MEMORANDUM

TO: EPA Docket ID No. EPA-HQ-OAR-2017-0483

DATE: April 12, 2018

SUBJECT: Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR Part 60, Subpart OOOOa

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1.0 INTRODUCTION

This memorandum summarizes the requirements of various state fugitive emissions programs for well sites and compressor stations. It compares each state programs' requirements to the proposed revisions to the Oil and Natural Gas Sector New Source Performance Standards (NSPS) at 40 CFR Part 60, Subpart OOOOa.

2.0 BACKGROUND

On June 3, 2016, the EPA published a final rule titled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources" in the **Federal Register** ("2016 NSPS OOOOa"). This rule introduced fugitive emissions requirements for the collection of fugitive emissions components located at well sites and compressor stations. The EPA has granted reconsideration of several issues in the 2016 NSPS OOOOa, including the fugitive emissions requirements and the process and criteria for requesting and receiving approval for the use of an alternative means of emission limitation (AMEL). To support the proposed reconsideration of the 2016 NSPS OOOOa ("2018 Proposal"), the EPA evaluated the equivalence of existing state programs to the fugitive emissions requirements in the 2018 Proposal.

This memorandum details the process taken to evaluate equivalency of these existing programs and provides support for the proposed alternative fugitive standards contained in the 2018 Proposal. Section 3.0 provides a summary of the 2016 NSPS OOOOa and the proposed requirements in the 2018 Proposal. In section 4.0, we describe the methodology and criteria used for evaluating equivalency. Section 5.0 provides an evaluation of the existing programs that were included in this analysis. A summary of the conclusions of this analysis is included in section 6.0. Links to each of the programs evaluated in this analysis are provided in Appendix 1.

3.0 FUGITIVE EMISSIONS REQUIREMENTS IN 2016 NSPS OOOOa AND 2018 PROPOSAL

The 2016 NSPS OOOOa sets standards to control greenhouse gases (GHG) (in the form of limitations on methane) and volatile organic compound (VOC) emissions from fugitive emissions components at well sites and compressor stations. Specifically, owners and operators must conduct semiannual monitoring for fugitive emissions at well sites and quarterly monitoring for fugitive emissions at compressor stations. Additionally, well sites located on the Alaskan North Slope must conduct annual monitoring. This monitoring must be conducted using

optical gas imaging (OGI), and repairs are required for any visible emissions observed. Method 21 of Appendix A-7 to Part 60 ("Method 21") may be used as an alternative monitoring method at a repair threshold level of 500 parts per million (ppm). Repairs must be made within 30 days of finding fugitive emissions, and a resurvey of the repaired component is required within 30 days of the repair using either OGI or Method 21. When using OGI for this resurvey, no visible emissions indicates successful repair. For Method 21, an instrument reading below 500 ppm indicates successful repair, or the presence of no visible emissions if using a soap solution. A monitoring plan that covers the collection of fugitive emissions components at a well site or compressor station within a company-defined area must be developed and implemented.

The 2018 Proposal includes amendments to these fugitive emissions standards. For instance, we are proposing to revise the monitoring frequency for well sites to annual for well sites that are not considered low production well sites. For low production well sites, we are proposing biennial monitoring (every other year). Low production well sites are well sites where the average combined oil and natural gas production is less than 15 barrels of oil equivalent (boe) per day, averaged over the first 30 days of production. The 2018 Proposal also proposes to revise the monitoring frequency for compressor stations to semiannual. Additionally, we are proposing separate monitoring requirements for compressor stations located on the Alaskan North Slope (annual monitoring). The 2018 Proposal includes changes to the repair deadlines for fugitive emissions; specifically, a first attempt at repair is required within 30 days of finding fugitive emissions, with a final repair that includes the resurvey within 60 days of finding the fugitive emissions.

A summary of the fugitive emissions requirements within the 2016 NSPS OOOOa and the 2018 Proposal is provided in Table 1.

Table 1. Summary of Fugitive Emissions Requirements in 2016 NSPS OOOOa and 2018 Proposal

Regulation	40 CFR Part 60, Subpart OOOOa			
	2016 NSPS OOOOa		2018 Proposal	
Monitoring Instrument	OGI	Method 21	OGI	Method 21
Leak Definition	Visible leak	500 ppm	Visible leak	500 ppm
Initial Monitoring				
- *Well Sites*	60 days		60 days	
- *Compressor Stations*				
Monitoring Frequency				
- *Well Sites*	Semiannual		Annual	
- *Low Production Wells*			Biennial (every two years)	
- *Compressor Stations*	Quarterly		Semiannual	
Repair				
- *First Attempt*	NA		30 days	
- *Final Repair*	30 days		60 days	
- *Resurvey*	30 days from repair		Included in final repair	
- *DOR Deadline*	Next scheduled shutdown, or 2 years		Next scheduled shutdown, or 2 years	

4.0 SUMMARY OF METHODOLOGY USED TO EVALUTATE EQUIVALENCY

This memorandum provides our evaluation of the fugitive emissions requirements for states with an existing fugitive emissions program. For this evaluation, we analyzed the components that were included in the fugitive emissions programs, the affected facilities, the effective date(s) of the program, approved monitoring instruments, fugitive emissions definitions, monitoring frequencies, repair and resurvey timelines, and delay of repair (DOR) provisions. Equivalency determinations were made by comparing each of these aspects to those of the 2018 Proposal and by considering the requirements in the broader context of their fugitive emissions programs. The states that we analyzed were selected based on programs that we reviewed in previous actions and through a review of regulations and permit information for other states with known oil and gas activities.

This analysis was limited to information from state programs that were publicly available at the time of production of this memorandum and may not include state programs that are currently being drafted or proposed. For this memorandum, we reviewed fugitive emission programs from Alaska, California, Colorado, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, and Wyoming. States that are not included in this analysis either do not have requirements, or we were unable to locate requirements for this analysis. A summary of each of the programs is provided in the following section.

5.0 ANALYSIS OF STATE FUGITIVE EMISSIONS REQUIREMENTS

5.1 Components

As mentioned in the previous section, this analysis began by examining the specific fugitive emissions components subject to the requirements in each state program. Only one state program (Wyoming) was identified that explicitly includes all the components that are included in the 2018 Proposal, although there are certain key components that are included in most of the state programs (connectors, flanges, pressure relief devices (PRDs), and valves). A comparison of the types of components included in the state programs and the 2018 Proposal is presented in Table 2.

5.2 Alaska

Title 18, Chapter 50 of the Alaska Administrative Code (AAC) adopts the 2012 NSPS OOOO requirements for Title V sources.[1] While this does not require fugitive emissions programs for well sites or compressor stations, in 2009, the state's Sub-Cabinet on Climate Change, within the Office of the Governor, recommended assessing the potential emissions reductions and costs associated with a fugitive emissions program.[2] We were unable to locate any additional information on this effort. Therefore, we are not able to evaluate equivalency of these requirements to the 2018 Proposal.

