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

B494240717

FACILITY: DOW AGROSCIENCES LLC		SRN / ID: B4942
LOCATION: 305 N HURON AVE, HARBOR BEACH		DISTRICT: Saginaw Bay
CITY: HARBOR BEACH		COUNTY: HURON
CONTACT: James W. McGee , EH&S Leader		ACTIVITY DATE: 07/11/2017
STAFF: Gina McCann	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Inspection of MI-ROP-B4942-2015a		
RESOLVED COMPLAINTS:		

Inspection date: 7/11/2017

Inspection started: 9:30 AM

Inspection ended: 12:00 PM

Compliance Status: Compliant

Dow and MDEQ-AQD staff present during the inspection.

Gina McCann (MDEQ-AQD, EQA)

Jim McGee (Dow AgroSciences, EH&S Specialist)

Matt Klaska (DowAgroSciences, Environmental Tech)

Scott Grekowicz (Dow AgroSciences, Utilities Production Engineer)

Jessica Reggenbach (Dow AgroSciences, Run Plant Engineer - Extraction)

Kevin Soper (Dow AgroSciences, Production Leader – Fermentation)

Kevin Deer (Dow AgroScience, Production Operator-Fermentation)

On June 29, 2017 a records request was sent via email to help facilitate the inspection. Mr. McGee dropped a thumb drive off to the office, with the requested records on July 7, 2017. It is attached to the hard copy file.

Items noted during the inspection.

EUPROCESS

Dow AgroSciences (DAS) manufactures three different grades of Spinosad. Spinosad is an insecticide primarily used for agricultural purposes. The active ingredient manufactured by DAS is also used to produce flea and lice medicine. Methanol is the primary HAP emitted from the process. The process consists of fermentation and extraction. The extraction step includes a belt press, dryer and packaging of the final product. The final product is a solid. It's packaged in super sacks or fiber board drums.

DAS currently has several fermentation vessels on-site. Not all vessels are operating at the same time. Fermentation vessels are operated as a batch process. Each vessel's

batch may take 5 – 12 days before being sent to the extraction process. The vessels in operation are normally in varied stages of the fermentation process.

Emissions from the fermentation and extraction process are vented to 4 thermal treatment units (TTUs) w/palladium catalyst. Emissions from a bioreactor that pretreats process waste prior to disposal to the city sewer are sent to flare.

DAS currently has 9 temperature monitoring devices on each TTU. Four of the devices are at the inlet to the catalyst, and 5 are at the outlet to the catalyst. DAS currently controls each TTU off of one temperature monitoring device at the inlet to the catalyst (i.e., firebox temperature monitoring device). With regard to one of the temperature monitoring devices located at the outlet of the catalyst, this temperature monitoring device is used for equipment protection purposes (i.e., protects against damage to heat exchangers, etc.). The temperature monitoring capability of this device is 0 – 1600 F, while the other 8 devices have temperature monitoring capabilities of 0 – 1200 F. DAS does not determine compliance based upon data from the temperature monitoring device used for equipment protection purposes.

Condition no. VI.1 of EUPROCESS of the ROP requires DAS to install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the temperature of each TTU on a continuous basis. During the inspection, I noted the following instantaneous inlet temperatures for each TTU in the control room.

TTU 850: inlet 675.00
outlet 671.06

TTU 855: inlet 675.00
outlet 675.94

TTU 860: inlet 675.00
outlet 672.06

Catalyst regeneration typically takes place every 90-100 days. The temperature maintains 1,000F for eight hours. This is in compliance with the approved Alternative Monitoring Request (AMR) dated July 1, 2011.
Condition no. VI.2 of EUPROCESS requires the facility to maintain monthly production records. DAS was in compliance with this requirement at the time of the inspection.

Condition no. VI.3 of table EUPROCESS of the ROP requires DAS to monitor and record, in a satisfactory manner, the daily average temperature of each TTU each day the TTU operates. Condition nos. IV.2 and 3 table in the ROP states, in part, DAS shall not operate the portions of EUPROCESS ducted to TTU Nos. 850, 855, 860 and 865 unless a minimum daily average temperature of 650 F is maintained (or other temperature determined by the most recent compliance demonstration). The average daily TTU temperatures reported in the Subpart MMM reports were all above 650F. I reviewed data for January 2017 through March 2017. Average TTU operating temperatures were in compliance.

Condition no. V of EUPROCESS of the ROP states, in part, no later than five years from the date of the previous performance test, the permittee shall verify the organic HAP and ammonia concentrations and emission rates from the four TTUs. The week of October

24, 2015, DAS conducted performance testing on the TTUs under the PAI MACT. This test determined the HAP outlet concentration and HAP destruction efficiency were in compliance.

Condition no I.5 of EUPROCESS of the ROP limits total VOC emissions from the four TTUs to 8.7 lbs/hr. VOC emissions from the October 2015 test results were below the permitted level.

Per the AMR the site has a 20 ppmv emission limit for VOC verified by a monthly Method 25 emission test. I reviewed test results for the months of December 2016 and May 2017 and results were below the limit.

