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

N730366551

FACILITY: Bluewater Gas Storage Facility - Columbus		**SRN / ID:** N7303
LOCATION: 333 South Wales Center Road, COLUMBUS		**DISTRICT:** Warren
CITY: COLUMBUS		**COUNTY:** SAINT CLAIR
CONTACT: Jeff Westrick , Asset Manager- Gas Storage		**ACTIVITY DATE:** 03/07/2023
STAFF: Sebastian Kallumkal	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Annual Scheduled Inspection to verify compliance with PTI No. 77-14C and other applicable federal requirements.		
RESOLVED COMPLAINTS:		

On Tuesday, March 7, 2023, Michigan Department of Environment, Great Lakes, Energy-Air Quality Division Staff Sebastian Kallumkal conducted an annual inspection at the Bluewater Gas Storage (BWGS) facility located at 333 South Wales Center Road, Columbus Township, Michigan. The purpose of the inspection was to determine the facility's compliance with the requirements of the federal Clean Air Act; Article II, Air Pollution Control, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (MEGLE-AQD) Administrative Rules and Permits to Install (PTI) No. 77-14C.

PTI NO. 77-14 (approved 9/16/2014) incorporated permits issued during construction into a single facility-wide permit. PTI No. 77-14 was voided when PTI No. 77-14A (approved on 8/21/2019) was issued to change the operating temperature and correct the typo error in facility-wide natural gas usage. PTI No. 77 -14A was voided when PTI No. 77-14B (approved on 11-13-2020) was issued to remove the vapor recovery unit from EUWGDEHY and for the installation of thermal oxidizer. PTI No. 77-14B was voided on March 8, 2021, when PTI No. 77-14C was approved on March 8, 2021, to change the stack exit diameter for SV-THERMALOXIDIZER. EGLE-AQD Consent Order (CO) No. 5-2005 was terminated upon request and compliance demonstration by the facility.

Bluewater Gas Storage is mainly involved in the storage of natural gas received from customers such as Consumers Energy, Vector Pipeline, MichCon, Great Lakes Gas Transmission Company, American Natural Resources, and Duke Energy of Canada during warm season and its withdrawal and transfer into the pipeline during cold months. (Storage: dolomite, 3200' deep, 300' thick, up to 2012 psi). During late spring through early fall season, the facility receives and stores pipeline natural gas in the underground rock formations. Later in the storage season, facility needs to use compressors (powered by reciprocating internal combustion engines) to store the gas against the high field pressure. The withdrawal season is from late October through early May. During the initial withdrawal season, the gas into the pipeline is free flow, but later in the season, the gas usually needs to be pumped out using compressors due to the low field pressure.

Depending on the nature of the rock formations, the withdrawal gas may contain excess moisture than allowed by the federal regulations. In that case, the natural gas would be dehydrated to meet the requirements prior to pushing back into the pipelines. The facility also had discovered that the withdrawal gas contained high concentration of heavy hydrocarbons than that is allowed. In order to reduce the hydrocarbon content, the facility installed a Joule-Thompson system (J-T System) in January 2006 that takes advantage of the cooling effects of expanding gas (Joule-Thompson effect).

During withdrawal from the field, the gas is cooled due to the reduction in pressure. This gas is heated using one of the heaters. The heated field gas is passed through one of the Gas to Gas (warm field gas and treated cold gas) U-Tube heat exchangers in the J-T System. They have two heat exchanger skids and are used depending on the amount of gas withdrawn. Ethylene glycol is sprayed into the field gas portion of the heat exchanger, from both sides (metered). Then the field gas goes through a J-T Valve. In the J-T system, as the gas withdrawn from the field is passed across the J-T valve, the pressure is reduced to 150 PSI and the gas is cooled due to expansion (Joule-Thompson effect). The cooling of the gas causes the hydrocarbons to condense, and the hydrocarbons are removed from the gas stream. This cooling also causes the moisture to condense. Ethylene Glycol is sprayed to absorb the moisture and prevent it from condensing and freezing. The glycol is measured through two Glycol Injection skids. At the time of

inspection only one skid was being used because the process (field) gas flow was low (each skid has two glycol flow meters).

