.1	122.4	1,084.4	77.4	786.5
1,700	368	1,138	303	0.321	16.7	61.9	122.1	1,093.1	70.7	801.4
1,600	360	1,182	315	0.318	16.1	60.6	123.0	1,105.9	64.0	821.6
1,500	350	1,224	326	0.315	15.5	58.6	122.5	1,124.6	56.9	848.6
1,400	338	1,269	338	0.314	15.0	56.3	123.2	1,154.8	50.5	888.0
1,300	299	1,207	321	0.313	13.2	48.6	119.2	1,151.6	40.1	915.0
1,200	261	1,144	305	0.314	11.6	41.5	121.1	1,158.8	31.3	946.3
1,100	227	1,082	288	0.314	10.0	33.9	118.1	1,151.3	23.8	967.6
1,000	189	993	264	0.320	8.5	25.9	120.9	1,148.5	17.0	997.3
900	155	904	241	0.327	7.1	19.9	111.5	1,130.4	12.6	1,007.7
800	124	816	217	0.345	6.0	14.9	120.6	1,130.7	8.8	1,025.2
700	90.9	682	182	0.349	4.5	9.6	106.9	1,053.5	5.7	971.8
600	62.8	550	146	0.356	3.1	6.0	109.9	932.0	3.7	871.7

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,200	375	64	391.6	912.2	1,562.2	3,974.0	4,105.5	625.5	576.5
2,100	375	65	386.0	889.8	1,537.6	3,864.5	3,993.2	617.4	568.9
2,000	375	66	380.3	861.8	1,510.7	3,728.6	3,854.6	606.9	558.8

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
1,900	375	66	376.9	827.8	1,481.7	3,569.7	3,693.0	591.9	544.0
1,800	375	66	375.6	795.3	1,461.6	3,419.0	3,540.9	576.7	529.0
1,700	368	65	371.1	748.0	1,417.9	3,205.4	3,323.5	552.8	505.9
1,600	360	63	365.4	701.4	1,379.9	2,992.8	3,107.4	529.5	483.3
1,500	350	61	359.9	646.7	1,325.7	2,749.2	2,859.2	498.2	453.1
1,400	338	58	356.3	589.4	1,270.2	2,497.8	2,604.0	463.4	419.5
1,300	299	50	333.3	501.8	1,139.1	2,118.1	2,211.7	407.4	367.6
1,200	261	43	308.8	421.4	1,006.7	1,772.2	1,854.4	352.1	316.3
1,100	227	35	278.7	347.9	865.6	1,458.8	1,529.9	298.2	266.7
1,000	189	26	242.2	274.4	714.7	1,148.5	1,208.9	241.2	214.1
900	155	20	213.6	220.9	588.7	923.6	974.2	197.3	174.4
800	124	15	184.5	174.2	477.1	727.8	770.6	158.0	138.6
700	90.9	10	153.9	134.9	358.2	563.7	595.4	123.0	108.4
600	62.8	6	129.6	107.2	264.5	448.0	470.3	97.7	87.2

Heat Rejection Data Top

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,200	375	6,813	1,650	14,289	7,192	2,147	4,272	15,923	40,316	42,947
2,100	375	6,578	1,583	13,942	6,934	2,104	4,063	15,923	39,512	42,090
2,000	375	6,366	1,514	13,466	6,687	2,056	3,848	15,923	38,598	41,117
1,900	375	6,199	1,450	13,089	6,524	2,015	3,632	15,923	37,825	40,294
1,800	375	6,100	1,403	12,912	6,496	1,990	3,467	15,923	37,367	39,805
1,700	368	5,953	1,344	12,486	6,321	1,930	3,197	15,622	36,237	38,602
1,600	360	5,836	1,283	12,075	6,191	1,869	2,906	15,273	35,084	37,373
1,500	350	5,724	1,203	11,536	6,044	1,795	2,613	14,823	33,700	35,899
1,400	338	5,689	1,119	11,222	5,971	1,735	2,332	14,345	32,581	34,707
1,300	299	5,296	914	9,856	5,344	1,527	1,816	12,666	28,676	30,547
1,200	261	4,908	778	8,745	4,750	1,343	1,332	11,088	25,207	26,851
1,100	227	4,530	670	7,476	4,074	1,161	938	9,611	21,803	23,226
1,000	189	4,256	565	6,339	3,394	987	558	8,019	18,528	19,737
900	155	3,988	489	5,109	2,787	827	378	6,571	15,522	16,535
800	124	3,703	433	4,411	2,275	700	186	5,268	13,144	14,002
700	90.9	2,878	319	3,211	1,609	519	106	3,857	9,736	10,371

Sound Data Top

EXHAUST: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	375	102.4	87.3	82.4	79.4	82.0	87.0	90.2	92.2	94.7	95.2	93.7
2,100	375	101.5	85.6	77.2	78.9	82.4	86.9	89.6	91.7	93.9	94.2	92.6
2,000	375	100.7	83.9	72.0	78.4	82.8	86.8	89.1	91.2	93.2	93.2	91.5
1,900	375	99.9	80.8	72.4	81.7	85.4	87.5	88.1	90.3	92.5	92.2	90.3
1,800	375	99.3	77.7	72.9	85.0	87.9	88.3	87.2	89.4	91.8	91.2	89.1
1,700	368	97.8	72.9	72.3	86.6	82.7	87.3	86.5	88.3	90.2	89.3	87.3
1,600	360	96.6	68.1	71.8	88.3	77.4	86.2	85.8	87.2	88.6	87.5	85.4
1,500	350	94.8	66.6	78.8	85.6	78.8	83.4	84.4	85.9	86.7	86.0	83.4
1,400	338	93.7	65.2	85.8	83.0	80.2	80.7	82.9	84.5	84.9	84.5	81.3
1,300	299	91.6	66.7	85.3	80.3	80.2	78.0	79.8	81.6	83.1	82.5	77.2
1,200	261	89.8	68.2	84.8	77.6	80.2	75.4	76.8	78.8	81.4	80.5	73.1
1,100	227	88.3	81.6	76.5	82.8	73.4	72.1	75.0	77.2	79.4	77.1	69.8
1,000	189	84.7	77.6	68.3	74.9	72.9	68.3	75.5	77.7	76.0	73.4	66.4
900	155	82.1	69.2	71.4	69.4	68.5	68.9	75.6	75.9	72.2	71.3	64.9
800	124	81.2	60.9	74.5	64.0	64.1	69.5	75.7	74.0	68.4	69.1	63.4
700	90.9	79.1	63.6	69.3	65.1	66.1	68.5	72.5	71.1	67.0	68.5	62.9
600	62.8	78.5	66.3	64.1	66.3	68.0	67.4	69.4	68.1	65.6	67.9	62.3

EXHAUST: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	375	91.7	89.8	87.8	86.1	84.6	84.2	82.9	81.8	81.3	79.2	75.9
2,100	375	90.7	88.8	86.8	85.2	83.7	83.3	82.0	81.0	80.4	78.4	75.2
2,000	375	89.6	87.8	85.8	84.3	82.9	82.5	81.1	80.2	79.6	77.6	74.4
1,900	375	88.5	86.6	84.8	83.3	81.8	81.4	80.1	79.2	78.5	76.7	73.6

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
1,800	375	87.3	85.5	83.7	82.4	80.8	80.4	79.2	78.3	77.5	75.8	72.8
1,700	368	85.5	83.8	82.2	80.9	79.3	78.9	77.7	76.8	75.9	74.3	71.6
1,600	360	83.8	82.1	80.8	79.5	77.8	77.3	76.2	75.3	74.4	72.8	70.3
1,500	350	81.5	80.0	78.8	77.5	75.7	75.2	74.2	73.4	72.4	70.7	69.0
1,400	338	79.2	78.0	76.8	75.5	73.6	73.1	72.2	71.4	70.4	68.6	67.7
1,300	299	75.2	74.1	72.9	71.6	69.6	69.2	68.4	68.3	66.5	64.9	66.8
1,200	261	71.1	70.2	69.0	67.7	65.5	65.3	64.5	65.2	62.6	61.1	65.9
1,100	227	66.9	65.9	64.6	63.3	61.3	60.9	60.1	63.0	58.6	58.5	65.8
1,000	189	62.9	61.6	60.4	58.8	57.1	56.4	56.3	62.1	56.7	57.7	65.7
900	155	60.6	59.0	58.0	56.4	55.0	54.6	55.0	62.0	56.5	57.7	65.8
800	124	58.4	56.4	55.6	54.0	52.9	52.8	53.7	61.9	56.3	57.7	65.8
700	90.9	62.9	60.1	60.2	56.5	56.6	55.7	55.5	62.1	56.5	57.8	65.7
600	62.8	67.4	63.8	64.8	59.0	60.3	58.6	57.3	62.3	56.7	57.9	65.7

MECHANICAL: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	375	114.0	80.0	89.1	85.0	88.0	89.2	91.6	92.1	98.4	98.9	100.7
2,100	375	113.0	80.0	85.0	86.2	86.5	88.8	90.2	93.3	97.5	98.5	99.7
2,000	375	112.1	80.1	80.8	87.4	84.9	88.3	88.7	94.5	96.6	98.0	98.7
1,900	375	111.2	75.9	83.0	87.6	85.4	87.5	87.5	92.5	95.2	97.2	97.0
1,800	375	110.4	71.8	85.2	87.9	85.8	86.7	86.2	90.5	93.9	96.3	95.4
1,700	368	109.7	72.5	87.4	85.6	84.1	85.5	85.2	90.4	93.6	96.2	95.4
1,600	360	109.0	73.2	89.6	83.4	82.4	84.3	84.1	90.3	93.3	96.2	95.4
1,500	350	107.6	72.8	85.1	81.8	82.4	83.8	83.6	88.2	91.3	94.1	93.9
1,400	338	106.2	72.5	80.6	80.1	82.4	83.3	83.2	86.1	89.3	92.0	92.4
1,300	299	105.0	70.8	78.1	79.1	80.6	83.0	81.8	85.6	88.5	91.0	91.5
1,200	261	103.8	69.1	75.6	78.0	78.8	82.7	80.4	85.1	87.8	90.1	90.5
1,100	227	103.3	70.2	75.2	78.5	78.7	81.9	81.1	84.3	85.7	88.8	88.8
1,000	189	103.6	70.5	82.0	78.1	79.5	82.8	81.1	83.4	85.4	89.1	88.7
900	155	103.4	67.0	77.7	77.6	78.5	81.1	79.9	82.4	84.8	88.0	90.3
800	124	103.3	63.6	73.3	77.1	77.4	79.4	78.6	81.3	84.3	87.0	91.9
700	90.9	103.2	62.6	72.9	77.9	77.3	78.0	86.5	82.1	83.0	86.6	91.5
600	62.8	103.6	61.5	72.5	78.7	77.1	76.6	94.4	82.9	81.8	86.3	91.2

MECHANICAL: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	375	108.6	105.7	105.6	102.9	102.5	100.2	98.4	98.0	96.2	94.7	92.2
2,100	375	107.4	105.2	104.7	102.0	101.4	99.3	97.6	97.3	95.2	93.8	90.9
2,000	375	106.2	104.6	103.8	101.0	100.2	98.5	96.8	96.5	94.1	92.9	89.6
1,900	375	105.9	104.1	102.2	99.7	99.2	97.2	95.8	95.6	93.1	92.2	88.6
1,800	375	105.5	103.6	100.6	98.3	98.1	95.9	94.7	94.7	92.2	91.4	87.6
1,700	368	105.3	102.5	99.1	97.3	97.2	95.0	93.3	93.2	90.9	90.2	86.6
1,600	360	105.0	101.4	97.7	96.2	96.4	94.1	91.9	91.8	89.7	88.9	85.6
1,500	350	103.3	99.7	96.6	95.5	95.5	93.5	91.4	91.2	88.8	88.2	85.3
1,400	338	101.7	97.9	95.5	94.8	94.7	93.0	90.8	90.7	88.0	87.5	85.0
1,300	299	100.5	96.4	94.2	93.3	93.2	91.3	89.9	90.0	87.1	87.0	84.4
1,200	261	99.4	94.9	92.9	91.8	91.8	89.6	89.0	89.2	86.2	86.4	83.8
1,100	227	98.9	95.0	92.7	91.5	91.4	89.2	88.6	89.6	85.8	85.4	82.6
1,000	189	98.3	96.5	92.9	92.3	92.3	90.4	88.2	90.8	85.0	84.9	81.4
900	155	97.3	96.3	93.2	92.6	92.5	89.5	88.4	92.0	85.3	84.8	81.2
800	124	96.4	96.2	93.4	92.9	92.7	88.7	88.7	93.3	85.6	84.8	81.0
700	90.9	96.4	95.8	93.1	93.1	92.7	90.2	89.0	91.9	85.5	83.5	79.5
600	62.8	96.5	95.3	92.9	93.2	92.7	91.6	89.3	90.5	85.4	82.2	78.0

Emissions Data Top

Units Filter All Units

RATED SPEED NOMINAL DATA: 2200 RPM

ENGINE POWER		BHP	375	282	188	93.9	37.5
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	68	17	6	5	17
TOTAL CC		G/HR	23	23	17	12	11
TOTAL HC		G/HR	4	8	8	8	12
TOTAL CO2		KG/HR	215	150	100	65	40
PART MATTER		G/HR	1.0	0.7	0.6	0.5	0.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	76.5	24.2	14.1	19.4	86.1
TOTAL CC	(CORR 5% O2)	MG/NM3	24.0	34.5	37.4	40.7	54.6
TOTAL HC	(CORR 5% O2)	MG/NM3	3.7	9.7	15.2	24.0	50.9
PART MATTER	(CORR 5% O2)	MG/NM3	0.9	1.1	1.2	1.5	1.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	37	12	7	9	42
TOTAL CC	(CORR 5% O2)	PPM	19	28	30	33	44
TOTAL HC	(CORR 5% O2)	PPM	7	18	28	45	95
TOTAL NOX (AS NO2)		G/HP-HR	0.18	0.06	0.03	0.05	0.46
TOTAL CC		G/HP-HR	0.06	0.08	0.09	0.13	0.28

ENGINE POWER		BHP	375	282	188	93.9	37.5
PERCENT LOAD		%	100	75	50	25	10
TOTAL HC		G/HP-HR	0.01	0.03	0.04	0.08	0.31
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.01	0.01
TOTAL NOX (AS NO2)		LB/HR	0.15	0.04	0.01	0.01	0.04
TOTAL CO		LB/HR	0.05	0.05	0.04	0.03	0.02
TOTAL HC		LB/HR	0.01	0.02	0.02	0.02	0.03
TOTAL CO2		LB/HR	475	331	221	143	89
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	10.1	12.4	14.1	15.5	16.9

SECONDARY SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER		BHP	375	282	188	93.9	37.5
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	29	10	4	4	8
TOTAL CO		G/HR	24	19	15	11	7
TOTAL HC		G/HR	2	3	3	3	5
TOTAL CO2		KG/HR	179	133	92	53	31
PART MATTER		G/HR	0.6	0.6	0.6	0.3	0.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	35.3	16.9	11.6	17.7	51.1
TOTAL CO	(CORR 5% O2)	MG/NM3	29.9	31.5	36.2	45.2	47.3
TOTAL HC	(CORR 5% O2)	MG/NM3	2.6	4.4	6.0	10.7	26.6
PART MATTER	(CORR 5% O2)	MG/NM3	0.6	0.9	1.2	1.1	0.1
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	17	8	6	9	25
TOTAL CO	(CORR 5% O2)	PPM	24	25	29	36	38
TOTAL HC	(CORR 5% O2)	PPM	5	8	11	20	50
TOTAL NOX (AS NO2)		G/HP-HR	0.08	0.04	0.02	0.04	0.21
TOTAL CO		G/HP-HR	0.06	0.07	0.08	0.12	0.18
TOTAL HC		G/HP-HR	0.01	0.01	0.01	0.03	0.13
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)		LB/HR	0.06	0.02	0.01	0.01	0.02
TOTAL CO		LB/HR	0.05	0.04	0.03	0.02	0.02
TOTAL HC		LB/HR	0.00	0.01	0.01	0.01	0.01
TOTAL CO2		LB/HR	396	294	204	117	68
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	10.3	11.4	12.7	14.6	16.4

Regulatory Information Top

EPA TIER 4 FINAL **2014 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1039 SUBPART F AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 4 FINAL	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.02

EU STAGE V **2019 - ----**

GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 2010/26/EU, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
EUROPE	EU	NON-ROAD	STAGE V	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.015

JAPAN MLIT TIER 4F **2016 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO MLIT ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1039 SUBPART F AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE JAPANESE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
JAPAN	JAPAN MLIT	NON-ROAD	TIER 4F	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.02

SOUTH KOREA MOE TIER 4F **2015 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO KOREA ARE CONSISTENT WITH THOSE DESCRIBED IN ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE KOREAN NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
SOUTH KOREA	SOUTH KOREA MOE	NON-ROAD	TIER 4F	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.025

UN R120 **2018 - ----**

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF INTERNAL COMBUSTION ENGINES TO BE INSTALLED IN AGRICULTURAL AND FORESTRY TRACTORS AND IN NON-ROAD MOBILE MACHINERY, WITH REGARD TO THE MEASUREMENT OF THE NET POWER, NET TORQUE AND SPECIFIC FUEL CONSUMPTION.

Altitude Derate Data Top

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)											
0	375	375	375	375	375	375	374	372	350	329	375
1,000	375	375	375	375	375	374	373	360	339	318	375
2,000	375	375	375	374	373	372	369	348	328	308	375
3,000	375	374	373	372	371	370	357	337	318	298	373
4,000	373	372	371	369	368	364	345	326	307	288	371
5,000	370	369	368	367	366	351	333	315	296	277	369
6,000	368	367	366	364	357	340	322	304	286	267	367
7,000	365	363	362	358	344	328	311	293	275	257	364
8,000	365	361	354	346	335	317	300	282	265	247	365
9,000	351	344	337	330	322	305	288	271	254	237	352
10,000	334	327	320	312	304	293	277	261	244	228	337
11,000	316	310	303	296	289	282	266	250	234	218	322
12,000	300	294	287	280	273	266	256	240	225	209	307
13,000	285	278	272	265	258	251	244	230	215	199	294
14,000	270	264	257	250	244	237	230	221	206	189	281
15,000	255	249	243	236	230	223	216	210	196	180	269

Cross Reference Top

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4581454	NAP	5062314	EE463	-	NGH00001	
5526639	PP7759	5062314	EE463	-	NGH00001	
4581810	NAP	5442938	EE465	-	NGK00001	
5526650	PP7793	5442938	EE465	-	NGK00001	
5526639	PP7759	5543101	EE463	-	NGH00001	

Performance Parameter Reference Top

Parameters Reference: DM9600 - 12

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.
Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS: Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 07/10/19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2020 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.** (U.S. Manufacturer or Importer) **Certificate Number: LCPXL09.3NTF-026**	**Effective Date:** 08/13/2019 **Expiration Date:** 12/31/2020	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** 08/13/2019 **Revision Date:** N/A

Model Year: 2020 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** LCPXL09.3NTF	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 130<=kW<=560 **Fuel Type:** Diesel **After Treatment Devices:** Diesel Oxidation Catalyst, PTOX-DPF-Active, Ammonia Slip Catalyst, Selective Catalytic Reduction **Non-after Treatment Devices:** Electronic Control, Engine Design Modification **FELs:** PM 0.01 g/kW-hr

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

This certificate of conformity is conditional upon compliance of said manufacturer with the averaging, banking and trading provisions of 40 CFR Part 1039, Subpart H. Failure to comply with these provisions may render this certificate void *ab initio*.

CALIFORNIA AIR RESOURCES BOARD	CATERPILLAR INC.	EXECUTIVE ORDER U-R-001-0621 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in California Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-19-095;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2020	LCPXL09.3NTF	9.3	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Oxidation Catalyst, Engine Control Module, Periodic Trap Oxidizer, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst	Loader, Tractor, Compressor, Excavator

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
130 ≤ kW ≤ 560	Tier 4 Final	STD	0.19	0.40	N/A	3.5	0.02	N/A	N/A	N/A
		FEL	N/A	N/A	--	N/A	0.01	N/A	N/A	N/A
		CERT	0.04	0.19	--	0.2	0.01	--	--	--

certified emissions data

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 11TH day of December 2019.

Allen Lyons, Chief
Emissions Certification and Compliance Division

ATTACHMENT 1 OF 2

Engine Model Summary Template

U-R001-0621
R/C
1/7/2020

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
LCPXL09.3NTF	Cert Test 1	C9.3B	456@2000	238	160	1536@1400	287	135	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	Cert Test 2	C9.3B	408@1500	272	137	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	1	C9.3B	335@2200	163	121	1130@1400	205	97	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	1A	1706J	335@2200	163	121	1130@1400	205	97	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	2	C9.3B	375@2200	181	134	1265@1400	229	108	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	2A	1706J	375@2200	181	134	1265@1400	229	108	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	3	C9.3B	416@2200	202	150	1401@1400	256	121	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	3A	1706J	416@2200	202	150	1401@1400	256	121	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	4	C9.3B	456@2000	238	160	1536@1400	287	135	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	4A	1706J	456@2000	238	160	1536@1400	287	135	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	5	C9.3B	314@1800	171	104	1154@1300	214	93	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	6	C9.3B	221@2200	113	84	1100@1200	206	83	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	6A	C9.3B	221@2200	113	84	1100@1200	206	83	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	7	C9.3B	274@2200	133	98	1263@1100	238	88	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	8	C9.3B	314@1800	175	106	1154@1300	217	95	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	9	C9.3B	408@1500	272	137	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	9A	1706J	408@1500	272	137	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	10	C9.3B	456@1800	259	157	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	10A	1706J	456@1800	259	157	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	11	C9.3B	343@1500	227	114	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	11A	1706J	343@1500	227	114	NA	NA	NA	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX

ATTACHMENT 2 OF 2

Engine Model Summary Template

U-R-001-0621
R/C
1/7/2020

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
LCPXL09.3NTF	12*	C9.3B	314@1800	175	106	1154@1300	217	95	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	13*	C9.3B	416@2200	202	150	1401@1400	256	121	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	13A*	1706J	416@2200	202	150	1401@1400	256	121	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	14*	C9.3B	416@2200	202	150	1401@1400	256	121	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	15*	C9.3B	294@2200	142	105	1314@1200	244	99	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	15A*	C9.3B	294@2200	142	105	1314@1200	244	99	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	16*	C9.3B	296@2200	144	106	1375@1200	259	104	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX
LCPXL09.3NTF	16A*	C9.3B	296@2200	144	106	1375@1200	259	104	DFI,TC,ECM,CAC,PTOX, OC,SCR-U,AMOX

* add new engine code

ATTACHMENT D-3

JAW CRUSHER:

- **FORM 5**
- **FORM 5EP**
- **FORM 6**
- **FORM 44**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800- 633- 6101www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium — Maryland — 21093
City — State — Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources — 6/10/2022
Print Name and Title — Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) — Premises No. (3-6)
Registration Class (7) — Equipment No. (8-11)
Data Year (12-13) — Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale — Maryland — 21237 — (410) 771 - 4311
City/Town — State — Zip — Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: **Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)**
McCloskey J45 Jaw crusher (JC1) ,100 tons per hour

5. Workmen's Compensation Coverage WC038108906 — July 2022
Binder/Policy Number — Expiration Date

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition debris - concrete, brick, and asphalt - handling and processing

9. Control Devices Associated with this Equipment

None [ ] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[X] Describe Water spray

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS (Specify Type)		ANNUAL AMOUNT CONSUMED (Specify Units of Measure)	OTHER FUEL (Specify Type)		ANNUAL AMOUNT CONSUMED (Specify Units of Measure)
Diesel	X	38,064 gal			
	66-1			66-2	

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
X					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	145,600	tons
2. Brick		100	tons	41,600	tons
3. Asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	145,600	tons
2. Processed brick		100	tons	41,600	tons
3. Processed asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.002	5.740	0.741
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0.018	0.035	0.002
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
1.184	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.506
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

McCloskey INTERNATIONAL

J45 HEAVY DUTY JAW CRUSHERS

The J45 and J45R high capacity jaw crushers feature a true 45" x 27" jaw, with both level and load sensors to ensure the most efficient material handling across applications. Measuring 14.85' x 7.75' the J45 hopper boasts close to 9 cubic yards (6.8m³) capacity.

The 5'x10' Screenbox features McCloskey "High Energy" technology, and the feeder is available with an independent pre-screen option. A powerhouse of productivity, the J45R combines a robust single toggle jaw and High Energy Screenbox with a recirculating conveyor system to create a full crushing and screening system for maximum productivity and unmatched portability.

Both J45 jaw crushers have a large gap between the crusher discharge and the main conveyor feed boot to eliminate bottlenecks and bridging. Easy to move from site to site, the J45 crushers can be on-site and operational in a matter of minutes with folding hoppers and conveyers.

Rugged and versatile, the J45 jaw offers the field-tested reliability required for the toughest projects around the globe.

J45
Conveyor
J45's Extended 42" main conveyor as standard, giving large stockpile capacity. Conveyor lowers and raises hydraulically and is easily removable for maintenance.

Feeder
Folding Hardox® hopper mounted over vibrating feeder. Feeder rate can be regulated manually or automatically by the load sensing jaw.

Crusher
True 45"x27" jaw with reversible hydrostatic drive, reversible jaw plates, and twin hydraulic ram wedge closed side setting (CSS) adjust.

Controls
User-friendly control panel with excellent machine diagnostics can drastically reduce downtime for maintenance.

Transportation Size
At only 2.5m wide, the J45 is easily transported between job sites.

