AIR QUALITY EFFECTS ANALYSIS FOR PERMIT TO CONSTRUCT
ACP-18175 v1.1

Applicant:

Hiland Partners Holdings LLC
1001 Louisiana Street, Suite 1000
Houston, TX 77002

Facility Location:

Edgewater Compressor Station
Mountrail County, North Dakota
48.096897, -102.635586
SE ¼, SE ¼, Sec. 4, T153N, R93W

Introduction:

On October 28, 2023, The Department of Environmental Quality – Division of Air Quality (Department) received a permit to operate renewal application for Air Permit to Operate No. AOP-28033 v2.0 for the Edgewater Compressor Station. Hiland Partners Holdings LLC (Hiland Partners) requested revisions to the emission limits of compressor engines along with renumbering all four compressor engines onsite to incorporate two permits to construct and in response to an internal audit disclosed to the Department on December 18, 2020. These revisions for the Edgewater Compressor Station necessitated a modification of Air Permit to Construct No. ACP-18175 v1.0. The station is used to compress field natural gas for pipeline transmission. The station is located approximately eleven miles northwest of New Town, North Dakota, in Mountrail County.

Table 1 – Emission units associated with the Edgewater Compressor Station

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Waukesha L7044GSI (4SRB) natural gas-fired compressor engine rated at 1,900 bhp manufactured September 2019 (NSPS JJJJ, OOOOa) (MACT ZZZZ)	C1	C1	Non-Selective Catalytic Reduction (NSCR)
Waukesha L7044GSI (4SRB) natural gas-fired compressor engine rated at 1,900 bhp manufactured September 2019 (NSPS JJJJ, OOOOa) (MACT ZZZZ)	C2	C2	NSCR

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Waukesha L5794GSI (4SRB) natural gas-fired compressor engine rated at 1,380 bhp manufactured November 2007 (NSPS JJJJ) (MACT ZZZZ)	C3	C3	NSCR
Caterpillar G3516 (4SLB) natural gas-fired compressor engine rated at 1,380 bhp manufactured February 2019 (NSPS JJJJ, OOOOa) (MACT ZZZZ)	C5	C5	Oxidation Catalyst
Triethylene Glycol (TEG) Reboiler rated at 0.5 x 10^6 Btu/hr	3	3	None
TEG Dehydration Unit rated at 27 x 10^6 scfd (HH)	4	3, 5, & 6	BTEX Condenser and TEG Reboiler [A]
Two 400 bbl Produced Water/Condensate Tanks	5 & 6	5 & 6	Submerged Fill Pipe
Fugitive Emissions	FUG	FUG	Leak Detection and Repair (LDAR)
Compressor Blowdowns	BD	BD	Gas Recycle System [B]
Produced water truck loading [C]	-	-	-
NGL truck loading [C]	-	-	-
Pigging [C]	-	-	-
Three methanol chemical storage tanks [C]	-	-	-

[A] Emissions from the TEG dehydration unit flash tank are recycled back into the process. Emissions from the TEG reboiler still column are controlled by a BTEX condenser, with non-condensable vapors exiting the condenser combusted in the TEG reboiler firebox.

[B] Some blowdowns do not go through the gas recycle system and are vented to atmosphere.

[C] Insignificant source of emissions.

Current/Proposed Engine Emission Limits:

Unit	Current Emission Limit [A, C]	Proposed Emission Limit [B, C]
Waukesha engine C1 (formerly EU 1)	NO_x: 4.19 lb/hr and 1.0 g/hp-hr or 82 ppmvd at 15% O_2 CO: 4.19 lb/hr and 1.0 g/hp-hr or 270 ppmvd at 15% O_2 VOC: 2.94 lb/hr and 0.7 g/hp-hr or 60 ppmvd at 15% O_2 Opacity: 20%	NO_x: 1.0 g/hp-hr or 82 ppmvd at 15% O_2 CO: 1.0 g/hp-hr VOC: 0.7 g/hp-hr or 60 ppmvd at 15% O_2 Opacity: 20%

Waukesha engine C2 (formerly EU 2)	NO_x: 4.19 lb/hr and 1.0 g/hp-hr or 82 ppmvd at 15% O_2 CO: 4.19 lb/hr and 1.0 g/hp-hr or 270 ppmvd at 15% O_2 VOC: 2.94 lb/hr and 0.7 g/hp-hr or 60 ppmvd at 15% O_2 Opacity: 20%	NO_x: 1.0 g/hp-hr or 82 ppmvd at 15% O_2 CO: 1.0 g/hp-hr VOC: 0.7 g/hp-hr or 60 ppmvd at 15% O_2 Opacity: 20%
Waukesha engine C3 (formerly EU 7)	NO_x: 3.04 lb/hr and 2.0 g/hp-hr or 160 ppmvd at 15% O_2 CO: 3.04 lb/hr and 4.0 g/hp-hr or 540 ppmvd at 15% O_2 VOC: 2.13 lb/hr 1.0 g/hp-hr or 86 ppmvd at 15% O_2 Opacity: 20%	NO_x: 1.0 g/hp-hr CO: 1.0 g/hp-hr VOC: 0.7 g/hp-hr Opacity: 20%
Caterpillar engine C5 (formerly EU C-8)	NO_x: 3.04 lb/hr and 1.0 g/hp-hr or 82 ppmvd at 15% O_2 CO: 6.08 lb/hr and 2.0 g/hp-hr or 270 ppmvd at 15% O_2 VOC: 2.74 lb/hr and 0.7 g/hp-hr or 60 ppmvd at 15% O_2 Opacity: 20%	NO_x: 1.0 g/hp-hr or 82 ppmvd at 15% O_2 CO: 2.0 g/hp-hr or 270 ppmvd at 15% O_2 VOC: 0.7 g/hp-hr or 60 ppmvd at 15% O_2 Opacity: 20%

A Except for the CO emissions limits in g/hp-hr for emission units C1 and C2, the emission limits in g/hp-hr and ppmvd at 15% O_2 are from 40 CFR 60, Subpart JJJJ. The 1.0 g/hp-hr CO emission limit for C1 and C2 is more stringent than the Subpart JJJJ CO emission limit of 2.0 g/hp-hr and 270 ppmvd at 15% O_2.