Condition no. VI.4 of EUPROCESS requires the facility to monitor and record each TTU inlet an outlet catalyst temperature. I reviewed records for January 2016 and March 2017. TTU temperatures were above 650F.

Ammonia addition occurs on a batch basis. The ammonia emission concentrations are greatest during ammonia addition not necessarily greatest production rate. The same amount of ammonia is added regardless of production DAS conducted a stack test for ammonia on October 21, 22, 23, 26, 27, 28 and 29, 2015. The stack test report received on May 23, 2016 indicated compliance with the emission limits.

Condition no. VI.6 of EUPROCESS of the ROP requires DAS to calculate the ammonia emission rates from EUPROCESS monthly, for the preceding 12-month rolling time period. Based upon information provided during the inspection through June 2017, the 12-month rolling total ammonia emissions were in compliance with the 12-month rolling time period limit of 2.0 tons per year.

Condition no. IX.1 of table EUPROCESS of the ROP requires DAS to comply with the PAI MACT. As a result of being subject to the PAI MACT, condition no. III.1 states DAS shall not operate the bioreactor unless the enclosed flare is installed, maintained, and operated in a satisfactory manner. In addition, condition no. IV.1 of the ROP states DAS shall operate a continuously burning pilot flame at the enclosed flare at all times when the bioreactor is operating. The latest NOCSR for the PAI MACT also specifies operating parameter requirements for the bioreactor (which vents to the flare) and the flare. MACT reports were reviewed upon receipt and compliance determined at that time.

The bioreactor contains bacteria, which takes the organic load and digests it and subsequently off gases methane, carbon dioxide and a minimal amount of hydrogen sulfide. If the temperature drops below 250C the bioreactor feed shuts down. At the time of the inspection, pilot A was 388.50C and pilot B was 351.81C. The temperature was being taken every five (5) seconds.

Based upon data observed during the inspection and information provided for the TTUs, bioreactor, and the flare, DAS appears to be in compliance with the operating limits specified in the NOCSR and the ROP.

EU_AMMONIA_TK

Condition no. III.1 of EU_AMMONIA_TK of the ROP states permittee shall not operate the ammonia facility unless an inspection and maintenance program, as approved by the District Supervisor, has been implemented and maintained. On 8/1/11, the AQD received

an ammonia inspection and maintenance program. This program was approved by the AQD in a letter dated 8/2/11. During the inspection, DAS confirmed that this is the current program and that it hasn't been updated.

Condition no. III.2 of EU_AMMONIA_TK of the ROP states DAS shall not operate the ammonia facility unless a remotely operated internal or external positive shut-off valve is installed to allow access for emergency shut-off of all flow from stationary storage containers. DAS has sniffers to detect ammonia leaks. There are emergency block valves and shut off feed valves to isolate a leak. Staff from extraction own the equipment and provide maintenance services to it. DAS has shut-off capabilities at multiple locations that meet this requirement.

Condition no. III.3 of EU_AMMONIA_TK of the ROP states, DAS shall not operate the ammonia facility unless a bulkhead, anchorage, or equivalent system is used at each transfer area so that any break resulting from a pull will occur at a predictable location while retaining intact the valves and piping on the plant side of the transfer area. I observed the bulkhead during my inspection and it appeared to meet the requirements of the condition.

Condition no. IV.1 of EU_AMMONIA_TK of the ROP states the hose used for transferring liquid and/or vapor to and from ammonia storage tanks shall not exceed 25 feet in length. Condition no. IV.2 of the states all ammonia transfer hoses shall be replaced five years after date of manufacture or more often if there is evidence of damage or deterioration. According to DAS the hoses are replaced annually and are shorter than 25 feet in length. They are stored securely in cylindrical piping near the tank so as to prevent damaging.

Condition no. IX.2 of EU_AMMONIA_TK of the ROP states after each ammonia transfer operation is completed, DAS shall vent hoses used to transfer the ammonia to a stack with a maximum diameter of 8 inches and an exit point not less than 85 feet above ground level. The ammonia system appeared to meet these requirements.

Energy facility
Operating Modes:

Supplemental Mode = gas turbine operating, heat recovery steam generator operating. Emissions for the north unit vent through SV00007 & the south unit through SV00009. TEG (Turbine Exhaust Gas) Mode = gas turbine operating & heat recovery steam generator operating (the burner is not operating). Emissions for the north unit vent through SV00007 & the south unit through SV00009.

Fresh Air Mode = burner operating & heat recovery steam generator operating (the gas turbine is not operating). Emissions for the north unit vent through SV00007 & the south unit through SV00009.

Turbine Running (Air Generation) = gas turbine operating (the burners & heat recovery steam generator are not operating). Emissions for the north unit vent through SV00008 & the south unit through SV00010.

During extreme weather conditions the SoLoNOx burner control equipment went offline and the facility exceeded permitted NOx emissions. The facility was issued a violation

notice on March 17, 2016 for these exceedances. The facility requested a permit change to establish a NOx limit during times when the SoLoNOx was down, uncontrolled. The permit required modeling to verify NAAQS could be met with current stack heights. This resulted in additional testing to verify emission factors and ultimately the facility extended stack heights to meet modeling.

