DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

B430739073

FACILITY: SPECIALTY CASTINGS INC		**SRN / ID:** B4307
LOCATION: 211 MILL ST, SPRINGPORT		**DISTRICT:** Jackson
CITY: SPRINGPORT		**COUNTY:** JACKSON
CONTACT: John Drinkwater , Plant Manager		**ACTIVITY DATE:** 02/27/2017
STAFF: Mike Kovalchick	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Scheduled Inspection. Found 2 non-compliant exhaust stacks.		
RESOLVED COMPLAINTS:		

Minor Source-

Facility Contacts

Mr. John Drinkwater- General Manager & Jesse Petrak – Management Assistant

john.drinkwater@specialtycasting.com & jesse.petrak@specialtycasting.com

ph 517-857-3660

Website: http://specialtycastings.com/wp/

Purpose

On March 27, 2017, I conducted an unannounced compliance inspection of Specialty Castings LLC (Company) located in Jackson, Michigan in Jackson County. The purpose of the inspection was to determine the facility's compliance status with the applicable federal and state air pollution regulations, particularly Michigan Act 451, Part 55, Air Pollution Control Act and administrative rules and their Permit to Install (PTI) # 223-09 which was issued on April 23, 2010. This permit is a consolidation of six existing permits 506-97, 507-97, 508-97, 509-97, 510-97 and 511-97 into one facility wide permit. The facility has elected to limit the amount of metal charged to the furnaces to 20,000 metric tons per year to meet the definition of a small iron foundry area source pertaining to the National Emission Standard for Hazardous Air Pollutants (NESHAP) 40 CFR 63 Subpart ZZZZZ – Iron and Steel Foundry Area Sources.

Facility Location

The facility is located in an industrial area with a residential area located about 250 feet to the northeast of the facility. See aerial photo dated October, 2016.

Facility Background

Specialty Castings makes high quality gray and ductile iron castings to meet the specifications of their customers. They offer making prototypes to production. They have more than 25 years of experience producing castings from a few ounces to 250 pounds in low to medium volume runs. Specialty Castings has been producing gray and ductile iron castings for industries including automotive and truck, government, diesel, mining, power transmission, process machinery, agriculture, fluid handling and machine tool.

The facility was last inspected on July 23, 2014 and found to be in compliance with their PTI.

The effective maximum charge rate is estimated to be only 17,520 English tons per year due to the limitations from how the melt is poured. (2 tons/hour X 8760). This suggests the facility is a true minor for all pollutants. (Note: Removal of requirement to operate baghouses would trigger major source thresholds for particulates.)

Regulatory Applicability

PTI 223-09 covers the entire facility.

The entire facility is also subject to (NESHAP) 40 CFR 63 Subpart ZZZZZ – Iron and Steel Foundry Area Sources. This makes the facility subject to annual $250 fee but currently does not report to MAERS due

to low actual emission levels below Operational Memo 13 guidance.

Arrival & Facility Contact

Visible emissions or odors were not observed upon my approach to the Company's facility. I arrived at 9:30 AM, proceeded to the facility office to request access for an inspection, provided my identification and spoke with John Drinkwater (JD)-General Manager of the facility. I informed him of my intent to conduct a facility inspection and to review the various records as necessary. I was also introduced to Jesse Petrak (JP) – Management Assistant who is very familiar with plant operations.

Both JD and JP extended their full cooperation and fully addressed my questions.

Pre-Inspection Meeting

JD outlined that the plant is operating 8 hours a day, 5 days a week. Business levels have declined. There have been no changes to the plant since the last inspection in 2014. Ownership of the facility did change and the Company is now called Specialty Castings LLC. JD noted that one of the melt furnaces broke about 2 weeks ago so only 1 is operating currently. The scrap metal used in the melt is from Omnisource. It is low alloy busheling steel which arrives in small pieces. The product is very consistent and only rarely oily. I indicated to them that I would be following up the inspection with an email requesting all the required records that are outlined in the PTI.

