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MEMORANDUM

**To:** Bev McKeone, NSR Program Manager  
**From:** Ed Andrews, Reviewing Engineer   
**Date:** April 8, 2016  
**Subject:** Class II A/U Request of Permit R13-2397B (R13-2397C) for Equitrans LP.

On April 17, 2015, Equitrans, LP (Equitrans) requested a Class II Administrative Update to Permit R13-2397B. This request calls for addressing the compliance plan of Consent Order CO-R13, 14-E-2015-05 into Permit R13-2397B and to correct the requirements listed in Section 9 (Source Specific Requirements {40 CFR 63 Subpart HHH for Dehy 004-02}) of the current Title V permit to reflect the classification of Dehy 004-02.

In 2012, Equitrans operated compressor engine C-005 for 8,099 hours per year, which is an exceedance of operational restriction in Condition 4.1.1.a. of 7,709 hours per year. The consent order resolves the exceedance by revising the carbon monoxide (CO) and volatile organic compounds (VOCs) emission limits in Permit R13-3297B based on manufacturer's data. The following table is comparison of the changes in the CO and VOC emission limits for Engine C-005.

	CO Emissions		VOC Emissions	
	lb/hr	TPY	lb/hr	TPY
Permit R13-2397B	3.0	11.6	0.2	0.77
Proposed Change	5.95	22.94	1.49	5.74
Net Difference	2.95	11.34	1.29	4.97

The emission change for each pollutant does not meet the definition of "modification" in Rule 13 of 6 pounds per hour and 10 tons per year for criteria pollutants. Thus, the proposed changes of the CO and VOC emission limits for Engine C-005 are classified as a Class II Administrative Update under Rule 13. Equitrans proposed no other changes to Engine C-005 in Permit R13-2397B.

In this request, Equitrans claim that the Dehy 004-02 was incorrectly identified as a "large glycol dehydration unit" in Title V Operating Permit R30-04100009-2012. Dehy 004-02

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is a glycol dehydration unit that supports a natural gas transmission pipeline system. 40 CFR §63.1271 defines a “*small glycol dehydration unit*” as a glycol dehydration unit, located at a major source, with an actual annual average natural gas flowrate less than 283.0 thousand standard cubic meters per day or actual annual average benzene emissions less than 0.90 Mg/yr, determined according to §63.1282(a).

Before evaluating whether the Storage Dehy is either a “*large glycol dehydration unit*” or a “*small glycol dehydration unit*” under Subpart HHH, it is first be determined if the facility is a major source of hazardous air pollutants (HAPs) in accordance with 40 CFR §63.1270. EQT believes that only HAPs emissions from Engines C004 & C005; and the Storage Dehy (which includes the in-line heater) should be aggregated for major source determination under Subpart HHH. These sources are either engaged in compressing natural gas into a transmission pipeline system or dehydrating natural gas exiting a storage field prior to entering a transmission pipeline system.

Based on piping schematic of the Copley Compressor Station, the writer agrees that these engines and the Storage Dehy are the only ones at the facility that have to be aggregated together for major source applicability with regards to Subpart HHH. The following table is the HAP potential of the emission sources engaged with the storage and transmission of natural gas.

Source	Benzene (tpy)	Ethylbenzene (tpy)	Toluene (tpy)	Xylene (tpy)	n-Hexane (tpy)	Formaldehyde (tpy)	Total (tpy)
C-004	0.112	0.006	0.056	0.016	0.026	3.196	3.412
C-005	0.074	0.004	0.037	0.010	0.017	2.019	2.161
Storage Dehy Reboiler*	0.5*	0.70	2.69	4.44	0.35	0.001	8.1*
In-line Heater	0.00002		0.00003		0.02	0.001	0.00002
Totals	0.68602	0.71	2.78303	4.466	0.413	5.217	13.67302

\* - Permit R13-2397B limits benzene and total HAPs to these levels from the Storage Dehy.

Table 2 does list a potential to emit of any single HAP greater than 10 tpy and the aggregated HAP total for these emission units are less than 25 tpy. Thus, the natural gas transmission and storage facility at the Copley Run Compressor Station is not major for HAP according to 40 CFR §63.1270 and §63.2. Therefore, Subpart HHH does not apply to the natural gas transmission and storage facility located at the Copley Run Compressor Station.

