

**DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: On-site Inspection**

A356770822

<b>FACILITY:</b> Ford Motor Company - Sterling Plant		<b>SRN / ID:</b> A3567
<b>LOCATION:</b> 39000 MOUND ROAD, STERLING HTS		<b>DISTRICT:</b> Warren
<b>CITY:</b> STERLING HTS		<b>COUNTY:</b> MACOMB
<b>CONTACT:</b> Adam Albright , Environmental Engineer		<b>ACTIVITY DATE:</b> 01/17/2024
<b>STAFF:</b> Adam Bogнар	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> SM OPT OUT
<b>SUBJECT:</b> Scheduled Inspection		
<b>RESOLVED COMPLAINTS:</b>		

On Wednesday, January 17, 2024, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff, I, Adam Bogнар, conducted a scheduled inspection of Ford Motor Company – Sterling Axle Plant (the “Facility”) located at 39000 Mound Road, Sterling Heights, MI 48310. The purpose of this inspection was to determine the facility’s compliance status with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; and Michigan Department of Environment, Great Lakes, Energy-Air Quality Division (EGLE-AQD) rules; 40 CFR Part 63 Subpart ZZZZ – National Emissions Standards for Stationary Reciprocating Internal Combustion Engines; 40 CFR Part 60 Subpart IIII – Performance Standards for Stationary Compression Ignition Internal Combustion Engines; 40 CFR Part 60 Subpart JJJ – Performance Standards for Stationary Spark Ignition Internal Combustion Engines; and Permit to Install (PTI) No. 135-11D.

I arrived at the facility at 9 am. I met with Adam Albright, Plant Environmental Control Engineer. I identified myself and stated the purpose of the inspection. Adam and I sat down and held a pre-inspection meeting where we talked about current operations, reviewed the emissions spreadsheets, and reviewed maintenance records. After the pre-inspection meeting, Adam gave me a tour of the manufacturing facility.

Ford Motor Company – Sterling Axle Plant manufactures automobile axles and driveshafts for the Ford F-150 and other Ford vehicles. The axle shaft production process at this facility involves metal being cut, formed, welded, machined, finished/polished, assembled, and painted. Gears and pinions are shipped to the facility from a foundry, heat treated, machined, and welded to the axle assembly. Once the axle assembly is assembled, it is painted black. Ford has been producing axles at this plant since 1956. There are currently around 2,000 employees operating this facility 24/7.

Equipment at this facility include heat treating furnaces with oil quenching, various machining operations including CNC machines, welding equipment, sealer/adhesive application equipment, ink marking equipment, two spray coating booths, a maintenance spray coating booth, parts washers, emergency engines, and a waste oil fume scrubber.

Adam provided me with the records I requested after the inspection. I reviewed records from January 1, 2022 through December 2023. These records are available on the AQD shared drive at the following address: S:\Air Quality Division\STAFF\Adam Bogнар\Inspection Documents\Ford Motor Company - Sterling Axle 2024

**Permit to Install No. 135-11D**

**EUWTP-669**

EUWTP-669 is a waste oil treatment process with two 20,000 gallon treatment tanks and a 2,500 CFM Heil fume scrubber. The waste oil tanks were the source of odor complaints in past years. To remedy the odor, the facility voluntarily installed a fume scrubber to scrub the gases coming out of the waste oil tanks.

Section III – Special Condition 1: States that the permittee shall not operate the fume scrubber unless a water flow indicator and pH monitor are installed and operating properly. I verified that both of these devices are installed. During this inspection, the pH value was 10.3 and the flow rate was 1.2 gallons/minute. The pH meter was last calibrated on October 30, 2023 based on the maintenance records I reviewed. An operator in the scrubber room checks the flow rate and pH every 2 hours and notes these values on a sheet of paper near the scrubber.

Section III – Special Condition 2: States that the permittee shall implement and maintain a PM program for the fume scrubber as recommended by the scrubber's manufacturer and establish an acceptable range of pH and water flow rate. I verified that this plan is maintained. The plan includes several quarterly maintenance checks for the pump, spray nozzle, and fan. The plan indicates that proper values for pH are between 10.1 and 10.6 and proper flow rates are between 0.5 and 2 gallons per minute. This PM program is being followed based on my findings during this inspection and record review.

