

Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

SEP 24 2019

Ms. Julie Ingoli
Environmental Specialist
Bodine Aluminum, Inc.
100 Cherry Blossom Way
Troy, MO 63379

RE: New Source Review Permit - Project Number: 2019-06-028

Dear Ms. Ingoli:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.

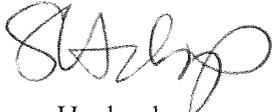


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If you have any questions regarding this permit, please do not hesitate to contact Jonathan Halla, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



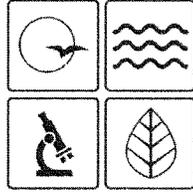
Susan Heckenkamp
New Source Review Unit Chief

SH:hja

Enclosures

c: St. Louis Regional Office
PAMS File: 2019-06-028

Permit Number: **092019-009**



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **092019-009**

Project Number: 2019-06-028
Installation Number: 113-0029

Parent Company: Toyota Motor Engineering & Manufacturing North America Inc.

Parent Company Address: 151 Engineering Way, Georgetown, KY 40324

Installation Name: Bodine Aluminum, Inc.

Installation Address: 100 Cherry Blossom Way, Troy, MO 63379

Location Information: Lincoln County, S38, T36N, R7W

Application for Authority to Construct was made for:

Installation of six (6) 500 KW emergency diesel generators (P41-P46). This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

Director or Designee
Department of Natural Resources

SEP 24 2019

Effective Date

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Enforcement and Compliance Section of the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted to the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (3)(E). "Conditions required by permitting authority."

Bodine Aluminum, Inc.
Lincoln County, S38, T36N, R7W

1. **Superseding Condition**
The conditions of this permit supersede Special Conditions 2, 3, and 4 found in the previously issued construction permit 072019-011 issued by the Air Pollution Control Program.
2. **Synthetic Area Source HAP Limitation**
 - A. Bodine Aluminum, Inc. shall emit less than 25 tons of combined HAP in any consecutive 12-month period from the entire installation as listed in Table 1.

Table 1: Installation-wide List of Combined HAP Emission Sources

Emission Source	Description
C01	Plantwide Natural Gas External Combustion (See Attachment D)
C02	80 kW Natural Gas Emergency Generator, Kohler 80REZGD
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cooling
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Finishing
O2	Lines GR-Kai #1 and #2 Casting Machines
O5	Line GR-Kai #1 Core Molding Machines
O2	Line GR-Kai #3 Casting Machines
O5	Lines GR-Kai #2 and #3 Core Molding Machines
O2	Lines AR #3 and #4 and UR Casting Machines
O5	Lines AR #3 and #4 and UR Core Molding Machines
O2	Line ZR Casting Machines
O5	Line ZR Core Molding Machines
OA7 & OA10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heat Treatment
P05	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #1
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #2
P11	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Coating

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
P35	3,230 HP Diesel Emergency Generator
P36	435 HP Diesel Emergency Fire Pump
P41	500 KW Emergency Diesel Generator
P42	500 KW Emergency Diesel Generator
P43	500 KW Emergency Diesel Generator
P44	500 KW Emergency Diesel Generator
P45	500 KW Emergency Diesel Generator
P46	500 KW Emergency Diesel Generator
I01l	Line I01 (3) Casting Machines
I01m	Line I01 Metal Cooling
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing
I02k	Line I02 (3) Casting Machines
I02l	Line I02 Metal Cooling
I03l	Line I03 (3) Casting Machines
I03m	Line I03 Metal Cooling
I03h	Line I03 Shakeout and Finishing
I04i	Line I04 (1) Casting Machine
I04k	Line I04 Metal Cooling
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing
Q01k	Line Q01 (3) Casting Machines
Q01l	Line Q01 Metal Cooling
Q02k	Line Q02 (3) Casting Machines
Q02l	Line Q02 Metal Cooling
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing
Q03m	Line Q03 (3) Casting Machines
Q03n	Line Q03 Metal Cooling
Q04m	Line Q04 (3) Casting Machines
Q04n	Line Q04 Metal Cooling
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing
Q05n	Line Q05 (3) Casting Machines
Q05l	Line Q05 Metal Cooling
Q06n	Line Q06 (3) Casting Machines
Q06l	Line Q06 Metal Cooling
Q07m	Line Q07 Shakeout and Finishing
Q07n	Line Q07 (3) Casting Machines
Q07l	Line Q07 Metal Cooling

- B. Attachment A or an equivalent form, such as an electronic form, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 2.A.

3. Synthetic Minor Source PM Limitation

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- A. Bodine Aluminum, Inc. shall emit less than 250 tons of PM in any consecutive 12-month period from the entire installation as listed in Table 2.

Table 2: Installation-wide List of PM Emission Sources

Emission Source	Description
C01	Plantwide Natural Gas External Combustion <small>Error! Bookmark not defined.</small>
C02	80 kW Natural Gas Emergency Generator, Kohler 80REZGD
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cooling
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Finishing
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shot Blasting
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR TIG Welding
O2	Lines GR-Kai #1 and #2 Casting Machines
O5	Line GR-Kai #1 Core Molding Machines
O2	Line GR-Kai #3 Casting Machines
O5	Lines GR-Kai #2 and #3 Core Molding Machines
O2	Lines AR #3 and #4 and UR Casting Machines
O5	Lines AR #3 and #4 and UR Core Molding Machines
O2	Line ZR Casting Machines
O5	Line ZR Core Molding Machines
P01	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Used Sand Crushing
P02	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Used Sand Sieving
P03	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Aluminum/Sand Separation
P04	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Final Sand Crushing
P05	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #1
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #2
P06	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Separation
P07	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Storage
P08	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Weighing

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
P09	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Dryer
P10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heated Sand Storage
P11	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Coating
P12	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Holding, Bin Charging
P13	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Storage
P14	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Crushing
P15	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Sieving
P16	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Storage
P34	Paved Haul Roads
P35	3,230 HP Diesel Emergency Generator
P36	435 HP Diesel Emergency Fire Pump
P37	Electric Aluminum Holding Furnaces - Fluxing
P41	500 KW Emergency Diesel Generator
P42	500 KW Emergency Diesel Generator
P43	500 KW Emergency Diesel Generator
P44	500 KW Emergency Diesel Generator
P45	500 KW Emergency Diesel Generator
P46	500 KW Emergency Diesel Generator
I01b	Line I01 Sand Polisher
I01d	Line I01 Sand Classifier
I01c	Line I01 Sand Classifier
I01f	Line I01 (5) Core Molding Machines
I01/I02e	Lines I01 and I02 (2) Sand Crushers
I01/I02g	Lines I01 and I02 (2) Transfer Devices
I01/I02h	Lines I01 and I02 (2) Heaters
I01/I02j	Lines I01 and I02 Vibra Mill Crusher
I01/I02i	Lines I01 and I02 (2) Sand Coolers
I01k	Line I01 Buffer Tank
I01l	Line I01 (3) Casting Machines
I01m	Line I01 Metal Cooling
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing
I02b	Line I02 Sand Polisher
I02c	Line I02 Sand Classifier
I02d	Line I02 Sand Classifier

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
I02f	Line I02 (5) Core Molding Machines
I02m	Line I02 Buffer Tank
I02k	Line I02 (3) Casting Machines
I02l	Line I02 Metal Cooling
I03b	Line I03 Sand Polisher
I03c	Line I03 Sand Classifier
I03d	Line I03 Sand Classifier
I03f	Line I03 (5) Core Molding Machines
I03e	Line I03 Sand Sub Vacuum
I03g	Line I03 Sand Sub Vacuum Transfer Unit
I03i	Line I03 Heater
I03k	Line I03 Sand Cooler
I03j	Line I03 Buffer Tank
I03l	Line I03 (3) Casting Machines
I03m	Line I03 Metal Cooling
I03h	Line I03 Shakeout and Finishing
I03a	Line I03 Vibra Mill Crusher
I04b	Line I04 Sand Polisher
I04c	Line I04 Sand Classifier
I04e	Line I04 (2) Core Molding Machines
I04h	Line I04 Transfer Device
I04d	Line I04 Sand Crusher
I04f	Line I04 Heater
I04g	Line I04 Sand Cooler
I04j	Line I04 Buffer Tank
I04i	Line I04 (1) Casting Machine
I04k	Line I04 Metal Cooling
Q01b	Line Q01 Sand Polisher
Q01c	Line Q01 Sand Classifier
Q01d	Line Q01 Sand Classifier
Q01f	Line Q01 (5) Core Molding Machines
Q01/Q02h	Lines Q01 and Q02 (2) Transfer Devices
Q01/Q02e	Lines Q01 and Q02 Vibra Mill Crusher
Q01/Q02i	Lines Q01 and Q02 (2) Heaters
Q01/Q02g	Lines Q01 and Q02 (2) Sand Coolers
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing
Q01j	Line Q01 Buffer Tank
Q01k	Line Q01 (3) Casting Machines
Q01l	Line Q01 Metal Cooling
Q02b	Line Q02 Sand Polisher
Q02c	Line Q02 Sand Classifier
Q02d	Line Q02 Sand Classifier

