
# *Malfunction Abatement Plan*

Approved 11/22/23

All equipment used for control of air emissions will be operated and maintained to the extent reasonably possible to prevent, detect and correct any malfunctions, or failures, that could result in emissions exceeding any applicable emission limitations. POET Biorefining-Caro is responsible for preparing and maintaining a preventative maintenance program for control equipment. Preventative maintenance schedules have been established for each piece of control equipment based on manufacturer's recommendations, permit requirements, testing, and facility or organizational operating experience. All POET Biorefining-Caro inspections, maintenance, and repairs will be completed by qualified operators, mechanics, contractors, or consultants.

**MAP Emission Control Equipment List**

| CAR Tag Number | Control Equipment Tag Number | Description | P&ID | Page |
|---|---|---|---|---|
| F-829 | CE001 | Corn Leg Baghouse | PID-801 | 2 |
| F-840 | CE002 | Scalper Baghouse | PID-100 | 3 |
| T-316 | CE004 | Wet Scrubber | PID-316 | 4-5 |
| T-326 | CE014 | Wet Scrubber | PID-326 | 6-7 |
| F-682 | CE008 | Fluid Bed Baghouse | PID-630 | 8 |
| F-849/F-620 | CE009 | DDG Silo Baghouse/ Flat Storage | PID-806 | 9 |
| T.O.-701 | CE010 | Thermal Oxidizer (TO) | PID-680 | 10-11 |
| K-675 | CE012 | Regenerative Thermal Oxidizer (RTO) | PID-681 | 12 |
| F-110 | NA | Hammer-mill-1 Baghouse | PID-101 | 13 |
| F-111 | NA | Hammer-mill-2 Baghouse | PID-101 | 14 |
| F-112 | NA | Hammer-mill-3 Baghouse | PID-101 | 15 |
| F-113 | NA | Hammer-mill-4 Baghouse | PID-101 | 16 |
| F-114 | NA | Hammer-mill-5 Baghouse | PID-102 | 17 |
| T-801 | NA | Low Proof Floating Roof | PID-850 | 18 |
| T-802 | NA | Denaturant Tank Floating Roof | PID-851 | 19 |
| T-803 | NA | Storage Tank Floating Roof | PID-852 | 20 |
| T-804 | NA | Storage Tank Floating Roof | PID-852 | 21 |
| T-805 | NA | Denaturant Tank Floating Roof | PID-851 | 22 |

## F-829 Corn Leg Baghouse

**Purpose**

This unit contains particulate emissions coming from the Corn Elevator system. If the baghouse is not operating then corn receiving and DDG Load-out is not permitted. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT829-1 is monitoring pressure drop across F-829.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annual**

- Check the filter bags for signs of excessive wear or damage.
- Drain condensation from air reservoir and check the compressed air dryer and filter for proper operation.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of H2O (PDT829-1/PDI829-1)

**Corrective Actions**

- If visible emissions are observed, IMMEDIATELY stop flow into and internally inspect
- If the 3-hour average dP is outside the normal operating conditions:
  - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
  - Verify PDT against local PDI to determine whether readings are accurate.
    - If pressure readings are not accurate then repair/ replace pressure instrument and perform monthly local PDI readings as back-up verification.
    - If pressure readings are accurate:
      - Verify the condition/operation of the blower belts
      - Check amps on the motor
      - Verify that the air purge is active and hopper is dumping
      - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement PDT dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-840 Scalper Baghouse

**Purpose**

This unit contains particulate emissions coming from the scalper and the corn surge bin. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT840-1 is monitoring pressure drop across F-840.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annual**

- Check the filter bags for signs of excessive wear or damage.
- Drain condensation from air reservoir and check the compressed air dryer and filter for proper operation.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 "$H_2O$ (PDT840-1/PDI840-1)

**Corrective Actions**

- If visible emissions are observed then stop flow into and internally inspect
- If the3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform monthly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## T-316 Wet Scrubber

**Purpose**

This packed bed scrubber minimizes ethanol loss and reduces VOC emissions. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor and maintain inlet flow-rate of scrubber water during normal operations and for 36-hours minimum following a shut down.
- Monitor scrubber exhaust temperature
- Monitor dP across scrubber PDT316-1/PDT316-2

