

6 NYCRR Part 203, Oil and Natural Gas Sector

6 NYCRR Part 200, General Provisions

Express Terms Summary

This proposal applies to owners and operators of equipment and components that are associated with sources in the following oil and natural gas sectors:

- (1) Oil and natural gas production
- (2) Oil, condensate and produced water separation and storage
- (3) Natural gas storage
- (4) Natural gas gathering and boosting
- (5) Natural gas transmission and compressor stations
- (6) Natural gas metering and regulating stations

Measurements, abbreviations and acronyms are listed.

Definitions specific to this rule are listed.

For wells, gathering lines, transmission lines and compressor stations, storage vessels with a potential to emit greater than or equal to six (6) tons per year (tpy) of volatile organic compounds (VOC) must meet the following requirements:

- (1) Storage vessels installed prior to January 1, 2023 must have a vapor control efficiency of ninety-five (95) percent.
- (2) Storage vessels installed on or after January 1, 2023 must not vent to the atmosphere.

For wells, gathering lines, transmission lines and compressor stations, Natural Gas actuated Pneumatic Devices and Pumps have the following requirements:

- (1) Beginning January 1, 2023, continuous bleed natural gas pneumatic devices shall not vent natural gas to the atmosphere with few exceptions which are outlined in the full regulation.
- (2) Intermittent bleed natural gas actuated pneumatic devices: Beginning January 1, 2023, intermittent bleed natural gas actuated pneumatic devices shall comply with the leak detection and repair (LDAR) requirements.
- (3) Natural gas actuated pneumatic pumps: Beginning January 1, 2023, natural gas actuated pneumatic pumps shall not vent natural gas to the atmosphere and shall comply with the LDAR requirements.

Centrifugal Compressors have the following requirements (compressors that operate fewer than 200 hours over a rolling twelve (12) month period):

- (1) Beginning January 1, 2023, centrifugal compressors with wet seals shall control the wet seal vent gas with the use of a vapor collection system as described in Subpart 203-8 or replaced with a dry seal.
- (2) Beginning January 1, 2023, components on driver engines and compressors that use a wet seal or a dry seal shall comply with the LDAR requirements specified in Subpart 203-7, and;
- (3) The compressor wet seal shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature in order to determine the wet seal emission flow rate using defined methods.
- (4) A compressor with a wet seal emission flow rate greater than three (3) standard cubic feet per minute (scfm), or a combined flow rate greater than the number of wet seals multiplied by three (3) scfm, shall be successfully repaired within thirty (30) days of the initial flow rate measurement.
- (5) If parts are not available to make the repairs, the wet seal shall be replaced with a dry seal no later than eighteen (18) months after the exceeding measurement is made.

Reciprocating Compressors have the following requirements (compressors that operate fewer than 200 hours over a rolling twelve (12) month period):

(1) Beginning January 1, 2023, components on driver engines and compressors shall comply with the LDAR requirements specified in Subpart 203-7 with potential exceptions.

(2) The compressor rod packing or seal emission flow rate through the rod packing or seal vent stack shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature using defined methods.

(3) Beginning January 1, 2023, compressor vent stacks used to vent rod packing or seal emissions shall be controlled with the use of a vapor collection system as specified; or,

(4) A compressor with a rod packing or seal with a measured emission flow rate greater than two (2) scfm, or a combined rod packing or seal emission flow rate greater than the number of compression cylinders multiplied by two (2) scfm, shall be successfully repaired within 30 days from the date of the initial emission flow rate measurement.

(a) An extension to the thirty (30) day deadline may be granted by the Department if the owner or operator can demonstrate that the parts or equipment required to make necessary repairs have been ordered and the owner or operator notifies the Department as specified in Section 203-10.3 to report the delay and provides an estimated time by which the repairs will be completed.

(5) A reciprocating natural gas compressor with a rod packing or seal emission flow rate measured above the standard specified as a critical component, shall be successfully repaired by the end of the next scheduled process shutdown or within twelve (12) months from the date of the initial flow rate measurement, whichever is sooner.

Blowdown activity at compressor stations and transmission pipelines greater than ten thousand (10,000) feet cubed (ft<sup>3</sup>) have the following requirements:

(1) Planned blowdowns

(i) Provide notification to the Department and appropriate local authorities forty-eight (48) hours in advance of a blowdown event, the notification shall include, but not be limited to, the following information:

(‘a’) Location

(‘b’) Date

(‘c’) Time and duration

(‘d’) Contact person

(‘e’) Reason for blowdown

(‘f’) Estimated volume of release

(ii) If any of the information reported prior to the blowdown changed during or after the blowdown, another notification to the Department and appropriate local authorities shall be made with the updates no later than forty-eight (48) hours after the end of the blowdown.

(2) Unplanned blowdowns

(i) Provide notification to the Department and appropriate local authorities within thirty (30) minutes of blowdown or as soon as it is safe to do so. The notification shall include, but not be limited to, the following information:

(‘a’) Location

(‘b’) Date

(‘c’) Time and duration

(‘d’) Contact person

(‘e’) Reason for blowdown

(‘f’) Estimated volume of release

Pigging activity along natural gas pipelines are required to:

(1) Record and report pigging activities and estimated natural gas loss and report to the Department by March 31<sup>st</sup> of each year for the previous calendar year. The report shall include, but not be limited to:

(i) Date of each activity

(ii) Estimated volume of release for each activity

#### Natural Gas Storage Monitoring Requirements

(1) Applicability: The requirements of this section apply to natural gas underground storage facilities.

(2) Natural gas underground storage facility sources are subject to the LDAR requirements as specified in Subpart 203-7.

#### City Gate Metering and Regulating

(a) Applicability: The requirements of this section apply to all metering and regulating components at the City Gate.

(b) Metering and regulating components are subject to the LDAR requirements in Subpart 203-7.

#### Provisions for Feasibility and Safety

(a) A repair or replacement may not be delayed unless it results in the following:

(1) a vented blowdown,

(2) a gathering and boosting station shutdown,

(3) a well shutdown,

(4) a well shut-in,

(5) is deemed technically infeasible or unsafe by the New York State Department of Public Service or other federal or state regulatory agency.

(b) The repair or replacement delay may be extended until the earliest event listed below.

(1) the next compressor station shutdown,

(2) the next gathering and boosting station shutdown,

(3) well shutdown,

(4) well shut-in,

(5) the next unscheduled, planned or emergency vent blowdown, or

(6) within one (1) year.

## Reporting and Recordkeeping

### (1) Baseline Report

(a) Applicability: All sources as described in Section 203-1.1.

(b) Owners or operators of components or processes subject to this Subpart must submit a report to the Department by March 31, 2023 or by March 31<sup>st</sup> the year following initiation of operation.

(c) The report shall be in a format approved by the Department and shall include, but not be limited to, information on the following:

(1) separators

(2) storage vessels

(3) compressors

(4) gas drying systems

(5) pneumatic devices

(6) metering and regulating systems

## (2) Recordkeeping

### (a) Reciprocating Natural Gas Compressors

- (1) Maintain, for at least five (5) years from the date of each leak concentration measurement, a record of each rod packing leak concentration measurement found above the minimum leak threshold as defined in Section 203-4.4.
- (2) Maintain, for at least five (5) years from the date of each emissions flow rate measurement, a record of each rod packing emission flow rate measurement.
- (3) Maintain, for at least five (5) years a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the rod packing leak concentration or emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection.
- (4) Maintain records that provide proof that parts or equipment required to make necessary repairs have been ordered.

### (b) Centrifugal Natural Gas Compressors

- (1) Maintain, for at least five (5) years from the date of each emissions flow rate measurement, a record of each wet seal emission flow rate measurement.
- (2) Maintain, for at least five (5) years, a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the wet seal emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection.
- (3) Maintain records that provide proof that parts or equipment required to make necessary repairs have been ordered.

### (c) Natural Gas Actuated Pneumatic Devices

(1) Maintain, for at least five (5) years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement

(d) Leak Detection and Repair

(1) Maintain, for at least five (5) years from each inspection, a record of each leak detection and repair inspection.

(2) Maintain, for at least five (5) years from the date of each inspection, component leak and repair documentation.

(3) Maintain records for at least five (5) years that provide proof that parts or equipment required to make necessary repairs have been ordered.

(4) Maintain gas service utility records for at least five (5) years that demonstrate that a system has been temporarily classified as critical to reliable public gas operation throughout the duration of the classification period.

(e) Vapor Collection System and Vapor Control Devices

(1) Maintain records for at least five (5) years that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

(3) Reporting submissions and retention

(a) Reports shall be delivered to both the:

(1) Bureau Director, Bureau of Air Quality Planning, Division of Air Resources, 625 Broadway, Albany NY 12233, and

(2) The Regional Air Pollution Control Engineer in the corresponding Department Region to the source.

(b) Source owners and operators must maintain reports for at least five (5) years and make them available to the Department upon request.



The Part 200 additions will incorporate by reference EPA Method 21, Volatile Organic Compound Leaks, found in Title 40 Code of Federal Regulations (CFR) Part 60, appendix A-7.

Severability: Each provision of this Part shall be deemed severable, and in the event that any provision of this Part is held to be invalid, the remainder of this Part shall continue in full force and effect.

## 6 NYCRR Part 203, Oil and Natural Gas Sector

### Express Terms

#### 203-1 Emissions from Oil and Natural Gas Activities General Provisions

##### 203-1.1 General Applicability

(a) This Part applies to owners and operators of equipment and components that are associated with sources in the following oil and natural gas sectors:

- (1) Oil and natural gas production
- (2) Oil, condensate and produced water separation and storage
- (3) Natural gas storage
- (4) Natural gas gathering and boosting
- (5) Natural gas transmission and compressor stations
- (6) Natural gas metering and regulating stations

##### 203-1.2 Measurements, abbreviations and acronyms

- (a) ASME: American Society of Mechanical Engineers
- (b) CH<sub>4</sub>: Methane
- (c) FID: Flame Ionization Detector
- (d) LDAR: Leak Detection and Repair
- (e) OGI: Optical Gas Imaging
- (f) PTE: Potential to Emit

- (g) psig: pounds per square inch, gauge
- (h) scfh: standard cubic feet per hour
- (i) scfm: standard cubic feet per minute
- (j) tpy: tons per year
- (k) VOC: volatile organic compound

### 203-1.3 Definitions

(a) For the purpose of this Part, the general definitions of Parts 200 and 201 of this Title apply unless they are inconsistent with subdivision 203-1.3(b).

(b) For the purpose of this Part, the following definitions also apply:

- (1) “Centrifugal compressor” means equipment that increases the pressure of natural gas by centrifugal action through an impeller.
- (2) “Centrifugal compressor seal” means a wet or dry seal around the compressor shaft where the shaft exits the compressor case.
- (3) “Citygate” means a point or measuring station at which a distributing gas utility receives gas from a natural gas pipeline company or transmission system.
- (4) “Component” is meant to include but is not limited to; a valve, fitting, flange, threaded-connection, process drain, stuffing box, pressure-vacuum valve, pressure-relief device, pipes, seal fluid system, diaphragm, hatch, sight-glass, meter, open-ended line, well casing, natural gas

actuated pneumatic device, natural gas actuated pneumatic pump, or reciprocating compressor rod packing or compressor seals.

(5) "Condensate" means liquid hydrocarbons that were originally in the gaseous phase in the reservoir and liquids recovered by surface separation from natural gas.

(6) "Continuous bleed" means the continuous venting of natural gas from a gas actuated pneumatic device to the atmosphere by design.

(7) "Critical component" means any component that would require the shutdown of a critical process unit if that component was shutdown or disabled.

(8) "Critical process unit" means a process unit or group of components at such unit that must remain in service because of their importance to the overall process. A critical process unit is required to continue to operate, has no equivalent equipment to replace it, cannot be bypassed, and for which it is technically infeasible to repair leaks from that process unit without shutting it down and opening the process unit to the atmosphere.

(9) "Emulsion" means any mixture of crude oil, condensate, or produced water with varying quantities of natural gas entrained in the liquids.

(10) "Equipment" means any stationary or portable machinery, object, or contrivance covered by this Part.

(11) "Fuel gas" means gas generated at a petroleum refinery or petrochemical plant and that is combusted separately or in any combination with any type of gas.

(12) "Fuel gas system" means any system that supplies natural gas as a fuel source to on-site natural gas actuated equipment other than a vapor control device.

(13) "Hoop stress" means the stress in a pipe wall, acting circumferentially in a plane perpendicular to the longitudinal axis of the pipe and produced by the pressure of the fluid in the pipe.

(14) "Intermittent bleed" means the intermittent venting of natural gas from a gas actuated pneumatic device to the atmosphere by design.

(15) "Leak or fugitive leak" means the unintentional release of emissions at a rate greater than or equal to the leak thresholds specified in this Part.

(16) "Leak detection and repair" or "LDAR" means the inspection of components to detect leaks of VOC and CH<sub>4</sub> and the repair of those components with leak rates above the standards and within the timeframes specified in this Part.

(17) "Metering Station" means a device designed for the continuous and simultaneous analysis of the quantity and quality of natural gas being transported in a pipeline.

(18) "Natural gas" means a naturally occurring mixture or process derivative of hydrocarbon and non-hydrocarbon gases. Its constituents include the greenhouse gases CH<sub>4</sub> and carbon dioxide, and may include natural gas liquids.

(19) "Natural gas gathering and boosting station" means all equipment and components associated with moving natural gas to a natural gas processing plant, transmission pipeline, or distribution pipeline.