J45R
Recirculation Conveyor
Allows operators to produce a crushed and screened final product with one machine.

www.mccloskeyinternational.com

J45	Transport Height: 11' - 1.8" (3.4m)
	Transport Width: 8' 2.5" (2.5m)
Engine: *Tier 3 261 kW (350 HP)	Transport Length: 47' - 5.9" (14.476m)
Stockpile Height: 12' - 8.7" (3880mm)	Weight: 96,783 lbs (43,900 kg) est.

J45R	Transport Height: 11' 1.8" (3.4m)
	Transport Width: 10' - 4" (3.15m)
Engine: 350 Hp C9 CAT engine	Transport Length: 50' - 3.2" (15.422m)
Stockpile Height: 9' 11" (3033mm)	Weight: 110,231 lbs (50,000 kg) est.

McCloskey International reserves the right to make changes to the information and design of the machines on this brochure without reservation and notification to the users. McCloskey International assumes no liability resulting from errors or omissions in this document.

36 Hazleton St., Ashley PA 18706
570-270-5790
www.commonwealthequipment.com

COMMONWEALTH EQUIPMENT

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
JC1 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph jaw crusher equipped with water spray, powered by 350-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	8	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☒ Dust Suppression System No. 1
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.063	0.063	0.507	0.066
Particulate Matter (filterable as PM2.5)	0.013	0.013	0.103	0.013
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.004	0.004	0.035	0.005
Oxides of Sulfur (SOx)	0.718	0.718	5.740	0.746
Oxides of Nitrogen (NOx)	0.093	0.093	0.741	0.096
Carbon Monoxide (CO)	0.002	0.002	0.018	0.002
Lead (Pb)	NA			
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
1,3-Butadiene	0.0001	0.0001	0.002	0.0001
Acetaldehyde	0.002	0.002	0.019	0.002
Acrolein	0.0003	0.0003	0.002	0.0003
Benzene	0.003	0.003	0.023	0.003
Formaldehyde	0.004	0.004	0.029	0.004
Toluene	0.001	0.001	0.010	0.001
Xylenes	0.001	0.001	0.007	0.001
PAHs	0.001	0.001	0.004	0.001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation Gray & Son, Inc.	**Telephone No.** (410) 771-4311		**Date of Application** June __, 2022
2. Mailing Address 430 West Padonia Road	**City** Timonium	**Zip Code** 21093	**County** Baltimore
3. Equipment Location 600 Todds Lane	**City/Town or P.O.** Rosedale		**County** Baltimore
4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno

5. Application Type: **Alteration** [ ] **New Construction** [X]

6. Date Construction is to Start: July 2022 **Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone [ ] **Multiple Cyclone** [ ] **Afterburner** [ ] **Electrostatic Precipitator** [ ]

Scrubber [ ] _____ (type) **Other** [X] Water spray (type)

8. Gas Cleaning Equipment Manufacturer **Model No.** **Collection Efficiency (Design Criteria)**

N/A

9. Type of Equipment which Control Equipment is to Service:

Integrated water spray on jaw crusher (JC1) will be used to provide wet suppression of dust generation from crushing of demolition debris.

10. Stack Test to be Conducted:

Yes [ ] **No** [X] _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.

PRESSURE DROP _____

Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content OR	_____	%	_____	%
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See process flow diagram included with the PTC application package for this project.

Date Received: **Local** _____ _____ **State** _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ **Date** _____

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Management Administration / Air Quality Permits Program
1800 Washington Boulevard, STE 720 Baltimore, MD 21230-1720
(410) 537-3230 ●1-800-633-6101 ● www.mde.state.md.us

Mail application to
MDE/ARMA
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Don't forget to:
✓Sign the application
✓Include vendor literature

Air Quality Permit to Construct & Registration Application for

INTERNAL COMBUSTION ENGINES

(Electrical Power Generators, Power Equipment, Fire Protection Pumps)

1) Applicability

You must check off one the following items to use this application form

☐ Electrical power generation (off grid, base load, peak, load shaving,, etc)
- Use MDE Form 42 for emergency use only generators

☒ Power equipment (hydraulic, mechanical, etc)
☐ Fire protection pump

***For electrical power generators only**, you must check off one the following items to use this application form*

☐ I have a CPCN Exemption from the Public Service Commission for this generator (contact the Public Service Commision at 410.767.8131)
☐ This generator was installed before October 1, 2001 and I do not need a CPCN Exemption

2) Business/Institution/Facility where the engine will be located ☐ Check if this is a federal facility

Name: GSI-Todds Lane Material Processing Operation Phone: (410) 771-4311

Street Address: 600 Todds Lane

City: Rosedale State: MD Zip Code: 21237 County: Baltimore

3) Owner/Operator of the engine (if different than above)

Name: Gray & Son, Inc. Phone: (410) 771-4311

Mailing Address: 430 West Padonia Road

City: Timonium State: MD Zip Code: 21093

4) Installer ☐ Check if installer is applying for permit. If checked, complete the following:

Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

5) Engine Information

Installation Date	Engine Manufacturer & Model	Horsepower	Manufacture Date	Fuel Type
July 2022	Caterpillar C9.3	350	10/20/2018	Diesel

6) Operating Information

Intended use description: (Examples, "a portable generator at a construction site" or "peak shaving with the emergency generator", etc)

Engine used to power jaw crusher (JC1) at material processing operation

8
Hours per day

2,080
Hours per year

7) Required Attachments

(Check that they are attached)

☒ Vendor literature

☐ CPCN Exemption from the Public Service Commission

- Electrical generators only
- Not needed for generators installed before October 1, 2001

8) Workers Compensation (Environmental article §1-202)

Workers insurance policy or binder number: WC038108906 (Zurich)

☐ Check if self employed or otherwise exempt from this requirement

"I CERTIFY UNDER PENALTY OF LAW THAT THE INFORMATION SUBMITTED IN THIS REQUEST FOR COVERAGE IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

Owners Signature	Printed Name & Title	Date
	Brandon Bonifacio / Gm Dan	6/10/2022

LEAVE BLANK, MDE use only

☐ Permit

☐ Registration (Less than 1,000 brake horsepower & installed prior to 11/24/03)

Permit/Registration Number: _____ - ____ - _____ - _____

AI: _____

	SOx	Nox	CO	VOC	PM	PM-10
Emissions Stack						
Fugitive						

CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**CS902549**
Sales Model	C9.3
Regulatory Build Date	20-OCT-2018
As Shipped Data	
Engine Arrangement Number	3857699
Certification Arrangement	3611820
Test Spec Number	4150274
Regulatory Status	EPA / ARB / EU / R120 / MLIT / S. Korea
Labeled Model Year	2018
EPA Family Code	JCPXL09.3HTF
EPA Emissions Level	EPA TIER 4f
EU Emissions Level	EU STAGE IV
Japan Emissions Level	STEP 4 FINAL
EU Type Approval	e11*97/68QA*2012/46*2581*02
Korea Type Approval	C9.3(CE9.3C6)//15EN*CA*01
UN R120 Type Approval	120R-011015
Current Flash file	5563083
Flash File Progression	5910501
CORR FL Power at RPM	351 HP (262.0 KW)2200 RPM
Advertised Power	350 HP 2,200RPM
Total Displacement	9.3 L

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

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P. RFORMANCE DATA [CS902549]

(CS902549)-ENGINE (CAB163551A)-CEM (PET080199M)-PETU

DECEMBER 23, 2019

For Help Desk Phone Numbers Click here

Perf No: EM0274 **Change Level:** 03

General Heat Rejection Sound Emissions Regulatory Altitude Derate Cross Reference Supplementary Data Perf Param Ref

View PDF

SALES MODEL:	C9.3	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	2,200
ENGINE POWER (BHP):	350	**PEAK TORQUE SPEED (RPM):**	1,400
PEAK TORQUE (FT-LB):	1,177.9	**TORQUE RISE (%):**	41
COMPRESSION RATIO:	17	**ASPIRATION:**	TA
RATING LEVEL:	INDUSTRIAL C - INTERMITTENT	**AFTERCOOLER TYPE:**	ATAAC
PUMP QUANTITY:	1	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
FUEL TYPE:	DIESEL	**INLET MANIFOLD AIR TEMP (F):**	122
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	192.2
GOVERNOR TYPE:	ELEC	**TURBO CONFIGURATION:**	SINGLE
ELECTRONICS TYPE:	ADEM4	**TURBO QUANTITY:**	1
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	GTB3782 0.66 A/R
IGNITION TYPE:	CI	**CERTIFICATION YEAR:**	2013
INJECTOR TYPE:	CR	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,150.9
REF EXH STACK DIAMETER (IN):	4		
MAX OPERATING ALTITUDE (FT):	8,901		

INDUSTRY	SUB INDUSTRY	APPLICATION
INDUSTRIAL	GENERAL INDUSTRIAL	INDUSTRIAL
INDUSTRIAL	CONSTRUCTION	INDUSTRIAL
INDUSTRIAL	MATERIAL HANDLING	INDUSTRIAL
INDUSTRIAL	AGRICULTURE	INDUSTRIAL
OIL AND GAS	WELL SERVICING	INDUSTRIAL
OIL AND GAS	LAND PRODUCTION	INDUSTRIAL
INDUSTRIAL	FORESTRY	INDUSTRIAL

General Performance Data Top

Note(s)

INLET MANIFOLD AIR TEMPERATURE ("INLET MFLD TEMP") FOR THIS CONFIGURATION IS MEASURED AT THE OUTLET OF THE AFTERCOOLER.

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BHP	LB-FT	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,200	350	836	222	0.364	18.3	61.6	122.0	1,106.0	90.1	803.1
2,100	350	875	233	0.357	18.0	61.5	122.0	1,109.7	86.0	810.8
2,000	350	919	245	0.349	17.6	60.9	122.0	1,117.0	80.2	822.6
1,900	350	968	257	0.341	17.2	60.0	122.0	1,123.3	75.6	832.9
1,800	350	1,021	272	0.335	16.9	60.0	122.0	1,131.7	73.3	841.1
1,700	342	1,056	281	0.332	16.3	58.4	122.0	1,140.8	68.7	856.4
1,600	334	1,096	292	0.329	15.8	57.3	122.0	1,164.2	66.5	883.3
1,500	325	1,136	302	0.327	15.3	55.0	122.0	1,189.1	59.4	912.1
1,400	314	1,177	313	0.324	14.7	51.8	122.0	1,227.1	54.8	951.1
1,300	278	1,121	298	0.328	13.1	46.7	122.0	1,230.5	47.7	967.2
1,200	243	1,062	283	0.326	11.4	40.1	122.0	1,222.4	39.9	976.9
1,100	211	1,005	268	0.325	9.9	32.5	122.0	1,208.4	30.8	983.5
1,000	174	916	244	0.326	8.3	27.2	122.0	1,169.4	27.1	967.4
900	143	837	223	0.334	6.9	19.9	122.0	1,160.8	18.7	977.5
800	114	748	199	0.340	5.7	13.7	122.0	1,137.8	12.4	971.6
700	83.1	624	166	0.350	4.2	8.0	122.0	1,036.8	7.4	900.7
600	57.7	505	134	0.355	2.9	4.3	122.0	893.0	4.5	799.6

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,200	350	65	375.3	683.8	1,198.1	2,980.2	3,108.6	466.5	422.4
2,100	350	65	372.5	662.9	1,182.0	2,883.8	3,009.7	457.5	413.7
2,000	350	64	368.9	634.9	1,163.3	2,756.0	2,879.4	446.1	402.5
1,900	350	63	364.6	608.2	1,140.6	2,634.2	2,754.8	433.8	390.6
1,800	350	63	364.5	595.7	1,140.2	2,578.1	2,696.3	431.0	387.9
1,700	342	61	359.9	562.4	1,112.1	2,428.8	2,543.2	415.4	373.0
1,600	334	59	358.9	532.0	1,094.6	2,292.6	2,403.6	400.7	359.0
1,500	325	57	351.9	497.3	1,061.3	2,138.2	2,245.1	380.4	339.7
1,400	314	53	345.6	440.5	1,000.8	1,887.6	1,990.3	348.8	308.8
1,300	278	48	328.6	396.5	938.1	1,695.0	1,786.8	323.3	286.3
1,200	243	41	305.8	347.4	850.3	1,482.1	1,562.2	291.0	258.0
1,100	211	33	275.2	290.9	738.2	1,238.6	1,307.8	251.5	222.2
1,000	174	28	253.9	260.4	659.5	1,107.5	1,165.3	227.2	202.1
900	143	20	217.8	205.9	540.8	875.3	923.8	185.0	163.5
800	114	14	185.8	159.1	423.4	675.6	715.2	145.4	127.8
700	83.1	8	150.1	120.2	308.6	510.5	540.2	111.5	98.1
600	57.7	4	130.0	93.7	222.2	397.2	417.8	86.8	77.1

Heat Rejection Data Top

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,200	350	10,059	1,928	12,196	5,971	2,096	3,143	14,843	39,344	41,911
2,100	350	9,664	1,851	11,967	5,886	1,974	2,961	14,843	38,606	41,125
2,000	350	9,389	1,773	11,646	5,786	1,934	2,821	14,843	37,830	40,298
1,900	350	8,923	1,690	11,321	5,667	1,887	2,634	14,843	36,900	39,307
1,800	350	8,568	1,621	11,115	5,644	1,891	2,586	14,843	36,230	38,594
1,700	342	8,178	1,568	10,829	5,502	1,792	2,390	14,502	35,056	37,343
1,600	334	7,813	1,483	10,598	5,492	1,736	2,243	14,160	33,956	36,172
1,500	325	7,546	1,432	10,270	5,428	1,712	2,026	13,762	32,794	34,933
1,400	314	7,547	1,442	9,660	5,181	1,744	1,744	13,307	31,486	33,540
1,300	278	6,835	1,289	8,784	4,780	1,619	1,439	11,772	28,144	29,980
1,200	243	5,994	1,126	7,748	4,248	1,466	1,126	10,293	24,572	26,175
1,100	211	5,401	1,017	6,598	3,601	1,424	791	8,928	21,212	22,596
1,000	174	4,492	849	5,643	3,113	1,283	585	7,393	17,716	18,872
900	143	4,121	777	4,612	2,518	1,189	349	6,085	14,878	15,849
800	114	3,715	712	3,586	1,936	1,087	181	4,834	12,151	12,944
700	83.1	3,091	591	2,481	1,288	911	58	3,526	9,097	9,690
600	57.7	2,048	391	2,135	803	599	40	2,445	6,323	6,735

Sound Data Top

Note(s)

SOUND DATA REPRESENTATIVE OF NOISE PRODUCED BY THE ENGINE AND AFTERTREATMENT.

EXHAUST: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	350	88.0	71.6	70.8	72.8	74.0	75.9	78.9	79.8	79.1	77.7	76.3
2,100	350	88.3	76.5	69.7	77.7	77.1	75.8	78.7	79.4	78.8	77.5	75.9
2,000	350	87.0	73.8	68.5	73.3	74.3	74.7	78.4	78.7	77.8	76.2	74.9
1,900	350	86.2	71.6	69.2	70.9	74.3	75.7	77.8	77.7	77.1	75.2	73.9
1,800	350	85.5	69.8	72.0	70.2	74.3	73.6	77.1	77.3	76.1	74.2	73.0
1,700	342	84.7	66.6	71.2	73.0	72.3	73.2	76.5	76.3	75.1	73.0	71.8
1,600	334	84.4	65.0	68.3	76.1	70.8	73.6	76.5	75.6	74.4	72.1	70.8
1,500	325	83.9	71.4	68.6	72.9	72.5	71.9	74.5	73.7	72.9	70.5	69.2
1,400	314	82.6	76.0	68.6	69.6	73.6	70.8	72.4	71.6	71.1	68.6	67.3
1,300	278	81.3	73.4	68.2	69.2	74.1	70.2	70.4	69.2	69.6	66.4	64.9
1,200	243	78.6	69.2	67.3	68.0	71.0	68.4	67.5	67.6	68.5	64.1	62.9
1,100	211	76.4	67.9	65.4	66.6	66.8	65.2	64.5	66.0	67.3	61.6	61.2

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
1,000	174	79.6	75.9	70.0	72.7	66.8	63.7	65.9	64.9	66.7	59.9	60.1
900	143	85.4	90.3	78.4	80.5	64.3	62.5	67.4	62.4	65.0	57.7	60.4

EXHAUST: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	350	76.1	75.2	74.3	72.5	71.5	70.9	68.6	66.9	63.4	60.3	55.9
2,100	350	75.7	74.8	73.9	71.8	70.9	70.5	68.2	66.2	63.0	59.8	55.5
2,000	350	74.7	73.7	72.8	70.4	69.7	69.2	67.0	64.9	61.5	58.4	54.0
1,900	350	73.6	72.9	71.8	69.6	68.7	68.3	66.1	63.7	60.5	57.3	53.0
1,800	350	72.7	72.2	71.3	69.3	68.3	67.9	65.7	63.0	59.7	56.6	52.3
1,700	342	71.5	71.2	70.2	68.5	67.4	66.8	64.5	61.6	58.4	55.2	53.0
1,600	334	70.4	70.5	69.5	68.1	67.1	66.3	63.8	60.5	57.4	54.0	52.6
1,500	325	69.4	69.4	69.1	67.8	66.4	65.7	63.2	59.6	56.4	53.2	53.2
1,400	314	68.0	67.9	67.9	66.8	65.2	64.7	62.0	58.1	54.8	51.9	54.3
1,300	278	65.9	65.5	65.4	64.6	63.2	62.4	59.7	55.7	52.5	50.1	52.2
1,200	243	63.5	62.9	62.5	61.8	60.9	59.6	57.2	53.2	50.8	49.2	48.9
1,100	211	61.5	60.8	60.5	59.4	58.5	57.1	55.2	51.3	49.5	50.8	45.1
1,000	174	60.2	59.7	58.9	57.9	57.4	55.5	53.3	50.1	48.2	50.8	40.4
900	143	59.0	58.9	57.1	55.9	55.9	54.5	51.9	49.6	47.4	47.9	37.5

MECHANICAL: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	350	111.6	76.2	74.9	78.7	87.4	88.3	89.9	94.7	92.2	96.4	98.6
2,100	350	110.5	75.4	72.2	78.4	85.9	85.3	88.9	91.1	92.6	94.9	95.9
2,000	350	109.2	74.8	71.5	77.4	84.8	83.4	87.8	92.4	92.1	95.1	95.5
1,900	350	109.5	74.3	72.1	77.2	85.7	83.6	87.7	94.9	91.1	94.6	94.9
1,800	350	110.1	72.1	72.6	76.7	83.6	85.0	87.2	93.2	90.8	93.7	94.5
1,700	342	110.0	68.0	73.1	76.2	82.3	83.5	86.2	91.7	90.3	92.5	94.0
1,600	334	110.1	65.0	73.5	75.7	81.5	80.8	85.4	90.9	90.3	92.0	94.4
1,500	325	111.0	68.8	73.1	75.4	81.8	80.9	86.3	91.1	91.3	93.2	95.3
1,400	314	111.2	72.6	73.1	74.1	81.3	80.8	86.5	91.0	92.0	93.2	95.6
1,300	278	109.5	70.4	72.2	72.4	80.1	80.9	84.4	88.8	90.0	91.7	94.4
1,200	243	107.2	67.6	71.2	70.3	79.4	80.4	81.8	87.3	87.3	90.2	93.2
1,100	211	105.4	65.7	69.6	69.0	76.9	79.4	80.4	86.4	86.1	89.1	92.2
1,000	174	104.3	63.4	65.8	68.0	73.9	78.1	80.2	85.9	84.8	87.9	91.2
900	143	103.0	61.3	61.2	67.4	71.4	77.1	78.5	85.2	82.9	85.7	89.2

MECHANICAL: Sound Power (1/3 Octave Frequencies)

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,200	350	99.9	101.0	104.0	103.4	101.9	101.2	99.0	98.5	97.5	97.3	93.9
2,100	350	98.9	101.1	102.4	101.7	101.1	99.8	98.3	97.5	96.9	96.7	93.5
2,000	350	97.0	99.4	100.5	100.7	99.5	98.1	97.1	96.3	96.4	96.3	93.4
1,900	350	97.0	100.8	100.8	100.9	100.6	98.4	96.9	95.5	96.0	95.9	93.2
1,800	350	96.7	101.3	101.7	103.0	101.2	98.8	97.0	95.8	96.4	95.8	93.7
1,700	342	96.6	100.8	101.4	102.7	101.4	99.0	97.2	95.6	96.0	95.8	95.1
1,600	334	97.2	100.6	101.5	102.8	102.1	99.4	97.6	95.7	95.6	95.8	95.4
1,500	325	98.8	101.0	103.0	103.7	102.8	100.2	97.8	96.1	95.9	95.4	96.1
1,400	314	99.9	100.9	103.4	103.9	102.9	100.7	97.9	96.4	96.1	95.1	97.2
1,300	278	97.8	99.0	101.2	102.0	101.2	98.7	96.0	94.8	94.7	94.0	95.3
1,200	243	95.6	97.1	98.5	99.9	99.2	96.1	93.8	92.8	93.2	93.1	92.8
1,100	211	94.1	95.4	96.8	97.4	96.8	93.8	92.0	91.2	92.0	93.4	89.0
1,000	174	93.1	94.4	95.5	95.5	95.8	93.0	90.3	90.1	91.0	94.1	85.0
900	143	92.1	93.5	93.8	93.5	95.0	92.2	89.4	89.6	90.7	92.4	83.2

Emissions Data Top

Units Filter All Units ▼

RATED SPEED NOMINAL DATA: 2200 RPM

ENGINE POWER	BHP	350	263	175	87.5	35.0
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	42	50	26	24	45
TOTAL CO	G/HR	1	1	1	1	1
TOTAL HC	G/HR	2	1	1	2	3
TOTAL CO2	KG/HR	187	138	100	64	40
PART MATTER	G/HR	0.1	0.0	0.0	0.0	0.0

ENGINE POWER		BHP	350	263	175	87.5	35.0
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	52.5	84.4	61.7	85.5	275.0
TOTAL CO	(CORR 5% O2)	MG/NM3	1.1	1.3	1.3	2.5	5.6
TOTAL HC	(CORR 5% O2)	MG/NM3	2.2	2.0	2.5	5.1	14.0
PART MATTER	(CORR 5% O2)	MG/NM3	0.1	0.0	0.1	0.1	0.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	26	41	30	42	134
TOTAL CO	(CORR 5% O2)	PPM	1	1	1	2	4
TOTAL HC	(CORR 5% O2)	PPM	4	4	5	10	26
TOTAL NOX (AS NO2)		G/HP-HR	0.12	0.19	0.15	0.27	1.28
TOTAL CO		G/HP-HR	0.00	0.00	0.00	0.01	0.03
TOTAL HC		G/HP-HR	0.01	0.01	0.01	0.02	0.08
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)		LB/HR	0.09	0.11	0.06	0.05	0.10
TOTAL CO		LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL HC		LB/HR	0.00	0.00	0.00	0.00	0.01
TOTAL CO2		LB/HR	413	305	220	141	89
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	8.0	9.8	11.6	14.4	16.0

SECONDARY SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER		BHP	350	263	175	87.5	35.0
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	60	35	7	0	37
TOTAL CO		G/HR	0	0	0	0	0
TOTAL HC		G/HR	2	1	1	1	2
TOTAL CO2		KG/HR	173	128	89	54	32
PART MATTER		G/HR	0.0	0.0	0.0	0.0	0.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	79.4	62.9	17.2	0.9	295.0
TOTAL CO	(CORR 5% O2)	MG/NM3	0.0	0.0	0.1	1.3	3.7
TOTAL HC	(CORR 5% O2)	MG/NM3	1.8	1.6	1.8	4.8	11.9
PART MATTER	(CORR 5% O2)	MG/NM3	0.0	0.0	0.1	0.1	0.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	39	31	8	0	144
TOTAL CO	(CORR 5% O2)	PPM	0	0	0	1	3
TOTAL HC	(CORR 5% O2)	PPM	3	3	3	9	22
TOTAL NOX (AS NO2)		G/HP-HR	0.17	0.13	0.04	0.00	1.07
TOTAL CO		G/HP-HR	0.00	0.00	0.00	0.00	0.01
TOTAL HC		G/HP-HR	0.00	0.00	0.00	0.01	0.05
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)		LB/HR	0.13	0.08	0.01	0.00	0.08
TOTAL CO		LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL HC		LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL CO2		LB/HR	382	283	197	118	71
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	6.8	8.0	9.7	13.1	16.3

Regulatory Information Top

EPA TIER 4 FINAL **2014 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1039 SUBPART F AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 4 FINAL	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.02

EU STAGE IV **2014 - ----**

GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 2010/26/EU, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
EUROPE	EU	NON-ROAD	STAGE IV	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.025

Altitude Derate Data Top

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)											
0	350	350	350	350	349	348	349	350	350	349	350
1,000	350	350	350	349	347	346	347	349	348	347	349
2,000	350	349	348	347	346	345	346	347	346	344	348
3,000	348	347	346	345	344	344	344	344	343	342	346
4,000	346	345	344	342	342	342	342	342	341	328	344
5,000	343	342	341	340	340	341	341	339	330	313	342
6,000	342	341	341	340	340	341	341	334	318	300	342

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	140	NORMAL
7,000	341	341	342	342	343	343	335	325	304	286	341
8,000	343	343	343	344	343	337	327	314	295	277	343
9,000	345	345	345	342	336	329	320	306	288	270	345
10,000	343	341	339	335	329	321	312	297	279	259	347
11,000	331	326	321	316	310	303	297	285	268	246	339
12,000	317	312	308	303	297	291	284	273	255	235	326
13,000	301	297	294	289	283	277	271	260	243	221	312
14,000	284	280	278	273	266	260	255	247	227	202	298
15,000	270	265	262	258	253	248	242	232	211	184	282

Cross Reference Top

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4150274	PP6919	3733979	EE124	-	CS900001	
3717448	NAP	3733980	EE124	-	N1F00001	
4150274	PP6919	3857699	EE124	-	CS900001	

Supplementary Data Top

Type	Classification	Performance Number
AMBIENT TEMP	50C (122F)	EM0682

This performance data is supplementary data for:

EM0682

Performance Parameter Reference Top

Parameters Reference: DM9600 - 11

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10% Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 deg C (84.2 deg F), where the density is 838.9 G/Liter (7.001 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.
Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS: Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 07/10/19

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2018 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Caterpillar Inc. (U.S. Manufacturer or Importer) **Certificate Number: JCPXL09.3HTF-023**	**Effective Date:** **08/21/2017** **Expiration Date:** **12/31/2018**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **08/21/2017** **Revision Date:** **N/A**

Model Year: 2018 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** JCPXL09.3HTF	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 130<=kW<=560 **Fuel Type:** Diesel **After Treatment Devices:** Diesel Oxidation Catalyst, PTOX-DPF-Active, Ammonia Slip Catalyst, Selective Catalytic Reduction **Non-after Treatment Devices:** Electronic Control, Engine Design Modification, Electronic/Electric EGR - Cooled **FELs:** PM 0.01 g/kW-hr

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

This certificate of conformity is conditional upon compliance of said manufacturer with the averaging, banking and trading provisions of 40 CFR Part 1039, Subpart H. Failure to comply with these provisions may render this certificate void *ab initio*.