After the J-T Valve, the natural gas, and the liquids (hydrocarbons/water/glycol mixture) goes to a J-T Separator Vessel. The cold gas from the J-T Separator Vessel is passed through a gas-to-gas heat exchanger (a heat exchanger with warm gas flowing from the field on one side, and cold flowing gas from the J-T Separator Vessel on the other side) to pre-cool the field gas. From the heat exchanger, the treated natural gas goes to pipeline.

The glycol/NGL/water mixture from the J-T Separator Vessel goes to a J-T liquid separator. This tank is heated to about 100oF to separate the hydrocarbons (NGL) and water/glycol. The top part NGL (similar to crude oil) goes to NGL tank and the bottom part, glycol/water, goes to the Glycol Regenerating Skid (Glycol Dehydration Unit).

The water-rich glycol goes to the withdrawal gas reboiler unit (surge tank) to drive off excess moisture. The mixture is then pumped to the flash tank. The glycol from the flash tank is filtered using charcoal filter, and sock filter (Mag 20) and is recycled back to the skids. The facility keeps a container of EG to replenish the skid.

Any NGL collected goes to NGL tank. The vapors from the reboiler go to a reboiler still column and then to the thermal oxidizer to be incinerated. The vapors from the flash tank also goes to the thermal oxidizer to be incinerated. The NGLs are sent to an aboveground storage tank, mixed with crude oil and eventually sold to various oil refining entities.

The facility is also permitted to extract crude oil from the underground. The facility had drilled seven oil wells (6 horizontal and 1 vertical well) which currently produces crude oil. Natural gas and brine also come along with the crude oil during extraction. The crude oil production is for about 6 weeks (Mid-March through April). This natural gas that comes up with the crude is not virgin gas; instead, it is part of the same gas the facility stores underground. This mixture is separated using a heater treater and an oil-water separator. The natural gas either put back to the underground if it is during storage season or will be dehydrated and put into the pipelines for transportation during withdrawal season. Reciprocating Internal Combustion Engine, EU-145BHPENG is normally used for this process. The brine is put back to the underground and crude oil is stored in one of the storage tanks and is transported out for processing.

The facility had provided information (correspondence from USEPA) to indicate that this facility is not subject to federal standards for Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants, as specified in 40 CFR, Part 60, Subpart KKK. The facility does not extract virgin natural gas while extracting crude oil. Instead, the facility extracts pipeline quality gas which was injected into the underground rock formations.

Inspection

I arrived at the facility at about 10:15 AM. I met Mr. Jeff Westrick, Asset Manager (Phone: Direct-810-642 9035, Office: 810 367 3404; Mobile: 810 531 8036; Fax: 810-367-7048), email:jeffrey.westrick@wecenergygroup.com). I introduced myself and stated the purpose of the visit.

After a short pre-inspection meeting, he accompanied me for an inspection of the facility. We visited the control room, glycol dehydration unit and the J-T System. He told me that none of the RICE engines are operating at that time due to high field gas pressure.

He explained that only one the gas heaters is operating on that day because of the low gas withdrawal rate. When withdrawn from the field, the gas pressure is reduced, and the gas is cooled. The heater is used to increase the temperature. At this time, the facility is in the withdrawal season.

During the inspection, none of the RICE (EU-145BHPENG, EUGEN, EUCOMPNORTH, EUCOMPEAST, EUCOMPWEST) appear to be operating. I did not observe any visible emissions from the RICE engine stacks. I did not inspect any of these engines.

During the post inspection meeting, we briefly discussed the records that the facility needs to submit. Jeff informed me that they want to replace the current 3.26 MMBtu/hr glycol reboiler in the withdrawal gas dehydration unit. They want to install a smaller unit because the EG circulation rate is lower than what is permitted. They plan to apply for a permit to install for this replacement and have the installation completed by 2024.