5.3 California

The California Air Resources Board (CARB) finalized fugitive emissions requirements for well sites and compressors stations on July 17, 2017, with an effective date of January 1, 2018.[3] A summary of California's fugitive emissions requirements is provided in Table 3.

[1] 18 AAC 50.040(a)(2)(WW); available at http://www.legis.state.ak.us/basis/aac.asp#18.50.040.
[2] Alaska Climate Change Strategy's Mitigation Advisory Group Final Report: Greenhouse Gas Inventory and Forecast and Policy Recommendations Addressing Greenhouse Gas Reduction in Alaska (2009); available at http://climatechange.alaska.gov/mit/mag.htm
[3] California regulations available at https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I401BB8146DA14B519A991D7827913AEE&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default).

Table 2. Components Included in the 2018 Proposal and State Requirements

	2018 Proposal	California	Colorado	Montana[4]	North Dakota[5]	Ohio	Pennsylvania[6]	Texas[7]	Utah	Wyoming
Compressors	X				X	X	X	X	X	X
Connectors	X	X[8]	X		X	X	X	X	X	X
Covers	X				X	X	X		X	X
CVSs	X[9]				X	X	X		X	X
Flanges	X	X	X		X	X	X	X	X	X
Instruments	X				X		X		X	X
Meters	X[10]	X			X		X		X	X
OELs	X	X			X	X	X	X	X	X
PRDs	X	X	X		X	X	X	X	X	X
Storage Vessels	X[11]				X	X	X			X
Thief Hatches	X				X		X	X	X	X
Valves	X	X	X		X	X	X	X	X	X
(Other)	X	X	X	X	X	X	X	X	X	X

[4] Montana only requires inspection of "VOC piping components".
[5] The North Dakota consent decree does not provide a definition for components. For the analysis, the EPA assumes all the 2018 Proposal components are included.
[6] Pennsylvania permit language does not list component types to be inspected. For this analysis, the EPA assumes all of the 2018 Proposal components are included. Exemption No. 38 only includes connectors, covers, flanges, storage vessels, valves, and other components.
[7] Texas does not include definitions for "components" but mentions certain components in their requirements.
[8] "Threaded connection".
[9] Only includes those not subject to 40 CFR §§60.5397a or 60.5411a.
[10] Does not include meters owned by third-parties.
[11] Only includes those not subject to 40 CFR §60.5395a.

Table 3. Summary of Fugitive Emissions Requirements in California

Regulation	Cal. Code Regs. tit. 17, § 95665-95677	
Effective Date	January 1, 2018	January 1, 2020
Monitoring Instrument	Method 21	
Leak Definition	10,000 ppm	1,000 ppm
Initial Monitoring		
- *Well Sites*	90 days	
- *Compressor Stations*		
Monitoring Frequency		
- *Well Sites*	Quarterly	
- *Low Production Wells*		
- *Compressor Stations*		
Repair		
- *First Attempt*	NA	
- *Final Repair*	(See Table 4)	
- *Resurvey*	Within repair timeframe	
- *DOR Deadline*	Next process shutdown or 12 months, whichever is sooner	
- *Additional DOR Info*	If parts needed, repair within 30 days of required date; DOR if deemed critical to reliability of public gas system	

The regulated components include threaded connections, flanges, meters, OELs, PRDs, valves, fittings, process drains, stuffing boxes, pipes, seal fluid systems, diaphragms, hatches, sight-glasses, well casings, pneumatic devices, and reciprocating compressor rod packing and seals. Weekly audio-visual and quarterly Method 21 inspections are required. OGI may be used as a screening tool prior to using Method 21 for quarterly inspections. The repair requirements change for leaks that are detected on or after January 1, 2020 because of the phase-in period of the rule that extends from January 1, 2018 to December 31, 2019. The timeline for repair also depends on the ppm instrument reading observed during Method 21 monitoring, as presented in Table 4:

Table 4. California Timelines to Finish Leak Repair After Detection (Days)

	1,000-9,999 ppm	**10,000-49,999 ppm**	**50,000 ppm or greater**
Before 2020	(N/A)	14	5
2020 and After	14	5	2

Critical components[12] or critical process units[13] must be repaired during the next scheduled shutdown or within 12 months of detecting the leak, whichever is sooner. The regulations also include DOR provision for when parts are needed and for when a component is considered to be critical to the reliability of the public gas system. Components used exclusively for crude oil with an American Petroleum Institute (API) gravity less than 20 are exempt from the fugitive emissions requirements. Records of when the inspection took place, components found leaking, repair dates, and leak concentrations before and after repair are required. Annual reporting of the results of all weekly and quarterly inspections, including the initial and final concentrations of each component, are also required. The annual reporting form is included in Appendix 1.

Table 5 provides a summary of the criteria evaluated for equivalency and our equivalency determination of California's fugitive emissions requirements to the 2018 Proposal:

Table 5. Equivalency of California's Fugitive Emissions Requirements to 2018 Proposal

Regulation	Cal. Code Regs. tit. 17, § 95665-95677	
Effective Date	January 1, 2018	January 1, 2020
Monitoring Instrument	Method 21	
Leak Definition	No	1,000 ppm – Yes
Initial Monitoring		
- *Well Sites*	No	
- *Compressor Stations*		
Monitoring Frequency		
- *Well Sites*	Yes	
- *Low Production Wells*		
- *Compressor Stations*		
Repair		
- *Final Repair*	Yes	
- *Resurvey*	Yes	
- *DOR Deadline*	Yes	

5.4 Colorado

Fugitive emissions requirements for oil and gas facilities in Colorado are located in the state's Regulation 7.[14] There are two sets of fugitive emissions requirements: one for facilities in

[12] A component that would require the shutdown of a critical process unit if that component was shutdown/disabled
[13] A process unit or group of components that must remain in service because of its importance to the overall process that requires it to continue to operate, and has no equivalent equipment to replace it or cannot be bypassed, and it is technically infeasible to repair leaks from that process unit without shutting it down and opening the process unit to the atmosphere
[14] Colorado regulations available at https://www.sos.state.co.us/CCR/DisplayRule.do?action=ruleinfo&ruleId=2341&deptID=16&agencyID=7&deptNa

ozone nonattainment areas (section XII.L) and one that covers the entire state (section XVII.F). A summary of these two sets of requirements is presented in Table 6.

