

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

N699639074

| | | |
|---|-------------------------------|---------------------------|
| FACILITY: Michigan Ethanol d/b/a POET Biorefining - Caro | | SRN / ID: N6996 |
| LOCATION: 1551 Empire Drive, CARO | | DISTRICT: Saginaw Bay |
| CITY: CARO | | COUNTY: TUSCOLA |
| CONTACT: Emily Boynton , Plant Manager | | ACTIVITY DATE: 03/27/2017 |
| STAFF: Sydney Bruestle | COMPLIANCE STATUS: Compliance | SOURCE CLASS: MAJOR |
| SUBJECT: Scheduled inspection to determine compliance with MI-ROP-N6996-2013, PTI 175-15A, and all other applicable state and federal air quality regulations | | |
| RESOLVED COMPLAINTS: | | |

On March 27, 2017 I (Sydney Bruestle) conducted an onsite inspection of Michigan Ethanol, LLC Poet Biorefining located at 1551 Empire Drive, Caro Michigan. While onsite I met with Emily Boynton (Plant Manager), Charles Hauxwell (EH &S Specialist), and Jacob Mackowski (Plant Engineer) of Poet Biorefining.

Poet Biorefining produces Ethanol for fuel. Processes onsite are continuous. The facility receives corn by rail and truck. The corn is stored in silos or a flat bed area. The corn is milled into flour (by one of 5 hammer mills) and conveyed to a slurry tank where water is added. Yeast is added to the slurry and the mixture is fermented for several days. After fermentation solids are separated (via centrifuge) and the mixture is distilled several times to produce ethanol. Denaturant is added to the ethanol and the final product is stored onsite before distribution.

Ms. Boynton and Mr. Hauxwell were able to provide me with all emission records required by MI-ROP-N6996-2013 and PTI 175-15A. The records reviewed are highlighted below.

| | Emission Limits | Reporting Requirements |
|--------------------------|---|---|
| FG-FACILITY | HAPs Less than 12 TPY Combined HAPs Less than 25 TPY | Semiannual Deviations Report March 15 and Sept 15 Annual Certification of Compliance Vva Semiannual Reports |
| Records Received/Checked | Feb 2017: Aggregate HAPs: 1.2 tpy February 2017: Acetaldehyde: 0.31 tpy Formaldehyde: 0.23 tpy Methanol: 0.29 tpy Acrolein: 0.43 tpy | In Compliance |

FB-COOLER: Fluidized Bed cooler

Pollution Control: Fabric Filter Collector (CE008)

| | Emission Limits | Reporting Requirements |
|--------------------------|--|--|
| EU-FBCOOLER | PM10 0.43 lb/hr PM2.5 0.07 lb/hr VOC 6.6 lb/hr | Semiannual Reporting/ Annual Certification |
| Records Received/Checked | VOC: 0.92 tpy (February 2017) | In Compliance |

Pollution Control: Fabric Filter Collector (F-849 and F-620)

| EU-DDGSSILO | Emission Limits | Reporting Requirements |
|---------------------------------|---|---|
| | <i>PM10 0.013 lbPM per 1000 lb of exhaust gases</i> | <i>Semiannual Reporting/ Annual Certification</i> |
| <i>Records Received/Checked</i> | In Compliance | |

EU-INHIBITTANK: Storage tank for corrosion inhibitor

| EU-INHIBITTANKS | Emission Limits | Reporting Requirements |
|---------------------------------|-----------------|---|
| | <i>NA</i> | <i>Semiannual Reporting/ Annual Certification</i> |
| <i>Records Received/Checked</i> | In Compliance | |

EU-BOILER: Natural Gas ONLY

| EU-BOILER (Natural Gas Only) | Emission Limits | Reporting Requirements |
|---------------------------------|---|--|
| | <i>PM10 7.6 lb/MMft3 natural gas consumed</i> | <i>Semiannual Reporting/ Annual Certification</i> <i>Reporting Dc</i> |
| <i>Records Received/Checked</i> | In Compliance | |

FG-CORN-DDGS: Corn and DDGS handling area

Pollution Control: Fabric Filter (CE001)

| FG- CORN-DDGS | Emission Limits | Record Keeping Requirements |
|---------------------------------|---|---|
| | <i>PM10 0.0040 lbPM10 per 1000 lb exhaust gases</i> | <i>Keep Records for hrs of operation EUCornelev daily</i> |
| <i>Records Received/Checked</i> | In Compliance | |

