



REGION 8

DENVER, CO 80202

Continental Resources, Inc. – Various Well Pads Partial Compliance Evaluation (PCE) On-Site Clean Air Act (CAA) Inspections

Inspection Date(s): October 21-22, 2024

Inspection Report Date: December 27, 2024

**Inspection Report Revision
Date:** April 3, 2025

**US EPA Region 8
Representatives:** Katelyn Bergl, Clean Air Act Inspector
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Company Representatives: None

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Date: 2025.04.10 14:00:12 -06'00'

Applicable Rules: North Dakota Administrative Code, Title 33.1, Article 15, as incorporated into North Dakota's EPA-approved State Implementation Plan at 40 C.F.R. Part 52, Subpart JJ – North Dakota (ND SIP), including the following chapters:

- Chapter 7, Control of Organic Compound Emissions (ND SIP Chapter 7);
- Chapter 12, Standards of Performance for New Stationary Sources (ND SIP Chapter 12); and
- Chapter 20, Control of Emissions from Oil and Gas Well Production Facilities (ND SIP Chapter 20)

40 C.F.R. Part 60, Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Facilities for Which

Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or Before September 18, 2015

40 C.F.R Part 60, Subpart OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 (NSPS OOOOa)

40 C.F.R Part 60, Subpart OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification or Reconstruction Commenced After December 6, 2022 (NSPS OOOOb)

Compliance Assistance

None

Enforcement History

Continental Resources, Inc. (Continental) was issued a Notice of Violation (NOV) on July 15, 2024, under Docket Number CAA-08-2024-0006.

Areas of Concern

1. The EPA detected hydrocarbon emissions from the storage tanks at or co-located with the following wells or well pads:
 - NADIA 8-10 PAD
 - Arthur 1,2,11 Hegler 1,2,11 Pad
 - Thorvald 1-6H
 - Lundberg 2-8AH
 - Lundberg 8-8AH
 - MOUNTAIN GAP 7-10 PAD
 - BANG 4-14 CTB/CS
2. The EPA detected visible emissions from an operating utility flare at or co-located with the following wells or well pads:
 - Arthur 1,2,11 Hegler 1,2,11 Pad
 - Thorvald 1-6H
 - Lundberg 2-8AH
 - Lundberg 8-8AH
 - ANGUS FED 7-13 SIMMENTAL FED 6-12 CTB
 - Tarentaise 7-19H, North Tarentaise 1-7 CTB & North Tarentaise 8-9 Eco Group
3. Following the inspection report, the EPA requested piping and instrumentation diagrams (P&IDs) from Continental on January 15, 2025. The representative from Continental responded on January 29, 2025, and February 5, 2025 with P&IDs of the following well pads:
NADIA 8-10 PAD
Arthur 1,2,11 Hegler 1,2,11 Pad

BANG 4-14 CTB/CS
Thorvald 1-6H
MOUNTAIN GAP 7-10 PAD
Lundberg 2-8AH

Upon review of the P&IDs, the EPA observed oil tanks and water tanks sharing the tank vapor space as part of one closed vent system to the control devices on the respective well pads. Therefore, the emissions observed, from the tanks in section 1 above, are hydrocarbon emissions.

See Table 1 below for more details regarding inspected locations and Tables 2 and 3 for inspection observation details for all pads. A log of images and videos captured during the inspections is provided in Appendix A.

General Inspection Information

Unannounced well pad inspections were conducted jointly by U.S. EPA and North Dakota Department of Environmental Quality – Division of Air Quality inspectors (Inspectors) on October 21-22, 2024, at multiple Continental facilities located in North Dakota.

The Inspectors evaluated each well site listed in Table 1 using audio, visual, and olfactory (AVO) inspection methods including the use of an optical gas imaging (OGI) camera and EPA Reference Method 22. At each facility, Inspectors scanned the crude and/or water storage tanks, closed vent system and flares onsite for any detectable emissions. Specifically, Inspectors scanned storage tank covers and closed vent systems for hydrocarbon emissions to determine compliance with the Clean Air Act, including the North Dakota SIP and NSPS regulations.