California Environmental Protection Agency Air Resources Board	CATERPILLAR INC.	EXECUTIVE ORDER U-R-001-0549 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2018	JCPXL09.3HTF	9.3	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Oxidation Catalyst, Engine Control Module, Exhaust Gas Recirculation, Periodic Trap Oxidizer, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst	Loader, Tractor, Agricultural Combine, Scraper, Excavator, Motor Grader, Commercial Equipment

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
130 ≤ kW ≤ 560	Tier 4 Final	STD	0.19	0.40	N/A	3.5	0.02	N/A	N/A	N/A
		FEL	N/A	N/A	--	N/A	0.01	N/A	N/A	N/A
		CERT	0.02	0.12	--	0.1	0.01	--	--	--

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 22 day of September 2017.

Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

ATTACHMENT 1 OF 2 **Engine Model Summary Template** U-R-CCI-0549
8/30/2017

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
JCPXL09.3HTF	Cert Test 1	C9.3	325@1800	192	116.3	1260@1200	243	98.1	DFI,TC,ECM,CAC,EGR,PTOx OC,SCR-U,AMOX
JCPXL09.3HTF	1	C9.3	268@2150	138.3	100.0	881@1400	172.4	81.2	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	2	C9.3	299@2200	148.5	109.9	1006@1400	187.8	88.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	3	C9.3	325@2200	161.7	119.7	1090@1400	206.6	97.3	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	4	C9.3	349@2200	175.5	129.9	1174@1400	223.8	105.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	5	C9.3	388@2200	192.5	142.5	1269@1400	240.2	113.1	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	6	C9.3	232@2000	129.3	87.0	850@1000	165.9	55.8	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	6A	C9.3	232@2000	129.3	87.0	850@1000	165.9	55.8	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	7	C9.3	253@2000	138.7	93.3	930@1000	183.0	61.6	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	7A	C9.3	253@2000	138.7	93.3	930@1000	183.0	61.6	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	7B	C9.3	253@2000	138.7	93.3	930@1000	183.0	61.6	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	8	C9.3	274@2000	146.3	98.4	1010@1000	196.7	66.2	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	8A	C9.3	274@2000	146.3	98.4	1010@1000	196.7	66.2	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	9	C9.3	295@2000	155.9	104.9	1090@1000	211.6	71.2	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	10	C9.3	296@2200	154.3	114.2	1166@1200	219.8	88.7	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	11	C9.3	299@2200	156.5	115.8	1261@1200	238.7	96.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	12	C9.3	303@2050	158.7	109.4	1263@1200	240.5	97.1	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	13	C9.3	314@1800	183.4	111.0	1154@1300	221.0	96.6	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	14	C9.3	221@2000	123.7	83.2	1022@1100	201.1	74.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	14A	C9.3	221@2000	123.7	83.2	1022@1100	201.1	74.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX

ATTACHMENT 2 OF 2

Engine Model Summary Template U-R-001-0549

8/30/2017

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
JCPXL09.3HTF	15	C9.3	311@1800	181.7	110.0	1029@1400	199.3	93.9	DFI,TC,ECM,CAC,EGR,PTO$_x$ OC,SCR-U,AMOX
JCPXL09.3HTF	15A	C9.3	311@1800	181.7	110.0	1029@1400	199.3	93.9	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	16	C9.3	325@1800	191.0	115.6	1262@1200	241.3	97.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	17	C9.3	325@1800	191.0	115.6	1262@1200	241.3	97.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	18	C9.3	221@2000	123.7	83.2	1022@1100	201.0	74.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	19	C9.3	224@2200	111.6	82.6	1103@1200	211.7	85.4	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	20	C9.3	325@2000	168.5	113.3	1094@1400	208.1	98.0	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX
JCPXL09.3HTF	21	C9.3	311@1800	181.7	110.0	1029@1400	199.3	93.9	DFI,TC,ECM,CAC,EGR,I OC,SCR-U,AMOX

ATTACHMENT D-4

SCREENERS:

- **FORM 5 – SCREENER 1**
- **FORM 5EP – SCREENER 1**
- **FORM 5 – SCREENER 2**
- **FORM 5EP – SCREENER 2**
- **FORM 44**

ATTACHMENT D-4

SCREENERS:

- **FORM 5 – SCREENER 1**
- **FORM 5EP – SCREENER 1**
- **FORM 5 – SCREENER 2**
- **FORM 5EP – SCREENER 2**
- **FORM 44**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium | Maryland | 21093
City | State | Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources
Print Name and Title

6/10/2022
Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale | Maryland | 21237 | (410) 771 - 4311
City/Town | State | Zip | Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey R155 Screener (SC1), 100 tph, powered by a 148-hp diesel engine

5. Workmen's Compensation Coverage WC038108906 (Binder/Policy Number) July 2022 (Expiration Date)

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition debris - concrete, brick, and asphalt - handling and processing

9. Control Devices Associated with this Equipment

None [X] 24-0

Material from crusher has been wetted with water spray

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[ ] Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS (Specify Type)		ANNUAL AMOUNT CONSUMED (Specify Units of Measure)	OTHER FUEL (Specify Type)		ANNUAL AMOUNT CONSUMED (Specify Units of Measure)
Diesel	X	16,227 gal			
	66-1			66-2	

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
X					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	145,600	tons
2. Brick		100	tons	41,600	tons
3. Asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	145,600	tons
2. Processed brick		100	tons	41,600	tons
3. Processed asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.026	2.427	0.783
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0.052	0.026	0.026
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
2.096	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.702
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

R155

High Energy Durable Screener

The McCloskey™ R155 High Energy Screener is a tough, robust screening tool designed to cope with the heaviest of applications. New for this R155 scalping screener are longer hopper and an extended tail conveyor. This provides maximum load flexibility to customers and accommodates a larger variety of loaders and can work in a variety of sites around the world.

No More Slow Loading! The R155 is designed for use with larger loaders. The 16ft target is 25% larger, allowing for more material and no spillage, making this R155 an excellent mobile solution for materials handling operations.

A perfect match for crushing spreads, in the two product position the extended tail conveyor will increase the discharge height 12’ 3” and feed directly into a C2 or C3 Cone Crusher.

Features

- 16x5 heavy duty high energy 2 bearing screenbox
- 127Hp diesel engine
- Direct feed Hardox lined hopper
- Travel out fixed walkways
- Integrated hydraulic folding stockpiling conveyors
- Fast on site setup time – 10 minutes
- Screen raises at lower end for easy bottom deck access
- Service standing room inside Powerpack
- Track mobile

COMMONWEALTH EQUIPMENT
877-217-4474
info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

McCloskey
INTERNATIONAL

Wide Feed Opening

Allows for free flow of material and high volume capacity.

16' Hopper

A larger 16ft wide hopper designed to be used with larger loaders, allowing for more material and no spillage.

Heavy Duty Build

One of the most robust and durable machines on the market, the R155 is built to excel at the toughest screening jobs.

Screenbox

High Energy 5' x 16' screenbox delivers the highest product capacity.

Extended Tail Conveyor

The larger tail conveyor allows for an increase discharge height and feeds easily into various crushers.

COMMONWEALTH EQUIPMENT
CRUSHING & SCREENING
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info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

SPECIFICATION DATA

Dimensions and Capacities

Engine	**127 Hp (95 kW) Diesel**
Transport Height	**11' 2" (3.40m)**
Transport Length	**50' 2" (15.30m)**
Transport Width	**9' 6" (2.90m)**
Weight	**29,860 Kgs (65,830 lbs)**
Stockpile Height - Extended Tail Conveyor	**12' 3" (3.75m)**
Stockpile Height - Side Fines Conveyor	**13' (3.96m)**
Stockpile Height - Side Mid Conveyor	**11' 10" (3.60m)**
Screenbox Dimensions	**5' x 16' (155 ft²)**

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MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
SC1 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph screener, powered by 148-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	8	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

☒ None — However, material from crusher has been wetted with water spray

☐ Baghouse No. _____

☐ Cyclone No. _____

☐ Elec. Precipitator (ESP) No. _____

☐ Dust Suppression System No. _____

☐ Venturi Scrubber No. _____

☐ Spray Tower/Packed Bed No. _____

☐ Carbon Adsorber No. _____

- ☐ Cartridge/Canister
- ☐ Regenerative

☐ Thermal Oxidizer No. _____

- ☐ Regenerative

☐ Catalytic Oxidizer No. _____

☐ Nitrogen Oxides Reduction No. _____

- ☐ Selective ☐ Non-Selective
- ☐ Catalytic ☐ Non-Catalytic

☐ Other No. _____
Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.114	0.114	0.706	0.004
Particulate Matter (filterable as PM2.5)	0.080	0.080	0.434	0.004
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.0033	0.0033	0.026	0.0034
Oxides of Sulfur (SOx)	0.303	0.303	2.427	0.316
Oxides of Nitrogen (NOx)	0.098	0.098	0.783	0.102
Carbon Monoxide (CO)	0.0065	0.0065	0.052	0.0068
Lead (Pb)	NA			
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
1,3-Butadiene	0.00004	0.00004	0.0003	0.00004
Acetaldehyde	0.00079	0.00079	0.006	0.001
Acrolein	0.00010	0.00010	0.001	0.0001
Benzene	0.0010	0.0010	0.008	0.001
Formaldehyde	0.0012	0.0012	0.010	0.001
Toluene	0.00042	0.00042	0.003	0.0004
Xylenes	0.00030	0.00030	0.002	0.0003
PAHs	0.00017	0.00017	0.001	0.0002

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium — Maryland — 21093
City — State — Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources — 6/1/2022
Print Name and Title — Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) — Premises No. (3-6)
Registration Class (7) — Equipment No. (8-11)
Data Year (12-13) — Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale — Maryland — 21237 — (410) 771 - 4311
City/Town — State — Zip — Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey R155 Screener (SC2), 100 tph, powered by a 131-hp diesel engine

5. Workmen's Compensation Coverage WC038108906 (Binder/Policy Number) July 2022 (Expiration Date)

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition debris - concrete, brick, and asphalt - handling and processing

9. Control Devices Associated with this Equipment

None [X] 24-0

Material from crusher has been wetted with water spray

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[ ] Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS: Diesel (Specify Type) [X] 66-1 — ANNUAL AMOUNT CONSUMED: 10,213 gal (Specify Units of Measure)

OTHER FUEL: _____ (Specify Type) [ ] 66-2 — ANNUAL AMOUNT CONSUMED: _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	1 8 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	43,200	tons
2. Brick		100	tons	14,400	tons
3. Asphalt		100	tons	14,400	tons
4. Soil		100	tons	72,000	tons
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	43,200	tons
2. Processed brick		100	tons	14,400	tons
3. Processed asphalt		100	tons	14,400	tons
4. Processed soil		100	tons	72,000	tons
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.023	2.153	0.695
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0.046	0.023	0.023
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
2.096	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.702
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** Date_____ By_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

R155

High Energy Durable Screener

The McCloskey™ R155 High Energy Screener is a tough, robust screening tool designed to cope with the heaviest of applications. New for this R155 scalping screener are longer hopper and an extended tail conveyor. This provides maximum load flexibility to customers and accommodates a larger variety of loaders and can work in a variety of sites around the world.

No More Slow Loading! The R155 is designed for use with larger loaders. The 16ft target is 25% larger, allowing for more material and no spillage, making this R155 an excellent mobile solution for materials handling operations.

A perfect match for crushing spreads, in the two product position the extended tail conveyor will increase the discharge height 12’ 3” and feed directly into a C2 or C3 Cone Crusher.

Features

- 16x5 heavy duty high energy 2 bearing screenbox
- 127Hp diesel engine
- Direct feed Hardox lined hopper
- Travel out fixed walkways
- Integrated hydraulic folding stockpiling conveyors
- Fast on site setup time – 10 minutes
- Screen raises at lower end for easy bottom deck access
- Service standing room inside Powerpack
- Track mobile

COMMONWEALTH EQUIPMENT
877-217-4474
info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

McCloskey
INTERNATIONAL

Wide Feed Opening

Allows for free flow of material and high volume capacity.

16' Hopper

A larger 16ft wide hopper designed to be used with larger loaders, allowing for more material and no spillage.

Heavy Duty Build

One of the most robust and durable machines on the market, the R155 is built to excel at the toughest screening jobs.

Screenbox

High Energy 5' x 16' screenbox delivers the highest product capacity.

Extended Tail Conveyor

The larger tail conveyor allows for an increase discharge height and feeds easily into various crushers.

COMMONWEALTH EQUIPMENT
CRUSHING & SCREENING
877-217-4474
info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

SPECIFICATION DATA

Dimensions and Capacities

Engine	**127 Hp (95 kW) Diesel**
Transport Height	**11' 2" (3.40m)**
Transport Length	**50' 2" (15.30m)**
Transport Width	**9' 6" (2.90m)**
Weight	**29,860 Kgs (65,830 lbs)**
Stockpile Height - Extended Tail Conveyor	**12' 3" (3.75m)**
Stockpile Height - Side Fines Conveyor	**13' (3.96m)**
Stockpile Height - Side Mid Conveyor	**11' 10" (3.60m)**
Screenbox Dimensions	**5' x 16' (155 ft²)**

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McCloskey International reserves the right to make changes to the information and design of the machines on this brochure without reservation and notification to the users. Information at time of print considered accurate — McCloskey International assumes no liability resulting from errors or omissions in this document.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
SC2 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph screener, powered by 131-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	8	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

☒ None — However, material from crusher has been wetted with water spray

☐ Baghouse No. _____

☐ Cyclone No. _____

☐ Elec. Precipitator (ESP) No. _____

☐ Dust Suppression System No. _____

☐ Venturi Scrubber No. _____

☐ Spray Tower/Packed Bed No. _____

☐ Carbon Adsorber No. _____

☐ Cartridge/Canister

☐ Regenerative

☐ Thermal Oxidizer No. _____

☐ Regenerative

☐ Catalytic Oxidizer No. _____

☐ Nitrogen Oxides Reduction No. _____

☐ Selective ☐ Non-Selective
☐ Catalytic ☐ Non-Catalytic

☐ Other No. _____
Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.091	0.091	0.756	0.065
Particulate Matter (filterable as PM2.5)	0.057	0.057	0.454	0.041
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.003	0.003	0.023	0.002
Oxides of Sulfur (SOx)	0.269	0.269	2.153	0.194
Oxides of Nitrogen (NOx)	0.087	0.087	0.695	0.063
Carbon Monoxide (CO)	0.006	0.006	0.046	0.004
Lead (Pb)	NA			
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
1,3-Butadiene	0.00004	0.00004	0.0003	0.00003
Acetaldehyde	0.00070	0.00070	0.006	0.001
Acrolein	0.00009	0.00009	0.001	0.0001
Benzene	0.0009	0.0009	0.007	0.001
Formaldehyde	0.0011	0.0011	0.009	0.001
Toluene	0.00038	0.00038	0.003	0.0003
Xylenes	0.00026	0.00026	0.002	0.0002
PAHs	0.00015	0.00015	0.001	0.0001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Management Administration / Air Quality Permits Program
1800 Washington Boulevard, STE 720 Baltimore, MD 21230-1720
(410) 537-3230 ●1-800-633-6101 ● www.mde.state.md.us

Mail application to
MDE/ARMA
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Don't forget to:
✓Sign the application
✓Include vendor literature

Air Quality Permit to Construct & Registration Application for

INTERNAL COMBUSTION ENGINES

(Electrical Power Generators, Power Equipment, Fire Protection Pumps)

1) Applicability

You must check off one the following items to use this application form

☐ Electrical power generation (off grid, base load, peak, load shaving,, etc)
- Use MDE Form 42 for emergency use only generators

☒ Power equipment (hydraulic, mechanical, etc)
☐ Fire protection pump

***For electrical power generators only**, you must check off one the following items to use this application form*

☐ I have a CPCN Exemption from the Public Service Commission for this generator (contact the Public Service Commision at 410.767.8131)
☐ This generator was installed before October 1, 2001 and I do not need a CPCN Exemption

2) Business/Institution/Facility where the engine will be located ☐ Check if this is a federal facility

Name: GSI-Todds Lane Material Processing Operation Phone: (410) 771-4311

Street Address: 600 Todds Lane

City: Rosedale State: MD Zip Code: 21237 County: Baltimore

3) Owner/Operator of the engine (if different than above)

Name: Gray & Son, Inc. Phone: (410) 771-4311

Mailing Address: 430 West Padonia Road

City: Timonium State: MD Zip Code: 21093

4) Installer ☐ Check if installer is applying for permit. If checked, complete the following:

Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

5) Engine Information

Installation Date	Engine Manufacturer & Model	Horsepower	Manufacture Date	Fuel Type
July 2022	Caterpillar C4.4	131	9/19/2019	Diesel
July 2022	Caterpillar C4.4	148	2/4/2021	Diesel

6) Operating Information

Intended use description: (Examples, "a portable generator at a construction site" or "peak shaving with the emergency generator", etc)

Engines used to power screeners (SC1 and SC2) for material processing/recycling operation

8
Hours per day

1,440 (131 HP)
2,080 (148 HP)
Hours per year

7) Required Attachments

(Check that they are attached)

- ☒ Vendor literature
- ☐ CPCN Exemption from the Public Service Commission
  - Electrical generators only
  - Not needed for generators installed before October 1, 2001

8) Workers Compensation (Environmental article §1-202)

Workers insurance policy or binder number: WC038108906 (Zurich)

☐ Check if self employed or otherwise exempt from this requirement

"I CERTIFY UNDER PENALTY OF LAW THAT THE INFORMATION SUBMITTED IN THIS REQUEST FOR COVERAGE IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

Owners Signature	Printed Name & Title	Date
	Brandon Bonanni / Gen Dem	6/8/2022

LEAVE BLANK, MDE use only

☐ Permit
☐ Registration (Less than 1,000 brake horsepower & installed prior to 11/24/03)

Permit/Registration Number: _____ - ____ - _____ - _____

AI: _____

	SOx	Nox	CO	VOC	PM	PM-10
Emissions Stack						
Fugitive						

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal (https://ercrequestspilotprogram.atlassian.net/servicedesk/customer/portal/2)

Serial Number(Engine)	*JKT13901*
Sales Model	C4.4
Regulatory Build Date	19-SEP-2019
As Shipped Data	
Engine Arrangement Number	4770973
Regulatory Status	CAT_NR_EPA/CARB_MLIT_EU_R120_R96_China Export
Regulatory Status	CAT_Korea
Labeled Model Year	2019
EPA Family Code	KPKXL04.4MT1 (https://cat-cert-repo-prod-cdn.azureedge.net/emission-certificates/2019/Cert_KPKXL04.4MT1-002_1552554576978337345213298367728 0.pdf?1gvdCzfiCHHbvvFNwytBgklq0XgueBkesoETtP0b4xUHj8phwVxCsmQ86WIF_yuN)
EPA Emissions Level	EPA TIER 4f
EU Emissions Level	IV
EU Type Approval	e5*97/68RA*2012/46*1002*00
Japan Emissions Level	STEP 4 FINAL
Korea Type Approval	C4.4+4134/2200//15EN*PE*01
UN R120 Type Approval	120R-011138 (https://cat-cert-repo-prod-cdn.azureedge.net/emission-certificates/archive/120R-011138 Ext 7.pdf?1gvdCzfiCHHbvvFNwytBgklq0XgueBkesoETtP0b4xUHj8phwVxCsmQ86WIF_yuN)
UN R96 Type Approval	96R-043599R
Advertised Power	131.3HP/2200RPM/T4134
Liters	4.40 L

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

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	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2019 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Perkins Engines Co Ltd (U.S. Manufacturer or Importer) **Certificate Number: KPKXL04.4MT1-002**	**Effective Date:** **07/06/2018** **Expiration Date:** **12/31/2019**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **07/06/2018** **Revision Date:** **N/A**

Model Year: 2019 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** KPKXL04.4MT1	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 75<=kW<130 **Fuel Type:** Diesel, Non-Standard Fuel **After Treatment Devices:** Diesel Oxidation Catalyst, Ammonia Slip Catalyst, Selective Catalytic Reduction **Non-after Treatment Devices:** Electronic/Electric EGR, Electronic Control, Electronic/Electric EGR - Cooled, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Pursuant to the authority vested in California Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2019	KPKXL04.4MT1	4.4	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Engine Control Module, Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst	Crane, Loaders, Tractor, Dozer, Pump, Compressor, Generator Set

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
56 ≤ kW < 130	Tier 4 Final	OPTIONAL STD	0.19	0.40	N/A	5.0	0.02	N/A	N/A	N/A
Certified Emissions Data		CERT	0.01	0.30	--	0.02	0.01	--	--	--

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has complied with the more stringent set of standards from the various power categories in conformance with Section 1039.230 (e) of the "California Exhaust Emission Standards and Test Procedures for 2008 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-D" adopted October 20, 2005 and last amended October 25, 2012.

BE IT FURTHER RESOLVED: That the manufacturer has elected to include engine models in this engine family which are identified for "emergency equipment use only". These "emergency equipment use only" engines are exempt from requirements imposed pursuant to California law and the regulations adopted pursuant thereto for motor vehicle pollution control devices per California Vehicle Code Section 27156.2. The manufacturer must clearly label these engines for "emergency vehicle use only" on the engines' emission control label.

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 4 day of October 2018.

Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

ATTACHMENT 1 OF 4
EO # U-R-022-0218
DATE: 07/27/2018

Engine Model Summary Template

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
KPKXL04.4MT1	Cert Test 1 * TESTED ENGINE	4074/2200	148@2200	114	55	413@1400	125.7	39	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	1	4074/2200	148@2200	114	55	413@1400	125.7	39	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	2	4138/2200	142@2200	110	53	413@1400	125.2	38	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	3	4136/2200	137@2200	106	51	413@1400	125.6	39	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	4	4134/2200	131@2200	103	50	391@1400	119	37	DDI TAA ECM DOC EGR SCR AMOX EPR

ATTACHMENT 2 OF 4
EO # U-R-022-0218
DATE 07/27/2018

Engine Model Summary Template

Engine Family	1.Engine Code	2. Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
KPKXL04.4MT1	5	4132/2200	124@2200	94	45	391@1400	121.9	37	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	6	4092/2200	122@2200	93	45	369@1400	114.6	35	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	7	4328/2000	122@2000	100	44	369@1400	114.6	35	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	8	4130/2200	115@2200	89	43	369@1400	114.6	35	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	9	4126/2200	110@2200	88	42	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR

ATTACHMENT 3 OF 4
EO # U-R-022-0218
DATE 07/27/2018

Engine Model Summary Template

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
KPKXL04.4MT1	10	4128/2200	100@2200	81	39	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	11	4248/2000	100@2000	86	38	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	12	4072/2200	94@2200	78	38	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	13	3996/2200	88@2200	75	36	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	14 AK444 (Emergency)	4132/2200	124@2200	94	45	391@1400	121.9	37	DDI TAA ECM DOC EGR SCR AMOX EPR

ATTACHMENT 4 OF 4
EO # U-R-022-0218
DATE 07/27/2018

Engine Model Summary Template

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
KPKXL04.4MT1	15 AK444 (Emergency)	4126/2200	110@2200	88	42	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	16 AK444 (Emergency)	4128/2200	100@2200	81	39	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
KPKXL04.4MT1	17 AK444 (Emergency)	3996/2200	88@2200	75	36	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR

TAA = TC + CAC

CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**JKT18169**
Sales Model	C4.4
Regulatory Build Date	04-FEB-2021
Engine ReRated	
Engine Arrangement Number	4770973
Certification Arrangement	
Test Spec Number	
Regulatory Status	CAT_NR_EPA/CARB_MLIT_R120_R96_China Exp_EU Exp
Regulatory Status	CAT_Korea
Labeled Model Year	2021
EPA Family Code	MPKXL04.4MT1
EPA Emissions Level	EPA TIER 4f
Japan Emissions Level	STEP 4 FINAL
UN R96 Type Approval	96R-043599R
Korea Type Approval	C4.4+4134/2200//15EN*PE*01
UN R120 Type Approval	120R-011138
CORR FL Power at RPM	
Advertised Power	
Total Displacement	4.40 L

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

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	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2021 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: **Perkins Engines Co Ltd** (U.S. Manufacturer or Importer) **Certificate Number: MPKXL04.4MT1-036**	**Effective Date:** **09/30/2020** **Expiration Date:** **12/31/2021**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **09/30/2020** **Revision Date:** **N/A**

Model Year: 2021 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** MPKXL04.4MT1	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 75<=kW<130 **Fuel Type:** Diesel, Non-Standard Fuel **After Treatment Devices:** Diesel Oxidation Catalyst, Ammonia Slip Catalyst, Selective Catalytic Reduction **Non-after Treatment Devices:** Electronic/Electric EGR, Electronic Control, Engine Design Modification, Electronic/Electric EGR - Cooled

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Pursuant to the authority vested in California Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-19-095;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2021	MPKXL04.4MT1	4.4	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Engine Control Module, Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst, Exhaust Pressure Regulator	Crane, Loaders, Tractor, Dozer, Pump, Compressor, Generator Set

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
56 ≤ kW < 130	Tier 4 Final	STD	0.19	0.40	N/A	5.0	0.02	N/A	N/A	N/A
		CERT	0.01	0.30	--	0.02	0.01	--	--	--

Certified Emissions Data

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

BE IT FURTHER RESOLVED: That for the listed engine models which include engines from different power categories in the same engine family, the manufacturer is complying with the more stringent set of standards from the 56 ≤ kW < 130 power categories in conformance with the incorporated Section 1039.230 (e) of the "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression Ignition Engines, Part 1-D" adopted October 20, 2005 and last amended October 25, 2012.