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
Q02f	Line Q02 (5) Core Molding Machines
Q02j	Line Q02 Buffer Tank
Q02k	Line Q02 (3) Casting Machines
Q02l	Line Q02 Metal Cooling
Q03h	Line Q03 Sand Polisher
Q03c	Line Q03 Sand Classifier
Q03b	Line Q03 Sand Classifier
Q03/Q04d	Lines Q03 and Q04 Vibra Mill Crusher
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing
Q03k	Line Q03 (5) Core Molding Machines
Q03/Q04f	Lines Q03 and Q04 (2) Transfer Devices
Q03/Q04g	Lines Q03 and Q04 (2) Heaters
Q03/Q04i	Lines Q03 and Q04 (2) Sand Coolers
Q03l	Line Q03 Pre-Classifier
Q03a	Line Q03 Sand Polisher
Q03j	Line Q03 Buffer Tank
Q03m	Line Q03 (3) Casting Machines
Q03n	Line Q03 Metal Cooling
Q04l	Line Q04 Pre-Classifier
Q04h	Line Q04 Sand Polisher
Q04a	Line Q04 Sand Polisher
Q04c	Line Q04 Sand Classifier
Q04b	Line Q04 Sand Classifier
Q04k	Line Q04 (5) Core Molding Machines
Q04j	Line Q04 Buffer Tank
Q04m	Line Q04 (3) Casting Machines
Q04n	Line Q04 Metal Cooling
Q05h	Line Q05 Sand Polisher
Q05d	Line Q05 Sand Classifier
Q05i	Line Q05 Sand Classifier
Q05/Q06a	Lines Q05 and Q06 (2) Vibra Mill Crushers
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing
Q05k	Line Q05 (5) Core Molding Machines
Q05/Q06c	Lines Q05 and Q06 (2) Transfer Devices
Q05/Q06f	Lines Q05 and Q06 (2) Heaters
Q05/Q06g	Lines Q05 and Q06 (2) Sand Coolers
Q05b	Line Q05 Pre-Classifier
Q05e	Line Q05 Sand Polisher
Q05j	Line Q05 Buffer Tank
Q05n	Line Q05 (3) Casting Machines
Q05l	Line Q05 Metal Cooling
Q06h	Line Q06 Sand Polisher

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
Q06d	Line Q06 Sand Classifier
Q06i	Line Q06 Sand Classifier
Q06k	Line Q06 (5) Core Molding Machines
Q06b	Line Q06 Pre-Classifier
Q06e	Line Q06 Sand Polisher
Q06j	Line Q06 Buffer Tank
Q06n	Line Q06 (3) Casting Machines
Q06l	Line Q06 Metal Cooling
Q07d	Line Q07 Sand Classifier
Q07h	Line Q07 Sand Polisher
Q07i	Line Q07 Sand Classifier
Q07a	Line Q07 Vibra Mill Crusher
Q07m	Line Q07 Shakeout and Finishing
Q07k	Line Q07 (5) Core Molding Machines
Q07c	Line Q07 Transfer Device
Q07f	Line Q07 Heater
Q07g	Line Q07 Sand Cooler
Q07b	Line Q07 Pre-Classifier
Q07e	Line Q07 Sand Polisher
Q07j	Line Q07 Buffer Tank
Q07n	Line Q07 (3) Casting Machines
Q07l	Line Q07 Metal Cooling

B. Attachment B or an equivalent form, such as an electronic form, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 3.A.

4. Synthetic Minor Source NO_x Limitation

A. Bodine Aluminum, Inc. shall emit less than 250 tons of NO_x in any consecutive 12-month period from the entire installation as listed in Table 3.

Table 3: Installation-wide List of NO_x Emission Sources

Emission Source	Description
C01	Plantwide Natural Gas External Combustion <small>Error! Bookmark not defined.</small>
C02	80 kW Natural Gas Emergency Generator, Kohler 80REZGD
O2	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cylinder Head Casting
O5	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Core Molding
OA7 &	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heat

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
OA10	Treatment Process Emissions
P09	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Dryer
P35	3,230 HP Diesel Emergency Generator
P36	435 HP Diesel Emergency Fire Pump
P41	500 KW Emergency Diesel Generator
P42	500 KW Emergency Diesel Generator
P43	500 KW Emergency Diesel Generator
P44	500 KW Emergency Diesel Generator
P45	500 KW Emergency Diesel Generator
P46	500 KW Emergency Diesel Generator
I01l	Line I01 (3) Casting Machines
I02k	Line I02 (3) Casting Machines
I03l	Line I03 (3) Casting Machines
I04i	Line I04 (1) Casting Machine
Q01k	Line Q01 (3) Casting Machines
Q02k	Line Q02 (3) Casting Machines
Q03m	Line Q03 (3) Casting Machines
Q04m	Line Q04 (3) Casting Machines
Q05n	Line Q05 (3) Casting Machines
Q06n	Line Q06 (3) Casting Machines
Q07n	Line Q07 (3) Casting Machines

- B. Attachment C or an equivalent form, such as an electronic form, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 4.A.

- 5. Record Keeping and Reporting Requirements
 - A. Bodine Aluminum, Inc. shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.

 - B. Bodine Aluminum, Inc. shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2019-06-028
Installation ID Number: 113-0029
Permit Number: 092019-009

Installation Address:
Bodine Aluminum, Inc.
100 Cherry Blossom Way
Troy, MO 63379

Parent Company:
Toyota Motor Engineering &
Manufacturing North America Inc.
151 Engineering Way
Georgetown, KY 40324

Lincoln County, S38, T36N, R7W

REVIEW SUMMARY

- Bodine Aluminum, Inc. has applied for authority to installation of six (6) 500 KW emergency diesel generators (P41-P46).
- The application was deemed complete on July 16, 2019.
- HAP emissions are expected from the proposed equipment from the combustion of diesel fuel, however, the total HAP emissions are expected to be less than their respective SMAL.
- 40 CFR 60 Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, applies to the Tier 2, 755 BHP engines in the six emergency diesel generators.
- 40 CFR 63 Subpart ZZZZ, *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, applies to the emergency generators (P41-P46). However, as new, emergency RICE at an area HAP source, they are subject to 40 CFR 60 IIII. If the requirements of Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engine* are met, then no further Subpart ZZZZ requirements apply.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Lincoln County, an attainment/unclassifiable area for all criteria pollutants.

- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below the de minimis levels and the SMALs.
- Emissions testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal or applicable rules.
- An update to the Part 70 Operating Permit application, Project 2015-05-043, is required for this installation within one year of commencement of operations.
- Approval of this permit is recommended with special conditions.

EXISTING INSTALLATION DESCRIPTION

Bodine Aluminum, Inc. is an aluminum die casting installation located in Lincoln County. The installation has been in operation since 1992. Bodine Aluminum, Inc. produces cylinder heads to support Toyota's North American vehicle manufacturing operations.

The installation receives molten aluminum from MOST, Inc. (113-0046). The Air Pollution Control Program has determined that MOST, Inc. and Bodine Aluminum, Inc. are separate installations, for additional information see Applicability Determination Project 2019-04-027. The molten aluminum is stored in electric aluminum holding furnaces until it is needed. A small amount of flux is added to the holding furnaces.

The installation uses sand cores to make internal voids in their casted cylinder heads. Sand cores are made by mixing sand with binders and molding the sand into a core. Used sand from shakeout is recycled and cleaned to remove any buildup. The sand is screened and reused to make new molds. Some green sand is added to replace sand that is lost during processing.

The molten aluminum floods the dies containing the sand cores on one of the installation's 18 casting lines. After the aluminum casting has cooled, the sand core is shaken out. The cast aluminum cylinder head then undergoes finishing operations, which remove any burrs, risers, or gates. After finishing, the cylinder head undergoes heat treatment.

The installation operates seven older casting lines: Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR. The sand operations associated with these older casting lines are shared. These older casting lines are subject to a combined annual sand processing limit of 58,500 tons and a combined annual metal production limit of 78,000 tons by Construction Permit 062014-002 Special Condition 3. These older casting lines use a phenolic resin binder in their sand core molding operations, which produces VOC and HAP emissions.

The installation operates eleven newer casting lines: Lines I01-I04 and Q01-Q07. These casting lines each have their own sand processing operations. These newer casting lines are not subject to the sand and metal limits of Construction Permit 062014-002 Special Condition 3. These newer casting lines use water-based sand binders, which produce very little VOC and no HAP emissions.

Bodine Aluminum, Inc. currently operates under Part 70 Operating Permit OP2012-122, which expired November 18, 2015. A Part 70 operating permit renewal application, Project 2015-05-043, was submitted on May 14, 2015. As the installation's renewal application was timely and complete, OP2012-122 remains effective until the operating permit renewal is issued.

