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

M414831338

FACILITY: DETROIT RENEWABLE POWER, LLC		**SRN / ID:** M4148
LOCATION: 5700 RUSSELL ST, DETROIT		**DISTRICT:** Detroit
CITY: DETROIT		**COUNTY:** WAYNE
CONTACT: William Alexander , Environmental Manager		**ACTIVITY DATE:** 07/31/2015
STAFF: Joyce Zhu	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Annual inspection. The noncompliance status due to non resolved odor problems.		
RESOLVED COMPLAINTS:		

On July 31, 2015, I conducted an annual inspection at Detroit Renewable Power (DRP). The facility is located on 5700 Russell St., Detroit. Mrs. Kerry Kelly from Air Quality accompanied me during the inspection. We arrived at the site around 9 AM. We met with Mr. William Alexander, the facility Environmental Manager. I explained the purpose of the inspection. Mr. Alexander took us to see the facility.

Inspection:
The company processes municipal solid waste (MSW) into refuse-derived fuel (RDF), which is then burned to generate steam & electricity. They provide steam to downtown Detroit as well as GM Hamtramck Facility; & sell the electricity to Detroit Edison Corp. The company is permitted to receive up to 20,000 tons of MSW per week. Trucks hauling MSW are weighed at the scale-house before dumping wastes onto the tipping floor at the waste processing facility (WPF). Smaller trucks, such as packer trucks, dump the wastes at the upper tipping floor whereas large trucks, at the lower tipping floor. Bulky or noncombustible materials, such as gas tanks, etc., are identified through ocular inspection & removed by the loader operators. Those materials will be sent to landfill. There are three processing lines (Line #100. 200, & 300) for the MSW. Each line consists of two shredders (primary & secondary). Emissions from the primary shredder are controlled by a baghouse; & secondary shredder, by a cyclone followed by a baghouse. After the primary shredder, there is a large rotating electromagnet to remove the ferrous metal from the trash. Materials coming out of the secondary shredder are called refuse-derived fuel (RDF). RDF is sent to adjacent room for storage. In the storage room, there are two conveyors (line Nos. 501 & 502) which carry the RDF to the boilers. There're three boilers (Boiler Nos. 11, 12, & 13) on site; however, only two of the three are allowed to operate at a time according to the Renewable Operating Permit (ROP). The bottom ash from the boilers goes to the end of the grate where it falls into the water quench. There is another magnetic system which removes metals in the bottom ash. The emissions from each boiler are sent to a spray dryer absorber (SDA) followed by a baghouse. In the SDA, a cloud of finely atomized droplets of hydrated lime slurry reacts with the acid gases in the flue gas; as a result, acid gases, trace metals & organics are removed. Unreacted lime reagent together with the flue gas enters the baghouse where particulate emission is further reduced. Because the lime reagent is embedded in the baghouse filter cake, it further removes the acid gas in the emission stream. Particulate (mainly fly ash) captured by the baghouse is transferred by an enclosed conveyor system to the ash discharger where the fly ash is wetted & mixed with the bottom ash. The mixture is stored in an enclosed building to be loaded into trucks for landfill. During the inspection, there was little debris in the plant yard as well as at the property fence lines.

Permits: ROP# MI-ROP-M4148-2011

EUASH-HANDLING

This is the ash handling process. Grate sifting & bottom ash from each boiler are discharged to a quench through & submerged scraper conveyor. Fly ash from the tubular air heater hoppers, economizer hoppers, & the baghouse hoppers is transported via drag-flight conveyor to a surge bin & to be wetted in a pugmill. Afterwards, the wetted fly ash is discharged onto the bottom ash conveyors & transported to the ash / load-out storage building prior to off-site disposal. During the inspection, I observed that the truck hauling the ash was covered when leaving the storage building. The truck was free from ash for the wheels. I didn't see any leak from the drag-flight fly ash conveyor system; nor did I see any from the bottom ash conveyor system. According to the company, they inspect the insertable dust filters in wall-mounted exhaust fan area bi-weekly. The filters will be replaced as needed basis. The company keeps records of daily Method 22 visible emission (VE) observation as well as bi-weekly inspection records for insertable dust filters, & wall mounted exhaust fans. The daily VE observation record shows there were no problems during July 27 – July 31, 2015.