Table 6. Summary of Fugitive Emissions Requirements in Colorado

Regulation	Regulation 7, Section XII.L			Regulation 7, Section XVII.F		
Effective Date	June 30, 2018			October 15, 2014 (well sites); January 1, 2015 (compressor stations)		
Monitoring Instrument	OGI	Method 21	Other approved	OGI	Method 21	Other approved
Leak Definition	Visible leak	500 ppm	State-defined	Visible leak	500 ppm	Visible leak
Initial Monitoring						
- *Well Sites*	15-30 days			(See Table 8)		
- *Compressor Stations*	90 days			(See Table 9)		
Monitoring Frequency						
- *Well Sites*	Based on Volatile Organic Compound (VOC) emissions: tpy $\geq$ 1 and $\leq$ 6 – Annual; tpy > 6 – Semiannual			(See Table 7)		
- *Low Production Wells*						
- *Compressor Stations*	Quarterly					
Repair						
- *First Attempt*	5 working days			5 working days		
- *Final Repair*	30 working days			NA		
- *Resurvey*	15 days of repair			15 days of repair		
- *DOR Deadline*	Next scheduled shutdown, with final repair within 2 years			Next scheduled shutdown		
- *Additional DOR Info*	If parts are ordered, repair within 15 days of receipt; if other good cause, repair within 15 days after cause ceases to exist			If parts are ordered, repair within 15 days of receipt; if other good cause, repair within 15 days after cause ceases to exist		

Both programs regulate the following types of components: connectors, flanges, PRDs, vales, pump seals, and other openings on a controlled storage tank. Components in process streams consisting of glycol, amine, produced water, or methanol are not included in the programs. Instrument monitoring for leaks is required using Method 21, OGI, or a state approved instrument monitoring method (AIMM). Leaks are defined as a measured hydrocarbon concentration greater than 500 ppm when Method 21 is used, and as detectable emissions when

me=Department%20of%20Public%20Health%20and%20Environment&agencyName=Air%20Quality%20Control%20Commission&seriesNum=5%20CCR%201001-9

OGI or AIMM are used. Operators must make their first attempt to repair leaks within 5 days after detection, and components must be resurveyed within 15 days of repair in order to ensure that the components are no longer leaking. DOR provisions are also included for situations where a shutdown is required or if parts are unavailable. If the operator needs to order parts, the repair must be made within 15 days of receipt of those parts.

For facilities in ozone nonattainment areas, the effective date of the fugitive emissions requirements is June 30, 2018. Well sites must conduct initial monitoring within 15 to 30 days after startup, and compressor stations must conduct initial monitoring within 90 days after startup. For well sites, the monitoring frequency is dependent on the uncontrolled VOC emissions from the highest emitting storage tank at the well site. If no storage tanks are present, then the monitoring frequency is based on the controlled VOC emissions from the well site. If the emissions are 1 ton per year (tpy) or greater but less than 6 tpy, then annual instrument monitoring is required. If the emissions are 6 tpy or greater, then semiannual monitoring is required. For compressor stations, quarterly instrument monitoring is required, regardless of emissions. Operators are required to complete leak repairs within 30 days after detection for these areas. If a shutdown is required to make repairs, then repairs must be completed during the next scheduled shutdown, or within two years.

For the statewide fugitive emissions requirements, the effective dates are October 15, 2014, and January 1, 2015, for well sites and compressor stations, respectively. Similar to the ozone nonattainment area requirements, the instrument monitoring frequency for a well site is dependent on the VOC emissions and the equipment present at the well site. For compressor stations, the frequency is based on the fugitive VOC emissions from the compressor station. The different frequency requirements for each type of facility are presented in Table 7.

Table 7. Colorado State-Wide Instrument Monitoring Frequencies

	Frequency
Well sites without storage tanks: Controlled VOC emissions (tpy)	
- > 0 and ≤ 6	One-time
- > 6 and ≤ 12	Annually
- > 12 and ≤ 20	Quarterly
- > 20	Monthly
Well sites with storage tanks: Uncontrolled VOC emissions from highest emitting tank (tpy)	
- > 0 and ≤ 6	One-time
- > 6 and ≤ 12	Annually
- > 12 and ≤ 50	Quarterly
- > 50	Monthly
Compressor stations: Fugitive VOC emissions (tpy)	
- > 0 and ≤ 12	Annually
- > 12 and ≤ 50	Quarterly
- > 50	Monthly

Initial monitoring requirements for compressor stations and well sites are presented in Tables 8 and 9, respectively.

Table 8. Colorado State-Wide Compressor Station Initial Monitoring

	Fugitive VOC Emissions	
Construction Date	tpy > 0 and ≤ 50	tpy > 50
On or Before January 1, 2015	90	30
After January 1, 2015	(Upon startup)	

Table 9. Colorado State-Wide Well Site Initial Monitoring

	Instrument Monitoring Frequency		
Construction Date	One-Time	Monthly	Other
On or After October 15, 2014	15-30 days after startup		
Before October 15, 2014	By January 1, 2016	30 days	90 days

According to the statement of basis and purpose within Regulation 7, distinctions between well sites with storage tanks and those without were used to complement the state's Storage Tank Emissions Monitoring programs. A 2014 guidance memo also clarifies that tank

batteries are included in the Regulation 7 definition for a "well production facility". [15] Monthly audio-visual-olfactory (AVO) inspections are also required for well sites that do not conduct monthly instrument monitoring. If a shutdown is required to repair any instrument monitoring leak identified, the leak must be repaired during the next scheduled shutdown. The recordkeeping form is included in Appendix 1.

Table 10 provides a summary of the criteria evaluated for equivalency and our determination of equivalency of Colorado's fugitive emissions requirements to the 2018 Proposal.

Table 10. Equivalency of Colorado's Fugitive Emissions Requirements to 2018 Proposal

Regulation	Regulation 7, Section XII.L		Regulation 7, Section XVII.F	
Effective Date	June 30, 2018		October 15, 2014 (well sites); January 1, 2015 (compressor stations)	
Monitoring Instrument	OGI	Method 21	OGI	Method 21
Leak Definition	Yes	Yes	Yes	Yes
Initial Monitoring				
- *Well Sites*	Yes		Yes[16]	
- *Compressor Stations*	No		Yes (> 50 tpy VOC emissions or constructed after January 1, 2015)	
Monitoring Frequency				
- *Well Sites*	Yes[17]		Yes[18]	
- *Low Production Wells*	Yes (> 1 tpy uncontrolled VOC emissions)		Yes[19]	
- *Compressor Stations*	Yes		Yes (> 12 tpy fugitive VOC emissions)	
Repair				
- *First Attempt*	Yes		Yes	
- *Final Repair*			No	
- *Resurvey*			Yes	
- *DOR Deadline*			No	

[15] Laplante, C. and S. Rucker (2014). Guidance for Oil & Gas Industry Regulation 7, Section XVII.F, Leak Detection and Repair Program for Well Production Facilities and Natural Gas Compressor Stations and Section XVII.B, General Provisions for Open Ended Valves or Lines. Denver, CO, CDPHE Stationary Sources Program. Available at https://www.colorado.gov/pacific/cdphe/summary-oil-and-gas-emissions-requirements

[16] If well site was constructed before October 15, 2014, and does not have one-time or monthly monitoring, Colorado requirements are not considered equivalent

[17] For sites with > 6 tpy uncontrolled VOC emissions for the first two years and > 1 tpy thereafter

[18] First two years – sites w/ tanks: > 12 tpy VOC emissions from highest emitting tank, sites w/out tanks: > 12 tpy controlled VOC emissions; then sites w/ tanks: > 6 tpy VOC emissions from highest emitting tank; for sites w/out tanks: > 6 tpy controlled VOC emissions

[19] Sites w/ tanks: > 6 tpy VOC emissions from highest emitting tank; for sites w/out tanks: > 6 tpy controlled VOC emissions

5.5 Montana

Fugitive emissions requirements in Montana are provided in the Administrative Rules of Montana (ARM) Title 17, Chapter 8, Subchapters 16 and 17.[20] A summary of Montana's requirements is presented in Table 11.