The Air Pollution Control Program has issued the following New Source Review permits to Bodine Aluminum, Inc.:

Table 4: Permit History

Permit Number	Description
0591-003	Original permit for the installation of the plant
0593-008	Installation of a natural gas oven to dry recycled aluminum prior to melting
1193-006	Addition of six machining centers and a washing station to produce engine brackets
0194-014	Addition of a shot blaster to rework surface areas
0995-005	Increase production by 1,825 tons of poured aluminum
0196-019	Addition of new building and increased production
0996-011	Addition of natural gas fired die heating oven, 2 MMBtu/hr
1299-009 & 1299-009A	Addition of casting machines
112004-005	Replace casting and machine equipment
032006-004	New casting line
112008-006	Modify product mix
032012-006, 032012-006A, & 032012-006B	Increase coolant to 5,000 gal/yr, reduce sand production to 58,500 tpy, install DC-10 furnace, startup four idle high pressure die casting machines
062014-002 & 062014-002A	Install casting machines, core machines, and a natural gas-fired heat treat furnace
102014-009	Removal of RTO from reclamation furnaces—modification of sand reclaim furnaces
102015-005	Install Lines I01-I04
012017-008	Install Lines Q01 and Q02
052019-001	Install Lines Q03 and Q04
072019-011	Install Lines Q05-Q07

PROJECT DESCRIPTION

The installation has applied for authority to construct six 500 KW emergency diesel generators (P41-P46). The equipment is rated at 1.706 million Btu/hr. Ultra low sulfur diesel will be used.

Table 5 contains a list of all emission sources at the installation and their associated control equipment.

Table 5: Installation Emission Source List

Emission Source	Description	Control Device
C01	Plantwide Natural Gas External Combustion ^{Error!} Bookmark not defined.	None
C02	80 kW Natural Gas Emergency Generator, Kohler 80REZGD	None
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout, Cooling, and Finishing	None
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shot Blasting and TIG Welding	None
M1	Plantwide Machining Stations	None
O2	Lines GR-Kai #1 and #2 Casting Machines	OD3 Wet Scrubber ¹
O5	Line GR-Kai #1 Core Molding Machines	
O2	Line GR-Kai #3 Casting Machines	OD4 Wet Scrubber ¹
O5	Lines GR-Kai #2 and #3 Core Molding Machines	
O2	Lines AR #3 and #4 and UR Casting Machines	OD5 Wet Scrubber ¹
O5	Lines AR #3 and #4 and UR Core Molding Machines	
O2	Line ZR Casting Machines	OD6 Wet Scrubber ¹
O5	Line ZR Core Molding Machines	
OA7 & OA10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heat Treatment Process Emissions	None
P01	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Used Sand Crushing	DC1B Dust Collector ²
P02	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Used Sand Sieving	
P03	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Aluminum/Sand Separation	
P04	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Final Sand Crushing	
P06	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Separation	
P07	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Storage	
P05	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #1	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #2	DC16 Baghouse ³
P08	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Weighing	DC1A Baghouse ²
P09	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Dryer	
P10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heated Sand Storage	
P12	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Holding, Bin Charging	

¹ Required by Special Condition 4 of Construction Permit 062014-002.

² Required by Special Condition 4 of Construction Permit 052019-001.

³ Required by Special Condition 4 of Construction Permit 032012-006B.

Emission Source	Description	Control Device
P13	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Cooling	
P14	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Crushing	
P16	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Storage	
P11	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Coating	OD1 RTO ⁴ and DC3 Dust Collector ³
P15	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Sieving	P15 Dust Collector ²
P34	Paved Haul Roads	Rain Days
P35	Emergency Generator	None
P36	Emergency Fire Pump	None
P40	(1) 4,650 gallon and (1) gallon Diesel Storage Tanks	None
P37	Electric Aluminum Holding Furnaces Fluxing	Building
P41	500 KW Emergency Diesel Generator	None
P42	500 KW Emergency Diesel Generator	None
P43	500 KW Emergency Diesel Generator	None
P44	500 KW Emergency Diesel Generator	None
P45	500 KW Emergency Diesel Generator	None
P46	500 KW Emergency Diesel Generator	None
I01b	Line I01 Sand Polisher	BH8 Dust Collector ²
I01d	Line I01 Sand Classifier	BH11 Dust Collector ²
I01c	Line I01 Sand Classifier	BH9 Dust Collector ²
I01f	Line I01 (5) Core Molding Machines	Building
I01/I02e	Lines I01 and I02 (2) Sand Crushers	
I01/I02g	Lines I01 and I02 (2) Transfer Devices	
I01/I02h	Lines I01 and I02 (2) Heaters	
I01/I02j	Lines I01 and I02 Vibra Mill Crusher	
I01/I02i	Lines I01 and I02 (2) Sand Coolers	
I01k	Line I01 Buffer Tank	Sock Filters ⁵
I01l	Line I01 (3) Casting Machines	Building
I01m	Line I01 Metal Cooling	Building
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing	BH16 Dust Collector ²
I02b	Line I02 Sand Polisher	BH5 Dust Collector ²
I02c	Line I02 Sand Classifier	BH6 Dust Collector ²
I02d	Line I02 Sand Classifier	BH7 Dust Collector ²
I02f	Line I02 (5) Core Molding Machines	Building
I02m	Line I02 Buffer Tank	Sock Filters ⁵
I02k	Line I02 (3) Casting Machines	Building
I02l	Line I02 Metal Cooling	Building
I03b	Line I03 Sand Polisher	BH13 Dust Collector ²
I03c	Line I03 Sand Classifier	BH14 Dust Collector ²
I03d	Line I03 Sand Classifier	BH15 Dust Collector ²
I03f	Line I03 (5) Core Molding Machines	Building
I03e	Line I03 Sand Sub Vacuum	BH19 Dust Collector ²

⁴ Required by Special Condition 4 of Construction Permit 102014-009.

⁵ Required by Special Condition 7 of Construction Permit 072019-011.

Emission Source	Description	Control Device
I03g	Line I03 Sand Sub Vacuum Transfer Unit	
I03i	Line I03 Heater	
I03k	Line I03 Sand Cooler	
I03j	Line I03 Buffer Tank	Sock Filters ⁵
I03l	Line I03 (3) Casting Machines	Building
I03m	Line I03 Metal Cooling	Building
I03h	Line I03 Shakeout and Finishing	BH20 Dust Collector ²
I03a	Line I03 Vibra Mill Crusher	BH13A Dust Collector ²
I04b	Line I04 Sand Polisher	BH2 Dust Collector ²
I04c	Line I04 Sand Classifier	BH3 Dust Collector ²
I04e	Line I04 (2) Core Molding Machines	Building
I04h	Line I04 Transfer Device	Building
I04d	Line I04 Sand Crusher	BH1 Dust Collector ²
I04f	Line I04 Heater	
I04g	Line I04 Sand Cooler	
I04j	Line I04 Buffer Tank	Sock Filters ⁵
I04i	Line I04 Casting Machine	Building
I04k	Line I04 Metal Cooling	Building
Q01b	Line Q01 Sand Polisher	BH23 Dust Collector ²
Q01c	Line Q01 Sand Classifier	BH24 Dust Collector ²
Q01d	Line Q01 Sand Classifier	BH31 Dust Collector ²
Q01f	Line Q01 (5) Core Molding Machines	Building
Q01/Q02h	Lines Q01 and Q02 (2) Transfer Device	BH18 Dust Collector ²
Q01/Q02e	Lines Q01 and Q02 Vibra Mill Crusher	
Q01/Q02i	Lines Q01 and Q02 (2) Heaters	
Q01/Q02g	Lines Q01 and Q02 (2) Sand Coolers	
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing	
Q01j	Line Q01 Buffer Tank	Sock Filters ⁵
Q01k	Line Q01 (3) Casting Machines	Building
Q01l	Line Q01 Metal Cooling	Building
Q02b	Line Q02 Sand Polisher	BH25 Dust Collector ²
Q02c	Line Q02 Sand Classifier	BH26 Dust Collector ²
Q02d	Line Q02 Sand Classifier	BH27 Dust Collector ²
Q02f	Line Q02 (5) Core Molding Machines	Building
Q02j	Line Q02 Buffer Tank	Sock Filters ⁵
Q02k	Line Q02 (3) Casting Machines	Building
Q02l	Line Q02 Metal Cooling	Building
Q03h	Line Q03 Sand Polisher	BH33 Dust Collector ²
Q03c	Line Q03 Sand Classifier	BH41 Dust Collector ²
Q03b	Line Q03 Sand Classifier	BH43 Dust Collector ²
Q03/Q04d	Lines Q03 and Q04 Vibra Mill Crusher	BH45 Dust Collector ²
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing	
Q03k	Line Q03 (5) Core Molding Machines	Building
Q03/Q04f	Lines Q03 and Q04 (2) Transfer Devices	BH40 Dust Collector ²
Q03/Q04g	Lines Q03 and Q04 (2) Heaters	
Q03/Q04i	Lines Q03 and Q04 (2) Sand Coolers	
Q03l	Line Q03 Pre-Classifier	BH35 Dust Collector ²