(20) "Natural gas transmission compressor station" means all equipment and components located within a facility fence line associated with moving natural gas from production fields or natural gas processing plants through natural gas transmission pipelines, or within natural gas underground storage fields.

(21) "Natural gas transmission pipeline" means a pipeline, other than a gathering line, that:

(i) transports gas from a gathering line or storage facility to a distribution center or storage facility, or directly to a large volume user that is not downstream from a distribution center; or

(ii) operates at a hoop stress of twenty (20) percent or more of specific minimum yield strength; or

(iii) transports gas within a storage field.

(22) “Natural gas underground storage” or “Reservoir” means all equipment and components associated with the temporary subsurface storage of natural gas in any underground reservoir, natural or artificial cavern or geologic dome, sand or stratigraphic trap, whether or not previously occupied by or containing oil or natural gas.

(23) “Non-associated gas” means natural gas that is not produced as a byproduct of crude oil production and may or may not be produced with condensate.

(24) “Oil” means crude petroleum oil and all other hydrocarbons, regardless of gravity, that are produced at the wellhead in liquid form by ordinary production methods and that are not the result of condensation of gas.

(25) “Optical gas imaging or OGI” means using an instrument, such as a thermal infrared camera, that makes emissions visible that may otherwise be invisible to the naked eye.

(26) “Pigging” means using devices or implements known as 'pigs' to perform various cleaning, clearing, maintenance, inspection, dimensioning, process and pipeline testing operations on new and existing pipelines.

(27) “Pneumatic device” means an automation device that uses natural gas or compressed air to control a process.

(28) “Pneumatic pump” means a device that uses natural gas or compressed air to power a piston or diaphragm in order to circulate or pump liquids.

(29) "Portable pressurized separator" means a pressure vessel, that can be moved from one location to another without having to be dismantled, and is capable of separating and storing crude oil, condensate, or produced water at the temperature and pressure of the separator required for sampling.

(30) "Portable tank" means a tank that can be moved from one location to another without having to be dismantled.

(31) "Pressure vessel" means any hollow container used to hold gas or liquid and rated, as indicated by an ASME pressure rating stamp, and operated to contain normal working pressures of at least 15 pounds per square inch, gauge (psig) without continuous vapor loss to the atmosphere.

(32) "Production" means all activities associated with the production or recovery of emulsion, crude oil, condensate, produced water, or natural gas at facilities to which this Part applies.

(33) "Produced water" means water recovered from an underground reservoir as a result of crude oil, condensate, or natural gas production that may be recycled, disposed, or re-injected into an underground reservoir.

(34) "Reciprocating natural gas compressor" means equipment that increases the pressure of natural gas by positive displacement of a piston in a compression cylinder that is powered by an internal combustion engine or electric motor.



(35) “Reciprocating natural gas compressor rod packing” means a seal comprised of a series of flexible rings in machined metal cups that fit around the reciprocating compressor piston rod to limit the amount of compressed natural gas that vents into the atmosphere.

(36) “Reciprocating natural gas compressor seal” means any device or mechanism used to limit the amount of natural gas that vents from a compression cylinder into the atmosphere.

(37) “Regulating Station” means a station that is placed along a pipeline to reduce the pressure of the gas to the appropriate operating pressure for each system.

(38) “Sales Gas” means the raw natural gas, after processing to remove liquid petroleum gas, condensate and carbon dioxide. Sales Gas usually consists mainly of CH<sub>4</sub> and ethane.

(39) “Separator” means a tank used to physically separate the oil, gas, and water produced simultaneously from a well.

(40) "Separator and tank system" means the first separator in a crude oil or natural gas production system and any tank or sump connected directly to the first separator.

(41) “Storage Vessel” means any container constructed primarily of non-earthen materials used for the purpose of storing, holding, or separating emulsion, crude oil, condensate, or produced water and that is designed to operate below a normal operating pressure of 15 psig.

(42) "Successful repair" means tightening, adjusting, or replacing equipment or a component for the purpose of stopping or reducing fugitive leaks below the minimum leak detection threshold or emission flow rate standard specified in this Part.

(43) "Total Hydrocarbon" means organic compounds of hydrogen and carbon whose densities, boiling points, and freezing points increase as their molecular weights increase. Although composed of only two elements, hydrocarbons exist in a variety of compounds, because of the strong affinity of the carbon atom for other atoms and for itself.

(44) "Vapor collection system" means equipment and components installed on compressors, pressure vessels, separators, tanks, or sumps including piping, connections, and flow-inducing devices used to collect and route emission vapors to a processing, sales gas, or fuel gas system, or to a vapor control device.

(45) "Vapor control device" means equipment used to reduce hydrocarbon emissions.

(46) "Vapor control efficiency" means the ability of a vapor control device to reduce emissions, expressed as a percentage, that can be estimated by calculation or by measuring the total hydrocarbon concentration or mass flow rate at the inlet and outlet of the vapor control device.

(47) "Vent or venting" means the intentional or automatic release of natural gas into the atmosphere from components, equipment, or activities described in this Part.

(48) "Well" means a boring in the earth for the purpose of the following:

(i) Exploring for or producing oil or gas.

(ii) Injecting fluids or gas for stimulating oil or gas recovery.

(iii) Re-pressuring or pressure maintenance of oil or gas reservoirs.

(iv) Disposing of oil field waste gas or liquids.

(v) Injection or withdrawal of gas from an underground storage facility.

(49) "Well Site" means the well pad and access roads, equipment storage and staging areas, vehicle turnarounds, and any other areas directly or indirectly impacted by activities involving a well.

## 203-2 Oil and Natural Gas Well Activities

### 203-2.1 Storage Vessels

(a) Applicability: The requirements of this section apply to all storage vessels located at oil and natural gas well sites with a PTE greater than or equal to six (6) tpy of VOC.

(b) Control requirements.

(1) Storage vessels installed prior to January 1, 2023 must have a vapor control efficiency of ninety-five (95) percent.

(2) Storage vessels installed on or after January 1, 2023 must not vent to the atmosphere.

203-2.2 Natural Gas Actuated Pneumatic Devices and Pumps

(a) Applicability: The requirements of this section apply to natural gas actuated pneumatic devices and pumps located at oil and natural gas well sites.

(b) Continuous bleed natural gas pneumatic devices:

(1) Beginning January 1, 2023, continuous bleed natural gas pneumatic devices shall not vent natural gas to the atmosphere except as described in 203-2.2(b)(2)(i) and shall comply with 203-2.2(b)(2)(ii)-(v) and the LDAR requirements specified in Subpart 203-7.

(2) Continuous bleed natural gas actuated pneumatic devices installed prior to January 1, 2023 may be used provided they meet all of the following requirements as of January 1, 2023:

(i) No device shall vent natural gas at a rate greater than six (6) standard cubic feet per hour (scfh) when the device is idle and not actuating.

(ii) All devices must be clearly marked with a permanent tag that identifies the natural gas flow rate as less than or equal to six (6) scfh.

(iii) All devices must be tested by January 1, 2024 and then tested annually, no later than thirteen (13) months and no earlier than eleven (11) months from the previous test using a direct measurement method (high volume sampling, bagging, calibrated flow measuring instrument); and,

(iv) Any device with a measured emissions flow rate greater than six (6) scfh shall be successfully repaired within fourteen (14) days from the date of the initial emission flow rate measurement.

(v) The owner or operator shall maintain a record of the flow rate measurement and shall report the result to the Department within sixty (60) days after completed.

(c) Continuous bleed natural gas actuated pneumatic devices and pumps that need to be replaced or retrofitted to comply with the requirements specified shall do so by either:

(1) Collecting all vented natural gas using a vapor collection system as specified in Subpart 203-8; or,

(2) By using compressed air or electricity in lieu of natural gas to operate.

(d) Intermittent bleed natural gas actuated pneumatic devices: Beginning January 1, 2023, intermittent bleed natural gas actuated pneumatic devices shall comply with the LDAR requirements specified in Subpart 203-7 when the device is idle and not controlling.

(e) Natural gas actuated pneumatic pumps: Beginning January 1, 2023, natural gas actuated pneumatic pumps shall not vent natural gas to the atmosphere and shall comply with the LDAR requirements specified in Subpart 203-7.

### 203-2.3 Metering and Regulating

(a) Metering and regulating components are subject to the LDAR requirements in Subpart 203-7.

## 203-3 Natural Gas Gathering Lines

### 203-3.1 Storage Vessels

(a) Applicability: The requirements of this section apply to all storage vessels located at oil and natural gas well sites with a PTE greater than or equal to six (6) tpy of VOC.

(b) Control requirements

(1) Storage vessels installed prior to January 1, 2023 must have a vapor control efficiency of ninety-five (95) percent.

(2) Storage vessels installed on or after January 1, 2023 must not vent to the atmosphere.

### 203-3.2 Natural Gas actuated Pneumatic Devices and Pumps

(a) Applicability: The requirements of this section apply to all natural gas actuated pneumatic devices and pumps located at gathering and boosting locations.

(b) Continuous bleed natural gas pneumatic devices:

(1) Beginning January 1, 2023, continuous bleed natural gas pneumatic devices shall not vent natural gas to the atmosphere except as described in 203-2.2(b)(2)(i) and shall comply with 203-3.2(b)(2)(ii)-(v) and the LDAR requirements specified in Subpart 203-7.

(2) Continuous bleed natural gas actuated pneumatic devices installed prior to January 1, 2023 may be used provided they meet all of the following requirements:

(i) No device shall vent natural gas at a rate greater than six (6) standard cubic feet per hour (scfh) when the device is idle and not actuating.

(ii) All devices must be clearly marked with a permanent tag that identifies the natural gas flow rate as less than or equal to six (6) scfh.

(iii) All devices must be tested by January 1, 2024 and then tested annually, no later than thirteen (13) months and no earlier than eleven (11) months from the previous test using a direct measurement method (high volume sampling, bagging, calibrated flow measuring instrument); and,

(iv) Any device with a measured emissions flow rate greater than six (6) scfh shall be successfully repaired within fourteen (14) days from the date of the initial emission flow rate measurement.

(v) The owner or operator shall maintain a record of the flow rate measurement and shall report the result to the Department within sixty (60) days after completed.

(c) Continuous bleed natural gas actuated pneumatic devices and pumps which need to be replaced or retrofitted to comply with the requirements specified shall do so by either:

(1) Collecting all vented natural gas with the use of a vapor collection system as specified in Subpart 203-8; or,

(2) By using compressed air or electricity in lieu of natural gas to operate.

(d) Intermittent bleed natural gas actuated pneumatic devices: Beginning January 1, 2023, intermittent bleed natural gas actuated pneumatic devices shall comply with the LDAR requirements specified in Subpart 203-7 when the device is idle and not controlling.



(e) Natural gas actuated pneumatic pumps: Beginning January 1, 2023, natural gas actuated pneumatic pumps shall not vent natural gas to the atmosphere and shall comply with the LDAR requirements specified in Subpart 203-7.

### 203-3.3 Metering and Regulating

(a) Metering and regulating components are subject to LDAR requirements in Subpart 203-7.

### 203-4 Natural Gas Transmission Pipelines and Compressor Stations

#### 203-4.1 Storage Vessels

(a) Applicability: The requirements of this section apply to all storage vessels located at oil and natural gas well sites with a PTE greater than or equal to six (6) tpy of VOC.

(b) Control requirements.

(1) Storage vessels installed prior to January 1, 2023 must have a vapor control efficiency of ninety-five (95) percent.

(2) Storage vessels installed on or after January 1, 2023 must not vent to the atmosphere.

#### 203-4.2 Natural Gas actuated Pneumatic Devices and Pumps

(a) Applicability: The requirements of this section apply to natural gas actuated pneumatic devices and pumps located at compressor stations.

(b) Continuous bleed natural gas pneumatic devices:

(1) Beginning January 1, 2023, continuous bleed natural gas pneumatic devices shall not vent natural gas to the atmosphere except as described in 203-2.2(b)(2)(i) and shall comply with 203-4.2(b)(2)(ii)-(v) and the LDAR requirements specified in Subpart 203-7.

(2) Continuous bleed natural gas actuated pneumatic devices installed prior to January 1, 2023 may be used provided they meet all of the following requirements as of January 1, 2023:

(i) No device shall vent natural gas at a rate greater than six (6) standard cubic feet per hour (scfh) when the device is idle and not actuating.

(ii) All devices must be clearly marked with a permanent tag that identifies the natural gas flow rate as less than or equal to six (6) scfh.

(iii) All devices must be tested by January 1, 2024 and then tested annually, no later than thirteen (13) months and no earlier than eleven (11) months from the previous test using a direct measurement method (high volume sampling, bagging, calibrated flow measuring instrument); and,

(iv) Any device with a measured emissions flow rate greater than six (6) scfh shall be successfully repaired within fourteen (14) days from the date of the initial emission flow rate measurement.

(v) The owner or operator shall maintain a record of the flow rate measurement and shall report the result to the Department within sixty (60) days after completed.

(c) Continuous bleed natural gas actuated pneumatic devices and pumps which need to be replaced or retrofitted to comply with the requirements specified shall do so by either:

(1) Collecting all vented natural gas with the use of a vapor collection system as specified in Subpart 203-8; or,

(2) By using compressed air or electricity in lieu of natural gas to operate.

(d) Intermittent bleed natural gas actuated pneumatic devices: Beginning January 1, 2023, intermittent bleed natural gas actuated pneumatic devices shall comply with the LDAR requirements specified in Subpart 203-7 when the device is idle and not controlling.