BE IT FURTHER RESOLVED: That the manufacturer has elected to include engine models in this engine family which are identified for "emergency equipment use only". These "emergency equipment use only" engines are exempt from requirements imposed pursuant to California law and the regulations adopted pursuant thereto for motor vehicle pollution control devices per California Vehicle Code Section 27156.2. The manufacturer must clearly label these engines for "emergency vehicle use only" on the engines' emission control label.

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed on this 29th day of October 2020.

Allen Lyons, Chief
Emissions Certification and Compliance Division

Engine Model Summary Template

Attachment 1 of 4
EO#: U-R-022-0281
Date: 10/13/2020

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
MPKXL04.4MT1	Cert Test 1	4074/2200	148@2200	114	55	413@1400	125.7	39	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	1	4074/2200	148@2200	114	55	413@1400	125.7	39	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	2	4138/2200	142@2200	110	53	413@1400	125.2	38	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	3	4136/2200	137@2200	106	51	413@1400	125.6	39	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	4	4134/2200	131@2200	103	50	391@1400	119	37	DDI TAA ECM DOC EGR SCR AMOX EPR

TAA = TC + CAC

SCR-U Apply to all ratings

Engine Model Summary Template

Attachment 2 of 4
EO#: U-R-022-0281
Date: 10/13/2020

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
MPKXL04.4MT1	5	4132/2200	124@2200	94	45	391@1400	121.9	37	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	6	4092/2200	122@2200	93	45	369@1400	114.6	35	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	7	4328/2000	122@2000	100	44	369@1400	114.6	35	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	8	4130/2200	115@2200	89	43	369@1400	114.6	35	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	9	4126/2200	110@2200	88	42	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR

TAA = TC + CAC

SCR-U Apply to all ratings

Engine Model Summary Template

Attachment 3 of 4
EO#: U-R-022-0281
Date: 10/13/2020

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
MPKXL04.4MT1	10	4128/2200	100@2200	81	39	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	11	4248/2000	100@2000	86	38	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	12	4072/2200	94@2200	78	38	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	13	3996/2200	88@2200	75	36	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	14 AK444 (Emergency)	4132/2200	124@2200	94	45	391@1400	121.9	37	DDI TAA ECM DOC EGR SCR AMOX EPR

TAA= TC + CAC

SCR-U Apply to all ratings

Engine Model Summary Template

Attachment 4 of 4
EO#: U-R-022-0281
Date: 10/13/2020

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
MPKXL04.4MT1	15 AK444 (Emergency)	4126/2200	110@2200	88	42	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	16 AK444 (Emergency)	4128/2200	100@2200	81	39	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR
MPKXL04.4MT1	17 AK444 (Emergency)	3996/2200	88@2200	75	36	332@1400	102.3	31	DDI TAA ECM DOC EGR SCR AMOX EPR

TAA= TC + CAC

SCR-U Apply to all ratings

ATTACHMENT D-5

STACKERS:

- **FORM 5 – STACKER 1**
- **FORM 5EP – STACKER 1**
- **FORM 6 – STACKER 1**
- **FORM 5 – STACKER 2**
- **FORM 5EP – STACKER 2**
- **FORM 6 – STACKER 2**
- **FORM 5 – STACKER 3**
- **FORM 5EP – STACKER 3**
- **FORM 6 – STACKER 3**
- **FORM 44**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium | Maryland | 21093
City | State | Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources
Print Name and Title

6/10/2022
Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale | Maryland | 21237 | (410) 771 - 4311
City/Town | State | Zip | Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey ST80T Stacker (ST1), 100-tph, powered by a 53-hp diesel engine

5. Workmen's Compensation Coverage WC038108906 (Binder/Policy Number) July 2022 (Expiration Date)

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition debris - concrete, brick, and asphalt - handling and processing

9. Control Devices Associated with this Equipment

None [ ] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[X] Describe Water spray

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS Diesel (Specify Type) [X] 66-1 ANNUAL AMOUNT CONSUMED 6,137 gal (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) [ ] 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	145,600	tons
2. Brick		100	tons	41,600	tons
3. Asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	145,600	tons
2. Processed brick		100	tons	41,600	tons
3. Processed asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.028	0.869	4.206
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
1.215	4.206	0.028
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.112	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.037
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

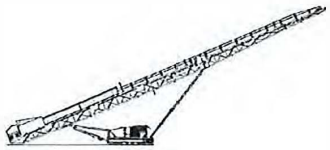
Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

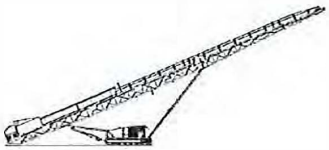
Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change



SPECIFICATIONS: ST80T

Note: Optional equipment may be displayed



DESCRIPTION

Heavy duty mobile tracked stockpiling conveyor with the following features:

- 900 mm (36") wide heavy duty 80' long conveyor
- 36.5 kW (49 hp) diesel engine
- On-site track mobility
- Large feed hopper
- Hydraulic folding frame for easy transport
- Fast on-site setup time (5 minutes)
- Abundant service room inside the power-pack
- Adjustable hopper height to optimize operational efficiency

DIMENSIONS AND WEIGHTS

Working Dimensions

Length	25.24 m (82' – 9 ½")
Width	2.49 m (8' – 2")
Height	9.88 m (32' – 5")

Transport Dimensions

Length	15.75 m (51' – 8")
Width	2.49 m (8' – 2")
Height (approximate)	3.42 m (11' – 3")

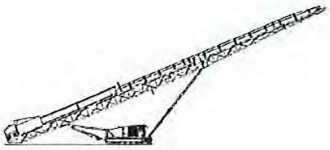
Weight (approximate)	11 400 kg (25 000 lbs)

CONVEYOR

Belt width	900 mm (36")
Belt length	24.38 m (80') drum centers
Belt spec	Heavy Duty Plain 36" – 3ply – 3/16 X 1/16
Drive drum diameter	355 mm (14")
Tail drum diameter	304 mm (12")
Motor	Eaton 630 cc/rev (38.4 cu.in/rev)
Flow rate	96 LPM (25.4 US GPM)
Adjustable speed	Yes
Drive drum maximum speed	152 rpm
Belt maximum speed	167 m/min (548 ft/min)

CAPACITIES

Stockpile height	10.0 m (32' – 10")
Stockpile capacity	1556 m^3 (2035 yd^3)
Production	500 TPH (standard)
Optional Production (Power Unit Upgrade)	800 TPH (maximum)



POWERUNIT AND HYDRAULICS

Engine power	36.5 kW (49 hp)
Engine speed	2400 rpm
Flywheel Pump	Permco 40cc (2.48 ci) cast iron
Total system flow	96 LPM (25.4 US GPM)
Hydraulic tank capacity	440 L (116 US gal)
Diesel tank capacity	330 L (87 US gal)
Hydraulic Oil cooler	Yes

ELECTRICS

Start Siren	Yes (10 sec delay)
Engine shutdowns	• Low oil pressure • High engine temp
Umbilical controlled tracks	Yes
Radio controlled tracks	Standard

TRACKS

Width	400 mm (1' – 3 ¾ ")
Length	2470 mm (8' – 1") centers
Height	594 mm (2' – 5")
Ratio	141:1
Motor	30 cc (1.8 cu.in)
Speed max	1.2 km/hr. (0.75 mph)
Flow rate	48 LPM (12.7 US GPM)
Attachment to chassis	Bolt on for quick change

Optional 4m Track

STANDARD FEATURES

External belt alignment points
Remote grease lines
Engine safety shutdown systems
Full safety guarding for pinch points

OPTIONS

Landing Gear
Belt Scale
Spray Bar
Chevron Belt
Asgco Scraper
Impact Idlers Under Hopper
Lift Axle
Magnet Material Separator
Anti-Segregation Paddle Wheel
Auxiliary Guarding
Hopper Wing Plates
Hopper Wear Plate Liner
TimBin - Large Hopper Bin (450tph)"

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
ST1 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph stacker, powered by a 53-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	16	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☒ Dust Suppression System No. 1
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.0081	0.0081	0.065	0.025
Particulate Matter (filterable as PM2.5)	0.0048	0.0048	0.038	0.015
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.526	0.526	4.206	0.547
Oxides of Sulfur (SOx)	0.109	0.109	0.869	0.113
Oxides of Nitrogen (NOx)	0.526	0.526	4.206	0.547
Carbon Monoxide (CO)	0.152	0.152	1.215	0.158
Lead (Pb)	NA			
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
1,3-Butadiene	0.00001	0.00001	0.0001	0.00002
Acetaldehyde	0.0003	0.0003	0.002	0.0003
Acrolein	0.00003	0.00003	0.0003	0.00004
Formaldehyde	0.0004	0.0004	0.004	0.0005
Toluene	0.0002	0.0002	0.001	0.0002
Xylenes	0.0001	0.0001	0.001	0.0001
PAHs	0.0001	0.0001	0.0005	0.0001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation Gray & Son, Inc.	**Telephone No.** (410) 771-4311		**Date of Application** June __, 2022
2. Mailing Address 430 West Padonia Road	**City** Timonium	**Zip Code** 21093	**County** Baltimore
3. Equipment Location 600 Todds Lane	**City/Town or P.O.** Rosedale		**County** Baltimore
4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno

5. Application Type: **Alteration** ☐ **New Construction** ☒

6. Date Construction is to Start: July 2022 **Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Water spray (type)

8. Gas Cleaning Equipment Manufacturer N/A **Model No.** **Collection Efficiency (Design Criteria)**

9. Type of Equipment which Control Equipment is to Service:
Integrated water spray on stacker (ST1) will be used to provide wet suppression of dust generated from demolition debris.

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.
	PRESSURE DROP _____			
Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content	_____	%	_____	%
OR				
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See process flow diagram included with the PTC application package for this project.

Date Received: Local _____ State _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐☐

Emission Calculations Revised By _____ Date _____

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium | Maryland | 21093
City | State | Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources
Print Name and Title

Date 6/10/2022

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale | Maryland | 21237 | (410) 771 - 4311
City/Town | State | Zip | Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey ST80T Stacker (ST2), 100-tph, powered by a 53-hp diesel engine

5. Workmen's Compensation Coverage WC038108906 (Binder/Policy Number) July 2022 (Expiration Date)

Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Demolition debris - concrete, brick, and asphalt - handling and processing

9. Control Devices Associated with this Equipment

None [ ] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[X] Describe Water spray

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS Diesel (Specify Type) [X] 66-1 ANNUAL AMOUNT CONSUMED 6,137 gal (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) [ ] 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	145,600	tons
2. Brick		100	tons	41,600	tons
3. Asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	145,600	tons
2. Processed brick		100	tons	41,600	tons
3. Processed asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.028	0.869	4.206
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
1.215	4.206	0.028
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.112	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.037
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

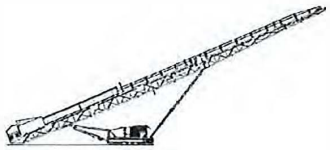
Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

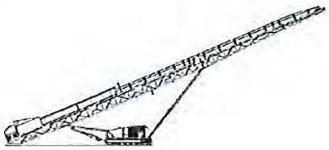
Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change



SPECIFICATIONS: ST80T

Note: Optional equipment may be displayed



DESCRIPTION

Heavy duty mobile tracked stockpiling conveyor with the following features:

- 900 mm (36") wide heavy duty 80' long conveyor
- 36.5 kW (49 hp) diesel engine
- On-site track mobility
- Large feed hopper
- Hydraulic folding frame for easy transport
- Fast on-site setup time (5 minutes)
- Abundant service room inside the power-pack
- Adjustable hopper height to optimize operational efficiency

DIMENSIONS AND WEIGHTS

Working Dimensions

Length	25.24 m (82' – 9 ½")
Width	2.49 m (8' – 2")
Height	9.88 m (32' – 5")

Transport Dimensions

Length	15.75 m (51' – 8")
Width	2.49 m (8' – 2")
Height (approximate)	3.42 m (11' – 3")

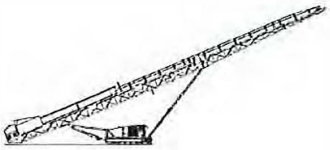
Weight (approximate)	11 400 kg (25 000 lbs)

CONVEYOR

Belt width	900 mm (36")
Belt length	24.38 m (80') drum centers
Belt spec	Heavy Duty Plain 36" – 3ply – 3/16 X 1/16
Drive drum diameter	355 mm (14")
Tail drum diameter	304 mm (12")
Motor	Eaton 630 cc/rev (38.4 cu.in/rev)
Flow rate	96 LPM (25.4 US GPM)
Adjustable speed	Yes
Drive drum maximum speed	152 rpm
Belt maximum speed	167 m/min (548 ft/min)

CAPACITIES

Stockpile height	10.0 m (32' – 10")
Stockpile capacity	1556 m^3 (2035 yd^3)
Production	500 TPH (standard)
Optional Production (Power Unit Upgrade)	800 TPH (maximum)



POWERUNIT AND HYDRAULICS

Engine power	36.5 kW (49 hp)
Engine speed	2400 rpm
Flywheel Pump	Permco 40cc (2.48 ci) cast iron
Total system flow	96 LPM (25.4 US GPM)
Hydraulic tank capacity	440 L (116 US gal)
Diesel tank capacity	330 L (87 US gal)
Hydraulic Oil cooler	Yes

ELECTRICS

Start Siren	Yes (10 sec delay)
Engine shutdowns	• Low oil pressure • High engine temp
Umbilical controlled tracks	Yes
Radio controlled tracks	Standard

TRACKS

Width	400 mm (1' – 3 ¾ ")
Length	2470 mm (8' – 1") centers
Height	594 mm (2' – 5")
Ratio	141:1
Motor	30 cc (1.8 cu.in)
Speed max	1.2 km/hr. (0.75 mph)
Flow rate	48 LPM (12.7 US GPM)
Attachment to chassis	Bolt on for quick change

Optional 4m Track

STANDARD FEATURES

External belt alignment points
Remote grease lines
Engine safety shutdown systems
Full safety guarding for pinch points

OPTIONS

Landing Gear
Belt Scale
Spray Bar
Chevron Belt
Asgco Scraper
Impact Idlers Under Hopper
Lift Axle
Magnet Material Separator
Anti-Segregation Paddle Wheel
Auxiliary Guarding
Hopper Wing Plates
Hopper Wear Plate Liner
TimBin - Large Hopper Bin (450tph)"

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
ST2 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph stacker, powered by a 53-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	16	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☒ Dust Suppression System No. 1
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.0081	0.0081	0.0065	0.025
Particulate Matter (filterable as PM2.5)	0.0048	0.0048	0.038	0.015
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.526	0.526	4.206	0.547
Oxides of Sulfur (SOx)	0.109	0.109	0.869	0.113
Oxides of Nitrogen (NOx)	0.526	0.526	4.206	0.547
Carbon Monoxide (CO)	0.152	0.152	1.215	0.158
Lead (Pb)	NA			

Greenhouse Gases (GHG)	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				

List individual federal Hazardous Air Pollutants (HAP) below:	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
1,3-Butadiene	0.00001	0.00001	0.0001	0.00002
Acetaldehyde	0.0003	0.0003	0.002	0.0003
Acrolein	0.00003	0.00003	0.0003	0.00004
Benzene	0.0003	0.0003	0.003	0.0004
Formaldehyde	0.0004	0.0004	0.004	0.0005
Toluene	0.0002	0.0002	0.001	0.0002
Xylenes	0.0001	0.0001	0.001	0.0001
PAHs	0.0001	0.0001	0.0005	0.0001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

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4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno

5. Application Type: **Alteration** ☐ **New Construction** ☒

6. Date Construction is to Start: July 2022 **Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Water spray (type)

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9. Type of Equipment which Control Equipment is to Service:
Integrated water spray on stacker (ST2) will be used to provide wet suppression of dust generated from demolition debris.

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

Form number: 6
Revision date: 0/2000
TTY Users 1-800-735-2258

Recycled Paper

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.
	PRESSURE DROP _____			
Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content OR	_____	%	_____	%
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

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By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ Date _____

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Street Address

Timonium | Maryland | 21093
City | State | Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources
Print Name and Title

6/14 2022
Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

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Street Number and Street Name

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Company Zurich

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6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

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[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[X] Describe Water spray

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS Diesel (Specify Type) [X] 66-1 ANNUAL AMOUNT CONSUMED 6,137 gal (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) [ ] 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Concrete		100	tons	145,600	tons
2. Brick		100	tons	41,600	tons
3. Asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Processed concrete		100	tons	145,600	tons
2. Processed brick		100	tons	41,600	tons
3. Processed asphalt		100	tons	20,800	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.028	0.869	4.206
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
1.215	4.206	0.028
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.112	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	0.037
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

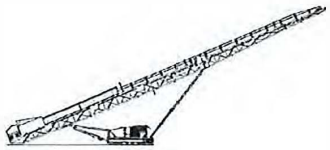
Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

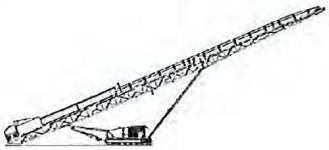
Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change



SPECIFICATIONS: ST80T

Note: Optional equipment may be displayed



DESCRIPTION

Heavy duty mobile tracked stockpiling conveyor with the following features:

- 900 mm (36") wide heavy duty 80' long conveyor
- 36.5 kW (49 hp) diesel engine
- On-site track mobility
- Large feed hopper
- Hydraulic folding frame for easy transport
- Fast on-site setup time (5 minutes)
- Abundant service room inside the power-pack
- Adjustable hopper height to optimize operational efficiency

DIMENSIONS AND WEIGHTS

Working Dimensions

Length	25.24 m (82' – 9 ½")
Width	2.49 m (8' – 2")
Height	9.88 m (32' – 5")

Transport Dimensions

Length	15.75 m (51' – 8")
Width	2.49 m (8' – 2")
Height (approximate)	3.42 m (11' – 3")

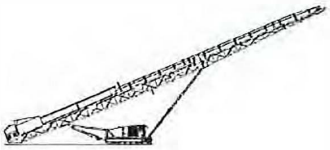
Weight (approximate)	11 400 kg (25 000 lbs)

CONVEYOR

Belt width	900 mm (36")
Belt length	24.38 m (80') drum centers
Belt spec	Heavy Duty Plain 36" – 3ply – 3/16 X 1/16
Drive drum diameter	355 mm (14")
Tail drum diameter	304 mm (12")
Motor	Eaton 630 cc/rev (38.4 cu.in/rev)
Flow rate	96 LPM (25.4 US GPM)
Adjustable speed	Yes
Drive drum maximum speed	152 rpm
Belt maximum speed	167 m/min (548 ft/min)

CAPACITIES

Stockpile height	10.0 m (32' – 10")
Stockpile capacity	1556 m^3 (2035 yd^3)
Production	500 TPH (standard)
Optional Production (Power Unit Upgrade)	800 TPH (maximum)



POWERUNIT AND HYDRAULICS

Engine power	36.5 kW (49 hp)
Engine speed	2400 rpm
Flywheel Pump	Permco 40cc (2.48 ci) cast iron
Total system flow	96 LPM (25.4 US GPM)
Hydraulic tank capacity	440 L (116 US gal)
Diesel tank capacity	330 L (87 US gal)
Hydraulic Oil cooler	Yes

ELECTRICS

Start Siren	Yes (10 sec delay)
Engine shutdowns	• Low oil pressure • High engine temp
Umbilical controlled tracks	Yes
Radio controlled tracks	Standard

TRACKS

Width	400 mm (1' – 3 ¾ ")
Length	2470 mm (8' – 1") centers
Height	594 mm (2' – 5")
Ratio	141:1
Motor	30 cc (1.8 cu.in)
Speed max	1.2 km/hr. (0.75 mph)
Flow rate	48 LPM (12.7 US GPM)
Attachment to chassis	Bolt on for quick change

Optional 4m Track

STANDARD FEATURES

External belt alignment points
Remote grease lines
Engine safety shutdown systems
Full safety guarding for pinch points

OPTIONS

Landing Gear
Belt Scale
Spray Bar
Chevron Belt
Asgco Scraper
Impact Idlers Under Hopper
Lift Axle
Magnet Material Separator
Anti-Segregation Paddle Wheel
Auxiliary Guarding
Hopper Wing Plates
Hopper Wear Plate Liner
TimBin - Large Hopper Bin (450tph)"

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
ST3 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
100-tph stacker, powered by a 53-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	16	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☒ Dust Suppression System No. 1
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	0.0081	0.0081	0.065	0.025
Particulate Matter (filterable as PM2.5)	0.0048	0.0048	0.038	0.015
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.526	0.526	4.206	0.547
Oxides of Sulfur (SOx)	0.109	0.109	0.869	0.113
Oxides of Nitrogen (NOx)	0.526	0.526	4.206	0.547
Carbon Monoxide (CO)	0.152	0.152	1.215	0.158
Lead (Pb)	NA			

Greenhouse Gases (GHG)	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				

List individual federal Hazardous Air Pollutants (HAP) below:	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
1,3-Butadiene	0.00001	0.00001	0.0001	0.00002
Acetaldehyde	0.0003	0.0003	0.002	0.0003
Acrolein	0.00003	0.00003	0.0003	0.00004
Benzene	0.0003	0.0003	0.003	0.0004
Formaldehyde	0.0004	0.0004	0.004	0.0005
Toluene	0.0002	0.0002	0.001	0.0002
Xylenes	0.0001	0.0001	0.001	0.0001
PAHs	0.0001	0.0001	0.0005	0.0001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation Gray & Son, Inc.	**Telephone No.** (410) 771-4311		**Date of Application** June __, 2022
2. Mailing Address 430 West Padonia Road	**City** Timonium	**Zip Code** 21093	**County** Baltimore
3. Equipment Location 600 Todds Lane	**City/Town or P.O.** Rosedale		**County** Baltimore
4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno
5. Application Type:	**Alteration** ☐		**New Construction** ☒
6. Date Construction is to Start: July 2022			**Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Water spray (type)

8. Gas Cleaning Equipment Manufacturer N/A	**Model No.**	**Collection Efficiency (Design Criteria)**

9. Type of Equipment which Control Equipment is to Service:
Integrated water spray on stacker (ST3) will be used to provide wet suppression of dust generated from demolition debris.

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.
	PRESSURE DROP _____			
Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content	_____	%	_____	%
OR				
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See process flow diagram included with the PTC application package for this project.

Date Received: Local _____ State _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ Date _____

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Management Administration / Air Quality Permits Program
1800 Washington Boulevard, STE 720 Baltimore, MD 21230-1720
(410) 537-3230 ●1-800-633-6101 ● www.mde.state.md.us

Mail application to
MDE/ARMA
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Don't forget to:
✓Sign the application
✓Include vendor literature

Air Quality Permit to Construct & Registration Application for

INTERNAL COMBUSTION ENGINES

(Electrical Power Generators, Power Equipment, Fire Protection Pumps)

1) Applicability

You must check off one the following items to use this application form

☐ Electrical power generation (off grid, base load, peak, load shaving,, etc)
- Use MDE Form 42 for emergency use only generators

☒ Power equipment (hydraulic, mechanical, etc)
☐ Fire protection pump

***For electrical power generators only**, you must check off one the following items to use this application form*

☐ I have a CPCN Exemption from the Public Service Commission for this generator (contact the Public Service Commision at 410.767.8131)
☐ This generator was installed before October 1, 2001 and I do not need a CPCN Exemption

2) Business/Institution/Facility where the engine will be located ☐ Check if this is a federal facility

Name: GSI-Todds Lane Material Processing Operation Phone: (410) 771-4311

Street Address: 600 Todds Lane

City: Rosedale State: MD Zip Code: 21237 County: Baltimore

3) Owner/Operator of the engine (if different than above)

Name: Gray & Son, Inc. Phone: (410) 771-4311

Mailing Address: 430 West Padonia Road

City: Timonium State: MD Zip Code: 21093

4) Installer ☐ Check if installer is applying for permit. If checked, complete the following:

Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

5) Engine Information

	July 2022	Caterpillar C2.2	49	7/23/2021	Diesel
OR	July 2022	Kubota V2403-CR-EF	53	2019	Diesel
	Installation Date	Engine Manufacturer & Model	Horsepower	Manufacture Date	Fuel Type

6) Operating Information

Intended use description: (Examples, "a portable generator at a construction site" or "peak shaving with the emergency generator", etc)

Engines will be used to power stackers (ST1, ST2, and ST3) for material processing/recycling operation. The three engines will be some combination of the engines listed above. Emission rates presented in this application are calculated with the highest emissions.