Emission Source	Description	Control Device
Q03a	Line Q03 Sand Polisher	BH42 Dust Collector ²
Q03j	Line Q03 Buffer Tank	Sock Filters ⁵
Q03m	Line Q03 (3) Casting Machines	Building
Q03n	Line Q03 Metal Cooling	Building
Q04l	Line Q04 Pre-Classifier	BH36 Dust Collector ²
Q04h	Line Q04 Sand Polisher	BH34 Dust Collector ²
Q04a	Line Q04 Sand Polisher	BH47 Dust Collector ²
Q04c	Line Q04 Sand Classifier	BH46 Dust Collector ²
Q04b	Line Q04 Sand Classifier	BH48 Dust Collector ²
Q04k	Line Q04 (5) Core Molding Machines	Building
Q04j	Line Q04 Buffer Tank	Sock Filters ⁵
Q04m	Line Q04 (3) Casting Machines	Building
Q04n	Line Q04 Metal Cooling	Building
Q05b	Line Q05 Pre-Classifier	BH55 Dust Collector ⁶
Q05/Q06c	Lines Q05 and Q06 (2) Transfer Devices	BH59 Dust Collector ⁶
Q05/Q06f	Lines Q05 and Q06 (2) Heaters	
Q05/Q06g	Lines Q05 and Q06 (2) Sand Coolers	
Q05d	Line Q05 Sand Classifier	BH58 Dust Collector ⁶
Q05e	Line Q05 Sand Polisher	BH81 Dust Collector ⁶
Q05h	Line Q05 Sand Polisher	BH56 Dust Collector ⁶
Q05i	Line Q05 Sand Classifier	BH57 Dust Collector ⁶
Q05j	Line Q05 Buffer Tank	Sock Filters ⁵
Q05k	Line Q05 (5) Core Molding Machines	Building
Q05n	Line Q05 (3) Casting Machines	Building
Q05l	Line Q05 Metal Cooling	Building
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing	BH50 Dust Collector ⁶
Q05/Q06a	Lines Q05 and Q06 (2) Vibra Mill Crushers	
Q06b	Line Q06 Pre-Classifier	BH70 Dust Collector ⁶
Q06d	Line Q06 Sand Classifier	BH72 Dust Collector ⁶
Q06e	Line Q06 Sand Polisher	BH71 Dust Collector ⁶
Q06h	Line Q06 Sand Polisher	BH52 Dust Collector ⁶
Q06i	Line Q06 Sand Classifier	BH53 Dust Collector ⁶
Q06j	Line Q06 Buffer Tank	Sock Filters ⁵
Q06k	Line Q06 (5) Core Molding Machines	Building
Q06n	Line Q06 (3) Casting Machines	Building
Q06l	Line Q06 Metal Cooling	Building
Q07a	Line Q07 Vibra Mill Crusher	BH79 Dust Collector ⁶
Q07m	Line Q07 Shakeout and Finishing	
Q07b	Line Q07 Pre-Classifier	BH74 Dust Collector ⁶
Q07c	Line Q07 Transfer Device	BH80 Dust Collector ⁶
Q07f	Line Q07 Heater	
Q07g	Line Q07 Sand Cooler	
Q07d	Line Q07 Sand Classifier	BH73 Dust Collector ⁶
Q07e	Line Q07 Sand Polisher	BH75 Dust Collector ⁶
Q07h	Line Q07 Sand Polisher	BH76 Dust Collector ⁶
Q07i	Line Q07 Sand Classifier	BH77 Dust Collector ⁶

⁶ Required by Special Condition 6 of Construction Permit 072019-011.

Emission Source	Description	Control Device
Q07j	Line Q07 Buffer Tank	Sock Filters ⁵
Q07k	Line Q07 (5) Core Molding Machines	Building
Q07n	Line Q07 (3) Casting Machines	Building
Q07l	Line Q07 Metal Cooling	Building

PROJECT EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis for SO_x, VOC, PM₁₀, and PM_{2.5} were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 3.4 *Large Stationary Diesel and All Stationary Dual-Fuel Engines* (October 1996). The emission factors for CO, NO_x, and PM were obtained from 40 CFR §89.112, *Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards*. These emission factors were for Tier 2 engines because what was provided in the manufacturer specifications of the emergency generators.

The following table provides an emissions summary for this project. Existing potential emissions were taken from Construction Permit 072019-011. Existing actual emissions were taken from the installation's 2018 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 6: Emissions Summary (tpy)

Pollutant	Regulatory <i>De Minimis</i> Levels / SMAL ^a	Existing Potential Emissions ^b	Existing Actual Emissions (2018 EIQ)	Potential Emissions of the Project	New Installation Conditioned Potential
PM	25.0	<250.0	N/A	0.33	<250.0
PM ₁₀	15.0	171.21	21.18	0.39 ^c	N/A
PM _{2.5}	10.0	108.99	20.80	0.39 ^c	N/A
SO _x	40.0	2.96	0.95	0.01	N/A
NO _x	40.0	<250.0	80.22	10.58	<250.0
VOC	40.0	55.90	19.51	0.80	N/A
CO	100.0	119.83	21.50	5.79	N/A
Total HAPs	10.0/25.0	<25.0	2.67	1.07 E-02	<25.0
Acetaldehyde	9	8.95	N/A	1.81 E-04	N/A
Acrolein	0.04	0.01	N/A	5.66 E-05	N/A
Benzene	2	2.96	N/A	5.58 E-03	N/A
Toluene	10	2.19	N/A	2.02 E-03	N/A
Formaldehyde	2	1.60	N/A	5.67 E-04	N/A
Napthalene	10	0.64	N/A	9.34 E-04	N/A
Xylenes	10	1.54	N/A	1.39 E-03	N/A

N/A = Not Applicable; N/D = Not Determined

^a SMAL of all individual HAPs

^b Other pollutants can be indirectly limited by the limits on PM, NO_x, and total HAPs. However, the values listed do not take into account any indirect limitations in the potential emissions.

^c PM₁₀ and PM_{2.5} are assumed to be equivalent

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all criteria air pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Bodine Aluminum, Inc. shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
 - Part 70 installations are required to submit a full EIQ each calendar year.
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070
 - *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, 40 CFR Part 60, Subpart IIII
- *MACT Regulations*, 10 CSR 10-6.075
 - *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ
- *Control of Sulfur Dioxide Emissions*, 10 CSR 10-6.261, this engine complies by the use of ultra-low sulfur diesel of 15ppm of sulfur.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated June 13, 2019, received June 13, 2019, designating Toyota Motor Engineering & Manufacturing North America Inc. as the owner and operator of the installation.

Attachment A – Combined HAP Compliance Worksheet

Bodine Aluminum, Inc.
 Lincoln County, S36, T36, R7W
 Project Number: 2019-06-028
 Installation ID Number: 113-0029
 Permit Number: **092019-009**

This sheet covers the period from _____ to _____.
 (month, year) (month, year)

Emission Source	Description	Monthly Usage	Combined HAP Emission Factor	Monthly Combined HAP Emissions ⁷ (tons)
C01	Plantwide Natural Gas External Combustion ^{Error! Bookmark not defined.}	MMscf	1.89 lb/MMscf ⁸	
C02	Natural Gas Emergency Generator	hours ⁹	0.09 lb/hr ¹⁰	
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout	tons metal	0.23 lb/ton ¹¹	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cooling	tons metal	0.08 lb/ton ¹¹	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Finishing	tons metal	0.01 lb/ton ¹²	
OA7 & OA10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heat Treatment	tons metal	4.73 x 10 ⁻³ lb/ton ¹⁷	
P05	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnaces #1 and #2	tons sand	0.05 lb/ton ¹³	
P35	3,230 HP Diesel Emergency Generator	hours ⁹	0.04 lb/hr ¹⁴	

⁷ Monthly Combined HAP Emissions (tons) = Monthly Usage x Combined HAP Emission Factor x 0.0005 (ton/lb).

⁸ Obtained from AP-42 Section 1.4 "Natural Gas Combustion" (July 1998).

⁹ Obtained from the non-resettable meter on the engine. Monthly usage = This month's meter reading (hours) – previous month's meter reading (hours).

¹⁰ An emission factor in lb/MMBtu was obtained from AP-42 Section 3.2 "Natural Gas-fired Reciprocating Engines" (August 2000) by summing all individual HAP emission factors. A natural gas heat content of 1,050 MMBtu/MMscf was obtained from AP-42 Appendix A "Miscellaneous Data and Conversion Factors" (September 1985). The engine combusts 1,185 scf/hr at full load.

