B8747
MANILA

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

B874728819

FACILITY: JOHNSON MATTHEY VEHICLE TESTING & Development, LLC		**SRN / ID:** B8747
LOCATION: 12600 UNIVERSAL DR, TAYLOR		**DISTRICT:** Detroit
CITY: TAYLOR		**COUNTY:** WAYNE
CONTACT: Mark Tomczyk , Manager		**ACTIVITY DATE:** 02/26/2015
STAFF: Terseer Hemben	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM ~~208A~~ OPT OUT
SUBJECT: Engine testing using dynamometers -Criteria pollutants		
RESOLVED COMPLAINTS:		

INSPECTED BY : **Terseer Hemben, MDEQ**

PERSONNEL PRESENT : **Mark Tomczyk, EHS/Coordinator**

CONTACT PHONE NUMBER : **(734)-946-9856**

FACILITY FAX : **(734) 946-8312**

DATES OF INSPECTION : **2/26/2015**

SRN: B8747

Precis: The evaluation of inspection observation was based on:

Federal Rule- 40 CFR 52,

State Rule- R201, R205, R225, R803, R804, R910.

FACILITY BACKGROUND: JOHNSON-MATTHEY TESTING.

I arrived at the facility at 1200 hours. The purpose of the visit was to conduct an annual inspection for compliance per permit requirements. Temperature at the hour was 14 F with the wind speed averaging 6 mph coming from the North, and humidity 64% (Light Snow). Johnson-Matthey Vehicle Testing (JVT) is located at 12600 Universal Drive in Taylor. I was admitted on the site by Mr. Mark Tomczyk (EHS Quality Supervisor). Mr. Tomczyk and I held a pre-inspection conference in the lobby.

During the pre-inspection conference, Mr. Tomczyk informed JVT operated internal combustion engines driven by dynamometers in test cells. Fundamentally, internal combustion engine testing process emits criteria pollutants hence they are subject to federal and state rules. JVT is subject to permitting exemptions on certain equipment. The facility is permitted as synthetic minor-opt out source that legally limits a stationary source's potential to emit criteria pollutants. Stipulated limits and record keeping directs the level of compliance enforcement.

JVT recently upgraded all the Test Cells to operate using catalytic converter system as control device for purposeful attainment of compliance with the synthetic minor-opt out permit conditions. The facility installed and used dilution technology for attainment of environmentally friendly discharge of pollutants to the ambient air. Dilution technology draws ambient air and mixes with pollutant effluent using plug flow for bulk transfer. The resulting gas stream discharges to the ambient air unobstructed vertically in a dilute dispersion pattern. Permit# 149-02L reflects the changes made during the upgrade.

Mr. Tomczyk walked me through the test Cells. Test Cells 1 through 9 were testing in-house projects that included internal combustion engines for John Deer Caterpillar, Generators, and automotive engines. Test Cells 10 were testing engines from international automotive designers. We held the post-

inspection conference at the lobby where I provided a feedback to my observations. I left the building and observed the opacity on stacks. I left the premises at 1250 hours.

COMPLAINT/COMPLIANCE HISTORY:

Johnson-Matthey Testing has no registered citizen air quality complaints at the time of inspection.

OUTSTANDING CONSENT ORDERS:

None

OUTSTANDING LOV'S:

None

OPERATING SCHEDULE/PRODUCTION RATE:

The JVT facility is capable of operating 24 hours per day, 365 days per year. However, currently, the facility is limited workload that fluctuates with oscillating economic forecast.

PROCESS DESCRIPTION:

JVT tests a wide variety of internal combustion engines for use in many applications. In addition, the company tests the aging process of catalysts for Ford and GM customers. Catalyst testing takes the same methodology as the standard engine testing. The difference in methodologies for internal combustion engine rating and catalyst aging is the extended run times allotted for testing catalysts. Performance rating requires extra run-times on catalysts. All testing processes take place in dynamometer test cells. Each test cell contains a dynamometer comprising an electrical signal recording and decoding device for measuring various mechanical performance characteristics of an engine. The dynamometer, as an equipment, does not have associated emissions. Emissions from the source are attributed to the engines. The emissions from each cell are exhausted through stacks.

