

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

P027124385

FACILITY: WHITING OIL AND GAS CORP - SOUTH BUCKEYE 127 CPF		SRN / ID: P0271
LOCATION: SOUTH BUCKEYE 127 CPF, BEAVERTON		DISTRICT: Saginaw Bay
CITY: BEAVERTON		COUNTY: GLADWIN
CONTACT:		ACTIVITY DATE: 02/05/2014
STAFF: Sharon LeBlanc	COMPLIANCE STATUS: Compliance	
SUBJECT: Scheduled site inspection for sweet gas processing facility- Permit Modification issued in 2013 for equipment to be installed as part of facility upgrade. No date for completion of activities available.		SOURCE CLASS: MINOR
RESOLVED COMPLAINTS:		

On Wednesday, February 5, 2014, AQD District Staff conducted a scheduled site inspection at the Whiting Oil & Gas Corporation (Whiting Oil) South Buckeye 127 CPF Gas Plant (AKA South Buckeye) (SRN P0271) Badger Road, Beaverton, Gladwin County, Michigan. One Permit to Install (PTI) No. 136-11A is of record for the facility. The referenced permit was modified and issued on August 13, 2013. The facility is a sweet gas production facility and a Minor Source.

The facility was operating upon arrival, and AQD staff conducted site inspection activities with Mr. Mark Keyes of Whiting Oil and Mr. Brian Osborne of Osborne Production Services.

#### FACILITY DESCRIPTION

Based on available information, the South Buckeye consists of an approximately 4 acres located within an approximately 53 acres, predominantly wooded parcel located approximately 1/2-mile west of the intersection of Badger Road and M-30. Whiting Oil had purchased the existing natural gas processing facility. Equipment in place had been determined to have been exempt, and was unpermitted. In August 2011, Whiting submitted a permit application to expand the existing facility which was reported to be over 6 years old. The resulting permit no. 136-11 was issued on December 22, 2011.

The South Buckeye is an unmanned, fenced facility which operates 24-hours a day, seven days a week. It is visible from Badger Road. The facility has a water well and small office for use when staff is onsite.

#### PROCESS EQUIPMENT

At the time of the permit modification, only a limited number of changes to the facility had occurred since the initial permit application. The process equipment onsite (note permit application IDs are presented in *italics*) consist of:

- One Compressor with a natural gas fired Waukesha reciprocating internal combustion engine (RICE)(*EUENGINE1* or *ENG-1*).

Controls associated with the RICE includes non-selective catalytic reduction and air to fuel ratio controls.

- One 9.5 MMSCFD TEG dehydration unit (*EUDEHY-TEG* or *TEG-1*)
- One TEG Reboiler (*RBL-1*) (Exempt)
- 4 GPU Burners (*HTRS*) (Exempt)
- Seven 400-bbl condensate tanks (*TANKS*) (Exempt)
- Four 400-bbl produced water tanks (*TANKS*)(Exempt)
- One 400-bbl Blowdown tank (*TNK-8*) (Exempt)

- One Emergency/Process Flare (*FLR-1*) with thermal camera and auto ignition (Exempt)
- One 30K NGL storage tank (Exempt)
- One 1K gallon methanol storage tank (Exempt)
- One 300-gallon TEG storage tank (Exempt)
- One 180-gallon antifreeze storage tank (Exempt)

Note that the condensate and produced water storage tanks are all manifolded together such that they act as a single emissions source (*TANKS*). Vapors are captured by a vapor recovery unit (VRU) and routed to the dehydration unit for final processing. If the VRU is down, the vapors are routed to the flare (*FLR-1*) for combustion. *TNK-8* is only used for a mechanical system blowdown during an upset.

Actual flow rate of NG is determined by the facility by meters at the wells before it reaches EUDEHY-TEG and again before it leaves the facility.

