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

B171649232

FACILITY: BETZ INDUSTRIES INC		**SRN / ID:** B1716
LOCATION: 2121 BRISTOL AVE NW, GRAND RAPIDS		**DISTRICT:** Grand Rapids
CITY: GRAND RAPIDS		**COUNTY:** KENT
CONTACT: Mark Kraak , Environmental Manager		**ACTIVITY DATE:** 06/20/2019
STAFF: Eric Grinstern	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: PCE - Night time inspection when facility is performing melting/pouring/cooling and shakeout.		
RESOLVED COMPLAINTS:		

Inspection conducted at nighttime to observe facility operations while they are melting, pouring, cooling and conducting shakeout. The facility conducts melting operations at night to utilize electricity during the off-peak time period. This inspection was conducted to supplement the observations made during a day time inspection conducted on April 17, 2019.

AQD staff (EG) arrived at the facility at approximately 21:45 and observed the facility from off-site. No abnormal odors or opacity was observed. EG proceed to the facility and met with Mark Kraak, Environmental Manager.

The facility was scheduled to melt and tap from Furnaces No. 1 and No. 2. Furnaces No. 2 and No. 3 had just been relined and sintered. While onsite EG observed the rebuilding of the tap spout on Furnace No. 2.

While waiting for the first pouring of the night, observation of the shakeout table was made. A majority of the molds placed on the shakeout table have already had the cast removed. The shakeout table is the only point where used sand enters the system for recycling. Observation of shakeout showed excellent capture, with no fugitive emissions observed.

Pressure drop readings for the baghouse associated with melting, shakeout and the sand system were collected.

Shakeout
Baghouse A: 1.2"
Baghouse B: 1.4"

Sand system
Baghouse C: 2.0"
Baghouse D: 1.25"
Baghouse E: (Not operating)

Melting
Baghouse 1: 1.2"
Baghouse 2: 1.0"
Baghouse 3: 0.4"

Baghouse operations are linked to the process operation they are controlling, i.e., the process will not operate unless the baghouse is operating. The established pressure drop range for the baghouses is 0.5 to 4.0". Baghouse 3 controls emissions from Furnace No. 3, which was not actively melting at the time. The refractory was recently replaced and was being sintered. Under this condition a pressure drop slightly less than the established range is not a concern.

While onsite, EG observed the tapping of Furnace No. 2 (twice) and the tapping of Furnace No. 1 (once). Since it was the first heat out of Furnace No. 2 after relining, some of the observed emissions were refractory dust and possibly steam from moisture in the refractory.

Furnace capture efficiency was evaluated for Furnaces No. 1 and No. 2. The furnaces are equipped with articulating hoods that can be adjusted to allow for capture during melting, charging and tapping. Observation of the furnaces during melting showed no visible fugitive emissions. Observation during charging showed no visible fugitive emissions. The facility uses a vibrating charge unit which allows the hood to capture emissions during charging.

During tapping, Furnace No. 2 had emissions that were not captured by the hood. As noted previously, some of

these emissions may have been steam resulting from recently being relined. While difficult to quantify the exact percentage of emissions not captured by the hood during tapping, EG estimates 10-15% of the emissions are not captured during the few minutes that tapping occurs.

The tapping of Furnace No. 1 was observed, which involved ductile inoculation. The facility conducts ductile inoculation in the same pour ladle (non-tundish) as gray iron. The inoculants are placed in the ladle prior to furnace tapping. During ductile inoculation an increased amount of emissions are generated compared to non-ductile. EG estimates that 10-15 % of the emissions generated during tapping/ductile inoculation are not captured by the furnace hood. The ladle was removed from under the hood while there were still emissions associated with the inoculation reaction. This is most likely done due to the time constraints associated with inoculation fade. Visible emissions were observed from the ladle for about 30 seconds after it was removed from under the hood.

The pouring of one mold was observed. Due to the size of the mold, two ladles were poured into the mold simultaneously. Due to the size of the molds, pouring is conducted on the facility floor. Pouring emissions are not captured/controlled. Emissions are emitted into the in-plant environment and to the ambient air through general ventilation fans located in the ceiling above the pouring floor.
Since the facility is a lost foam casting operation there is a large amount of emissions associated with the burn-off of the polystyrene foam pattern. During pouring, the mold auto-ignited, with visible flames observed from multiple points around the mold. The facility has historically assumed that 10% of the mold binder is partially combusted during pouring and emitted. The 10% factor is based on the assumption that due to the size of the molds (high sand to metal ratio), the heat from pouring does result in emissions from 90% of the mold sand/binder.

Observations of furnace capture and pouring emissions will be used to evaluate if the assumptions used by the facility in recording and reporting emissions are correct.

NAME _____ DATE 6/26/19 SUPERVISOR _____