Onsite Inspection

JP gave me a tour of the facility. See attached photos.

EUMIPCC: The iron melting, inoculating, pouring/casting, and cooling operations consisting of two electric induction furnaces, all controlled by one 40,000 CFM Dustar Reverse Air baghouse designated as the Furnace Baghouse. The baghouse is equipped with a magnehelic to monitor the pressure drop across the baghouse. They are required to monitor and record the pressure drop daily and when the lines are purged and cleaned. One of two of the melt furnaces were operating at the time of the inspection. Each furnace has a capacity of 4000 pounds. It takes about one hour to melt the scrap metal and one hour to pour. When both furnaces are operating, they are used tandem with one melting and one pouring. The furnaces are lined with refractory and are water cooled using coils to maintain temperature. The water for the cooling process is circulated through a cooling tower and reused. The molten metal is manually poured into a pot by tilting the furnace. The pot is then used to manually fill the molds using an overhead crane. (Note: The pot is manually heated with a natural gas fired torch to keep it warm in between melts.) After the mold box is half filled a cover is placed over the mold box which is then mechanically shaken to distribute the sand throughout the mold. The final filling includes being shaken and pressed to squeeze the sand into the mold box. When both sides of the mold are shaped, they are aligned as one piece and kept in place with frames until they are dry and ready for the molten metal.

There is a scale under the raw material feed so they can determine the weight of the metal that will be melted. The raw materials are a combination of pig iron and steel and parts that did not meet quality requirements. These pig iron and steel have certified content and quality requirements by Specialty Castings from their supplier, Omnisource. The metal did appear to be clean and as described by the Company.

Very little smoke was observed from the one operating furnace. In the ceiling which I estimated to be about 30 feet above the furnaces are located 2 separate hoods that feed into the one baghouse located outside. The 2 furnace hoods are estimated to be 8 X 8 feet in size. The hoods are so far away from the furnaces that there is some question on how effective they are. There is an additional hood much lower that is located above where the ladle is poured. It is about 6 X 6 feet in size. JP indicated that there is rarely much smoke and that when there is smoke he observes that it rises straight up and can be seen visibly being pulled into the hoods. (Note: The hoods are located in the ceiling as they are out of the way cranes that hoist metal into the furnaces.)

The baghouse outside the building appeared to be well maintained. It showed a pressure reading of 5" of water which is within the normal operating range of 1 to 6". Excess particulate that falls down via a cone that is underneath the baghouse is collected in a large bag that is tied to it. The bag is being disposed of in a landfill. JP was unaware if the bags had been tested for toxicity but indicated that

nickel and chromium levels in the melt were very low. The area underneath the baghouse was very muddy and it wasn't clear if the facility was being diligent about making sure that collected air contaminants are re-entrained back into the air when the mud dries out and turns in dust. There were no visible emissions observed coming from the baghouse stack.

EUSHELLCORE: The shell core making process consisting of two shell core machines with no emissions control. Resin coated sand is used in making the cores for this process. This resin coated sand comes in 3,000 pound super sacks. The resin in the cores is heat activated for mold setting purposes. A small permanent die is used and the core box temperature is operated at 450 degrees Fahrenheit. The heat hardens the core shell. The shells are filled in with the sand and resin mixture using a spout over the mold. There are at least three mold filling stations where the top and the bottom of the mold (inside the mold box) are filled from an overhead hopper that senses when it needs to refill from the Mueller.

After the molds have the cavity filled, they are cooled with a weight on top to keep the mold and metal in place until completely cooled. After cooling the cast piece is removed from the mold and the spent sand is reclaimed on the sand handling line that uses magnetic conveyors and vibration to separate metal from sand and to break down the sand until it is useable again.

There is no emission limits associated with this process, only material limits in pounds of the Resin-coated sand used.

EUAIRSETCORE: The air set core making operations with no emissions control.

A resin and a catalyst are used in making the hand packed air set cores. I did observe the air set core making during the inspection. These cores are air dried prior to being filled with molten metal. The Furan Resin and Furan Catalyst are delivered in 55 gallon drums and are mixed with a 2:1 ratio, respectively.

