

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

B663668480

<b>FACILITY:</b> Consumers Energy - Ray Compressor Station		<b>SRN / ID:</b> B6636
<b>LOCATION:</b> 69333 OMO RD., ARMADA		<b>DISTRICT:</b> Warren
<b>CITY:</b> ARMADA		<b>COUNTY:</b> MACOMB
<b>CONTACT:</b> Amy D. Kapuga , Principal Environmental Engineer		<b>ACTIVITY DATE:</b> 11/15/2022
<b>STAFF:</b> Noshin Khan	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> scheduled on-site inspection		
<b>RESOLVED COMPLAINTS:</b>		

On Tuesday, November 15, 2022, I, Noshin Khan, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff, performed a scheduled, on-site inspection of Consumers Energy Company – Ray Compressor Station located at 69333 Omo Road, Armada, Michigan 48005 (SRN: B6636). The purpose of the inspection was to determine the facility’s compliance status with the requirements of the federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 Public Act 451, as amended (Act 451); the AQD administrative rules, and the conditions of Renewable Operating Permit (ROP) Number MI-ROP-B6636-2020a.

Sebastian and I arrived at the facility at 9AM and met with Consumers staff Amy Kapuga, Senior Environmental Engineer; Tom Fox, Field Environmental Coordinator; and Fred Harvey, Field Leader, to discuss the facility’s operations. Ray Compressor Station is a natural gas storage and transmission facility that uses natural gas to fuel emissions units including reciprocating internal combustion engines (RICE), turbines, boilers, and heaters. Natural gas is injected underground between April and November and withdrawn for distribution between November and March. During our inspection, the facility was in the process of switching operations to withdrawal of natural gas from the storage fields, but the process was not yet running. The operating hours for the station are 6:30AM-3PM, and 11 employees are assigned to the station.

According to Consumers staff, Plant 1 will be undergoing demolition in the near future as it is no longer in use. The engines that were previously in Plant 1 were decommissioned and removed from the facility’s ROP. During the facility walkthrough, Sebastian and I observed caps on gas lines associated with the engines of this plant.

Below, I discuss compliance with permit conditions by emission unit (EU) and flexible group (FG) as organized in MI-ROP-B6636-2020a.

### EUENGINE2-7

This emission unit is a RICE that drives a compressor to compress natural gas for transportation between the storage field and the pipeline system. It has not operated since September 2018 and, according to Consumers staff, the engine’s gas supply was cut and capped on October 27, 2022. During the facility walkthrough, Sebastian and I observed that the gas lines associated with this engine were cut and capped.

In January 2023, Consumers Energy applied for a minor modification to MI-ROP-B6636-2020a. The changes included removal of EUENGINE2-7, EUTURBINE2-5, and EUTURBINE2-6 and their associated conditions from the ROP since these emission units were decommissioned and removed. MI-ROP-B6636-2020b was issued on April 17, 2023 with these changes.

## EUDEHY3

This is a glycol dehydration system consisting of a natural gas-fired reboiler, still column, two contact towers, a surge tank, and a flash tank. This system processes natural gas drawn from the storage field to remove moisture from the gas.

**I.1, I.2, VI.4:** Emission limit Special Conditions (S.C.) I.1 and I.2 set VOC emission limits of 4.2 lb/hr and 18.2 tons per year (tpy) based on a 12-month rolling time period as determined at the end of each calendar month.

In accordance with S.C. VI.4, Amy Kapuga provided VOC emission calculations. These include hourly emission rates determined using the GRI-GLYCalc software, monthly emissions in tons, and 12-month rolling emissions in tpy. Amy confirmed that results from the most recent wet gas analysis are used as inputs in GRI-GLYCalc. According to the provided records, between September 2021 and October 2022, Plant 3 operated only in February, March, and April of 2022.

The highest VOC emission rate during this period was 0.2058 lb/hr as determined using GRI-GLYCalc for April 2022. The highest monthly VOC emissions were 0.0502 tons in March 2022. The highest 12-month rolling VOC emissions were 0.1041 tpy as calculated in April 2022. The facility is in compliance with these conditions.

**I.3, V.2:** S.C. I.3 sets a NO<sub>x</sub> emission limit of 1.3 lb/hr. The AQD has not requested testing, per S.C. V.2, to verify the NO<sub>x</sub> emission rate from EUDEHY3.

**I.4, VI.3, VI.4, VI.7:** S.C. I.4 sets a benzene emission limit of less than 0.9 megagrams (Mg) per year based on a 12-month rolling time period as determined at the end of each calendar month.

Amy confirmed that the GRI-GLYCalc software (S.C. VI.3.a) is used to determine benzene emissions and provided monthly and 12-month rolling benzene emission calculations in accordance with VI.4 and VI.7.

