AIR QUALITY EFFECTS ANALYSIS
FOR
PERMIT TO CONSTRUCT
ACP-17848 v1.1

Applicant:

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

Facility Location:

Alex Compressor Station
McKenzie County, North Dakota
47.964429, -103.309632
SE ¼, SE ¼, Sec. 23, T152N, R99W

Introduction:

On October 3, 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-27961 v2.0 for the Alex Compressor Station. Hiland Partners Holdings LLC (Hiland Partners) requested revisions to the emission limits of three compressor engines along with renumbering all four compressor engines onsite in response to an internal audit disclosed to the Department on December 18, 2020. These revisions for the Alex Compressor Station necessitated a modification of Air Permit to Construct No. ACP-17848 v1.0. The station is used to compress field natural gas for pipeline transmission to a gas plant. The station is located approximately eleven miles north of Watford City, North Dakota, in McKenzie County.

Table 1 – Emission units associated with the Alex 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 1,680 bhp manufactured June 2014 (NSPS JJJJ, OOOOa) (MACT ZZZZ)	C1	C1	Non-Selective Catalytic Reduction (NSCR)
Waukesha L7044GSI (4SRB) natural gas-fired compressor engine rated at 1,680 bhp manufactured January 2014 (NSPS JJJJ, OOOOa) (MACT ZZZZ)	C2	C2	NSCR

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Waukesha L7042GSI (4SRB) natural gas-fired compressor engine rated at 1,478 bhp manufactured December 2004 (MACT ZZZZ)	C3	C3	NSCR
Waukesha L7044GSI (4SRB) natural gas-fired compressor engine rated at 1,680 bhp manufactured October 2013 (NSPS JJJJ, OOOOa) (MACT ZZZZ)	C4	C4	NSCR
Two 400 barrel (bbl) condensate tanks	2 & 3	2 & 3	Submerged Fill Pipe
Triethylene Glycol (TEG) reboiler rated at 0.5 x 10^6 Btu/hr	7	7	None
TEG dehydration unit rated at 20 x 10^6 scfd (MACT HH)	8	2, 3, & 7	BTEX Condenser & TEG Reboiler [A]
Fugitive emissions	FUG	FUG	Leak Detection and Repair (LDAR) Program
Compressor blowdowns	BD	BD	Gas Recycle System [B]
Pigging [C]	-	-	-
Produced water truck loading [C]	-	-	-
NGL truck loading [C]	-	-	-
Two methanol storage tanks [C]	-	-	-

[A] Emissions from the TEG dehydration unit flash tank are recompressed or recycled back into the process. Emissions from the regenerator are controlled by a condenser and non-condensable gasses exiting the condenser are 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, B]	Proposed Emission Limit [A, B]
Waukesha engine C1 (formerly EU 4)	NO_x: 3.70 lb/hr and 1.0 g/hp-hr or 82 ppmvd CO: 3.70 lb/hr and 2.0 g/hp-hr or 270 ppmvd VOC: 2.59 lb/hr and 0.7 g/hp-hr or 60 ppmvd 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 5)	NO_x: 3.70 lb/hr and 1.0 g/hp-hr or 82 ppmvd CO: 3.70 lb/hr and 2.0 g/hp-hr or 270 ppmvd VOC: 2.59 lb/hr and 0.7 g/hp-hr or 60 ppmvd 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 1)	NO_x: 3.30 lb/hr CO: 6.60 lb/hr Opacity: 20%	NO_x: 3.30 lb/hr CO: 6.60 lb/hr Opacity: 20%
Waukesha engine C4 (formerly EU 6)	NO_x: 3.70 lb/hr and 1.0 g/hp-hr or 82 ppmvd CO: 3.70 lb/hr and 2.0 g/hp-hr or 270 ppmvd VOC: 2.59 lb/hr and 0.7 g/hp-hr or 60 ppmvd 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%

A Except for the CO emissions limits in g/hp-hr for emission units C1, C2, and C4, 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, C2, and C4 is more stringent than the Subpart JJJJ CO emission limit of 2.0 g/hp-hr and 270 ppmvd at 15% O_2. The permittee must also meet all applicable emission limits for emission units C1 through C4 established by 40 CFR 63, Subpart ZZZZ.

B 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	16.22	16.22	0.04	11.52	1.32	1.32	1.32	0.76	Formaldehyde
Waukesha L7044GSI compressor engine	C2	16.22	16.22	0.04	11.52	1.32	1.32	1.32	0.76	Formaldehyde
Waukesha L7042GSI compressor engine	C3	28.58	14.29	0.04	10.15	1.39	1.39	1.39	0.77	Formaldehyde
Waukesha L7044GSI compressor engine	C4	16.22	16.22	0.04	11.52	1.32	1.32	1.32	0.76	Formaldehyde
400-bbl produced water tank	2	---	---	---	1.00	---	---	---	---	
400-bbl produced water tank	3	---	---	---	1.00	---	---	---	---	
TEG regenerator reboiler	7	0.12	0.15	0.00	0.01	0.02	0.02	0.02	---	
TEG dehydration unit	8	---	---	---	0.98	---	---	---	0.57	Toluene
Fugitive emissions	FUG	---	---	---	4.20	---	---	---	0.07	Hexane
Compressor engine and equipment blowdowns	BD	---	---	---	14.04	---	---	---	0.20	Hexane
Pigging	N/A	---	---	---	1.00	---	---	---	---	
Truck loading – produced water	N/A	---	---	---	0.44	---	---	---	---	
Truck loading – NGL	N/A	---	---	---	0.82	---	---	---	---	
Two methanol storage tanks	N/A	---	---	---	0.02	---	---	---	---	
Total (without Fugitives):		**77.36**	**63.10**	**0.16**	**64.01**	**5.37**	**5.37**	**5.37**	**3.82**	
Total (with Fugitives):		**77.36**	**63.10**	**0.16**	**68.21**	**5.37**	**5.37**	**5.37**	**3.89**	

[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 have been provided in the updated PTE emissions from January 15, 2021. 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 CO 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 Alex 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 Alex Compressor Station following completion of a 30-day public comment period.

Update post comment period:
[Reserved]

Date of Draft Analysis: February 15, 2024
Date of Final Analysis: [Reserved]

Analysis By:

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RSM