**Annually**

- Internal visual inspection of the scrubber's packing and overall condition

**Normal Operating Conditions (Based on Compliance Testing and engineering calculations)**

- 3 hr water flow rate (FT316-1) averages 25-GPM with mash flow online, and for at least 36-hours with mash flow off. This rate was established during performance testing in January 2023. After 36-hours of mash flow OFF—a 15-GPM average rate is acceptable.
- Maintain a minimum flow rate of 22 GPD rate of sodium bisulfite (SBS) to the scrubber, and for at least 36-hours with mash flow off. This rate was established during performance testing in January 2023. After 36-hours of mash flow OFF—SBS can be shut-off.
- Combined 3-hour average dP is less than 9 in of $H_2O$ (PDT316-1 + PDT316-2)
- Scrubber temperature (TT316-1) 3-hour average less than 65°F. The chiller may be started/ stopped based on scrubber exhaust temperature.
- After Slurry is off (extended shutdowns) the POET CAR Scrubber Emissions Estimator will be used to determine when the VOC emissions are below the current threshold limit of 19.66 lbs/hr. When the emissions are below, the water to the scrubber can be turned off.

**Corrective Actions**

- If 3 hr water flow averages less than expected flow rate
  - Verify all water valves are in their correct positions toward scrubber
  - Verify that the flow transmitter is working correctly
- If the 3 hr average dP is outside the normal range
  - If average pressure readings are not accurate then repair/ replace pressure instrument
  - If average pressure readings are accurate then shut down and CIP scrubber to clean internals.
- If 3hr average scrubber temp is higher than normal temperature
  - Verify temperature gauge is working properly
  - Verify H-316 is being utilized with optimum recirculation flow
  - Verify H-317 is not being bypassed
  - Verify water chiller is online
  - If possible, reduce set-point on chiller unit to bring water temp down
- If average high ambient (summer) temperatures are the cause of deviation
  - Try to reduce cooling tower temperature
  - Increase cooling water flow-rate to the plant
  - Check the cooling tower blow down temperature, and bypass T-930 going to the slurry tank
  - Increase fresh water flow up to 65-gpm
  - Optimize Total Water Recovery flow-rate from T-930

**Critical Replacement Parts**

- Replacement dP transmitters/ gauges, Flow Transmitter for water, Temperature Transmitter assembly for exhaust

**Recordkeeping**

- Daily and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process

## T-326 Wet Scrubber

**Purpose**

This packed bed scrubber minimizes ethanol loss and reduces VOC emissions. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor and maintain inlet flow-rate of scrubber water during normal operations and for 36-hours minimum following a shut down.
- Monitor scrubber exhaust temperature
- Monitor dP across scrubber PDT326-1/PDT326-2

**Annually**

- Internal visual inspection of the scrubber's packing and overall condition

**Normal Operating Conditions (Based on Compliance Testing and engineering calculations)**

- 3 hr water flow rate (FT940-1) averages 45-GPM with mash flow online, and for at least 36-hours with mash flow off. This rate was established during performance testing in April 2023. After 36-hours of mash flow OFF—a 23-GPM average rate is acceptable.
- Maintain a minimum flow rate of 22 GPD rate of sodium bisulfite (SBS) to the scrubber, and for at least 36-hours with mash flow off. After 36-hours of mash flow OFF—SBS can be shut-off.
- Combined 3-hour average dP is less than 9 in of $H_2O$ (PT326-X-CAL).
- Scrubber temperature (TT326-1) 3-hour average less than 65°F. The chiller may be started/ stopped based on scrubber exhaust temperature.
- After Slurry is off (extended shutdowns) the POET CAR Scrubber Emissions Estimator will be used to determine when the VOC emissions are below the current threshold limit of 19.66 lbs/hr. When the emissions are below, the water to the scrubber can be turned off.