During testing performed, the weeks of May 23rd and May 30th, 2016, the facility met the instantaneous NOx concentration emission limit, but the north turbine exceeded the 3.8 lb/hr limit in TEG SoLoNOx On mode. The ROP requires the facility to use the emission factor determined during the most recent stack test for calculations. Since the exceeded pound per hour value was being used to calculate NOx emissions, the emission factor determined during the most recent stack test, the facility was reporting occasional NOx exceedances in their monthly recordkeeping. The facility was issued a violation notice on November 3, 2016 for exceeding the NOx limit of 3.8 lb/hr, based upon a calendar day averaging period, for several days in the fourth quarter of 2016. The facility had used manufactures specifications to derive the limit in the permit. The pound per hour limit (3.8 lb/hr) was subsumed from the NSPS for turbines, 40 CFR Part 60 Subpart GG, and the actual NSPS limit was much higher than what was reflected in the ROP. Resolution was to remove the pound per hour limit and require testing once every five (5) years to verify the concentration limit.

The violation notices issued on March 17, 2016 and November 3, 2016 should be considered resolved with the issuance of ROP minor modification on July 6, 2017.

FG-BURNERS
Two 30 MMBTU/hr natural gas fired burners. One is installed in each of the two turbine exhaust ducts to provide supplemental heat to the HRSG.

Condition no. VI.2, VI.3 and VI.5 of FG-BURNERS of the ROP requires the facility to maintain records of total daily natural gas usage, total operating hours in fresh air mode on a monthly and 12 month rolling time period, and a log of the hours of operation and mode of operation of each burner in FG_BURNERS. For the month of May 2017, the 12-month rolling average of hours of fresh air operating mode was 728.2 hours.

Condition no. VI.4 of FG-BURNERS of the ROP states within 30 days following the end of each calendar month, permittee shall calculate and record emissions from FG-BURNERS to demonstrate compliance with emission limits listed in table I for NOx at 4.5 lbs/hr and for CO at 4.8 lbs/hr. The emission factors (EFs) used in the calculations shall be based on the most recent testing data for each burner in FG-BURNERS. The January 2017 through May 2017 daily NOx emissions for each burner ranged between 0.1 and 3.6 lbs/hr. The CO emissions ranged between 0.1 and 3.8 lbs/hr.

FG-TURBINES
Two 4700 horsepower/42.47 MMBtu/hr heat input rated natural gas fired turbines equipped with SoLoNOx combuster.

Condition no. VI.1 of table FG-TURBINES of the ROP requires DAS to monitor/record the following:

Total natural gas usage rate on a daily basis in standard cubic feet per day and the hourly usage rate as required in SC II.1. The total hours of uncontrolled operation for FG

-TURBINES on a monthly and 12-monthly rolling time period as determined at the end of each calendar month.

Based upon information provided to me during the inspection, from September 2015 until present, DAS is keeping all of the required information for FG-TURBINES.

FG-SOLID-HAND

Condition no. III.1 of table FG-SOLID-HAND of the ROP states permittee shall not operate EU-SOLID-HAND1 (F-585A) or EU-SOLID-HAND2 (F-586) unless the associated dust collector for that line is installed, maintained and operated in a satisfactory manner. At the time of the inspection the differential pressure for dust collector F-585A was 0.2" W.C, and FH-586 was 2.56" W.C. The dust collector exhaust vents to the TTUs. The dust collector appeared to be maintained & operated properly.

According to DAS, EU-SOLID-HAND3 (DC-583A) is used to control particulate emissions during Spinosad product load events. This dust collector vents is used by employees to collect any visible accumulated solids in the loading area. The dust collector vents to the in-plant environment.

FG-UTILITIES

All fuel burning devices within FG-UTILITIES including compressed air, steam and chilled water generation equipment, (EU_N_BURNER, EU_S_BURNER, EU_N_TURBINE, and EU_S_TURBINE). Dry ultra-low NOx burner (SoLoNOx) for the turbines is the pollution control device listed for this flexible group.

Condition I. of the emission limit table in FG-UTILITIES limits NOx to 63 tpy and CO to 66 tpy, both based upon a 12-month rolling time period ad determined at the end of each calendar month. According to DAS records from September 2015 through May 2017, NOx emissions ranged from 30.28 tpy in November 2016 to 33.99 tpy in May 2017 and CO emissions ranged from 28.25 tpy in May 2017 to 29.00 in July 2016.

Condition V. requires the facility to perform a performance test, at least once every (5) five years, to verify NOx and CO mass emissions and emission factors from each burner/turbine pairing in FG-UTILITIES (EU_N_BURNER/EU_N_TURBINE and EU_S_BURNER/EU_S_TURBINE), while firing in Supplemental Mode. Testing was performed the weeks of May 23rd and May 30th, 2016. The results of this testing were discussed earlier in this report.

NAME Nina L. McCann DATE 7/21/17 SUPERVISOR C. Hare