(e) Natural gas actuated pneumatic pumps: Beginning January 1, 2023, natural gas actuated pneumatic pumps shall not vent natural gas to the atmosphere and shall comply with the LDAR requirements specified in Subpart 203-7.

## 203-4.3 Centrifugal Compressors

### (a) Applicability.

(1) The requirements of this section apply to centrifugal natural gas compressors located at natural gas transmission compressor stations, and natural gas underground storage facilities.

(2) The requirements of this section do not apply to centrifugal natural gas compressors that operate fewer than 200 hours over a rolling twelve (12) month period total provided that the owner or operator:

(i) Maintains a non-re-settable hour meter for operation, and

(ii) Maintains a record, for a minimum of five (5) years, of the operating hours per month, and

(iii) Provide a rolling twelve (12) month total calculation of hours to the Department once per year.

(b) Beginning January 1, 2023, centrifugal compressors with wet seals shall control the wet seal vent gas with the use of a vapor collection system as described in Subpart 203-8 or shall replace the wet seal with a dry seal.

(c) Beginning January 1, 2023, components on driver engines and compressors that use a wet seal or a dry seal shall comply with the LDAR requirements specified in Subpart 203-7, and;

(d) The compressor wet seal shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature in order to determine the wet seal emission flow rate using one of the following methods:

(1) Vent stacks shall be equipped with a meter or instrumentation to measure the wet seal emissions flow rate; or,

(2) Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six (6) feet above ground level or a permanent support surface for making wet seal emission flow rate measurements.

(3) If the measurement is not obtained because the compressor is not operating for the scheduled test date and the remainder of the inspection period, then testing shall be conducted within fourteen (14) days of resumed operation. The owner or operator shall maintain for at least five (5) years, and make available upon request by the Department, a copy of operating records that document the compressor hours of operation and run dates and a signed statement from the responsible official in order to demonstrate compliance with this requirement.

(e) A compressor with a wet seal emission flow rate greater than three (3) scfm, or a combined flow rate greater than the number of wet seals multiplied by three (3) scfm, shall be successfully repaired within thirty (30) days of the initial flow rate measurement.

(1) An extension to the thirty (30) day deadline may be granted by the Department if the owner or operator can demonstrate that the parts or equipment required to make necessary repairs have been ordered and the owner or operator notifies the Department as specified in 203-10.3 to report the delay and provides an estimated time by which the repairs will be completed.

(f) If parts are not available to make the repairs, the wet seal shall be replaced with a dry seal no later than eighteen (18) months after the exceeding measurement is made.

(g) The owner or operator shall maintain for at least five (5) years, a record of the flow rate measurement and shall report the result to the Department within sixty (60) days after completed.

(h) A centrifugal natural gas compressor with a wet seal emission flow rate measured above the standard specified in subdivision 203-4.3(e) and which is a critical component, shall be successfully repaired by the end of the next scheduled process shutdown or within twelve (12) months from the date of the initial flow rate measurement, whichever is sooner.

#### 203-4.4 Reciprocating Compressors

(a) Applicability.

(1) The requirements of this section apply to reciprocating natural gas compressors located at natural gas transmission compressor stations, and natural gas underground storage facilities.

(2) The requirements of this section do not apply to reciprocating natural gas compressors that operate fewer than 200 hours over a rolling twelve (12) month period total, provided that the owner or operator:

(i) Maintains a non-resettable hour meter on the engine, and

(ii) Maintains a record, for a minimum of five (5) years, of the operating hours per month, and

(iii) Provides a rolling twelve (12) month total calculation of hours to the Department once per year.

(b) Beginning January 1, 2023, components on driver engines and compressors shall comply with the LDAR requirements specified in Subpart 203-7, except for the rod packing components subject to subdivision 203-4.4(c) and,

(c) The compressor rod packing or seal emission flow rate through the rod packing or seal vent stack shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature using one of the following methods:

(1) Vent stacks shall be equipped with a meter or instrumentation to measure the rod packing or seal emissions flow rate; or,

(2) Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six (6) feet above ground level or a permanent support surface for making individual or combined rod packing or seal emission flow rate measurements.

(3) If the measurement is not obtained because the compressor is not operating for the scheduled test date and the remainder of the inspection period, then testing shall be conducted within seven (7) days of resumed operation. The owner or operator shall maintain, and make available upon request by the Department, a copy of operating records that document the compressor hours of operation and run dates and a signed statement from the responsible official in order to demonstrate compliance with this requirement.

(d) Beginning January 1, 2023, compressor vent stacks used to vent rod packing or seal emissions shall be controlled with the use of a vapor collection system as specified in Subpart 203-8; or,

(e) A compressor with a rod packing or seal with a measured emission flow rate greater than two (2) scfm, or a combined rod packing or seal emission flow rate greater than the number of compression cylinders multiplied by two (2) scfm, shall be successfully repaired within thirty (30) days from the date of the initial emission flow rate measurement.

(1) An extension to the thirty (30) day deadline may be granted by the Department if the owner or operator can demonstrate that the parts or equipment required to make necessary repairs have been ordered and the owner or operator notifies the Department as specified in Section 203-10.3 to report the delay and provides an estimated time by which the repairs will be completed.



(f) The owner or operator shall maintain for at least five (5) years a record of the flow rate measurement and shall report the result to the Department within sixty (60) days after completed.

(g) A reciprocating natural gas compressor with a rod packing or seal emission flow rate measured above the standard specified as a critical component shall be successfully repaired by the end of the next scheduled process shutdown or within twelve (12) months from the date of the initial flow rate measurement, whichever is sooner.

#### 203-4.5 Pipeline or Compressor Station Blowdown

(a) Applicability: Blowdown activity at compressor stations and transmission pipelines greater than ten thousand (10,000) feet cubed (ft<sup>3</sup>).

(b) Requirements.

(1) Planned blowdowns.

(i) Provide notification to the Department and appropriate local authorities forty-eight (48) hours in advance of a blowdown event; the notification shall include, but not be limited to, the following information:

(‘a’) Location

(‘b’) Date

(‘c’) Time and duration

- (‘d’) Contact person
- (‘e’) Reason for blowdown
- (‘f’) Estimated volume of release

(ii) If any of the information reported prior to the blowdown changed during or after the blowdown, another notification to the Department and appropriate local authorities shall be made with the updates no later than forty-eight (48) hours after the end of the blowdown.

(2) Unplanned blowdowns.

(i) Provide notification to the Department and appropriate local authorities within thirty (30) minutes of blowdown or as soon as it is safe to do so. The notification shall include, but not be limited to, the following information:

- (‘a’) Location
- (‘b’) Date
- (‘c’) Time and duration
- (‘d’) Contact person
- (‘e’) Reason for blowdown
- (‘f’) Estimated volume of release

(a) Applicability: Pigging activity along natural gas pipelines.

(b) Requirements.

(1) Record and report pigging activities and estimated natural gas loss to the Department by March 31<sup>st</sup> of each year for the previous calendar year. The report shall include, but not be limited to:

(i) Location of activity.

(ii) Date of each activity.

(iii) Estimated volume of release for each activity.

## 203-5 Natural Gas Underground Storage Facilities

### 203-5.1 Natural Gas Storage Monitoring Requirements

(a) Applicability: The requirements of this section apply to natural gas underground storage facilities.

(b) Natural gas underground storage facility sources are subject to the LDAR requirements as specified in Subpart 203-7.

### 203-5.2 Metering and Regulating

(a) Metering and regulating components are subject to the LDAR requirements in Subpart 203-7.

## 203-6 City Gate

### 203-6.1 Metering and Regulating

(a) Applicability: The requirements of this section apply to all metering and regulating components at the City Gate.

(b) Metering and regulating components are subject to the LDAR requirements in Subpart 203-7.

## 203-7 Leak Detection and Repair.

(a) The requirements of this Subpart apply to the components subject to LDAR within this Part.

(b) The requirements of this Subpart do not apply to the following:

(1) Components that are buried below ground. The portion of well casing that is visible above ground is not considered a buried component.

(2) Components used to supply compressed air to equipment or instrumentation.

- (3) Components operating under a negative gauge pressure or below atmospheric pressure.
- (4) Temporary components used for general maintenance and used fewer than fifteen (15) days over a twelve (12) month period if the owner or operator maintains for at least five (5) years, and can make available at the request of the Department, a record of the date when the components were installed and removed.
- (5) Pneumatic devices or pumps that use compressed air or electricity to operate.
- (6) A compressor rod packing which is subject to annual emission flow rate testing as specified in section 203-4.4 of this Part.

#### 203-7.1 Leak Detection Monitoring Techniques

(a) All owners and operators opting to comply using EPA Method 21, Volatile Organic Compound Leaks at 40 CFR Part 60, appendix A-7 (see table 1, section 200.9 of this Title), must meet the following requirements:

- (1) For the purposes of complying with the fugitive emissions monitoring program using EPA Method 21, a fugitive emission is defined as an instrument reading of 500 ppm CH<sub>4</sub> and VOC.
- (2) For purposes of instrument capability, the fugitive emissions definition shall be 500 ppm or greater CH<sub>4</sub> and VOC using a Flame Ionization Detector (FID)-based instrument.

(3) If an analyzer other than a FID-based instrument is used, a site-specific fugitive emission definition must be developed by the owner or operator that would be equivalent to 500 ppm CH<sub>4</sub> and VOC using a FID-based instrument. Such site-specific fugitive emission definition is subject to approval by the Department.

(b) Optical gas imaging. All owners and operators opting to comply using OGI must meet the following requirements:

(1) OGI equipment must be capable of imaging gases in the spectral range for CH<sub>4</sub> and VOC in the potential fugitive emissions.

(2) Calibration and maintenance procedures must comply with those recommended by the manufacturer.

(c) Alternative techniques. The Department may approve the use of an alternative technique that may be used in lieu of, or in combination with, OGI, Method 21, or other previously approved alternative methods. A proposed alternative method must be able to demonstrate that it is capable of identifying leaks and that it is at least as effective as the leak detection methods achieved using Method 21 or OGI. Owners and operators seeking approval of an alternative technique must submit the following information to the Department:

(1) Describe the technology and, at a minimum, include information on:

(i) Commercial availability of proposed alternative.

(ii) Other approved applications or uses.

(iii) Reliability (ability to detect emissions at a specified threshold and frequency, as well as identify or determine specific emission leak locations).

(iv) Capable of identifying leaks and is at least as effective as leak detection achieved using Method 21 or OGI demonstrated through field test data and modeling.

(v) Limitations/Restrictions (detection limits, weather/temperature/moisture, maximum/minimum operating parameters, other).

(vi) Data quality indicators for precision and bias.

(vii) Quality control and quality assurance procedures for proper operation.

(viii) Describe how the technology works

.

(ix) How the technology quantifies emissions.

(2) Description of use, maintenance and calibration.

(i) Description of where, when and how the alternative technique will be used.

(ii) User guide.

- (iii) Manufacturer-recommended maintenance and calibration.
- (iv) Calibration process.

(3) Process for recordkeeping.

- (i) Frequency of data measurements.
- (ii) Data logging capabilities.

(4) Training documentation or program, including any ongoing support provided.

(5) Provide any documentation associated with field testing or modeling to demonstrate leak detection is at least as effective as that achieved using Method 21 or OGI.

## 203-7.2 LDAR Frequency

(a) For Oil and Natural Gas Well components subject to Subpart 203-2, each well site shall be inspected by OGI, Method 21 or similar approved alternative method:

(1) Semiannually, or

(2) One (1) time over twenty-four (24) months if using an approved alternative method which offers continuous monitoring.



(b) For Natural Gas Gathering and Boosting components subject to Subpart 203-3, each gathering and boosting station shall be inspected by OGI, Method 21 or similar approved alternative method:

(1) Quarterly, or

(2) One (1) time over twenty-four (24) months if using an approved alternative method which offers continuous monitoring.

(c) Natural Gas Transmission Compressor Station components subject to Subpart 203-4 shall be inspected by OGI, Method 21 or similar approved alternative method:

(1) Bimonthly, at least forty-five (45) days apart, or

(2) One (1) time over twelve (12) months if using an approved alternative method which offers continuous monitoring.

(d) Storage Facility components subject to Subpart 203-5 shall be inspected by OGI, Method 21 or similar approved alternative method:

(1) Bimonthly, at least forty-five (45) days apart, or

(2) One (1) time over twelve (12) months if using an approved alternative method which offers continuous monitoring.

(e) City Gate components subject to Subpart 203-6 shall be inspected by OGI, Method 21 or similar approved alternative method:

(1) Quarterly, or

(2) One (1) time over twelve (12) months if using an approved alternative method which offers continuous monitoring.

### 203-7.3 Repair of leaks

(a) Upon detection of a leak from any equipment or component subject to this Part, the owner or operator shall affix to that component a weatherproof, readily visible tag that identifies the date and time of leak detection. The tag shall remain affixed to the component until the following conditions are met:

(1) The leaking component has been successfully repaired or replaced; and,

(2) The component has been re-inspected utilizing one of the methods specified in Subpart 203-7.

(b) The owner or operator shall maintain for at least five (5) years, and make available upon request by the Department, a record of leaks identified and shall report to the Department within sixty (60) days after repair re-inspection as defined in 203-7.3(d) is complete. Records shall include the date that the leak was detected, location of leak, the date that the leak was repaired and any delays that occurred.

(c) Leaks shall be repaired within thirty (30) days of identification unless one of the conditions of 207-3(f) apply.

(d) Repaired leaks shall be re-inspected using the methods specified in 203-7 within fifteen (15) days of repair.

