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

N741256362

FACILITY: Carbon Green Bioenergy		**SRN / ID:** N7412
LOCATION: 7795 Saddlebag Lake Rd, LAKE ODESSA		**DISTRICT:** Grand Rapids
CITY: LAKE ODESSA		**COUNTY:** BARRY
CONTACT: Dzenis Dzajic , EHS Manager		**ACTIVITY DATE:** 12/22/2020
STAFF: Eric Grinstern	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Off-Site Compliance Inspection		
RESOLVED COMPLAINTS:		

Carbon Green BioEnergy, LLC (SRN: N7412)

FACILITY DESCRIPTION

Carbon Green BioEnergy (CGB) is located in Barry County near the unincorporated community of Woodbury. CGB is a fuel-grade corn ethanol production facility. The facility is a dry mill operation permitted to produce up to 79.9 million gallons of denatured ethanol. In additional to ethanol, the facility produces distillers dried grains and solubles (DDGS) as a byproduct of ethanol production that is sold as livestock feed.

REGULATORY ANALYSIS

The facility has as an opt-out permit (No. 258-04G) that covers all permitted processes. The facility was initially issued air use permit No. 258-04 on May 2, 2005 and was called Superior Corn Products LLC. In June 2009, the facility was purchased by the current owners and renamed Carbon Green BioEnergy.

The facility has fuel storage tanks that are subject to NSPS Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels.

The facility's pumps, valves, etc. are subject to NSPS VV, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry.

Due to the COVID-19 pandemic, the facility significantly reduced ethanol fuel production and shifted plant recources to the manufaturing of ethanol based sanitizer from March 2020 through June 2020. The facility provided estimated emissions associated with the sanitizer production, which were accounted for within the appropriate emission units. The facility requested enforcement discrection at the begining of the COVID-19 pandemic due to concerns in maintaining the minimal CO2 scrubber water flow rate and minimum thermal oxidizer combustion temperature due to reduced production. The facility reported that the CO2 scrubber water flow was maintained at or above the 45 gpm minimum. The facility reported that there was one hour that the TO temperature averaged 1,330 degrees F, however the 3-hour low TO temperature was 1,353 degrees F and the daily averge was 1,363 degrees F. The required minimum TO temperature is 1,335 degrees F.

Stationary Source

CGB and the adjacent grain elevator, Woodbury Grain LLC, (WG) are considered to be a single stationary source for the purpose of air quality regulation. WG is considered a support facility to CGB because greater than 50% of the output or services provided by WG is dedicated to CGB. During the last inspection of WG, on-site staff stated that 100% of the storage capacity at WB is dedicated to CGB. Additionally, there is a contractural agreement that establishes a binding relationship between the two facilities.

NSPS Subpart DD

NSPS Subpart DD, Standards of Performance for Grain Elevators, applies to affected facilities at grain elevators. As part of the last inspeciton (2017) an applicability evaluation was conducted. The evaluation determined that neither CGB or WG were subject to Subpart DD, since neither CGB nor WG individually has a storage capacity of 2.5 million bushels. Staff is not aware of any modifications since the 2017 that would change the determination of that Subpart DD is not applicable at either facility.

The facility (CGB & WG) is one stationary source for NSR/PSD and Title V purposes; however, EPA has previously determined that NSPS regulations are different in regards to defining "stationary source". In summary EPA has provided guidance that co-location issues are not relevant to NSPS. (USEPA Applicability Determination Control Number: 1000049, Single Source Determination for Grain Elevators, September 17, 2010.) Therefore, NSPS applicability is based on each individual grain terminal or storage elevator.

COMPLIANCE EVALUATION

This was an off-site inspection due to COVID-19. Compliance records were requested and reviewed prior to a virtual plant tour. Off-site observations were made from the public roadway on November 10, 2020. A virtual inspection was conducted via Microsoft TEAMS on December 22, 2020. During the virtual inspection the facility was represented by Dzenis Dzajic, EHS Manager, Bill Bosch, Process Safety Engineer, and Ed Thomas, Plant Manager.

EUFIREPUMP

300 HP emergency firewater diesel pump

PROCESS/OPERATIONAL RESTRICTIONS

EUFIREPUMP is limited to operate no more than 500 hours per 12-month rolling time period.

MONITORING/RECORDKEEPING

The facility is required to maintain monthly and 12-month rolling records of hours of operation in order to demonstrate compliance with the 500 hours per 12-month time period limit.

