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

N165247124

FACILITY: West Branch Production Gathering & Compressor Stat		**SRN / ID:** N1652
LOCATION: 2251 SIMMONS RD, WEST BRANCH		**DISTRICT:** Saginaw Bay
CITY: WEST BRANCH		**COUNTY:** OGEMAW
CONTACT: Jim Clark , Facility Compliance Coordinator		**ACTIVITY DATE:** 12/03/2018
STAFF: Meg Sheehan	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Scheduled site inspection for FY19.		
RESOLVED COMPLAINTS:		

On Monday, December 3, 2018, a scheduled site inspection was conducted by AQD District staff at COBRA's West Branch Production and Gathering Station in West Branch, Ogemaw County. COBRA representative Jim Clark (Facility Compliance Coordinator) provided a tour of the facility, which was in operation upon arrival. Site inspection activities were conducted with the intent of confirming compliance with Permit to Install (PTI) No. 184-14B.

FACILITY DESCRIPTION

The COBRA West Branch Production and Gathering Station is a synthetic minor source for criteria pollutants, and an area (minor) source of hazardous air pollutants (HAPs). It is located on a parcel approximately 82 acres, about a half mile south of the intersection of M-55 and Simmons Road, east of West Branch (attachment 1). Adjacent properties include residential, agricultural, and oil and gas production fields. The facility was constructed in 1988, is fenced and operates 24-hours a day, seven days a week. It is only manned daily as necessary to observe and document operating conditions, perform maintenance, and conduct other related tasks. COBRA's West Branch field office is located out front of the fenced facility.

Some equipment and a few buildings remain onsite from previous owners and gas collecting activities but have been permanently taken out of operation. An inventory of this equipment was included with the PTI application for 184-14B and a list may be found under the Equipment section of this report.

PROCESS

COBRA's West Branch facility gathers, compresses, dehydrates, and processes natural gas from multiple wells with varying field pressures. The natural gas comes into the facility via three pipelines: one low pressure (LP) and two high pressure (HP). The gas streams are routed through KO (knock-out) scrubbers, which remove any free liquids (condensates, natural gas liquids (NGLs), and water) from the gas. LP slop and water liquids are routed to the slop/water tank. Water-free HP hydrocarbon liquids are routed to a deethanizer.

The LP inlet stream is compressed by EUENGINE1 and sent to the triethylene glycol (TEG) dehydrator to remove any remaining water vapor. The LP stream comingles with the HP stream and moves through Joule-Thompson (JT) gas processing equipment. JT gas processing uses a drop in gas pressure to create a cooling effect. The cooling effect condenses NGLs out of the gas to lower the BTU of the natural gas to meet pipeline specifications. The ethylene glycol (EG) dehydrator is used in the JT processing to inhibit hydrates.

The NGLs are stabilized in the deethanizing tower by flashing off lighter hydrocarbons. The remaining liquids are routed to the NGL storage tanks. High BTU overhead gas from the deethanizer does not meet the specifications for the sales pipeline, so it is either blended back into the residue gas stream and facility fuel or routed to a combustor (enclosed flare) for destruction. Any flash gas collected throughout the production/gathering is routed back to EUENGINE1, is dehydrated and injected back into the HP gas stream. Once all the liquids have been extracted from the gas stream, it is compressed by EUENGINE2 and EUENGINE3 and sent back to the JT process as needed for makeup recycling. The remaining gas is sent to the HP residue sales gas pipeline.

PERMITTING HISTORY

Two permits have been issued since the most recent inspection was conducted on January 26, 2016:

- PTI 184-14: issued February 17, 2015; voided December 20, 2016
  - The previous inspection evaluated the facility's compliance with this PTI.
- PTI 184-14A: issued December 20, 2016; voided May 23, 2018
  - Replaced existing RICE CAT 3408 rich burn 405 HP with RICE CAT 398 rich burn 625 HP
  - Facility is subject to 40 CFR Part 60 Subparts A and OOOOa

- PTI 184-14B: issued May 23, 2018; currently active
  - o This inspection evaluated the facility's compliance with this PTI.
  - o Permitted an additional dehydrator, two additional fuel burning engines, two combustors and loadout activities for two pressurized NGL tanks. Please see the Equipment section for additional information.
  - o The engines associated with the Emission Unit IDs are not specified in the permit to allow the facility operational flexibility based on varying field gas volumes. Please see the permit application package in the district files for further explanation, as well was the permit evaluation document.

It should be noted that there are an additional three active PTIs associated with the facility: 529-87, 544-88, and 709-96. These PTIs were issued to the facility when it was under Marathon Oil's ownership. Ownership changes of record in the District file include:

Transfer Date	Previous Owner	New Owner
November 2000	Marathon Oil	RSEC, LLC
September 2002	RSEC, LLC	Whiting Petroleum Corporation
March 2004	Whiting Petroleum Corporation	Whiting Oil and Gas Corporation
August 2015	Whiting Oil and Gas Corporation	COBRA Oil and Gas Corporation

The facility was re-permitted by Whiting Oil and Gas Corporation in February 2015 under PTI 184-14, but the previously mentioned PTIs were not voided. Because the most recent PTI (184-14B) covers the entire facility and was intended to supersede any other active PTIs, a request to void them will be made.