(e) Critical components or critical process units shall be successfully repaired by the end of the next process shutdown or within twelve (12) months from the date of initial leak detection, whichever is sooner.

(f) A delay of repair may be granted by the Department under the following conditions:

(1) The owner or operator can demonstrate that the parts or equipment required to make necessary repairs have been ordered. A delay of repair to obtain parts or equipment shall not exceed thirty (30) days, unless the owner or operator notifies the Department to report the delay and provides an estimated time by which the repairs will be completed, or

(2) A gas service utility can provide documentation, in a form suitable to the Department, that a system has been temporarily classified as critical to reliable public gas system operation as ordered by the utility's gas control office.

## 203-8.1 Vapor collection

(a) Beginning January 1, 2023, the following requirements apply to equipment that must be controlled using a vapor collection system and control device pursuant to the requirements specified in this Part.

(b) The vapor collection system shall direct the collected vapors to one of the following:

(1) A sales gas system; or,

(2) A fuel gas system.

(c) If no sales gas system or fuel gas system is available at the facility, the owner or operator must control the collected vapors by January 1, 2024 as follows:

(1) For facilities without an existing vapor control device, the owner or operator must install a new vapor control device as specified in section 203-8.1(d); or,

(2) For facilities currently operating an existing vapor control device that is required to control additional vapors as a result of this Part, if the device does not already meet the requirements specified in subdivision 203-8.1(d), the owner or operator must modify or replace the existing vapor control device to control vapors at the same efficiency or greater than that required in subdivision 203-8.1(d).

(d) Any vapor control device required in subdivision 203-8.1(c) must achieve at least 95 percent vapor collection control efficiency of total emissions and must meet all applicable federal and state requirements.

(e) Vapor collection systems and control devices may be taken out of service for up to thirty (30) days per rolling twelve (12) month period to perform maintenance while the facility continues to operate.

(1) A time extension to perform maintenance not to exceed fourteen (14) days per twelve (12) month period may be granted by the Department. The owner or operator is responsible for maintaining a record of the number of days per year that the vapor collection system or vapor control device is out of service and shall provide a record of such activity at the request of the Department.

(2) If an alternate vapor control device compliant with this section is installed prior to conducting maintenance and the vapor collection and control system continues to collect and control vapors during the maintenance operation consistent with the applicable standards specified in this Subpart, the event does not count towards the thirty (30) day limit.

(3) Vapor collection system and control device shutdowns that result from emergencies as defined in Section 201-1.5 of this Title are not subject to enforcement action, provided the equipment resumes normal operation immediately after the emergency and the requirements in Section 201-1.5 of this Title are met. Vapor collection system and control device shutdowns that result from utility power outages do not count towards the thirty (30) day limit for maintenance.

(a) A repair or replacement may not be delayed unless it results in the following:

- (1) a vented blowdown,
- (2) a gathering and boosting station shutdown,
- (3) a well shutdown,
- (4) a well shut-in,
- (5) is deemed technically infeasible or unsafe by the New York State Department of Public Service or other federal or state regulatory agency.

(b) The repair or replacement delay may be extended until the earliest event listed below.

- (1) the next compressor station shutdown,
- (2) the next gathering and boosting station shutdown,
- (3) well shutdown,
- (4) well shut-in,
- (5) the next unscheduled, planned or emergency vent blowdown, or
- (6) within one (1) year.

203-10 Reporting and Recordkeeping

203-10.1 Baseline Report

(a) Applicability: This section applies to all sources as described in Section 203-1.1.

(b) Owners or operators of components or processes subject to this Subpart must submit a report to the Department by March 31, 2023 or by March 31<sup>st</sup> of the year following initiation of operation.

(c) The report shall be in a format approved by the Department and shall list the number and type of components, including but not be limited to the following:

- (1) separators
- (2) storage vessels
- (3) compressors
- (4) gas drying systems
- (5) pneumatic devices
- (6) metering and regulating systems

## 203-10.2 Recordkeeping

(a) Reciprocating Natural Gas Compressors.

(1) Maintain, for at least five (5) years from the date of each leak concentration measurement, a record of each rod packing leak concentration measurement found above the minimum leak threshold as defined in Section 203-4.4.

(2) Maintain, for at least five (5) years from the date of each emissions flow rate measurement, a record of each rod packing emission flow rate measurement.

(3) Maintain, for at least five (5) years a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the rod packing leak concentration or emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection.

(4) Maintain, for at least five (5) years, records that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

(b) Centrifugal Natural Gas Compressors.

(1) Maintain, for at least five (5) years from the date of each emissions flow rate measurement, a record of each wet seal emission flow rate measurement.

(2) Maintain, for at least five (5) years, a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the wet seal emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection.

(3) Maintain, for at least five (5) years, records that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

(c) Natural Gas Actuated Pneumatic Devices.



(1) Maintain, for at least five (5) years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement

(d) Leak Detection and Repair.

(1) Maintain, for at least five (5) years from each inspection, a record of each LDAR inspection.

(2) Maintain, for at least five (5) years from the date of each inspection, component leak and repair documentation.

(3) Maintain records for at least five (5) years that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

(4) Maintain gas service utility records for at least five (5) years that demonstrate that a system has been temporarily classified as critical to reliable public gas operation throughout the duration of the classification period.

(e) Vapor Collection System and Vapor Control Devices.

(1) Maintain records for at least five (5) years that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

(a) Reports shall be delivered to both the:

(1) Bureau Director, Bureau of Air Quality Planning, Division of Air Resources, 625 Broadway, Albany NY 12233, and

(2) The Regional Air Pollution Control Engineer in the corresponding Department Region in which the source is located.

(b) Source owners and operators must maintain reports for at least five (5) years and make them available to the Department upon request.

#### 203-11 Severability

Each provision of this Part shall be deemed severable, and in the event that any provision of this Part is held to be invalid, the remainder of this Part shall continue in full force and effect.

Express Terms

6 NYCRR Part 200, General Provisions

(Existing Sections 200.1 through 200.8 remain unchanged.)

Existing Section 200.9, Table 1 is amended to add the following:

Regulation	CFR Cite	Availability
<u>203-7.1(a)</u>	<u>40 CFR part 60, appendix A-7 (July 1, 2017)</u>	* —

6 NYCRR Part 203, Oil and Natural Gas Sector

6 NYCRR Part 200, General Provisions

Regulatory Impact Statement Summary

The New York State Department of Environmental Conservation (DEC or Department) is proposing new 6 NYCRR Part 203, “Oil and Natural Gas Sector” and Part 200 and attendant revisions to 6 NYCRR Part 200, “General Provisions.”

Statutory Authority

The statutory authority for the promulgation of 6 NYCRR Part 203 and the attendant revision to 6 NYCRR Part 200 is found in the New York State Environmental Conservation Law (ECL), Sections 1-0101, 3-0301, 3-0303, 19-0103, 19-0105, 19-0107, 19-0301, 19-0302, 19-0303, 19-0305, 71-2103, 71-2105, and 75-0107.

Needs/Benefits

The primary need for this rulemaking is to protect the health and welfare of New York residents and resources by: 1) reducing methane (CH<sub>4</sub>), a greenhouse gas, in support of the goals and requirements of the Climate Leadership and Community Protection Act (CLCPA),<sup>1</sup> 2) reducing associated volatile organic compounds (VOCs), an ozone precursor, and 3) fulfilling the requirements of the Environmental Protection Agency’s (EPA) 2016 Control Techniques Guidelines (CTG) for the oil and gas industry.<sup>2</sup>

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<sup>1</sup> Chapter 106 of the Laws of 2019.

<sup>2</sup> 81 FR 74798 (October 27, 2016).

On July 18, 2019 Governor Cuomo signed into law the Climate Leadership and Community Protection Act, Chapter 106 of the Laws of 2019 (CLCPA). As added by the CLCPA, ECL Section 75-0107 requires a 40 percent reduction in Statewide GHG emissions from 1990 levels by 2030, and an 85 percent reduction from 1990 levels by 2050. ECL § 75-0107; 6 NYCRR Part 496. This proposal will support this overall requirement of the CLCPA by reducing statewide GHG emissions.

Ignoring the well-developed body of work on the benefits of reducing GHG and VOC emissions from this sector, on August 13, 2020, the EPA Administrator signed the finalized rollback amendments to the 2012 and 2016 rules affecting the oil and natural gas industry, titled, respectively, “Oil and Natural Gas Sector: New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants Reviews; Final Rule” (2012 Rule) and “Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources; Final Rule” (2016 Rule). As a result of this lack of protection, DEC must develop regulations for both new and existing sources in this sector with the goal of lowering CH<sub>4</sub> and VOC emissions within New York.

Methane is a GHG that is emitted from both human activities and natural processes.<sup>3</sup> GHGs like CH<sub>4</sub> trap heat in the atmosphere, which is a driving force of climate change. CH<sub>4</sub> is also a precursor for tropospheric ozone (O<sub>3</sub>) which is harmful to human health and crop production.

Estimates show that methane emissions from the oil and gas supply chain are 63% higher than the EPA Greenhouse Gas Inventory (GHGI).<sup>4</sup> These higher estimates make it crucial to address methane emissions from the oil and gas industry.

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<sup>3</sup> <https://www.epa.gov/ghgemissions>.

<sup>4</sup> Alvarez et al., Assessment of methane emissions from the U.S. oil and gas supply chain, July 2018.

The New York-Northern New Jersey-Long Island, NY-NJ-CT metropolitan area (New York metropolitan area, or NYMA) is designated "nonattainment" with a "serious" classification for the 2008 ozone NAAQS and "nonattainment" with a "moderate" classification for the 2015 ozone NAAQS. New York submitted a State Implementation Plan (SIP) for the 2008 ozone NAAQS in 2020 and is required to submit an additional SIP for the 2015 ozone NAAQS by August 3, 2021. These SIPs must demonstrate how the NYMA plans to attain the 2008 NAAQS by July 20, 2021 and the 2015 NAAQS by August 3, 2024.

Despite DEC's aggressive emission reduction efforts and calls for EPA to address interstate transport of ozone, the NYMA continues to struggle to attain the 2008 and 2015 NAAQS. More in-state emission reductions are needed to assist the area with attaining both ozone standards.

A variety of sources contribute to CH<sub>4</sub> emissions along the natural gas supply chain. VOCs are also released from equipment along the supply chain and these direct emissions are precursors to the production of ozone which is a regulated criteria pollutant harmful to human health.

### Proposal

The proposed requirements are expected to reduce CH<sub>4</sub> and VOC emissions from the oil and natural gas sector in New York State. The requirements apply at natural gas and oil wells, natural gas gathering lines, natural gas transmission, natural gas storage and areas where natural gas metering and regulating occurs.

If a potential to emit (PTE) threshold of 6 tons per year is exceeded, storage vessels are required to install a vapor recovery system which is subject to leak detection and repair (LDAR). The wellhead, piping, heater separators and pneumatic devices will all be subject to LDAR requirements.

This proposal allows for optical gas imaging (OGI) or EPA Method 21 as pre-approved methods for leak detection. In addition, the proposal allows for alternative techniques for leak detection which may be submitted to the Department for approval. Alternatives must be at least as effective as OGI or Method 21 in identifying leaks. The Department is also proposing an option to reduce the frequency of LDAR if an approved alternative method which offers continuous monitoring is utilized. A study focused on leak detection found that, in 31% of the cases, emissions concentrations either stayed within the same range or increased after leak repairs.<sup>5</sup> Therefore, the Department also proposes monitoring after leaks are repaired to ensure that leaks are successfully fixed.

Collected vapors may be sent to the sales gas system or the fuel gas system. If these options are not available, then the collected vapors must be routed to an existing or new vapor collection system that must achieve at least ninety-five percent vapor control efficiency. Vapor collection systems will also be subject to LDAR.

This proposal requires LDAR at well sites (semiannually), gathering and boosting sources (quarterly), transmission compressor stations (bimonthly), storage facilities (bimonthly), and the City Gate (quarterly).

The proposal requires each source to submit a list of the components that are located at its site.

The Department expects the following annual CH<sub>4</sub> and VOC reductions if this proposal is adopted. Until sources are assessed, there is uncertainty about the number of sources which will be required to install controls.

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<sup>5</sup> Carbon Limits, Statistical Analysis of Leak Detection and Repair in Europe, November 2017.

**Table 1: Summary of potential annual reductions**

	<b>Metric tons (MT) CH4</b>	<b>MTCO2e (100 yr GWP)</b>	<b>MTCO2e (20 yr GWP)</b>	<b>Tons of VOC</b>
<b>Storage Vessels</b>	6,309-31,545	157,725 - 788,625	529,956 – 2,649,780	1,009-5,047
<b>Reciprocating Compressors</b>	708	17,700	59,472	113
<b>Centrifugal Compressors</b>	3,164 – 15,819	79,100-395,475	265,776 – 1,328,796	506-2,531
<b>LDAR</b>	4,462	111,550	374,808	714
<b>Total Emissions Reductions</b>	14,643-52,534	366,075-1,313,350	1,230,012 – 4,412,856	2,343-8,405
<b>2017 NYS Oil/Gas CH4 Emissions</b>	106,561	2,664,182	8,951,124	
<b>% Emissions Reductions within Sector</b>	13% - 49%			

Costs

Storage Vessels: The 2016 EPA CTG lists capital costs to install vapor recovery at \$171,538 and annual costs at \$28,230.