Compliance

EU-145BHPENG:

In 2009, facility installed a Caterpillar, 2008 model (Mfg Date: 7/2/2008), natural gas fired, 4-stroke, rich burn, 145 HP, reciprocating internal combustion engine which runs a compressor to inject producer gas back into the field and to boost the withdrawal gas pressure to add it to the pipeline. This RICE is exempt from PTI pursuant to Rule 285(2)(g). However, the engine is subject to 40 CFR 63, Subpart ZZZZ which requires this RICE to comply with 40 CFR 60, Subpart JJJJ-NSPS for Spark Ignition RICEs. NSPS-Subpart JJJJ (40 CFR 60.6244) requires a one-time performance test within 10% of 100 percent peak (or the highest achievable) load for EU-145BHPENG. This engine was not operating at the time of the inspection.

40 CFR 60.4243 states that the facility must comply with the applicable emission standards by purchasing an engine certified to the emission standards in 40 CFR 60.4231. Additionally, if the engine is not operated or maintained as a certified engine (100-500 HP), the permittee must comply with the emission standards by keeping a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, permittee must conduct an initial performance test to demonstrate compliance. Subsequent performance testing every 8,760 hours or 3 years is not required (40 CFR 60.4243(a)(2)(ii).

40 CFR 60.4233(e) states that a SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 of NSPS Subpart JJJJ performance test to demonstrate compliance. Table 1 has limits for NOx, CO, VOC in g/Hp-hr and ppmvd at 15%O2.

On August 13, 2013, facility conducted the required initial performance tests to demonstrate compliance with NOx, CO and NMHC (as C3H8) limits. The test plan for the performance test was received by AQD on July 15, 2013, and was approved on August 1, 2013. AQD received the test report on September 23, 2013. See the "Emissions Compliance Study"-"Report Submittal Date: September 16, 2013)" for details.

Facility performs maintenance on this engine such as change spark plugs, oil samples and changes, compression checks, monitor catalyst temperatures. They only run this unit for the functional testing, so minimal maintenance has been performed based on hours of operation lately.

The primary use of EU-145BPENG is to re-inject natural gas generated during crude oil production. Jeff told me that currently they use the EU-COMPNORTH for this purpose.

Permits To Install (PTI) No. 77-14C

This permit includes Emergency Generator (EU-GEN), Withdrawal Gas Dehydration Unit (EU-WGDEHY), EU-DRAINTANK and FGENGINES (EU-COMPNORTH, EU-COMPWEST, EU-COMPEAST-three internal combustion engines which drive compressors). The permit also includes FG-FACILITY table which sets facility wide limits for NOx, CO, VOC and individual and aggregate hazardous air pollutants (HAPs). This facility is an area source (synthetic minor) for hazardous air pollutants (HAP). The VOC/HAP emissions from these five engines are controlled by individual catalytic oxidation systems.

EU-GEN

8.5 MMBtu/hr heat input Caterpillar G3516 natural gas-fired engine driving an emergency generator. VOC and CO emissions are controlled with a catalytic oxidation system.

This engine is limited to operate less than 500 hours per year based on 12-month rolling time period. From the submitted records, in 2022, EU-GEN was run about 19.32 hours including power outages and weekly test run. EU-GEN conducted weekly test runs (readiness testing) about every week and each run lasted about 23-30 minutes. In 2023, Jan-Mid March, EU-GEN was operated about 2.16 hours for weekly testing and 5.93 hours for power outage. The facility is only using pipeline quality natural gas to fuel EU-GEN. The fuel usage is limited to pipeline quality natural gas.

This engine is required to be operated with catalytic oxidation system installed and operated satisfactorily which includes cleaning the catalyst panels according to procedures in Appendix A of PTI No. 77-14C or an approved plan. EU-GEN is equipped with catalytic oxidation system. Submitted the catalyst bed differential pressure monitor calibration data for 2022 (conducted 9-9-2022) and maintenance records (oil analyses for 2022). Oil changed 10-22-2022.

Stack dimensions were not verified at the time of the inspection, but stack dimensions appear to be in compliance with the requirements of Special Conditions VIII.1.

This condition requires the permittee to comply with all provisions of National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 63, Subpart ZZZZ, as they apply to EU-GEN. See discussion under 40 CFR 63, Subpart ZZZZ- NESHAP for Reciprocating Internal Combustion Engines.