The catalyst testing is monitored by emissions bench. A bench consists of an Analyzer, which provides emissions data every five hours (sampling time). The Analyzer samples and provides the levels of C, CO, O2, hydrocarbons, and NOx. Oxygen levels, are, however read every 6 seconds for the purpose of measuring air/fuel ratios (sampling frequency). This monitoring was approved for Test Cells #5 & #6.

The exhaust stacks are characterized by the following common features:

- An inside diameter of 12 inches
- A height above grade of 35 feet
- An average exhausts temperature of 800 deg. F.
- An average exhaust flow rate of 1600 acfm

JVT added an exhaust gas dilution mechanism to its exhaust process. The dilution machine takes in fresh ambient air and mixes with exhaust gases from the TestCells before discharging to the ambient air through the stacks. The dilution technology facilitates dilution of pollutants before discharge, and subsequently improves dispersion of pollutants in low concentration into the ambient air.

EQUIPMENT AND PROCESS CONTROLS:

JVT approximates its fuel consumption to 1, 250, 000 gallons or more, per year. This value poses as the worst case condition, when maximum use is made of 6.8 Liter V-10 Modular engines on continuous basis. Modular engines provide the greatest displacement among other Ford internal combustion engines.

APPLICABLE RULES/PERMIT# 149-02L CONDITIONS:

Based on the Permit# 149-02L conditions highlighted in the Federal Rule- 40 CFR 52; and State Rule- R201, R205, R225, R803, R804, R910, the findings indicated JVT operated:

1. In compliance –JVT demonstrated there had been modifications to TESTCELLS system or process at the facility in the last 12 months. JVT stated the modifications were authorized through PTI# 149-02M issued by DEQ-AQD. Records are on file.

2. In compliance- JVT demonstrated the NOx emissions from the FG-TESTCELLS did not exceed the 35.9 tpy limit calculated on monthly and 12-month rolling time period as determined by the end of each calendar month [SC.I.1]. Records for the last 12 months indicated emissions were 0.903 tons per yearbased on 12-month rolling time period [Sheet 4, Rolling Yearly Summary Sheet, pg. 1 of 2].

3. In compliance- JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 0.35 lb. per gallon of gasoline limit without catalytic control determined based on protocol testing [SC. I.3]. Gasoline was not run as fuel in the uncontrolled test cells [Sheet 4, Rolling Year Summary Sheet, pg. 2 of 2]. Thus the condition did not apply to the 2014 operations.

4. In compliance- JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 0.07 lbs. per gallon gasoline limit with catalytic control determined based on protocol testing [SC. I.2]. Rolling year emission records from JVT indicated the facility emitted 0.0149 lb. NOx per gallon gasoline in permitted test cells with catalyst in 2014 year. [Yearly Summary Sheet 4, pg. 2 of 2].

5. In compliance – JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 0.0250 lbs. per gallon diesel limit with catalytic control determined based on protocol testing [SC I.4]. Records covering the last 12 months indicated the maximum NOx emission was 0.0153 lb. per gallon [Yearly Summary Sheet 4, pg. 2 of 2].

6. In compliance – JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 0.0667 lbs. per gallon diesel limit without catalytic control determined based on protocol testing [SC. I.5]. Records covering the last 12 months indicated the JVT did not run Diesel fuel in uncontrolled test cells [Yearly Summary Sheet 4, pg. 2 of 2]. Thus the condition did not apply to the 2014 operations.

7. In compliance – JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 681.6 lbs. per million cubic feet of natural gas limit with catalytic control determined based on protocol testing [SC I.6]. Records covering the last 12 months indicated JVT did not run natural gas with catalytic control. [Sheet 4, Yearly Summary Sheet, pg. 2 of 2]. Thus the condition did not apply to the 2014 operations.