¹¹ Obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999).

¹² Based on an uncontrolled PM emission factor of 0.58333 lb/ton from Toyota Design Data and the metal composition of the aluminum from the installation's September 8, 2016 analysis.

¹³ Obtained from December 2014 RTO inlet/baghouse outlet stack test results.

¹⁴ An emission factor in lb/MMBtu was obtained from WebFIRE for Process SCC 20200401 by summing all individual HAP emission factors. A diesel heat content of 130 MMBtu/Mgal was obtained from AP-42 Appendix A "Miscellaneous Data and Conversion Factors" (September 1985). The engine combusts 173.92 gal/hr at full load.

Emission Source	Description	Monthly Usage	Combined HAP Emission Factor	Monthly Combined HAP Emissions ⁷ (tons)
O2	Lines GR-Kai #1 and #2 Cylinder Head Casting – controlled by OD3 Wet Scrubber	tons metal	0.13 lb/ton ¹⁵	
	Line GR-Kai #3 Cylinder Head Casting – controlled by OD4 Wet Scrubber	tons metal	0.13 lb/ton ¹⁵	
	Lines AR #3 and #4 and UR Cylinder Head Casting – controlled by OD5 Wet Scrubber	tons metal	0.13 lb/ton ¹⁵	
	Line ZR Cylinder Head Casting – controlled by OD6 Wet Scrubber	tons metal	0.13 lb/ton ¹⁵	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cylinder Head Casting – SSM emissions	tons metal	0.26 lb/ton ¹⁶	
O5	Line GR-Kai #1 Core Molding – Controlled by OD3 Wet Scrubber	tons sand	0.09 lb/ton ¹⁷	
	Lines GR-Kai #2 and #3 Core Molding – Controlled by OD4 Wet Scrubber	tons sand	0.09 lb/ton ¹⁷	
	Lines AR #3 and #4 and UR Core Molding – Controlled by OD5 Wet Scrubber	tons sand	0.09 lb/ton ¹⁷	
	Line ZR Core Molding – Controlled by OD6 Wet Scrubber	tons sand	0.09 lb/ton ¹⁷	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Core Molding – SSM emissions	tons sand	0.18 lb/ton ¹⁶	
P11	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Coating – Controlled by OD1 RTO	tons sand	0.01 lb/ton ¹⁸	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Coating – SSM emissions	tons sand	0.05 lb/ton ¹³	
P36	435 HP Diesel Emergency Fire Pump	hours ⁹	0.01 lb/hr ¹⁹	

¹⁵ VOC HAPs obtained from January 2016 stack test. Metal HAPs obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999).

¹⁶ Assumes the wet scrubber achieves 50% control of combined HAPs.

¹⁷ Obtained from January 2016 stack test.

¹⁸ Obtained from December 2014 RTO outlet stack test results.

¹⁹ An emission factor in lb/MMBtu was obtained from WebFIRE for Process SCC 20200102 by summing all individual HAP emission factors. A diesel heat content of 130 MMBtu/Mgal was obtained from AP-42 Appendix A "Miscellaneous Data and Conversion Factors" (September 1985). The engine combusts 23.423 gal/hr at full load.

Emission Source	Description	Monthly Usage	Combined HAP Emission Factor	Monthly Combined HAP Emissions⁷ (tons)
P41	500 KW Emergency Diesel Generator	hours ¹⁰	7.15×10^{-3} lb/hr ⁵³	
P42	500 KW Emergency Diesel Generator	hours ¹⁰	7.15×10^{-3} lb/hr ⁵³	
P43	500 KW Emergency Diesel Generator	hours ¹⁰	7.15×10^{-3} lb/hr ⁵³	
P44	500 KW Emergency Diesel Generator	hours ¹⁰	7.15×10^{-3} lb/hr ⁵³	
P45	500 KW Emergency Diesel Generator	hours ¹⁰	7.15×10^{-3} lb/hr ⁵³	
P46	500 KW Emergency Diesel Generator	hours ¹⁰	7.15×10^{-3} lb/hr ⁵³	
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing – Controlled by BH16 Dust Collector	tons metal	9.14×10^{-4} lb/ton ²⁰	
I03h	Line I03 Shakeout and Finishing – Controlled by BH20 Dust Collector	tons metal	9.14×10^{-4} lb/ton ²⁰	
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing – Controlled by BH18 Dust Collector	tons metal	9.14×10^{-4} lb/ton ²⁰	
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing – Controlled by BH45 Dust Collector	tons metal	9.14×10^{-4} lb/ton ²⁰	
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing – Controlled by BH50 Dust Collector	tons metal	9.14×10^{-4} lb/ton ²⁰	
Q07m	Line Q07 Shakeout and Finishing – Controlled by BH79 Dust Collector	tons metal	9.14×10^{-4} lb/ton ²⁰	

²⁰ Assumes 90% overall capture and control for the use of a dust collector/baghouse.

Emission Source	Description	Monthly Usage	Combined HAP Emission Factor	Monthly Combined HAP Emissions ⁷ (tons)
I01/I02/I04a, I03h, Q01/Q02a, Q03/Q04e, Q05/Q06m, & Q07m	Lines I01-I04 and Q01-Q07 Shakeout and Finishing – SSM emissions	tons metal	9.14×10^{-3} lb/ton ²¹	
I01i, I02k, I03l, I04i, Q01k, Q02k, Q03m, Q04m, Q05n, Q06n, & Q07n	Lines I01-I04 and Q01-Q07 Casting Machines	tons metal	0.01 lb/to 0.02 n ²²	
I01m, I02l, I03m, I04k, Q01l, Q02l, Q03n, Q04n, Q05l, Q06l, & Q07l	Lines I01-I04 and Q01-Q07 Metal Cooling	tons metal	2.65×10^{-3} lb/ton ²²	
Installation Monthly Combined HAP Emissions²³ (tons):				
Installation 12-Month Rolling Total Combined HAP Emissions²⁴ (tons):				

²¹ Shakeout emission factor obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999). Finishing emission factor based on an uncontrolled PM emission factor of 0.58333 lb/ton from Toyota Design Data and the heavy metal composition of the aluminum from the installation's September 8, 2016 analysis.

²² Emission factor obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999). Includes 1.5% overall capture and control for being located within a building.

²³ Installation Monthly Combined HAP Emissions (tons) = the sum of each emission source's Monthly Combined HAP Emissions (tons).

²⁴ Installation 12-Month Rolling Total Combined HAP Emissions (tons) = the sum of the most recent 12 months' Installation Monthly Combined HAP Emissions (tons). **Installation 12-Month Rolling Total Combined HAP Emissions of less than 25 tons indicates compliance with Special Condition 2.A.**

Attachment B - PM Compliance Worksheet

Bodine Aluminum, Inc.
 Lincoln County, S36, T36, R7W
 Project Number: 2019-06-028
 Installation ID Number: 113-0029
 Permit Number: **092019-009**

This sheet covers the period from _____ to _____.
 (month, year) (month, year)

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ²⁵ (tons)
C01	Plantwide Natural Gas External Combustion ^{Error! Bookmark not defined.}	MMscf	1.9 lb/MMscf ⁸	
C02	Natural Gas Emergency Generator	hours ⁹	9.59 x 10 ⁻⁵ lb/hr ²⁶	
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout	tons metal	0.53 lb/ton ¹¹	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cooling	tons metal	0.46 lb/ton ¹¹	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Finishing	tons metal	0.58 lb/ton ²⁷	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shot Blasting	tons blast media	54 lb/ton ²⁸	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Welding	tons welding rod	20 lb/ton ²⁹	
P01	Used Sand Crushing – Controlled by DC1B Dust Collector	tons sand	0.40 lb/ton ²⁰	
	Used Sand Crushing – SSM emissions	tons sand	4.02 lb/ton ²⁷	
P02	Used Sand Sieving – Controlled by DC1B Dust Collector	tons sand	0.23 lb/ton ²⁰	
	Used Sand Sieving – SSM emissions	tons sand	2.25 lb/ton ²⁷	
P03	Aluminum/Sand Separation – Controlled by DC1B Dust Collector	tons sand	0.19 lb/ton ²⁰	
	Aluminum/Sand Separation – SSM emissions	tons sand	1.9 lb/ton ²⁷	

²⁵ Monthly PM Emissions (tons) = Monthly Usage x PM Emission Factor x 0.0005 (ton/lb).

²⁶ A PM emission factor of 7.71 x 10⁻⁵ lb/MMBtu was obtained from AP-42 Section 3.2 "Natural Gas-fired Reciprocating Engines" (August 2000) Table 3.2-1 and a natural gas heat content of 1,050 MMBtu/MMscf obtained from AP-42 Appendix A "Miscellaneous Data and Conversion Factors" (September 1985). The engine combusts 1,185 scf/hr at full load.

²⁷ Obtained from Toyota Design Data.