EU-WGDEHY

Withdrawal Gas dehydration unit which contains a 3.26 MMBTU/Hr glycol reboiler burner which is associated with SV-REBOILER. Emissions from the reboiler and the flash tank are controlled by a thermal oxidizer which is associated with SV-THERMOXIDIZER.

Due to the presence of high hydrocarbon content, the EU-WGDEHY does not use the glycol contact towers. Instead, it is using the JT system as described previously. Glycol is sprayed into the gas stream to absorb moisture prior to entering the JT valve. The wet glycol is reclaimed and reused; organic liquids are collected and sold; and waste gases are incinerated using a thermal oxidizer.

This facility does not use the organic gases from the flash tank as fuel for the reboiler because "gases are too wet". The vapors from the flash tank and reboiler are incinerated in the thermal oxidizer.

Emission Limits

Conditions 1.1a and 1.1b limits the NOx and VOC emissions to 5.14 tons per year and 2.57 tons per year based on 12-month rolling time period respectively. The records show that the total NOx emissions from this process (reboiler and TO) were 0.29 tons based on a 12-month rolling period as of February 2023 and the VOC emissions are 0.02 tons based on a 12-month rolling period as of February 2023. Facility provided electronic records of the emission calculations.

Material Usage Limits

The records show that the natural gas processed through the dehydration system was 13,632.1 MMscf as of February 2023 (12-month rolling) which is in compliance with the limit of 81,900 MMSCF based on a 12-month rolling period.

The natural gas fuel used in Glycol reboiler burner was 0.73 MMscf as of February 2023, (12-month rolling) which is in compliance with the annual limit of 28.0 MMscf based on a 12-month rolling time period.

The natural gas fuel used in thermal oxidizer is 3.21 MMscf as of February 2023, which is in compliance with the annual limit of 35.2 MMscf calculated based on a 12-month rolling time period.

Process/Operational Limits

The records show that glycol re-circulation rate for FGWGDEHY is below the permit limit of 26 gallons per minute. That capacity of the recirculation pump is set at 13 gpm. The normally the recirculation rate is between 3-5 gpm. The facility submitted of the records of the recirculation rates.

The PTI requires the facility to submit a malfunction abatement plan (MAP) for the operation of the thermal oxidizer. The most recent approvable MAP was received on September 14, 2020, which included the new thermal oxidizer.

Design/Equipment Parameters

The facility has installed the flash tank, and the thermal oxidizer (TO). The current TO was installed on October 16, 2020. The satisfactory operation of the TO requires it to have a minimum 95% (by weight) destruction efficiency and maintaining a minimum temperature of 1600 +/- 50oF and minimum retention time of 0.75 seconds. PTI No. 77-14C, SC IV.1 allows the facility, in lieu of a minimum temperature of 1600 °F ±50 degrees Fahrenheit, to use the temperature from the most recent approved destruction efficiency test as required by SC V.2. Satisfactory operation of the includes a minimum VOC control efficiency of 95% (by weight). (See discussion under SC V.2).

The facility has installed devices to continuously monitor and record temperature of the TO and monitor the natural gas usage in the glycol reboiler burner and thermal oxidizer.

Testing/Sampling

The facility is required to conduct natural gas analysis during withdrawal season. Recent sampling was performed on February10, 2023 (sample date: 2/7/2023), January 17, 2022 (Sample Date: 2/11/2022). The submitted records include the gas analysis results and GlyCalc report.

The facility is required to verify VOC destruction efficiency from the thermal oxidizer by testing at the owner's expense, in accordance with Department requirements, within 180 days of the permit issuance date. PTI No. 77-14A was approved on August 21, 2019. AQD-TPU received the test plan on October 15, 2019 and approved on November 15, 2019. The testing was conducted on December 17, 2019, and the report was received on January 29, 2020. The report showed that the TO achieved 95% DE at 1400oF.

On Wednesday, December 09, 2020, the facility conducted stack test to verify the destruction efficiency (control efficiency) and to determine the operating temperature that can meet the minimum control efficiency of the newly installed thermal oxidizer (TO) for the glycol dehydration unit, pursuant to SC V.2 of PTI No.77-14B. The test plan was received on September 17, 2020, and AQD-TPU approved on November 13, 2020. Report received on February 1, 2021. Showed that the newly installed TO achieved 95% DE at 1400oF.