The highest benzene emission rate in lb/hr for Plant 3 from September 2021 through October 2022 was 0.0158 lb/hr as determined using GRI-GLYCalc for April 2022. The highest monthly emissions were 0.0036707 tons in March 2022. The highest 12-month rolling benzene emissions were 0.0074 Mg/year as calculated in April 2022. The facility is in compliance with these conditions.

**I.5, I.6, V.3:** S.C. I.5 and I.6 set NO<sub>x</sub> and VOC emission limits of 0.098 lb/MMBTU and 0.0054 lb/MMBTU, respectively, for the reboiler associated with EUDEHY3. The AQD has not requested testing, per S.C. V.3, to verify the NO<sub>x</sub> and VOC emission rates from the reboiler.

**III.1:** During the pre-inspection meeting, Consumers staff told me that stripping gas is not used in EUDEHY3, in compliance with this condition.

**III.2, IV.2, VI.2, VI.5:** According to Consumers staff, the facility operates the thermal oxidizer combustion chamber at a set point of 1600°F to meet the minimum temperature of 1400°F and minimum retention time of 0.5 seconds required by S.C. III.2. Per S.C. VI.2, the facility maintains a device that monitors the temperature in the combustion chamber of the thermal oxidizer on a continuous basis.

S.C. IV.2 defines satisfactory operation of the thermal oxidizer as having a minimum VOC destruction efficiency of 98% by weight, maintaining a minimum combustion chamber temperature of 1400°F, and maintaining a minimum retention time of 0.5 seconds. Amy provided a manufacturer operation and maintenance manual for the thermal oxidizer which indicates a destruction efficiency of 99.5%. During the inspection, staff provided me a copy of maintenance procedures for the thermal oxidizer that indicate that the thermocouple is calibrated annually. According to Amy, an Ametek Sensor Teset & Calibration Hot Box is used to do this calibration.

Records provided for plant hours of operation show that between September 2021 and October 2022, Plant 3 operated in February, March, and April of 2022. Amy provided the Plant 3 thermal oxidizer stack temperature records for this time period as required by S.C. VI.5. I discuss compliance with the minimum required operating temperature for the facility's thermal oxidizers in section FGDEHYHHH.

**III.3:** In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for the Plant 3 glycol dehydration system. This plan includes equipment covered by the PM/MAP, operating variables to be monitored, malfunction event procedures, a preventative maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP.

**IV.1:** During the pre-inspection meeting, Consumers staff explained that glycol dehydrator flash tank exhaust gas is directed to the reboiler combustion unit or to the thermal oxidizer for destruction, in compliance with this condition.

**V.1, VI.6:** As required by S.C. VI.6, the facility keeps records of wet gas composition determined through required annual wet gas analysis. Amy provided the analytical results from the test performed on February 10, 2022. The results include analysis for nitrogen, carbon dioxide, hydrogen sulfide, C1-C6 series hydrocarbons, benzene, toluene, xylene, ethylbenzene, and heptanes plus, as required by S.C. V.1.

**VI.8:** In accordance with this condition, Amy provided records for maintenance, tune-ups, and testing done on the reboiler burner for EUDEHY3. The provided record indicates these actions were performed on December 18, 2020.

#### **EUAUXGEN2-7**

This is a natural gas-fired emergency generator subject to 40 CFR 63 Subpart ZZZZ. I observed this unit during my inspection and observed that the nameplate listed a rating of 750 kW and 800 horsepower. The ROP description lists a maximum heat input of 7.1 MMBtu/hr and rated output of 1085 BHP.

**III.1, VI.1, VI.2, IX.1:** Amy provided a copy of the emergency generator use log which indicates the reason for operation, amount of time in operation, and the generator hour meter reading, in compliance with VI.1 and VI.2. During the inspection, I observed the non-resettable hour meter and it read 640 hours. The log shows that between October 2020 and November 2022, the generator operated for 6 hours, which is below both the 50 hours (for non-emergency) and 100 hours (for

maintenance and testing) per year limits set by 40 CFR 63 Subpart ZZZZ, indicating compliance with the rule.

### EUEMERGGEN3

As described in the permit, this is a natural gas-fired RICE emergency generator with Lo-NOx combustion technology and a maximum rated heat input of 12.25 MMBtu/hr. I observed this unit during my inspection and observed a rating of 1818 HP on the nameplate, which matches the description in the ROP.

**I.1-I.5, V.1, V.2, VI.2, VII.4, IX.1:** The facility provided records from the initial emissions compliance demonstration performed on March 28, 2014 (per S.C. V.1), the most recent test summary report from 2020 (per S.C. V.2), and EUEMERGGEN3 maintenance records, in accordance with S.C. VI.2. In accordance with the timeline in S.C. V.2, the facility performed 2023 testing on the unit on September 7. Amy provided a copy of the initial notification, dated April 2, 2023, required by S.C. VII.4.

S.C. I.1 sets a NOx emission limit of 0.5 g/HP-hr; I.3 sets a NOx emission limit of 2.0 g/HP-hr in accordance with 40 CFR 60 Subpart JJJJ. The 2020 compliance test showed a NOx emission rate of 0.3 g/HP-hr, in compliance with both limits.