Each well pad inspection followed the approach below:

1. Record the entry sign of the well pad when available. Survey the entire well pad with OGI camera.
2. Record the number and type of site process equipment such as well heads, tanks, and emission control devices.
3. Record AVO indications of emissions from the storage tanks, closed vent system to the control devices and control devices.
4. Using the OGI camera, survey each process in infrared modes (auto, manual, and/or high-sensitivity modes). Record any uncontrolled emissions with the OGI camera and describe the frequency and magnitude of emissions in the field notebook.
5. Observe control devices (enclosed combustor or utility flare) for visible emissions. If there is visible emissions present, conduct Method 22 and record the observations.
6. Using another OGI camera, if available, confirm any observations of uncontrolled emissions with another Inspector.
7. If there are operators present onsite, share any Areas of Concern.

Table 1 lists general inspection and well pad details for each inspected well pad. The well pad information located in Table 1 is from the North Dakota Industrial Commission (NDIC) well index located online at <https://www.dmr.nd.gov/oilgas/>.

Table 1: Inspection and Facility Details of Facilities Inspected						
Date	Arrival Time	Departure Time	Well Pad Name	API Number(s)	Latitude	Longitude
10/21/24	8:11	8:32	Edward 1-12 Central Tank Battery (CTB)	3302504608 3302504609 3302504610 3302504611 3302504612 3302504613	47.445292	-102.994076
10/21/24	8:39	8:48	Edward 1-23H	3302501292	47.4443691	-102.999143
10/21/24	11:55	12:07	NADIA 8-10 PAD	3302503792 3302503793 3302503794	47.4645309	-102.970678
10/21/24	12:17	12:29	Arthur 1,2,11 Hegler 1,2,11 Pad	3302501009 3302501010 3302501055 3302501056 3302504699 3302504700	47.4743296	-102.974068
10/21/24	12:39	12:58	Thorvald 1-6H	3302502698 3302502699 3302502700 3302502701 3302502702 3302502703 3302504039 3302504682 3302504683 3302504684	47.4860228	-102.959551
10/21/24	13:10		Lundberg 2-8AH	3302501539	47.4874283	-102.940031
10/21/24	13:26		Lundberg 8-8AH	3302504747 3302504748 3302504749 3302504750 3302504751 3302504752	47.4871543	-102.94252
10/21/24	13:40		MOUNTAIN GAP 7-10 PAD	3302503236 3302503237 3302503238 3302503239	47.4896226	-102.907126

Date	Arrival Time	Departure Time	Well Pad Name	API Number(s)	Latitude	Longitude
10/21/24	13:52		BANG 4-14 CTB/CS	3302504372 3302504373 3302504374 3302504375 3302504376 3302504378	47.4896622	-102.90968
10/22/24	11:44	12:09	ANGUS FED 7- 13 SIMMENTAL FED 6-12 CTB	3305309220 3305309221 3305309222 3305309223 3305309224 3305309225 3305309226 3305309227 3305309228 3305309229 3305309230 3305309231 3305309232 3305309233 3305309234 3305309235 3305309236 3305309237	48.0761762	-102.776681
10/22/24	12:13	12:23	Hereford-Angus Eco Pad	3305307786 3305307787 3305307788 3305307789 3305308150 3305308152 3305308807	48.0656681	-102.784939
10/22/24	12:59	13:08	Brangus Pad	3305309582 3305309583 3305309584 3305309585 3305309586 3305309587 3305309588 3305309589 3305309590 3305309591 3305309592 3305309593 3305309594 3305309595	48.0744601	-102.735335

Date	Arrival Time	Departure Time	Well Pad Name	API Number(s)	Latitude	Longitude
10/22/24	13:35	13:43	HEREFORD FEDERAL 1-9 CTB	3305307425 3305307426 3305307427 3305307428 3305307429 3305307430 3305307431 3305307432 3305307433	48.0617097	-102.800005
10/22/24	13:52	14:07	Tarentaise 7-19H, North Tarentaise 1-7 CTB & North Tarentaise 8-9 Eco Group	3305310016 3305310017 3305310018 3305310019 3305310020 3305310021 3305310022 3305310036 3305310041	48.062827	-102.821551

Observations and Regulatory Applicability

North Dakota SIP and NSPS regulations which are relevant to the Areas of Concern observed during the inspections are summarized in this section.