> **CGB provided requested hours of operation records for December 2019 through November 2020. The facility recorded a total of 22.5 hours of operation over the 12 month period.**

EUDDGSCOOLER

DDGS cooling cyclone (centrifugal mechanical separator)

EMISSION LIMITS

Restricts the emissions of PM and PM10. Compliance with the emission limits is based on stack testing (PM10) and proper operation of the baghouse.

PROCESS/OPERATIONAL RESTRICTIONS

Requires a properly operated baghouse and operation according to a malfunction abatement plan (MAP).

The facility previously provided a current copy of the MAP, dated August 2016. The MAP contains the preventative maintenance conducted to assure proper operation of the baghouse. The MAP contains weekly PM for the baghouse.

TESTING/SAMPLING

PM10 testing required within 180 days of commencing trial operation.

Compliance testing was conducted in 2007, at which time PM10 emissions from the baghouse were 0.190 lbs. /hr. and 0.0015 lb. /1000 lbs. of exhaust gas. Compliance was demonstrated with the PM10 limit of 1.89 lbs. /hr. limit.

EUNH3STGTANK

Anhydrous ammonia storage tank.

The ammonia storage tank is still on-site, but has been disconnected and deinventoried.

The facility now uses urea instead of ammonia as an additive to the slurry tank.

FGCORNHAND

Corn receiving, storage, and handling

Emission Units: EUTRUCKPIT, EURAILPIT, EURECEIVINGCONV, EUCORNELEV1, EUCORNELEV2, EUCORNBIN1, EUCORNBIN2, EUSCALPER, EUSCALPINGBIN, EUGRINDINGBIN

EMISSION LIMITS

Restricts the emissions of PM and PM10. Compliance with the emission limits is based on stack testing (PM10) and proper operation of the baghouse.

DESIGN/EQUIPMENT PARAMETERS

Requires a properly operated baghouse and operation according to a malfunction abatement plan (MAP).

The facility previously provided a current copy of the MAP, dated August 2016. The MAP contains the preventative maintenance conducted to assure proper operation of the baghouse. The MAP contains weekly PM for the baghouse.

Observation of the baghouse showed no visible emissions.

TESTING/SAMPLING

PM10 testing required within 180 days of commencing trial operation.

Compliance testing was conducted in 2007, at which time PM10 emissions from the baghouse were 0.417 lbs. /hr. and 0.0025 lb. /1000 lbs. of exhaust gas. Compliance was demonstrated with the PM10 limit of 1.67 lbs. /hr. limit.

FGCORNMILL

Corn hammer milling and flour handling

Emission Units: EUHAMMERMILL1, EUHAMMERMILL2, EUFLOURELEVATOR, EUFLOURCONVEYOR

EMISSION LIMITS

Restricts the emissions of PM and PM10. Compliance with the emission limits is based on stack testing (PM10) and proper operation of the baghouse.

DESIGN/EQUIPMENT PARAMETERS

Requires a properly operated baghouse and operation according to a malfunction abatement plan (MAP).

The facility previously provided a current copy of the MAP, dated August 2016. The MAP contains the preventative maintenance conducted to assure proper operation of the baghouse. The MAP contains weekly PM for the baghouse.

Observation of the baghouse showed no visible emissions.

TESTING/SAMPLING

PM10 testing required within 180 days of commencing trial operation.

Compliance testing was conducted in 2007, at which time PM10 emissions from the baghouse were 0.101 lbs. /hr. and 0.0015 lb. /1000 lbs. of exhaust gas. Compliance was demonstrated with the PM10 limit of 1.5 lbs. /hr. limit.

FGFERMENTATION

Ethanol fermentation tanks and beer well

Emission Units: EUFERMENTER1, EUFERMENTER2, EUFERMENTER3, EUFERMENTER4, EUBEERWELL

EMISSION LIMITS

Restricts the emission of VOC and acetaldehyde. Compliance with the emission limits is based on stack testing, proper operation of the vent gas scrubber, and by maintaining process and emission records.

Review of the records for December 2019 through November 2020 supplied by the facility showed compliance with the VOC (10.1 lb. /hr.) and acetaldehyde (1.9 lb. /hr.) emission limits, each based on a monthly average The highest VOC emission rate was 0.9 lbs. /hr., while the highest acetaldehyde emission rate was 1.0 lbs. /hr., based on a monthly average.