²⁸ Obtained from AP-42 Section 13.2.6 "Abrasive Blasting" (October 1997)

²⁹ Obtained from the General District-ARB-Nassco GMAW emission estimation procedure (August 1999)

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ²⁵ (tons)
O2	Lines GR-Kai #1 and #2 Cylinder Head Casting – controlled by OD3 Wet Scrubber	tons metal	0.17 lb/ton ¹⁷	
	Line GR-Kai #3 Cylinder Head Casting – controlled by OD4 Wet Scrubber	tons metal	0.17 lb/ton ¹⁷	
	Lines AR #3 and #4 and UR Cylinder Head Casting – controlled by OD5 Wet Scrubber	tons metal	0.17 lb/ton ¹⁷	
	Line ZR Cylinder Head Casting – controlled by OD6 Wet Scrubber	tons metal	0.17 lb/ton ¹⁷	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cylinder Head Casting – SSM emissions	tons metal	0.58 lb/ton ³⁰	
O5	Line GR-Kai #1 Core Molding – Controlled by OD3 Wet Scrubber	tons sand	0.01 lb/ton ¹⁷	
	Lines GR-Kai #2 and #3 Core Molding – Controlled by OD4 Wet Scrubber	tons sand	0.01 lb/ton ¹⁷	
	Lines AR #3 and #4 and UR Core Molding – Controlled by OD5 Wet Scrubber	tons sand	0.01 lb/ton ¹⁷	
	Line ZR Core Molding – Controlled by OD6 Wet Scrubber	tons sand	0.01 lb/ton ¹⁷	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Core Molding – SSM emissions	tons sand	1.1 lb/ton ³¹	
P04	Final Sand Crushing – Controlled by DC1B Dust Collector	tons sand	0.17 lb/ton ²⁰	
	Final Sand Crushing – SSM emissions	tons sand	1.68 lb/ton ²⁷	
P05	Sand Reclamation Furnace #1 – controlled by DC2 Baghouse	tons sand	0.02 lb/ton ¹³	
	Sand Reclamation Furnace #2 – controlled by DC16 Baghouse	tons sand	0.02 lb/ton ¹³	
	Sand Reclamation Furnaces #1 and #2 – SSM emissions	tons sand	2 lb/ton ³²	
P06	Sand Separation – Controlled by DC1B Dust Collector	tons sand	0.17 lb/ton ²⁰	
	Sand Separation – SSM emissions	tons sand	1.68 lb/ton ²⁷	

³⁰ Emission factor obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999).

³¹ Obtained from AP-42 Section 12.10 "Gray Iron Foundries" (May 2003).

³² Obtained from AP-42 Section 11.19.1 "Sand & Gravel Processing" (November 1995).

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ²⁵ (tons)
P07	Sand Storage – Controlled by DC1B Dust Collector	tons sand	0.04 lb/ton ²⁰	
	Sand Storage – SSM emissions	tons sand	0.42 lb/ton ²⁷	
P08	Sand Weighing – Controlled by DC1A Baghouse	tons sand	0.04 lb/ton ²⁰	
	Sand Weighing – SSM emissions	tons sand	0.42 lb/ton ²⁷	
P09	Sand Dryer – Controlled by DC1A Baghouse	tons sand	0.04 lb/ton ²⁰	
	Sand Dryer – SSM emissions	tons sand	0.42 lb/ton ²⁷	
P10	Heated Sand Storage – Controlled by DC1A Baghouse	tons sand	0.04 lb/ton ²⁰	
	Heated Sand Storage – SSM emissions	tons sand	0.42 lb/ton ²⁷	
P11	Resin Coating – Controlled by OD1 RTO and DC3 Dust Collector	tons sand	0.01 lb/ton ¹⁸	
	Resin Coating – SSM emissions	tons sand	1.75 lb/ton ³³	
P12	Resin Holding, Bin Charging – Controlled by DC1A Baghouse	tons sand	2.9×10^{-3} lb/ton ²⁰	
	Resin Holding, Bin Charging – SSM emissions	tons sand	0.03 lb/ton ³⁴	
P13	Coated Sand Cooling – Controlled by DC1A Baghouse	tons sand	0.38 lb/ton ²⁰	
	Coated Sand Cooling – SSM emissions	tons sand	3.8 lb/ton ²⁷	
P14	Coated Sand Crushing – Controlled by DC1A Baghouse	tons sand	0.17 lb/ton ²⁰	
	Coated Sand Crushing – SSM emissions	tons sand	1.68 lb/ton ²⁷	
P15	Coated Sand Sieving – Controlled by P15 Dust Collector	tons sand	0.23 lb/ton ²⁰	
	Coated Sand Sieving – SSM emissions	tons sand	2.25 lb/ton ²⁷	
P16	Coated Sand Storage – Controlled by DC1A Baghouse	tons sand	0.42 lb/ton ²⁰	
	Coated Sand Storage – SSM emissions	tons sand	4.22 lb/ton ²⁷	
P34	Paved Haul Roads	VMT	2.03 lb/VMT ³⁵	

³³ Obtained from December 2014 RTO inlet/baghouse outlet stack test results and assuming a 99% combined capture and control efficiency for the dust collector.

³⁴ Obtained from WebFIRE for Process SCC 30502503.

³⁵ Obtained from AP-42 Section 13.2.1 "Paved Haul Roads" (January 2011).

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ²⁵ (tons)
P35	3,230 HP Diesel Emergency Generator	hours ⁹	2.38 lb/hr ³⁶	
P36	435 HP Diesel Emergency Fire Pump	hours ⁹	1.00 lb/hr ³⁷	
P37	Electric Aluminum Holding Furnaces Flux Usage	tons flux	963 lb/ton ³⁸	
P41	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ⁵⁴	
P42	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ⁵⁴	
P43	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ⁵⁴	
P44	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ⁵⁴	
P45	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ⁵⁴	
P46	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ⁵⁴	
I01/I02j	Lines I01 and I02 Vibra Mill Crusher – Controlled by BH4 Dust Collector	tons sand	0.40 lb/ton ²⁰	
I03a	Line I03 Vibra Mill Crusher – Controlled by BH13A Dust Collector	tons sand	0.40 lb/ton ²⁰	
Q01/Q02e	Lines Q01 and Q02 Vibra Mill Crusher – Controlled by BH18 Dust Collector	tons sand	0.40 lb/ton ²⁰	
Q03/Q04d	Lines Q03 and Q04 Vibra Mill Crusher – Controlled by BH45 Dust Collector	tons sand	0.40 lb/ton ²⁰	
Q05/Q06a	Lines Q05 and Q06 (2) Vibra Mill Crushers – Controlled by BH50 Dust Collector	tons sand	0.40 lb/ton ²⁰	
Q07a	Line Q07 Vibra Mill Crusher – Controlled by BH79 Dust Collector	tons sand	0.40 lb/ton ²⁰	
I01/I02j, I03a, Q01/Q02e, Q03/Q04d, Q05/Q06a, & Q07a	Lines I01-I03 and Q01-Q07 Vibra Mill Crushers – SSM emissions	tons sand	4.02 lb/ton ²⁷	
Q03l	Line Q03 Pre-Classifer – Controlled by BH35 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q04l	Line Q04 Pre-Classifer – Controlled by BH36 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q05b	Line Q05 Pre-Classifer – Controlled by BH55 Dust Collector	tons sand	0.23 lb/ton ²⁰	

³⁶ An emission factor in lb/1,000 gal was obtained from WebFIRE for Process SCC 20200401. The engine combusts 173.92 gal/hr at full load.

³⁷ An emission factor in lb/1,000 gal was obtained from WebFIRE for Process SCC 20200102. The engine combusts 23.423 gal/hr at full load.

³⁸ Obtained from WebFIRE for Process SCC 30400104, includes 3.7% control for being located in a building.