There is no emission limit associated with this process, only material limits in pounds for the Furan Resin and the Furan Catalyst.

EUOILCOREMAKING: The oil core making process consisting of one oil core machine and one natural gas fired oven for curing the molds, with no emissions control. This process uses oil as an additive to a cereal (true flour) binder made in a batch process. The oil arrives at the facility via 55 gallon drums. After the cores are formed, they are baked. There is an oil and sand drop for molds that are hand packed.

There is no emission limit associated with this process, only a material limit in gallons for the Core Oil usage volume.

EUGRINDING: Multiple grinding stations (snag grinders, double wheel grinders, grinding tables), all controlled by one 7,500 CFM Wheelabrator cartridge dust collector, designated as Wheelabrator Baghouse. The baghouse is equipped with a magnehelic to monitor the pressure drop across the baghouse. Records are kept of the daily readings and times when the lines are purged and cleaned.

I did observe some of the grinding operations during the inspection. All of these processes involve a person holding the part while it is being ground.

The emission limit for this process is a particulate matter concentration that can only be verified by testing and an opacity limit which is observed and recorded daily by plant personnel.

The pressure gauge on the dust collector was reading 4.0" of water which is within the normal operating range of 1 to 6". This dust collector is located outside the building along the building wall. The exhaust from it was pointed directly downward which a violation of the PTI. The height of the stack was also not meeting the necessary 18.5 feet. The ground surrounding the dust collector was stained iron/rust color as well as the adjacent building wall. There were no visible emissions.

EUSHOTBLASTING: The shot blasting operation consisting of one Wheelabrator shot blast machine and one GOFF shot blast machine, both controlled by one 55,000 cfm Mold Line Wheelabrator Ultra-Jet baghouse designated as Main Baghouse. I did not observe this process in operation at the time of the inspection. All of the cast parts are sandblasted using a steel shot to remove burrs from the molding process. This emission unit is part of FGFACILTY and FGSANDHANDLING, it does not have a unique section in the permit.

The baghouse of the facility is located outside the building and appeared to be well maintained. The pressure drop across the baghouse was 5.9" which was at the top end of the normal operating range of 1 to 6" of water. There were no visible emissions. The stack was being vented horizontally which is a violation of the PTI. The stack height also was much lower than the required 35.67 feet.

FGSANDHANDLING: The shot blasting operation identified above, and the sand handling process consisting of a shakeout table, conveyors, mold making equipment (three green sand mold making machines), screens, Muller, and silos, all controlled by one 55,000 cfm Mold Line Wheelabrator Ultra-Jet baghouse designated as Main Baghouse. I did observe this process operating at the time of the inspection and it was fairly dusty in the vicinity of the shakeout table. The Mueller and the sand cooler are automated to control the moisture in the sand.

There are two silos on site, one of them holds washed and screen sand and the other one holds the bonding agent for the green mold process. The silos are loaded from a truck and dispense material pneumatically to the processes.

The temperature of the sand and the pouring temperature of molten metal are critical in the casting process. The hot metal burns out the binder and the hot sand gets cooled and re-used.

At the end of the inspection, JP brought me to the lab where they analyze samples of the melt to determine if they met customer specs or not. He showed me the latest results. It showed a chromium content of the melt at 0.02%. He said it is never higher than 0.5%. Rarely, a customer requests that some chromium be present and they will add up to 2.5 lb/chromium in the melt. The nickel content was observed to be only 0.0092%.

Recordkeeping/Permit Requirements Review

Shortly after the inspection, I sent the following email to JD:

Hi John,

Per my inspection today, I am following up to request some additional information/documents. Here is the list:

1) MSDS's for the inoculants you use in the furnaces.

2) Quantity of each inoculant used in 2016.

3) Total amount of chromium added to the furnaces in 2016. (I understand that occasionally 2.5 lbs/chromium is added per batch for certain jobs.)