DESIGN/EQUIPMENT PARAMETERS - RECORDKEEPING

Requires the installation and operation of a vent gas scrubber with a minimum liquid flow rate of 45 gallons per minute (daily average) and a sodium bisulfite addition rate of 1.5 gallons per hour (daily average).

The facility supplied requested records for November 2020. which showed compliance with the minimum flow rates. All days showed a flow rate average of 45 gpm or greater. Review of the sodium bisulfite addition rate showed a daily flow rate average of 4.1 gph or greater.

Obervation of the control panel during the inspection showed a liquid flow rate of 50.24 gpm and a sodium bisulfite addition rate of 4.63 gallons per hour.

TESTING/SAMPLING

VOC and Acetaldehyde testing required within 180 days of commencing trial operation.

Compliance testing was conducted in 2007, at which time VOC emissions from the scrubber were 1.93 lbs. /hr. and acetaldehyde emissions were 1.56 lbs. /hr. Both pollutants were below the permitted limits. Compliance testing was also conducted in 2010, demonstrating compliance with the emission limits for acetaldehyde and VOC.

FGDRYERSLIQHAND

Ethanol distillation and purification, mash preparation, and centrifuges

Emission Units: EUDDGSDRYER1, EUDDGSDRYER2, EUTO&HRB, EUBEERCOLUMN, EUSIDESTRIP, EURECTIFIER, EUMOLSIEVE1, EUMOLSIEVE2, EUMOLSIEVE3, EUCENTRIFUGE1, EUCENTRIFUGE2, EUCENTRIFUGE3, EUCENTRIFUGE4, EUMASHPREP

EMISSION LIMITS

Restricts the emission of PM, PM10, VOC, NOx, and CO (FGDRYERSLIQHAND) and NOx from EUTO&HRB. Compliance with the emission limits is based on stack testing, proper operation of the thermal oxidizer, operations of a CEMS for NOx (EUTO&HRB) and by maintaining process and emission records. The facility provided requested records for December 2019 through November 2020. Hourly emission rates are based on monthly records, prorated to an hourly rate.

PM Limit (0.019 lb/1000 pounds of exhaust gas) - verifiable via stack testing

PM10 Limit (4.9 lb/hr) - highest recorded hourly average - 0.82 lbs.

PM2.5 Limit (4.9 lb/hr) - highest recorded hourly average - 0.82 lbs.

VOC Limit (4.9 lb/hr) - highest recorded hourly average - 0.090 lbs.

NOx Limit (20.9 lb/hr) - highest recorded hourly average - 13.4 lbs.

NOx Limit (0.1 lb/MMBTU)(30 day rolling average) - The facility provided a CEMS report showing no NOx readings greating than 0.1 lb/MMBTU. Additionally, the facility has not reported an exceedance of the NOx limit in the quarterly CEMS reports for at least the previous two years of reports reviewed. Review of the CEMS records for December 2019 through November 2020 showed a recorded 30-day rolling average high of 0.070 lb/MMBTU.

CO Limit (20.4 lb/hr) - highest recorded hourly average - 4.5 lbs.

SO2 Limit (14.84 lb/hr) - highest recorded hourly average - 0.6 lbs.

MATERIAL LIMITS

Restricts fuel in EUDDGSDRYER1 & EUDDGSDRYER2 to sweet natural gas and biomethanator off-gas. Also restricts supplemental fuel to sweet natural gas in the thermal oxidizer.

Facility records document compliance with the fuel usage limits.

DESIGN/EQUIPMENT PARAMETERS

Requires the installation and operation of a thermal oxidizer (TO) to attain a minimum VOC destruction efficiency of 95%. The temperature has to be maintained at or above 90% of the average temperature to achieve a minimum 95% destruction efficiency. Also requires maintenance in accordance with the MAP. The facility has installed and is operating a TO. The facility tested and demonstrated a destruction efficiency of 99.83% in 2007. The facility previously provided a MAP that addresses the operation of the TO.

The established minimum operating temperature of the TO is 1335 degrees F.

The facility provided the requested TO temperature records for December 2019 through November 2020. All of the recorded temperature readings were above 1335 degrees F, with the daily averages all above 1470 degrees F. Review of the hourly averages showed no reading below 1460 degrees F. The facility did report that they had a single hour average temperature reading below 1335 degrees F that occured due to decreased production due to COVID-19. The single hour reading was 1330 degrees F. The facility previously requested enforcement discretion due to COVID-19.

