

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

N732070820

FACILITY: MAHLE Industries, Inc.		SRN / ID: N7320
LOCATION: 23030 MAHLE DRIVE., FARMINGTN HLS		DISTRICT: Warren
CITY: FARMINGTN HLS		COUNTY: OAKLAND
CONTACT: Michael Zack ,		ACTIVITY DATE: 02/08/2024
STAFF: Robert Joseph	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Scheduled inspection of Research and Development Facility		
RESOLVED COMPLAINTS:		

On February 8, 2024, I, Michigan Department Environment, Great Lakes, and Energy-Air Quality Division staff, Robert Joseph, conducted a scheduled inspection of MAHLE Industries, Inc. (also referred to as "the facility") located at 23030 Mahle Drive, Farmington, MI, 48335. 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; and the Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) Administrative Rules, and conditions of the facility's Permit to Install (PTI) 295-03G.

General Information

I arrived at the facility shortly after 1 p.m. and met with Susan Palmer, Occupational Health & Safety Coordinator. I stated my name, the purpose of my visit as a civil service AQD employee of the state, and presented my credentials. I asked Susan to provide some general information regarding the facility. MAHLE Industries, Inc. operates a research and development facility for testing engines using diesel, gasoline and alternative fuels (E85/ethanol, compressed natural gas, liquified petroleum gas, and hydrogen). The primary purpose of these test cells is to conduct engine research and development testing to evaluate characteristics such as emissions, friction mapping, noise, vibration, and engine calibration.

Susan randomly visits the MAHLE facilities in the region on occasion for safety purposes and stated the Farmington Hills facility typically operates Monday - Friday, 8 a.m. - 5 p.m. and with two staff personnel who perform the engine testing. She stated that Michael Zack, Compliance Official, is the primary contact for the facility.

Background History

The facility previously operated under Permit to Install (PTI) 295-03F, issued August 5, 2016, to operate five engine dynamometer test cells for testing engines using diesel, gasoline and alternative fuels (E85/ethanol, compressed natural gas (CPG), liquefied petroleum gas (LPG) and hydrogen). The test cells were previously permitted as a Flexible Group (FG-TESTCELLS) with fuel usage limits based upon 12-month rolling time periods.

Under this permit, the site operated as a minor source under both Prevention of Significant Deterioration (PSD) and Renewable Operating Permit (ROP) programs with a carbon monoxide limit (CO) of 89.9 tons/year and a nitrogen oxides (NOx) limit of 24.9 tons/year. The permit was voided during the COVID-19 pandemic (2020) when engine testing ceased, and the dynamometers were removed from the facility. MAHLE resumed engine testing at the facility upon permit issuance of 295-03G with the previously permitted fuels, but with lower proposed annual emission limits than the previous PTI with 79.9 tons/year CO and

17.4 tons/year of NO_x. The facility was a synthetic minor source as PTI 295-03F (voided) contained synthetic minor restrictions for five engine dynamometer test cells, and was not an opt-out as the synthetic minor restrictions did not cover all of the equipment at the facility (FG-FACILITY). The facility remained a minor source under both PSD and ROP programs and is classified as a synthetic minor source.

Facility Tour

Susan escorted me to the engine test area where personnel staff were conducting testing on two engine dynamometers, test cells EU-TC₁1A (Test Cell 1) and EU-TC₂2A (Test Cell 2). Both of these test cells can accommodate an engine rated up to 670 HP. EU-TC₁1A and EU-TC₂2 share a cooling system that restricts their total operating rating to 780 HP. EU-TC₁1A was utilizing kerosene fuel and EU-TC₂2A was utilizing CNG. I met with technician staff member, Nick, and inquired about the use of kerosene fuel (Jet Propulsion 8, used commonly for military purposes) given that the permit does not contain an emission limit for its usage. Nick stated that kerosene fuel is similar to diesel fuel which has a corresponding emission limit in the permit. I indicated that kerosene is not similar to diesel regarding air quality emissions given its chemical properties and that I would provide follow-up regarding this.