S.C. I.2 sets a VOC emission limit of 0.81 g/HP-hr; I.5 sets a VOC emission limit of 1.0 g/HP-hr in accordance with 40 CFR 60 Subpart JJJJ. The 2020 compliance test showed a VOC emission rate of 0.36 g/HP-hr, in compliance with both limits.

S.C. I.4 sets a CO emission limit of 4.0 g/HP-hr in accordance with 40 CFR 60 Subpart JJJJ. The 2020 compliance test showed a CO emission rate of 1.4 g/HP-hr, in compliance with this condition.

**III.1, III.4, VI.1, IX.1, IX.2:** S.C. III.1 sets a limit of 500 hours of operation per 12-month rolling time period as determined at the end of each calendar month. Amy provided records for monthly and 12-month rolling hours of operation of EUEMERGGEN3, in compliance with S.C. VI.1. The generator log provided indicates the date of operation, the reason for operation (including emergency or non-emergency use), and the total time of operation. From September 2021 through November 2022, the highest 12-month rolling hours of operation was 47.75 hours as calculated in November 2022 and indicates compliance with S.C. III.1. Between August 17, 2021 and November 30, 2022, the generator operated for 41 hours, including both emergency and non-emergency use. This is below the 50 hours (for non-emergency) and 100 hours (for maintenance and testing) per year limits set by 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart JJJJ, and listed in S.C. III.4.

**III.2, VI.3:** During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in the generator in compliance with S.C. III.2. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that "gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet." Based on this record provided in accordance with S.C. VI.3, the facility is meeting the requirements for these conditions.

**III.3:** In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for EUEMERGGEN3. This plan includes



equipment covered by the PM/MAP, engine operation procedures, malfunction event procedures, a maintenance schedule, and record retention procedures.

**IV.1:** During the facility walkthrough, I observed a non-resettable hour meter on the generator. I observed a reading of 258 hours.

### EUBOILER3

This natural gas-fired boiler is rated at a maximum heat input of 12.25 MMBtu/hr, according to the permit, and is used for building heat and hot water according to Consumers staff. I observed this unit during the inspection and the nameplate read a maximum gas firing rate of 11,694,000 Btu/hr, which is consistent with the maximum heat input listed in the ROP.

**I.1, I.2, V.1:** These conditions set a NO<sub>x</sub> emission limit of 0.43 lb/hr and a VOC emission limit of 0.05 lb/hr. Testing for verification of these emission rates has not been requested by the AQD per S.C. V.1. Recordkeeping condition VI.5, discussed below, is used to evaluate compliance with S.C. I.1. Recordkeeping condition VI.6, also discussed below, is used to verify compliance with S.C. I.1 and I.2. These records indicate that the facility is in compliance with the emission limits.

**III.1, VI.3:** During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in the boiler in compliance with S.C. III.1. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that “gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet.” Based on this record provided in accordance with S.C. VI.3, the facility is meeting the requirements for these conditions.

**III.2:** In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for the Plant 3 heating boiler. This plan includes equipment covered by the PM/MAP, boiler operating variables to be monitored, boiler malfunction event procedures, a preventative maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP.

**IV.1, VI.2, VI.4, IX.1:** The facility maintains a device to monitor and record the natural gas usage for EUBOILER3 on a monthly basis in compliance with S.C. IV.1, and Amy provided these records in compliance with S.C. VI.2 (and underlying rules 40 CFR 60 Subparts A and Dc) and VI.4. The records show that from September 2021 through October 2022, the highest EUBOILER3 fuel use was 3,005.10 MSCF in February 2022. The highest 12-month rolling fuel use in this period was 15,402.87 MSCF as calculated in September 2021.

**IV.2, VI.5:** During the pre-inspection meeting, Consumers staff confirmed that EUBOILER3 is equipped with a low NO<sub>x</sub> burner in compliance with S.C. IV.2. Amy provided a vendor data sheet for the boiler which states that “the low NO<sub>x</sub> burner is capable of meeting EPA testing for an emission limit of 0.035 lb NO<sub>x</sub>/MMBtu,” indicating compliance with S.C. VI.5.

**VI.6:** In compliance with this condition, Amy provided records for maintenance, tune-ups, and testing performed on the boiler. The records show that these activities were performed on December 20, 2021 and November 17, 2022.

### FGTURBINES

This flexible group is associated with emission units EUTURBINE2-5 and EUTURBINE2-6, which are two natural gas-fired turbine engines that drive compressors to compress natural gas for transportation between the storage field and pipeline system. According to Consumers staff, these turbines have not operated since July 2020, and both were cut and capped on October 27, 2022. Sebastian and I observed that the gas lines associated with these units were cut and capped during our walkthrough.

### FGLOADLIMIT

This flexible group is also associated with EUTURBINE2-5 and EUTURBINE2-6. Both of these emission units in addition to FGTURBINES and FGLOADLIMIT were removed from the ROP as of April 17, 2023.