4) Daily Pressure drop records for the 2 baghouses, 1 cartridge collector for the last 12 months.

5) Monthly Resin coated sand usage in pounds for EUSHELLCOR for the last 12 months

6) Monthly Furan resin and catalyst usage rates in pounds for EUAIRSETCORE for the last 12 months.

7) MSDS for the Resin/Catalyst.

8) Monthly core oil usage rates in pounds for EUOILCOREMAKING for the last 12 months.

9) MSDS for the core oil.

10) Monthly metal melt production rate in tons for FGFACILITY for the last 12 months.

11) All Monthly emission calculations that are required for FGFACILITY for the last 12 months.

Please email this information by not later than Thursday of this week. Let me know if you have any questions. Thanks!

JD sent me an email with the records I requested on March 30, 2017. This is a summary of the review of the information provided:

1) MSDS's for the inoculants you use in the furnaces.

Not provided.

2) Quantity of each inoculant used in 2016.

C-6 (Ductile Iron Treatment) was purchased 42,000 lbs since the start of last year.

3) Total amount of chromium added to the furnaces in 2016. (I understand that occasionally 2.5 lbs/chromium is added per batch for certain jobs.)

120 pounds in the last 12 months. They add it to the ladle. If we assume that 95% of it remains in the metal and 90% capture..this works out to about 0.6 pounds of chromium emissions per year of which a small fraction of that could be in the form of hexavalent chromium. (Most would be in the form of chromium oxide which is much less toxic than the hexavalent variety.) Since this is less than one pound, it appears this does not represent a meaningful change in the original permit application which did not describe added chromium as an inoculant or otherwise a material to alter the specs of the final product.

4) Daily Pressure drop records for the 2 baghouses, 1 cartridge collector for the last 12 months.

See Attachment (2). I have only included the information for this 2017. Daily gauge readings and visual observations are being conducted.

5) Monthly Resin coated sand usage in pounds for EUSHELLCOR for the last 12 months

See Attachment (3). Sand usage well below permit limits.

6) Monthly Furan resin and catalyst usage rates in pounds for EUAIRSETCORE for the last 12 months.

See Attachment (4). Only included 2017. Well below permit limits.

7) MSDS for the Resin/Catalyst.

See Attachment (1). Appears to be basically the same compounds that were used during last inspection.

8) Monthly core oil usage rates in pounds for EUOILCOREMAKING for the last 12 months.

See Attachment (5). Shows no core oil usage.

9) MSDS for the core oil.

See Attachment (1).

10) Monthly metal melt production rate in tons for FGFACILITY for the last 12 months.

See Attachment (6). Monthly melt rate has fallen from a high of 246 tons in 2012 to a low 96 tons in December of 2016. All well below permit levels.

11) All Monthly emission calculations that are required for FGFACILITY for the last 12 months

See Attachment (6). All particulate and HAP emissions are calculated to be very low.

A Preventative Maintenance/Malfunction Abatement Program for the plant operations is on file. I also reviewed the required NESHAP Semiannual Report for 7/1/2016 to 12/31/2015 that was received in our office on January 26, 2017. It showed compliance with the NESHAP.

Post-Inspection Meeting

I held a brief post-inspection meeting with JD and JP. I indicated that I would be following up with email to request additional information. I indicated that the stacks associated with the grinding process and the sand handling process were not meeting permit requirements. I thanked both gentlemen for their time and cooperation, and I departed the facility at approximately 10:45 AM.

Compliance Summary

The Company is in compliance with their air permit with the following exceptions:

EUGRINDING VIII. STACK/VENT RESTRICTIONS

"The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted"

The stack exhausts directly downward.

Minimum Height Above Ground (feet) 18.5

The stack exhaust point is less than 18.5 feet above the ground.

FGSANDHANDLING VIII. STACK/VENT RESTRICTIONS

"The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted"

The stack exhaust horizontally.

Minimum Height Above Ground (feet) 35.67

The stack exhaust point is much less than 35.67 feet above the ground.