Tables 2 and 3 at the end of this report summarize inspection observations and findings. Table 2 summarizes storage tank observations. Table 3 includes details of control devices and related observations. See Appendix A for a log of images and videos taken during the inspections.

ND SIP Applicability

Chapter 7 Applicability [33.1-15-07]

The provisions of ND SIP Chapter 7 apply to all facilities constructed on or after July 1, 1970, which are located in the state of North Dakota and produce volatile organic compound (VOC) emissions (ND SIP Chapter 7, 33.1-15-07-01.1). All well pads listed in Table 1 meet the applicability requirements and are thus subject to the ND SIP Chapter 7.

Chapter 20 Applicability [33.1-15-20]

The provisions of ND SIP Chapter 20 “apply to any oil or gas well facility which emits air contaminants to the atmosphere” which are located in the state of North Dakota (ND SIP Chapter 20, 33.1-15-20-01.1). All well pads listed in Table 1 are oil and gas well facilities located in North Dakota and are thus subject to the ND SIP Chapter 20.

ND SIP Requirements relevant to Areas of Concern

ND SIP Facility-wide Emission Requirements [33.1-15-07-02.1 & 33.1-15-20-04]

Per 33.1-15-07-02.1, “No person may cause or permit the emission of organic compounds gases and vapors, except from an emergency vapor blowdown system or emergency relief

system, unless these gases and vapors are burned by flares, or an equally effective control device...” The EPA, using an OGI camera, detected organic compound vapor emissions from production and storage tanks at 7 out of 14 inspected well pads. See Area of Concern #1 above.

Per 33.1-15-20-04.4, “Routine inspections and maintenance of tanks, hatches, compressors, vent lines, pressure relief valves, packing elements, and couplings must be conducted to minimize emissions from equipment at a production facility. Tank hatches must hold a positive working pressure or must be repaired or replaced.” The EPA, using an OGI camera, detected emissions from production and storage tanks at 7 out of 14 inspected well pads. See Area of Concern #1 above.

NSPS OOOO Applicability

Based on well production information reported by Continental to the NDIC and the date of construction, reconstruction, or modification of the storage vessels, the storage vessels and associated emissions control equipment co-located with the Lundberg 2-8AH well are subject to requirements for storage vessel affected facilities in NSPS OOOO, and as incorporated by reference in ND SIP Chapter 12.

Closed Vent System Equipment Requirements [§ 60.5411(c)(1)]

Per § 60.5411(c)(1), owners and operators must “design the closed vent system to route all gases, vapors, and fumes emitted from the material in the storage vessel to a control device that meets the requirements specified in § 60.5412(c) and (d), or to a process.” The EPA, using an OGI camera, observed emissions from the closed vent system co-located with the Lundberg 2-8AH well. See Area of Concern #1 above.

Control Device Requirements [§ 60.5412(d)]

Per § 60.5412(d)(1)(iii), owners and operators must, “Operate the combustion control device with no visible emissions, except for periods not to exceed a total of 1 minute during any 15-minute period.” The EPA observed black smoke continuously for more than one minute (per Method 22) at a flare co-located with the Lundberg 2-8AH well. See Area of Concern #2 above.

NSPS OOOOa Applicability

Based on Continental’s NSPS OOOOa annual reporting, the storage vessels and associated emissions control equipment at the NADIA PAD, MOUNTAIN GAP 7-10 PAD, BANG 4-14 CTB/CS and ANGUS FED 7-13 SIMMENTAL FED 6-12 CTB are subject to requirements for storage vessel affected facilities in NSPS OOOOa, and as incorporated by reference in ND SIP Chapter 12.

Closed Vent System Equipment Requirements [§ 60.5411a(c)]

Per § 60.5411a(c)(1), owners and operators must “Design the closed vent system to route all gases, vapors, and fumes emitted from the material in the storage vessel affected facility to a control device that meets the requirements specified in § 60.5412a(c) and (d), or to a process.” The EPA, using an OGI camera, observed emissions from the closed

vent systems at the NADIA PAD, MOUNTAIN GAP 7-10 PAD, and the BANG 4-14 CTB/CS. See Area of Concern #1 above.