Compressors – Reciprocating: Based on typical operation, EPA estimates the cost to be \$2,153 per compressor per year<sup>6</sup> which translates into \$165,781 per year for all 77 permitted reciprocating compressors in the state.<sup>7</sup>

Compressors – Wet Seal Centrifugal: The capital cost to retrofit a gas capture system is estimated in the Environmental Defense Fund’s (EDF) 2014 report at \$50,000 for a 95% reduction of natural gas loss. A survey

<sup>6</sup> EPA 2016 CTG, Table 5-5.

<sup>7</sup> EPA Gas Star program, “Reducing Methane Emissions From Compressor Rod Packing Systems.” [https://www.epa.gov/sites/production/files/2016-06/documents/ll\\_rodpack.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/ll_rodpack.pdf).



of the 40 centrifugal compressors permitted in New York indicate that most already have a dry seal, so the Department does not expect high costs associated with this requirement.

LDAR at Wells: Annual costs for LDAR personnel or consultants and repairs are estimated at \$2,285, ICF estimated this cost to be \$2,006.<sup>8</sup>

LDAR at Compressors: EPA estimates a capital cost for semiannual LDAR at gathering and boosting stations of \$2,393 and annual costs at \$13,534.<sup>9</sup> EDF estimates an annual cost of \$6,017 for quarterly LDAR, for gathering and boosting stations and transmission compressor stations.<sup>10</sup> To account for the costs associated with performing bimonthly LDAR, quarterly LDAR costs are multiplied by 1.5 (50% increase), resulting in an annual cost estimate of \$9,025.5 (EDF) or \$20,301 (EPA).

It is estimated that this rulemaking and ongoing support will require 1.5 full time equivalent (FTE) or \$237,500<sup>11</sup> during the first year and 1.0 FTE annually thereafter.

This proposal may also impact other Departments such as the Department of Public Service (DPS). It is unknown exactly how many FTE's will be required to support any requests for rate cases from the impacted sources, however it is expected that there will be additional workload.

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<sup>8</sup> ICF, 2014, Table 3-4.

<sup>9</sup> EPA CTG, 2016, Table 9-26.

<sup>10</sup> ICF, 2014, Table 3-4.

<sup>11</sup> Assumptions: Grade 24 pay rate of \$97,448 per year and an overhead rate of 62.48 percent. Per: <https://www.osc.state.ny.us/agencies/guide/MyWebHelp/#VII/9/9.htm>.

Extrapolating from United States Energy Information Administration data indicates that over 5.5 billion dollars passed through the natural gas market in New York in 2019. <sup>12</sup>

<b>Table 2: Summary of Potential Costs</b>					
	<b>Quantity</b>	<b>Initial Cost Low</b>	<b>Initial Cost High</b>	<b>Annual Cost Low</b>	<b>Annual Cost High</b>
Storage Vessels vapor recovery	10% - 50%	34,787,906	173,939,532	5,725,044	28,625,220
Compressor - recip	All compressors			165,781	165,781
Compressor - centrifugal	10% - 50%	200,000	1,000,000		
LDAR - wells	All wells	369,261	369,261	924,766	1,053,385
LDAR - compressors	All compressors			288,816	649,632
<b>TOTAL</b>		<b>35,357,167</b>	<b>175,308,793</b>	<b>7,104,407</b>	<b>30,494,018</b>

Estimated costs are summarized in Table 2 and demonstrate that a large portion, over eighty percent, of the costs fall into the potential for storage vessel vapor recovery. This is also the category where the Department is uncertain if any vessels will be required to install these controls. After storage vessels are assessed, it may result that very few, if any, will actually trigger the requirement to install vapor recovery which would eliminate over eighty percent of these costs.

### Costs of Emissions

Using the estimated emissions reductions calculated (Table 1), Table 3 shows the cost of the missed opportunity to reduce these emissions. It is important to note that not all potential emission reductions have been calculated as data does not exist on the amount of reductions. For example, this proposal requires LDAR at the Citygate which does not have an estimated reduction factor.

<sup>12</sup> EIA Natural Gas Summary, 2019. [https://www.eia.gov/dnav/ng/ng\\_sum\\_lsum\\_dcu\\_SNY\\_a.htm](https://www.eia.gov/dnav/ng/ng_sum_lsum_dcu_SNY_a.htm).

<b>Table 3</b>			
<b>Annual Cost of Methane</b>			
Total Potential Emissions Reductions (MTCH <sub>4</sub> )	14,643 – 52,534		
Social Cost if Reductions are not achieved (2020 dollars)	\$96,321,654 - \$345,568,652	\$40,736,826 - \$146,149,588	\$22,359,861 - \$80,219,418
	<b>1% Discount Rate (\$6,578/metric ton)</b>	<b>2% Discount Rate (\$2,782/metric ton)</b>	<b>3% Discount Rate (\$1,527/metric ton)</b>

There are also costs associated with VOC emissions and the formation of ozone, including increased hospital visits, sick days and other associated costs.

Comparing Tables 2 and 3 demonstrates that the cost of reducing emissions from these sources is significantly less than the value achieved by the reductions.

#### Local Government Mandates

The proposed regulation does not impose a mandate on local governments. Local governments have no additional compliance obligations as compared to other subject entities.

#### Paperwork

In general, this proposal requires impacted sources to maintain records for five years and submit records within 60 days of certain events and annually for maintenance.

## Federal Regulation

This proposal implements EPA's CTG, but adds methane and other requirements in order to be fully protective.

## Alternatives

Alternative #1 – No Action: If the Department chooses not to act, this will constitute a violation of the Clean Air Act.

Alternative #2 – Include Required Continuous Emission Monitoring at all sites; The Department did not choose this alternative because at this time the Department does not believe that CEM technology is as advanced as needed.

Alternative #3 – Remove LDAR requirements: The Department did not choose this alternative because research clearly demonstrates that significant reductions are achieved through LDAR.

## Federal Standards

EPA has both a federal NSPS and a CTG that places requirements on this sector. This proposal satisfies the CTG requirement while addressing the State's commitment to reduce GHG emissions under the CLCPA. The requirements of this proposal include those set by the EPA, and it also includes requirements to segments within the sector and additional requirements across the entire sector that EPA does not include in order to achieve the NAAQS and protect human health and welfare.

## Compliance Schedule

The Department has proposed an initial compliance start date of January 1, 2023. The first report must be submitted by March 31, 2023.

6 NYCRR Part 203, Oil and Natural Gas Sector

6 NYCRR Part 200, General Provisions

Regulatory Impact Statement

The New York State Department of Environmental Conservation (DEC or Department) is proposing new 6 NYCRR Part 203, “Oil and Natural Gas Sector” and attendant revisions to 6 NYCRR Part 200, “General Provisions.” (collectively, Part 203). The primary need for this rulemaking is to protect the health and welfare of New York residents and resources by: 1) reducing methane (CH<sub>4</sub>), a greenhouse gas (GHG), in support of the goals and requirements of the Climate Leadership and Community Protection Act (CLCPA);<sup>1</sup> 2) reducing associated volatile organic compounds (VOCs), an ozone precursor; and 3) fulfilling the requirements of the United States Environmental Protection Agency’s (EPA) 2016 Control Techniques Guidelines (CTG) for the oil and gas industry.<sup>2</sup>

Statutory authority

The statutory authority for the promulgation of 6 NYCRR Part 203 and the attendant revisions to 6 NYCRR Part 200 is found in the New York State Environmental Conservation Law (ECL), Sections 1-0101, 3-0301, 3-0303, 19-0103, 19-0105, 19-0107, 19-0301, 19-0302, 19-0303, 19-0305, 71-2103, 71-2105, and 75-0107.

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<sup>1</sup> Chapter 106 of the Laws of 2019.

<sup>2</sup> 81 FR 74798 (October 27, 2016).

ECL Section 1-0101. This section declares it to be the policy of the state to conserve, improve and protect its natural resources and environment and control air pollution in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being. Section 1-0101 further expresses, among other things, that it is the policy of the state to coordinate the state's environmental plans, functions, powers and programs with those of the federal government and other regions and manage air resources so that the state may fulfill its responsibility as trustee of the environment for present and future generations. This section also provides that it is the policy of the state to foster, promote, create and maintain conditions by which man and nature can thrive in harmony by providing that care is taken for air resources that are shared with other states.

ECL Section 3-0301. This section states that it shall be the responsibility of DEC to carry out the environmental policy of the state. In furtherance of that mandate, Section 3-0301(1)(a) gives the Commissioner authority to “[c]oordinate and develop policies, planning and programs related to the environment of the state and regions thereof...”. Section 3-0301(1)(b) directs the Commissioner to promote and coordinate management of, among other things, air resources “to assure their protection, enhancement, provision, allocation, and balanced utilization consistent with the environmental policy of the state and take into account the cumulative impact upon all of such resources in making any determination in connection with any license, order, permit, certification or other similar action or promulgating any rule or regulation, standard or criterion.” Pursuant to ECL Section 3-0301(1)(i), the Commissioner is charged with promoting and protecting the air resources of New York including providing for the prevention and abatement of air pollution. Section 3-0301(2)(a) permits the Commissioner to adopt rules and regulations to carry out the purposes and provisions of the ECL. Section 3-0301(2)(m) gives the Commissioner authority to “[a]dopt such rules, regulations, and procedures as may be necessary, convenient or desirable to effectuate the purposes of this chapter.”

ECL Section 3-0303. This section requires that DEC formulate and, from time to time, revise a statewide environmental plan for the management and protection of the quality of the environment and the natural resources of the state. In formulating this plan and any revisions, DEC is required to conduct public hearings, cooperate with other departments, agencies and government officials, and any other interested parties, and obtain assistance and data as may be necessary from any department, division, board, bureau, commission or other agency of the state or political subdivision or any public authority to enable DEC to carry out its responsibilities.

ECL Section 19-0103. This section declares that it is the policy of New York State to maintain a reasonable degree of purity of air resources. In carrying out such policy, DEC is required to balance public health and welfare, the industrial development of the state, propagation and protection of flora and fauna, and the protection of personal property and other resources. To that end, DEC is required to use all available practical and reasonable methods to prevent and control air pollution in the state.

ECL Section 19-0105. This section declares that it is the purpose of Article 19 of the ECL to safeguard the air resources of the state under a program which is consistent with the policy expressed in Section 19-0103 and in accordance with other provisions of Article 19.

ECL Section 19-0107. This section provides definitions to be used in the application of the requirements of Article 19 of the ECL. Under these definitions, just like other GHGs, methane is an “air contaminant” that causes “air pollution.”

ECL Section 19-0301. This section authorizes DEC to adopt regulations to prevent and control air pollution in such areas of the state that are affected by air pollution, develop a general comprehensive plan for



the control and abatement of existing air pollution and for the control and prevention of new air pollution and cooperate with government agencies and other states or interstate agencies with respect to the control of air pollution.

ECL Section 19-0302. This section states that permit applications, renewals, modifications, suspensions and revocations are governed by rules and regulations adopted by DEC, and that permits issued may not include performance, emission or control standards more stringent than any standard established by the Act or EPA unless such standards are authorized by rules or regulations.

ECL Section 19-0303. This section provides that the terms of any air pollution control regulation promulgated by DEC may differentiate between particular types and conditions of air pollution and air contamination sources. Additionally, this section requires the Department to include analysis in the Regulatory Impact Statement explaining state regulatory requirements that are more stringent than those found in the Act or its implementing regulations. The requirements of this proposal include those set by the EPA Control Techniques Guideline; however, it also includes requirements to segments within the sector and additional requirements across the entire sector that EPA does not include. The Department further discusses the decision to be more stringent than EPA regulations below.

ECL Section 19-0305. This section authorizes DEC to enforce the codes, rules and regulations established in accordance with Article 19.

ECL Sections 71-2103 and 71-2105. These sections include provisions for the civil and criminal enforcement of Article 19 of the ECL.

ECL Section 75-0107. This section requires a 40 percent reduction in Statewide GHG emissions from 1990 levels by 2030, and an 85 percent reduction from 1990 levels from 2050. See also 6 NYCRR Part 496. Under the CLCPA, statewide GHG emissions include both GHG emissions from all sources located within the state and certain sources that are located outside of the state that are associated with in-state energy consumption. In particular, the statute requires that statewide GHG emissions include both: (1) “the total annual emissions of greenhouse gases produced within the state from anthropogenic sources,” and (2) “greenhouse gases produced outside of the state that are associated with [a] the generation of electricity imported into the state and [b] the extraction and transmission of fossil fuels imported into the state.” ECL § 75-0101(13). Moreover, the CLCPA defines “carbon dioxide equivalent” as a measurement of global warming potential (GWP) based on a twenty-year timeframe. ECL § 75-0101(2). For methane, this carbon dioxide equivalent value is currently set at 84. 6 NYCRR § 496.5.

### Legislative objectives

Article 19 of the ECL was enacted to safeguard the air resources of New York from pollution and ensure the protection of the public health and welfare, the natural resources of the state, and physical property by integrating industrial development with sound environmental practices. It is the policy of the state to require the use of all available, practical and reasonable methods to prevent and control air pollution in New York. To facilitate this objective, the Legislature granted specific powers and duties to DEC, including the power to adopt and promulgate regulations to prevent, control and prohibit air pollution. The provisions cited above clearly provide DEC with the requisite authority to create this regulation. Moreover, as acknowledged by the Legislature through its enactment of the CLCPA, significant reductions of GHG emissions, including methane, are necessary to mitigate the ongoing impacts of climate change on New York State. By reducing methane emissions, this regulation will further the goals and requirements of the CLCPA.

Finally, because it will lead to reductions in emissions of methane, a GHG, the proposed promulgation of Part 203 is consistent with the goals and requirements of the CLCPA. The CLCPA establishes Statewide GHG emission reduction requirements and renewable and clean energy generation requirements.