8	2,080 each
Hours per day	Hours per year

7) Required Attachments

(Check that they are attached)

☒ Vendor literature

☐ CPCN Exemption from the Public Service Commission

- Electrical generators only
- Not needed for generators installed before October 1, 2001

8) Workers Compensation (Environmental article §1-202)

Workers insurance policy or binder number: WC038108906 (Zurich)

☐ Check if self employed or otherwise exempt from this requirement

"I CERTIFY UNDER PENALTY OF LAW THAT THE INFORMATION SUBMITTED IN THIS REQUEST FOR COVERAGE IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

	Brandon Burdsall / Kim Dunn	4/10/22
Owners Signature	Printed Name & Title	Date

LEAVE BLANK, MDE use only

☐ Permit

☐ Registration (Less than 1,000 brake horsepower & installed prior to 11/24/03)

Permit/Registration Number: _____ - ____ - _____ - _____

AI: _____

	SOx	Nox	CO	VOC	PM	PM-10
Emissions Stack						
Fugitive						

CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**G4306386**
Sales Model	C2.2
Regulatory Build Date	23-JUL-2021
Engine ReRated	
Engine Arrangement Number	EQ4798034N
Certification Arrangement	
Test Spec Number	
Regulatory Status	CAT_NR_EPA/CARB
Regulatory Status	CAT_EU Export
Regulatory Status	CAT_China Export
Labeled Model Year	2021
EPA Family Code	MPKXL02.2TD7
EPA Emissions Level	EPA TIER 4f
CORR FL Power at RPM	
Advertised Power	
Total Displacement	2.22 L

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

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	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2021 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Perkins Engines Co Ltd (U.S. Manufacturer or Importer) **Certificate Number: MPKXL02.2TD7-028**	**Effective Date:** **09/09/2020** **Expiration Date:** **12/31/2021**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **09/09/2020** **Revision Date:** **N/A**

Model Year: 2021 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** MPKXL02.2TD7	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 19<=kW<37 **Fuel Type:** Diesel **After Treatment Devices:** Diesel Oxidation Catalyst **Non-after Treatment Devices:** Electronic Control, Electronic/Electric EGR - Cooled **FELs:** PM 0.05 g/kW-hr

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

This certificate of conformity is conditional upon compliance of said manufacturer with the averaging, banking and trading provisions of 40 CFR Part 1039, Subpart H. Failure to comply with these provisions may render this certificate void *ab initio*.

CALIFORNIA AIR RESOURCES BOARD	PERKINS ENGINES COMPANY LIMITED	EXECUTIVE ORDER U-R-022-0275 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in California Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-19-095;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2021	MPKXL02.2TD7	1.66, 2.22	Diesel	5000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Control Module, Electronic Diesel Injection, Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Turbocharger	Loaders, Tractor, Compressor, Mini Hydraulic Excavators, Material Handling Equipment, Access Platforms

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
19 ≤ kW < 37	Tier 4 Final	STD	N/A	N/A	4.7	5.5	0.03	N/A	N/A	N/A
		FEL	N/A	N/A	--	--	0.05	--	--	--
		CERT	--	--	4.5	1.3	0.03	--	--	--

Certified Emissions Data

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed on this 1st day of October 2020.

Allen Lyons, Chief
Emissions Certification and Compliance Division

EO#: U-R-022-0275
Attachment page 1 of 1
Date: 09/03/2020

Engine Model Summary Template

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Displacement (l) /Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
MPKXL02.2TD7	404F-E22T**	EQ49DI/2800ABT	48.9@2800	33.7	2.22/20.8	165@1800	38.5	15.3	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	C2.2**	EQ49DI/2800ABT	48.9@2800	33.7	2.22/20.8	165@1800	38.5	15.3	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	403F-E17T*	EW40DI/2800ABT	38.9 @ 2800	35.7	1.66/16.5	120@ 1800	37.6	11.2	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	C1.7*	EW40DI/2800ABT	38.9 @ 2800	35.7	1.66/16.5	120@ 1800	37.6	11.2	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	404F-E22T**	6743/2600	48.3@2600	33.4	2.22/19.1	155.4@1600	35.0	12.3	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	C2.2**	6743/2600	48.3@2600	33.4	2.22/19.1	155.4@1600	35.0	12.3	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	403F-E17T*	6748/2600	40.2@2600	37.7	1.66/16.2	116@1600	37.4	9.9	DDI, ECM, TC, EGR, DOC
MPKXL02.2TD7	403F-E17T*	6752/2600	36.2@2600	35	1.66/15.0	116@1600	37.4	9.9	DDI, ECM, TC, EGR, DOC

** = 2.22 disp.

* = 1.66 disp.

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2019 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION** **AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Kubota Corporation (U.S. Manufacturer or Importer) **Certificate Number: KKBXL02.4END-048**	**Effective Date:** **11/15/2018** **Expiration Date:** **12/31/2019**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **11/15/2018** **Revision Date:** **N/A**

Model Year: 2019 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** KKBXL02.4END	**Mobile/Stationary Indicator:** Mobile **Emissions Power Category:** 37<=kW<56 **Fuel Type:** Diesel **After Treatment Devices:** Diesel Oxidation Catalyst, PTOX-DPF-Active **Non-after Treatment Devices:** Electronic Control, Engine Design Modification, Electronic/Electric EGR - Cooled

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

CALIFORNIA AIR RESOURCES BOARD	KUBOTA Corporation	EXECUTIVE ORDER U-R-025-0834 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in California Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2019	KKBXL02.4END	2.435	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Exhaust Gas Recirculation, Electronic Control Module, Diesel Oxidation Catalyst, Periodic Trap Oxidizer	Loader, Tractor, Pump, Compressor, Other Industrial Equipment

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kW-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kW-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
19 ≤ kW < 56	Tier 4 Final	OPTIONAL STD	N/A	N/A	4.7	5.0	0.03	N/A	N/A	N/A
		CERT	--	--	3.1	0.04	0.001	--	--	--

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has complied with the more stringent set of standards from the various power categories in conformance with Section 1039.230 (e) of the "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression Ignition Engines, Part I-D" adopted October 20, 2005 and last amended October 25, 2012.

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 28TH day of November 2018.

For Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

Engine Model Summary Form

EO # U-R-025-0834

Date: 10/22/2018

Attachment page 1 of 1

Manufacturer: **KUBOTA Corporation**
Engine category: **Nonroad CI**
EPA Engine Family: **KKBXL02.4END**
Mfr Family Name: **N/A**
Process Code: **New Submission**

1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
V2403-CR-EF01	V2403-CR-EF	52.7@2700	34.3	20.7	126.1@1600	40.5	14.5	EM, DFI, EGR, ECM, PTOX, DOC
V2403-CR-EF02	V2403-CR-EF	49.3@2700	32.0	19.3	116.1@1600	38.1	13.6	EM, DFI, EGR, ECM, PTOX, DOC
V2403-CR-EF03	V2403-CR-EF	48.5@2700	32.9	19.9	116.1@1600	38.1	13.6	EM, DFI, EGR, ECM, PTOX, DOC
V2403-CR-EF04	V2403-CR-EF	48.7@2700	32.6	19.7	114.6@1600	36.9	13.2	EM, DFI, EGR, ECM, PTOX, DOC

ATTACHMENT D-6

TROMMEL:

- **FORM 5**
- **FORM 5EP**
- **FORM 44**

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Gray & Son, Inc.

Mailing Address

430 West Padonia Road
Street Address

Timonium — Maryland — 21093
City — State — Zip

Telephone Number

(410) 771 - 4311

Signature

Brandon Bonanno, General Manager-Demolition/Material Resources — 6/10/2022
Print Name and Title — Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) — Premises No. (3-6)
Registration Class (7) — Equipment No. (8-11)
Data Year (12-13) — Application Date

1B. Equipment Location and Telephone Number (if different from above)

600 Todds Lane
Street Number and Street Name

Rosedale — Maryland — 21237 — (410) 771 - 4311
City/Town — State — Zip — Telephone Number

GSI-Todds Lane Material Processing Operation
Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0722	0822	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
McCloskey 621RE Trommel (T1), 150 tons per hour

5. Workmen's Compensation Coverage WC038108906 — July 2022
Binder/Policy Number — Expiration Date
Company Zurich

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Soil handling and processing

9. Control Devices Associated with this Equipment

None [X] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

[ ] Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS: Diesel (Specify Type) [X] 66-1 — ANNUAL AMOUNT CONSUMED: 13,072 gal (Specify Units of Measure)

OTHER FUEL: _____ (Specify Type) [ ] 66-2 — ANNUAL AMOUNT CONSUMED: _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
X				0 8	5	1 8 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent
X				
76	77-78	79-80	81-82	83-84

(Total Seasons= 100%)

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [ ] 85

If not, then

Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Soil		150	tons	216,000	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Soil		150	tons	216,000	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0.061	2.854	0.859
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0.092	0.031	0.061
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
37.20	NA	NA
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
NA	NA	13.08
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	2	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

McCloskey
INTERNATIONAL

621RE

Wheeled Trommel

With over thirty years of experience, McCloskey International is the world's leading trommel manufacturer and has pioneered trommel design and innovation.

Over this time, the 621 Trommel has established a proven reliability in construction and demolition, topsoil, compost, waste recycling, and many other large screening applications.

With a 174 HP engine, accessible engine bay, and high efficiency diesel hydraulic system the 621 is sure to deliver the maximum operating time.

Available as a wheeled mobile unit or hydraulic raise/lower track bogie system and with numerous custom options offered to meet each customer's unique requirements.

Features

- 6'x21' heavy duty trommel drum
- 130kW (174Hp) engine
- Integrated hydraulic folding stockpiling conveyors
- Remote control radial conveyor
- Fast on-site setup time (10 minutes)

COMMONWEALTH EQUIPMENT
CRUSHING & SCREENING
877-217-4474
Info@CommonwealthEquipment.com
Visit our website at
CommonwealthEquipment.com

McCloskey INTERNATIONAL

SPECIFICATION DATA

Brushes

Ground level adjustable brushes keep the screen clean and rotate away from drum for ease of drum change.

Hopper Capacity

Hopper capacity of 5.0m³ (6.5yd³) with extensions for greater effciency.

Radial Conveyor

Radial conveyor offers the trommel a 4.98m (16’ 4”) stockpile height.

Wheeled Mobility

Wheeled unit with 72” spread tandem axle or tri-axle (REG).

Trommel Drum

Features a 6’ x 21’ steel drum, with numerous drum and screen options available.

Dimensions and Capacities

Engine	**130kW (174Hp)**
Transport Length	**18.52m (60’ 9”)**
Transport Width	**2.73m (8’ 11.5”)**
Transport Height	**4.12m (13’ 6”)**
Weight	**23,470kg (51,750 lbs)**
Working Height	**5.11m (16’ 9”)**
Working Length	**29.13m (95’ 7”)**
Radial Conveyor Stockpile Height	**4.98m (16’ 4”)**
Hopper Capacity	**5.0m³ (6.5yd³)**
Drum	**6’ x 21’ (1.83m x 6.40m)**

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COMMONWEALTH EQUIPMENT
CRUSHING & SCREENING

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info@CommonwealthEquipment.com
Visit our website at
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MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Gray & Son, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
T1 (see process flow diagram)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
150-tph trommel, powered by a 174-hp diesel engine

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	16	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):			
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

☒ None

☐ Baghouse No. _____

☐ Cyclone No. _____

☐ Elec. Precipitator (ESP) No. _____

☐ Dust Suppression System No. _____

☐ Venturi Scrubber No. _____

☐ Spray Tower/Packed Bed No. _____

☐ Carbon Adsorber No. _____

☐ Cartridge/Canister

☐ Regenerative

☐ Thermal Oxidizer No. _____

☐ Regenerative

☐ Catalytic Oxidizer No. _____

☐ Nitrogen Oxides Reduction No. _____

☐ Selective ☐ Non-Selective
☐ Catalytic ☐ Non-Catalytic

☐ Other No. _____
Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	1.643	1.643	13.141	1.183
Particulate Matter (filterable as PM2.5)	0.0077	0.0077	0.061	0.006
Particulate Matter (condensables)	NA			
Volatile Organic Compounds (VOC)	0.004	0.004	0.031	0.003
Oxides of Sulfur (SOx)	0.357	0.357	2.854	0.257
Oxides of Nitrogen (NOx)	0.107	0.107	0.859	0.077
Carbon Monoxide (CO)	0.012	0.012	0.092	0.008
Lead (Pb)	NA			
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
1,3-Butadiene	0.00005	0.00005	0.0004	0.00003
Acetaldehyde	0.0009	0.0009	0.007	0.001
Acrolein	0.0001	0.0001	0.001	0.0001
Benzene	0.0011	0.0011	0.009	0.001
Formaldehyde	0.0014	0.0014	0.011	0.001
Toluene	0.0005	0.0005	0.004	0.0004
Xylenes	0.0003	0.0003	0.003	0.0002
PAHs	0.0002	0.0002	0.002	0.0001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Management Administration / Air Quality Permits Program
1800 Washington Boulevard, STE 720 Baltimore, MD 21230-1720
(410) 537-3230 ●1-800-633-6101 ● www.mde.state.md.us

Mail application to
MDE/ARMA
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Don't forget to:
✓Sign the application
✓Include vendor literature

Air Quality Permit to Construct & Registration Application for

INTERNAL COMBUSTION ENGINES

(Electrical Power Generators, Power Equipment, Fire Protection Pumps)

1) Applicability

You must check off one the following items to use this application form

☐ Electrical power generation (off grid, base load, peak, load shaving,, etc)
- Use MDE Form 42 for emergency use only generators

☒ Power equipment (hydraulic, mechanical, etc)
☐ Fire protection pump

***For electrical power generators only**, you must check off one the following items to use this application form*

☐ I have a CPCN Exemption from the Public Service Commission for this generator (contact the Public Service Commision at 410.767.8131)
☐ This generator was installed before October 1, 2001 and I do not need a CPCN Exemption

2) Business/Institution/Facility where the engine will be located ☐ Check if this is a federal facility

Name: GSI-Todds Lane Material Processing Operation Phone: (410) 771-4311

Street Address: 600 Todds Lane

City: Rosedale State: MD Zip Code: 21237 County: Baltimore

3) Owner/Operator of the engine (if different than above)

Name: Gray & Son, Inc. Phone: (410) 771-4311

Mailing Address: 430 West Padonia Road

City: Timonium State: MD Zip Code: 21093

4) Installer ☐ Check if installer is applying for permit. If checked, complete the following:

Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

5) Engine Information

Installation Date	Engine Manufacturer & Model	Horsepower	Manufacture Date	Fuel Type
July 2022	Caterpillar C4.4	174	7/19/2017	Diesel

6) Operating Information

Intended use description: (Examples, "a portable generator at a construction site" or "peak shaving with the emergency generator", etc)

Engine used to power trommel (T1) for material processing/recycling operation

8 Hours per day

1,440 Hours per year

7) Required Attachments

(Check that they are attached)

☒ Vendor literature

☐ CPCN Exemption from the Public Service Commission

- Electrical generators only
- Not needed for generators installed before October 1, 2001

8) Workers Compensation (Environmental article §1-202)

Workers insurance policy or binder number: WC038108906 (Zurich)

☐ Check if self employed or otherwise exempt from this requirement

"I CERTIFY UNDER PENALTY OF LAW THAT THE INFORMATION SUBMITTED IN THIS REQUEST FOR COVERAGE IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

Owners Signature	Printed Name & Title	Date
	Brian Brand / Gm Dir	4/10/2022

LEAVE BLANK, MDE use only

☐ Permit

☐ Registration (Less than 1,000 brake horsepower & installed prior to 11/24/03)

Permit/Registration Number: _____-____-_____-_____

AI: _____

	SOx	Nox	CO	VOC	PM	PM-10
Emissions Stack						
Fugitive						

EMISSIONS DATA [JKT04627]

(JKT04627)-ENGINE (CHK148932B)-CEM

AUGUST 01, 2018

For Help Desk Phone Numbers Click here

TMI Emissions Data Survey

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

Serial Number(Engine)	*JKT04627*
Sales Model	C4.4
Regulatory Build Date	07/19/2017
As Shipped Data	
Engine Arrangement Number	4556291
Regulatory Status	CAT_Korea
Regulatory Status	CAT_NR_EPA/CARB_MLIT_EU_R120_China Export
Labeled Model Year	2017
EPA Family Code	HPKXL04.4MU1
EU Emissions Level	IV
EU Type Approval	e11*97/68RA*2012/46*3041*01
Japan Emissions Level	STEP 4 FINAL
Korea Type Approval	C4.4+4068/2200//15EN*PE*01
UN R120 Type Approval	R120-011138
Advertised Power	173.5HP/2200RPM/T4068
Liters	4.40

This is not an official emission certificate. This is for emission data information only.

Caterpillar Confidential: **Green**
Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: 8/1/2018 9:30:47 AM
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Data Privacy Statement.

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2017 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION** **AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Perkins Engines Co Ltd (U.S. Manufacturer or Importer) **Certificate Number: HPKXL04.4MU1-010**	**Effective Date:** **10/05/2016** **Expiration Date:** **12/31/2017**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **10/05/2016** **Revision Date:** **N/A**

Model Year: 2017 **Manufacturer Type:** Original Engine Manufacturer **Engine Family:** HPKXL04.4MU1	**Mobile/Stationary Indicator:** Both **Emissions Power Category:** 75<=kW<130 **Fuel Type:** Diesel, Non-Standard Fuel **After Treatment Devices:** Diesel Oxidation Catalyst, Ammonia Slip Catalyst, Selective Catalytic Reduction **Non-after Treatment Devices:** Electronic/Electric EGR, Electronic Control, Engine Design Modification, Electronic/Electric EGR - Cooled

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Parts 60 and 1039, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Parts 60 and 1039 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Parts 60 and 1039 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Parts 60 and 1039.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Parts 60 and 1039. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Parts 60 and 1039.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

California Environmental Protection Agency AIR RESOURCES BOARD	PERKINS ENGINES COMPANY LTD.	EXECUTIVE ORDER U-R-022-0209 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engine and emission control system produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2017	HPKXL04.4MU1	4.4	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Engine Control Module, Diesel Oxidation Catalyst, Exhaust Gas Recirculation, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst	Crane, Loaders, Tractor, Dozer, Pump, Compressor, Generator Set

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
75 ≤ KW < 130	Tier 4 Final	STD	0.19	0.40	N/A	5.0	0.02	N/A	N/A	N/A
Certified Emissions		CERT	0.01	0.28	--	0.03	0.02	--	--	--

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 7 day December 2016.

Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

Attachment 1 of 2

Engine Model Summary Template

U-R-022-0209
12/6/16

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
HPKXL04.4MU1	Cert Test 1	4068/2200	174@2200	133	64	553@1400	162	50	DDI TAA ECM DOC EGR SCR AMOX EPR
HPKXL04.4MU1	1	4068/2200	174@2200	133	64	553@1400	162	50	DDI TAA ECM DOC EGR SCR AMOX EPR
HPKXL04.4MU1	2	4070/2200	157@2200	125	60	504@1400	148	45	DDI TAA ECM DOC EGR SCR AMOX EPR
HPKXL04.4MU1	3	4186/2200	150@2200	119	57	479@1400	139	43	DDI TAA ECM DOC EGR SCR AMOX EPR
HPKXL04.4MU1	4	3992/2200	141@2200	116	56	465@1400	136	42	DDI TAA ECM DOC EGR SCR AMOX EPR

Attachment 2 of 2

Engine Model Summary Template

V-R-022-0209
12/6/12

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
HPKXL04.4MU1	Cert Test 5	4526/1800	173@1800	154	61	505@1800	154	61	DDI TAA ECM DOC EGR SCR AMOX EPR
HPKXL04.4MU1	5	4526/1800	173@1800	154	61	505@1800	154	61	DDI TAA ECM DOC EGR SCR AMOX EPR

TAA: TC + CAC

ATTACHMENT D-7

- FORM 5T

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Applicant Name: Gray & Son, Inc.

Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels (µg/m³)			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
ex. ethanol	*64175*	*II*	*18843*	*3769*	*N/A*	*0.60*	*0.15*	*0.75*	*1500*
ex. benzene	*71432*	*I*	*80*	*16*	*0.13*	*0.5*	*0.75*	*1.00*	*400*
See attachment									

(attach additional sheets as necessary.)

Note: Screening levels can be obtained from the Department's website (http://www.mde.maryland.gov) or by calling the Department.

Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.

Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))
A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m³.

Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))
A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m³, and any applicable annual screening level for the TAP must be greater than 1 µg/m³.

If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)
In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
ex. ethanol and benzene	*Thermal Oxidizer*	*99*	*$50,000*	*$100,000*	*no*
ex. ethanol and benzene	*Low VOC materials*	*80*	*0*	*$100.000*	*yes*
PM and associated TAPs	Wet suppression	Use of AP-42			
		Controlled Factors			
		(Table 11.19.2-2)			

(attach additional sheets as necessary)

Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)
Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels ($\mu g/m^3$)			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis ($\mu g/m^3$)			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
ex. ethanol	*64175*	*18843*	*3769*	*N/A*	*0.75*	*1500*	*0.89*	*N/A*	*N/A*	*N/A*	*N/A*	*AER*
ex. benzene	*71432*	*80*	*16*	*0.13*	*1.00*	*400*	*0.04*	*36.52*	*1.5*	*1.05*	*0.12*	*Screen*
See attachment												

(attach additional sheets as necessary)

If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
TAPs

Pollutant	CAS	Class I or II	Premise Emissions (lb/hr)	Premise Emissions (lb/yr)	Screening Level	AER 8-hr	TAP < AER?
Asphalt Cement	8052-42-4	II	0.035	70.771	50.0	0.179	Yes
Crytalline Silica	14808-60-7	II	0.010	18.582	1.0	0.004	No
Aluminum Silicate	1302-76-7	II	0.026	50.750	10.0	0.036	Yes
Chromium Compounds (as Chromium)	7440-47-3	II	0.001	1.218	5.0	0.018	Yes
Manganese Compounds (as Manganese)	7439-96-5	II	0.001	1.218	2.0	0.007	Yes
Iron Compounds (as Iron)	7439-89-6	II	0.001	1.218	1230.0	4.403	Yes
Calcium Compounds (Calcium Oxide)	1305-78-8	II	0.0005	0.943	20.0	0.072	Yes
Calcium Hydroxide	1305-62-0	II	0.054	92.383	50.0	0.179	Yes

AER = SL * 0.00358 for shorter and/or fugitive sources

SCREEN3:

Pollutant	CAS	lb/hr	SCREEN3 8-hr Result µg/m^3	8-hr Screening Level µg/m^3	Below Screening Level?
Crytalline Silica	14808-60-7	0.010	0.88	1.0	Yes

Model Inputs:

Area Source Area:	8,050.0	m^2	
Area Source Height:	6.1	m	
Unit Area Source Emission Rate:	1.57E-05	g/(s-m^2)	(where 1 lb/hr = 0.126 g/s)
SCREEN3 Normalized 1-hr Impact:	129.9	µg/m^3	
Normalized 8-hr Impact:	90.93	µg/m^3	(after application of EPA-recommended adjustment factor of 0.7)

05/27/22
10:49:09

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 13043 ***

GSI Area Source

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =         AREA
   EMISSION RATE (G/(S-M**2)) =     0.157000E-04
   SOURCE HEIGHT (M)          =       6.1000
   LENGTH OF LARGER SIDE (M)  =     115.0000
   LENGTH OF SMALLER SIDE (M) =      70.0000
   RECEPTOR HEIGHT (M)        =       0.0000
   URBAN/RURAL OPTION         =        URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =    0.000 M**4/S**3;  MOM. FLUX =    0.000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
24.	68.63	4	1.0	1.0	320.0	6.10	20.
100.	128.0	5	1.0	1.0	10000.0	6.10	27.
200.	85.65	5	1.0	1.0	10000.0	6.10	2.
300.	51.76	5	1.0	1.0	10000.0	6.10	0.
400.	34.03	5	1.0	1.0	10000.0	6.10	0.
500.	24.19	5	1.0	1.0	10000.0	6.10	1.
600.	18.23	5	1.0	1.0	10000.0	6.10	2.
700.	14.35	5	1.0	1.0	10000.0	6.10	1.
800.	11.68	5	1.0	1.0	10000.0	6.10	1.
900.	9.753	5	1.0	1.0	10000.0	6.10	1.
1000.	8.309	5	1.0	1.0	10000.0	6.10	1.
1100.	7.195	5	1.0	1.0	10000.0	6.10	4.
1200.	6.321	5	1.0	1.0	10000.0	6.10	2.
1300.	5.618	5	1.0	1.0	10000.0	6.10	2.
1400.	5.040	5	1.0	1.0	10000.0	6.10	2.
1500.	4.559	5	1.0	1.0	10000.0	6.10	4.

```
  1600.    4.155        5     1.0    1.0 10000.0    6.10      4.
  1700.    3.811        5     1.0    1.0 10000.0    6.10      4.
  1800.    3.515        5     1.0    1.0 10000.0    6.10      4.
  1900.    3.259        5     1.0    1.0 10000.0    6.10      4.
  2000.    3.035        5     1.0    1.0 10000.0    6.10      2.
  2100.    2.838        5     1.0    1.0 10000.0    6.10      2.
  2200.    2.663        5     1.0    1.0 10000.0    6.10      2.
  2300.    2.506        5     1.0    1.0 10000.0    6.10      2.
  2400.    2.365        5     1.0    1.0 10000.0    6.10      2.
  2500.    2.237        5     1.0    1.0 10000.0    6.10      3.
  2600.    2.122        5     1.0    1.0 10000.0    6.10      4.
  2700.    2.018        5     1.0    1.0 10000.0    6.10      4.
  2800.    1.922        5     1.0    1.0 10000.0    6.10      4.
  2900.    1.835        5     1.0    1.0 10000.0    6.10      4.
  3000.    1.755        5     1.0    1.0 10000.0    6.10      4.
  3500.    1.437        5     1.0    1.0 10000.0    6.10      4.
  4000.    1.213        5     1.0    1.0 10000.0    6.10      4.
  4500.    1.047        5     1.0    1.0 10000.0    6.10      4.
  5000.   0.9197        5     1.0    1.0 10000.0    6.10      4.
  5500.   0.8194        5     1.0    1.0 10000.0    6.10      2.
  6000.   0.7381        5     1.0    1.0 10000.0    6.10      2.
  6500.   0.6711        5     1.0    1.0 10000.0    6.10      2.
  7000.   0.6149        5     1.0    1.0 10000.0    6.10      2.
  7500.   0.5672        5     1.0    1.0 10000.0    6.10      2.
  8000.   0.5263        5     1.0    1.0 10000.0    6.10      2.
  8500.   0.4907        5     1.0    1.0 10000.0    6.10      4.
  9000.   0.4596        5     1.0    1.0 10000.0    6.10      2.
  9500.   0.4322        5     1.0    1.0 10000.0    6.10      2.
 10000.   0.4077        5     1.0    1.0 10000.0    6.10      2.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND    24. M:
   110.    129.9        5     1.0    1.0 10000.0    6.10     26.

     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

 CALCULATION        MAX CONC    DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   ---------   -------
SIMPLE TERRAIN       129.9          110.        0.


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
```

ATTACHMENT D-8

- FORM 6
(WATER TRUCK)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation Gray & Son, Inc.	**Telephone No.** (410) 771-4311		**Date of Application** June __, 2022
2. Mailing Address 430 West Padonia Road	**City** Timonium	**Zip Code** 21093	**County** Baltimore
3. Equipment Location 600 Todds Lane	**City/Town or P.O.** Rosedale		**County** Baltimore
4. Signature of Owner or Operator	**Title** General Manager-Demolition/Material Resources		**Print or Type Name** Brandon Bonanno
5. Application Type:	**Alteration** ☐		**New Construction** ☒
6. Date Construction is to Start: July 2022			**Completion Date (Estimate):** August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Water truck or trailer-mounted fogger for wet suppression (type)

8. Gas Cleaning Equipment Manufacturer N/A	**Model No.**	**Collection Efficiency (Design Criteria)**

9. Type of Equipment which Control Equipment is to Service:
Water truck or trailer-mounted fogger will be used, as needed, to provide wet suppression of dust generation from facility roads and material storage piles.