B Except for the proposed CO emissions limits in g/hp-hr for emission units C1 and C2, and the proposed NO_x, CO, and VOC emission limits in g/hp-hr for emission unit C3, the emission limits in g/hp-hr and ppmvd at 15% O_2 are from 40 CFR 60, Subpart JJJJ. The proposed 1.0 g/hp-hr CO emission limit for C1 and C2 is more stringent than the Subpart JJJJ CO emission limit of 2.0 g/hp-hr and 270 ppmvd at 15% O_2. The proposed 1.0 g/hp-hr NO_x, 1.0 g/hp-hr CO, and 0.7 g/hp-hr VOC emission limits for C3 are more stringent than the Subpart JJJJ NO_x emission limit of 2.0 g/hp-hr and 160 ppmvd at 15% O_2, CO emission limit of 4.0 g/hp-hr and 540 ppmvd at 15% O_2, and VOC emission limit of 1.0 g/hp-hr and 86 ppmvd at 15% O_2. The permittee must also meet all applicable emission limits for emission units C1 through C5 established by 40 CFR 63, Subpart ZZZZ.

C 40% opacity is permissible for not more than one six-minute period per hour.

Facility Wide Emissions Profile
Potential to Emit (PTE)

Table 2 - PTE (tons per year) [A]

Emission Unit Description	EU	CO	NO_X	SO_2	VOCs	Total PM	PM_{10}	$PM_{2.5}$	Total HAPs	HAP Name (Largest HAP)
Waukesha L7044GSI compressor engine	C1	18.35	18.35	0.04	12.86	1.34	1.34	1.34	0.43	Methanol
Waukesha L7044GSI compressor engine	C2	18.35	18.35	0.04	12.86	1.34	1.34	1.34	0.43	Methanol
Waukesha L5794GSI compressor engine	C3	13.33	13.33	0.03	9.46	1.04	1.04	1.04	0.45	Formaldehyde
Caterpillar G3516 compressor engine	C5	26.65	13.33	0.03	11.99	0.95	0.95	0.95	2.67	Formaldehyde
TEG regenerator reboiler	3	0.18	0.21	0.001	0.01	0.02	0.02	0.02	---	Hexane
TEG dehydration unit	4	---	---	---	1.06	---	---	---	0.18	Toluene
400-bbl produced water/condensate tank	5	---	---	---	1.31	---	---	---	---	
400-bbl produced water/condensate tank	6	---	---	---	1.31	---	---	---	---	
Fugitive emissions	FUG	---	---	---	4.24	---	---	---	---	
Compressor blowdowns	BD	---	---	---	18.33	---	---	---	.54	
Produced water truck loading	PW-TL	---	---	---	0.44	---	---	---	---	
NGL truck loading	PW-NGL	---	---	---	0.82	---	---	---	---	
Pigging	PIG	---	---	---	1.00	---	---	---	---	
Three methanol chemical storage tanks	TK	---	---	---	0.03	---	---	---	---	
Total (without Fugitives):		**76.85**	**63.56**	**0.14**	**71.48**	**4.68**	**4.68**	**4.68**	**4.71**	
Total (with Fugitives):		**76.85**	**63.56**	**0.14**	**75.73**	**4.68**	**4.68**	**4.68**	**4.71**	

[A] Abbreviations:
Total PM: filterable and condensable particulate matter
PM_{10}: particulate matter with an aerodynamic diameter less than or equal to 10 microns (≤10 μm) including $PM_{2.5}$
$PM_{2.5}$: particulate matter with an aerodynamic diameter less than or equal to 2.5 microns (≤2.5 μm)
SO_2: sulfur dioxide
NO_X: oxides of nitrogen
CO: carbon monoxide
VOCs: volatile organic compounds
HAPs: hazardous air pollutants as defined in Section 112(b) of the Clean Air Act

As shown in Table 2, the facility wide PTE is below 100 tons per year (tpy) for all criteria air pollutants, below 10 tpy for any single hazardous air pollutant (HAP), and below 25 tpy for the combined HAP emissions. Detailed calculations were provided in the original PTC application for ACP-18175 v1.1 from December 29, 2022. The Department has reviewed these calculations and believes they accurately represent the proposed facility operations.

The facility PTE is based on enforceable emissions restrictions put in place on the four natural gas compressor engines, limiting the allowable amount of NO_x, CO, and VOC emissions. These restrictions mean the facility will be a synthetic minor source of air pollution, as the emissions are limited to below major source thresholds for both the prevention of significant deterioration (PSD) and Title V programs.

Summary and Recommendations:

A complete review of the proposed project indicates that the Edgewater Compressor Station is expected to comply with the applicable federal and state air pollution rules and regulations. The Department will make a final recommendation on the issuance of a modified Permit to Construct for the Edgewater Compressor Station following completion of a 30-day public comment period.

Update post comment period:
[Reserved]

Date of Draft Analysis: April 19, 2024
Date of Final Analysis: [Reserved]

Analysis By:

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Division of Air Quality

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