### FGENGINES3

Per the description in the ROP, these are five natural gas fired, spark ignition, four-stroke lean burn, reciprocating internal combustion engines that drive compressors to compress natural gas for transportation between the storage field and pipeline system; each has a maximum rated heat input of 32 MMBtu/hr and rated output of 4,735 horsepower. I observed these units during the inspection but did not observe the nameplates to see if they are consistent with the ROP description.

**I.1-I.7, IV.1, V.6, VI.11:** In accordance with recordkeeping requirement S.C. VI.11, Amy provided a copy of the most recent test results for emissions testing required by S.C. V.6 of the engines in this flexible group for evaluation of compliance with ROP emission limits (S.C. I.1-I.7), 40 CFR Part 63, Subpart ZZZZ, and 40 CFR Part 60, Subpart JJJJ. This test was performed on June 15-17, 2021, for Engines 3-1, 3-2, 3-3, and 3-4, and on July 13, 2021 for Engine 3-5.

S.C. I.1, I.2, and I.4 establish the following limits:

NOx: 0.5 g/HP-hr

CO: 0.2 g/HP-hr

VOC: 0.19 g/HP-hr

S.C. I.5-I.7 and 40 CFR 60 JJJJ establish the following limits:

NOx: 1.0 g/HP-hr

CO: 2.0 g/HP-hr

VOC: 0.7 g/HP-hr

S.C. I.3, IV.1.a, IV.1.b, and 40 CFR 63 ZZZZ establish the following requirements:

≥93% CO reduction

Catalyst pressure drop change: less than 2 inches from initial

Catalyst inlet temperature (°F): 450-1350

Below are the results for each engine:

EUENGINE3-1:

NOx: 0.36 g/HP-hr

CO: 0.04 g/HP-hr

VOC: 0.01 g/HP-hr

97.8% CO reduction  
Catalyst pressure drop change: 0.4 inches  
Catalyst inlet temperature: 841°F

EUENGINE3-2:  
NOx: 0.31 g/HP-hr  
CO: 0.01 g/HP-hr  
VOC: <0.024 g/HP-hr  
99.2% CO reduction  
Catalyst pressure drop change: 0.3 inches  
Catalyst inlet temperature: 860°F

EUENGINE3-3:  
NOx: 0.39 g/HP-hr  
CO: 0.03 g/HP-hr  
VOC: 0.02 g/HP-hr  
98.7% CO reduction  
Catalyst pressure drop change: 0.2 inches  
Catalyst inlet temperature: 817°F

EUENGINE3-4:  
NOx: 0.41 g/HP-hr  
CO: 0.06 g/HP-hr  
VOC: 0.02 g/HP-hr  
96.7% CO reduction  
Catalyst pressure drop change: 0.2 inches  
Catalyst inlet temperature: 844°F

EUENGINE3-5:  
NOx: 0.37 g/HP-hr  
CO: 0.04 g/HP-hr  
VOC: <0.02 g/HP-hr  
97.8% CO reduction  
Catalyst pressure drop change: 0.1 inches  
Catalyst inlet temperature: 846°F

The results indicate compliance with the above conditions.

**II.1, VI.12:** During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in FGENGINE3 in compliance with S.C. II.1. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that “gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet.” Based on this record provided in accordance with S.C. VI.12, the facility is meeting the requirements for these conditions.

**III.3:** In accordance with this condition, Amy provided a copy of the Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for the Plant 3 compressor engines. This plan

includes equipment covered by the PM/MAP, engine and oxidation catalyst operating variables to be monitored, engine and oxidation catalyst malfunction event procedures, emission check procedures, an oxidation catalyst maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP.

**III.5, VI.1, IX.1:** S.C. VI.1 requires the permittee to maintain a continuous parameter monitoring system (CPMS) for each stationary RICE in FGENGINES3. S.C. III.5 requires a site-specific monitoring plan that addresses oxidation catalyst parameter monitoring system design, data collection, and quality assurance. Amy provided a copy of this plan for the CPMS associated with FGENGINES3. The plan includes sections discussing design specifications for monitoring system equipment, catalyst temperature measurement locations, the data acquisition system, periodic quality assurance/quality control procedures, recordkeeping and reporting procedures, and a program of corrective action for a malfunctioning CPMS.

**IV.2, VI.2, VI.3, VI.5, VI.6, VI.7:** In compliance with these conditions, the CPMS collects oxidation catalyst temperature data at least once every 15 minutes, and the facility maintains records for 4-hour rolling average catalyst inlet temperature. Amy provided temperature records that show that the CPMS records the pressure drop across the catalyst and the catalyst temperature every 15 minutes when an engine operates, and provided a record of the 4-hour rolling values. Due to the format of the data in the spreadsheet provided, I was unable to verify compliance with the pressure drop and 4-hour rolling average temperature limits. Overall, the pressure drop appears to be within 2 in. H<sub>2</sub>O from the pressure drop measured during the performance test, and the 4-hour rolling average temperature appears to be maintained between 450F and 1350F.