### Needs and benefits

As noted in the introduction the primary need for this rulemaking is to protect the health and welfare of New York residents and resources by: 1) reducing CH<sub>4</sub> in support of the goals and requirements of the CLCPA, 2) reducing associated VOCs, and 3) fulfilling the requirements of the EPA's 2016 CTG.

The CTG contains requirements to lower VOC emissions from existing sources. When originally proposed and adopted, the CTG was accompanied by a New Source Performance Standard (NSPS) which addressed both CH<sub>4</sub> and VOC emissions from new sources. The Department is moving forward with this proposal to address both CH<sub>4</sub> and VOCs from all applicable oil and natural gas sources. The emission reductions are achieved through the capture and reduction of released natural gas. As a result, the Department will achieve a greater level of reduction than required by the CTG through this proposal.

The Department's proposal covers both new and existing sources. The EPA finalized a regulation in 2016 for new sources which has gone through various levels of rollbacks since that time. Most recently, the EPA finalized rollbacks to the regulation for new sources which is inconsistent with the original regulation as well as this proposal. Although this proposal covers existing as well as new sources, there are some areas of duplication between the EPA regulation and this proposal. The Department does not believe that, in its current iteration, the EPA regulation is protective of the health and welfare of U.S. residents.

## Background on Methane

On July 18, 2019, Governor Cuomo signed into law the CLCPA, Chapter 106 of the Laws of 2019. The CLCPA is intended to "create a comprehensive regulatory program to reduce greenhouse gas emissions that corresponds with emission reduction goals as set forth in Executive Order 24, the State Energy Plan, and the [United States Global Change Research Program] and [Intergovernmental Panel on Climate Change] projections." CLCPA §1. As noted above under Statutory Authority, ECL Section 75-0107 requires a 40 percent reduction in Statewide GHG emissions from 1990 levels by 2030, and an 85 percent reduction from 1990 levels from 2050. ECL § 75-0107; 6 NYCRR Part 496. This proposal will support these overall requirements of the CLCPA, as established in ECL § 75-0107 and implemented by DEC through 6 NYCRR Part 496, of lowering statewide GHG emissions.

Ignoring the well-developed body of work on the benefits of reducing GHG and VOC emissions from this sector, on August 13, 2020, the EPA Administrator signed the final amendments to the 2012 and 2016 rules affecting the oil and natural gas industry, essentially a rollback of critical environmental regulations. These rollbacks affected two previous rules titled, respectively, "Oil and Natural Gas Sector: New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants Reviews; Final Rule" (2012 Rule)<sup>3</sup> and "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources; Final Rule" (2016 Rule).<sup>4</sup> Those rules initially established NSPS for VOCs and GHGs, in the form of limitations on VOCs and CH<sub>4</sub>, for that industry.<sup>5</sup> In its announcement of the rollback of requirements on August 13, 2020, EPA stated that "[t]hese rules will provide significant benefits to our small oil and natural gas producers that make up over 80 percent of the industry[.]"<sup>6</sup> while neglecting to show any benefit to the

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<sup>3</sup> 77 FR 49490 (August 16, 2012).

<sup>4</sup> 81 FR 35824 (June 3, 2016).

<sup>5</sup> Docket ID No. EPA-HQ-OAR-2010-0505.

<sup>6</sup> EPA, 2020. [https://www.epa.gov/sites/production/files/202008/documents/og\\_actions.overviewfactsheet.final.8.13.2020.pdf](https://www.epa.gov/sites/production/files/202008/documents/og_actions.overviewfactsheet.final.8.13.2020.pdf).

environment or human health, their primary function. As a result of this lack of protection, DEC must develop regulations for both new and existing sources in this sector with the goal of lowering CH<sub>4</sub> and VOC emissions within New York.

CH<sub>4</sub> is a GHG that is emitted from both human activities (e.g. agriculture, oil & gas sector, waste) and natural processes (e.g. wetlands).<sup>7</sup> GHGs like CH<sub>4</sub> trap heat in the atmosphere, which is a driving force of climate change. GWP measures how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO<sub>2</sub>. CH<sub>4</sub> is a potent GHG with a 100-yr GWP of 28-34 and a 20-yr GWP of 84-86.<sup>8</sup> In addition to being a GHG, CH<sub>4</sub> is a precursor for tropospheric ozone (O<sub>3</sub>) which is harmful to human health and crop production. Therefore, reducing CH<sub>4</sub> emissions results in a two-fold benefit because it is both a GHG and an ozone precursor.

In a nationwide study of the natural gas transmission and storage sector, the performance gap between companies that volunteered for the study and those that did not reinforced the need for governments to set standards to manage CH<sub>4</sub> emissions. Reported emissions from non-partner facilities were 1.4 times larger than those reported by facilities that participated in the study.<sup>9</sup> Given the variance in emissions from natural gas facilities, it is crucial for governments to set standards to manage CH<sub>4</sub> emissions for the natural gas industry. Furthermore, estimates show that CH<sub>4</sub> emissions from the oil and gas supply chain are 63% higher than the EPA GHG inventory (GHGI).<sup>10</sup> These estimates make it crucial to address CH<sub>4</sub> emissions from the oil and gas industry.

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<sup>7</sup> <https://www.epa.gov/ghgemissions>.

<sup>8</sup> Myhre et al. Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. For purposes of the Department's Part 496, Statewide Greenhouse Gas Emission Limits regulation, which implements the requirements of ECL § 75-0107, the 20-yr GWP of CH<sub>4</sub> is 84.

<sup>9</sup> Subramanian et al., Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol, February 2015.

<sup>10</sup> Alvarez et al., Assessment of methane emissions from the U.S. oil and gas supply chain, July 2018.

## Background on Ozone

In March of 2008, the EPA lowered the eight-hour National Ambient Air Quality Standard (NAAQS) for ozone from 0.08 parts per million (ppm) to 0.075 ppm.<sup>11</sup> EPA lowered the NAAQS again on October 1, 2015 to 0.070 ppm.<sup>12</sup> Both standards are currently in effect. Ozone NAAQS attainment status is determined from the monitor with the highest "design value" within the designated area. The "design value" is calculated as the 4<sup>th</sup> highest daily maximum eight-hour ozone concentration, averaged over three years,<sup>13</sup> and is compared to the NAAQS to determine attainment status and classification.

The New York-Northern New Jersey-Long Island, NY-NJ-CT metropolitan area (New York metropolitan area, or NYMA) is designated "nonattainment" with a "serious" classification for the 2008 ozone NAAQS and "nonattainment" with a "moderate" classification for the 2015 ozone NAAQS. New York submitted a State Implementation Plan (SIP) for the 2008 ozone NAAQS in 2020 and is required to submit an additional SIP for the 2015 ozone NAAQS by August 3, 2021. These SIPs must demonstrate how the NYMA plans to attain the 2008 NAAQS by July 20, 2021 and the 2015 NAAQS by August 3, 2024.

While the current "design value" for monitors within New York State is 0.075 ppm, the current "design value" for the entire NYMA ozone nonattainment area is 0.082 ppm based on data from monitors in Westport and Stratford, Connecticut. This clearly demonstrates that despite DEC's aggressive emission reduction efforts, and calls for EPA to address interstate transport of ozone, the NYMA continues to struggle to attain the 2008 and 2015 NAAQS. Therefore, more in-state emission reductions are needed to assist the area with attaining both ozone standards and protecting the health of New York residents and the environment.

## Background on the Oil and Natural Gas Sector

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<sup>11</sup> 73 FR 16436 (March 27, 2008), codified at 40 CFR section 50.15. Attainment of the 2008 ozone NAAQS is determined when the fourth highest daily maximum 8-hour average ambient air quality ozone concentration, averaged over three years, is less than or equal to 0.075 ppm.

<sup>12</sup> 80 FR 65292 (October 26, 2015).

<sup>13</sup> Code of Federal Regulations, Part 50 Appendix I.

New York State has a 200-year history with oil and gas production and distribution and with that history comes the existence of conventional wells and infrastructure throughout the State, concentrated in the Western Tier. While the history is long, the industry is changing quickly and has been spotlighted by stakeholders aware of and concerned about air emissions and potential emissions increases from this sector as demand has grown.

The U.S. Energy Information Administration (EIA) projects that by 2040, total natural gas production in the United States will increase by 40% and oil production will increase by over 27%.<sup>14</sup> In New York State while total oil and natural gas production has fluctuated up and down since 1979 overall production has generally increased over time. For example, when the Trenton Black River gas was extracted between 2000 and 2007 gas production increased by as much as 35% from previous years.

The New York State Energy Research and Development Authority (NYSERDA) has estimated that natural gas leakage in New York State has emitted between 2 and 5.2 million metric tons of carbon dioxide equivalents (MMtonCO<sub>2</sub>e) per year since 1990 expressed as a 100-yr GWP.<sup>15</sup> Using the CLCPA's 20-yr GWP metric, this would equate to between 6.72 and 17.5 MMtonCO<sub>2</sub>e. CH<sub>4</sub>, a primary component of natural gas, is a potent GHG, and a variety of sources contribute to CH<sub>4</sub> emissions along the natural gas supply chain. VOCs are also released from equipment along the supply chain and these direct emissions are precursors to the production of ozone which is a regulated criteria pollutant harmful to human health and the environment.

Table 1 shows the current estimates for GHGs from New York's oil and natural gas sector.

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<sup>14</sup> US Energy Information Administration. Annual Energy Outlook; U.S. Department of Energy: Washington D.C., 2015.<  
<http://www.eia.gov/beta/aeo/#/?id=1-AEO2015&region=0-0&cases=ref2015&start=2012&end=2040&f=L&linechart=1-AEO2015.3>>.

<sup>15</sup> NYSERDA. Web. <http://www.nyserdan.ny.gov/-/media/Files/EDPPP/Energy-Prices/Energy-Statistics/greenhouse-gas-inventory.pdf>.

<b>Table 1: 2017 GHG and VOC emissions from the oil and natural gas sector in New York<sup>16</sup></b> <b>(in metric tons)<sup>16</sup></b>				
<b>Sub-Sector</b>	<b>MTCO<sub>2</sub>e (100 yr GWP)</b>	<b>MTCO<sub>2</sub>e (20 yr GWP)</b>	<b>MTCH<sub>4</sub></b>	<b>MTVOC</b>
<b>Production</b>	371,862	1,249,416	14,874	2,380
<b>Gathering &amp; Processing</b>	32,627	109,620	1,305	209
<b>Transmission</b>	1,143,021	3,840,564	45,721	7,315
<b>Storage</b>	631,361	2,121,336	25,254	4,041
<b>Distribution</b>	296,142	995,064	11,846	1,895
<b>Abandoned Wells</b>	4,547	15,288	182	29
<b>Degreasing</b>	2,696	9,072	108	17
<b>Well Completions</b>	808	2,688	32	5
<b>Meters</b>	181,095	608,496	7244	1,159
<b>Total</b>	2,664,159	8,951,544	106,566	17,051

There are 32 permitted compressor stations with a total of 117 permitted compressors in New York State. New York also has 27 underground natural gas storage sources. While this proposal establishes requirements for metering and regulating stations actual counts for these stations are not well-established. It has been estimated that there may be somewhere between three to four thousand metering and regulating stations in New York. In 2018 there were 3,411 active oil wells and 6,729 active gas wells. In 2018, 10.6 billion cubic feet (bcf) of natural gas and 224,717 barrels (bbl) of oil were extracted from New York’s wells. These well locations are shown in Figure 1.

<sup>16</sup> New York State Energy Research and Development Authority (NYSERDA). 2019. “New York State Oil and Gas Sector Methane Emissions Inventory.” NYSERDA Report Number 19-36. Prepared by Abt Associates, Rockville, MD and Energy and Environmental Research Associates, LLC, Pittsford, NY. [nyserdera.ny.gov/publications](http://nyserdera.ny.gov/publications). VOC emissions estimated by weight percent of methane with the assumption of a natural gas stream with volumetric percent of 95% methane and 5% VOC.