A Violation Notice (VN) will be sent noting the above findings. The Company will be given 21 days to respond.

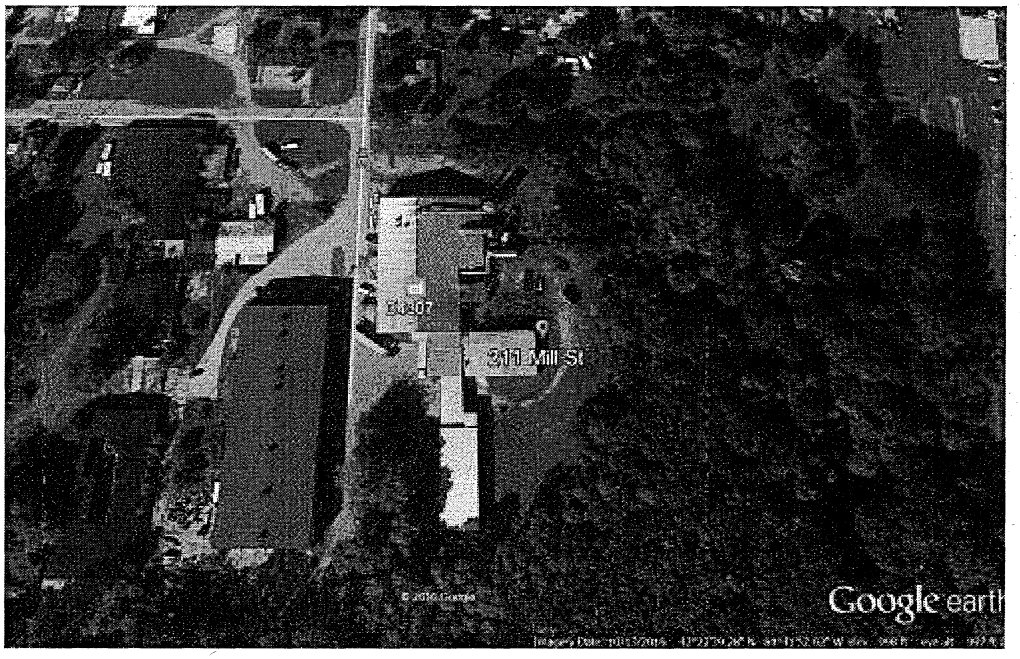

Image 1(aerial photo) : Aerial photo

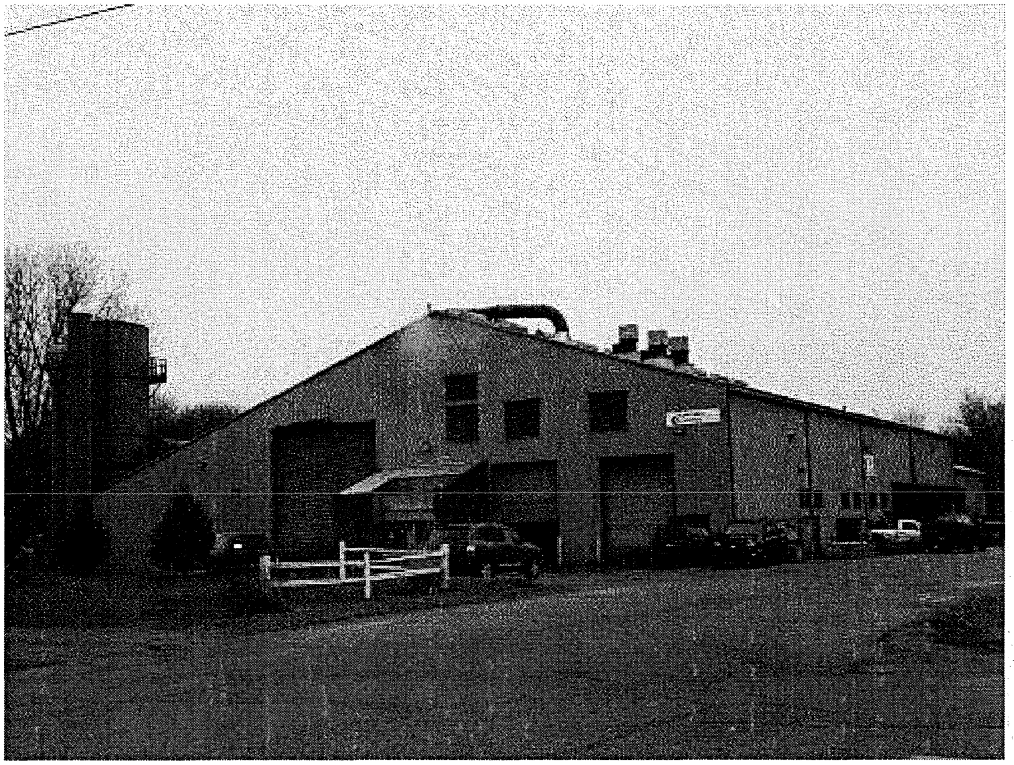