In compliance with S.C. VI.6, Amy provided records of 2022 compliance notifications and reports for 40 CFR Part 60, Subpart JJJJ, and 40 CFR Part 63, Subpart ZZZZ. She also provided 2022 maintenance records for the annual CPMS catalyst transducer calibration for each engine. Amy confirmed that these annual calibrations include accuracy audits which ensure that the temperature monitors meet the requirements in 40 CFR 63.6625(b)(4).

**VI.8:** Amy provided records of maintenance activities conducted according to the PM/MAP for FGENGINES3 in compliance with this condition. Records include 2022 maintenance activities performed on the engines such as oil and coolant changes and cylinder troubleshooting for Engine 3-3.

**VI.9:** Amy provided monthly fuel use records for each engine from September 2021 through October 2022 in compliance with this condition. The record shows that the highest monthly fuel use in Engine 3-1 was 20,458 million cubic feet (MCF) in September 2022; for Engine 3-2 it was 25,604 MCF in August 2022; for Engine 3-3 it was 12,456 MCF in August 2022; for Engine 3-4 it was 13,978 MCF in August 2022; for Engine 3-5 it was 22,049 MCF in August 2022.

**VI.10:** I asked Amy to provide records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b) as required by this condition. She reported that no malfunctions have occurred between September 2021 and October 2022.

FGGLYCDEHYDS

Glycol dehydrators are used to remove hydrocarbons and moisture that the natural gas absorbs while underground. The saturated glycol that comes out of the dehydrators goes to a 3-phase separator with a flash tank to remove entrained gas and hydrocarbon liquid, then through filters, and the resulting lean glycol is recirculated back to the glycol contact towers. Emissions from the flash tank are directed to a thermal oxidizer or reboiler.

This flexible group is associated with EUGLYCDEHYD01 and EUGLYDEHYD02. I observed these units and associated thermal oxidizers during my inspection. I did not inspect the temperature monitors. Gas was not being processed during our visit.

**I.1-I.3, V.1-V.4, VI.1:** In compliance with S.C. VI.1, Amy provided annual VOC and benzene emission calculations for each glycol dehydration unit process, based on a 12-month rolling period. In accordance with S.C. V.1-V.4, the facility conducts an analysis of the wet gas stream annually to determine the composition of the gas processed through the glycol dehydration units, and GRI-GLYCalc software is used to calculate VOC and benzene emission factors each time the natural gas is analyzed.

The records provided show that from September 2021 through October 2022, Plant 1 and 2 operated from January through April. In this time period, the highest monthly VOC emissions for EUGLYCDEHYD01 and EUGLYCDEHYD02 combined was 0.0305 tons in March 2022. The highest 12-month rolling VOC emissions for the two units combined was 0.0661 tpy as calculated in April 2022. This is below the 12.0 tpy limit specified in S.C. I.2. The highest GRI-GLYCalc VOC emission factor for EUGLYCDEHYD01 was 0.116 lbs/hr, calculated in March 2022. Using this value to calculate a daily VOC emission factor, assuming operation for 24 hours, gives a value of 2.78 lbs/day. For EUGLYCDEHYD02, the highest emission factor was 0.087 lbs/hr, calculated in March 2022, and gives a daily emission factor of 2.09 lbs/day. Combining these two daily emission factors gives a combined VOC emission factor of 4.87 lbs/day, which is below the 71.0 lbs/day limit specified by S.C. I.1 for both units combined.

The highest monthly benzene emissions for EUGLYCDEHYD01 were 0.0015 tons in March 2022, and the highest 12-month rolling emissions were 0.0028 Mg/year as calculated in April 2022. This is below the 0.90 Mg/year limit specified in S.C. I.3.

The highest monthly benzene emissions for EUGLYCDEHYD02 were 0.0008 tons in March 2022, and the highest 12-month rolling emissions were 0.0020 Mg/year as calculated in January 2022. This is below the 0.90 Mg/year limit specified in S.C. I.3.

**III.1:** During the inspection, Consumers staff confirmed that stripping gas is not used in the glycol regenerator stills in compliance with this condition.

**IV.1-IV.4, VI.3:** These conditions require that the glycol dehydration units are not operated unless the thermal oxidizers are maintained and operated in a satisfactory manner, which is defined by maintaining a daily average minimum combustion chamber temperature of 1400°F and a minimum retention time of 0.5 seconds (IV.3). In accordance with S.C. IV.2, the facility operates a device to monitor and record the combustion chamber temperature for each thermal oxidizer every 15 minutes. As discussed under EUDEHY3 S.C. IV.1, flash tank off-gas is burned in the glycol dehydration reboiler combustion units or thermal oxidizer, in compliance with S.C. IV.4.