Table 11. Summary of Fugitive Emissions Requirements in Montana

Regulation	ARM 17.8.1601 through 17.8.1713
Effective Date	April 7, 2006
Monitoring Instrument	AVO
Leak Definition	NA
Initial Monitoring	
- *Well Sites*	30 days
- *Compressor Stations*	
Monitoring Frequency	
- *Well Sites*	Monthly
- *Low Production Wells*	
- *Compressor Stations*	NA
Repair	
- *First Attempt*	As soon as practicable
- *Final Repair*	15 days
- *Resurvey*	NA
- *DOR Deadline*	Next shutdown
- *Additional DOR Info*	NA

Subchapter 16 addresses well sites prior to the issuance of a permit, and subchapter 17 addresses permitted facilities. For both types of facilities, Montana requires monthly AVO inspections of VOC piping components. Operators must first attempt to repair a leak within 5 days after detection, with final repair completed within 15 days. DOR provisions are included when the repair requires a shutdown. In those situations, operators are given until the next scheduled shutdown to repair the leak. Table 12 provides a summary of the criteria evaluated for equivalency and the determination of equivalency of Montana's fugitive emissions requirements to the 2018 Proposal.

[20] Montana regulations available at http://deq.mt.gov/DEQAdmin/dir/legal/Chapters/ch08-toc.

Table 12. Equivalency of Montana's Fugitive Emissions Requirements to 2018 Proposal

Regulation	ARM 17.8.1601 through 17.8.1713
Effective Date	April 7, 2006
Monitoring Instrument	AVO
Leak Definition	No
Initial Monitoring	
- *Well Sites*	Yes
- *Compressor Stations*	
Monitoring Frequency	
- *Well Sites*	Yes
- *Low Production Wells*	
- *Compressor Stations*	NA
Repair	
- *First Attempt*	Yes
- *Final Repair*	
- *Resurvey*	No
- *DOR Deadline*	

5.6 New Mexico

Title 19, Chapter 15, Part 2 of the New Mexico Administrative Code (NMAC) prevents production operators from allowing gas to "either leak or escape from … wells, tanks, containers, pipe or other storage, conduit, or operating equipment."[21] However, we were unable to determine how these requirements are enforced. Therefore, we are not able to evaluate equivalency of these requirements to the 2018 Proposal.

5.7 North Dakota

Chapter 33-15-07 of the North Dakota Administrative Code (N.D.A.C.) states that operators must prevent the release of VOC,[22] and this requirement is enforced through company-wide consent decrees. A summary of North Dakota's fugitive emissions requirements is provided in Table 13.

[21] NMAC 19.15.2.8(B); available at http://www.emnrd.state.nm.us/OCD/documents/SearchablePDFofOCDTitle19Chapter15-Revised10-5-16.pdf.
[22] N.D.A.C. § 33-15-07-02(1); available at http://www.legis.nd.gov/information/acdata/pdf/33-15-07.pdf

Table 13. Summary of Fugitive Emissions Requirements in North Dakota

Regulation	N.D.A.C. § 33-15-07-02(1), enforced by Consent Decrees	
Effective Date	October 17, 2016	
Monitoring Instrument	OGI	Other approved
Leak Definition	Visible leak	State-defined
Initial Monitoring		
- *Well Sites*	Complete by December 31, 2016	
- *Compressor Stations*		
Monitoring Frequency		
- *Well Sites*	Semiannual	
- *Low Production Wells*	NA	
- *Compressor Stations*		
Repair		
- *First Attempt*	5 calendar days	
- *Final Repair*	30 calendar days	
- *Resurvey*	Included in final repair	
- *DOR Deadline*	"Difficult to repair" components must be repaired by the end of the consent decree term (two years) or during next scheduled shutdown or well shut-in, whichever is sooner	
- *Additional DOR Info*	Must notify North Dakota Department of Public Health	

The consent decree required the completion of initial monitoring by the end of 2016 at well sites, with monthly AVO and semiannual OGI inspections occurring thereafter. Low-production wells are excluded from these regular monitoring requirements, where low production is defined as producing less than 15 barrels (bbl) per day. Operators must attempt leak repairs within 5 days of detection, and repairs must be completed within 30 days, with a resurvey required upon completing the repair. If components are difficult to repair, the operator may repair them by the end of the consent decree term (2 years) or during the next schedule shutdown or well shut-in, whichever is sooner. Records of each monitoring survey, when each survey took place, equipment inspected, leaks found, and the repair fate of the leaks, including DOR, are also required. Based on discussions with state regulators, approximately 9,000 wells are subject to this consent decree.[23]

Table 14 provides a summary of the criteria evaluated for equivalency and determination of equivalency of North Dakota's fugitive emissions requirements to the 2018 Proposal. However, we are not determining these requirements to be equivalent because by their nature, consent decrees are negotiated terms for non-compliance and contain an expiration date, after which sources return to compliance with the underlying regulatory provisions, permit terms, etc. Further, inclusion of settlement terms from a consent decree as an alternative standard would essentially endorse regulation through enforcement as a pathway to the establishment of

[23] Conversation with Jim Semerad, North Dakota Department of Health. September 11, 2017.

alternative standards. For these reasons, the EPA believes that evaluation of settlement agreement terms reached through negotiated resolution to an enforcement action would be an inappropriate basis from which to determine equivalency for regulations promulgated through notice and comment rulemaking.

Table 14. Equivalency of North Dakota's Fugitive Emissions Requirements to 2018 Proposal

Regulation	N.D.A.C. § 33-15-07-02(1), enforced by Consent Decrees
Effective Date	October 17, 2016
Monitoring Instrument	OGI
Leak Definition	Yes
Initial Monitoring	
- *Well Sites*	Yes
- *Compressor Stations*	
Monitoring Frequency	
- *Well Sites*	Yes
- *Low Production Wells*	No
- *Compressor Stations*	
Repair	
- *First Attempt*	Yes
- *Final Repair*	
- *Resurvey*	
- *DOR Deadline*	

5.8 Ohio

On April 4, 2014, the Ohio EPA approved general permits 12.1 and 12.2 for well sites with small and large flares, respectively, that have conducted high-volume horizontal hydraulic fracturing.[24] These permits only apply to well sites that emit less than 1 tpy of any hazardous air pollutant (HAP), excluding those subject to 40 CFR Part 63, Subpart HH.[25] The fugitive emissions requirements in these permits are referred to as leak detection and repair (LDAR), and are the same for both permits. Ohio also approved general permit 18.1 for equipment leaks at natural gas compressor stations on February 7, 2017.[26] This permit applies to facilities that have the potential to emit 10.56 tpy of VOC or greater from fugitive equipment leaks. A summary of Ohio's fugitive emissions requirements is provided in Table 15.