Image 2(Front of facility) : Front of facility

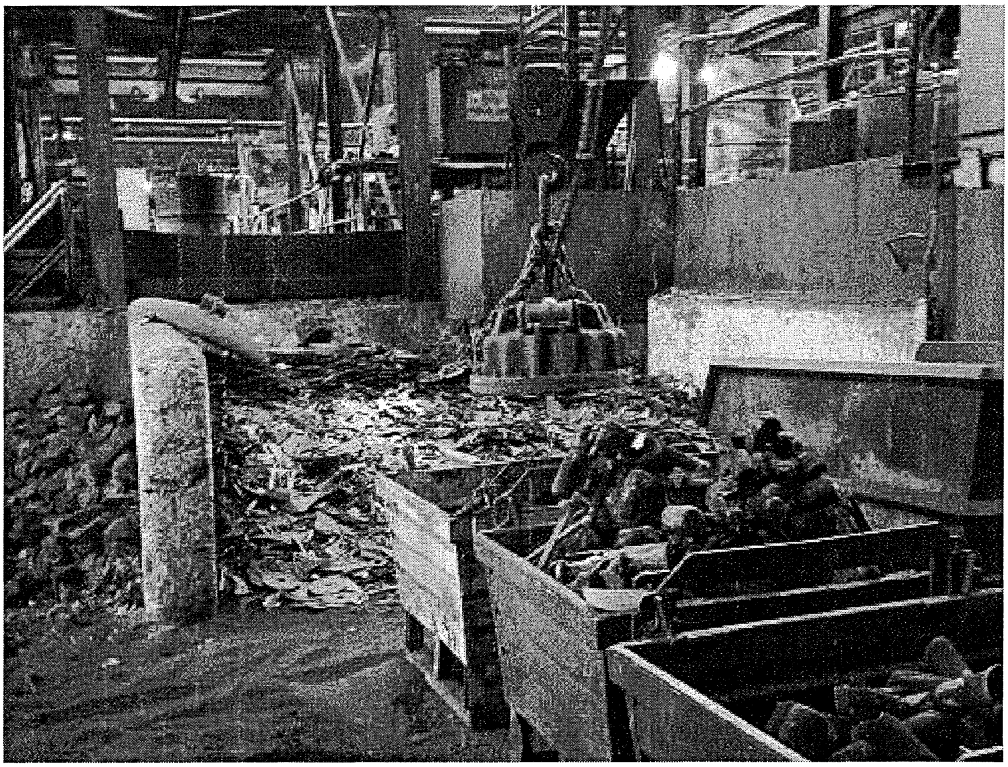

Image 3(Scrap metal storage) : Scrap metal that is being lifted by a magnet to be carried to melt furnaces.