At the time of the inspection, observation of the control panel showed a TO temperature of 1,509 degrees F.

TESTING/SAMPLING

PM10, VOC, NOx and CO testing required within 180 days of commencing trial operation.

Compliance testing was conducted in 2007, at which time compliance for each of the pollutant emission limits was verified.

MONITORING/RECORDKEEPING

Requires the operation of a temperature monitoring device for the TO.

The facility provided TO records documenting compliance.

Requires the operation of a continuous NOx monitoring device.

The facility has installed and is operating a NOx CEMS unit, for which records were provided.

At the time of the inspection, observation of the control panel showed a NOx emission reading of 64.85 ppm.

Requires daily, monthly and 12-month rolling time period records of fuel use and annual capacity factor for EUTO&HRB.

As requested the facility provided monthly and 12-month rolling time period records for for December 2019 through November 2020 as well as daily records for the month of November 2020. The records document fuel use and capacity factor data.

Requires daily records, pursuant to 40 CFR 60.49b, for EUTO&HRB.

The facility provided records requested pursuant to 40 CFR 60.49b requirements. The facility also submits semi-annual reports of NOx monitoring data.

The facility submits quarterly CEMS reports.

Requires monthly production records and other records necessary to demonstrate compliance with PM, NOx, VOC and CO emission limits.

The facilty provided requested records demonstrating compliace for the time period.

FGDDGSHAND

DDGS storage, handling, and loadout

Emission Units: EUDDGSSTGPILE, EUDDGSELEV, EUDDGSRAILCONVEY, EUDDGSRAILLOAD, EUDDGSTRUCKLOAD, EUDDGSSTGCONVEY

EMISSION LIMITS

Restricts the emissions of PM and PM10. Compliance with the emission limits is based on stack testing (PM10) and proper operation of the baghouse.

PROCESS/OPERATIONAL RESTRICTIONS

Requires a properly operated baghouse and operation according to a malfunction abatement plan (MAP).

The facility previosly provided a current copy of the MAP, dated August 2016. The MAP contains the preventative maintenance conducted to assure proper operation of the baghouse.

Observation of the baghouse showed no visible emissions.

TESTING/SAMPLING

PM10 testing required within 180 days of commencing trial operation.

Compliance testing was conducted in 2007, at which time PM10 emissions from the baghouse were 0.0190 lbs. /hr. and 0.0018 lb. /1000 lbs. of exhaust gas. Compliance was demonstrated with the PM10 limit of 0.32 lbs. /hr. limit.

FGNSPSTANKS

Storage tanks subject to NSPS Kb

Emission Units: EU190TANK, EUNATGASTANK, EUDENATTANK1, EUDENATTANK2, EUDENATTANK3, EUDENATTANK4, EU200TANK

PROCESS/OPERATIONAL RESTRICTIONS

Requires EUNATGSTANK to be equipped with a permanent submerged fill pipe.

The facility previously stated that the tank is equipped with submerged fill.

NSPS Kb compliance certification received on September 20, 2006 for all of the subject tanks, except the 30,000 gallon gasoline tank for which the certification was submitted on September 20, 2016.

DESIGN/EQUIPMENT PARAMETERS

Requires compliance with design requirements of NSPS Subpart Kb.

The facility previously stated that the tanks were designed and installed in accordance with the requirements of Subpart Kb. The facility monitors the tank levels though two methods, level tape and via pressure drop.

MONITORING/RECORDKEEPING

Requires compliance with inspection and monitoring requirements in accordance with NSPS Subpart Kb.

The facility conducts daily, weekly, monthly, annual, 5 year, and 10 year inspections.

The tanks are due for 5/10 year re-inspections as follows:

EU190TANK, EU200TANK:

5 year inspection was conducted on both tanks on September 5, 2018, 10 year inspection due 2023

EUDENATTANK1, DENATTANK2:

8308 Tank (south tank), 8309 Tank (north tank) - 5 year inspection conducted on September 5, 2018, 10 year inspection due 2023

EUDENATTANK3:

NSPS Kb notification received on January 19, 2012; the five year inspection was conducted on April 21, 2016.

EUDENATTANK4 – not installed

FGETHLOAD

Truck and rail ethanol loadout

The facility is currently shipping approximately 98% of the ethanol by truck. The facility conducts denature blending at the time the trucks are loaded.