Test Cell 1 is manufactured in Austria and is an Elin EBG Elektronik testing machine, and Test Cell 2 is manufactured in the United States and is Baldor Reliance testing machine. Test Cells 3 - 5 (EU-TC₃3A, EU-TC₄4A, EU-TC₅5A) were not in the testing area.

I requested to view the fuel supply room where the facility houses all fuel types. All were closed and properly contained. Kerosene fuel (Jet Propulsion 8) was the predominate fuel in storage. In addition, the facility housed two other dynamometers which Nick and Susan could not identify. I informed them that I would provide follow-up to Michael regarding the kerosene fuel usage and if any permitting requirements were necessary regarding the dynamometers in storage.

Upon completion of reviewing the facility's permit record-keeping requirements, I exited the facility without further concerns.

PTI 295-03G

Attachment A - General Conditions

There were no concerns with any of these conditions with the exception of the two identified test cells which do not appear to be permitted in this permit which violates State Rule 201.

FG - TESTCELLSA

I. EMISSION LIMITS

The emission unit table lists hourly emission limits for CO and NO_x pollutants regarding diesel, gasoline, and alternative fuels testing. In addition, both have 12-month rolling emission totals.

II. MATERIAL LIMITS

According to facility records, the facility has only burned gasoline and alternative fuels - kerosene and CNG. The facility's permit was issued in December 2022 but began

testing cells in June 2023 and has not completed 12-months of testing to accurately assess the 20,000-gallon gasoline/E85 usage limit, the 200,000 gallon diesel fuel limit, and the 15,000 kilogram LPG, CNG and hydrogen each usage limit.

III. PROCESS/OPERATIONAL RESTRICTIONS

There are no operating conditions regarding the process and operational restrictions.

IV. DESIGN/EQUIPMENT PARAMETERS

The facility provided documentation which indicates the flow meters (Micro Motion) were calibrated on 08-02-23, 11-22-23, and 01-17-24 to measure fuel usage. No adjustments have been made to the cooling system since the engines have not exceeded 2,562 hp simultaneously.

V. TESTING/SAMPLING

The permit erroneously references condition V.2 which does not exist. The AQD has not requested CO and NOx emission rates for any of the test cells to be verified as referenced in condition V.1.

VI. MONITORING/RECORDKEEPING

The facility has only tested fuels within the test cells for an 8-month period (June 2023 - January 2024). Records indicate 39 gallons of gasoline, 129 gallons of kerosene (JP-8 which the facility indicates as diesel), and 94 gallons of CNG used during this time period.

CO monthly emissions during this period indicate a high of 454 lbs in June 2023 with a low of 0 lbs (no usage) in November 2023. The 12-month rolling total (8 months of usage) is 775 lbs. NOx monthly emissions during this period indicate a high of 33 lbs in June 2023 with a low of 0 lbs (no usage) in November 2023. The 12-month rolling total (8 months of usage) is 61 lbs.

It appears the facility has maintained proper calibration records for CNG usage.

VII. REPORTING

The facility provided notification in June 2023 regarding the commencement of the emission units' operations authorized by this permit.

VIII. STACK/VENT RESTRICTIONS

There were no concerns observed with the facility's stack.

IX. OTHER REQUIREMENTS

There are no other requirements regarding the facility's operations.

Conclusion

Evaluation of the facility's permit application indicates that kerosene fuel was included in the submittal, however, the AQD Permits Division acknowledged that kerosene fuel was

not given an enforceable emission limit since it was mistakenly not modeled by AQD staff. The Warren District agrees with this assessment so the facility will be informed that they must submit a permit application for the evaluation of kerosene as a toxic air containment (TAC). The underlying requirement in Section I. Emission Limit(s) which erroneously references condition V.2 will also be removed since it does not exist.

In addition, after further discussion with facility personnel and its consultant - as well as with AQD Permits staff, it was determined that the two dynamometer housing units do not require a permit. The dynamometers alone are not emission units and require additional components and therefore this is not a State Rule 201 permit violation.

Given the above as well as the facility's inspection and records review, MAHLE is in compliance with aforementioned requirements and conditions of PTI 295-03G.

NAME Robert Joseph

DATE 03-26-24

SUPERVISOR Joyce