FG-SCALP: Scalper unit

Pollution Control: Fabric Filter Collector (CE002)

| FG SCALP | Emission Limits | Reporting Requirements |
|----------|-----------------|------------------------|
| | | |

| | | |
|---------------------------------|---|---|
| | <i>PM10 0.010 PM10 per 1000 lb of exhaust gases</i> | <i>Semiannual Reporting/ Annual Certification</i> |
| <i>Records Received/Checked</i> | <i>In Compliance</i> | |

FG-FLOUR: Milling area. Includes Hammer Mills 1-5 and corn and flour elevators

Pollution Control: 5 bag houses, one for each hammer mill

| | | |
|---------------------------------|--|---|
| FG Flour | Emission Limits | Reporting Requirements |
| | <i>PM10 0.22lbs/hr PM2.5 0.04 lbs/hr</i> | <i>Semiannual Reporting/ Annual Certification</i> |
| <i>Records Received/Checked</i> | <i>In compliance, testing is up to date.</i> | |

FG- FER&DIST: Fermentation and distillation processes

Pollution Control: Packed-bed wet scrubber

| | Emission Limits | Record Keeping Requirements | Testing Requirements |
|---------------------------------|--|--|--|
| FG FER&DIST | <i>(vent through scrubber) VOC 16.6 lb/hr (vent through RTO) VOC 28.0 lb/hr Acetaldehyde 0.80 lb/hr</i> | <i>Wet Scrubber Flow Rate/Exhaust Temp Continuously and Daily Wet Scrubber Pressure Drop Daily</i> | <i>Verify Acetaldehyde and VOC emissions by testing on or before 6 mo if ROP expiration date</i> |
| <i>Records Received/Checked</i> | <i>In compliance</i> | | |

FG-DDGS DRYERS: Dried Distillate Grains with solubles (DDGS) dryers and centrifugation. (two dryers, thermal oxidizer, regenerative thermal oxidizer, six centrifuges)

Pollution Control: Multiclone dust collector (CE006 & CE007), Thermal Oxidizer (TO) (CE010), and Regenerative Thermal Oxidizer (RTO) (CE012).

| | Emission Limits | Record Keeping Requirements | Testing Requirements |
|-----------------------|---|---|---|
| FG DDGS DRYERS | <i>PM 3.75 lbs/hr PM10 3.75 lbs/hr PM2.5 3.75 lbs/hr VOC 6.3 lb/hr combined for the FGDDGS DRYERS VOC 2.0 lb/hr combined EUCENTRIGUGE NOx 0.10 lb/MMBtu</i> | <i>Continuously monitor temp exhaust gases from dryers are exposed in the TO Continuously monitor temp exhaust gases from the dryers are exposed to in the RTO Continuously monitor the pressure drop across the dust collector Keep Monthly production records, monthly records of ethanol content of distillation bottoms Keep monthly wet cake production records Records of natural gas consumption</i> | <i>Testing to verify PM10, VOC, and NOx emission rates on or before six months of the ROP expiration date</i> |

| | | | |
|---------------------------------|---|---------------|--|
| | | daily | |
| <i>Records Received/Checked</i> | February 2017: VOC Emission rate 0.93 lb/hr(Combined for FGDDGSDRYERS) EUCENTRIFUGE: VOC emission rate 0.4 lbs/hr | In Compliance | |

FG-ETHLOAD: Ethanol truck and rail load out.

