DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection

B642535613

FACILITY: INTERNATIONAL CASTING CORP		**SRN / ID:** B6425
LOCATION: 37087 GREEN ST, NEW BALTIMORE		**DISTRICT:** Southeast Michigan
CITY: NEW BALTIMORE		**COUNTY:** MACOMB
CONTACT: Kevin Barrickman , Health, Safety and Environmental Coordinator		**ACTIVITY DATE:** 07/01/2016
STAFF: Francis Lim	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MINOR
SUBJECT:		
RESOLVED COMPLAINTS: C-16-00970		

On July 1, 2016, I conducted an inspection at International Casting Corporation ("ICC") located at 37087 Green St., New Baltimore, Michigan. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) Administrative Rules; Permit-to-Install Nos. 703-83, 489-87, 663-92B, 497-98, and 355-08; and to investigate a recent complaint regarding a metallic foundry odor. Mr. Kevin Barrickman, Environmental, Safety, and Health Coordinator assisted during the inspection.

Facility Description

International Casting is a small "jobber" sized iron and steel foundry, casting low volume specialty parts in various iron alloys. In a foundry, metals are turned into parts by melting the metal into a liquid, pouring the molten metal in a mold, and then removing the molded material from the mold. Products include machine tools, dies, and automotive products. This facility operates one shift a day, 5 to 6 days per week.

Molten metal is produced in any of the six electric induction furnaces that vent into the in-plant atmosphere without capture or control. The facility's charge materials consist of pig iron, 1010 steel slugs and revert. The furnaces are of the following sizes: (3) 6,000 lb. capacity, (1) 2,400 lb. capacity, (1) 800 lb. capacity and (1) 300 lb. capacity. The four larger furnaces each have its own power supply while the two smaller ones share one power supply. The melt is poured into a ladle which is carried via overhead hoist to the molds. The ladle is preheated prior to use. NOTE: Iron that contains less than 2% carbon is called steel. Iron that contains more than 2% carbon (typically 2-4%) is called pig iron.

The facility produces a limited amount of ductile iron (2% of total production) utilizing the ductile inoculation sandwich method in a standard pour ladle. The inoculant, magnesium/silicon is added to the ladle when the molten metal is poured from the furnace.

Prior to pouring the molten metal from the ladle, the foundry produces the mold (using a pattern), which is made out of silica sand and binder. The mold gives the shape of the molten metal poured into it to harden. The binder keeps the shape of the sand mold. The sand is gravity-fed to an electric heater, then to the three sand mixers, where a three-part "no-bake" phenolic urethane binder (part A resin, part b resin, catalyst) is mixed in. The mixers mix the sand and binder used for the large floor rammed molds and for the smaller molds made in the conveyor. A combination of fresh sand and reclaimed sand is used for molding. The mixers have capacities of 800 pounds, 600 pounds, and 200 pounds.

To produce cavities within the casting, cores may be inserted. Cores are also made up of

sand molds. Molds and cores are produced without capture or control. Same binder is used for the core production.

A flask is the frame that holds the molding sand in place. It consists of a top piece (the cope) and a bottom portion (the drag) to facilitate removal of the pattern. The pattern is a model of the metal casting. Patterns are made of Styrofoam or wood. The pattern is placed in the flask and molding sand is dumped and packed around the pattern. The pattern is supplied by the client.

In order for the molten metal to be poured into the mold cavity, holes called sprues (opening where metal is poured) and risers (reservoir of molten metal to fill cavity as metal casting shrinks) must be created in the molding sand. A channel must be cut from the sprue and riser to allow molten metal into the mold cavity. This is called the gate. After the binder sets in, the cope is lifted, the pattern is removed and the flask is reassembled. Cores, if needed are inserted into the mold after removal of the pattern. To facilitate removal of the pattern, a parting compound, called Isomol (isopropyl alcohol based) is used.

After pouring the molten metal through the sprues and risers, the castings are cooled within the molds. The cooling is followed by the shakeout process where the molds are manually knocked out on the floor to remove the molds. No shakedown machines are installed. Sand adhering to the casting is scraped off. The chunks of sand are sent to the Vibramill sand reclaimer.