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

Form number: 6
Revision date: 0/2000
TTY Users 1-800-735-2258

Recycled Paper

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	_____	ACFM*	_____	ACFM*
Gas Temperature	_____	°F	_____	°F
Gas Pressure	_____	INCHES W.G.	_____	INCHES W.G.

PRESSURE DROP _____

Dust Loading	_____	GRAINS/ACFD**	_____	GRAINS/ACFD**
Moisture Content OR	_____	%	_____	%
Wet Bulb Temperature	_____	°F	_____	°F
Liquid Flow Rate (Wet Scrubber)	_____	GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See process flow diagram included with the PTC application package for this project.

Date Received: **Local** _____ _____ **State** _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ **Date** _____

ATTACHMENT E EMISSIONS CALCULATIONS

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
Summary (Tons per year)

Pollutant	Jaw Crusher	Cone Crusher	Impact Crusher	Main Screener	2nd Screener	Stackers	Trommel	TOTAL (TPY)
Engines (plus Fugitive Particulates)								
PM	0.154	0.107	0.156	0.006	0.191	0.055	3.354	**4.02**
PM_{10}	0.066	0.046	0.068	0.004	0.065	0.025	1.183	**1.46**
$PM_{2.5}$	0.013	0.010	0.015	0.004	0.041	0.015	0.006	**0.10**
NOx	0.096	0.122	0.155	0.102	0.063	1.641	0.077	**2.26**
VOC	0.005	0.005	0.009	0.003	0.002	1.641	0.003	**1.67**
CO	0.002	0.003	0.052	0.007	0.004	0.474	0.008	**0.55**
SO2	0.746	0.649	0.800	0.316	0.194	0.339	0.257	**3.30**
Engine HAPs								
Benzene	0.003	0.002	0.003	0.001	0.0006	0.001	0.001	**0.01**
Toluene	0.001	0.001	0.001	0.0004	0.0003	0.0005	0.0004	**0.005**
Xylenes	0.001	0.001	0.001	0.0003	0.0002	0.0003	0.0002	**0.003**
1,3-Butadiene	0.0001	0.0001	0.0001	0.00004	0.00003	0.00005	0.00003	**0.0005**
Formaldehyde	0.004	0.003	0.003	0.001	0.001	0.001	0.001	**0.01**
Acetaldehyde	0.002	0.002	0.002	0.001	0.0005	0.001	0.001	**0.01**
Acrolein	0.0003	0.0002	0.0003	0.0001	0.00006	0.0001	0.0001	**0.001**
PAHs	0.001	0.000	0.000	0.0002	0.0001	0.0002	0.0001	**0.002**
Fugitive TAPs								
Asphalt Cement	0.012	NA	0.016	0.002	0.002	0.004	NA	**0.04**
Crystalline Silica	0.002	0.0005	0.001	0.004	0.001	0.0006	NA	**0.01**
Aluminum Silicate	0.008	NA	NA	0.011	0.004	0.002	NA	**0.03**
Chromium Compounds	0.000	NA	NA	0.000	0.0001	0.00004	NA	**0.001**
Manganese Compounds	0.000	NA	NA	0.000	0.0001	0.00004	NA	**0.001**
Iron Compounds	0.000	NA	NA	0.000	0.0001	0.00004	NA	**0.001**
Calcium Compounds	0.000	NA	NA	0.0002	0.00006	0.00003	NA	**0.000**
Calcium Hydroxide	0.009	0.018	NA	0.013	0.004	0.002	NA	**0.05**

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
Stack Emissions for Engines

	HP	kW	Days/yr	Hr/day	Hr/Yr	Note
Jaw Crusher	350	260.99	260	8	2080	EPA Tier 4F
Cone Crusher	440	328.11	180	8	1440	EPA Tier 4F
Main Screener	148	110.36	260	8	2080	EPA Tier 4F
2nd Screener	131.3	97.91	180	8	1440	EPA Tier 4F
Impactor	375	279.64	260	8	2080	EPA Tier 4F
Trommel	174	129.75	180	8	1440	EPA Tier 4F
Stacker G4306386	53	39.52	260	8	2080	EPA Tier 4F

Jaw Crusher: HP = 350

Pollutant	Emission Factor		Emissions			
	g/hr	Source		lb/hr	lb/day	TPY
NOx	42	Manufacturer Data		0.093	0.741	0.096
VOC	2			0.004	0.035	0.005
PM	0.1			0.0002	0.002	0.0002
CO	1			0.002	0.018	0.002
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.718	5.740	0.746
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.003	0.023	0.003
Toluene	4.09E-04		2.863E-06	0.001	0.010	0.001
Xylenes	2.85E-04		1.995E-06	0.001	0.007	0.001
1,3-Butadiene	3.91E-05		2.737E-07	0.0001	0.001	0.0001
Formaldehyde	1.18E-03		8.26E-06	0.004	0.029	0.004
Acetaldehyde	7.67E-04		5.369E-06	0.002	0.019	0.002
Acrolein	9.25E-05		6.475E-07	0.0003	0.002	0.0003
PAHs	1.68E-04		1.176E-06	0.001	0.004	0.001

Cone Crusher: Serial #: N3F01896 HP = 440

Pollutant	Emission Factor		Emissions			
	g/hr	Source		lb/hr	lb/day	TPY
NOx	77	Manufacturer Data		0.170	1.358	0.122
VOC	3			0.007	0.053	0.005
PM	0.5			0.001	0.009	0.001
CO	2			0.004	0.035	0.003
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.902	7.216	0.649
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.003	0.023	0.002
Toluene	4.09E-04		2.863E-06	0.001	0.010	0.001
Xylenes	2.85E-04		1.995E-06	0.001	0.007	0.001
1,3-Butadiene	3.91E-05		2.737E-07	0.0001	0.001	0.0001
Formaldehyde	1.18E-03		8.26E-06	0.004	0.029	0.003
Acetaldehyde	7.67E-04		5.369E-06	0.002	0.019	0.002
Acrolein	9.25E-05		6.475E-07	0.0003	0.002	0.0002
PAHs	1.68E-04		1.176E-06	0.001	0.004	0.0004

Main Screener Serial #: JKT13901 HP = 148

Pollutant	Emission Factor		Emissions			
	g/hp-hr	Source	g/hr	lb/hr	lb/day	TPY
NOx	0.3	Manufacturer Data	44.4	0.0979	0.783	0.1018
VOC	0.01		1.48	0.0033	0.026	0.0034
PM	0.01		1.48	0.0033	0.026	0.0034
CO	0.02		2.96	0.0065	0.052	0.0068
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.3034	2.427	0.3155
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.0010	0.008	0.001
Toluene	4.09E-04		2.863E-06	0.00042	0.003	0.0004
Xylenes	2.85E-04		1.995E-06	0.00030	0.002	0.0003
1,3-Butadiene	3.91E-05		2.737E-07	0.00004	0.0003	0.00004
Formaldehyde	1.18E-03		8.26E-06	0.0012	0.010	0.001
Acetaldehyde	7.67E-04		5.369E-06	0.00079	0.006	0.001
Acrolein	9.25E-05		6.475E-07	0.00010	0.001	0.0001
PAHs	1.68E-04		1.176E-06	0.00017	0.001	0.0002

2nd Screener Serial #: JKT18169 HP = 131.3

Pollutant	Emission Factor		Emissions			
	g/hp-hr	Source	g/hr	lb/hr	lb/day	TPY
NOx	0.3	381	39.39	0.087	0.695	0.063
VOC	0.01		1.313	0.003	0.023	0.002
PM	0.01		1.313	0.003	0.023	0.002
CO	0.02		2.626	0.006	0.046	0.004
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.269	2.153	0.194
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.0009	0.007	0.001
Toluene	4.09E-04		2.863E-06	0.00038	0.003	0.0003
Xylenes	2.85E-04		1.995E-06	0.00026	0.002	0.0002
1,3-Butadiene	3.91E-05		2.737E-07	0.00004	0.0003	0.00003
Formaldehyde	1.18E-03		8.26E-06	0.0011	0.009	0.001
Acetaldehyde	7.67E-04		5.369E-06	0.00070	0.006	0.001
Acrolein	9.25E-05		6.475E-07	0.00009	0.001	0.0001
PAHs	1.68E-04		1.176E-06	0.00015	0.001	0.0001

Impactor Serial #: NGH01900 HP = 375

Pollutant	Emission Factor		Emissions			
	g/hp-hr	Source	g/hr	lb/hr	lb/day	TPY
NOx	0.18	Manufacturer Data	67.5	0.149	1.190	0.155
VOC	0.01		3.75	0.008	0.066	0.009
PM	0		1	0.002	0.018	0.002
CO	0.06		22.5	0.050	0.397	0.052
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.769	6.150	0.800
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.0024	0.020	0.003
Toluene	4.09E-04		2.863E-06	0.00107	0.009	0.001
Xylenes	2.85E-04		1.995E-06	0.00075	0.006	0.001
1,3-Butadiene	3.91E-05		2.737E-07	0.00010	0.001	0.0001
Formaldehyde	1.18E-03		8.26E-06	0.00310	0.025	0.003
Acetaldehyde	7.67E-04		5.369E-06	0.00201	0.016	0.002
Acrolein	9.25E-05		6.475E-07	0.00024	0.002	0.0003
PAHs	1.68E-04		1.176E-06	0.00044	0.004	0.0005

Trommel Serial #: JKT04627 HP = 174

Pollutant	Emission Factor		Emissions			
	g/hp-hr	Source	g/hr	lb/hr	lb/day	TPY
NOx	0.28	Manufacturer Data	48.72	0.107	0.859	0.077
VOC	0.01		1.74	0.004	0.031	0.003
PM	0.02		3.48	0.008	0.061	0.006
CO	0.03		5.22	0.012	0.092	0.008
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.357	2.854	0.257
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.0011	0.009	0.001
Toluene	4.09E-04		2.863E-06	0.0005	0.004	0.0004
Xylenes	2.85E-04		1.995E-06	0.0003	0.003	0.0002
1,3-Butadiene	3.91E-05		2.737E-07	0.00005	0.0004	0.00003
Formaldehyde	1.18E-03		8.26E-06	0.0014	0.011	0.001
Acetaldehyde	7.67E-04		5.369E-06	0.0009	0.007	0.001
Acrolein	9.25E-05		6.475E-07	0.0001	0.001	0.0001
PAHs	1.68E-04		1.176E-06	0.0002	0.002	0.0001

Stacker Serial #: G4306386 HP = 53

Pollutant	Emission Factor		Emissions (each unit)				3 units
	g/hp-hr	Source	g/hr	lb/hr	lb/day	TPY	TPY
NOx	4.5	Manufacturer Data	238.500	0.526	4.206	0.547	1.641
VOC	4.5		238.500	0.526	4.206	0.547	1.641
PM	0.03		1.590	0.004	0.028	0.004	0.011
CO	1.3		68.900	0.152	1.215	0.158	0.474
SO2	0.00205	lb/hp-hr; AP-42, 3.3-1		0.109	0.869	0.113	0.339
HAP	**lb/MMBtu**	**Source**	**lb/hp-hr**	**lb/hr**	**lb/day**	**TPY**	**3 units - TPY**
Benzene	9.33E-04	AP-42, Table 3.3-2	6.531E-06	0.0003	0.003	0.0004	0.001
Toluene	4.09E-04		2.863E-06	0.0002	0.001	0.0002	0.0005
Xylenes	2.85E-04		1.995E-06	0.0001	0.001	0.0001	0.0003
1,3-Butadiene	3.91E-05		2.737E-07	0.00001	0.0001	0.00002	0.00005
Formaldehyde	1.18E-03		8.26E-06	0.0004	0.004	0.0005	0.001
Acetaldehyde	7.67E-04		5.369E-06	0.0003	0.002	0.0003	0.001
Acrolein	9.25E-05		6.475E-07	0.00003	0.0003	0.00004	0.0001
PAHs	1.68E-04		1.176E-06	0.0001	0.0005	0.0001	0.0002

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
Crushing Emissions (Controlled with water spray)

Process	Control Efficiency	Controlled Emission Factors (lb/ton)												
		PM	PM_{10}	$PM_{2.5}$	Asphalt Cement	Crystalline Silica in Asphalt	Crystalline Silica in Brick	Aluminum Silicate in Brick	Chromium Compounds in Brick	Manganese Compounds in Brick	Iron Compounds in Brick	Calcium Compounds in Brick	Crystalline Silica in Concrete	Calcium Hydroxide in Concrete
Crushing [1]	included in emission factor	1.20E-03	5.40E-04	1.00E-04	1.35E-04	5.40E-06	8.10E-05	3.38E-04	8.10E-06	8.10E-06	8.10E-06	8.10E-06	5.40E-06	1.08E-04
Material Transfer within Crushing Equipment [2]	included in emission factor	1.40E-04	4.60E-05	1.30E-05	1.15E-05	4.60E-07	6.90E-06	2.88E-05	6.90E-07	6.90E-07	6.90E-07	6.90E-07	4.60E-07	9.20E-06
Material Transfer to Pile/Equipment [2]	included in emission factor	1.40E-04	4.60E-05	1.30E-05	1.15E-05	4.60E-07	6.90E-06	2.88E-05	6.90E-07	6.90E-07	6.90E-07	6.90E-07	4.60E-07	9.20E-06

[1] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Crushing (controlled with water suppression)*
[2] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Conveyor Transfer Point (controlled with water suppression). Transfer to pile is from stackers*

Total Emissions from Crushers

Pollutant	Total TPY	lb/day	lb/hr
PM	0.41	3.55	0.44
PM_{10}	0.18	1.52	0.19
$PM_{2.5}$	0.04	0.30	0.04
Asphalt Cement	0.03	0.21	0.03
Crystalline Silica	0.00	0.03	0.00
Aluminum Silicate	0.01	0.06	0.01
Chromium Compounds	0.0002	0.002	0.0002
Manganese Compounds	0.0002	0.002	0.0002
Iron Compounds	0.0002	0.002	0.0002
Calcium Compounds	0.0002	0.002	0.0002
Calcium Hydroxide	0.03	0.28	0.03

Jaw Crusher:

Amount of material processed (Tons/yr): 20,800 41,600 145,600

Operation Time: 260 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TPY			TOTAL TPY	lb/day	lb/hr
		Asphalt	Brick	Concrete			
PM	0.0015	0.015	0.031	0.108	0.154	1.184	0.148
PM_{10}	0.0006	0.007	0.013	0.046	0.066	0.506	0.063
$PM_{2.5}$	0.0001	0.001	0.003	0.009	0.013	0.101	0.013
Asphalt Cement	0.0002	NA	NA	0.012	0.012	0.088	0.011
Crystalline Silica: in Asphalt	0.00001	NA	NA	0.0005	0.0005	0.004	0.0004
in Brick	0.00009	NA	0.002	NA	0.002	0.015	0.002
in Concrete	0.00001	0.0001	NA	NA	0.000	0.001	0.0001
Aluminum Silicate	0.00040	NA	0.008	NA	0.008	0.063	0.008
Chromium Compounds	0.00001	NA	0.0002	NA	0.0002	0.002	0.0002
Manganese Compounds	0.00001	NA	0.0002	NA	0.0002	0.002	0.0002
Iron Compounds	0.00001	NA	0.0002	NA	0.0002	0.002	0.0002
Calcium Compounds	0.00001	NA	0.0002	NA	0.0002	0.002	0.0002
Calcium Hydroxide	0.00013	NA	NA	0.009	0.009	0.071	0.009

Cone Crusher: (only processes concrete)

Amount of material processed (Tons/yr): 0 0 144,000

Operation Time: 180 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TPY			TOTAL TPY	lb/day	lb/hr
		Asphalt	Brick	Concrete			
PM	0.0015	NA	NA	0.107	0.107	1.184	0.148
PM_{10}	0.0006	NA	NA	0.046	0.046	0.506	0.063
$PM_{2.5}$	0.0001	NA	NA	0.009	0.009	0.101	0.013
Asphalt Cement	0.0002	NA	NA	NA	0.000	0.000	0.000
Crystalline Silica: in Asphalt	0.00001	NA	NA	NA	0.000	0.000	0.000
in Brick	0.00009	NA	NA	NA	0.000	0.000	0.000
in Concrete	0.00001	NA	NA	0.0005	0.0005	0.005	0.001
Aluminum Silicate	0.00040	NA	NA	NA	0.000	0.000	0.000
Chromium Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Manganese Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Iron Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Calcium Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Calcium Hydroxide	0.00013	NA	NA	0.018	0.018	0.204	0.026

Impactor: (only processes asphalt)

Amount of material processed (Tons/yr): 208,000 0 0

Operation Time: 260 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TPY			TOTAL TPY	lb/day	lb/hr
		Asphalt	Brick	Concrete			
PM	0.0015	0.154	NA	NA	0.154	1.184	0.148
PM_{10}	0.0006	0.066	NA	NA	0.066	0.506	0.063
$PM_{2.5}$	0.0001	0.013	NA	NA	0.013	0.101	0.013
Asphalt Cement	0.0002	0.016	NA	NA	0.016	0.126	0.016
Crystalline Silica: Asphalt	0.00001	0.001	NA	NA	0.001	0.005	0.001
Brick	0.0001	NA	NA	NA	0.000	0.000	0.000
Concrete	0.0000	NA	NA	NA	0.000	0.000	0.000
Aluminum Silicate	0.0004	NA	NA	NA	0.000	0.000	0.000
Chromium Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Manganese Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Iron Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Calcium Compounds	0.00001	NA	NA	NA	0.000	0.000	0.000
Calcium Hydroxide	0.0001	NA	NA	NA	0.000	0.000	0.000

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
Stacker Emissions (Controlled with water spray)

Process	Control Efficiency	Controlled Emission Factors (lb/ton)												
		PM	PM_{10}	$PM_{2.5}$	Asphalt Cement	Crystalline Silica in Asphalt	Crystalline Silica in Brick	Aluminum Silicate in Brick	Chromium Compounds in Brick	Manganese Compounds in Brick	Iron Compounds in Brick	Calcium Compounds in Brick	Crystalline Silica in Concrete	Calcium Hydroxide in Concrete
Material Transfer to Pile/Equipment [1]	included in emission factor	1.40E-04	4.60E-05	1.30E-05	1.15E-05	4.60E-07	6.90E-06	2.88E-05	6.90E-07	6.90E-07	6.90E-07	6.90E-07	4.60E-07	9.20E-06

[1] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Conveyor Transfer Point (controlled with water suppression). Transfer to pile is from stackers*

Total Emissions **3 Stackers**

Pollutant	Total TPY	lb/day	lb/hr
PM	0.04	0.34	0.04
PM_{10}	0.01	0.11	0.014
$PM_{2.5}$	0.00	0.03	0.004
Asphalt Cement	0.004	0.03	0.003
Crystalline Silica	0.001	0.00	0.001
Aluminum Silicate	0.002	0.01	0.002
Chromium Compounds	0.00004	0.0003	0.00004
Manganese Compounds	0.00004	0.0003	0.00004
Iron Compounds	0.00004	0.0003	0.00004
Calcium Compounds	0.00003	0.0002	0.00003
Calcium Hydroxide	0.002	0.015	0.002

Stacker: (each)

Amount of material processed (Tons/yr): 20,800 41,600 145,600

Operation Time: 260 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TPY			TOTAL TPY	lb/day	lb/hr
		Asphalt	Brick	Concrete			
PM	0.0001	0.001	0.003	0.010	0.015	0.112	0.014
PM_{10}	0.00005	0.0005	0.001	0.003	0.005	0.037	0.005
$PM_{2.5}$	0.00001	0.0001	0.0003	0.001	0.001	0.010	0.001
Asphalt Cement	0.00001	0.0001	0.0002	0.001	0.001	0.009	0.001
Crystalline Silica: in Asphalt	0.0000005	0.000005	NA	NA	0.000005	0.00004	0.000005
in Brick	0.00001	NA	0.0001	NA	0.0001	0.001	0.0001
in Concrete	0.000001	NA	NA	0.0001	0.0001	0.000	0.0000
Aluminum Silicate	0.000029	NA	0.001	NA	0.001	0.005	0.0006
Chromium Compounds	0.000001	NA	0.00001	NA	0.00001	0.0001	0.00001
Manganese Compounds	0.000001	NA	0.00001	NA	0.00001	0.0001	0.00001
Iron Compounds	0.000001	NA	0.00001	NA	0.00001	0.0001	0.00001
Calcium Compounds	0.0000005	NA	0.00001	NA	0.00001	0.0001	0.00001
Calcium Hydroxide	0.00001	NA	NA	0.001	0.001	0.005	0.0006

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
Screener Emissions (Controlled with water spray)

Process	Control Efficiency	Controlled Emission Factors (lb/ton)												
		PM	PM_{10}	$PM_{2.5}$	Asphalt Cement	Crystalline Silica in Asphalt	Crystalline Silica in Brick	Aluminum Silicate in Brick	Chromium Compounds in Brick	Manganese Compounds in Brick	Iron Compounds in Brick	Calcium Compounds in Brick	Crystalline Silica in Concrete	Calcium Hydroxide in Concrete
Screening [1]	included in emission factor	0.0022	0.00074	0.00050	0.0002	0.00001	0.00011	4.63E-04	1.11E-05	1.11E-05	1.11E-05	1.11E-05	7.40E-06	1.48E-04
Material Transfer with Screener Equipment [2]	included in emission factor	1.40E-04	4.60E-05	1.30E-05	0.00001	0.0000005	0.00001	2.88E-05	6.90E-07	6.90E-07	6.90E-07	6.90E-07	4.60E-07	9.20E-06
Material Transfer with Screener Equipment [2]	included in emission factor	1.40E-04	4.60E-05	1.30E-05	0.00001	0.0000005	0.00001	2.88E-05	6.90E-07	6.90E-07	6.90E-07	6.90E-07	4.60E-07	9.20E-06
Material Transfer to Pile [2]	included in emission factor	1.40E-04	4.60E-05	1.30E-05	0.00001	0.0000005	0.00001	2.88E-05	6.90E-07	6.90E-07	6.90E-07	6.90E-07	4.60E-07	9.20E-06

[1] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Screening.*
[2] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Conveyor Transfer Point*

Total Screener Emissions

Pollutant	Total TPY	lb/day	lb/hr
PM	0.46	4.19	0.52
PM_{10}	0.15	1.40	0.18
$PM_{2.5}$	0.09	0.86	0.11
Asphalt Cement	0.004	0.04	0.00
Crystalline Silica	0.01	0.04	0.01
Aluminum Silicate	0.02	0.13	0.02
Chromium Compounds	0.000	0.00	0.000
Manganese Compounds	0.000	0.00	0.000
Iron Compounds	0.000	0.00	0.000
Calcium Compounds	0.0002	0.002	0.0003
Calcium Hydroxide	0.02	0.14	0.02

Main Screener:

Amount of material processed (Tons/yr): 20,800 41,600 145,600

Operation Time: 260 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TPY			TOTAL TPY	lb/day	lb/hr
		Asphalt	Brick	Concrete			
PM	0.0026	0.027	0.054	0.191	0.272	2.096	0.262
PM_{10}	0.0009	0.009	0.018	0.064	0.091	0.702	0.088
$PM_{2.5}$	0.0005	0.006	0.011	0.039	0.056	0.431	0.054
Asphalt Cement	0.0002	0.002	NA	NA	0.002	0.018	0.002
Crystalline Silica:							
in Asphalt	0.00001	0.0001	NA	NA	0.0001	0.001	0.0001
in Brick	0.00013	NA	0.0027	NA	0.003	0.021	0.003
in Concrete	0.00001	NA	NA	0.001	0.001	0.007	0.001
Aluminum Silicate	0.00055	NA	0.011	NA	0.011	0.088	0.011
Chromium Compounds	0.00001	NA	0.0003	NA	0.0003	0.002	0.0003
Manganese Compounds	0.00001	NA	0.0003	NA	0.0003	0.002	0.0003
Iron Compounds	0.00001	NA	0.0003	NA	0.0003	0.002	0.0003
Calcium Compounds	0.00001	NA	0.0002	NA	0.0002	0.001	0.0002
Calcium Hydroxide	0.00018	NA	NA	0.013	0.013	0.098	0.012