EQUIPMENT

Exempt emission units have been determined/identified by COBRA.

Existing

- 2.0 MMSCFD TEG dehydrator (EUDEHY1 – FGDEHYS)
- 0.125 MMBTU/Hr TEG dehy reboiler burner (exempt under R 336.1282(2)(b)(i))
- CAT G398 TA LCR 625 HP RICE* (EUENGINE1 – FGENGINES)
- 0.750 MMBTU/Hr line heater (exempt under R 336.1282(2)(b)(i))
- One flare (FGNATGASCOMPSTA; exempt under R 336.1288(2)(c))
- Four 400 bbl storage tanks for condensate/slop/water (exempt under R 336.1284(2)(e))
- 300-gallon methanol storage tank (exempt under R 336.1284(2)(n))
- 500-gallon propane storage tank (exempt under R 336.1284(2)(b))
- Up to three 300-gallon engine oil storage tanks (exempt under R 336.1284(2)(i))

New

- 9.5 MMSCFD JT Process / EG dehydrator (EUDEHY2 – FGNATGASCOMPSTA / FGDEHYS)
- 0.275 MMBTU/Hr EG dehy reboiler burner (exempt under R 336.1282(2)(b)(i))
- Waukesha F1197G 208 HP RICE* (EUENGINE3 – FGENGINES)
- 200 HP Variable Frequency Drive (VFD) electric motor** (EUENGINE2 – FGENGINES; exempt)
- One combustor (FGNATGASCOMPSTA; exempt under R 336.1288(2)(c))
- Two 42,000-gallon pressurized NGL storage tanks (FGNATGASCOMPSTA; no special conditions)

Permanently out of service

- Two pressurized NGL storage tanks
- 500 bbl water tank
- 240 bbl slop tank
- 3,000 bbl condensate storage tank
- 20,000 bbl condensate storage tank
- Condensate heater
- Salt bath heater
- Several buildings – additional information may be found in the permit application for PTI 184-14 under attachment 3.

*These engines were changed out on June 22, 2018 in compliance with Special Condition VII.1. under FGENGINES. Please see the Compliance Evaluation section for further explanation.

**Please note that while the 200 HP VFD electric motor is labeled as "EUENGINE2" for the purposes of this report, it is not actually an engine and therefore is not a source of air pollution.

COMPLIANCE HISTORY

No complaints are of record for the facility. At the time of the most recent site inspection (January 2016), the facility was found to be in compliance with its air permit and air rules. The facility is required to report to MAERS and has done so in a timely manner for the past several years.

COMPLIANCE EVALUATION

FGDEHYS – One TEG dehydrator (EUDEHY1) and one EG dehydrator (EUDEHY2). Emissions are controlled by regenerator still column overhead vapor to the glycol reboiler burners.

I.1. / VI.4. Based on records that were provided pursuant to Special Condition VI.4. (attachment 2), the benzene emissions from each dehydrator are below the permit limit of 0.9 megagrams (0.99208 tons) benzene per 12-month rolling time period.

II.1. The permittee reported no use of stripping gas in either of the dehydrators.

III.1. / VII.1. Currently, the MDEQ does not have delegation of 40 CFR Part 63, Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities for area sources.

VI.1. Meters to monitor and record the natural gas flow rate through each of the dehydrators were installed and operational at the time of the inspection. The meters are tied into the facility's central computer tracking system and throughput volumes are recorded daily.

VI.2. The permittee has elected to comply with the exemption criteria in 40 CFR 63.764(e)(1)(ii) and uses GRI-GLYCalc™ to determine actual average benzene emissions (attachment 2).

VI.3. Not applicable – the permittee has elected to comply with the exemption criteria in 40 CFR 63.764(e)(1)(ii).

FGENGINES – currently, only two natural gas fired reciprocating engines have been installed: CAT 398 (identified as EUENGINE1 by COBRA) and Waukesha F1197G (identified as EUENGINE3 by COBRA). Both engines are rich burn and are equipped with Non-Selective Catalyst Reduction (NSCR) and Air-Fuel Ratio Controller (AFRC). The engine identified as EUENGINE2 by COBRA is the 200 HP VFD electric motor which is not a source of air pollution.

I.1. / I.2. / VI.4. / VI.5. Based on records that were provided pursuant to Special Conditions VI.4. and VI.5. (attachment 3), the NOx and CO emissions from EUENGINE1 are below the permit limits of 6 tpy NOx and 13 tpy CO per 12-month rolling time period.

I.3. / I.4. Currently not applicable.