[24] Ohio well site permits available at http://epa.ohio.gov/dapc/genpermit/oilandgaswellsiteproduction.aspx
[25] National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities
[26] Available at http://epa.ohio.gov/dapc/genpermit/ngcs/GP_181.aspx

Table 15. Summary of Fugitive Emissions Requirements in Ohio

Permit	General Permits 12.1 and 12.2		General Permit 18.1	
Effective Date	April 14, 2014		February 7, 2017	
Monitoring Instrument	OGI	Method 21	OGI	Method 21
Leak Definition	Visible leak	500 or 10,000 ppm	Visible leak	500, 2,000, or 10,000 ppm[a27]
Initial Monitoring				
- *Well Sites*	90 days		NA	
- *Compressor Stations*	NA		60 days	
Monitoring Frequency				
- *Well Sites*	Quarterly for 1 year, then semiannual or annual (based on 2% leak rate)		NA	
- *Low Production Wells*				
- *Compressor Stations*	NA		Quarterly	
Repair				
- *First Attempt*	5 calendar days		As soon as practicable	
- *Final Repair*	30 calendar days		30 calendar days	
- *Resurvey*	Within repair timeframe		Within repair timeframe	
- *DOR Deadline*	40 CFR § 60.5416(c)(5)		40 CFR § 60.5397a(h)(2)	
- *Additional DOR Info*	NA		NA	

[a] When using Method 21, leak definitions vary depending on component: for compressors and closed vent systems (CVS), the leak definition is 500 ppm, and for all other equipment, the leak definition is 10,000 ppm.

Each permittee for well sites is required to develop and implement an LDAR program for ancillary equipment that requires monitoring using OGI or Method 21. The permits do not appear to allow for alternative instrument monitoring methods. Initial monitoring is required within 90 days of startup followed by quarterly monitoring for a period of 1 year. After the first year, if less than 2% of components are found to be leaking, then the monitoring frequency is reduced to semiannual. If less than 2% of components are found to be leaking after two semiannual inspections, then the monitoring frequency can be reduced to annual. However, if the percent of components leaking during any subsequent monitoring events is equal to or greater than 2%, the monitoring frequency is reset to quarterly for a 1-year period before less frequent monitoring can be utilized.. When using OGI, leaks are defined as visible emissions. When using Method 21, leak definitions vary depending on component: for compressors and closed vent systems (CVS), the leak definition is 500 ppm, and for all other equipment, the leak definition is 10,000 ppm. Open-ended lines (OEL) must be equipped with a cap, blind flange, plug, or a second valve. Permittees must make a first attempt at repair within 5 days of detection of a leak, and the repair must be completed within 30 days after detection. If leaks cannot be repaired

[27] When using Method 21, leak definitions vary depending on component: for compressors and closed vent systems (CVS), the leak definition is 500 ppm, and for all other equipment, the leak definition is 10,000 ppm.

within that time frame, the general permit references the DOR provisions allowed under the 2012 NSPS OOOO, which require completion of delayed repairs at the end of the next shutdown.[28]

The requirements for compressor stations are similar to those for well sites, with a few exceptions. Initial monitoring must be completed by June 3, 2017 or within 60 days of startup, with subsequent monitoring on a quarterly basis. Intermittent/snap-acting pneumatic controllers are included in the list of ancillary equipment, and a separate leak definition of 2,000 ppm is provided for pumps. The permit requires operators to begin repairs as soon as practicable upon detection, with completion of repairs within 30 days. If leaks cannot be repaired within that time frame, the general permit references the DOR provisions allowed under the 2016 NSPS OOOOa. The permit also requires weekly AVO inspections when operators are present at a facility and the facility is operating.

Table 16 provides a summary of the criteria evaluated for equivalency and our determination of equivalency of Ohio's fugitive emissions requirements to the 2018 Proposal.

Table 16. Equivalency of Ohio's Fugitive Emissions Requirements to 2018 Proposal

<table>
<tr><td>Permit</td><td colspan="2">General Permits 12.1 and 12.2</td><td colspan="2">General Permit 18.1</td></tr>
<tr><td>Effective Date</td><td colspan="2">April 14, 2014</td><td colspan="2">February 7, 2017</td></tr>
<tr><td>Monitoring Instrument</td><td>OGI</td><td>Method 21</td><td>OGI</td><td>Method 21</td></tr>
<tr><td>Leak Definition</td><td>Yes</td><td>500 ppm – Yes</td><td>Yes</td><td>500 ppm - Yes</td></tr>
<tr><td>Initial Monitoring</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>- Well Sites</td><td colspan="2">No</td><td colspan="2">NA</td></tr>
<tr><td>- Compressor Stations</td><td colspan="2">NA</td><td colspan="2">Yes</td></tr>
<tr><td>Monitoring Frequency</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>- Well Sites</td><td colspan="2" rowspan="2">Yes</td><td colspan="2" rowspan="2">NA</td></tr>
<tr><td>- Low Production Wells</td></tr>
<tr><td>- Compressor Stations</td><td colspan="2">NA</td><td colspan="2">Yes</td></tr>
<tr><td>Repair</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>- First Attempt</td><td colspan="2" rowspan="3">Yes</td><td colspan="2" rowspan="3">Yes</td></tr>
<tr><td>- Final Repair</td></tr>
<tr><td>- Resurvey</td></tr>
<tr><td>- DOR Deadline</td><td colspan="2">No[29]</td><td colspan="2"></td></tr>
</table>

[28] The specific requirements in the 2012 NSPS OOOO (at 40 CFR 60.5416(c)(5)) are limited to emissions detected on closed vent systems associated with storage vessels, however, it is our understanding that Ohio applies these same requirements for all affected components under the permit program.
[29] GPs 12.1 and 12.2 refer to DOR provisions in the 2012 NSPS OOOO.

5.9 Oklahoma

The Oklahoma Administrative Code (OAC) prohibits leakage from wellhead connections, surface equipment, and tank batteries (OAC 165:10-3-12), as well as any other gaseous waste at well sites (OAC 165:10-3-14). In addition, OAC 252:100-7-60.5(a)(2)(A) requires that minor sources comply with the 2016 NSPS OOOOa.[30] We are not evaluating equivalency of the permit requirements for Oklahoma because the current requirements incorporate the 2016 NSPS OOOOa.

5.10 Pennsylvania

5.10.1 General Permits 5 and 5A

On June 7, 2018, the Pennsylvania Department of Environmental Protection (PADEP) finalized General Permits 5 and 5A[31] for compressor stations and unconventional well sites, respectively, with an effective date of August 8, 2018. A summary of the fugitive emissions requirements within each permit is provided in Table 17.