**Corrective Actions**

- If 3 hr water flow averages less than expected flow rate
  - Verify all water valves are in their correct positions toward scrubber
  - Verify that the flow transmitter is working correctly
- If the 3 hr average dP is outside the normal range
  - If average pressure readings are <u>not</u> accurate then repair/ replace pressure instrument
  - If average pressure readings are accurate then shut down and CIP scrubber to clean internals.
- If 3hr average scrubber temp is higher than normal temperature
  - Verify temperature gauge is working properly
  - Verify H-326 is being utilized with optimum recirculation flow
  - Verify H-327 is not being bypassed
  - Verify water chiller is online
  - If possible, reduce set-point on chiller unit to bring water temp down
- If average high ambient (summer) temperatures are the cause of deviation
  - Try to reduce cooling tower temperature
  - Increase cooling water flow-rate to the plant
  - Check the cooling tower blow down temperature, and bypass T-930 going to the slurry tank
  - Increase fresh water flow up to 65-gpm
  - Optimize Total Water Recovery flow-rate from T-930

**Critical Replacement Parts**

- Replacement dP transmitters/ gauges, Flow Transmitter for water, Temperature Transmitter assembly for exhaust

**Recordkeeping**

- Daily and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-682 Fluid Bed Baghouse

**Purpose**

This unit recovers DDG product and reduces particulate emissions coming from the fluid bed. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT682-1 is monitoring pressure drop across F-682.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Drain condensation from air reservoir and check the compressed air dryer and filter for proper operation.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of $H_2O$ (PDT682-1/PDI682-1)

**Corrective Actions**

- If visible emissions are observed then stop flow into the fluid bed baghouse and internally inspect
- If the 3-hour average dP is outside the normal range
  - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
  - Verify PDT against local PDI to determine whether readings are accurate.
    - If pressure readings are not accurate then repair/ replace pressure instrument and perform monthly local PDI readings as back-up verification.
    - If pressure readings are accurate:
      - Verify the condition/operation of the blower belts
      - Check amps on the motor
      - Verify that the air purge is active and hopper is dumping
      - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring are tracked by this method.

## F-849/F-620 DDG Silo Baghouse/ Flat Storage

**Purpose**

This unit recovers DDG product and reduces particulate emissions coming from the DDG Silo. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT849-1/PDT620-1 is monitoring pressure drop.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Drain condensation from air reservoir and check the compressed air dryer and filter for proper operation.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of $H_2O$ (PDT849-1/PDI849-1 or PDT620-1/PDI620-1)

**Corrective Actions**

- If visible emissions are observed then stop flow into the DDG Silo baghouse and internally inspect
- If the 3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform monthly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, monthly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring are tracked by this method.
- Monthly records of dP readings will be kept in the Scale Building or with EHS files.

## T.O.- 701 Thermal Oxidizer (TO)

**Purpose**

This unit reduces particulate and VOC emissions from dryers. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor the TO chamber temperature (TT-850-4)

**Daily**

- Check combustion chamber for leaks that may cause air infiltration
- Monitor actual Air/ Fuel ratio to target (RA704-1-CAL)
- Verify Beer Stripper bottoms ethanol% is acceptable
- Check the combustion chamber for hot-spots
- Observe flame zone for irregularities; including stability, centering, and flame length

**Semi/ Annual**

- Remove the gas gun assembly and clean the gas orifices
- Verify Chamber temperature transmitter (DH12-T4) is reading correctly
- Inspect refractory within the TO and throat cone for badly cracked or broken refractory

**Normal Operating Conditions**

- Chamber 3-hr average temperature > 800°F (TT850-4-CAL2) with dryer/s up, NOT fed
- 45-minute timer to safely increase chamber temp from 800°F to 1454°F once dryers are fed
- Chamber 3-hr average temperature > 1454°F (TT850-4-CAL2) with dryer/s fed beyond 45-minutes. This rate was established during performance testing in January 2023.
- Beer Stripper Ethanol Bottoms average less than 1%
- Combustion Air/ Fuel ratio greater than 5.0 (RA704-1-CAL) during steady state