Pollution Control: Thermal Oxidizer CE010 for truck load out

| | Material Limits | Record Keeping Requirements |
|---------------------------------|---|---|
| FG-ETHLOAD | <p><i>Throughput not to exceed:</i> 5,000,000 gallons per year of natural gasoline 65,000,000 gallons per year of denaturd ethanol 77,400,000 gallons per year of combined denatured ethanol and denaturant total of 5,000,000 gallons per 12 mo rolling time period of denatured ethanol when TO is not controlling displaced Vapor and when transferring from EURAILROAD2 to recieving railcars</p> | <p><i>Monthly records of: Throughput of denaturant and or denatured ethanol for FGETHLOAD Throughput of denatured ethanol for EUTRUCKLOAD3 and EUTRUCKLOAD4 combined with dispaced vapor contents Throughput of denatured ethanol for EURAILROAD2 to receiving railcars Total of throughputs recorded Railcars receiving material through EURAILROAD2 each month and which railcars are certified</i></p> |
| <i>Records Received/Checked</i> | In Compliance | |

FG-NSPSTANKS/ FGETHANOLTANKS: It appears the facility is in compliance with 40 CFR Part 60 Subpart VVa and 40 CFR Part 60 Subpart Kb. They were able to provide me with LDAR detection records for all pumps and valves and tank inspection records for T-802 and T-805.

The facility operates under a CAM plan for FG-FERM&DIST and FG-DDGSDRYERS and a Malfunction Abatement Plan (MAP) for the bag houses and fabric filter collectors onsite. The records reviewed onsite showed compliance with the parameters established in each plan. Below are the values recorded live

onsite:

| Baghouse Number | Pressure Drop Indicator Range | Observed Range |
|---|-------------------------------|----------------------|
| <i>F-829 Corn Leg Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>4.6 in H2O</i> |
| <i>F-840 Scalper Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>3.4 in H2O</i> |
| <i>F-682 Fluid Bed Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>0.6 in H2O</i> |
| <i>F-849/F-620 DDG Silo Baghouse/Flat Storage</i> | <i>0.3-6.0 in H2O</i> | <i>not operating</i> |
| <i>F-110 Hammermill Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>Not operating</i> |
| <i>F-111 Hammermill Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>0.6 in H2O</i> |
| <i>F-112 Hammermill Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>3.3 in H2O</i> |
| <i>F-113 Hammermill Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>0.6 in H2O</i> |
| <i>F-114 Hammermill Baghouse</i> | <i>0.3-6.0 in H2O</i> | <i>0.6 in H2O</i> |

| Wet Scrubber | Inlet Flow Rate Range Water (Normal Operation) | Inlet Flow Rate Range Water after 36-hr shut down | Inlet Flow Rate Range SBS (Normal Operation) | Inlet Flow Rate Range SBS after 36-hr shut down | Pressure Drop Range | Scrubber Exhaust Temp Range |
|---------------------------|--|---|--|---|-------------------------------|-------------------------------|
| <i>T-316 Wet Scrubber</i> | <i>30 Gallons per Min</i> | <i>15 Gallons per Min</i> | <i>20 Gallons per day</i> | <i>SBS can be shut off</i> | <i>less than 15 in of H2O</i> | <i>less than 65 degrees F</i> |
| <i>Observed Range</i> | <i>61 gal per min</i> | <i>61 gallons/min</i> | <i>26 gallons/24 hours</i> | <i>ok</i> | <i>1.7 in H2O</i> | <i>56.7 Degrees F</i> |

| Chamber Temp | Chamber | Acceptable Beer | Acceptable |
|--------------|---------|-----------------|------------|
| | | | |

| T.O.-701 Thermal Oxidizer | Minimum Dryers up/not fed | Temp Minimum Dryers Fed | Stripper Bottom ethanol Percentage | Combustion Air/ Fuel Ratio |
|---------------------------------|---------------------------------|-------------------------------|---|-------------------------------|
| | <i>800 Degrees F</i> | <i>1500 Degrees F</i> | <i>Less than 0.01%</i> | <i>Greater than 5.0</i> |
| Observed Value | NA | 1531 | Test once a week .001% | 5.55 |

| K-675 Regenerative Thermal Oxidizer | Chamber 3-hr Temp Minimum | Exhaust Temp Minimum | Acceptable Beer Stripper Bottom ethanol Percentage |
|--|---------------------------------|--|---|
| | <i>1650 Degrees F</i> | <i>at least 50 degrees F greater than inlet temp</i> | <i>Less than 0.01%</i> |
| Observed Value | 1670 | 292 | 0.0005 |

At the time of my inspection is appeared Poet Biorefining was in compliance with MI-ROP-N6996-2013, PT1175-15A, and all other applicable state and federal air quality regulations.

NAME *Sybil B...*

DATE *4/11/17*

SUPERVISOR *Chris Hale*