EULIME-FEEDSYS

This emission group includes a lime storage silo with a baghouse, two lime slackers which are equipped with a grit screen, & a slurry tank connecting both lines. The lime slurry from the slurry tank is pumped into each boiler's slurry head tank where the slurry is fed by gravity into the SDA. During the inspection, I didn't observe any opacity from the process. The baghouse is located on the top of the storage silo. The dust collected by the baghouse during loading is send back to the silo. From the company's record, they replaced "B" grit screen in March of this year; & "A" grit screen, in May. The last time they replaced the bags of the baghouse was in July 2013. The company keeps a record of the daily VE readings during unloading lime. The record includes the dates, name of the reader, & visual inspection of the baghouse during unloading. According to the company's record, there was no significant issue reported during the month of July.

EUSTORAGETANK

This emission unit covers the 500,000-gal fix roof storage tank for No. 2 fuel oil. The company keeps the following records on-site as required by the permit: a) true vapor pressure of the material stored; b) dimensions of the vessel; c) design capacity of the vessel.

FGMSWPROC-LINES & Consent Judgment #14-1184CE

This relates to all activities of processing MSW in the facility; activities, such as weighing, unloading the MSW in the tipping area, MSW processing, RDF storage, RDF loading into two boiler-feed conveyor lines, & conveying RDF into the power Block Building, are covered by the flexible group. In addition to the cyclone & baghouse to control the particulate emission from the processing lines, the process building exhausts have been equipped with the vent filters. According to the company, the bags in the baghouses as well as the roof exhaust vent filters are inspected on a monthly basis; & the cyclones, daily. A level detector is installed at the air lock location which is at the end of the cyclone. The level detector will provide indications if the air-lock is jammed. Dust collected from the primary shredder baghouse, the cyclone as well as the

baghouse for the secondary shredder will be sent to the RDF pit. Because the baghouses & the cyclone are located in the same area where they operate the heavy equipment, such as loaders, it would not be safe for us to physically get closer to the controls. As a result, I didn't inspect the integrity of the controls. Each processing line can process 50 tons of MSW per hour. They receives the MSW from Monday to Friday & sometime during Saturday mornings; however, the boilers are expected to run seven days a week; as a result, they received MSW on weekdays more than they can processed on those days in order to have enough RDF for the boilers during the weekends. Normally, they'd like to have two day inventory onsite. The ROP requires the company to clean tipping floor on a daily basis; however, the tipping floor area has limited space. During weekdays, the floor is covered by MSW. It's impossible to clean the entire floor. By the end of Sunday, the tipping floor area as well as the RDF storage area is cleared. They normally clean those areas during weekends. They apply odor neutralizing agent in the tipping floor area during weekends. They clean the aisles, waste transfer point, the visible accessible areas of the tipping floors, & the pit area on a daily basis. Whenever the processing equipment is down, they will clean the equipment. Also, they clean the roadways & paved area multiple times a day. Weekly, they clean the surface around the infeed conveyors in MSW reception area as well as the infeed conveyors in RDF dispatch area; or when the areas are available, they will scrub the areas. In the waste processing section, at the areas of the entrance and the tipping floor, they apply odor neutralizing agent, an enzyme that reacts with the odor molecules. At the RDF area, the company used waterless vapor system with a material called Ecosorb 606 to control the odor. The wet odor neutralizing system for the MSW processing area & the waterless odor absorb system for the RDF area are operated primarily during mid of April through mid of October when the odor problem becomes intensive. They will stop using Ecosorb 606 when the RDF building exhausts are ducted to the boilers. According to Bill, by August, they have used around 125 gallons of odor neutralizing agent since the mid-April. There have been odor complaints about the company's operation. The odor could be attributed to the accumulation of either the MSW or RDF on site. If the process lines are down & they continue to receive waste, it could accumulate trash in the tipping area. As a result, waste will be piled up. As the pile builds up, so does the pressure inside the trash; the bottom of the trash will decompose & cause odor. Similarly, when boilers are taking off line, the RDF may be accumulating in the storage area. Odor will be generated due to decomposition. In 2014, the company hired Derenzo Environmental Service to conduct an Odor Study. The study concludes that the majority of odor is due to the storage of RDF. In order to mitigate the odor problem, DRP has entered a Consent Judgment with the State. Under the Consent Judgment, the companies will control the odor from the RDF storage area by ventilating the exhaust from the area to the boilers; this is called the RDF control system. This odor reduction strategy will undergo different phases. By January 27, 2016, the RDF control system will be connected to at least one boiler. By 7/25/16, the company will connect the RDF system to all the boilers. The company has kept AQD updated about the RDF control project. So far, the company has met the target dates as required by the Consent Judgment. Meanwhile, the company has implemented odor management plan to manage the odor problem. In addition to the application of odor neutralizing agents, the plan includes plant maintenance, housekeeping practices, implementation of waste diversion program (WDP). The company keeps the following information: the daily pressure drop for each baghouse of the three primary as well as the secondary