I.5. / 1.6. / VI.4. / VI.5. Based on records that were provided pursuant to Special Conditions VI.4. and VI.5. (attachment 3), the NOx and CO emissions from EUENGINE3 are below the permit limits of 5 tpy NOx and 11 tpy CO per 12-month rolling time period.

II.1. The permittee reported burning only sweet natural gas in EUENGINE1 and EUENGINE3. All gas streams entering the facility are coming from sweet wells, which is verified by annual gas analysis.

III.1. An updated PM/MAP reflecting the engines currently onsite was received by the District office on September 20, 2018 and appeared to meet the requirements outlined in the Special Condition.

III.2. Neither of the engines have been operated for more than 200 hours per year without the NSCR and AFRC according to records that were provided (attachment 3).

IV.1. The NSCR and AFRC were installed and operational at the time of the inspection. Maintenance performed on the catalyst is recorded in the maintenance log for the corresponding engine (attachment 4). Invoices for catalyst parts are also maintained at the facility and were reviewed as part of the inspection.

IV.2. / VI.2. / VI.6. / IX.2. The natural gas usage for each engine is monitored using fuel meters like the ones used for the dehydrators; they were installed and operational at the time of the inspection. The meters are also tied into the central computer tracking system and the usage volumes are recorded daily, pursuant to Special Condition VI.2. Natural gas usage rates may be found on attachment 3, pursuant to Special Condition VI.6.

V.1. The MDEQ may request stack testing for NOx and CO emission factors, however, no testing has been required by District staff.

VI.1. All required calculations were complete and available at the time of the inspection.

VI.3. All maintenance activities performed on each engine and its associated pollution control device (catalyst) are recorded in a computerized maintenance management system (attachment 4). Maintenance is performed by the company whom COBRA leases the engines from according to manufacturer's specifications.

VII.1. The MDEQ was notified on September 20, 2018 of two engine change-outs:

- EUENGINE1 (CAT G398 TA LCR 625 HP) underwent a like-kind replacement. Calculations submitted with the notification indicated the emissions were equivalent. The replacement engine was manufactured pre-6/12/2006.
- EUENGINE3 (CAT G3408 405 HP proposed for PTI 184-14B but never installed) was swapped for the Waukesha F1197G 208 HP, and calculations submitted with the notification indicated the potential emissions were below the Potential To Emit (PTE) calculated for the CAT G3408 for PTI 184-14B. The Waukesha engine was manufactured pre-6/12/2006.

These change-outs have been determined to be in compliance with Special Condition VII.1. The notification from COBRA may be found in the District file.

IX.1. Currently, the MDEQ does not have delegation of 40 CFR Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines for area sources. The source reports complying with Subpart ZZZZ by routinely inspecting and replacing belts, plugs, and O_2 sensors on the engines.

FGNATGASCOMPSTA – Natural gas gathering and compression facility. Excess emissions are either routed through a vapor recovery unit (VRU) or controlled by a flare/combustor.

III.1. The permittee reported burning only sweet natural gas throughout the entire facility. All gas streams entering the facility are coming from sweet wells, which is verified by annual gas analysis.

III.2. The facility processes less than 9.5 million SCF of field gas per day. This is demonstrated on the recordkeeping for the dehydrators (attachment 2).

III.3. / VI.2. The pilot flame at the flare is kept continuously burning and was in operation at the time of the inspection. Infrared cameras are trained on the flare to detect a malfunction. If the pilot flame is extinguished, staff are immediately notified by the facility's automatic call-out system, and the facility is shut down until it can be re-lit. Records are kept for hours of operation while the pilot flame is extinguished (attachment 5). In 2018 there was only one instance in which the pilot flame was extinguished, and COBRA reports that no venting of natural gas occurred during this time.

III.4. The permittee reports that no blowdown events have occurred that did not meet the requirements of R 336.1285(mm).

IV.1. The storage tank vapors are captured by a VRU and routed back through EUENGINE1 to the TEG dehydrator. If the VRU malfunctions or is offline for maintenance, tank vapors are routed to the flare. The VRU is also tied into the facility's automatic call-out system, so if a malfunction is detected, staff are notified immediately.

VI.1. The permittee reported that compressors are blown down each time maintenance is performed (attachment 4). The amount of natural gas blown down is the same amount each time and was calculated as part of the permit application for PTI 184-14B. Please see attachment 5.2 in the PTI application for these calculations. Blown down natural gas is routed to the flare for destruction and is not vented to the atmosphere.

IX.1. The facility is subject to 40 CFR Part 60 Subparts A and OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015. To comply with Subpart OOOOa, the facility reports conducting twice yearly optical gas imaging surveys to monitor for equipment leaks. The surveys are performed quarterly on the compressors.

COMPLIANCE DETERMINATION

At this time, the COBRA West Branch Production and Gathering Station appears to be in general compliance with PTI 184-14B and all applicable rules and regulations.

NAME Meg Sheehan DATE 1/7/19 SUPERVISOR C. Hare