Table 17. Summary of Permit Fugitive Emissions Requirements in Pennsylvania

Permit	General Permit 5			General Permit 5A		
Effective Date	August 8, 2018			August 8, 2018		
Monitoring Instrument	OGI	EPA Method 21	Other approved	OGI	EPA Method 21	Other approved
Leak Definition	Visible leak	500 ppm	State-defined	Visible leak	500 ppm	State-defined
Initial Monitoring						
- *Well Sites*	NA			60 days		
- *Compressor Stations*	60 days			NA		
Monitoring Frequency						
- *Well Sites*	NA			Quarterly (unconventional wells)		
- *Low Production Wells*						
- *Compressor Stations*	Quarterly			NA		
Repair						
- *First Attempt*	5 days			5 days		
- *Final Repair*	15 days			15 days		
- *Resurvey*	30 days			30 days		
- *DOR Deadline*	Next blowdown, with final repair within 2 years			Next blowdown, with final repair within 2 years		
- *Additional DOR Info*	If parts are ordered, repair within 10 days or receipt			If parts are ordered, repair within 10 days or receipt		

[30] Oklahoma regulations available at: www.oar.state.ok.us/.
[31] Pennsylvania's General Permits 5 and 5A available at http://www.dep.pa.gov/Business/Air/BAQ/Permits/Pages/GeneralPermits.aspx

The requirements for the two permits are the same. Monitoring must begin within 60 days of startup, and follow a quarterly instrument monitoring schedule. Operators must use OGI, Method 21 at 500 ppm, or other approved device to detect gaseous hydrocarbon leaks. Operators must first attempt to repair leaks within 5 days of detection, with final repairs being made within 15 days. Components must be resurveyed within 30 days of the final repair. DOR provisions are included for situations where a shutdown is required or if parts are needed to make repairs. The general permits also require monthly AVO inspections.

Table 18 provides a summary of the criteria evaluated for equivalency and our determination of equivalency of Pennsylvania's permit fugitive emissions requirements to the 2018 Proposal.

Table 18. Equivalency of Pennsylvania's Permit Fugitive Emissions Requirements to 2018 Proposal

Permit	General Permit 5		General Permit 5A	
Effective Date	August 8, 2018		August 8, 2018	
Monitoring Instrument	OGI	EPA Method 21	OGI	EPA Method 21
Leak Definition	Yes	Yes	Yes	Yes
Initial Monitoring				
- *Well Sites*	NA		Yes	
- *Compressor Stations*	Yes		NA	
Monitoring Frequency				
- *Well Sites*	NA		Yes	
- *Low Production Wells*				
- *Compressor Stations*	Yes		NA	
Repair				
- *First Attempt*	Yes		Yes	
- *Final Repair*				
- *Resurvey*				
- *DOR Deadline*	Other state-approved monitoring instruments		Other state-approved monitoring instruments	

5.10.2 Exemption No. 38

Exemption No. 38 of the Air Quality Permit Exemption List applies to unconventional well sites.[32] The PADEP has also finalized updates to this exemption, but we did not identify any changes from the current fugitive requirements.[33] Components included in the exemption's fugitive emissions requirements are connectors, flanges, storage vessels, valves, and compressor

[32] Exemption available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-96215/275-2101-003.pdf.
[33] Proposed exemption available at http://www.dep.pa.gov/business/air/pages/methane-reduction-strategy.aspx.

seals in natural gas or hydrocarbon liquids service. The exemption requires monitoring within 60 days of startup and annually thereafter. Monitoring may be conducted using OGI, gas leak detectors, or other state approved methods. Leaks are defined as "no detectable emissions"[34] if using Method 21, 500 ppm if using a gas leak detector, and visible leaks if using OGI. All leaks must be repaired within 15 days of finding the leak. The exemption also includes DOR provisions for when a shutdown is necessary or if parts are needed. However, we were unable to determine any specific requirements related to when delayed repairs must be completed from the information available at the time of our analysis.

We have not determined whether the requirements in Exemption No. 38 are equivalent to those in the 2018 Proposal, though we are soliciting comment in the preamble on whether or not a state would revert back to its original program once the monitoring frequency for well sites is reduced. A summary of the requirements contained in the exemption is presented in Table 19.

Table 19. Summary of Fugitive Emissions Requirements in Pennsylvania's Exemption No. 38

Regulation	Exemption No. 38		
Effective Date	December 11, 2015		
Monitoring Instrument	OGI	Gas analyzer	Other approved
Leak Definition	Visible leak	500 ppm	State-defined
Initial Monitoring			
- *Well Sites*	60 days		
- *Compressor Stations*	NA		
Monitoring Frequency			
- *Well Sites*	Annual (for unconventional wells)		
- *Low Production Wells*			
- *Compressor Stations*	NA		
Repair			
- *First Attempt*	NA		
- *Final Repair*	15 days		
- *Resurvey*	NA		
- *DOR Deadline*	Next shutdown		
- *Additional DOR Info*	DOR provision if parts are ordered, but no requirements on repair timeline		

[34] Defined as a local VOC concentration at the surface of a leak source, adjusted for local VOC ambient concentration, that is less than 2.5 percent of the specified leak definition concentration. that indicates that a VOC emission (leak) is not present.

5.11 Texas

There are three sets of fugitive emissions requirements that may apply to well sites in Texas: the Permit by Rule (PBR) requirements and two Standard Permit requirements. The PBR requirements may be applied to well sites that emit less than 25 tpy of VOC, while those that emit higher amounts may be required to follow the Standard Permit requirements. The PBR requirements are found within the Texas Administrative Code (TAC), [35] and the Standard Permits can be found within either the TAC[36] or the "Air Quality Standard Permit for Oil and Gas Handling and Production Facilities".[37] A summary of the fugitive emissions requirements in Texas are presented in Table 20.

[35] 30 TAC § 106.352(e)(6); available at https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=106&rl=352.

[36] 30 TAC § 106.620; available at https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=116&rl=620

[37] Texas "Air Quality Standard Permit for Oil and Gas Handling and Production Facilities" available at https://www.tceq.texas.gov/assets/public/permitting/air/Announcements/oilgas-sp.pdf.