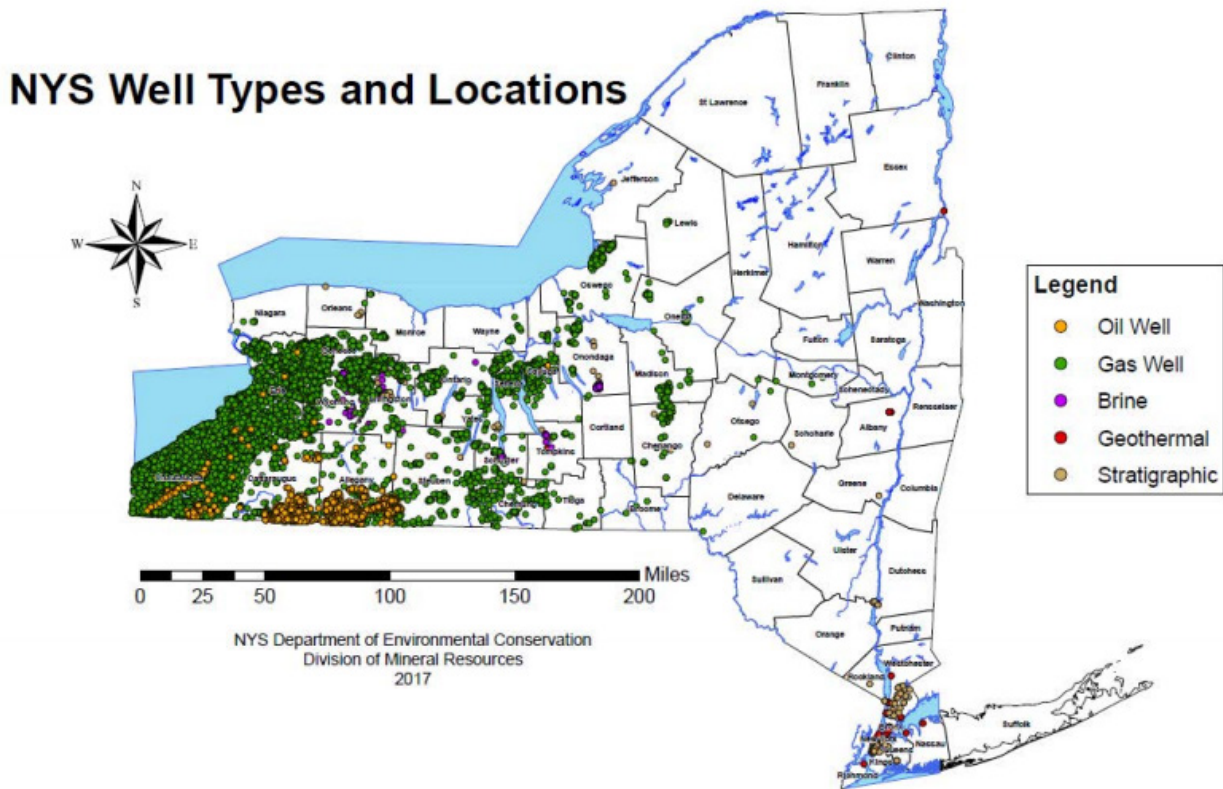


Figure 1: Well locations

To further characterize the oil and natural gas sector, the Department believes it is important to establish the concept of high-emitting sources, also known as “super-emitters.” Studies suggest that methane emissions are underestimated from this sector based on atmospheric research.<sup>17, 18</sup> This underestimation may be due to super-emitters which represent a small fraction of sites but may be responsible for a large fraction of emissions. Many studies support this phenomenon<sup>19, 20, 21, 22</sup> and it serves as a large part of the basis behind the Department proposal to cover all affected sources in New York State.

<sup>17</sup> Brandt, A.R., et al. 2014. Methane Leaks from North American Natural Gas Systems. *Science*. Vol. 343.

<sup>18</sup> Miller, S.M., et al. 2013. Anthropogenic Emissions of Methane in the United States. *Proceedings of the National Academy of Sciences*. December 10, 2013.

<sup>19</sup> Brandt, A.R., et al. 2014. Methane Leaks from North American Natural Gas Systems. *Science*. Vol. 343.

<sup>20</sup> Lamb, Brian K, et al. 2015. Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States. *Environmental Science & Technology*.

<sup>21</sup> Zavala-Araiza, Daniel, et al. 2015. Toward a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites. *Environmental Science & Technology*.

<sup>22</sup> Zimmerle, Daniel J., et al. 2015. Methane Emissions from the Natural Gas Transmission and Storage System in the United States. *Environmental Science & Technology*.

## Proposal

The proposed requirements are expected to reduce CH<sub>4</sub> and VOC emissions from the oil and natural gas sector in New York State. The requirements apply to all natural gas and oil wells, natural gas gathering lines, natural gas transmission, natural gas storage and areas where natural gas metering and regulating occurs.

**Well Sites:** Oil and gas well sites in New York are simpler than those found in other regions of the United States because most of the natural gas extracted in New York is very dry. This dry gas does not have to be processed to the extent required in other regions before it can enter a natural gas transmission pipeline. There may be storage vessels, or tanks, at well sites which may contain produced water, separation products or other fluids. These storage vessels may emit VOCs or CH<sub>4</sub>. The proposal includes requirements that if a VOC potential to emit (PTE) threshold of 6 tpy is exceeded, storage vessels at well sites are required to install a vapor recovery system which is subject to leak detection and repair (LDAR) requirements.

A finished and producing natural gas well will also include flow lines and gathering lines and may include heater separators. Pneumatic devices may be used for maintaining process conditions. The wellhead, piping, heater separators and pneumatic devices will all be subject to LDAR requirements.

**Gathering and Boosting Stations:** Gathering and boosting stations collect gas from multiple wells and move it toward a transmission pipeline. Components at these stations typically include compressors to increase the pressure of the gas to that needed to move it into the pipeline, pneumatic devices and pumps to maintain process conditions and storage vessels. The proposed regulation establishes operational standards for compressors and LDAR standards for the compressors as well as all of the other components. If a VOC PTE

threshold of 6 tpy is exceeded, storage vessels at these stations are required to install a vapor recovery system which is subject to LDAR requirements.

**Natural Gas Transmission Pipeline and Compressor Stations:** The function of natural gas transmission pipelines and compressor stations is to move gas down a pipeline by either increasing the pressure of the gas in the pipeline from the pressure coming from the gathering and boosting stations or maintaining the high pressure needed in the transmission pipeline when pipeline flow pressure decreases. The proposed regulation establishes operational standards and LDAR standards for compressors and other components. If a VOC PTE threshold of 6 tpy is exceeded, storage vessels at compressor stations are required to install a vapor recovery system which is subject to LDAR requirements. In addition, the Department is requesting data for all pigging activities.

**Natural Gas Underground Storage:** Natural gas is stored in underground locations to be used for system balancing or saved for winter months when demand for natural gas to heat homes and businesses increases. The natural gas is stored in what are often depleted natural gas or oil reservoirs but may be any natural or artificial cavern or geologic dome, sand or stratigraphic trap, whether or not previously occupied by or containing oil or natural gas. Storage sources typically include compressors to move the natural gas, pneumatic devices and pumps to maintain system conditions and storage vessels to store any liquids removed. The proposed regulation establishes operational standards for compressors and LDAR standards for the compressors as well as all of the other components. If a PTE threshold of 6 tpy of VOC is exceeded, storage vessels located at underground storage sites are required to install a vapor recovery system which is subject to LDAR requirements.

**Leak Detection and Repair:** LDAR is the process of locating and repairing leaks from equipment and components including pipes, flanges, seals, valves, pumps and compressors. This proposal allows for optical gas imaging (OGI) or EPA Method 21 as pre-approved methods for leak detection. In addition, the proposal

allows for alternative techniques for leak detection which may be submitted to the Department for approval. Alternatives must be at least as effective as OGI or Method 21 in identifying leaks. The Department is also proposing an option to reduce the frequency of LDAR if an approved alternative method which offers continuous monitoring is utilized. A study focused on leak detection found that, in 31% of the cases, emissions concentrations either stayed within the same range or increased after leak repairs.<sup>23</sup> Therefore, the Department also proposes monitoring after leaks are repaired to ensure that leaks are successfully fixed.

Vapor Collection Systems: Vapor collection is the process of collecting vapors from storage vessels so that they are not released into the atmosphere. Collected vapors may be sent to the sales gas system or the fuel gas system. If these options are not available, then the collected vapors must be routed to an existing or new vapor collection system that must achieve at least ninety-five percent vapor control efficiency. Under this proposal, vapor collection systems will also be subject to LDAR requirements.

Data Collection: The proposal requires each source to submit a list of the components that are located at its site to the Department. This will allow the Department to better understand component emissions and where regulation may or may not be needed in the future.

Blowdowns: The proposal requires reporting of both planned and unplanned blowdowns of natural gas greater than ten thousand feet cubed.

This proposal impacts the transmission of natural gas to end users and the Department recognizes the importance of assuring that residents receive this fuel to heat homes in the winter. In addition, it is imperative

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<sup>23</sup> Carbon Limits, Statistical Analysis of Leak Detection and Repair in Europe, November 2017.

that electricity generating sources receive this fuel to ensure that the grid continues to operate reliably. As a result, the Department has included feasibility and safety provisions in the proposal to ensure that fuel resources are available as needed for heat and electricity reliability.

## Emissions Reductions

Storage Vessels: The Department calculated the Barrels of Oil Equivalent (BOE) for each of the producing wells in New York State based on 2018 data.<sup>24</sup> The Department compared the calculated BOE against EPA's table 4.2 from the 2016 CTG. Table 4.2 demonstrates a correlation between BOE and VOC emissions in tons per year. Based on this correlation the Department has determined that very few wells may have storage vessels that would trigger the threshold for the proposed vapor recovery requirement. Furthermore, the natural gas that is extracted in New York State is generally defined as "dry" and "sweet" which means that it requires very little, if any, processing before it enters the transmission pipeline. If vapor recovery is required for an applicable storage vessel it is estimated that each uncontrolled storage vessel emitting at 2 tpy over the threshold of 6 tpy of VOC will result in 6,223 MTCH<sub>4</sub> per year reduction (155,575 MTCO<sub>2e</sub> – 100 year GWP) (522,732 MTCO<sub>2e</sub> – 20 year GWP).<sup>25</sup> While the Department does not believe there are many storage vessels that exceed this threshold, if an assumption is made that ten to fifty percent of active wells have storage vessels that exceed the threshold, then New York can expect CH<sub>4</sub> emission reductions between 6,309 and 31,545 MTCH<sub>4</sub> (157,725 and 788,625 MTCO<sub>2e</sub> – 100 year GWP)(529,956 and 2,649,780 MTCO<sub>2e</sub> – 20 yr GWP) and potential corresponding VOC reductions of 1,009 to 5,047 tons.

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<sup>24</sup> DEC "Annual Well Production Search" [www.dec.ny.gov](http://www.dec.ny.gov).

<sup>25</sup> Derived from EPA CTG 2016, Table 4-4.

Reciprocating compressors: The Department permits 77 reciprocating compressors within New York State. EPA's NSPS OOOO proposal estimated that individual compressor reductions through adherence to the proposed requirements would result in 9.2 tpy of CH<sub>4</sub> reduced per reciprocating compressor. Based on these estimates the proposed requirements would result in CH<sub>4</sub> reductions of 708 MTCH<sub>4</sub> (17,700 MTCO<sub>2e</sub> – 100 year GWP)(59,472 MTCO<sub>2e</sub> – 20 year GWP) and a corresponding reduction of 113 tons of VOC.

Centrifugal Compressors: The Department permits 40 centrifugal compressors within New York State. Based on outreach and permit analysis, the Department believes that most of the permitted centrifugal compressors are dry seal but has not been able to confirm that all of them are. If any centrifugal compressors are wet seal, they will have the option to comply with the proposal by converting to dry seal or through the addition or use of a control system. Converting to dry seal is more costly than the installation of a control system so the Department expects that if a source is wet seals, it would use the less costly control system option. Based on the ICF 2014 study, the average CH<sub>4</sub> emissions from centrifugal compressor wet seal degassing are 63 scfm of natural gas per compressor. Assuming 8,000 hours of operation per year, the installation of controls would capture approximately 30 MMcf of natural gas per compressor or 791 MTCH<sub>4</sub> (66,444 MTCO<sub>2e</sub> – 20 yr GWP)(19,775 MTCO<sub>2e</sub> – 100 yr GWP) per compressor.<sup>26</sup> If an assumption is made that between ten and fifty percent of centrifugal compressors are dry seal, then the emission reductions would total between 3,164 and 15,819 MTCH<sub>4</sub> (265,776 and 1,328,796 MTCO<sub>2e</sub> – 20 year GWP) (79,100 and 395,475 MTCO<sub>2e</sub> – 100 yr GWP) per year and between 506 to 2,531 tons of VOC.

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<sup>26</sup> ICF, 2014, Table 3-4.

LDAR: A 2016 study determined a three-year fugitive emissions reduction from quarterly LDAR to be 78 percent.<sup>27</sup> EPA and ICF International both conservatively estimate emissions reductions from LDAR at 60 percent. New York’s 2017 Greenhouse Gas Inventory<sup>28</sup> show CH<sub>4</sub> emissions of 14,874 MTCH<sub>4</sub> (371,850 MTCO<sub>2</sub>e – 100 year GWP)(1,249,416 MTCO<sub>2</sub>e – 20 year GWP) and 2,379 tons of VOC from wells. Since New York’s pneumatic devices are rarely continuous bleed and since it is unknown what assumption was used to account for tanks located at wells, a conservative assumption that one half of these emissions are fugitive would result in emissions reductions of 4,462 MTCH<sub>4</sub> (111,550 MTCO<sub>2</sub>e – 100 year GWP) (374,808 MTCO<sub>2</sub>e – 20 year GWP) and 714 tons of VOC per year from LDAR.

**Table 2: Summary of potential reductions**

	<b>Metric tons (MT) CH<sub>4</sub></b>	<b>MTCO<sub>2</sub>e (100 yr GWP)</b>	<b>MTCO<sub>2</sub>e (20 yr GWP)</b>	<b>Tons of VOC</b>
<b>Storage Vessels</b>	6,309-31,545	157,725 - 788,625	529,956 – 2,649,780	1,009-5,047
<b>Reciprocating Compressors</b>	708	17,700	59,472	113
<b>Centrifugal Compressors</b>	3,164 – 15,819	79,100-395,475	265,776 – 1,328,796	506-2,531
<b>LDAR</b>	4,462	111,550	374,808	714
<b>Total Emissions Reductions</b>	14,643-52,534	366,075-1,313,350	1,230,012 – 4,412,856	2,343-8,405
<b>2017 NYS Oil/Gas CH<sub>4</sub> Emissions</b>	106,561	2,664,182	8,951,124	
<b>% Emissions Reductions within Sector</b>	13% - 49%			

Costs

<sup>27</sup> ICF International. *Leak Detection and Repair Cost-Effectiveness Analysis*. Revised May 2, 2016. Using data from subpart W, EPA/GRI, City of Fort Worth Natural Gas Air Quality Study, UT Study – Methane Emissions in the Natural Gas Supply Chain Production.