**Corrective Actions**

- If 3-hr average temp is not > 1454°F but is > 800°F then shut-off dryer feeds
- If 3-hr average temp is not >800°F shut down dryers
- If 3-hr average Chamber temperature approaches 1454°F (TT850-4-CAL2)
  - If possible, adjust larger percent of flow to RTO, and/ or increase TO set-point Temperature
  - Begin Slip-streaming to reduce load on TO
  - Verify the fresh air and bypass dampers are closed and there are no air leaks on system
  - Verify temperature is accurate through PLC or alternative thermo-readings
  - Consider adjusting centrifugation to further reduce moisture to the dryers
  - Verify inlet duct pressure, fan speed, gas and air flow have not changed
- If Air/ Fuel ratio is less than 5.0
  - Verify Combustion air damper is controlling properly
  - Verify Gas valve is controlling properly
- If Beer Stripper bottoms ethanol % is out of spec
  - Redirect to Beer Well until issues are resolved

**Critical Replacement Parts**

- Natural gas flow valve, Combustion Air and Fresh Air Damper actuator, Burner Sight Glass, (2) 24" Inconel Thermocouple, UV Scanner and amplifier, Flame Safe Guard Controller, (2) Burner, Ignition Rod

**Recordkeeping**

- Three-hour average temperatures will be tracked through PI, or operator round/ logsthat will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring are tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## K-675 Regenerative Thermal Oxidizer (RTO)

**Purpose**

This unit reduces particulate and VOC emissions coming from dryers. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor the RTO combustion chamber temperature (DH20-TT675-4)
- Monitor that the inlet and outlet dampers are cycling properly when unit is fed

**Daily**

- Visually inspect combustion chamber for visible leaks
- Check the combustion chamber for external hot-spots
- Verify Beer Stripper bottoms ethanol% is acceptable

**Annual**

- Internal inspection of the RTO including brick and insulation

**Normal Operating Conditions**

- Combustion chamber has a 3-hour temperature of at least 1637°F (TT675-4-CAL2). This rate was established during performance testing in January 2023
- Beer Stripper Ethanol Bottoms less than 1%

**Corrective Actions**

- If 3-hr average temp is not > 1637°F, place the RTO into Standby
- If 3-hr average combustion chamber temperature approaches 1645°F (TT675-4-CAL2)
  - Reduce inlet duct pressure set-point (SP), increase RTO temperature SP while maintaining a minimum acceptable temperature on the TO
  - Verify amps on the process fan are 50-75% of full load amps
  - Consider adjusting centrifugation to further reduce moisture to the dryers
  - Verify inlet duct pressure, gas flow, and air flow have not shifted
- If Beer Stripper bottoms ethanol % is out of spec
  - Redirect to Beer Well until issues are resolved

**Critical Replacement Parts**

- Spark electrode, Inlet diverter, exhaust diverter actuator, Pressure switch, Air filter element, Type J D17 Thermocouple (12" & 24"), Type "K" Thermocouple, Flame detector

**Recordkeeping**

- Three-hour average temperatures will be tracked through PI, or operator round/ logs that will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-110 Hammermill Baghouse

**Purpose**

This unit recovers corn flour and reduces particulate emissions coming from the hammermill. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION o our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT110-1 is monitoring pressure drop across F-110.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of H2O (PDT110-1/PDI110-1)

**Corrective Actions**

- If visible emissions are observed then shut down the unit and internally inspect
- If the 3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform weekly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained bythe Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-111 Hammermill Baghouse

**Purpose**

This unit recovers corn flour and reduces particulate emissions coming from the hammermill. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION o our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT111-1 is monitoring pressure drop across F-111.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of $H_2O$ (PDT111-1/PDI111-1)

**Corrective Actions**

- If visible emissions are observed then shut down the unit and internally inspect
- If the 3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform weekly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained bythe Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-112 Hammermill Baghouse

**Purpose**

This unit recovers corn flour and reduces particulate emissions coming from the hammermill. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION o our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT112-1 is monitoring pressure drop across F-112.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of $H_2O$ (PDT112-1/PDI112-1)

**Corrective Actions**

- If visible emissions are observed then shut down the unit and internally inspect
- If the 3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform weekly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained bythe Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-113 Hammermill Baghouse

**Purpose**

This unit recovers corn flour and reduces particulate emissions coming from the hammermill. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION o our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- During days of operation, PDT113-1 is monitoring pressure drop across F-113.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of $H_2O$ (PDT113-1/PDI113-1)

**Corrective Actions**

- If visible emissions are observed then shut down the unit and internally inspect
- If the 3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform weekly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained bythe Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## F-114 Hammermill Baghouse

**Purpose**

This unit recovers corn flour and reduces particulate emissions coming from the hammermill. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION o our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures Continuous**

- During days of operation, PDT113-1 is monitoring pressure drop across F-113.
- Monitoring that the blower is running.