Control Device Requirements [§ 60.5412a(d)]

Per § 60.5412a(d)(1)(iii), owners and operators must, “Operate the combustion control device with no visible emissions, except for periods not to exceed a total of 1 minute during any 15-minute period.” The EPA observed black smoke continuously for more than one minute (per Method 22) at the ANGUS FED 7-13 SIMMENTAL FED 6-12 CTB facility. See Area of Concern #2 above.

NSPS OOOOb Applicability

Based on well production information reported by Continental to the NDIC; and the date of construction, reconstruction, or modification of the storage vessels; the storage vessels and associated emissions control equipment at or co-located with the Arthur 1,2,11 Hegler 1,2,11 Pad; Thorvald 1-6H well; Lundberg 8-8AH well; and Tarentaise 7-19H, North Tarentaise 1-7 CTB & North Tarentaise 8-9 Eco Group are subject to requirements for storage vessel affected facilities in NSPS OOOOb.

Closed Vent System Equipment Requirements [§ 60.5411b(a)]

Per § 60.5411b(a)(2), owners and operators must “design the closed vent system to capture and route all gases, vapors, and fumes to a process or a control device that meets the requirements specified in § 60.5412b(a) through (d)...” Furthermore, § 60.5411b(a)(3) requires that the closed vent system be designed and operated “with no identifiable emissions.” The EPA, using an OGI camera, observed emissions from the closed vent system at or co-located with the Arthur 1,2,11 Hegler 1,2,11 Pad; Thorvald 1-6H well; and Lundberg 8-8AH well. See Area of Concern #1 above.

Control Device Requirements [§ 60.5412b(a)]

Per § 60.5412b(a)(3)(vii), owners and operators must, “operate the flare with no visible emissions, except for periods not to exceed a total of 1 minute during any 15-minute period.” The EPA observed black smoke continuously for more than one minute (per Method 22) from a flare at or co-located with the Arthur 1,2,11 Hegler 1,2,11 Pad; Thorvald 1-6H well; Lundberg 8-8AH well; and Tarentaise 7-19H, North Tarentaise 1-7 CTB & North Tarentaise 8-9 Eco Group. See Area of Concern #2 above.

Table 2: Inspection Details: Storage Tank Observations					
Well Pad Name	Number of Storage Tanks	AVO (Audio, visual, olfactory) Observations	Applicable NSPS Regulation	Emissions Description	Media File Name
NADIA 8-10 PAD	12		0000a	Continuous emissions from produced water tanks	MOV_3528.mp4
Arthur 1,2,11 Hegler 1,2,11 Pad	18		0000b	Continuous emissions from top of the tanks 203, 204, 205 and continuous emissions from vent lines and thief hatches	MOV_3529.mp4
Thorvald 1-6H	16		0000b	Continuous emissions from center of the tank battery	MOV_3530.mp4
Lundberg 2-8AH	4	EPA inspectors observed oil stains on the surface of the tanks.	0000	Continuous emissions from the piping on top of the produced water tanks	MOV_3531.mp4
Lundberg 8-8AH	22		0000b	Continuous emissions from the tanks	MOV_3532.mp4
MOUNTAIN GAP 7-10 PAD	16		0000a	Continuous emissions from the tanks	MOV_3533.mp4
BANG 4-14 CTB/CS	14		0000a	Continuous emissions from two tanks	MOV_3534.mp4

Table 3: Inspection Details: Control Devices and AVO/OGI Observations						
Well Name	Number of Control Device(s)	Control Device Type(s)	Visible Pilot Flame (Y/N)	Active Flaring (Y/N)	Method 22 Observations	Emission Description
Edward 1-12 CTB	1	Air Assisted Steffes	Y	Y	None	