Amy provided monitoring records in accordance with S.C. VI.3 for thermal oxidizer combustion chamber temperature for each glycol dehydration unit. Compliance with the minimum operating temperature is discussed in section FGDEHYHHH.

**VI.2:** This condition requires that the facility maintain records of annual natural gas throughput to meet underlying requirements of 40 CFR Part 63, Subpart HHH. Amy provided a memorandum dated December 15, 2005, which explains that 40 CFR 60.1270(a) allows the use of facility design maximum natural gas throughput as an alternative to 40 CFR 60.1270(a)(1) and (2), and that previous permit to install documents show that Ray Compressor is limited in volume to 40.0 billion cubic feet of working gas cyclic capacity.

#### FGDEHYHHH

40 CFR Part 63 Subpart HHH applies to natural gas transmission and storage facilities that are major sources of HAP emissions, and affected sources include glycol dehydration units. The conditions of this flexible group apply to EUGLYCDEHYD01, EUGLYCDEHYD02, and EUDEHY3.

**I.1, III.3, IV.2, V.2:** The facility is required to operate thermal oxidizers at or above a minimum temperature determined during testing required by S.C. V.2 for compliance with BTEX emission limits. Amy provided a copy of results for the most recent BTEX tests performed in December 2019 for EUDEHY3 and January 2020 for EUGLYCDEHYD01 and EUGLYCDEHYD02. The following are the BTEX concentrations, emissions, and minimum combustion chamber temperature for each glycol dehydrator control:

##### EUGLYCDEHYD01:

BTEX Compound Concentrations (ppmv): < 0.07

BTEX Emission Rate (Mg/year): < 0.01

BTEX Emission Limit (Mg/year): 2.1

Minimum Combustion Chamber Temperature (°F): 1553

##### EUGLYCDEHYD02:

BTEX Compound Concentrations (ppmv): < 0.06

BTEX Emission Rate (Mg/year): < 0.01

BTEX Emission Limit (Mg/year): 1.8

Minimum Combustion Chamber Temperature (°F): 1538

##### EUDEHY3:

BTEX Compound Concentrations (ppmv): < 0.06

BTEX Emission Rate (Mg/year): < 0.02

BTEX Emission Limit (Mg/year): 1.9

Minimum Combustion Chamber Temperature (°F): 1530

**III.2-III.3, IV.3-IV.4, VI.3:** Per S.C. III.3, the facility is required to operate the thermal oxidizers at the minimum temperatures noted above, based on daily average temperatures (S.C. III.2), to be considered in compliance with thermal oxidizer performance requirements. The facility is required to continuously monitor and record the temperature on the thermal oxidizers (IV.3-IV.4) and calculate the daily average temperature. In accordance with S.C. VI.3, Amy provided thermal oxidizer stack temperature records for Plants 1, 2, and 3, including continuous monitoring records



(recorded every 15 minutes) and daily average temperature calculations for periods when the glycol dehydration units were operating.

The data for Plant 1 indicates that the facility operated the thermal oxidizer in accordance with performance requirements. Daily average temperatures were above the minimum temperature established during testing.

The data for Plant 2 shows that there were 19 days in January, February, and March of 2022 where the daily average temperature was below the minimum required operating temperature.

The data for Plant 3 shows that the thermal oxidizer operated below the minimum required temperature on March 16, March 27, and March 28, 2022.

The facility reported the deviations seen in Plant 2 and Plant 3 as a part of their ROP Semiannual Reporting, dated September 9, 2022. This report was processed by former AQD staff, Bob Elmouchi, on October 7, 2022. In the report, the facility provides the following reasons for the deviations:

For Plant 2, a bearing that helps control the air-to-fuel ratio for the fuel train was going bad, which caused the combustion chamber temperature to vary throughout the day. The bearing was replaced.

For Plant 3, a plugged strainer on the fuel gas regulator caused the daily average combustion chamber temperature to fall below 1400°F on March 16, 2022. The fuel line was cleaned before the unit was placed back into service, and the facility's maintenance plan was updated to include a check on strainers. On March 27 and 28, ice buildup on the air inlet resulted combustion chamber temperatures below the required minimum of 1530°F.

According to the report, no alarms were triggered because unit-specific operating limits hadn't been updated in the system's logic. In response, the facility increased the set point on the temperature controllers for the combustion chambers and adjusted alarm settings to trigger sooner. GRI-GLYCalc was utilized to verify that VOC and benzene emission limits were not exceeded for any of the above incidents. According to Amy, for the days of these excursions the control factor was removed when calculating the emissions using GRI-CLYCalc.

These excursions were incidents of noncompliance with EUDEHY S.C. III.2 and IV.2, and FGDEHYHHH S.C. III.2 and III.3. A violation was not issued at the time because AQD staff determined that appropriate corrective actions were made and, per the facility, VOC and benzene emissions were not exceeded.