Temporary appendages including sprues, gates, and risers are cut off. The finished product is refined using grinding, cutting, and abrasive blasting equipment

Compliance Evaluation

PTI No. 497-78 is for the foundry sand distribution system, including transporter, hopper, sand heater, mixer, and associated ducting. Fresh silica sand is received in trucks and pneumatically transferred to three roof-mounted silos (2-50 tons, 1-40 tons). There is another storage silo (40 tons) used for chromite sand (core manufacturing). The silos are equipped with passive dust collectors. The permit establishes an emission limit of 0.10 pounds per 1,000 pounds of exhaust gas and an opacity limit of 20%. Compliance with the particulate and opacity limit is demonstrated by proper operation of the dust collector. During the inspection, there was no sand loading activity. For 2015, facility purchased 3,119,930 pounds of new silica sand and 374,420 pounds of chromite.

Although the use of a binder is addressed in PTI No. 497-78, there are no specific usage and emission limits for the binder. The phenolic urethane binder components contain naphthalene, formaldehyde, cumene, xylene, and phenol, which are on the Clean Air Act Section 112 list of hazardous air pollutants (HAPs).

Staff obtained purchase records of the binder from January to June, 2016. Facility purchased 56,025 pounds of Alphatane binder and 997 pounds of Pepset binder.

Facility submitted a potential to emit calculation (PTE) for HAPs to show that their PTE is below major source thresholds, and therefore a true minor source. PTE was based on the total amount of ferrous alloys that can be melted in all furnaces. HAPs emissions are primarily from the binder and come from mold making, during pouring of the metal, cooling of the cast, mold shakeout, and from the sand reclaimer. Facility used the following binder emission factors: phenol, 0.00086 pounds/pound of binder; formaldehyde, 0.00001; naphthalene,

0.00160; cumene, 0.00051; and xylene, 0.00016. A permit issued by Hien Nguyen, to Global Foundry Prototype, Inc., PTI No. 39-06 also used a low emission factor for a phenolic urethane no-bake binder.

PTI No 663-92 consists of the Vibramill Sand Reclaimer, a pneumatic sand-handling system, and a baghouse. Sand reclamation only consists of breaking up the sand mold into a granular form in the Vibramill. The reclaimed sand is transported to two reclaimed sand silos (100 tons each) by an elevator. It is not necessary to remove the adhering binder in the sand. For the type of work that ICC does, removing the binder is not critical to reuse the sand. The permit establishes an emission limit of 0.10 pounds per 1,000 pounds of exhaust gas and an opacity limit of 20%. Compliance with the particulate and opacity limit is demonstrated by proper operation of the baghouse. During the inspection, observation of the baghouse exhaust showed no opacity. On April 27, 2006, facility conducted and passed a stack test for the Vibramill baghouse exhaust. The permit also requires the facility to maintain monthly baghouse inspection records. A magnehelic that measures differential pressure is installed for this baghouse.

PTI No. 703-83 is for the Carver sand reclaimer, reclaimed sand silo and baghouse. Note that the Carver sand reclaimer has been removed but PTI 703-83 remains active because the two reclaimed sand silos are still installed. The permit establishes an emission limit of 0.10 pounds per 1,000 pounds of exhaust gas and an opacity limit of 5%. Compliance with the particulate and opacity limit is demonstrated by proper operation of the dust collector. During the inspection, I did not notice any visible emissions from the reclaimed silos.

The finishing station has a permit, PTI No. 489-87 for five swing grinding stations equipped with a ventilation system that consists of hoods in series that exhausts outdoor to a cyclonic separator and a Torit filter baghouse. The baghouse was only installed after the previous inspector, Jim Voss verified that there was no fabric filter collector installed after the cyclonic separator. The permit establishes an emission limit of 0.010 pounds per 1,000 pounds of exhaust gas and an opacity limit of 0%. Compliance with the particulate and opacity limit is demonstrated by proper operation of the baghouse. During the inspection, I did not notice any visible emissions from the baghouse.