shredders, the daily negative pressure reading from the solid waste receiving room by using velometers, monthly inspection records for roof exhaust filters, cyclones, & baghouses, daily description of the MSW, & the daily VE observations on all applicable emission points on FGMSWPROC-LINES. According to the company data, there was no visible emission from stacks of each process line from 7/27 – 7/31. The pressure drops of the baghouses during the period while operating the process lines are above the pressure drops for the corresponding baghouses during the stack test in February. The last time they calibrated the pressure gauges for the baghouses was on 9/19/14.

FGBOILERS011-013
This flexible group covers the power block operation which consists of three identical RDF fired spreader-stoker boilers. Each boiler is rated at 520 MMBTU per hour heat input, 390 pounds per hour steam at 900 psig & 825 °F. Power block operates an electric generator with name plate capacity of 68 MWe to convert unsold steam into electricity for internal use & for sale to the grid. The emissions from each boiler are controlled by a spray dryer absorber (SDA) followed by a baghouse. Each SDA is located on the top of the associated boiler. For startup, shutdown, & other conditions as necessary for the boilers, natural gas is used as the primary auxiliary fuel; & No. 2 fuel oil, as back-up. There are 10 compartments in each baghouse. Each compartment has 168 bags. The ROP requires the company to conduct stack test annually to verify compliance with regards to particulate matter, cadmium, hexavalent chromium, total chromium, lead, mercury, dioxin/furan, fluorides, hydrogen chloride, & volatile organic compounds. In addition, the company continuously monitors carbon monoxide, nitrogen oxides, & sulfur dioxide through continuous emissions monitoring system (CEMS); and opacity through a continuous opacity monitoring system (COMS). The test performed in 2014 & early 2015 showed that the emissions complied with the corresponding limits. According to Bill, for the dry oxygen, the company utilizes an extractive gas monitoring system for oxygen analyzer, but in-situ system for the greenhouse gas (GHG). The QA manual for the CEMS is stored in the CEMS building. The quarterly report is generated according to the data generated from the control room. They check the transmitter & flow meter daily; they perform calibration check every morning. The check lasts about 15 minutes. Cylinder gas is used for the check. They will adjust the calibrating analyze if there is calibration drift (CD). They have checked the transmitter, transducer, & flowmeters of the CEM in early July of 2015. The CEMS cylinder gas audits (CGA) was performed on June 4, 2015; & opacity, June 25, 2015. During the inspection, only Boiler #11 & # 12 were operating. I observed that the umbilical lines entering the CEMS were sheltered for condensations. The temperatures of chillers which were used for dry system were no more than 2.6 C. They do not use corrective algorithms. No CEM as well as COM data was entered by hand. The delivery pressure of the cylinder (#cc43204) was at 28 psi. The cylinder pressure was at 1100 psi. The calibration drift control chart showed that the daily calibration drift (CD) of each CEM for oxygen, sulfur dioxides, NOx, & carbon dioxide, in June were within 5% requirements. Also, the daily calibration summary showed that the CEMS & COMS were within the required range on July 31, 2015. The COMS showed that the opacity from the exhaust of Boiler #11 as well as #12 was no more than 4.4% during July 31, 2015. The CEMS data showed that the CO, NOx, & SO2 emissions from the two boilers were below the corresponding permit limits on the same date. During the inspection, I took some instantaneous readings at 10:10 AM. The combustion zone temperature of Boiler No. 11 was at 2238 °F; Boiler No.12, 2083 °F.