The most recent permit includes the addition of the following process equipment:

- Natural Gas fired Ajax RICE (EUENGINE2 or *ENG-2*) with selective oxidation catalyst for operation of a refrigeration compressor to be added to the facility.
- A medium heat heater/boiler (*HTR-1*) (Exempt)
- Ethylene Glycol (EG) dehydration unit (EUDEHY-EG or *EG-1*) which will replace EUDEHY-TEG (*TEG-1*)
- Four GPU Burners (*HTRS*) (Exempt)
- Four 400-bbl tanks (*TANKS*) (Exempt)

Natural Gas (NG) enters the facility goes through the GPU heaters (*HTRS*) resulting in the initial separation of condensate from the incoming gas stream. A liquid knockout drum, secondary stage water separator and secondary stage condensate separator are used at various points to further remove entrained waters as well as to further reduce moisture in the gas. Dehydration is achieved using a TEG-dehydration unit (EUDHY-TEG) prior to the gas being ready for sales or fuel. Condensate, water and NGLs are trucked out independently.

#### FEDERAL STANDARDS

Based on information provided by the Facility in their permit modification application the subject site is subject to the following Federal Standards:

- 40 CFR Part 63 Maximum Achievable Control Technology (MACT) Standards,
  - o Subpart A,
  - o Subpart HH (EUDHY-TEG) and
  - o Subpart ZZZZ (FGENGINES)
- 40 CFR Part 60 Standards of Performance for New Stationary Sources, Subparts A, VV and KKK.

In addition, during the recent permit modification, Whiting requested a federally enforceable limit that

restricts the facility's capacity to 9.5 million standard cubic feet per day. In their application, Whiting indicated that the inclusion of the limit was requested to confirm the applicability of an exemption 40 CFR 60.633(d) (NSPS KKK) for routine monitoring as defined in the exemption at facilities with a design capacity to process field gas of less than 10 million scf/day.

It should also be noted that with the installation of ENG-2 and TANKS the facility will also be subject to applicable requirements under:

40 CFR Part 60 Standards of Performance for New Stationary Sources,

- o Subpart JJJJ (EUENGINE2) and
- o Subpart OOOO

Compliance History –

No records of complaints are of record for the facility. No Notices of Violation (NVs) or Letters of Violation (LOVs) of record for the facility. No previous compliance inspection is of record for the facility. Required reporting is limited to the annual MAERs submittals which have been submitted in a timely manner.

COMPLIANCE EVALUATION

As part of the compliance evaluation, District Staff confirmed the installation of appropriate control devices identified in the permit. The facility was operating at the time of the inspection. However, not all permitted equipment (EUDEHY-EG or EUENGINE2) had been installed at the time of the inspection. EUENGINE1 and EUENGINE2 comprise the flexible group FGENGINES.

Operational Limits – Operational limits outlined in Permit 136-11a include:

**FGFACILITY-**

Process/Operational limits for the referenced flexible group includes a maximum process limit of no more than 9.5 million standard cubic feet of field gas per day. Available records indicated that the daily through put was well below the limit and in compliance with the permit condition. Measurements are taken from totalizing meters onsite and input into an electronic database for the facility in compliance with permit conditions.

Permit 136-11A requires the loadout for any storage tank to have a vapor return system installed. Facility staff confirmed that the vapor go back to the tanks.

**FGENGINES-**

Process/Operational limits for the referenced EU include submittal of a Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) within 30 days of startup of Engine 2. At the time of this report Engine-2 has not been installed onsite.

The facility maintains records onsite of the make, model, horsepower rating, date of manufacture, date of last rebuild and date of installation for engine EUENGINE1, in compliance with their permit. Note the permit also requires that any replacement of an engine within this flexible group with an equivalent-emitting or lower emitting engine must be reported and supporting data provided to the district within 30-days of the engine change out. No change out is reported to have occurred.

In addition, the permit limits operation of the EUs associated with FGENGINES without add-on control device to 200-hours per 12-month rolling time period. Onsite staff reported that they are well below the limit, and data reviewed confirmed compliance.

FGENGINES are required to be equipped with appropriate equipment to monitor and record the hours of operation for each Engine under the flexible group. EUENGINE1 is in compliance with the permit restriction.

Material Limits – Material limits outlined in Permit 136-11a include:

**FGFACILITY-**

Material limits associated with Permit 136-11A restricts the facility from burning any sour natural gas. Sulfur content from the annual wet gas stream analysis (sampled December 16, 2013) confirmed that the gas stream was not sour.

**EUDHY-TEG-**

Permit 136-11A restricts the use of stripping gas in EUDEHY-TEG. Facility representatives reported that no stripping gas is used, in compliance with the permit. In addition, the unit shall not be operated unless the BTEX condenser is installed maintained and operated properly. Exhaust gases for the condenser are routed to the dehy burner in compliance with the permit conditions.