2nd Screener:

Amount of material processed (Tons/yr): 14,400 14,400 43,200 72,000

Operation Time: 180 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TPY				TOTAL TPY	lb/day	lb/hr
		Asphalt	Brick	Concrete	Soil			
PM	0.0026	0.019	0.019	0.057	0.094	0.189	2.096	0.262
PM_{10}	0.0009	0.006	0.006	0.019	0.032	0.063	0.702	0.088
$PM_{2.5}$	0.0005	0.004	0.004	0.012	0.019	0.039	0.431	0.054
Asphalt Cement	0.0002	0.002	NA	NA	NA	0.0016	0.018	0.002
Crystalline Silica: in Asphalt	0.00001	0.00006	NA	NA	NA	0.00006	0.0007	0.0001
in Brick	0.00013	NA	0.001	NA	NA	0.0009	0.011	0.001
in Concrete	0.00001	NA	NA	0.0003	NA	0.0003	0.003	0.0004
Aluminum Silicate	0.00055	NA	0.004	NA	NA	0.004	0.044	0.005
Chromium Compounds	0.00001	NA	0.0001	NA	NA	0.00009	0.0011	0.0001
Manganese Compounds	0.00001	NA	0.0001	NA	NA	0.00009	0.0011	0.0001
Iron Compounds	0.00001	NA	0.0001	NA	NA	0.00009	0.0011	0.0001
Calcium Compounds	0.00001	NA	0.00006	NA	NA	0.00006	0.0007	0.0001
Calcium Hydroxide	0.00018	NA	NA	0.004	NA	0.004	0.042	0.005

GSI - Todds Lane Material Processing Operation
Maximum Expected Emissions Estimates
Trommel Emissions (Uncontrolled) for Processing Soil Only

Process	Control Efficiency	Uncontrolled Emission Factors (lb/ton)		
		PM	PM_{10}	$PM_{2.5}$
Trommel/Screening [1]	NA	0.025	0.0087	ND
Conveyor Transfer within equipment [2]	NA	0.0030	0.0011	ND
Material Transfer to Pile [2]	NA	0.0030	0.0011	ND

[1] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Screening. Assume both screeners and trommel use these factors*

[2] ***Reference:*** *AP 42, Fifth Edition, 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2, Conveyor Transfer Point*

Total Emissions

Pollutant	TPY	lb/day	lb/hr
PM	3.348	37.200	4.650
PM_{10}	1.177	13.080	1.635
$PM_{2.5}$	NA	NA	NA

Trommel:

Amount of material processed (Tons/yr): 216,000.00 Operation Time: 180 days/yr 8 hrs/day

Pollutant	EF (lb/T)	TOTAL TPY	lb/day	lb/hr
PM	0.0310	3.348	37.200	4.650
PM_{10}	0.0109	1.177	13.080	1.635
$PM_{2.5}$	ND	NA	NA	NA

GSI - Todds Lane Material Processing Operation
Composition & TAPS Screening Levels (SL)/Allowable Emission Rates (AER) Based on SDS Data

Material	Listed TAP Components	CAS Number	Average Wt%	8-HR SL	AER
Waste Asphalt	Aggregate (crushed stone, sand, gravel, slag)	N/A	75.0	N/A	N/A
	Asphalt Cement *	8052-42-4	25.0	50.0	0.179
	Silica, Crystalline - Quartz *	14808-60-7	1.00	1.00	0.00358
Brick	Quartz *	14808-60-7	15.00	1.00	0.00358
	Aluminum Silicate	1302-76-7	62.50	10.00	0.0358
	Chromium Compounds	7440-47-3	1.50	5.00	0.0179
	Manganese Compounds	7439-96-5	1.50	2.00	0.00716
	Iron Compounds	7439-89-6	1.50	1230.00	4.4034
	Calcium Compounds	1305-78-8	1.50	20.0	0.0716
Concrete Block	Crystalline silica *	14808-60-7	1.00	1.00	0.00358
	Calcium Hydroxide	1305-62-0	20.00	50.00	0.179
	Portland Cement	65997-15-1	7.50	10.00	0.0358

Notes:
Average weight percentage of material represents the median value of the range, where a range is given, on the SDS
SL calculated using the 1991-1992 ACGIH TWA method. Crystalline Silica (Quartz) SL based on 0.1 TWA as resprirable dust, from 1991-1992 ACGIH; therefore, SL =1
AER for fugitive sources = SL * 0.00358

ATTACHMENT F SAFETY DATA SHEETS

SAFETY DATA SHEET

Effective Date: 3/01/2017
Replaces: 6/01/2015

Recycled Asphalt Product (RAP)

1. Identification

Product name:
Recycled Asphalt Product

Other means of identification/Synonyms/Common Names:
Re-crushed Asphaltic Concrete, Recycled Base (Crushed Misc. Base), Rap Cap Agg.

Recommended use:
Recycled Asphalt Product is used as a construction material.

Recommended restrictions:
None Known

Manufacturer/Contact info:	General Phone Number:
Vulcan Materials Company and its subsidiaries and affiliates 1200 Urban Center Drive Birmingham, AL 35242	1.866.401.5424
	Emergency Phone Number: 1.866.401.5424 (3E Company, 24hours/day, 7 Days/week)
	Website: www.vulcanmaterials.com

2. Hazard(s) Identification

Physical hazards:
Not Classified

Health hazards:
Carcinogenicity-Category 1A
Specific target organ toxicity, repeated exposure- Category 2

Signal word:

Danger

Hazard Statement:
May Cause Cancer (Inhalation).
Causes damage to organs (lungs, respiratory system) through prolonged or repeated exposure (inhalation)

Precautionary statement:

Prevention

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Use personal protective equipment as required. Wear protective gloves, protective clothing, eye protection, and face protection.
- Wash hands thoroughly after handling.
- Do not eat, drink or smoke when using this product.

Response

- If exposed or concerned get medical advice/attention.

Disposal

- Dispose of contents/container in accordance with all local, regional, national, and international regulations.

Supplemental information:
Recycled Asphalt Product contains a naturally occurring mineral complex with varying quantities of quartz (crystalline silica). Respirable Crystalline Silica (RCS) may cause cancer. Recycled Asphalt Product may be subjected to various natural or mechanical forces that produce small particles (dust) which may contain respirable crystalline silica (particles less than 10 micrometers in aerodynamic diameter). Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC, NTP; ACGIH states that it is a suspected cause of cancer.

3. Composition/information on ingredients

Chemical name	CAS number	%
Aggregate (crushed stone, sand, gravel, slag) Quartz (crystalline silica)	Mixture 14808-60-7	60-90 >1
Asphalt Cement Reclaimed product may contain contaminants such as heavy metals, hydrocarbons and various asphalt additives.	8052-42-4	10-40

4. First-aid measures

Inhalation:

Remove person to fresh air. If lung irritation persists or later develops, contact a physician. If not breathing, initiate rescue breathing, give oxygen by trained personnel and get immediate medical attention. Do not attempt to rescue victim from confined spaces without adequate protective equipment.

Eyes:

Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from eye(s). Contact a physician if irritation persists or later develops.

Skin:

Not expected to be a significant exposure route. Clean exposed skin with soap or mild detergent and large amounts of water until all material is removed from the skin. Do not use solvents or thinners to remove material from skin.

Ingestion:

If swallowed, do not induce vomiting. Drink a large volume of water and get immediate medical attention. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than hips to prevent aspiration.

Most important symptoms/effects, acute and delayed:

Dust particles can scratch and irritate the skin with redness, an itching or burning sensation, swelling of the skin and/or rash. Dust may irritate the eyes, skin, and respiratory tract. Breathing respirable crystalline silica-containing dust for prolonged periods in the workplace can cause lung damage and a lung disease called silicosis. Symptoms of silicosis may include (but are not limited to) shortness of breath, difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure.. Unconsciousness and asphyxiation may occur in poorly ventilated or confined spaces. **Note:** Since this product is not sold heated, exposure to asphalt emissions (fumes, vapors, or mists) are expected to be minimal. Potential for exposure increases if product comes in contact with heated surfaces or is heated.

Indication of immediate medical attention and special treatment needed:

Not all individuals with silicosis will exhibit symptoms of the disease. However, silicosis can be progressive and symptoms can appear even years after exposures have ceased. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

For emergencies contact 3E Company at 1.866.401.5424 (24 hours/day, 7 days/week).

5. Fire-fighting measures

Suitable extinguishing media:

Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, halogenated agents, foam, and steam) and water fog.

Unsuitable extinguishing media:

Avoid use of straight-stream water. Adding water to hot asphalt presents an explosion hazard.

Specific hazards arising from the chemical:

Do not heat above flash point. Fumes/vapors can explode when concentrated in an enclosed environment and supplied with an ignition source. Never weld or use a cutting torch or open flame on a full, partially full or empty bin, hopper, or other container that holds or has held asphaltic material unless precautions are taken to prevent explosion. WARNING: Hydrogen sulfide (H_2S) and other hazardous gases/vapors may evolve and collect in the headspace of storage tanks or other enclosed vessels, and can create an explosive, toxic, or oxygen deficient atmosphere. H_2S gas is extremely flammable and can explode if an ignition source is provided. See Section 11 for health effects of H_2S gas.

Special protective equipment and precautions for firefighters:
Avoid breathing irritating and potentially toxic fumes, including hydrogen sulfide gas. Firefighters should wear NIOSH/MSHA approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

Fire-fighting equipment/instructions:
Adding water to hot asphalt presents an explosion hazard.

Specific methods:
Use water spray to keep fire-exposed containers cool.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:
Ventilate area and avoid inhalation by using appropriate precautions outlined in this SDS (see Section 8). Prevent materials from entering streams, drainages, or sewers. Spills entering surface waters or sewers entering/leading to surface waters must be reported to the National Response Center 1-800-424-8802. Based on volume and use, components of this product may be subject to reporting requirements of Title III of SARA, 1986, and 40 CFR 372.
For emergencies, contact 3E Company at 1-866-401-5424 (24 hours/day, 7 days/week).

Environmental precautions:
Contain spilled material with sand, aggregate fines, or other inert adsorbent. Collect adsorbed product and clean up materials in appropriate container for proper disposal. Notify proper authorities.

Methods and materials for containment and cleaning up:
Contact the asphalt plant to determine feasibility of recycling material. Dispose of waste materials in accordance with applicable federal, state and local laws and regulations.

7. Handling and storage

Precautions for safe handling:
Follow personal protection and protective controls set forth in Section 8 of this SDS when handling this product. If personnel must enter a tank or other confined space that contained this material, follow the OSHA Confined Space Entry Program as specified in 29 CFR 1910.146. Do not store near food, beverages or smoking materials. Respirable crystalline silica-containing dust may be generated when recycled asphalt product is subjected to mechanical forces, such as demolition work, surface treatment (sanding, grooving, chiseling, etc.), and/or recycling of pavement.
Do not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition as they may explode and cause injury or death. Tripping accidents have occurred because of asphalt buildup on bottoms of shoes and boots; buildup should be removed regularly to prevent such accidents. Do not use solvents or thinners to clean footwear.

Conditions for safe storage, including any incompatibilities:
Store away from all ignition sources and open flames in accordance with applicable laws and regulations.
When petroleum asphalt products are heated, potentially irritating emissions (fumes, mists, and vapors) may be released.

8. Exposure controls/personal protection

Legend:
NE = Not Established; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Limit; OSHA = Occupational Safety and Health Administration; MSHA = Mine Safety and Health Administration; NIOSH = National Institute for Occupational Safety and Health; ACGIH = American Conference of Governmental Industrial Hygienists

Component	OSHA/MSHA PEL	ACGIH TLV	NIOSH REL
Particulates not otherwise classified	15 m (total dust) 5 (respirable fraction)	10 (inhalable fraction) 3 mg/m^3 (respirable fraction)	NE
Respirable dust containing silica	10 ÷ (% silica + 2)	Use Respirable Silica TLV	Use Respirable Silica TLV
Total dust containing silica	MSHA: 30 ÷ (% silica + 3)	NE	NE

Legend:
NE = Not Established; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Limit; OSHA = Occupational Safety and Health Administration; MSHA = Mine Safety and Health Administration; NIOSH = National Institute for Occupational Safety and Health; ACGIH = American Conference of Governmental Industrial Hygienists

Component	OSHA/MSHA PEL	ACGIH TLV	NIOSH REL
Respirable Crystalline Silica (quartz)	OSHA: 0.05 (PEL) OSHA: 0.025 (Action Level) MSHA: Use Respirable Dust containing Silica PEL (above)	0.025	0.05
Respirable Tridymite and Cristobalite (other forms of crystalline silica)	OSHA: Use respirable crystalline silica PEL MSHA: 1/2 of respirable dust containing silica PEL	0.025	0.05

Exposure Guidelines:
Total dust containing silica, respirable silica-containing dust and respirable crystalline silica (quartz) levels should be monitored regularly to determine worker exposure levels. Exposure levels in excess of allowable exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee workstations.

Engineering Controls:
Activities with dried/hardened product that generate dust require the use of general ventilation, local exhaust and/or wet suppression methods to maintain exposures below appropriate exposure limits.

Eye Protection:
Safety glasses with side shields should be worn as minimum protection at ambient temperatures. Contact lens should not be worn when eye contact with product is possible.

Skin Protection (Protective Gloves/Clothing):
Avoid skin contact with material by wearing impervious gloves and protective clothing. With product at ambient temperatures, use disposable nitrile, neoprene or butyl rubber material.

Respiratory Protection:
Not expected to be necessary under normal use and working conditions. All respirators must be NIOSH-approved for the exposure levels present. (See NIOSH Respirator Selection Guide). The need for respiratory protection should be evaluated by a qualified safety and health professional. For air-contaminant concentrations which exceed or are likely to exceed applicable exposure limits, use a NIOSH-approved, contaminant-specific, air purifying respirator. If such conditions are sufficiently high that the air-purifying respirator is inadequate, or if oxygen adequate to sustain life is not present, use a positive-pressure, self-contained breathing apparatus. Activities that generate dust require the use of an appropriate dust respirator where dust levels exceed or are likely to exceed allowable exposure limits. For respirable silica-containing dust levels that exceed or are likely to exceed an 8-hour time-weighted average (TWA) of 0.25 $\mathrm{mg/m^3}$, a high efficiency particulate filter respirator must be worn at a minimum; however, if respirable silica-containing dust levels exceed or are likely to exceed an 8-hour TWA of 1.25 $\mathrm{mg/m^3}$ an air-purifying, full-face respirator or equivalent is required. Respirator use must comply with applicable MSHA (42 CFR 84) or OSHA (29 CFR 1910.134) standards, which include provisions for a user training program, respirator inspection, repair and cleaning, respirator fit testing, medical surveillance and other requirements.

9. Physical and chemical properties

Appearance:
Angular particles, light salt and pepper colored ranging in size from 1 ½ inch down to 200 mesh.

Odor: Petroleum odor.	**PH:** Not applicable	**Decomposition temperature:** Not applicable
Melting point/freezing point: Not applicable	**Initial boiling point and boiling range:** Not applicable	**Flash point: Product NA** **Asphalt :**> 500°F (min). COC
Evaporation rate: Not applicable	**Flammability:** Not applicable	**Upper/lower flammability or explosive limits:** Not applicable
Vapor pressure: Not applicable	**Vapor density:** >1	**Solubility:** Negligible

Partition coefficient: n-octanol/water.	Autoignition temperature:	Specific Gravity (H_2O = 1):
Not applicable	Not applicable	1.0-1.1 @ 60° F

10. Stability and reactivity

Reactivity:
Not reactive under normal use.

Chemical stability:
Stable under normal temperatures and pressures.

Possibility of hazardous reactions:
None under normal use.

Conditions to avoid (e.g., static discharge, shock or vibration):
Keep away from direct flame/ignition sources. Contact with incompatible materials should be avoided (see below). See Sections 5, 6 and 7 for additional information.

Incompatible materials:
Strong oxidizers may react with hydrocarbons. Contact with fluorine may cause burning or explosion. Adding water to hot asphalt presents an explosion hazard.

Hazardous decomposition products:
Carbon monoxide and other compounds (such as amines, ammonia, nitrogen dioxide, sulfur dioxide, ozone, hydrogen sulfide, and various hydrocarbons) may be released by thermal decomposition. Hazardous vapors can collect in enclosed vessels or areas if not properly ventilated. If hydrogen sulfide is present, the flammable limits range from 4.3 to 45.5% by volume and its presence may promote the formation of pyrophoric (spontaneously igniting) iron compounds (See 29 CFR 1910.146). Respirable crystalline silica-containing dust may be generated. When heated, quartz is slowly transformed into tridymite (above 860°C/1580°F) and cristobalite (above 1470°C/2678°F). Both tridymite and cristobalite are other forms of crystalline silica.

11. Toxicological information

Primary Routes of Exposure:
Inhalation and contact with the eyes and skin.

Symptoms related to the physical, chemical, toxicological characteristics
Inhalation:
Breathing silica containing dust for prolonged periods in the workplace can cause lung damage and lung disease called silicosis. Several scientific organizations have classified crystalline silica as causing lung cancer in humans. Silicosis and lung cancer can result in permanent injury or death.

Eye Contact:
May scratch the eye causing tearing, redness and a stinging sensation.

Skin Contact:
Repeated or prolonged exposure may result in absorption of component petroleum distillates.

Ingestion:
Asphalt has a low toxicity when ingested; however, chewing and swallowing asphalt may cause gastrointestinal effects. Gastric masses (Bezoars) and stomach (pyloric) obstructions have been reported in individuals who have chewed and swallowed asphalt.

Medical Conditions Aggravated by Exposure:
Pre-existing medical conditions that may be aggravated by exposure include disorders of the eye, skin and/or lung.

Delayed and immediate effects and also chronic effects from short- and long-term exposure:
If the product is subjected to mechanical forces (such as demolition or asphalt recycling work), crystalline silica-containing dust particles may be generated. Prolonged overexposure to respirable dusts in excess of allowable exposure limits can cause inflammation of the lungs leading to possible fibrotic changes, a medical condition known as pneumoconiosis.
Prolonged and repeated overexposure to high levels of respirable crystalline silica-containing dust may cause a chronic form of silicosis, an incurable lung disease that may result in permanent lung damage or death. Chronic silicosis generally occurs after 10 years or more of overexposure; a more accelerated type of silicosis may occur between 5 and 10 years of higher levels of prolonged and repeated overexposure. In early stages of silicosis, not all individuals will exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms can appear at any time, even years after exposure has ceased.

Repeated overexposures to very high levels of respirable crystalline silica for periods as short as six months may cause acute silicosis. Acute silicosis is a rapidly progressive, incurable lung disease that is typically fatal. Symptoms include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain.
Respirable dust containing newly broken crystalline silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older crystalline silica particles of similar size. Respirable crystalline silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures to respirable dust containing newly broken particles of respirable crystalline silica.
There are reports in the literature suggesting that excessive respirable crystalline silica exposure may be associated with autoimmune disorders and other adverse health effects involving the kidney. In particular, the incidence of scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) appears to be higher in silicotic individuals. To date, the evidence does not conclusively determine a causal relationship between silica exposure and these adverse health effects.

Carcinogenicity:

If the product is subjected to mechanical forces (such as demolition or asphalt recycling work), crystalline silica-containing dust particles may be generated. Epidemiology studies on the association between respirable crystalline silica exposure and lung cancer have had both positive and negative results. There is some speculation that the source, type, and level of exposure of respirable crystalline silica may play a role. Studies of persons with silicosis indicate an increased risk of developing lung cancer, a risk that increases with the level and duration of exposure. It is not clear whether lung cancer develops in non-silicotic patients. Several studies of silicotics do not account for lung cancer confounders, especially smoking, which have been shown to increase the risk of developing lung disorders, including emphysema and lung cancer.
In October 1996, an IARC Working Group designated respirable crystalline silica as carcinogenic (Group 1). In 2012, an IARC Working Group re-affirmed that inhalation of crystalline silica was a known human carcinogen. The NTP's Report on Carcinogens, 9th edition, lists respirable crystalline silica as a "known human carcinogen." In the year 2000, the American Conference of Governmental Industrial Hygienists (ACGIH) listed respirable crystalline silica (quartz) as a suspected human carcinogen (A-2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to respirable crystalline silica.
Repeated breathing of asphalt emissions has not resulted in a carcinogenic response in laboratory animal testing. Although epidemiological studies on asphalt workers have suggested a possible link between asphalt fumes and certain types of cancer, confounding factors such as smoking and concomitant exposure to other agents in the workplace may have influenced the results of these studies. Asphalt is not listed as a carcinogen by the National Toxicology Program (NTP) or the Occupational Safety and Health Administration (OSHA). IARC states that there is sufficient evidence that extracts (asphalts dissolved in hydrocarbon solvents) are carcinogenic to laboratory animals and recently the agency determined that occupational exposures to oxidized asphalt and their emissions during roofing applications are “probably carcinogenic to humans “(Group 2A). They also determined that occupation exposures to hard asphalts and their emissions during mastic asphalt work and occupational exposures to straight-run asphalts and their emissions during paving operations are “possibly carcinogenic to humans” (Group 2B).

Additional information on toxicological-effects:

Acute toxicity: Not classified
No specific data on product. Based on components, not expected to be classified for acute toxicity.

Asphalt:
Acute Oral, rat: LD50 >5000 mg/kg
Acute Dermal, rat: LD50 >2000 mg/kg

Skin corrosion/irritation: Not Classified

Serious eye damage/eye irritation: Not Classified

Respiratory sensitization: Not Classified

Germ cell Mutagenicity: Not Classified

Carcinogenicity: May cause cancer (Inhalation)

Reproductive toxicity: Not Classified

Specific target organ toxicity - single exposure: Not Classified

Specific target organ- toxicity – repeated exposure: Causes damage to organs (lungs, respiratory system) through prolonged or repeated exposure (inhalation)

Aspiration toxicity: Not Classified (not applicable- solid material)

12. Ecological information

Ecotoxicity (aquatic and terrestrial, where available):
No specific data on this product.

Persistence and degradability:
Expected to be resistant to biodegradation.

Bioaccumulative potential.
Significant migration into the environment and bioaccumulation are unlikely.

Mobility in soil.
Not determined

Other adverse effects.
Not determined

13. Disposal considerations

Safe handling and disposal of waste:
Place contaminated materials in appropriate containers and dispose of in a manner consistent with applicable federal, state, and local regulations. Prevent from entering drainage, sewer systems, and unintended bodies of water. It is the responsibility of the user to determine, at the time of disposal, whether product meets criteria for hazardous waste. Product uses, transformations, mixture and processes, may render the resulting material hazardous.

14. Transport information

UN Number:
Not regulated.

UN Proper shipping name:
Not regulated.

Transport Hazard class:
Not applicable.

Packing group, if applicable:
Not applicable.

Marine pollutant (Yes/No):
Not applicable.

15. Regulatory information

Toxic Substances Control Act (TSCA):
The components in this product are listed on the TSCA Inventory or are exempt.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):
Releases of this material to water may be reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act. (See Section 6)

Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III:
Section 302 extremely hazardous substances: None
Section 311/312 hazard categories: Delayed Health
Section 313 reportable ingredients at or above de minimus concentrations: None

California Proposition 65:
This product contains a chemical (crystalline silica, bitumen, various aromatic hydrocarbons) known to the State of California to cause cancer and birth defects or other reproductive harm.

State Regulatory Lists:
Each state may promulgate standards more stringent than the federal government. This section cannot encompass an

inclusive list or all state regulations. Therefore, the user should review the components listed in Section 2 and consult state or local authorities for specific regulations that apply.

16. Other information

Disclaimer

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

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Issue date:
3/01/2017

Revision date:
3/01/2017

Vulcan Materials Company and its subsidiaries and affiliates
1200 Urban Center Drive
Birmingham, AL 35242

THE BELDEN BRICK COMPANY

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY/UNDERTAKING

Product Identifier

Material Name: Brick

Trade Name:	Clay and/or Shale Brick; Face Brick; Pavers; Red Shale / Fireclay Chemical Resistant Brick
Chemical Family:	Predominately Aluminum Silicates
Formula:	Mixture

Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Intended Use: Building material used for structural support.

Details of the Supplier of the Safety Data Sheet

The Belden Brick Company
PO Box 20910
Canton, OH 44701-0910
Product Support/Technical Services Phone: 330-456-0031

Emergency telephone number: (24 hours): 1-330-456-0031

Contact E-Mail: Info@beldenbrick.com

2. HAZARDS IDENTIFICATION

Appearance: Granular brick-shaped solid; comes in wide range of colors

Hazard Classification of the Substance or Mixture:
Skin irritation 2
Eye irritation 2A
Skin sensitization 1B
Carcinogenicity 1A
Specific target organ toxicity-Single exposure 3
Specific target organ toxicity-Repeated exposure 1

Signal Word: Danger

Hazard Statement: Brick dust may contain crystalline silica, a chemical that has been determined by certain agencies to cause cancer. See Section 11 for more information on health hazards.

Pictograms:

2. HAZARDS IDENTIFICATION

Precautionary Statements: Limit inhalation of clay dust. Do not eat, drink, or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in well-ventilated area.