Table 20. Summary of Fugitive Emissions Requirements in Texas

Regulation/Permit	30 TAC § 106.352(e)(6)	Standard Permit	30 TAC § 106.620
Effective Date	February 27, 2011	November 8, 2012	September 4, 2000
Monitoring Instrument	(Not specified)	Method 21	Gas Analyzer
Leak Definition	NA	500 or 10,000 ppm	500, 2,000, or 10,000 ppm
Initial Monitoring			
- *Well Sites*	90 days	90 days	90 days
- *Compressor Stations*			
Monitoring Frequency			
- *Well Sites*	Quarterly, with potential to reduce to annual if % leaking valves is low	Quarterly, with potential to reduce to annual if % leaking valves is low	Quarterly, with potential to reduce to annual if % leaking valves is low
- *Low Production Wells*			
- *Compressor Stations*	NA	NA	NA
Repair			
- *First Attempt*	NA	5 days	NA
- *Final Repair*	30 - 60 days	15 days	15 days
- *Resurvey*	15 days	NA	NA
- *DOR Deadline*	Next shutdown	Next shutdown	Next scheduled shutdown
- *Additional DOR Info*	If repair would create more emissions, repair during next shutdown	If repair would create more emissions, repair during next shutdown	NA

The PBR and Standard Permit fugitive requirements apply to connectors, flanges, OEL, PRD, thief hatches, valves, and agitator, compressor, and pump seals. The PBR does not specify a monitoring instrument for conducting fugitive emissions monitoring while the standard permit requires Method 21 (or a gas analyzer in the TAC version). For the standard permit, if site-wide emissions are less than 25 tpy VOC, then the leak definition is 10,000 ppm. If site-wide emissions are greater than or equal to 25 tpy VOC, then the leak definition is 500 ppm. In the TAC version of the standard permit, the leak definition varies based on the component, the site-wide emissions, and the facility's proximity to an off-plant receptor (e.g., a residential area). Texas does not require separate initial monitoring for fugitive emissions, though regular quarterly instrument monitoring is required. The PBR and Standard Permit also allow for well sites to reduce their monitoring frequency to annual if the percentage of leaking valves at the site is low. If a leak is detected, operators must begin repair of the leak within 5 days if operating under the Standard Permit, and the timeline for repair completion can range from 15 to 60 days depending on the specific requirements for the site. DOR provisions are included for when a

shutdown or blowdown is necessary. In these situations, operators are required to complete the repair during the next scheduled shutdown.

Table 21 provides a summary of the criteria evaluated for equivalency and our determination of equivalency of Texas's fugitive emissions requirements to the 2018 Proposal. It is difficult to draw a conclusion of equivalency for the PBR because that program does not specify a monitoring instrument.

Table 21. Equivalency of Texas Fugitive Emissions Requirements to 2018 Proposal

Regulation/Permit	30 TAC § 106.352(e)(6)	Standard Permit	30 TAC § 106.620
Effective Date	February 27, 2011	November 8, 2012	September 4, 2000
Monitoring Instrument	(Not specified)	Method 21	Gas Analyzer
Leak Definition	No	500 ppm - Yes	2,000 ppm - Yes[38]
Initial Monitoring			
- *Well Sites*	No	No	No
- *Compressor Stations*	NA	NA	NA
Monitoring Frequency			
- *Well Sites*	Yes	Yes	Yes
- *Low Production Wells*			
- *Compressor Stations*	NA	NA	NA
Repair			
- *First Attempt*	Yes	Yes	Yes
- *Final Repair*			
- *Resurvey*	No	No	No
- *DOR Deadline*	Yes	Yes	Yes

5.12 Utah

The Utah Department of Environmental Quality (UDEQ) approved a "General Approval Order for a Crude Oil and Natural Gas Well Site and/or Tank Battery" on June 5, 2014[39] and has also finalized PBR fugitive emissions requirements for certain well sites within the Utah Administrative Code, with an effective date of March 2, 2018.[40] A summary of Utah's fugitive emissions requirements is provided in Table 22.

[38] If Method 21 is used as the instrument monitoring

[39] Utah General Approval Order available at http://www.deq.utah.gov/Permits/GAOs/docs/2014/6June/DAQE-AN149250001-14.pdf.

[40] Utah Admin. Code r. 307-509. Final rule text available at https://www.utah.gov/pmn/files/359797.pdf#page=2

Table 22. Summary of Fugitive Emissions Requirements in Utah

Regulation	General Approval Order			Utah Admin. Code r. 307-509	
Effective Date	June 5, 2014			March 2, 2018	
Monitoring Instrument	OGI	Method 21	TDLAS	OGI	Method 21
Leak Definition	Visible leak	500 ppm	500 ppm	Visible leak	500 ppm
Initial Monitoring					
- *Well Sites*	90 days			60 days	
- *Compressor Stations*	NA			NA	
Monitoring Frequency					
- *Well Sites*	Annual if production ≥ 10,000 bbl/a; Quarterly if production ≥ 25,000 bbl/a and storage vessel present.			Semiannual if uncontrolled storage tank and dehydrators emissions > 4 tpy VOC	
- *Low Production Wells*					
- *Compressor Stations*	NA			NA	
Repair					
- *First Attempt*	5 days			NA	
- *Final Repair*	15 days			15 days	
- *Resurvey*				30 days	
- *DOR Deadline*	Next shutdown, with final repair within 6 months			Next shutdown or shut-in, after a vent blowdown, or within 2 years, whichever is earlier	
- *Additional DOR Info*	If parts are ordered, repair within 15 days of receipt			Unsafe to repair during operation of the unit	

The General Approval Order (GAO) requires LDAR for components (compressors, connectors, flanges, PRDs, valves, pumps, other vents, process drains, pump seals, compressor seals, access door seals, and other seals that contain or contact a process stream with hydrocarbons) based on the annual throughput of crude oil and condensate, as well as the equipment present at the site. Annual instrument monitoring is required for sources that have a throughput greater than or equal to 10,000 bbl and for sources that do not have a crude oil or condensate storage tank on site. Quarterly instrument monitoring is required for sources that have a throughput greater than or equal to 25,000 bbl. For sources subject to quarterly monitoring, provisions are available for reduced monitoring frequency if no leaks are found within a single year monitoring timeframe. Repairs must be made within 15 days of finding a leak. DOR is allowed if replacement parts are unavailable (parts must be ordered within 5 days of detection and repairs must be completed within 15 days after receipt of the parts) or technically infeasible to repair without a shutdown (shutdown must occur within 6 months of finding leak or operators must demonstrate emissions from shutdown would be greater than the uncontrolled leaking component). The monitoring can be performed using Method 21, a tunable diode laser absorption spectroscopy (TDLAS) or OGI. A leak is defined as a reading of 500 ppm with Method 21 or TDLAS, or a visible leak with OGI.

Operators had the option to comply with the requirements of the GAO, or they could have obtained a source-specific approval order (i.e., Utah's version of a permit) from UDEQ. No well sites have operated under this GAO, and the state is no longer accepting applications under the order. Of the source-specific approval orders that have been issued, all require at least annual monitoring. With UDEQ's PBR rules, well sites that are not major sources[41] will no longer be able to apply for source-specific approval orders and must comply with the PBR requirements. When complying with these requirements, well sites must also register with the state, as required by Utah Admin. Code r. 307-505. It should be noted that neither the GAO nor the PBR apply to compressor stations, which are covered by source-specific approval orders that differ in their requirements among sites.

The fugitive emissions requirements in the PBR only cover well sites where uncontrolled storage vessel and dehydrator emissions are greater than 4 tpy. The requirements cover most of the components included in the 2018 Proposal (except for storage vessels) and allow for OGI or Method 21 monitoring with a leak definition of 500 ppm. Monitoring must be conducted 60 days after startup and semiannually thereafter. Operators have 15 days to repair a leak after detection and must resurvey the components 30 days after the leak is repaired. DOR provisions are included if a shutdown or vent blowdown is needed to repair a leak or if it is unsafe to repair during operation of the unit. In these situations, operators have until the next shutdown or 2 years to repair the leak, whichever is earlier. Table 23 provides a summary of the criteria evaluated for equivalency and our preliminary evaluation of equivalency of Utah's fugitive emissions requirements to the 2018 Proposal. Since no operators have elected to comply with the GAO requirements and the opportunity to apply to do so has closed, we do not think it is appropriate to conclude the GAO is equivalent.