The Dehy 400-02 was installed in 1992. In 2007 and 2009, Equitrans conducted testing on both glycol dehydration units at the Copley Run Compressor Station. The results of 2009 testing showed that the burner for Dehy 400-02 (Storage Dehy) achieved a destruction efficiency of 98% for benzene and over 99% for total VOCs. Annualizing the measured benzene emissions, Dehy 400-02 had an annual rate of 0.004 tons of benzene per year.

As part of this application, EQT attempted to redefine the Storage Dehy’s potential to emit of HAPs. Samples of the rich and lean glycols were taken on February 5, 2015 and analyzed on March 5, 2015. The intent of these glycol analytical results was to enhance the predicted of emissions using GRI-GLYCalc 4.0 glycol dehydrator emission estimating program.

During a January 12, 2016 site visit of facility, the records on site for the Storage Dehy indicated that the unit was not in operation on the date that the rich/lean glycol samples were taken. Thus, the writer and EQT concluded that the rich/lean glycol analytical results are not representative for the Storage Dehy. The writer did obtain a Certificate of Analysis of a wet gas sample taken on December 4, 2014 and other useful information (i.e. temperatures, pressures and water content) the natural gas in the storage fields. This data was entered into GYLCalc to ensure that the Storage Dehy could comply with the permitted limits in R13-2397B. The results of this GYLCalc prediction indicated that compliance is achievable at maximum permitted throughput of 140 MMSCFD, which is illustrated in the following table.

Pollutant	Hourly Predicted Rate (lb/hr)	Annual Predicted Rate (tpy)	Permitted Annual Limits (tpy)
VOC	2.52	11.05	15.10
Total HAPs	1.07	4.71	0.50
Benzene	0.10	0.44	8.10

Thus, the emission limits in Permit R13-2397B does not need to be adjusted with regards to the Subpart HHH applicability determination. Recommended changes to the Permit R13-2397B with regards to the dehydrations units from Mark Sowa, EQT’s Sr. Environmental Coordinator, and this writer are focused on clarity of the dehydration in the permit, monitoring, testing, recordkeeping, and reporting.

In the past documentation provide by EQT and information DAQ files, Dehy 004-01 has been referred as the Transmission Dehy, which is miss leading with regards to Subpart HHH. Dehy 004-01 is receiving natural gas from EQT’s gathering line that has not been sent to a natural gas processing facility (extracting plant). The incoming gas to the Copley Run Compressor Station is first compress then dehydrated by Dehy 004-01 before being routed to Dominion Transmission’s Copley Run Extraction Plant. In simple terms, Dehy 004-01 is a production gas dehydration unit. EQT and the DAQ both agree that the reference to “Transmission Dehy” in the permit needs to be replace with “Dehy 004-01”.

Dehy 004-02 is only dehydrating natural gas that being placed into storage which is down stream of the chain of custody point from a natural gas process plant. The reference to “Storage Dehy” is appropriate terminology for Dehy 004-02 in Permit R13-2397B.

Permit R13-2397B was issued to make the use of the Dehy Flare control emissions from Dehy 004-01 federal enforceable to avoid emission standard and work practice requirements of Subpart HH. Subpart HH still have recordkeeping requirements even for dehydration units that apply federal enforceable controls (See 40 CFR 63.774(d)). The language in Condition 4.4.5. and in Subpart does not match up with regards to monitoring and recording natural gas

throughput through the Dehy 004-01. Thus, this writer recommends adopting the throughput recording requirements from Subpart HH for Dehy 004-01 in Condition 4.2.1.a. Also, Subpart HH requires controlled dehydration that meet the one ton of benzene exclusion determine the actual annual average benzene emissions from the dehydration unit. To address this and the wet gas sampling Conditions of 4.2.1 and 4.3.1. of Permit R13-2397B, the writer proposed to establish one monitoring condition for Dehy 004-01 and another one for the Storage Dehy, which will account for the throughput according to the respective subparts, wet gas sampling frequency, and determining annual benzene emissions, and monitoring the presence of flame for the respective control device with the maintenance these records be in accordance with Condition 3.4.1.

Thus, Conditions 4.4.5., 4.4.6., 4.4.9. and 4.4.10. redundant and this writer recommends these conditions with the following as Conditions 4.2.1. and 4.2.2.