The facility requested approval from AQD, pursuant to SC IV.2, to operate the TO, at 1400oF instead of 1600 +/- 50oF. AQD approved the request because the TO achieved 95% DE at the lower temperature.

The facility submitted TO operating records for March 2022 through February 26, 2023. During 2022-2023 withdrawal season, the TO was operated above the minimum operating temperature except during malfunctions, except for the following:

On Monday, March 6, 2023, the facility reported that:

In reviewing temperature data yesterday for the thermal oxidizer associated with EU-WGDEHY, it was noted the facility had four instances in which the temperature fell below the minimum operating temperature of 1400°F as required to operate in a satisfactory manner. (Permit No. 77-14C – Section EUWGDEHY IV.2.) Below is information on each of the four events in which the facility experienced an issue with the thermal oxidizer temperature falling below the minimum 1400°F.

11/18/2022 – 13:00 (1 hour duration)

The Facility was testing the low level switch on the system's liquid separator. This caused the thermal oxidizer to trip offline. The Facility promptly restarted the thermal oxidizer, so by 14:00, temperature was once again above 1400°F.

2/4/2023 – 23:00 (1 hour duration)

The Facility was adjusting the gas flow rate through the dehydration system. This quick change in flow rate tripped the thermal oxidizer on high temperature. The Facility promptly restarted the thermal oxidizer so by 00:00 on 2/5/2023, the thermal oxidizer was once again above 1400°F.

2/5/2023 – 02:00 (1 hour duration)

Similar to the event on 2/4/2023, the Facility was adjusting the gas flow rate through the dehydration system. The quick change in flow rate tripped the thermal oxidizer on high temperature. The Facility promptly restarted the thermal oxidizer so by 03:00, the thermal oxidizer was once again above 1400°F.

02/22/2023 – 17:00 through 02/23/2023 – 03:00 (11 hour duration)

Due to icy winter weather conditions in the evening of 02/22/2023, both the fire eye and the air intake for the thermal oxidizer were covered in ice and forced the thermal oxidizer to trip offline. The Facility worked expeditiously to remove the ice from both the fire eye and the air intake. By 04:00 on 02/23/2023, the Facility had successfully opened up the air intake to the thermal oxidizer. The temperature was once again restored above 1400°F.

The Facility has completed the emission calculations during these four events in which the thermal oxidizer temperature was below 1400°F.

The sum of emissions from these events does not exceed the VOC Permit Limitation of 2.57 tons/year as listed within EUWGDEHY I.2.

Following Michigan Administrative Code R.336.1912, the Facility is providing notification of these abnormal operating conditions of the thermal oxidizer associated with EUWGDEHY. As part of R336.1912 and Permit 77-14C General Condition 7, please advise if you would like a written report also submitted to provide additional detail of the abnormal conditions.

Because the facility, as indicated, did not exceed any VOC permit limits, no further reporting, pursuant to R912 was required.

The facility submitted TO testing protocol to determine the minimum combustion temperature that will achieve the required minimum VOC destruction efficiency of 95% (by weight) . The plan was received via email on November 11, 2022. The testing is scheduled for January 12, 2023. On January 11th, they plan to perform a temperature ladder test and determine the minimum temperature that is required to achieve the 95% by weight VOC destruction efficiency.

On January 10, 2023, the facility informed AQD of the cancellation of the testing because of the inability to operate the EU-WGDEHY at a maximum routine flow due to the mild winter weather conditions. The facility did not have a need to withdraw, and process stored gas.

Monitoring/Recordkeeping

The facility monitors the glycol recirculation rate and the natural gas processing rate, on a continuous basis. Mr. Westrick informed me that they calibrate the monitors as required.

Facility calculates NOx, VOC and BTEX emission rates from the EU-WGDEHY as necessary. It uses GRI-GLYCalc to calculate the VOC and BTEX emissions. It keeps adequate records of natural gas processing rate, wet gas composition, natural gas fuel usage, glycol recirculation rate, thermal oxidizer exhaust gas temperature, documentation for the vapor recovery unit, etc. as required by conditions VI.4.