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions²⁵ (tons)
Q06b	Line Q06 Pre-Classifier – Controlled by BH70 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q07b	Line Q07 Pre-Classifier – Controlled by BH74 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q03l, Q04l, Q05b, Q06b, & Q07b	Lines Q03-Q07 Pre-Classifiers – SSM emissions	tons sand	2.25 lb/ton ²⁷	
I04d	Line I04 Sand Crusher – Controlled by BH1 Dust Collector	tons sand	0.40 lb/ton ²⁰	
	Line I04 Sand Crusher – SSM emissions	tons sand	4.02 lb/ton ²⁷	
I01e	Line I01 Sand Crusher – Controlled by BH4 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I02e	Line I02 Sand Crusher – Controlled by BH4 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I01e & I02e	Lines I01 and I02 Sand Crushers – SSM emissions	tons sand	1.68 lb/ton ²⁷	
I03e	Line I03 Sand Sub Vacuum – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ²⁰	
	Line I03 Sand Sub Vacuum – SSM emissions	tons sand	0.42 lb/ton ²⁷	
I01/I02g	Lines I01 and I02 (2) Transfer Devices – Controlled by BH4 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q01/Q02h	Lines Q01 and Q02 (2) Transfer Devices – Controlled by BH18 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q03/Q04f	Lines Q03 and Q04 (2) Transfer Devices – Controlled by BH40 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q05/Q06c	Lines Q05 and Q06 (2) Transfer Devices – Controlled by BH59 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q07c	Line Q07 Transfer Device – Controlled by BH80 Dust Collector	tons sand	0.04 lb/ton ²⁰	
I01/I02g, Q01h, Q02h, Q03/Q04f, Q05/Q06c, & Q07c	Lines I01, I02, and Q01-Q07 Transfer Devices – SSM emissions	tons sand	0.42 lb/ton ²⁷	
I03g	Line I03 Sand Sub Vacuum Transfer Unit – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ²⁰	
	Line I03 Sand Sub Vacuum Transfer Unit – SSM emissions	tons sand	0.42 lb/ton ²⁷	

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions²⁵ (tons)
I04h	Line I04 Transfer Device	tons sand	0.40 lb/ton ³⁹	
I01d	Line I01 Sand Classifier – Controlled by BH11 Dust Collector	tons sand	0.23 lb/ton ²⁰	
I02d	Line I02 Sand Classifier – Controlled by BH7 Dust Collector	tons sand	0.23 lb/ton ²⁰	
I03d	Line I03 Sand Classifier – Controlled by BH15 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q01d	Line Q01 Sand Classifier – Controlled by BH31 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q02d	Line Q02 Sand Classifier – Controlled by BH27 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q03c	Line Q03 Sand Classifier – Controlled by BH41 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q04c	Line Q04 Sand Classifier – Controlled by BH46 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q05d	Line Q05 Sand Classifier – Controlled by BH58 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q06d	Line Q06 Sand Classifier – Controlled by BH72 Dust Collector	tons sand	0.23 lb/ton ²⁰	
Q07d	Line Q07 Sand Classifier – Controlled by BH73 Dust Collector	tons sand	0.23 lb/ton ²⁰	
I01d, I02d, I03d, Q01d, Q02d, Q03c, Q04c, Q05d, Q06d, & Q07d	Lines I01-I03 and Q01-Q07 Sand Classifiers – SSM emissions	tons sand	2.25 lb/ton ²⁷	
I01/I02h	Lines I01 and I02 (2) Heaters – Controlled by BH4 Dust Collector	tons sand	0.04 lb/ton ²⁰	
I03i	Line I03 Heater – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ²⁰	
I04f	Line I04 Heater – Controlled by BH1 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q01/Q02i	Lines Q01 and Q02 (2) Heaters – Controlled by BH18 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q03/Q04g	Lines Q03 and Q04 (2) Heaters – Controlled by BH40 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q05/Q06f	Lines Q05 and Q06 (2) Heaters – Controlled by BH59 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q07f	Line Q07 Heater – Controlled by BH80 Dust Collector	tons sand	0.04 lb/ton ²⁰	

³⁹ Obtained from Toyota Design Data. Includes 3.7% overall capture and control for being located within a building.

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions²⁵ (tons)
I01/I02h, I03i, I04f, Q01/Q02i, Q03/Q04g, Q05/Q06f, & Q07f	Lines I01-I04 and Q01-Q07 Heaters – SSM emissions	tons sand	0.42 lb/ton ²⁷	
I01/I02i	Lines I01 and I02 (2) Sand Coolers – Controlled by BH4 Dust Collector	tons sand	0.04 lb/ton ²⁰	
I03k	Line I03 Sand Cooler – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ²⁰	
I04g	Line I04 Sand Cooler – Controlled by BH1 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q01/Q02g	Lines Q01 and Q02 (2) Sand Coolers – Controlled by BH18 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q03/Q04i	Lines Q03 and Q04 (2) Sand Coolers – Controlled by BH40 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q05/Q06g	Lines Q05 and Q06 (2) Sand Coolers – Controlled by BH59 Dust Collector	tons sand	0.04 lb/ton ²⁰	
Q07g	Line Q07 Sand Cooler – Controlled by BH80 Dust Collector	tons sand	0.04 lb/ton ²⁰	
I01/I02i, I03k, I04g, Q01/Q02g, Q03/Q04i, Q05/Q06g, & Q07g	Lines I01-I04 and Q01-Q07 Sand Coolers – SSM emissions	tons sand	0.42 lb/ton ²⁷	
I01b	Line I01 Sand Polisher – Controlled by BH8 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I02b	Line I02 Sand Polisher – Controlled by BH5 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I03b	Line I03 Sand Polisher – Controlled by BH13 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I04b	Line I04 Sand Polisher – Controlled by BH2 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q01b	Line Q01 Sand Polisher – Controlled by BH23 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q02b	Line Q02 Sand Polisher – Controlled by BH25 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q03a	Line Q03 Sand Polisher – Controlled by BH42 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q03h	Line Q03 Sand Polisher – Controlled by BH33 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q04a	Line Q04 Sand Polisher – Controlled by BH47 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q04h	Line Q04 Sand Polisher – Controlled by BH34 Dust Collector	tons sand	0.17 lb/ton ²⁰	

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions²⁵ (tons)
Q05e	Line Q05 Sand Polisher – Controlled by BH81 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q05h	Line Q05 Sand Polisher – Controlled by BH56 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q06e	Line Q06 Sand Polisher – Controlled by BH71 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q06h	Line Q06 Sand Polisher – Controlled by BH52 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q07e	Line Q07 Sand Polisher – Controlled by BH75 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q07h	Line Q07 Sand Polisher – Controlled by BH76 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I01b, I02b, I03b, I04b, Q01b, Q02b, Q03a, Q03h, Q04a, Q04h, Q05e, Q05h, Q06e, Q06h, Q07e, & Q07h	Lines I01-I04 and Q01-Q04 Sand Polishers – SSM emissions	tons sand	1.68 lb/ton ²⁷	
I01c	Line I01 Sand Classifier – Controlled by BH9 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I02c	Line I02 Sand Classifier – Controlled by BH6 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I03c	Line I03 Sand Classifier – Controlled by BH14 Dust Collector	tons sand	0.17 lb/ton ²⁰	
I04c	Line I04 Sand Classifier – Controlled by BH3 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q01c	Line Q01 Sand Classifier – Controlled by BH24 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q02c	Line Q02 Sand Classifier – Controlled by BH26 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q03b	Line Q03 Sand Classifier – Controlled by BH43 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q04b	Line Q04 Sand Classifier – Controlled by BH48 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q05i	Line Q05 Sand Classifier – Controlled by BH57 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q06i	Line Q06 Sand Classifier – Controlled by BH53 Dust Collector	tons sand	0.17 lb/ton ²⁰	
Q07i	Line Q07 Sand Classifier – Controlled by BH77 Dust Collector	tons sand	0.17 lb/ton ²⁰	

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ²⁵ (tons)
I01c, I02c, I03c, I04c, Q01c, Q02c, Q03b, Q04b, Q05i, Q06i, & Q07i	Lines I01-I04 and Q01-Q07 Sand Classifiers – SSM emissions	tons sand	1.68 lb/ton ²⁷	
I01k	Line I01 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
I02m	Line I02 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
I03j	Line I03 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
I04j	Line I04 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q01j	Line Q01 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q02j	Line Q02 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q03j	Line Q03 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q04j	Line Q04 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q05j	Line Q05 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q06j	Line Q06 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
Q07j	Line Q07 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ⁴⁰	
I01k, I02m, I03j, I04j, Q01j, Q02j, Q03j, Q04j, Q05j, Q06j, & Q07j	Lines I01-I04 and Q01-Q07 Buffer Tanks – SSM emissions	tons sand	0.42 lb/ton ²⁷	
I01f, I02f, I03f, I04e, Q01f, Q02f, Q03k, Q04k, Q05k, Q06k, Q07k	Lines I01-I04 and Q01-Q07 Core Molding Machines	tons sand	1.06 lb/ton ⁴¹	

⁴⁰ Assumes 50% overall capture and control for the use of sock filters.

⁴¹ Obtained from AP-42 Section 12.10 "Gray Iron Foundries" (May 2003). Includes 3.7% overall capture and control for being located within a building.