*4.2.1. The permittee shall monitor and record the following parameters for the purpose of demonstrating compliance with Condition 4.1.2. for Dehy 004-01:*

- a. The permittee shall determine the actual annual average natural gas throughput as determined by dividing the annual flowrate by the number of days per year the glycol dehydration unit processed natural gas.  
[40 CFR §63.774(d)(1) & §63.772(b)(1)]*
- b. The actual average benzene emissions (in terms of benzene emissions per year) shall be determined on an annual basis in accordance with 40 CFR §63.772(b)(2) . Determination of the actual average benzene emissions from the dehydration unit shall be made using the model GRIGLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1)  
[40 CFR §63.772(b)(2)(i) & §63.774(d)(1)(ii)]*
- c. Identify any periods there was no flame present for the flare or pilot light of the flare when the dehydration unit was in operation.*
- d. The permittee shall sample the inlet gas to Dehy 004-01 in accordance with GPA Method 2166 and analyze the samples utilizing the extended GPA Method 2286 as specified in the GRI-GLYCalc V4 Technical Reference User Manual and Handbook once per calendar year. As specified in the handbook, the permittee shall sample the wet gas stream at a location prior to the glycol dehydration column, but after any type of separation device, in accordance with GPA method 2166.*

- e. *Records of such monitoring shall be maintained in accordance with Condition 3.4.1.*

4.2.2. *The permittee shall monitor and record the following parameters for the purpose of demonstrating compliance with Condition 4.1.3. for the Storage Dehy (Dehy 004-02):*

- a. *The permittee shall determine the actual natural gas flowrate to the storage dehy and the number of days during the calendar year that the storage dehy actually operated. The permittee shall determine actual annual average natural gas throughput (in terms of natural gas flowrate to the glycol dehydration unit per day) by converting the annual natural gas flowrate to a daily average by dividing the annual flowrate by the number of days per year the storage dehy processed natural gas.*
- b. *Identify any periods there was no flame presence for the pilot light of the reboiler when the dehydration unit was in operation.*
- c. *Determination of the actual average benzene emissions from the dehydration unit shall be made using the model GRIGLYCalc<sup>TM</sup>, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc<sup>TM</sup> Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1).*
- d. *The permittee shall sample the inlet gas to Storage Dehy in accordance with GPA Method 2166 and analyze the samples utilizing the extended GPA Method 2286 as specified in the GRI-GLYCalc V4 Technical Reference User Manual and Handbook once every three years. Should the dehydration unit is not in operation within the above noted time period to take a representative the gas sample, the permittee shall the inlet gas sample within 30 days after resuming operations of the dehydration unit. As specified in the handbook, the permittee shall sample the wet gas stream at a location prior to the glycol dehydration column, but after any type of separation device, in accordance with GPA method 2166.*

*Records of such monitoring shall be maintained in accordance with Condition 3.4.1.*

The Storage Dehy is only operated if EQT is pulling gas out of the storage fields to be injected in the transmission pipeline. Typically, EQT operates the transmission side of the Copley Station in "free flow mode", which means a gas processed by Dominion free flows through Copley Station into the transmission pipeline. For EQT to be able to obtain a representative sample of gas going to the Storage Dehy, EQT must be pulling gas out of storage. Therefore, this writer recommends establishing a wet sampling frequency of once every three year or within 30 days after resuming operations of dehydration unit. EQT currently samples or attempts to sample annually.

Condition 4.3.1. is kind of meaning less as written. It requires the permittee to use GYLCalc to demonstrate compliance with the emission limits but does state when to do so. This writer recommends adjusting this testing to only be triggered if the permittee elects to use a different sampling and analytical producer other than following GPA method 2166 with Method 2286 to analyze the BTEX in the gas sample. The writer recommends adjusting Condition 4.3.1. to the following:

*4.3.1. Should the permittee elect to utilize other equivalent method(s) than the ones listed in Conditions 4.2.1.d. or 4.2.2.d. provided the method(s) are approved in advance by the Director as part of a testing protocol. If alternative methods are proposed, a test protocol shall be submitted for approval no later than 60 days before the scheduled test date. Records of the protocol, approval letter, chain of custody document, and result shall be maintained in accordance with Condition 3.4.1.*

EQT has already successfully conducted the one time testing required in Conditions 4.3.2., 4.3.3., and 4.3.4. (VE test for the flare, the flare tip velocity, heat content). This writer recommends replacing these with quarterly one-hour visible emission observation as Condition 4.2.3. This observation will verify that the control device (flare) is operating in accordance with the design criteria in Condition 4.1.2.

Equitrans filed a complete application, published a Class I legal ad in the on April 22, 2015, and paid the Class II filing fee on April 29, 2015. The information provided in the permit application indicates that the applicant meets all the requirements of applicable regulations. Therefore, it is recommended that the Copley Run Compressor Station should be granted a Class II Administrative Update in accordance with 45CSR13.