**III.4:** Amy provided a copy of the site-specific monitoring/quality control plan for the CPMS associated with the glycol dehydrators on site. As required by the condition, the plan includes descriptions and design specifications for CPMS equipment, monitoring and quality assurance/quality control procedures, CPMS operation and maintenance procedures, data management procedures, and CPMS malfunction procedures.

**IV.1, V.1, VI.7-VI.13:** S.C. IV.1 requires that process vents are connected to control devices through a closed vent system, which should be operated with no detectable emissions. S.C. VI.7-VI.13 specify inspection requirements for each closed-vent system, except for parts that are designated as unsafe or difficult to inspect. According to Amy, no parts are designated as unsafe or difficult to

inspect. Amy provided a copy of the work order for the annual “no detectable emissions” inspection required by S.C. V.1 that was performed on March 6, 2022. The report showed that leaks were not detected for any components for the glycol dehydrators.

**VI.1:** In accordance with this condition, Amy provided a log for January 2022 through October 2022 showing the flow rate of natural gas, in million standard cubic feet per day (MMscfd), to each glycol dehydration unit. The log indicates whether the dehydrators were operating and processing gas each day, and includes the hours operated each day.

**VI.2, IX.1:** S.C. VI.2 requires the permittee to maintain records of the annual facility natural gas throughput. As discussed under FGGLYCDEHYDS VI.2, and per S.C. IX.1, the facility uses the design maximum natural gas throughput to estimate the maximum potential emissions as an alternative to calculating the annual maximum natural gas throughput.

**VI.5, VI.18:** Amy provided records for CPMS maintenance operation, including work orders for maintenance on dehydration unit equipment and thermal oxidizer calibration. Maintenance activities for various components of the dehydration equipment include inspection, pressure testing, cleaning, and greasing bearings. These activities were performed in September and October 2022. Thermal oxidizer calibrations were performed on August 24, 2022 for Plant 3; September 12, 2022 for Plant 2; and September 13, 2022 for Plant 1. Amy confirmed that these annual calibrations include accuracy audits which ensure that the temperature monitors meet the requirements in 40 CFR 63.1283(d)(3)(i)(A).

**VI.21:** The facility is required to maintain records of occurrence and duration of each malfunction of process equipment, pollution control equipment, and monitoring equipment. Based on the facility's reporting of the temperature excursions discussed, these records are maintained.

### FGPIPEHEATERS3

This flexible group applies to EUPIPEHEATER31 and EUPIPEHEATER32, which are natural gas-fired pipeline heaters equipped with low NOx burners and rated at maximum heat input of 18 MMBTU/hr, each. I observed these units during my inspection but did not verify if the nameplates match the descriptions in the ROP.

**I.1, I.2, V.1:** S.C. I.1 and I.2 specify NOx and VOC emission limits of 0.9 lb/hr for each pollutant. The AQD has not requested testing per S.C. V.1 to verify compliance with these emission rates. Recordkeeping condition VI.6, discussed below, is used to verify compliance with S.C. I.1. Recordkeeping condition VI.7, also discussed below, is used to verify compliance with S.C. I.2. Based on the records provided, the facility is in compliance with the emission limits.

**III.1, VI.4:** During the pre-inspection meeting, Consumers staff confirmed that only natural gas is burned in the pipe heaters in compliance with S.C. III.1. Amy provided a tariff sheet that lists gas quality requirements, including a requirement that “gas shall not contain more than 5.0 grains of total sulfur (including hydrogen sulphide and mercaptan sulfur) per 100 cubic feet.” Based on this record provided in accordance with S.C. VI.4, the facility is meeting the requirements for these conditions.

**III.2:** In accordance with this condition, Amy provided a copy of the PM/MAP for the Plant 3 line heaters. This plan includes equipment covered by the PM/MAP, operating variables to be

monitored, malfunction event procedures, a preventative maintenance schedule, a spare parts inventory, supervisory personnel responsible for maintenance, record retention procedures, and procedures for updates/revisions of the PM/MAP.

**IV.1, VI.1, VI.3, VI.5:** The facility is required by these conditions and 40 CFR Part 60 Subparts A and Dc to maintain a device to monitor and record the monthly natural gas usage for EUPIPEHEATER31 and EUPIPEHEATER32. I did not observe this device during my walkthrough. In accordance with these conditions, Amy provided a record of the monthly and 12-month rolling fuel use for the pipe heaters individually and combined. The highest monthly fuel use in FGPIPEHEATERS from January 2021 through October 2022 was 7978.29 MSCF in February 2022.

**VI.6:** Amy provided a copy of the manufacturer's guarantee for the pipe heaters to demonstrate that each low-NOx burner is designed to emit no more than 0.05 lb NOx per million Btu of heat input, in accordance with this condition. The manufacturer is GasTech Engineering, LLC according to this document.

**VI.7:** Amy provided copies of pipe heater tune-up work orders for 2021 and 2022. Tune-ups were performed on September 20, 2021 and November 14, 2022.

#### FGBLRMACT

The conditions of this flexible group apply to EUPIPEHEATER31, EUPIPEHEATER32, and EUBOILER3.