**Daily**

- During days of operation, observe the baghouse stack for **any** visible fugitive emissions.

**Annually**

- Check the filter bags for signs of excessive wear or damage.
- Check for evidence of moisture or dust buildup inside the filter housing.

**Normal Operating Conditions**

- No Visible Emissions
- 3-hour average dP is 0.3 to 6.0 in of H2O (PDT113-1/PDI113-1)

**Corrective Actions**

- If visible emissions are observed then shut down the unit and internally inspect
- If the 3-hour average dP is outside the normal range
    - Note that new bags, or recently blown-out bags, may show dP values < 0.3" h2o for a few days until filter cake is established on bag/s.
    - Verify PDT against local PDI to determine whether readings are accurate.
        - If pressure readings are not accurate then repair/ replace pressure instrument and perform weekly local PDI readings as back-up verification.
        - If pressure readings are accurate:
            - Verify the condition/operation of the blower belts
            - Check amps on the motor
            - Verify that the air purge is active and hopper is dumping
            - When practicable, safely shut down operations related to this baghouse, and inspect/ repair. Until shutdown, verify no visible emissions at least once per shift.

**Critical Replacement Parts**

- Replacement filter bags, Replacement dP gauges

**Recordkeeping**

- Daily, weekly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## T-801 Low Proof Tank and Floating Roof

**Purpose**

This storage tank holds low-proof ethanol awaiting conversion into 200-proof. The floating roof reduces VOCs. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor level to verify floating roof is within its proper floating range.

**Monthly**

- Perform visual inspection of floating roof to verify seals are working properly.

**Annual**

- Internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover.

**10- Year**

- Internally inspect the tank and floating roof looking at flooring & wall thickness, pontoons, lower legs, and pontoons following API and NSPS guidelines.

**Normal Operating Conditions**

- Level range is between 25,067-gallons (13.9%) and 180,486-gallons (100%)

**Corrective Actions**

- If level is out of range
  - Stop all transfers into tank
  - Verify the level transmitter is reading accurately
  - Verify by stick test that the floating roof is working correctly
- If floating roof gets stuck above liquid level
  - Conduct an internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover
  - Verify vacuum break on tank is working properly
- If floating roof becomes submerged
  - Stop all transfers into the tank
  - Empty contents of tank to "land" the roof. Follow recommendations provided in vendor's operating manual.
  - Drain any residual liquid lying on the floating roof into the tank
  - Empty and prep tank for underside inspection of floating roof

**Critical Replacement Parts**

- Vacuum Break

## T-802 Denaturant Tank Floating Roof

**Purpose**

This unit reduces VOC emissions coming from T-802. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor level to verify floating roof is within its proper floating range.

**Monthly**

- Perform visual inspection of floating roof to verify seals are working properly.

**Annual**

- Internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover.

**10-Year**

- Internally inspect the tank and floating roof looking at flooring & wall thickness, pontoons, lower legs, and pontoons following API and NSPS guidelines.

**Normal Operating Conditions**

- Level range is between 25,067-gallons (13.9%) and 180,486-gallons (100%)

**Corrective Actions**

- If level is out of range
  - Stop all transfers into tank
  - Verify the level transmitter is reading accurately
  - Verify by stick test that the floating roof is working correctly
- If floating roof gets stuck above liquid level
  - Conduct an internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover
  - Verify vacuum break on tank is working properly
- If floating roof becomes submerged
  - Stop all transfers into the tank
  - Empty contents of tank to "land" the roof. Follow recommendations provided in vendor's operating manual.
  - Drain any residual liquid lying on the floating roof into the tank
  - Empty and prep tank for underside inspection of floating roof

**Critical Replacement Parts**

- Vacuum Break

## T-803 Storage Tank and Floating Roof

**Purpose**

This storage tank holds 200-proof undenatured ethanol product. The floating roof reduces VOCs. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor level to verify floating roof is within its proper floating range.