The stack/vent dimensions were not verified. However, the stack appears to be in compliance with the requirements of special conditions VIII.1 and 2.

FG-ENGINES

Natural gas fired 4 stroke lean burn reciprocating internal combustion engines driving Compressors. Controlled with catalytic oxidation systems

(Unit 1- EUCOMPNORTH, Unit 3-EUCOMPWEST, Unit 4-EUCOMPEAST)

Emission Limits:

The conditions 1.1 through 1.9 include emission limits for NOx, CO and Formaldehyde, from the three engines. The stack tests show that these engines are in compliance with the emission limits.

Process/Operational Limits & Material Usage Limits:

Mr. Westrick informed me that they are burning pipeline quality natural gas in FG-ENGINES. The records show that the natural gas fuel usage for EU-COMPEAST and EU-COMPWEST together are 121.26 MMscf as of February 2023. This is in compliance with the permit limit of 323 MMSCF based on a 12-month rolling period.

Design/Equipment Parameters

This condition requires that the FGENGINES shall not be operated unless the catalytic oxidation system on each engine is installed, maintained and operated in a satisfactory manner. Satisfactory operation includes cleaning of the catalyst panels. Each of the engines is installed with a catalytic oxidation system.

Mr. Westrick told me that currently the catalysts are being sent out to be cleaned on an annual basis. The engines are also maintained (oil analysis every month, adjust burner settings, valve settings, compressor checks, etc.) annually. He informed me that they follow the requirements in the SC IV.1 for the catalyst maintenance. The facility submitted records of the catalyst cleanings for 2022 (7/1/2022, 7/26/2022).

Facility has been using all three engines during different times of the year. At the time of the inspection none of the engines were in use for the reasons described above.

Testing/Sampling

The facility is required to test each engine in FGENGINES for NOx and CO every 12 months. 2020 test was conducted on September 15, 2020 (plan received on July 16, 2020, approved on August 31, 2020, report received on November 14, 2020). 2021 test was conducted on September 28, 2021 (test plan received on July 13, 2021, approved on September 7, 2021. report received on November 16, 2021)

The 2022 stack test plan was received on July 12, 2022 and approved on September 2, 2022. The tests were conducted on September 13, 2022 and the report was received, via email, on November 11, 2022.

EU-COMPNORTH: CO ppmvd 15% O2 2022 Test Result = 0.354 NESHAP limit = 47

EU-COMPEAST: CO ppmvd 15% O2 2022 Test Result = 2.17 NESHAP limit = 47

EU-COMPWEST CO ppmvd 15% O2 2022 Test Result = 3.59 NESHAP limit = 47

EU-COMPNORTH: CO lb/hr 2022 Test Result = 0.00542 PTI limit = 0.4 lb/hr

EU-COMPEAST: CO lb/hr 2022 Test Result = 0.141 PTI limit = 1.85 lb/hr

EU-COMPWEST CO lb/hr 2022 Test Result = 0.243 PTI limit = 1.85 lb/hr

EU-COMPNORTH: NOx lb/hr 2022 Test Result = 1.05 PTI limit = 4.5 lb/hr

EU-COMPEAST: NOx lb/hr 2022 Test Result = 2.68 PTI limit = 7.4 lb/hr

EU-COMPWEST NOx lb/hr 2022 Test Result = 4.65 PTI limit = 7.4 lb/hr

The five-year stack tests for NOx, CO, and formaldehyde were conducted September 19-20, 2018. The plan was received on July 11, 2018 and approved on September 15, 2018. Test report was received on November 13, 2018. The reports show compliance with emission limits.

Monitoring/Recordkeeping

SC VI.1 requires facility to keep records of each measurement of NOx for each engine and keep on file for five years. The facility is keeping the emission measurement records.

SC VI.2 requires the facility to monitor the natural gas usage for EUCOMPEAST and EUCOMPWEST on a monthly basis. The facility is monitoring and keeping records as required.

SC VI.3 requires the facility to keep records of all maintenance on each catalytic system and keep records for five years. The facility is keeping necessary records. See attached.

Stack/Vent Restrictions

Stack dimensions were not verified at the time of the inspection, but stack dimensions appear to be in compliance with the requirements of Special Conditions VIII.1, 2 and 3.