There temperatures were above 1800 °F. The slurry flow rate was at 24.525 gallons per minute (gpm) for SDA-11; & 33.896 gallons per minute (gpm) for SDA-12. Please note that the SDA-12 slurry flow rate is slightly higher than the range established in the company's SSMA plan (between 3 gpm & 30 gpm); nevertheless, SO2 emission 1-hour average at 10 am well as 11 am was no more than 15 ppm for Boiler No.12 (permit limit 29 ppm for 24-hour average). The pressure drop across the baghouse for the Boiler No. 11 was at 8.44 inches of water; & for Boiler No. 12, 8.99. During the same time, the inlet temperature for SDA-11 was at 441.60 °F; & for SDA-12, 431.50 °F. These temperatures were above 350 °F as required by the company's SSMA plan. The SDA-11 outlet was at 299 °F; & SDA-12, 314 °F. Please note that the SDA outlet temperature is the same as the baghouse inlet temperature. As can be seen, the inlet temperature was above 200 °F & below 400 °F. The steam load for Boiler No. 11 was at 283.042 klb/hr; & for Boiler No.12, 292.17 klb/hr. The flue gas oxygen content (wet) by volume was at 7.7% for Boiler No. 11. Those indicators were within the range between 4% & 8.9% as required by the SSMA plan. From the control screen, I could see that the bypass dampers were closed; & that the baghouse compartment dampers were aligned. The company has kept a list of the people who have the current provisional operator certificate from ASME & completed EPA trainings for municipal waste combustor operators. According to the company, they check the burners & valves of each boiler every day. The fly ash hoppers are emptied daily. I didn't see any corrosive appearance on the baghouses; nor did I observe any fallout in the baghouses area. Bags are replaced every few year on an average or as necessary when there's opacity problem. The company keeps following data:

1. COM data
2. CEMS data for SO2, NOx, & CO in 1-hr average concentration & 24-hr daily geometric average as well as the daily check zero & span calibration drifts of the CEMS
3. Quarterly accuracy determination test for SO2, NOx, & CO.
4. Steam flow calculated in 4-hour block arithmetic average on a monthly basis
5. 4-hour block arithmetic average combustor load level
6. Flue gas stream baghouse inlet temperatures for the corresponding boilers while operating
7. Flue gas stream temperature prior to the boiler bank inlet/after the superheater
8. Flue gas stream temperature at the combustion zones
9. Dates when any of the average emission concentration, % reductions, operating parameters recorded, or opacity exceeded the applicable limits, the reasons for the exceedances, & a description of corrective action taken.
10. Heat input rates in 12-month rolling time period for the auxiliary fuels for each boiler.
11. Hours of operation for each boiler each month
12. Atomizer unit replacement data, including dates, affected boiler emission unit, length of time of replacement, & emission rate during replacement
13. The maximum demonstrated combustor unit load during dioxin/furan performance test.
14. The maximum demonstrated PM (particulate matter) control device temperature for each baghouse
15. Records of the person who completed the EPA municipal waste combustor operator training course.
16. Startup, shutdown, & malfunction in the operation, control equipment, CEM, or COM.
17. Total number of days that the minimum number of hours of data for SO2, NOx, CO,

unit load, & PM control device inlet temperature data were not obtained based on the data recorded.
18. Annual capacity factor for combined auxiliary fuel using for each boiler determined on a 12-month rolling average with a new capacity factor calculated at the end of each month.
19. Site-specific operating manual

FGCOLDCLEANERS
There is a cold cleaner onsite. It is located at the mechanical maintenance area. A written procedure for compliance with Rule 611 or Rule707 was posted on the unit. The air/vapor interface of the unit was less than 10 square feet. Crystal Clean is responsible for replacing the solvent in the cleaner. During the inspection, I didn't see any spillage in the cleaner area. According to the MSDS of the solvent used, there is no regulated halogenated solvent used in the unit; therefore, the unit is not subject to the NESHAP for cold cleaners.

FGRULE290
This flexible group covers any emission units that are exempted from the permit to install requirements per Rule 290. The company states that they do not have such unit on site.

In conclusion, in July, the boiler operation appeared to be in compliance with the Air Quality Regulations & the ROP requirements; however, the odor problems resulted from the MSW processing operation have not yet been resolved.

NAME Joyce [signature] DATE 9/25/2015 SUPERVISOR W.M.