8. In compliance-JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 0.015 lbs. per gallon ethanol limit with catalytic control determined based on protocol testing [SC. I.7]. Records covering the last 12 months indicated JVT did not run the FG-TESTCELLS using ethanol as fuel with catalytic control [Yearly Summary Sheet, pg. 2 of 2]. Thus the condition did not apply to the 2014 operations.

9. In compliance –JVT demonstrated that NOx emissions from the FG-TESTCELLS did not exceed the 2.8 lbs. per 1000 gallons propane limit with catalytic control determined based on protocol testing [SC. I.9]. Records covering the last 12 months indicated JVT did not run FG-TESTCELLS using propane with catalytic control [Yearly Summary Sheet, pg. 2 of 2]. Thus the condition did not apply to the 2014 operations.

10. In compliance – JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 20.5 lbs. per hour limit calculated on monthly determined by the end of each calendar month [SC. I.9]. Records covering the last 12 months indicated the maximum CO emission was 0.616 lb. per hour [Sheet 5, Monthly Summary Sheet, pg. 1 of 1].

11. In compliance – JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 0.1752 lbs. per gallon limit on gasoline, with catalytic controlled calculated based on protocol testing [SC. I.10]. JVT submitted records covering the last 12 months indicating the maximum CO emissions from FG-TESTCELLS 1 through 8 in the 2014 year was 0.0720 lb/gallon with catalytic control. **[Sheet 4**, Yearly Summary Sheet pg. 2 of 2].

12. In compliance- JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 1.752 lbs. per gallon limit on gasoline, without catalytic controlled calculated based on protocol testing [SC. I.11]. Records covering the last 12 months indicated JVT did not run FGT-ESTCELLS 1 through 8 using gasoline without catalytic control [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

13. In compliance – JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 39.9 lbs. per Million cubic feet limit of natural gas with catalytic control determined based on protocol testing. [SC. I.12]. Records covering the last 12 months indicated JVT did not run natural gas in FG-TESTCELLS 1 through 8 with catalytic control [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

14. In compliance – JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 0.19 lbs. per 1000 gallons limit of propane, with catalytic controlled calculated based on protocol testing [SC. I.13]. Records covering the last 12 months indicated the maximum CO emission was 0.1345 lb. per gallon/1000 gallons limit [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

15. In compliance – JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 0.23 lbs. per gallon limit of ethanol, with catalytic control calculated based on protocol testing [SC. I.14]. Records covering the last 12 months indicated the maximum CO emission was 0.00 lb. per gallon limit [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

16. In compliance- JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 0.1434 lbs. per gallon limit of diesel, with catalytic control calculated based on protocol

testing [SC. I.15]. Records covering the last 12 months indicated the maximum CO emission was 0.0204 lb. per gallon [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

17. In compliance – JVT demonstrated that CO emissions from the FG-TESTCELLS did not exceed the 1.424 lbs. per gallon limit of diesel, without catalytic controlled calculated based on protocol testing [SC. I.16]. Records covering the last 12 months indicated JVT did not use Diesel as fuel in FG-TESTCELLS without catalytic control [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

18. In compliance – JVT demonstrated that SO2 emissions from the FG-TESTCELLS did not exceed the 6.81 lbs. per hour limit determined by the end of each calendar month [SC. I.17]. Records covering the last 12 months indicated the maximum SO2 emission was 0.816 lb. per hour [Sheet 5, Monthly Summary Sheet, pg. 1 of 1].

19. In compliance - JVT demonstrated that Benzene emissions from the FG-TESTCELLS did not exceed the 740.0 lbs. per year limit based on 12-month rolling time period as determined at the end of each calendar month. [SC. I.18]. Records covering the last 12 months indicated the maximum Benzene emission was 61.741 lb. per year [Sheet 4, Table B. Yearly Summary Sheet, pg. 2 of 2].