Other Requirements:

SC IX.1 requires that all engines in FGENGINES comply with applicable requirements of 40 CFR 63, Subpart ZZZZ-NESHAP for RICE. See discussion under 40 CFR 63, Subpart ZZZZ- NESHAP for Reciprocating Internal Combustion Engines.

FG-FACILITY

Emission Limits:

SC I.1 through I.5 limit the annual emission rates for NOx, CO, VOC, Individual HAP and Total HAPs to 89.59 TPY, 43 TPY, 21.1 TPY, less than 10 TPY, less 25 TPY, respectively based on a 12-month rolling period. The records show that 12-month rolling period emissions for NOx, CO, VOC, Individual HAP and Total HAPs are 8.08 tons, 1.09 tons, 5.76 tons, Individual HAP (highest Individual HAP = formaldehyde) 0.54 tons, and 1.44 tons, respectively as of February 2023.

Material Limits:

SC II.1 limits facility wide natural gas usage to 1,048 MMscf based on a 12-month rolling period. The records show that the facility wide fuel usage is 132.31 MMscf as of February 2023.

Monitoring/Recordkeeping:

SC VI. 1 & 2 requires the facility to keep monthly, and 12-month rolling time period emission rate calculations for NOx, CO, VOC, single HAP and Total HAP and complete the calculations by the 30th of the calendar month. The facility is keeping adequate records and preparing calculations as necessary. They emailed the electronic records.

SC VI.3 requires the facility to keep monthly and 12-month rolling time period fuel usage for each emission unit in FGFACILITY. The facility is keeping adequate fuel usage records.

SC IXI.1 requires the facility to comply with all applicable provisions of federal New Source Performance Standards for New Stationary Sources as specified in 40 CFR 60, Subparts A, Dc and JJJJ. The facility is monitoring fuel gas usage, conducted the initial testing for NSPS RICE engine, etc. The facility appears to be compliance with the applicable NSPS requirements.

40 CFR 63, Subpart ZZZZ- NESHAP for Reciprocating Internal Combustion Engines

40 CFR 63.6590(a) (iii)-For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006. FG-ENGINES (EU-COMPNORTH, EU-COMPWEST, and EU-COMPEAST) and EU-GEN were installed prior to 2006 and are considered existing sources.

RICE MACT for existing RICEs (> 500 hp, 4-Stroke Lean Burn, Non-emergency, (operates more than 24 hrs/year) at area sources requires installation of an oxidation catalyst to reduce HAP emissions from the stationary RICE, install a CPMS to continuously monitor catalyst inlet temperature according to the requirements in 40 CFR 63.6625(b), or install equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F, conduct initial performance test or other initial compliance demonstration according to 40 CFR 63.6630(e) within 180 days after the compliance date (October 29, 2013). The RICE MACT also requires to demonstrate continuous compliance pursuant to 40 CFR 63.6640 and keep records as required in 40 CFR 63.6655.

EU-COMPNORTH, EU-GEN, EU-COMPWEST and EU-COMPEAST are subject to National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE), 40 CFR 63, Subpart ZZZZ (RICE MACT) located at an area source of HAP emissions. The compliance date for the facility was October 19, 2013. The MACT standards require initial testing for these engines which was done during August 13-15, 2013 and test report was received on September 23, 2014. Follow up annual tests, for EU-COMPNORTH, EU-COMPWEST and EU-COMPEAST are conducted, as required.

EU-145BHENG is subject to 40 CFR 63, Subpart ZZZZ which requires this RICE to comply with 40 CFR 60, Subpart JJJJ-NSPS for Spark Ignition RICEs. Complying with NSPS requirement is deemed compliance with MACT requirements.

The records submitted by the facility can be found at S:/Air Quality Division/STAFF/KALLUMKAL/2023 Inspections/N7303 BWGS

Conclusion: Bluewater Gas Storage appears to be compliance with the requirements of PTI No.77-14C. MIEGLE-AQD has not verified compliance with RICE MACT (40 CFR 63, Subpart ZZZZ) for area sources.

NAME Sebastian Kallumkal DATE 04/18/2023 SUPERVISOR Joyce