Image 4(broken melt furnace) : broken melt furnace

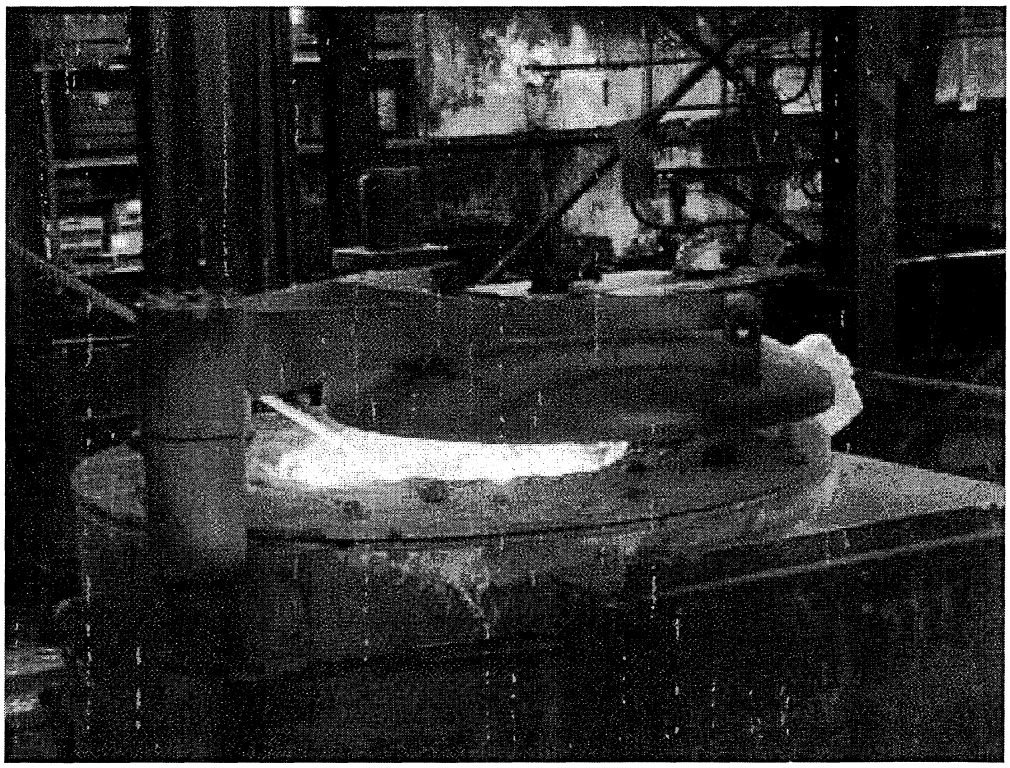

Image 5(melt furnace) : melt furnace

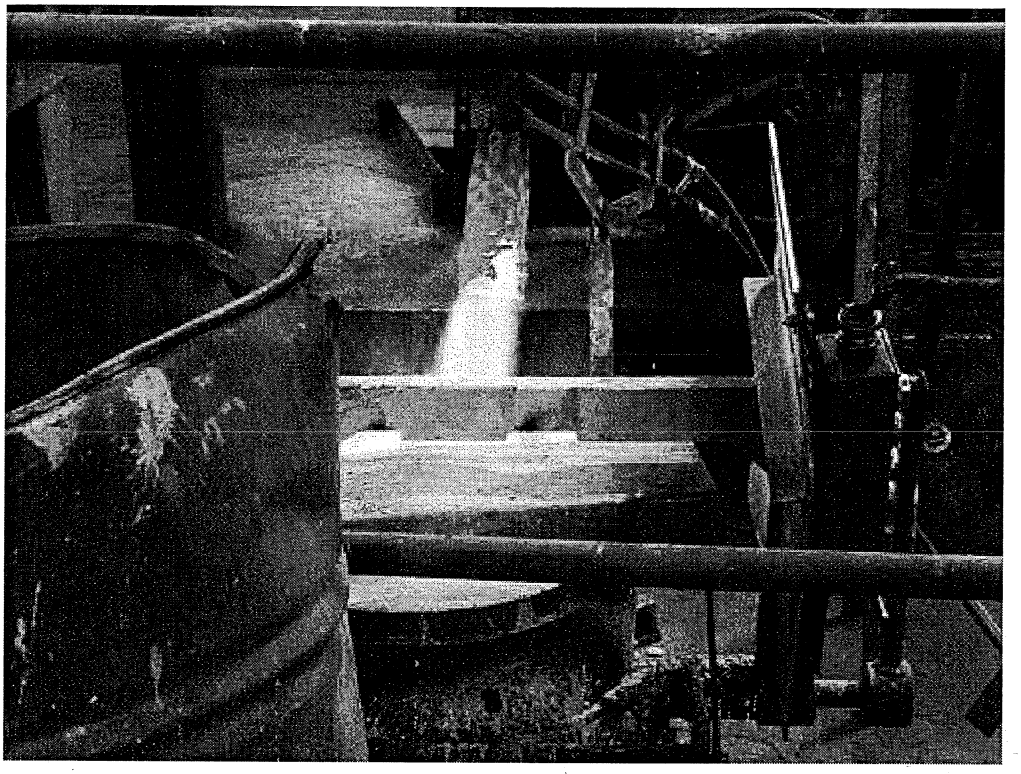

Image 6(Natural gas torch) : Natural gas torch heating laddle