20. In compliance – JVT demonstrated that Benzene emissions from the FG-TESTCELLS did not exceed the 0.0047 lbs. per gallon gasoline limit with Catalytic control determined based on protocol testing [SC. I.19]. Records covering the last 12 months indicated the maximum Benzene emission was 0.0002 lb. per gallon [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

21. In compliance – JVT demonstrated that Benzene emissions from the FG-TESTCELLS did not exceed the 0.0031 lbs. per gallon diesel limit without catalytic control determined based on protocol testing [SC. I.20]. Records covering the last 12 months indicated JVT did not run diesel in FG-TESTCELLS without catalytic control [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

22. In compliance – JVT demonstrated that Benzene emissions from the FG-TESTCELLS did not exceed the 0.0038 lbs. per gallon limit on diesel, with catalytic control calculated based on protocol testing [SC. I.21]. Records covering the last 12 months indicated the maximum Benzene emission was 0.0002 lb. per gallon [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

23. In compliance – JVT demonstrated that Benzene emissions from the FG-TESTCELLS did not exceed the 0.0253 lbs. per gallon limit of Diesel fuel limit check, without catalytic controlled calculated based on protocol testing [SC. I.22]. Records covering the last 12 months indicated JVT did not run diesel in FG-TESTCELLS without catalytic control [Sheet 4, Yearly Summary Sheet, pg. 2 of 2].

24. In compliance –JVT demonstrated that Benzene emissions from the FG-TESTCELLS did not exceed the 0.0047 lbs. per gallon limit of Ethanol, with catalytic control calculated based on protocol testing [SC. I.23]. Records covering the last 12 months indicated the maximum Benzene emission from ethanol was 0.0002 lb. per gallon [Sheet 4 Yearly Summary Sheet, pg. 2 of 2].

25. In compliance – JVT did not need to demonstrate the maximum amount of fuel usage for the FG-TESTCELLS did not exceed 1,000 gallons per 12 month rolling time period in test cells which have no catalytic control as determined at the end of each calendar month [SC. II.1]; and Permittee did not use more than 2000 gallons of diesel fuel per rolling 12-month time period in test cells that have no catalytic control as listed in the units basis. JVT stated all test cells were coupled with catalytic converter.

26. In compliance – JVT did not need to demonstrate the sulfur content of all gasoline used in FG -TESTCELLS did not exceed 0.085 percent by weight, and the sulfur content of all diesel used in FG-TESTCELLS did not exceed 0.28 percent by weight [SC.II.2]. JVT stated the facility did run tests with gasoline in FG-TESTCELLS that did not exceed percentage by weight specifications.

27. In compliance - JVT demonstrated the permittee equipped and maintained each emission unit included in FG-TESTCELLS with a catalytic converter, and is operated in a satisfactory manner with each catalytic converter operated at a minimum temperature of 600F based on an hourly average [SC. IV.1]. JVT stated all test cells were coupled with catalytic converter as listed in Permit# 149-02L on file. Staff inspected the cells and confirmed they were coupled with catalytic converter. Temperature profile of the converters is logged in Attachment# 3.

Observation of monthly temperature profile of FG-TESTCELLS 1-6 (exception of 9 & 10) that used diesel fuel with catalytic converter indicated temperature logs were above 450F. However, Cell 1 registered an average 268F below the 450F for diesel fuel. JVT explained the temperature average represented the performance Cell 1 was not actually in run. The cell 1was only idled for warm up for maintenance upkeep [Attachment 3]. Sheet# 3, Table A, Page 1 of 2 listed the throughput for use of Gasoline in Cells 9 and 10 under exempt cells with catalytic converter as 93.25 thousand gallons. JVT explained the cells were exempt to run for research tests during the recorded period. However, the exempt period expired when Permit 149-02L was issued and all cells were coupled with catalytic converters. No gasoline was run in the uncontrolled cells. Compliance was acknowledged.

28. In compliance- JVT demonstrated the permittee monitored either electronically, using a strip chart recorder or manually logged the exhaust gas temperature immediately before and after each catalytic bed; and temperature recordings were made at least once per every 15 min (4 per hour) [SC. VI.1]. Inspector observed all temperature and pressure data were electronically acquired and monitored digitally using electronic dashboard.