Emission Points – In addition to the EU conditions identified below, the facility reports that monitoring conducted to meet Subpart KKK VOC leak detection requirements.

**EUDEHYD-TEG-**

Emissions for the referenced emission unit include Benzene and VOCs in tons per year annually. The facility uses GRI-GLYCalc v.4 to determine emissions. A review of data for the past two years confirmed that emissions are below permit limits for the emission unit.

**FGENGINES-**

Emission limits for EUENGINE1, a natural gas fired reciprocating engine are controlled by a non-selective catalytic converter/catalyst and air to fuel ratio controller. Both NOx and CO emission limits exist for the referenced EU. Limits for the referenced emission unit are based on a 12-month rolling time period. Emission data reviewed indicated that emissions are in compliance with permit limits for the EU. Emission factors used by the facility are consistent with those submitted as part of the permit modification package.

District staff confirmed that the existing stack for EUENGINE1 met the permitted dimensions, and that it is discharged unobstructed into the atmosphere.

Monitoring, Testing and Record Keeping – Monitoring and recordkeeping requirements outlined in Permit 136-11A include appropriate monitoring and recording of emissions and operating information as required under 40 CFR, Part 60, subpart KKK, OOOO and VV. Facility staff reported that the monitoring/testing are being conducted and that the records are maintained by the company.

**FGFACILITY-**

Permit requirements for the Facility flexible group are limited to monitoring, and recording the amount of field gas processed by the facility on a daily basis. A review of records confirmed that the data is being collected in compliance with permit conditions.

In addition, the facility is required to keep monthly and 12-month rolling fuel use records for the facility. The facility is reported to have a total flow fuel meter that records the fuel usage for the entire facility. Fuel usage for each piece of equipment is then based on manufacturer's data and hours of operation in compliance with the permit conditions.

Wet gas stream sampling and analysis is conducted by the facility every calendar year to confirm the

H2S and/or sulfur content of the natural gas burned which has been reported to be sweet gas. Analytical data provided by the facility for 2013 (sampled December 16, 2013) confirms the appropriate hydrogen sulfide content of less than 1 ppm (1 grain per 100 cubic ft is reported to be the equivalent of 15.7 ppmv).

#### EUDEHYD-TEG-

Requirements for the referenced emission unit include sampling and analysis once per calendar year (most recent sampled December 16, 2013) of the wet gas stream for nitrogen, CO<sub>2</sub>, H<sub>2</sub>S, C1-C6 series hydrocarbons, BTEX and heptanes. Staff report that the sampling and analysis had been conducted for 2013, and that sampling for 2014 was tentatively scheduled for March 2014.

To meet alternative exemption criteria outlined in condition VI.1(c), the facility has reported actual benzene emissions of <0.90 mega grams per year for EUDEHY-TEG. The actual benzene emission calculations are completed using GRI-GLYCalc.4 in compliance with the subpart HH monitoring exemption outlined in 40 CFR 63.674(e)(1)(ii). Benzene emissions reported were below permit limits.

In addition the EU is required to calculate the VOC emission rates for each calendar month and 12-month rolling time period. Facility staff reports that the emissions are calculated using GRI-GLYCalc, and use the most recent wet gas stream analysis data (sampled December 16, 2013) in compliance with the permit conditions. VOC emissions reported for the past two years were below permit limits.

#### FGENGINES-

In addition to calculating and recording NO<sub>x</sub> and CO emissions for EUENGINE1, the facility is required to maintain a log of all maintenance as well as records of operating periods for the EU when operating both with and without it's add on controls. The required information is available as electronic records and is maintained in compliance with their permit requirements.

#### SUMMARY

Site inspection activities at the Whiting Oil & Gas Corporation South Buckeye 127 CPF Gas Plant (SRN P0271) Badger Road, Beaverton, Gladwin County, Michigan. One Permit to Install (PTI) No. 136-11A is of record for the facility. The referenced permit was modified and issued on August 13, 2013. Based on the conditions outlined in the referenced permit, it appears that the facility is being operated in general compliance with permit conditions.

NAME



DATE



SUPERVISOR