**Monthly**

- Perform visual inspection of floating roof to verify seals are working properly.

**Annual**

- Internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover.

**10- Year**

- Internally inspect the tank and floating roof looking at flooring & wall thickness, pontoons, lower legs, and pontoons following API and NSPS guidelines.

**Normal Operating Conditions**

- Level range is between 86,365-gallons (8.9%) and 972,931-gallons (100%)

**Corrective Actions**

- If level is out of range
  - Stop all transfers into tank
  - Verify the level transmitter is reading accurately
  - Verify by stick test that the floating roof is working correctly
- If floating roof gets stuck above liquid level
  - Conduct an internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover
  - Verify vacuum break on tank is working properly
- If floating roof becomes submerged
  - Stop all transfers into the tank
  - Empty contents of tank to "land" the roof. Follow recommendations provided in vendor's operating manual.
  - Drain any residual liquid lying on the floating roof into the tank
  - Empty and prep tank for underside inspection of floating roof

**Critical Replacement Parts**

- Vacuum Break

## T-804 Storage Tank and Floating Roof

**Purpose**

This storage tank holds 200-proof undenatured ethanol product. The floating roof reduces VOCs. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor level to verify floating roof is within its proper floating range.

**Monthly**

- Perform visual inspection of floating roof to verify seals are working properly.

**Annual**

- Internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover.

**10-Year**

- Internally inspect the tank and floating roof looking at flooring & wall thickness, pontoons, lower legs, and pontoons following API and NSPS guidelines.

**Normal Operating Conditions**

- Level range is between 86,365-gallons (8.9%) and 972,931-gallons (100%)

**Corrective Actions**

- If level is out of range
  - Stop all transfers into tank
  - Verify the level transmitter is reading accurately
  - Verify by stick test that the floating roof is working correctly
- If floating roof gets stuck above liquid level
  - Conduct an internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover
  - Verify vacuum break on tank is working properly
- If floating roof becomes submerged
  - Stop all transfers into the tank
  - Empty contents of tank to "land" the roof. Follow recommendations provided in vendor's operating manual.
  - Drain any residual liquid lying on the floating roof into the tank
  - Empty and prep tank for underside inspection of floating roof

**Critical Replacement Parts**

- Vacuum Break

**Recordkeeping**

- Daily, monthly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.

## T-805 Denaturant Tank Floating Roof

**Purpose**

This unit reduces VOC emissions coming from T-805. If this emission unit is not working or maintained properly, operating this piece of equipment is a VIOLATION of our air permit.

**Frequency of Monitoring and Preventative Maintenance Measures**

**Continuous**

- Monitor level to verify floating roof is within its proper floating range.

**Monthly**

- Perform visual inspection of floating roof to verify seals are working properly.

**Annual**

- Internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover.

**10-Year**

- Internally inspect the tank and floating roof looking at flooring & wall thickness, pontoons, lower legs, and pontoons following API and NSPS guidelines.

**Normal Operating Conditions**

- Level range is between 12,950-gallons (22.0%) and 59,051-gallons (100%)

**Corrective Actions**

- If level is out of range
  - Stop all transfers into tank
  - Verify the level transmitter is reading accurately
  - Verify by stick test that the floating roof is working correctly
- If floating roof gets stuck above liquid level
  - Conduct an internal visual inspection of floating roof from a top hatch looking for scale build-up on the sides, cable condition, or legs protruding above the cover
  - Verify vacuum break on tank is working properly
- If floating roof becomes submerged
  - Stop all transfers into the tank
  - Empty contents of tank to "land" the roof. Follow recommendations provided in vendor's operating manual.
  - Drain any residual liquid lying on the floating roof into the tank
  - Empty and prep tank for underside inspection of floating roof

**Critical Replacement Parts**

- Vacuum Break

**Recordkeeping**

- Daily, monthly, and annual records of Normal Operating Conditions will be tracked through PI, or operator round/ logs, and will be maintained by the Area Supervisor for 5-years. Incidental Maintenance and/or deviations occurring will be tracked using this method.
- All other records, as well as those corrective actions requiring a mechanic will be recorded and logged using Maintenance tracking software and kept for 5-years.
- Corrective actions requiring engineering will be tracked through the MOC process.