Section IV – Special Condition 1: States that the permittee shall not operate the oil separation portion of EUWTP-669 unless the fume scrubber is installed, operating continuously, and operating properly. Based on my review of the pH/flow rate records, the fume scrubber is operating continuously and properly.

Section VI – Special Conditions 1,2,3: Specify recordkeeping requirements for EUWTP-669. The permittee must keep records of flow rate & pH once per shift when the fume scrubber is operating. Records of any preventative maintenance must also be kept. I verified that these records were kept. I reviewed maintenance records that showed that on October 30, 2023, fans/pumps were checked and the pH meter was calibrated.

Section VIII – Specifies stack requirements. I did not verify stack dimensions during this inspection. It was unusually cold and windy on the day of this inspection and we decided not to go onto the roof to view the stacks.

### **EUDEPT21PAINT**

EUDEPT21PAINT is a spray coating operation consisting of two electrostatic spray booths. These booths are used to apply a black water-based coating to assembled axles. Paint usage is tracked based on the liquid level in totes and based on a digital meter that tracks the total paint through the systems. Adam looks at both of these values and selects the higher of the two values for compliance reporting.

Section I – Special Condition 1: Limits VOC emissions to 7.8 tons per year. This emission limit is met based on the records I reviewed. VOC emissions were reported highest during the 12-month period ending in January 2022 at 1.29 tons.

Section III – Special Condition 1: States that the permittee shall capture all waste coatings and shall store them in closed containers and dispose of them in an acceptable manner. I observed that

waste coatings are stored in a sealed tote. Adam stated that waste coatings are sent to an incinerator periodically.

Section III – Special Condition 2: States that the permittee shall handle VOC containing materials in a manner that minimizes fugitive emissions. I observed that coatings were stored in closed containers. I did not observe any open containers of paint.

Section III – Special Condition 3: States that the permittee shall not operate EUDEPT21PAINT unless a malfunction abatement plan (MAP) is implemented and maintained. I verified that this plan is maintained. The MAP contains the information required by Rule 911. The MAP has been followed based on my inspection and record review.

Section IV – Special Condition 1: States that the permittee shall not operate the spray booths unless the exhaust filters are installed, maintained, and operated in a satisfactory manner. I observe that dry filters were installed in both booths. I did not see any gaps in the filters that particulate could get through. Adam stated that these filters are generally changed once per day.

Section IV – Special Condition 2: States that the permittee shall equip each spray booth with electrostatic paint application equipment. I observed that all applicators were electrostatic. I observed a monthly inspection sheet which showed that the voltages of each applicator were checked and were found to be within the manufacturer's recommended voltages. Quarterly, the applicators undergo a scheduled "system overload" to check that the interlock system is functioning (outlined in MAP). According to the MAP, an interlock system will shut down the coating line if the electrostatic nozzle voltages are incorrect.

Section V – Special Condition 1: States that the permittee shall determine the VOC content, water content, and density of any coating, as applied and as received, using EPA Method 24. Alternatively, the permittee can request to use formulation data from the AQD district supervisor. In 2010, the AQD district supervisor approved the facility's request to use formulation data in lieu of Method 24. This approval was granted after the facility conducted a Method 24 Variability Testing Study for water-based coatings obtained from this coating process. The tests showed a wide range of results indicating unreliability of Method 24 testing for very low VOC content water-based coatings. The facility determines VOC content using manufacturer's formulation data. The VOC content of the only coating used is 0.032 lb/gallon VOC.

Section VI – Special Conditions 1,2,3: Specify recordkeeping requirements for EUDEPT21PAINT. The permittee must keep records of the chemical composition of each coating, the gallons of each coating used, and the monthly/12-month rolling VOC emission rate. I verified that these records are kept.

Section VIII – Specifies stack requirements. I did not verify stack dimensions during this inspection. It was unusually cold and windy on the day of this inspection and we decided not to go onto the roof to view the stacks.