29. In compliance – JVT demonstrated permittee maintained the following records for FG-TESTCELLS:

a. The amount (in gallons) of diesel fuel used in FG-TESTCELLS without catalytic control and the average hourly usage rate of diesel fuel without catalytic control. This information shall be compiled on a monthly basis [SC. VI.2a]. Records presented in Pages 34 through 43 supported that no FG-TESTCELLS without catalytic control were run.

b. Total aggregated operating hours for all test cells. This information shall be compiled on a monthly basis [SC. VI.2b]. Records presented in Table A on pages1 indicated operating hours of all test cells were recorded. [Sheet 5, Page 1 of 1].

c. The amount (in gallons) of gasoline fuel used in FG-TESTCELLS without catalytic control and the average hourly usage rate of gasoline without catalytic control. This information shall be compiled on a monthly basis [SC. VI.2c]. Records presented in Sheet 5, page 1 of 1 presented total quantity of gasoline, and average hourly usage rate in FG-TESTCELLS without catalytic control.

d. The amount (in gallons) of ethanol used in FG-TESTCELLS and the average hourly usage rate of ethanol. This information shall be compiled on a monthly basis [SC. VI.2d]. Records presented in Sheets Pages 56 through 60 list the amount of ethanol usage, and average hourly usage compiled on a monthly basis.

e. The amount (in cubic feet) of natural gas used in FG-TESTCELLS and the average hourly usage rate of natural gas. This information shall be compiled on a monthly basis [SC. VI.2e]. Records presented in pages 49 and 50 list the amount of natural gas and average hourly usage rate compiled on monthly basis.

f. Total amount (in gallons) or propane fuel used in FG-TESTCELLS and the average hourly usage rate [SC. VI.2f]. Records presented in pages 64 and 65 indicated compliance with propane average hourly usage and amount used in the FG-TESTCELLS . This information was compiled on a monthly basis.

g. Monthly NOx emission calculation records for FG-TESTCELLS [SC VI.2g]. Records presented in Table A indicated compliance, [Sheet 5, page 1 of 1].

h. Monthly CO emission calculation records for FG-TESTCELLS [SC VI.2h]. Records presented in Table A indicated compliance. [Sheet 5, page 1 of 1].

i. Monthly SO2 emission calculation records for FG-TESTCELLS [SC VI.2i]. Records presented in Tables A indicated compliance. [Sheet 5, page 1 of 1].

j. Monthly benzene emission calculation records for FG-TESTCELLS [SC VI.2j]. Records presented in Tables A indicated compliance. [Sheet 5, page 1 of 1].

k. Hourly records of the inlet and outlet temperatures in each catalytic converter [SC. VI.2k]. Records presented in Attachment# 3, Cell# 3 & 6 indicated compliance with hourly recordings..

l. Records of the maximum sulfur content in the fuel for each delivery [SC VI.2l]. Records presented in Tests and Laboratories indicated compliance. Pages 15 through 23 in Gasoline fuel exemplifies sulfur content monitoring.

30. In compliance -JVT demonstrated the exhaust gases from stacks SV-TESTCELLS1-2 to SV-TESTCELLS 7-8 are discharged unobstructed vertically upwards to the ambient [SC. VIII.1 through 20]. Staff verified visually the gases from stacks were discharged unobstructed upwards to the ambient.

Inspection Areas of Focus:

Buildings and controlled Test cells – Engine Dynamo recordkeeping the buildings were neatly kept and the indoor was free of odor.

1. Engine dynamometers were serviced and engaged for productivity.
2. The gaseous dilution system was working satisfactorily. Visible emissions on buildings were checked. The highest opacity reading from stacks was less than 5 %. There were no open containers with organic liquids on the site.

DETERMINATON

Based on the inspection and records provided by JVT, the Johnson-Matthey facility was determined to be in compliance with the permit# 149-02L requirements. In general, the facility was maintained in a satisfactory manner. The company provided records relating to the opt out permit requirements for compliance timely. However, determination based on PTI #143-07 and PTI# 170-13 will be evaluated in the next inspection cycle.

NAME _____ DATE 9/8/2015 SUPERVISOR JK