DESIGN/EQUIPMENT PARAMETERS

Requires the operation of the ethanol loadout flare and maintenance of the flare according to the MAP.

> **During the inspection staff observed the flare temperature cirular recording chart. During operation the temperate varied between 1400 and 1600 degrees F. The temperature at the time of the inspection was 1527 degrees F.**
>
> **The MAP addresses the ethanol loadout flare.**

MONITORING/RECORDKEEPING

Requires records of monthly and 12-month rolling time period ethanol, and denaturant throughput.

> **The facility provided requested records of material throughput for December 2019 through November 2020. The records show 54,358,971 gallons of denatured ethanol shipped which includes 400,170 gallons of denaturant and 145,144 gallons of gasoline used.**

FGMETHANATORS

Biomethanator system.

Emission Units: EUMETHANATORFEED, EUMETHANATOR1, EUMETHANATOR2

EMISSION LIMITS

Restricts emissions from natural gas combustion in the flare to the following tpy limits listed below. The permit does not specifically require records to demonstrate compliance, however, the facility maintains records.

The facility provided records requested for December 2019 through November 2020.

- NOx limit: 1.0 tpy

- VOC limit: 0.8 tpy

- COlimit: 5.2 tpy

The facility records show a maximum of a few pounds of emissions for each pollutant for the reviewed time period, well under the limits.

DESIGN/EQUIPMENT PARAMETERS

Requires off-gases from FGMETHANATORS to be routed through either the dryers or methanator flare.

The facility stated that the off-gases are routed to the dryers, unless the TO is down or during startup/shutdown periods.

The MAP addresses the methanator flare.

FGNSPSVV

All pumps, valves, and pressure relief devices in light liquid and heavy liquid service; all

valves and pressure relief devices in gas/vapor service; each sampling connection; and

each open ended valve or line and all associated closed vent systems and control

devices.

The facility complies with NSPS VV via LDAR. The facility provides semiannual reports of LDAR monitoring.

Review of the LDAR reports showed that the facility appeared to be meeting the monitoring and recordkeeping requirements. No issues of concern were noted.

FGFACILITY

EMISSION LIMITS/Recordkeeping

Establishes facility-wide opt-out emission limits for NOx, VOC, CO and HAPs.

In January 2019, the facility started accounting for VOC emissions from 18 different process tanks that have low VOC potential from shaft seals and atmospheric vents. The facility reported 4.01 tons of emissions for the requested reporting period.

The facility provided requested records for December 2019 through November 2020.

12-month rolling limits

- NOx 12-month rolling average high: 53.44 tpy, limit: 95 tpy

- VOC 12-month rolling average high: 20.60 tpy, limit 98 tpy

- CO 12-month rolling average high: 21.05 tpy, limit: 98 tpy

- PM10 12-month rolling average high: 6.10 tpy, limit: 60 tpy

- PM2.5 12-month rolling average high: 6.10 tpy, limit: 60 tpy

- SO2 12-month rolling average high: 2.29 tpy, limit: 65 tpy

- HAP (individual) 12-month rolling average high: 3.75 tpy, limit: 10 tpy

- HAP (aggregate) 12-month rolling average high: 3.75 tpy, limit: 25 tpy

Note: The above emissions include emissions from WG.

MATERIAL LIMITS/Recordkeeping

Limits ethanol and denaturant throughputs.

The facility provided requested records for December 2019 through November 2020..

Summary, highest 12-month rolling:

- 56.1MM gallons of ethanol w/denaturant shipped, limit: 79.9MM gal.

- 2.06MM gallons of denaturant used, limit: 8.0MM gal

Note: denaturant inlcudes both denaturant and gasoline.

PROCESS/OPERATIONAL RESTRICTIONS

Requires the facility to submit and operate according to a malfunction abatement plan (MAP) and odor management plan.

The facility previously submitted an updated copy of the MAP and odor plan.

Requires all plant roadways to be paved.

All roadways are paved.

DESIGN/EQUIPMENT PARAMETERS

Requires signage for emergency contacts as well as fencing and warning signs to prevent unauthorized entry to the plant property.

Signage observed during pervious inspections.

CONCLUSION

Based on the information and observations made as part of this inspection, the facility appears to be in compliance with applicable air quality rules and regulations.

NAME Eric Grinstern DATE 12/23/2020 SUPERVISOR HH