### **FGHEATTREAT**

FGHEATTREAT consists of two heat treat systems, each with one pre wash station, three carburizing furnaces, three quenching stations, one post-wash station, and one tempering furnace – all in department 8.

Section I – Special Condition 1: Limits NOx emissions to 15.3 pounds per hour. Compliance with this limit is demonstrated through stack testing. The stack test conducted in 2008 showed a NOx emission rate of 3.92 lb/hour.

Section II – Special Condition 1: Limits natural gas usage from FGHEATTREAT to 340.834 MMcf per year. This limit has not been exceeded based on the records I reviewed. Natural gas usage was reported highest during the 12-month period ending in October 2023 at 39.16 MMcf.

Section II – Special Condition 2: States that the permittee shall only combust pipeline quality natural gas in FGHEATTREAT. Adam stated that only pipeline quality natural gas is combusted in these furnaces. The records I reviewed show natural gas as the only fuel used.

Section VI – Special Condition 1,2: States that the permittee shall keep monthly and 12-month rolling records of natural gas usage in FGHEATTREAT in a satisfactory manner. I verified that these records are kept.

Section VIII – Specifies stack requirements. I did not verify stack dimensions during this inspection. It was unusually cold and windy on the day of this inspection and we decided not to go onto the roof to view the stacks.

### **FGQUENCH**

FGQUENCH consists of heat treat systems throughout the facility with associated quench oil processes. These are located in departments 6, 7, 8, and 10. According to Adam, all furnaces in department 7 have been decommissioned. Department 7 did not appear operational during my inspection.

Section I – Special Condition 1: Limits VOC emissions to 23.6 tons per year. The facility has not exceeded this emission limit based on the records I reviewed. VOC emissions from FGQUENCH were reported highest in June 2023 at 5.38 tons.

Section II – Special Condition 1: Limits the total amount of metal processed in FGQUENCH to 92,500 tons per year. The facility has not exceeded this material limit based on the records I reviewed. Total metal processed was highest during the 12-month period ending in June 2023 at 22,908 tons.

Section VI – Special Condition 1,2: Specifies recordkeeping requirements for FGQUENCH. The facility must keep records of the tons of metal processed per month and 12-month rolling time period, the VOC emission factor for each heat-treating process, and the VOC mass emission calculations on a monthly and 12-month rolling time period. I verified that these records are kept.

Department 6 & 8 use a VOC emission factor of 0.52 lb/ton of metal, which was determined during a stack test on October 9, 2013. Department 10 uses a VOC emission factor of 0.27 lb/ton metal, which was determined during a stack test on December 6-8, 2016.

Section VIII – Specifies stack requirements. I did not verify stack dimensions during this inspection. It was unusually cold and windy on the day of this inspection and we decided not to go onto the roof to view the stacks.

### **FGFACILITY**

The conditions of FGFACILITY apply to all process equipment source-wide including equipment covered by other permits, grandfather equipment, and exempt equipment.

Section I – Special Condition 1,2: Limits individual HAP emissions to less than 10 tons per year and aggregate HAP emissions to less than 25 tons per year. The facility has not exceeded this emission limit based on the records I reviewed. Aggregate HAP emissions were reported highest during the 12-month period ending in January 2022 at 1.38 tons. The individual HAP emitted in the highest quantity is Hexane from natural gas combustion, which was reported at 0.478 tons during the 12-month period ending in January 2022.

Section I – Special Condition 3: Limits NOx emissions to 98.7 tons per year. The facility has not exceeded this emission limit based on the records I reviewed. NOx emissions were reported highest during the 12-month period ending in December 2022 at 48 tons.

The permit requires that a NOx emission factor of 445 lb/MMcf of natural gas be used for Heat Treat Carburizing Furnaces and an emission factor of 100 lb/MMcf of natural gas for Space Heaters, Tempering Furnaces, and Misc. Combustion units. The permittee did not use these emission factors in all occasions.