The finishing station also has 3 shotpeening units: Pangborn Rotoblast, Blastec, and a small Pangborn blast booth. The Pangborn Rotoblast booth is controlled by a baghouse. The Blastec and the small Pangborn are ducted to a separate baghouse. The Pangborn Rotoblast, Blastec and small Pangborn are equipped with an air wash separator that serves as a precleaner to the baghouse dust collector, and therefore exempt under 285(l)(6). PTI No. 740-91A for the Pangborn Rotoblast was voided in 2005 upon the request of the facility since the emission unit is exempt.

According to Dave, Maintenance supervisor, bags for the dust collectors are replaced once a year or sooner if they notice visible emissions. Not all baghouses are equipped with a magnehelic.

PTI No. 355-08 is for the Mold Coating Process. A coating called Isomol is used. The permit establishes a VOC limit of 9.9 tons per year and a coating usage of 5,157 gallons on a 12-month rolling average. Staff obtained records for the 12-month period ending 2016. VOC emissions are 4.18 tons per year and Isomol usage is 2177 gallons per year. See attached monthly and 12-month period emissions and usage.

The four larger induction furnaces are exempt under Rule 290 and the other two smaller

induction furnaces are exempt under Rule 282(a) (less than 1,000 pounds capacity). Attached to this report is a record of Rule 290 monthly emission calculations for the four induction furnaces for the period January 2015 to May 2016. Records show compliance.

Ductile inoculation is done on 2% of the steel processed at ICC. The process is exempt under Rule 290. In the previous inspection, ICC submitted documents to show compliance with Rule 290.

ICC is considered a true minor source for criteria pollutants and HAPs.

Area Source Iron and Steel Foundry NESHAP, Subpart ZZZZZ

The facility is subject to 40 CFR 63 Subpart ZZZZZ, Area Source Iron and Steel Foundry NESHAP and is considered an existing small area source since their metal melt production is below 20,000 tons on an annual basis. As an existing small area source the facility is subject to the pollution prevention management practices regarding metallic scrap and mercury switches, as well as notification and semi-annual certification reporting requirements.

The facility certified as part of their Notification of Compliance Status Report, received on May 1, 2009, that they are operating in accordance with both the "Restricted Metallic Scrap" and "General Iron and Steel Scrap" material acquisition requirements. The facility's scrap management plan complies with §63.10890(e)(2) which requires records of the written materials specifications. Based upon the scrap the facility is currently receiving, it appears to meet the definition of restricted metallic scrap. §63.10890(e)(2), also requires the facility to maintain records demonstrating compliance with the metallic scrap requirements. In accordance with the scrap management plan, facility keeps copies of Scrap Inspection Records of incoming scrap.

During the previous inspection conducted July 28, 2011, staff requested Subpart ZZZZZ semi-annual certification forms supplied for the following periods:

1/2/2009 – 6/30/2009
7/1/2009- 12/31/2009
1/1/2010 – 6/30/2010
7/1/2010 –12/31/2011

AQD staff Eric Grinstern noticed that all of the certifications supplied by ICC were on forms that were not made available until February 2011. The forms had signatures that were dated from July 10, 2009 to January 12, 2011. The original certification forms were developed in July 2009 and then modified in January 2011. The January 2011 modifications were not uploaded to the AQD website until the beginning of February 2011.

ICC has been submitting the Semi-Annual Compliance Report - NESHAP for Iron and Steel Foundry Area Sources 40 CFR Part 63, Subpart ZZZZ. A Semi-Annual report was submitted on January 21, 2016 for the July 1, 2015 to December 31, 2015 period.

Complaint Investigation

Staff talked to the complainant on June 30, 2016. The complainant stated that she noticed a "very bad, acrid" odor in the morning of June 29, 2016 at approximately 10 AM. I checked wind direction from wunderground.com and noticed that the wind was from NNW at that time. The complainant was upwind at that time.

Staff conducted an odor observation near the complainant's home. I did not detect any odor.

NAME J. A. T. DATE 07-20-16 SUPERVISOR CTE