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions²⁵ (tons)
I01l, I02k, I03l, I04i, Q01k, Q02k, Q03m, Q04m, Q05n, Q06n, & Q07n	Lines I01-I04 and Q01-Q07 Casting Machines	tons metal	0.56 lb/ton ⁴²	
I01m, I02l, I03m, I04k, Q01l, Q02l, Q03n, Q04n, Q05l, Q06l, & Q07l	Lines I01-I04 and Q01-Q07 Metal Cooling	tons metal	0.47 lb/ton ⁴²	
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing – Controlled by BH16 Dust Collector	tons metal	0.11 lb/ton ²⁰	
I03h	Line I03 Shakeout and Finishing – Controlled by BH20 Dust Collector	tons metal	0.11 lb/ton ²⁰	
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing – Controlled by BH18 Dust Collector	tons metal	0.11 lb/ton ²⁰	
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing – Controlled by BH45 Dust Collector	tons metal	0.11 lb/ton ²⁰	
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing – Controlled by BH50 Dust Collector	tons metal	0.11 lb/ton ²⁰	
Q07m	Line Q07 Shakeout and Finishing – Controlled by BH79 Dust Collector	tons metal	0.11 lb/ton ²⁰	
I01/I02/I04a, I03h, Q01/Q02a, Q03/Q04e, Q05/Q06m, & Q07m	Lines I01-I04 and Q01-Q07 Shakeout and Finishing – SSM emissions	tons metal	1.11 lb/ton ⁴³	
Installation Monthly PM Emissions⁴⁴ (tons):				
Installation 12-Month Rolling Total PM Emissions⁴⁵ (tons):				

⁴² Obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999). Includes 3.7% overall capture and control for being located within a building.

⁴³ Shakeout emission factor obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999). Finishing emission factor obtained from Toyota Design Data.

⁴⁴ Installation Monthly PM Emissions (tons) = the sum of each emission source's Monthly PM Emissions (tons).

⁴⁵ Installation 12-Month Rolling Total PM Emissions (tons) = the sum of the most recent 12 months' Installation Monthly PM Emissions (tons). **Installation 12-Month Rolling Total PM Emissions of less than 250.0 tons indicates compliance with Special Condition 3.A.**

Attachment C – NO_x Compliance Worksheet

Bodine Aluminum, Inc.
 Lincoln County, S36, T36, R7W
 Project Number: 2019-06-028
 Installation ID Number: 113-0029
 Permit Number: **092019-009**

This sheet covers the period from _____ to _____.
 (month, year) (month, year)

Emission Source	Description	Monthly Usage	NO _x Emission Factor	Monthly NO _x Emissions ⁴⁶ (tons)
C01	Plantwide Natural Gas External Combustion ^{Error! Bookmark not defined.}	MMscf	100 lb/MMscf ⁸	
C02	Natural Gas Emergency Generator	hours ⁹	5.08 lb/hr ⁴⁷	
O2	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cylinder Head Casting	tons metal	0.01 lb/ton ⁴⁸	
O5	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Core Molding	tons sand	0.5 lb/ton ⁴⁹	
OA7 & OA10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heat Treatment Process Emissions	tons metal	0.79 lb/ton ¹⁷	
P09	Sand Dryer	tons sand	1.6 lb/ton ²⁷	
P35	3,230 HP Diesel Emergency Generator	hours ⁹	76.18 lb/hr ³⁶	
P36	435 HP Diesel Emergency Fire Pump	hours ⁹	3.54 lb/hr ³⁷	
P41	500 KW Emergency Diesel Generator	hours ¹⁰	7.05 lb/hr ⁵⁴	
P42	500 KW Emergency Diesel Generator	hours ¹⁰	7.05 lb/hr ⁵⁴	
P43	500 KW Emergency Diesel Generator	hours ¹⁰	7.05 lb/hr ⁵⁴	
P44	500 KW Emergency Diesel Generator	hours ¹⁰	7.05 lb/hr ⁵⁴	
P45	500 KW Emergency Diesel Generator	hours ¹⁰	7.05 lb/hr ⁵⁴	
P46	500 KW Emergency Diesel Generator	hours ¹⁰	7.05 lb/hr ⁵⁴	
I01i, I02k, I03l, I04i, Q01k, Q02k, Q03m, Q04m, Q05n, Q06n, & Q07n	Lines I01-I04 and Q01-Q07 Casting Machines	tons metal	0.01 lb/ton ⁴⁸	
Installation Monthly NO_x Emissions⁵⁰ (tons):				
Installation 12-Month Rolling Total NO_x Emissions⁵¹ (tons):				

⁴⁶ Monthly NO_x Emissions (tons) = Monthly Usage x NO_x Emission Factor x 0.0005 (ton/lb).

⁴⁷ A NO_x emission factor of 4.08 lb/MMBtu was obtained from AP-42 Section 3.2 "Natural Gas-fired Reciprocating Engines" (August 2000) Table 3.2-1 and a natural gas heat content of 1,050 MMBtu/MMscf obtained from AP-42 Appendix A "Miscellaneous Data and Conversion Factors" (September 1985). The engine combusts 1,185 scf/hr at full load.

⁴⁸ Obtained from WebFIRE for Process SCC 30400114.

⁴⁹ Obtained from WebFIRE for Process SCC 30400371.

⁵⁰ Installation Monthly NO_x Emissions (tons) = the sum of each emission source's Monthly NO_x Emissions (tons).

⁵¹ Installation 12-Month Rolling Total NO_x Emissions (tons) = the sum of the most recent 12 months' Installation Monthly NO_x Emissions (tons). **Installation 12-Month Rolling Total NO_x Emissions of less than 250.0 tons indicates compliance with Special Condition 4.A.**

⁵³ Obtained from Ap-42 Section 3.4 "Large Stationary Diesel and All Stationary Dual-Fuel Engines" (October 1996).

⁵⁴ Obtained from 40 CFR §89.112, *Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards*

Attachment D – C01 Plantwide Natural Gas External Combustion includes all of the following equipment:

Bodine Aluminum, Inc.
 Lincoln County, S36, T36, R7W
 Project Number: 2019-06-028
 Installation ID Number: 113-0029
 Permit Number: 092019-009

Description	Total MHDR (MMBtu/hr)	Process Emissions are reported under...
Sand Reclamation Furnace #1	4.8	P05
Sand Reclamation Furnace #2	4.8	
(1) Resin Coating/Muller Pre-heater	4	P11
(1) Regenerative Thermal Oxidizer	8.9	
(53) Low Pressure Die Casting Die Heaters	24.91	N/A
(9) Toyota New Global Architecture (TNGA) Die Heaters	0.234	N/A
(31) HVAC Units	135.98	N/A
(4) Conventional Heat Treatment Furnaces: (4) natural gas aging burners at 1.76 MMBtu/hr each and (4) electric solution burners	7.04	OA7
(6) Simple Slim Heat Treatment Furnaces: (6) solution burners at 2.34 MMBtu/hr each and (6) aging burners at 2.374 MMBtu/hr each	28.284	
(6) TNGA Heat Treatment Furnaces: (4) solution burners at 2.374 MMBtu/hr each, (4) aging burners at 1.187 MMBtu/hr each, and (2) aging burners at 2.374 MMBtu/hr each	23.67	
(1) Simple Slim Heat Treatment Furnace	1.586	
Line GR Kai #1 Die Heaters	5.64	N/A
Line GR Kai #2 Die Heaters	4.7	N/A
Line GR Kai #3 Die Heaters	3.76	N/A
Line UR Die Heaters	4.7	N/A
Line I03 Die Heaters	1.41	N/A
Line ZR Die Heaters	1.88	N/A
Lines I01 and I02 Die Heaters	2.82	N/A
Sand Dryer	0.03948	N/A
Lines Q01-Q07 Die Heaters	9.87	N/A
Boiler Room A Water Heater	0.2	N/A
Boiler Room B Water Heater	0.2	N/A
Kitchen Water Heater	0.13	N/A
SW Restrooms Water Heater	0.04	N/A
Lines I01-I04 and Q01-Q07 Heat Treatment Furnaces	26.18	N/A

APPENDIX A

Abbreviations and Acronyms

%	percent	Mgal	1,000 gallons
°F	degrees Fahrenheit	MW	megawatt
acfm	actual cubic feet per minute	MHDR	maximum hourly design rate
BACT	Best Available Control Technology	MMBtu	Million British thermal units
BMPs	Best Management Practices	MMCF	million cubic feet
Btu	British thermal unit	MSDS	Material Safety Data Sheet
CAM	Compliance Assurance Monitoring	NAAQS	National Ambient Air Quality Standards
CAS	Chemical Abstracts Service	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CEMS	Continuous Emission Monitor System	NO_x	nitrogen oxides
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	carbon monoxide	NSR	New Source Review
CO₂	carbon dioxide	PM	particulate matter
CO_{2e}	carbon dioxide equivalent	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
COMS	Continuous Opacity Monitoring System	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
CSR	Code of State Regulations	ppm	parts per million
dscf	dry standard cubic feet	PSD	Prevention of Significant Deterioration
EQ	Emission Inventory Questionnaire	PTE	potential to emit
EP	Emission Point	RACT	Reasonable Available Control Technology
EPA	Environmental Protection Agency	RAL	Risk Assessment Level
EU	Emission Unit	SCC	Source Classification Code
fps	feet per second	scfm	standard cubic feet per minute
ft	feet	SDS	Safety Data Sheet
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	SSM	Startup, Shutdown & Malfunction
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		
m/s	meters per second		