[41] As defined in Utah Admin. Code r. 307-101-2

Table 23. Equivalency of Utah's Fugitive Emissions Requirements to 2018 Proposal

Regulation	General Approval Order		Utah Admin. Code r. 307-509	
Effective Date	June 5, 2014		March 2, 2018	
Monitoring Instrument	OGI	Method 21	OGI	Method 21
Leak Definition	Yes	Yes	Yes	Yes
Initial Monitoring				
- *Well Sites*	No		Yes	
- *Compressor Stations*	NA		NA	
Monitoring Frequency				
- *Well Sites*	No (only applies to well sites with annual production > 10,000 bbl)		Yes (sites where uncontrolled storage tank and dehydrators emissions > 4 tpy VOC)	
- *Low Production Wells*				
- *Compressor Stations*	NA		NA	
Repair				
- *First Attempt*	Yes		Yes	
- *Final Repair*				
- *Resurvey*				
- *DOR Deadline*				

5.13 West Virginia

Permits issued for well sites and compressor stations in West Virginia require compliance with the fugitive emissions requirements in the 2016 NSPS OOOOa.[42] This requirement is found in section 12 of the Class II General Permit G70-D for well sites, and in section 16 of the Class II General Permit G35-D for compressor stations. Before the 2016 NSPS OOOOa, West Virginia had separate fugitive emissions requirements for well sites in sections 4.1.3 through 4.2 of the Class II General Permit G70-B. Those previous permits required quarterly monitoring with AVO, Method 21 (at a leak definition of 500 ppm), OGI, or a combination of the three and applied to valves, above-ground piping, and pumps. Operators were required to complete the repair within 15 days of finding a leak, with a first attempt made within 5 days. No resurvey requirements were included. DOR provisions were included for situations where a shutdown would be required to repair a leak or if emissions would be higher as a result of repairing the leak without the delay. For these situations, operators were required to repair the leak during the next shutdown.

We are not evaluating equivalency of the permit requirements for West Virginia because the current requirements incorporate the 2016 NSPS OOOOa.

5.14 Wyoming

The Wyoming Department of Environmental Quality (Wyoming DEQ) issued regulations in June 2015 for existing (as of January 1, 2014) PAD facilities (locations where more than one

[42] West Virginia permits available at http://dep.wv.gov/daq/permitting/Pages/airgeneralpermit.aspx.

well and/or associated production equipment are located, where some or all production equipment is shared by more than one well or where well streams from more than one well are routed through individual production trains at the same location), single-well oil and gas production facilities or sources, and all compressor stations that are located in the Upper Green River Basin (UGRB) ozone nonattainment area.[43] A summary of the Wyoming requirements is presented in Table 24.

Table 24. Summary of Fugitive Emissions Requirements in Wyoming

Regulation	020-002-008 Wyo. Code R. § 6(g)	
Effective Date	December 20, 2016	
Monitoring Instrument	OGI	Method 21
Leak Definition	State-defined	State-defined
Initial Monitoring		
- *Well Sites*	90 days	
- *Compressor Stations*		
Monitoring Frequency		
- *Well Sites*	Quarterly (UGRB with site-wide emissions ≥ 4 tpy VOC)	
- *Low Production Wells*		
- *Compressor Stations*		
Repair		
- *First Attempt*	NA	
- *Final Repair*		
- *Resurvey*		
- *DOR Deadline*		
- *Additional DOR Info*		

The Wyoming DEQ rule requires operators with fugitive emissions greater than or equal to 4 tpy of VOC to develop and implement an LDAR protocol. The deadline for development of this protocol was January 1, 2017. Operators are required to monitor components (flanges, connectors (other than flanges), OELs, pumps, valves, and "other" components listed in Table 2-4 of the EPA's Protocol for Equipment Leak Emissions Estimates) quarterly using a combination of Method 21, OGI, other instrument based technologies, or AVO inspections. No specific repair deadlines are included in the regulation. Table 25 provides a summary of the criteria evaluated for equivalency and determination of equivalency of Wyoming's fugitive emissions requirements to the 2018 Proposal. However, due to the flexibility of the requirements, we are unable to include alternative fugitive standards relative to these requirements.

[43] Wyoming regulations are available at https://rules.wyo.gov/.

Table 25. Equivalency of Wyoming's Fugitive Emissions Requirements to 2018 Proposal

Regulation	020-002-008 Wyo. Code R. § 6(g)	
Effective Date	December 20, 2016	
Monitoring Instrument	OGI	Method 21
Leak Definition	Yes	No
Initial Monitoring		
- *Well Sites*	No	
- *Compressor Stations*		
Monitoring Frequency		
- *Well Sites*	Yes (for UGRB with site-wide emissions > 4 tpy VOC)	
- *Low Production Wells*		
- *Compressor Stations*		
Repair		
- *First Attempt*	No	
- *Final Repair*		
- *Resurvey*		
- *DOR Deadline*		

6.0 CONCLUSIONS

Based on the analysis presented in section 5.0, we are proposing that fugitive emissions requirements related to monitoring, repair, and recordkeeping are equivalent to the 2018 Proposal for the following state programs:

- California Code of Regulations, title 17, §§95665-95667, effective January 1, 2020;
- Colorado Regulation 7, §§XII.L, effective June 30, 2018, or XVII.F, effective October 15, 2014 for well sites and January 1, 2015 for compressor stations;
- Ohio General Permits 12.1 and 12.2, effective April 14, 2014;
- Ohio General Permit 18.1, effective February 7, 2017;
- Pennsylvania General Permit 5, effective January 16, 2015;
- Texas Air Quality Standard Permit for Oil and Gas Handling and Production Facilities, effective November 8, 2012, or at 30 Texas Administrative Code §116.620, effective September 4, 2000; and
- Utah Administrative Code R307-509, effective March 2, 2018.

For reasons stated in section 5.0 and summarized here, we are unable to determine equivalency of the fugitive emissions requirements for the following state programs:

- Administrative Rules of Montana Title 17, Chapter 8, Subchapters 16 and 17 because instrument monitoring is not required.
- New Mexico Administrative Code Title 19, Chapter 15, Part 2 because we were unable to determine the enforcement mechanism.

- North Dakota Administrative Code Chapter 33-15-07 because of the temporary nature of the Consent Decrees used to enforce these requirements.
- Wyoming Administrative Rules Reference No. 020.0002.8.12202016 because of the flexibility of the requirements.

Finally, the following states either incorporate the fugitive emissions requirements in the 2016 NSPS OOOOa or do not have requirements that we were able to evaluate:

- Alaska
- Oklahoma
- West Virginia