Edward 1-23H	N/A – There were no control devices at this facility. Tanks were empty and production was routed to a nearby site which was undergoing hydraulic fracturing or refracturing.					
NADIA 8-10 PAD	1	High-Low	Y	N	None	
Arthur 1,2,11 Hegler 1,2,11 Pad	1	Air Assisted Steffes	Y	Y	Yes	Continuous smoking from the flare. Method 22 was performed.
Thorvald 1-6H	1	Air Assisted Steffes	Y	Y	Yes	Continuous smoking from the flare. Method 22 was performed.
Lundberg 2-8AH	1	HP	Y	Y	Yes	Continuous smoking from the flare. Method 22 was performed.
Lundberg 8-8AH	1	Air Assisted Steffes	Y	Y	Yes	Continuous smoking from the flare. Method 22 was performed.
MOUNTAIN GAP 7-10 PAD	1	HP	Y	N	None	
BANG 4-14 CTB/CS	1	Air Assisted Steffes	Y	Y	None	
ANGUS FED 7-13 SIMMENTAL FED 6-12 CTB	1	Air Assisted Steffes	Y	Y	Yes	Continuous smoking from the flare. Method 22 was performed.
Hereford-Angus Eco Pad	1	Air Assisted Steffes	Y	Y	None	
Brangus Pad	1	Air Assisted Steffes	Y	Y	None	
HEREFORD FEDERAL 1-9 CTB	1	Air Assisted Steffes	Y	Y	None	
Tarentaise 7-19H, North Tarentaise 1-7 CTB & North Tarentaise 8-9 Eco Group	1	Air Assisted Steffes	Y	Y	Yes	Intermittent smoking from the flare. Method 22 was performed.

APPENDIX A: Photograph and Video Log

Media File	Description	Well Pad Name
MOV_3528.mp4*	Continuous emissions from produced water tanks	NADIA 8-10 PAD
MOV_3529.mp4*	Continuous emissions from top of the tanks 203, 204, 205 and continuous emissions from vent lines and thief hatches	Arthur 1,2,11 Hegler 1,2,11 Pad
MOV_3530.mp4*	Continuous emissions from center of the tank battery	Thorvald 1-6H
MOV_3531.mp4*	Continuous emissions from the piping on top of the produced water tanks	Lundberg 2-8AH
MOV_3532.mp4*	Continuous emissions from the tanks	Lundberg 8-8AH
MOV_3533.mp4*	Continuous emissions from the tanks	MOUNTAIN GAP 7-10 PAD
MOV_3534.mp4*	Continuous emissions from two tanks	BANG 4-14 CTB/CS
entrysign-20241021-143533.jpg	Entry Sign	Edward 1-12 CTB
entrysign-20241021-143946.jpg	Entry Sign	Edward 1-23H
entrysign-20241021-175639.jpg	Entry Sign	NADIA 8-10 PAD
entrysign-20241021-121533.jpg	Entry Sign	Arthur 1,2,11 Hegler 1,2,11 Pad
entrysign-20241021-185055.jpg	Entry Sign	Thorvald 1-6H
entrysign-20241021-192123.jpg	Entry Sign	Lundberg 2-8AH
entrysign-20241021-193057.jpg	Entry Sign	Lundberg 8-8AH
entrysign-20241021-194105.jpg	Entry Sign	MOUNTAIN GAP 7-10 PAD
entrysign-20241021-195408.jpg	Entry Sign	BANG 4-14 CTB/CS
entrysign-20241022-164453.jpg	Entry Sign	ANGUS FED 7-13 SIMMENTAL FED 6-12 CTB
entrysign-20241022-171458.jpg	Entry Sign	Hereford-Angus Eco Pad
entrysign-20241022-180040.jpg	Entry Sign	Brangus Pad
entrysign-20241022-183531.jpg	Entry Sign	HEREFORD FEDERAL 1-9 CTB
entrysign-20241022-185428.jpg	Entry Sign	Tarentaise 7-19H, North Tarentaise 1-7 CTB & North Tarentaise 8-9 Eco Group

*In addition to recording metadata through the OGI camera's system, EPA collected metadata for the media files recorded during the inspections, including the date, time, and location of the recorded media, in the Survey123 ArcGIS application at the time of the inspections. Due to a technical issue experienced with the OGI camera's metadata captured for the .mp4-type files, the Survey123 metadata was used as the primary reference for verifying inspection media file data.