In heat treating Departments 6 & 10, an emission factor of 326.3 lb NOx/MMcf natural gas was used. This factor was determined by taking a weighted average of the two emission factors required by the permit. The weighting was determined based on the maximum heat capacity of the carburizing versus tempering furnaces (185MMBtu/hr Carburizing, 100 lb/MMBtu/hr tempering). The calculation based on heat capacity shows that carburizing (hardening) accounts for 65.6% of natural gas usage and tempering accounts for 34.4% of natural gas usage. This calculation methodology has been accepted by AQD in the past several years. AQD will accept this calculation to determine compliance during this inspection; however, in future inspections the facility must perform this calculation according to the permit without using a weighted average.

In Department 8, an emission factor of 3.92 lbs/hour was used. This was determined through stack testing in 2008. The 2008 stack test report shows that carburizing emissions are 0.64 lb/hour/furnace, and tempering emissions are 0.04 lb/hour/furnace. There are 6 carburizing furnaces and 2 tempering furnaces.  $(0.64*6)+(0.04*2)=3.92\text{lb/hour}$ .

Section II – Special Condition 1: Limits natural gas usage to 1,400 MMcf per year. The facility has not exceeded this material usage limit based on the records I reviewed. Total natural gas usage was reported highest during the 12-month period ending in December 2022 at 534 MMcf.

Section V – Special Condition 1: Requires the permittee to determine the HAP content of materials using the manufacturer's formulation data. Adam stated that the facility uses formulation data to determine HAP content of materials. The majority of HAPs come from natural gas combustion, which uses EPA AP-42 emission factors to determine HAP emissions, not formulation data.

Section VI – Special Conditions 1,2,3,4: Specifies recordkeeping conditions for FGFACILITY. The facility must keep records of monthly and 12-month rolling natural gas usage, gallons of each HAP containing material used, the HAP content of each material used, monthly and 12-month rolling HAP emissions, and monthly and 12-month rolling NOx emissions. I verified that these records are kept.

**Emergency Generators**

The facility operates 9 emergency generators – 3 fire pumps (diesel), a security generator (natural gas), a hospital generator (natural gas), and 4 other emergency generators (natural gas). All engines are less than 500 HP based on the records I reviewed.

During my inspection I looked at fire pump #4. I observed that the total engine hours on fire pump #4 were 423.3 hours. The facility sent me a picture of the hour meters on the other two fire pumps. Fire pump #3 had 908 hours, and fire pump #2 had 300.5 hours. I did not observe the other 6 emergency engines during my inspection.

The facility provided monthly and 12-month rolling records showing that 8 of the 9 engines were operated for less than 50 hours per calendar year in non-emergency situations (this includes maintenance operation). The three fire pumps were each operated on an emergency basis for around 8 hours in November and December 2022. I did not ask what the emergency was on these dates.

The hospital generator was operated for 201.1 hours in November 2023. Adam stated that this was due to a fried circuit board on the unit causing it to run continuously. Once operators discovered this issue, the engine was turned off. Due to this error the facility operated the hospital generator in a non-emergency situation for greater than 50 hours annually, which is a violation of MACT ZZZZ. At AQD discretion, no violation notice was issued for this non-compliance.

The facility submitted a document to AQD that describes this issue and provides pictures of where the circuit board shorted out. According to the document, the engine is still not functional at this time. The facility is waiting on a replacement circuit board.

The facility provided documentation showing that six of these generators are certified for compliance with 40 CFR Part 60 (NSPS Standards). The security generator, hospital generator, and fire pump #3 are not certified for compliance with 40 CFR Part 60.

The security generator is a 67 horsepower natural gas fired emergency engine installed in October 2004. This engine is considered an existing RICE engine under MACT ZZZZ.

The hospital generator is a 174 horsepower natural gas fired emergency engine installed in August 2005. This engine is considered an existing RICE engine under MACT ZZZZ.

Fire pump #3 is a 255 horsepower diesel fired emergency engine installed in February 1974. This engine is considered an existing RICE engine under MACT ZZZZ.

The facility provided records showing that the engines received regular preventative maintenance including oil changes, filter changes, and regular inspections.

**Maintenance Spray Booth**

The facility operates one maintenance spray booth. I observed that the booth is equipped with dry filters which did not appear to have any gaps. Adam provided records showing that total paint usage in 2023 was 14.25 gallons in this booth. Based on my inspection and record review, this booth is exempt from Rule 201 requirements pursuant to Rule 287(2)(c).