Response: If exposed or concerned: Get medical advice/attention. If skin rash occurs: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If brick dust is inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you fell unwell.

Storage: Not Applicable

Disposal: Dispose of unused or unwanted brick products in accordance with all local, regional, national and international regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	% Weight
Aluminum Silicates	Various	50 – 75%
Quartz	14808-60-7	5 - 25%
Chromium compounds	Various	0 – 3
Manganese compounds	Various	0 – 3
Iron Compounds as granular body additives	Various	0 – 3
Calcium compounds	Various	0 – 3

Additional Information: The above chemistries are provided for industrial hygiene and environmental purposes and are not intended to represent product specifications. This information has been compiled from data believed to be reliable. Elements such as aluminum, arsenic, boron, barium, chromium, cobalt, copper, lead, molybdenum, nickel, tin, titanium, vanadium, and zirconium may be present in trace amounts. Brick products as shipped do not present an exposure hazard.

4. FIRST AID MEASURES

Description of First Aid Measures

Eye Contact: Flush with running water. Obtain medical assistance if irritation continues.

Skin Contact: Wash with soap and water. If an allergic reaction causes a rash that does not heal within a few days consult a physician. Treat abrasions as any other scrape or cut with disinfectants and bandages.

Ingestion: None (no known acute effects).

Inhalation: Remove from exposure to airborne particulates. Consult a physician if breathing does not return to normal.

Most Important Symptoms and Effects, Both Acute and Delayed

Symptoms and Effects of Exposure: For information on potential signs and symptoms of exposure, See Section 2 - Hazards Identification and/or Section 11 - Toxicological Information.

Medical Conditions Aggravated by Exposure: Excessive dust exposure may aggravate any existing respiratory disorders or diseases. Possible complications or allergies resulting in irritation to skin, eyes, and respiratory tract may occur from excessive exposure to dusts.

Recommendations for Immediate Medical Attention and Special Treatment Needed

Notes to Physician: Symptoms may not appear immediately.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Not applicable

Special Hazards Arising from the Substance or Mixture

Hazardous Combustion Products: No data available

Fire / Explosion Hazards: Bricks as shipped do not pose a fire or explosion hazard.

Advice for Fire-Fighters

None

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Protective Equipment

Use personal protection recommended in Section 8.

Emergency Procedures

Not applicable.

Methods and Material for Containment and Cleaning Up

Not applicable.

Cleanup Procedures

Not applicable.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Minimize dust generation and accumulation. Avoid breathing dust.

Conditions for Safe Storage, Including any Incompatibilities

Storage Conditions: Always stack and store bricks in a stable manner to avoid falling hazards.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Aluminum Silicates

OSHA PEL	15 mg/m^3
ACGIH TLV	10 mg/m^3

Quartz

OSHA PEL	10 / %SiO_2 + 2 mg/m^3
ACGIH TLV	0.025 mg/m^3 (respirable)

Chromium Compounds

OSHA PEL	Not available
ACGIH TLV	Not available

Manganese Compounds

OSHA PEL	Not available
ACGIH TLV	Not available

Iron Compounds as granular body additives

OSHA PEL	Not available
ACGIH TLV	Not available

Calcium Compounds

OSHA PEL	Not available
ACGIH TLV	Not available

Exposure Controls

Engineering Controls:	Provide adequate ventilation to maintain exposures below the OSHA PEL and ACGIH TLV for quartz and other substances.
Personal Protective Equipment:	Refer to applicable national standards and regulations in the selection and use of personal protective equipment (PPE).
Feet:	Use of steel toe shoes is recommended when handling brick.
Eyes and Face:	Face shields should be used when sawing brick.
Skin:	Use gloves and or protective clothing if abrasions or allergic reactions are experienced.
Respiratory protection:	For airborne concentration exceeding the OSHA PEL or ACGIH TLV use a NIOSH and/or MSHA approved respirator.
Other:	Use of wet sawing methods is recommended anytime that bricks must be cut.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Granular solid	**Color:**	Bricks come in a wide range of colors
Odor:	Essentially odorless	**Odor Threshold:**	No data available
Molecular Formula:	Mixture	**Molecular Weight:**	Mixture

Solvent Solubility: No data available
Water Solubility: Negligible
pH: No data available.
Melting/Freezing Point (°C): No data available
Boiling Point (°C): No data available
Partition Coefficient: (Method, pH, Endpoint, Value)
No data available
Decomposition Temperature (°C): No data available.

Evaporation Rate (Gram/s): No data available
Vapor Pressure (kPa): No data available
Vapor Density (g/ml): No data available
Relative Density: No data available
Viscosity: No data available

Flammablity:
- **Autoignition Temperature (Solid) (°C):** No data available
- **Flammability (Solids):** No data available
- **Flash Point (Liquid) (°C):** No data available
- **Upper Explosive Limits (Liquid) (% by Vol.):** No data available
- **Lower Explosive Limits (Liquid) (% by Vol.):** No data available

10. STABILITY AND REACTIVITY

Reactivity: Bricks as shipped are not reactive
Chemical Stability: Stable under normal conditions of use
Possibility of Hazardous Reactions:
- **Oxidizing Properties:** No data available
- **Incompatible Materials:** No data available
- **Hazardous Decomposition Products:** No data available

11. TOXICOLOGICAL INFORMATION

Effects of Short Term and Long Term Exposure:

Short Term
Bricks as shipped do not present an inhalation, ingestion or contact hazard. However, operations such as sawing and grinding may result in the following effects.

Eye: May cause irritation by abrasion with dust or chips.

11. TOXICOLOGICAL INFORMATION

Skin: Brick dust or chips may cause allergic reactions in hypersensitive individuals; May cause cuts and skin abrasions.

Inhalation: Brick dust or chips may cause congestion and irritation in nasal and respiratory passages.

Ingestion: No known acute effects.

Long Term
Excessive exposures to respirable particulates (dust) over an extended period of time may result in the development of pulmonary diseases such as silicosis.

Information on Toxicological Effects
General Information: Toxicological properties of the formulation have not been investigated. The information in this section describes the potential hazards of crystalline silica. Brick dust may contain crystalline silica, a chemical that has been determined by certain agencies to cause cancer and other chemicals known to cause cancer, birth defects and other reproductive harm. Inhalation of brick dust above established or recommended exposure levels should be avoided by use of wet sawing or shaping and/or use of a NIOSH and/or MSHA approved respirator.

Carcinogen Status: The following carcinogenicity classifications for crystalline silica have been established by the following agencies:

OSHA: Not regulated as a carcinogen

IARC: Group 1 carcinogenic in humans

NIOSH: Carcinogen, with no further categorization

NTP: Known carcinogen

12. ECOLOGICAL INFORMATION

There are no known environmental impacts.

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods: Dispose of waste in accordance with all applicable laws and regulations. State specific and Community specific provisions must be considered. It is recommended that waste minimization be practiced.

14. TRANSPORT INFORMATION

This material is not regulated for transportation as a hazardous material/dangerous good.

DOT: Bricks as shipped are not hazardous materials per DOT regulations.

15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

RCRA	Brick in its solid form is typically considered a non-hazardous waste for disposal, but local regulation may vary, therefore all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations. Water containing brick solids, such as from wet sawing operations, should also be disposed of in accordance with federal, state and local environmental regulation. Brick waste should not be used as a blasting agent.
EPCRA Section 311/312:	Bricks as shipped are not a Section 311/312 reportable product.
EPCRA Section 313:	Bricks as shipped are not subject to the Section 313, Toxic Chemical Release Inventory reporting requirements.
DOT:	Bricks as shipped are not hazardous materials per DOT regulations.

16. OTHER INFORMATION

The Belden Brick Company considers our product an “article” as defined in 30 CFR 1200(b)(g)(iv) and 40 CFR 372.38. As an article, an SDS is not required and the product is exempt from all other requirements of the hazard communication standard. OSHA requires an SDS for brick because it is occasionally dry sawed. We recommend only wet sawing of brick.

Data Sources:	The data contained in this SDS may have been gathered from confidential internal sources, raw material suppliers, or from the published literature.
Reasons for Revision	Converted MSDS to SDS.
Prepared by:	The Belden Brick Company

This SDS was prepared with information believed accurate at the time of preparation and was prepared and provided in good faith. However, The Belden Brick Company assumes no responsibility as to the accuracy or suitability of such information and no warranty expressed or implied is made.

End of Safety Data Sheet

Safety Data Sheet

Product Name: Concrete Structural Units

SECTION 1: COMPANY AND PRODUCT IDENTIFICATION

PRODUCT NAME **Concrete Structural Units**	Revised: 31 December 2014
SYNONYMS Manholes, box culverts, curb inlets, inverts, etc.	
Manufacturer **Concrete Pipe and Precast, LLC**	*Emergency Phone Number* **1-804-798-6068**

SECTION 2: HAZARDS IDENTIFICATION

HAZCOM GHS CLASSIFICATION

GHS SYMBOLS

SIGNAL WORD: WARNING!

HAZARD STATEMENT:

Concrete structure itself is not hazardous.
Odorless, gray, solid or hollow concrete objects of various shapes.
Non-flammable product.
Exposure to dust may cause respiratory irritation.
Repeated or prolonged exposure to dust can damage lungs if inhaled.
Exposure to crystalline silica dust can cause Silicosis, a form of lung cancer.
Exposure to dust may cause irritation to skin or contact dermatitis.
Exposure to dust can cause irritation to eyes.

PREVENTION STATEMENT:

Do not eat, drink or use tobacco when using this product.
Do not chip, grind or break product to create dust.
Do not breathe dust created.
Wear respiratory protection, protective gloves and eye/face protection if large amounts of dust are created.
Wash exposed skin thoroughly until dust is removed.
Flush eyes for 15 minutes. It irritation persists, seek medical attention.

RESPONSE:

If concerns or exposure occurs, seek medical attention.

STORAGE:

Prevent rolling, falling or tip over.

DISPOSAL:

Dispose of structure or parts thereof in accordance with state and local regulations.

SECTION 3: COMPOSITION & INFORMATION ON INGREDIENTS

OSHA / MSHA REGULATORY STATUS

Safety Data Sheet

Product Name: Concrete Structural Units

Concrete structural units are not considered hazardous as shipped. Dust generated from crushing, cutting, grinding or drilling hardened concrete may contain amounts of crystalline silica considered hazardous under the OSHA and MSHA Hazard Communication Standards.

Concrete is a mixture is gravel or rock, sand, Portland cement and water. It may also contain fly ahs, slag, silica fume, fibers (organic) and color pigment.

HAZARDOUS COMPONENTS	***Percent (By Weight)***	***CAS Number***	***OSHA PEL-TWA (mg/m3)***	***ACGIH TLV--TWA (mg/m3)***	***MSHA PEL-TWA (mg/m3)***
Crystalline Silica	<1%	14808-60-7	(10)/(%SiO2 + 2)(**R**) (30)/(%SiO2 + 2)(**T**)	.025 (R)	(10)/(%SiO2 + 2)(**R**)
Portland Cement	5-10	65997-15-1	(5) (R) ; (15) (T)	1 (R)	(10)
Calcium Hydroxide	15-25	1305-62-0	(5) (R) ; (15) (T)	5 (T)	(5)

Notes: 1. Concrete contains No Asbestos.

2. (T)= Total Particulate

3. (R)= Respirable Particulate

SECTION 4: FIRST AID MEASURES

INHALATION

Move exposed individual to fresh air. Dust in throat and nasal passages should clear naturally by coughing, sneezing and nasal discharge. Obtain medical attention if symptoms persist or develop later.

EYE CONTACT

Do not allow individual to rub eyes. Flush gently under running water for 15 minutes or longer, making sure that the eyelids are held open. Other than washing with water, do not attempt to remove material from eyes. If pain or irritation persist or develop later, obtain medical attention.

SKIN CONTACT

If irritation occurs, flush gently with water until dust is removed. If irritation persists or develops later, obtain medical attention.
Dermatitis- Concrete dust, in association with sweat and friction, can lead to skin irritation and dermatitis. Skin affected by dermatitis may include symptoms such as redness, itching, rash, scaling and cracking. Irritant dermatitis is caused by the physical properties of concrete dust such as abrasion.

INGESTION

Ingestion is not a common route of occupational exposure for this product.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT	***FLAMMABLE LIMITS***
Not combustible	Not applicable

EXTINGUISHING AGENTS

Not combustible. Use extinguishing agent appropriate for surrounding flammable materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Spalling of hardened concrete may occur under conditions of intense heat.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

If large amounts of dust have been generated, eye protection and appropriate respiratory protection should be used to protect cleanup personnel against dust.

SPILL AND LEAK PROCEDURES

Do not dry sweep broken, dusty material. Use water spray to minimize dust or vacuum with HEPA filters

SECTION 7: HANDLING AND STORAGE

HANDLING PRECAUTIONS

General- Concrete products are heavy and pose risks such as sprains and strains to the back, arms, shoulders and legs during maneuvering. Handle with care and use appropriate control measures. Use appropriately rated equipment (such as cranes) and rigging when moving and placing concrete products.

Housekeeping- Dust containing crystalline silica may be generated during cutting, grinding or crushing. Activities which generate dust should take place in well ventilated areas. Use good housekeeping methods to prevent the accumulation of dust in the workplace. Wear appropriate PPE when dust is present.

RECOMMENDED STORAGE CONDITIONS

Store concrete products in a secure manner to prevent falling or rolling. Ensure adequate load bearing capacity of ground, floor or other areas when placing or storing concrete products.

SECTION 8: EXPOSURE CONTROLS, PRESONAL PROTECTION

ENGINEERING CONTROLS

When crushing, cutting, grinding or drilling concrete, use general ventilation, local exhaust and/or wet suppression methods to maintain exposures below allowable exposure limits.

RESPIRATORY PROTECTION

The need for respiratory protection should be evaluated by a qualified professional. The use of respirators for controlling exposures in excess of PEL must comply with OSHA and MSHA requirements for medical surveillance, respirator fit testing, repair and cleaning and user training.

EYE PROTECTION

ANSI rated Safety glasses with side shields should be worn as minimum protection. Dust

goggles or full face protection should be worn when conditions with high dust concentrations exist or are anticipated.

FOOT PROTECTION

ANSI rated safety-toed boots when handling or working around concrete products.

SKIN PROTECTION

Use gloves to provide hand protection from abrasion. In very dusty conditions, clothing with long sleeves will provide skin protection. Contaminated work clothing should be washed after use.

ADDITIONAL PROTECTIVE MEASURES

Air monitoring for respirable dust containing quartz should be conducted regularly. Airborne dust levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE Solid or hollow concrete objects of various shapes.	***SPECIFIC GRAVITY*** Unknown
COLOR Gray.	***EVAPORA TION RA TE*** Not applicable.
ODOR None.	***VAPOR DENSITY (AIR = 1)*** Not applicable.
BOILING POINT Not applicable.	***pH*** Not applicable.
VAPOR PRESSURE Not applicable.	***SOLUBILITY IN WATER*** Negligible.

SECTION 10: STABILITY AND REACTIVITY

STABILITY

Stable.

INCOMPATIBILITY

Strong acids may etch concrete.

HAZARDOUS DECOMPOSITION PRODUCTS

None.

HAZA RDOUS POLYMERIZATION

Does not polymerize.

CONDITIONS TO AVOID

Avoid contact with strong acids.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA

Standard animal toxicity data (e.g. LD_{50}, LC_{50}) are not available for quartz. Epidemiologic studies of workers indicate an increased risk of lung cancer from chronic exposure to respirable crystalline silica; this effect was more pronounced in those with silicosis. However, many of the studies did not account for effects of smoking or other confounding exposures.

Epidemiologic studies have linked crystalline silica exposure with autoimmune diseases and kidney disorders. Individuals with silicosis show a higher incidence of scleroderma, a thickening of the skin. Current data have not shown a definite causal effect between these effects and exposure to respirable crystalline silica.

In laboratory animal tests, dust containing newly broken particles of respirable silica particles caused greater lung injury than equal exposures to particles aged for sixty days or more.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL DATA

Generally considered chemically inert in the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Dispose of waste product and unused product in compliance with federal, state and local requirements. Used material which has become contaminated, may have significantly different characteristics based on the contaminant and should be evaluated accordingly.

SECTION 14: TRANSPORT INFORMATION

DOT HAZARD CLASS

None.

DOT PLACARD

None.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

OSHA/ MSHA HAZARD COMMUNICATION

This product is considered by OSHA/ MSHA to a hazardous chemical and should be included in the employer's hazard communication program.

SARA 313

Not applicable.

CERCLA 103

Not applicable.

Safety Data Sheet

Product Name: Concrete Structural Units

RCRA HAZARDOUS WASTE	
Waste is not hazardous according to 40 CFR 261.	
California Proposition 65	
Crystalline silica (airborne particles of respirable size) is a substance known y the State of California to cause cancer.	
STATE REGULATIONS	
COMPONENT	***STATE REGULATORY LISTS***
Crystalline Silica, quartz 14808-60-7	CA, FL, MA, MN, NJ, PA

SECTION 16: OTHER INFORMATION

This MSDS (SDS), Sections 1-16 was updated on December 31, 2014

NOTICE: Concrete Pipe and Precast LLC., believes that the information contained in this Material Safety Data Sheet is accurate. The suggested procedures are based on experience as of date of publication. They are not necessarily all-inclusive or fully adequate in every circumstance. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulations, rules, or insurance requirements.

NO WARRANTY IS MADE, EXPRESSED OR IMPLIED, OR MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

ATTACHMENT G EVIDENCE OF WORKMAN'S COMPENSATION COVERAGE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 6/13/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
HMS Insurance Associates, Inc.
20 Wight Ave Suite 300
Hunt Valley MD 21030

CONTACT NAME: Beth Kilgore
PHONE (A/C, No, Ext): 443-632-3399 FAX (A/C, No): 443-632-3484
E-MAIL ADDRESS: bkilgore@hmsia.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Zurich American Insurance	16535
INSURER B : Great American Insurance Company	16691
INSURER C : Selective Insurance Company of America	12572
INSURER D : XL Specialty Insurance Company	37885
INSURER E :	
INSURER F :	

INSURED GRAY&SO-01
Gray & Son, Inc.
430 West Padonia Road
Timonium MD 21093

COVERAGES **CERTIFICATE NUMBER:** 1630452032 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY**			GLO038109006	7/1/2021	7/1/2022	EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 1,000,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	POLICY X PRO-JECT X LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:							$
A	**AUTOMOBILE LIABILITY**			BAP038109106	7/1/2021	7/1/2022	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
B	X **UMBRELLA LIAB** X OCCUR			TUU128036205	7/1/2021	7/1/2022	EACH OCCURRENCE	$ 10,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 10,000,000
	DED X RETENTION $ 10,000							$
A	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N	N / A		WC038108906	7/1/2021	7/1/2022	X PER STATUTE / OTH-ER	MD
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. EACH ACCIDENT	$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
C	Employee Theft			B 6054372	7/1/2021	7/1/2022	Limit	$500,000
D	Installation Floater			UM00025703MA21A	7/1/2021	7/1/2022	Limit at any 1 loc	$100,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Evidence of Insurance

CERTIFICATE HOLDER

Evidence of Insurance

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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GRAY & SON

QUALITY | PRIDE | SERVICE

26 January 2023

Matthew Hafner, Chief
Chemical and Mineral Division
Air Quality Permits Program
Air and Radiation Administration
Maryland Dept. of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

RE: GRAY & SON, CONSTRUCTION PERMIT APPLICATION FOR CRUSHING & SCREENING PLANT BATAVIA FARM RD/TODDS LANE

Dear Mr. Hafner,

With regard to the above-referenced application for a crushing & screening plant (CSP), we are requesting that the construction permit be processed as a "Flexible Permit" for Crushing & Screening Plants.

Thank you.

Best regards,

William Poole
Executive VP/GM Asphalt Div. & Demolition

cc: Kathryn Gunkel, Wildwood Environmental Engineering

JOHN A. OLSZEWSKI, JR.
County Executive

C. PETE GUTWALD, AICP, *Director*
Department of Permits,
Approvals & Inspections

January 19, 2023

Wildwood Environmental Engineering Consultants, Inc.
PO Box 16690
Baltimore, Maryland 21204

Re: Zoning Verification
Tax No. 1518102591 & 1518102590
13th Election District

To Whom It May Concern:

Your letter request to this office regarding the above referenced property was forwarded to me for reply. Based upon the information provided and my review of the available zoning records, the following has been determined.

The above reference properties are currently zoned MH-IM (Manufacturing, Heavy- Industrial Major Overlay district) as shown on the official Baltimore County zoning maps no.089C3 (copy enclosed). Uses of the property will be as permitted and restricted by Sections 256 of the Baltimore County Zoning Regulations (BCZR). Offices or office buildings and warehouse are permitted as a matter of right in a MH-IM zone. For a complete list of permitted uses by right or by special exception please visit our website at www.baltimorecountymd.gov.

Based on the information provided, and pursuant to Section 256 of the BCZR, Zoning Review is able to confirm that a crush and screen plant and operation are permitted uses.

A search of Zoning Review's database found no prior zoning cases on this property. The Division of Code Enforcement digital records do not indicate any outstanding violation cases on the referenced property.

This site is not part of a Planned Unit Development. Certificates of Occupancy are not available for structures built prior to March 1989 however; failure to possess the Certificate of Occupancy in no way constitutes a violation of Baltimore County's Zoning Regulations or County Codes.

Provided the property was developed and occupied in accordance with the Baltimore County approved Development Plan and all subsequent construction permit applications adhered to the approved Development Plan, then all current uses and structures meet the requirements of the BCZR and the present uses and structures on the property are in compliance with the applicable zoning regulations.

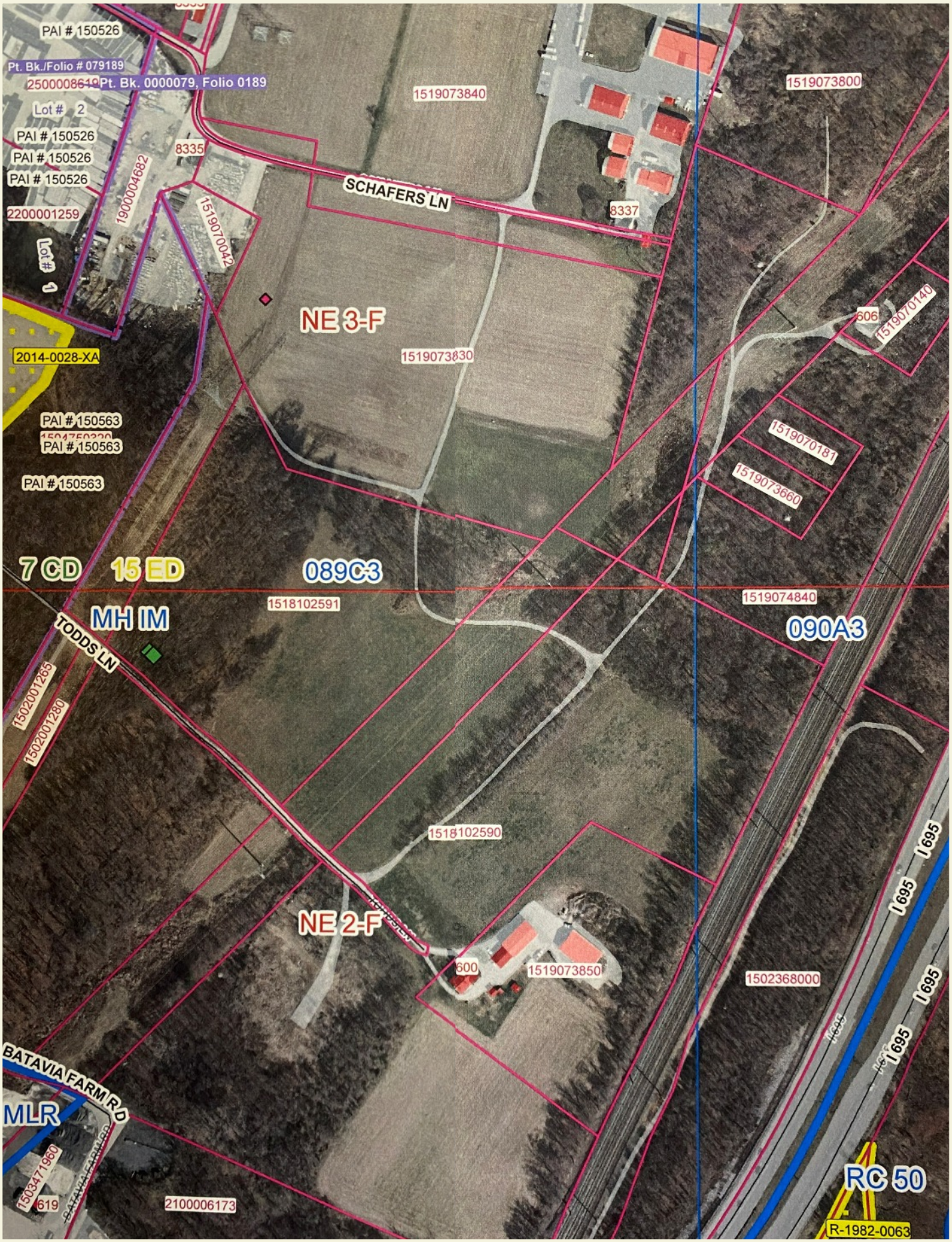
I hope you find this information satisfactory. If you need further assistance, you can reach Zoning at 410-887-3391.

The foregoing is merely an informal opinion; it is not an expert or legal opinion. It is not intended to be relied on as expert or legal advice, and it is not legally or factually binding on Baltimore County or any of its officials, agents, or employees. Baltimore County expressly disclaims any and all liability arising out of, or in any way connected with the information provided in this document, or any interpretation thereof.

Sincerely,

Shaun Crawford
Zoning Review

23-0022-SC
Enclosures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