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

N555143832

FACILITY: DETROIT STEEL TREATING CO		SRN / ID: N5551
LOCATION: 1631 HIGHWOOD EAST, PONTIAC		DISTRICT: Southeast Michigan
CITY: PONTIAC		COUNTY: OAKLAND
CONTACT: Raymond Fox , President		ACTIVITY DATE: 02/15/2018
STAFF: Adam Bognar	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

On Thursday, February 15th, 2018, Michigan Department of Environmental Quality Air Quality Division (MDEQ-AQD) staff, I, Adam Bognar, conducted an unannounced targeted inspection of Detroit Steel Treating Company located at 1631 East Highwood, Pontiac, Michigan. The purpose of the inspection was to determine the facility's compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) Administrative Rules; and PTI No. 219-96.

I arrived at Detroit Steel Treating Company at around 2 pm and met with Mr. Raymond R. Fox (Bob), President. I introduced myself, provided identification, and stated the purpose of the inspection. Mr. Fox gave me a tour and explained the processes at the facility.

Detroit Steel Treating Company performs contract heat treating on steel parts for various industries including automotive, aerospace, defense, agriculture, and others. There are eleven employees that operate three shifts each day. Steel heat treating at this facility basically consists of two processing steps – hardening and tempering. First the steel parts are heated to high temperature for a short duration and then cooled rapidly; this is known as hardening. This produces a harder steel, but also a more brittle steel. Secondly, the steel parts are heated to a relatively lower temperature to soften the steel and reduce brittleness; this is known as tempering. Heating is achieved using several natural gas fired furnaces. The furnace temperature, duration of heating, and the atmospheric composition within the furnace all play important roles in the final properties of the treated steel.

PTI No. 219-96 was issued to this facility in 1996 for two molten salt baths and an open oil quench tank. This equipment has not been used in several years, but it is still on-site. The only special condition of the permit is a 20% opacity limit.

There are three batch furnaces used for hardening. Two of them were in operation during the inspection while one of them is being repaired. These are the largest furnaces on-site, with a maximum natural gas input of 1000 CF/hr. Using a heating value of 1020 BTU/CF, this corresponds to a maximum heat input of 1,020,000 BTU/hr. Mr. Fox estimated the current temperature of one of the furnaces to be around 1550 °F. After the parts sit at high temperature for the appropriate amount of time, they are cooled (quenched) in an oil bath located within the furnace unit.

The atmospheric composition within the hardening furnaces is precisely controlled using endothermic gas generators. These "endo" gas generators are natural gas fired. The endo gas serves to inhibit or reverse oxidation of the part surfaces during heat treatment by creating an oxygen poor environment within the furnaces. The generators can provide 750 cubic feet per hour of endo gas to each hardening furnace. These generators appear to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(l)(iv).

For certain parts, a high nitrogen environment is desired during the heat treatment process. This process, known as nitriding, results in a relatively hard outer surface on the part while allowing the inner part to remain relatively soft. At this facility, the nitrogen is supplied to the hardening furnaces by piping in gaseous anhydrous ammonia at a rate of approximately 20-25 cubic feet per hour. The anhydrous ammonia is stored in a 1000-gallon tank adjacent to the facility.

I informed Mr. Fox that a permit to install is required to operate the three heat-treating furnaces (hardening furnaces) that utilize both oil quench and ammonia. Operation of these three heat-treating furnaces without obtaining a permit to install is a violation of MDEQ-AQD Rule 201. The MDEQ-AQD rule that would allow these furnaces to operate without a permit to install (Rule 282 (2)(a)(i)) only applies to heat treating furnaces that do not involve ammonia, molten materials, oil-coated parts, or oil quenching. The three steel heat treat furnaces at this facility utilize both ammonia and oil quenching. A violation notice was sent to Detroit Steel Treating CO on March 2, 2018.

The facility has an anhydrous ammonia tank with a 1000-gallon capacity. This tank was installed prior to December 20, 2016; before the current exemption was promulgated. The previous exemption did not include a size restriction on anhydrous ammonia tanks. The new exemption, MDEQ-AQD Rule 284 (2)(j), promulgated on December 20, 2016, requires that a permit to install be obtained for pressurized anhydrous ammonia tanks larger than 500 gallons. The facility can operate this 1000-gallon anhydrous ammonia tank under the previous exemption rule; however, if any changes are made then a permit to install may be required. These changes include reconstruction, replacement, relocation, or modification of the anhydrous ammonia tank.

After hardening, steel parts are tempered in tempering furnaces. There are six tempering furnaces at this facility. Compared to the hardening furnaces, these tempering furnaces are smaller and run at lower temperatures. No oil quenching or ammonia is used in the tempering process. These furnaces appear to be exempt from Rule 201 requirements pursuant to Rule 282 (2)(a)(i).

The facility operates a "rust prevention" line consisting of a series of tanks: Black oxide conversion→ water rinse 1 → water rinse 2 → oil coat → hot water cleaning tank. All tanks are exhausted to the general in-plant environment. These tanks appear to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(r).

Three sand blasting stations are used for certain parts. I observed that these stations are exhausted to a fabric filtration system located inside the building, and into the general in-plant environment. These stations appear to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(l)(vi).

Compliance Determination

Observations made during my inspection and record review indicate that Detroit Steel Treating CO is not operating in compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); and Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) Administrative Rules. The facility must obtain a permit to install for the three steel heat treat (hardening) furnaces that utilize both ammonia and internal oil quench.

NAME Adam Boyer DATE 3/28/2018 SUPERVISOR SK