**Adhesive Application (Loctite)**

The facility operates 21 separate adhesive application processes used to apply Loctite to various workpieces. I observed one of these stations during my inspection. The facility provided records showing that each of these adhesive application processes are exempt from Rule 201 requirements pursuant to Rule 287(2)(c). Reported usages are less than 200 gallons/month. The highest reported monthly usage was 102.7 gallons of "Loctite 150505 Bore Sealent Red" used near the welder in Department 73.

Rule 287(2)(c) applies to surface coating lines. "Surface Coating" is defined in AQD rules as "any paint, lacquer, varnish, ink, adhesive, or other coating material applied on a surface."

### **Ink Marking Applications**

There are several ink marking stations throughout the plant used to mark gears/pinions to aid in assembly. The facility provided records showing that these ink marking stations are exempt from Rule 201 requirements pursuant to Rule 287(2)(c). Reported usage from all ink marking activities combined is less than 200 gallons/month. The highest reported monthly ink usage was 23.3 gallons used in January 2023.

### **Machining/Welding Operations**

Machining/welding operations take up a large portion of the manufacturing plant. There appears to be hundreds of these stations scattered throughout the plant. Many of these systems are exhausted through oil-mist collectors and into the general in-plant environment. These systems are exempt from Rule 201 requirements pursuant to Rule 285(2)(l)(vi)(B).

I observed that some of these systems, located in Department 95, are exhausted through the roof without going through an air-cleaner. Adam believed this equipment may be grandfathered due to its old age. I asked Adam to find out when this equipment was installed.

After the inspection, Adam sent me an email which states that Department 95 is tied to a mist collector on the roof where emissions are filtered before venting to the atmosphere. He also stated that Department 95 was installed in 1997. I did not go onto the roof during this inspection due to the very cold weather on this date.

Due to the large number of machining/welding operations at this facility, I was unable to get a full picture of how each emission unit is exhausted. I informed Adam that during future inspections, AQD will focus on getting a full picture of how machining/welding operations are exhausted to ensure that each of these units is following AQD rules.

### **Cold Cleaners**

Adam stated that there are 30 parts washers at this facility, about half of which are aqueous and the other half solvent based. I did not see each cold cleaner. I observed 3 cold cleaners during my inspection. All three had their lids closed, had proper operating instructions posted, were equipped with a device to drain parts, had a freeboard ratio greater than 0.7, and had an air/vapor interface less than 10 square feet. The cold cleaners at this facility are exempt from Rule 201 requirements pursuant to Rule 281(2)(h).

### **Endothermic Gas Generators**

There are several endothermic gas generators located near the heat treating area. These units are used to provide a high carbon low oxygen environment to the heat treating furnace atmosphere.

This allows the facility to dial in the precise amount of carbon in that atmosphere that will diffuse into parts. This also prevents explosions by eliminating oxygen in the furnace atmosphere. Based on my observations, these units are exempt from Rule 201 requirements pursuant to Rule 285(2)(I) (iv), which specifically exempts these types of units when used in a heat treating process.

**Compliance Determination**

The facility operated the hospital emergency generator for greater than 50 hours in a non-emergency scenario. This is a violation of 40 CFR Part 63, Subpart ZZZZ. At AQD discretion, no violation was issued for this non-compliance.

Based on my inspection and record review, the facility is in compliance with all other requirements of the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; and Michigan Department of Environment, Great Lakes, Energy-Air Quality Division (EGLE-AQD) rules; 40 CFR Part 63 Subpart ZZZZ – National Emissions Standards for Stationary Reciprocating Internal Combustion Engines; 40 CFR Part 60 Subpart IIII – Performance Standards for Stationary Compression Ignition Internal Combustion Engines; 40 CFR Part 60 Subpart JJJJ – Performance Standards for Stationary Spark Ignition Internal Combustion Engines; and Permit to Install (PTI) No. 135-11D.

NAME Adam BognerDATE 3/18/2024SUPERVISOR K. Kelly