Image 7(Sand silos) : Sand silos

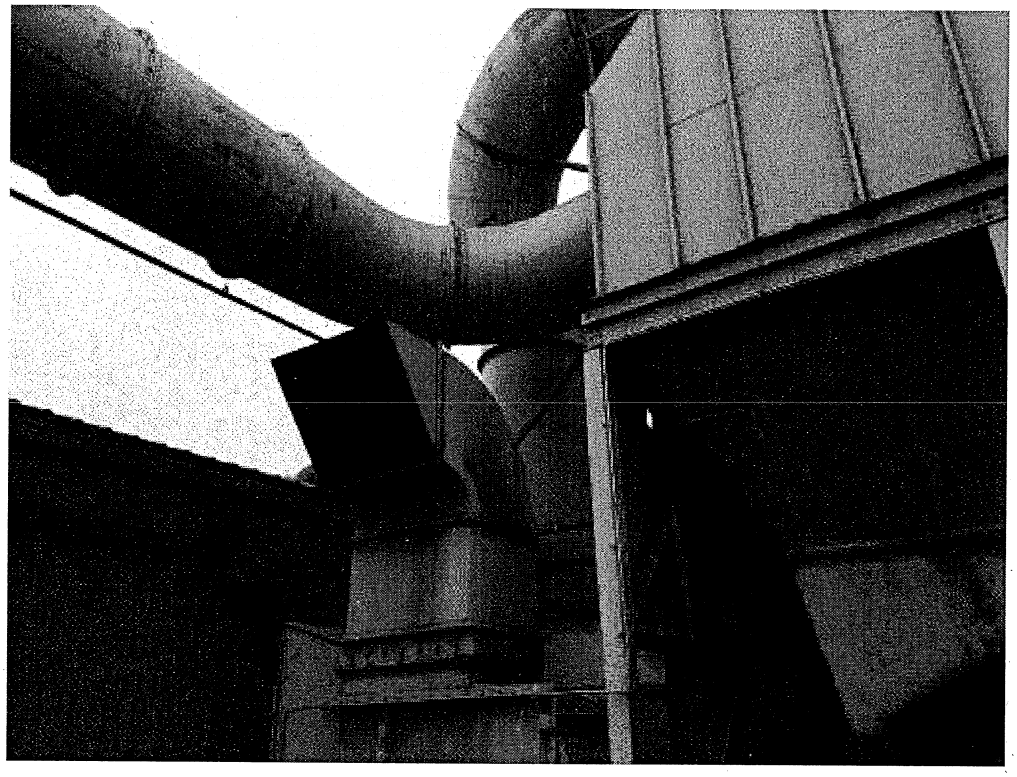

Image 8(horizontal stack) : horizontal exhaust stack coming from the baghouse associated with the sand handling system

NAME M. Kovalchick DATE 3/31/2017 SUPERVISOR