**III.2, VI.1:** Amy provided notification records submitted for compliance with 40 CFR 63 Subpart DDDDD. The annual compliance report for January 1, 2021 through December 31, 2021 shows that annual tune-ups required by S.C. III.2 were done on December 20, 2021 for EUBOILER3, and on September 20, 2021 for EUPIPEHEATER31 and EUPIPEHEATER32. 2022 tune-ups were performed on November 17 for EUBOILER3 and November 14 for EUPIPEHEATER31 and EUPIPEHEATER32.

**VI.2.** I asked Amy to provide records for the hours per calendar year that alternative fuel was burned and total hours per calendar year that units operated during periods of curtailment or gas supply emergencies. According to Amy, none of these situations occurred.

#### FGBLRMACTSMALL

The conditions of this flexible group apply to new and existing boilers and process heaters with a heat input capacity of < 10 MMBtu/hr. I observed EUPIPEHTR1, EUPIPEHTR2, EUPIPEHTR3, and EUPIPEHTR4 during my inspection, which were identical and read a maximum heat input of 6 MMBtu/hr on the nameplates. This is consistent with the description in the ROP.

**III.4-III.5, VI.1:** Amy provided notification records for compliance with 40 CFR 63 Subpart DDDDD. The biennial compliance report for January 1, 2020 through December 31, 2021 indicates that tune-ups were done on January 7, 2020 for EUPIPEHTR1 and EUPIPEHTR2, and on December 6, 2019 for EUPIPEHTR3 and EUPIPEHTR4. According to Amy, EUPIPEHTR1 and EUPIPEHTR2 were tuned up on March 8, 2022; EUPIPEHTR3 and EUPIPEHTR4 were tuned up on March 9, 2022, for compliance with tune ups once in a two-year period for units rated between 5 and 10 MMBtu/hr.

As found in AQD files, reporting dated March 12, 2021 for the ROP Annual Certification of Compliance and ROP Semiannual (second half) includes Annual and 5-year Industrial Boiler MACT

Compliance Reports. The 5-year compliance report for the reporting period of January 1, 2016 through December 31, 2020 (63.7550(b) & (c)) lists the last tune-up date for boiler and heater units rated less than 5 MMBtu/hr: EUAUXBLR2-7(12/08/2020), EUFGHEATER,(10/20/2020) EUFGHTR-P1 (10/21/2020), EUDEHYBLR1(12/14/2020), EUDEHYBLR2(12/14/2020), and EUDEHYBLR3 (12/18/2020). Amy also provided copies of the work orders for these 5-year tune ups.

The facility has been submitting reporting required under section VII for these heaters.

### FGCOLDCLEANERS

**III.2, IV.1-IV.3, VI.2, VI.3:** Amy provided me with records in accordance with S.C. VI.2 that list information for the cold cleaners at the facility. Sebastian and I only observed one cold cleaner during the facility walkthrough and observed that a lid covered it in compliance with S.C. IV.3. The air/vapor interface was less than 10 square feet in accordance with S.C. IV.1, and instructions for use were posted in accordance with S.C. VI.3. The cleaner also had a device for draining cleaned parts in accordance with S.C. IV.2. Consumers staff informed us that maintenance is performed monthly in accordance with S.C. III.2. The cleaner is not heated.

**II.1, IV.4-IV.5:** Amy provided the SDS for the solvent used, which is Zep Dyna 143. This solvent has a Reid Vapor Pressure of 0.0077 psia, which is less than less than 0.3 psia and consequently the cleaner is not required to be mechanically assisted per S.C. IV.4. The VOC content of the solvent is 6.59 lbs/gallon.

### FGRULE285(2)(mm)

Since September 2021, the AQD has not received any release reports for releases of natural gas greater than 1,000,000 standard cubic feet. During the inspection, Consumers staff confirmed that no releases had occurred. The facility is in compliance with the requirements of this flexible group and R 336.1285(mm).

### FGTANKS3

This flexible group is associated with seven above-ground storage tanks. There are no requirements applicable to this flexible group. According to the PTI evaluation document, emissions from these tanks using worst case inputs were determined using the USEPA TANKS program and indicated that the combined VOC emissions will be less than 10 pounds per year. The top-down BACT analysis demonstrated that no control is BACT for these storage tanks.

### Reporting

The facility submits semiannual and annual compliance certification reports as required by the ROP.

Based on my observations during the inspection and records review, the dehydration unit thermal oxidizer temperature excursions were incidents of noncompliance with EUDEHY S.C. III.2 and IV.2, and FGDEHYHHH S.C. III.2 and III.3. A violation was not issued at the time because AQD staff determined that appropriate corrective actions were made and, per the facility, VOC and benzene emissions were not exceeded. The facility appears to be operating in compliance with the other evaluated rules and regulations.

NAME Nashin Kha

DATE 10/02/2023

SUPERVISOR K Kelly