<sup>28</sup> New York State Energy Research and Development Authority (NYSERDA). 2019. “New York State Oil and Gas Sector Methane Emissions Inventory.” NYSEDA Report Number 19-36. Prepared by Abt Associates, Rockville, MD and Energy and Environmental Research Associates, LLC, Pittsford, NY. nysesda.ny.gov/publications.

For the cost analysis the Department relied on a comprehensive analysis by ICF International and the Environmental Defense Fund (EDF) and EPA’s CTG for the Oil and Natural Gas Industry.

Storage Vessels: The proposal requires controls for storage vessels which have a PTE greater than 6 tpy of VOCs. It is not expected that there are many, if any, storage vessels within New York that will be above the threshold, however, the Department included this requirement in the proposal to ensure that all storage vessels are reviewed and that those that exceed the threshold are controlled. The 2016 EPA CTG lists capital costs to install vapor recovery at \$171,538 and annual costs at \$28,230.

<b>Table 3: Capital Investments and Annual Costs of Vapor Recovery for Storage Vessels<sup>29</sup></b>	
<b>Item</b>	<b>Cost (\$2012)</b>
<b>Capital Costs</b>	
Vapor Recovery Unit (VRU) <sup>a</sup>	\$90,000
Freight and Design <sup>a</sup>	\$1,648
VRU Installation <sup>a</sup>	\$11,154
Storage Vessel Retrofit <sup>b</sup>	\$68,736
<b>Total Capital Investment</b>	<b>\$171,538</b>
<b>Annual Costs</b>	
Maintenance (\$/yr)	\$9,396
Capital Recovery (7 percent interest, 15-year equipment life) (\$/yr)	\$18,834
<b>Total Annual Costs w/o Savings (\$/yr)</b>	<b>\$28,230</b>
<sup>a</sup> Economic Impact Analysis Colorado Air Quality Control Commission.	
<sup>b</sup> Assumes storage vessel retrofit is 75 percent of the purchased equipment price, assumptions from Exhibit 6 of the EPA Natural Gas Star Lessons Learned, Installing Vapor Recovery Units on Storage Tanks, October 2006.	

If the recovered vapor cannot be reintroduced into the fuel gas system or sales gas system, then an additional process must be added to reduce emissions. Typically, combustion of the vapor is considered here. EPA estimates the capital and annual costs in Table 4.

<sup>29</sup> EPA CTG 2016, Table 4-3.



<b>Table 4: Capital Investments and Annual Costs of Vapor Recovery leading to Combustion<sup>30</sup></b>	
<b>Item</b>	<b>Cost (\$2012)</b>
<b>Capital Costs</b>	
Combustor <sup>a</sup>	\$18,169
Freight and Design <sup>a</sup>	\$1,648
Auto Igniter <sup>a</sup>	\$1,648
Surveillance System <sup>b,c,d</sup>	\$3,805
Combustor Installation <sup>a</sup>	\$6,980
Storage Vessel Retrofit <sup>e</sup>	\$68,736
<b>Total Capital Investment</b>	<b>\$100,986</b>
<b>Annual Costs</b>	
Operating Labor <sup>f</sup>	\$5,155
Maintenance Labor <sup>f</sup>	\$4,160
Non-Labor Maintenance <sup>a</sup>	\$2,197
Pilot Fuel	\$1,537
Data Management <sup>c</sup>	\$1,057
Capital Recovery (7 percent interest, 15-year equipment life) (\$/yr)	\$11,088
<b>Total Annual Costs w/o Savings (\$/yr)</b>	<b>\$25,194</b>
<sup>a</sup> Economic Impact Analysis Colorado Air Quality Control Commission.	
<sup>b</sup> Surveillance system identifies when pilot is not lit and attempts to relight it, documents the duration of time when the pilot is not lit, and notifies the operator that repairs are necessary.	
<sup>c</sup> EPA Oil and Natural Gas Sector: Standards of Performance for Crude Oil and natural Gas Production, Transmission and Distribution – Background Supplemental Technical Support Document for the Final New Source Performance Standards. (2012 TSD).	
<sup>d</sup> Cost established from 2012 TSD and escalated using the change in GDP: Implicit Deflator from 2008 to 2012. FRED GRP.	
<sup>e</sup> Operating labor includes technical operation of device at 130 hr/yr and supervisory labor at 15% of technical labor. Maintenance labor hours are assumed to be the same as operatory labor at 130 hr/yr. Labor rates are \$32/hr for technical and maintenance and 51.03/hr for supervisory and were obtained from the U.S. Department of Labor, Bureau of Labor Statistics.	

Compressors – Reciprocating: Gas Science to Achieve Results (STAR) data results show that rings (the compressor packing) cost between \$300 and \$600 per cylinder and \$1,000 to \$2,500 per compressor to install.<sup>31</sup> Assuming \$2,500 per compressor, the cost to change the rod packing for all 77 permitted reciprocating compressors is \$192,500 for each 26,000 hours of operation. Based on typical operation, EPA estimates the

<sup>30</sup> EPA Control Techniques Guidelines for the Oil and Natural Gas Sector, 2016.

<sup>31</sup> EPA Gas Star program, “Reducing Methane Emissions From Compressor Rod Packing Systems” [https://www.epa.gov/sites/production/files/2016-06/documents/ll\\_rodpack.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/ll_rodpack.pdf).

cost to be \$2,153 per compressor per year<sup>32</sup> which translates into \$165,781 per year for all 77 reciprocating compressors.

Compressors – Wet Seal Centrifugal: This proposal allows for two compliance mechanisms for high emitting wet-seal centrifugal compressors; convert to dry-seal or capture the gas. The 2014 EDF report estimated that converting a wet-seal system to a dry-seal system costs approximately \$300,000 and would likely not be the choice for most impacted sources even though the EPA Gas Star program estimated that the cost of conversion would pay for itself within a year with natural gas savings.<sup>33</sup> The other option, to capture the natural gas, is less costly and savings may be realized by generating additional gas sales if the natural gas is rerouted to the compressor inlet, or if the recovered gas is used for site fuel. The capital cost to retrofit a gas capture system is estimated in the EDF 2014 report at \$50,000 for a 95% reduction of natural gas loss. A survey of the 40 centrifugal compressors permitted in New York indicate that most already have a dry seal, so the Department does not expect high costs associated with this requirement.

Leak Detection and Repair: This proposal requires LDAR at well sites (semiannually), gathering and boosting sources (quarterly), transmission compressor stations (bimonthly), storage facilities (bimonthly), and the City Gate (quarterly).

The capital cost for semiannual LDAR at well sites is estimated at \$801 for up to 22 wells to develop an LDAR plan. Annual costs for LDAR personnel or consultants and repairs are estimated at \$2,285, ICF estimated this cost to be \$2,006.<sup>34</sup> There are 3,411 producing oil wells and 6,729 producing natural gas wells in

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<sup>32</sup> EPA 2016 CTG, Table 5-5.

<sup>33</sup> EPA Gas Star program, [https://www.epa.gov/sites/production/files/2016-06/documents/ll\\_wetseals.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/ll_wetseals.pdf).

<sup>34</sup> ICF, 2014, Table 3-4.

New York. Assuming groupings of 22 wells, the initial capital cost for LDAR is \$369,261 and the recurring annual cost is estimated at between \$924,766 and \$1,053,385.

EPA estimates a capital cost for semiannual LDAR at gathering and boosting stations of \$2,393 and annual costs at \$13,534.<sup>35</sup> However, EDF estimates an annual cost of \$6,017 for quarterly LDAR, for gathering and boosting stations and transmission compressor stations.<sup>36</sup> To account for the costs of performing bimonthly LDAR, quarterly LDAR costs are multiplied by 1.5 (50% increase), resulting in an annual cost estimate of \$9,025.5 (EDF) or \$20,301 (EPA). There are 32 compressor stations permitted in New York with 117 compressors. Based on this information, the range of annual costs for LDAR at these compressor stations is between \$288,816 and \$649,632.

<b>Table 5: Summary of Potential Costs</b>					
	<b>Quantity</b>	<b>Initial Cost Low</b>	<b>Initial Cost High</b>	<b>Annual Cost Low</b>	<b>Annual Cost High</b>
Storage Vessels vapor recovery	10% - 50%	34,787,906	173,939,532	5,725,044	28,625,220
Compressor - recip	All compressors			165,781	165,781
Compressor - centrifugal	10% - 50%	200,000	1,000,000		
LDAR - wells	All wells	369,261	369,261	924,766	1,053,385
LDAR - compressors	All compressors			288,816	649,632
<b>TOTAL</b>		<b>35,357,167</b>	<b>175,308,793</b>	<b>7,104,407</b>	<b>30,494,018</b>

Estimated costs are summarized in Table 5 and demonstrate that a large portion, over eighty percent, of the costs fall into the potential for storage vessel vapor recovery. This is also the category where the Department is uncertain if any vessels will be required to install these controls. The Department made the assumptions that ten to fifty percent of applicable vessels would need to install controls and that groupings of 5

<sup>35</sup> EPA CTG, 2016, Table 9-26.

<sup>36</sup> ICF, 2014, Table 3-4.

wells shared a storage vessel. After storage vessels are assessed, it may result that very few, if any, will actually trigger the requirement to install vapor recovery which would eliminate over eighty percent of these costs.

These potential costs are associated with the New York natural gas market which according to the United States Energy Information Administration (EIA) reported natural gas consumption of 1,312,031 million cubic feet. EIA also reports a price at the Citygate of \$4.25 per thousand cubic feet.<sup>37</sup> Extrapolating from this data indicates that over 5.5 billion dollars passed through this market in 2019.

### Cost of Emitting Methane

The Department agrees with EPA's previously accepted conclusion of the Interagency Working Group on Social Cost of Greenhouse Gases (IWG) that GHG emissions are a global externality that damage the entire world, not just the United States, and therefore the only appropriate figure to use is the full global social cost of carbon when calculating the damages.<sup>38</sup> The social cost of CH<sub>4</sub>, when valued in line with the IWG, is \$1,100 (2007 dollars) per metric ton.<sup>39</sup> The Department recently [proposed/finalized] its Value of Carbon guidance, as required under the CLCPA. ECL § 75-0113. This guidance includes updated values for the social cost of methane, valued in line with the IWG and using various discount rates. Under the DEC's Value of Carbon guidance, the social cost of methane in 2020 ranges from \$1,527 per metric ton at a three percent discount rate, to \$6,578 per metric ton at a one percent discount rate, with a central value of \$2,782 per metric ton at the 2% discount rate.

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<sup>37</sup> EIA Natural Gas Summary, 2019. [https://www.eia.gov/dnav/ng/ng\\_sum\\_lsum\\_dcu\\_SNY\\_a.htm](https://www.eia.gov/dnav/ng/ng_sum_lsum_dcu_SNY_a.htm).

<sup>38</sup> IPCC Special Report on Global Warming of 1.5°C (SRIS) <http://www.ipcc.ch/report/sr15/>. See summary for Policy makers.

<sup>39</sup> Marten & Newbold, 2011 Working Paper, Estimating the Social Costs of Non-CO<sub>2</sub> GHG Emissions: Methane and Nitrous Oxide.

Using the estimated emissions reductions calculated (Table 2), Table 6 shows the cost of the missed opportunity to reduce these emissions. Put another way, Table 5 shows the value of the benefits of reducing this amount of methane emissions. It is important to note that not all potential emission reductions have been calculated as data does not exist on the amount of reductions. For example, this proposal requires LDAR at the Citygate which does not have an estimated reduction factor.

<b>Table 6</b>			
<b>Annual Cost of Methane</b>			
Total Potential Emissions Reductions (MTCH <sub>4</sub> )	14,643 – 52,534		
Social Cost if Reductions are not achieved <sup>40</sup> (2020 dollars)	\$96,321,654 - \$345,568,652	\$40,736,826 - \$146,149,588	\$22,359,861 - \$80,219,418
	<b>1% Discount Rate (\$6,578/metric ton)</b>	<b>2% Discount Rate (\$2,782/metric ton)</b>	<b>3% Discount Rate (\$1,527/metric ton)</b>

Comparing Tables 5 and 6 demonstrates that the cost of reducing emissions from these sources is significantly less than the value achieved by the reductions.

#### Cost of emitting VOC's

There is a cost associated with emitting VOC's resulting in the formation of ground level ozone. This proposal is part of a suite of New York State efforts to bring the NYMA into attainment for ozone, in order to adequately protect human health and welfare. In the Regulatory Impact Analysis (RIA) for the 2015 ozone NAAQS, EPA projected a wide array of benefits that would be realized on a national level, excluding

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<sup>40</sup> NYSDEC Cost of Carbon Guidance

California, if ozone attainment is achieved. This includes co-benefits from reduced PM<sub>2.5</sub> which both EPA and DEC include because PM<sub>2.5</sub> is reduced automatically with NO<sub>x</sub> controls and there is no additional cost for these reductions. According to the U.S. Census Bureau, New York’s nonattainment county population accounts for 14 percent of total United States population<sup>41</sup> excluding California. On a population basis, the benefits to New York State are the prevention of the following annually:

<b>Table 7</b>	
<b>Attainment Provides Prevention of:</b>	
Deaths from effects of ozone	13 - 22
Deaths from effects of PM <sub>2.5</sub>	31 - 70
Nonfatal heart attacks	4 - 36
Hospital admissions & emergency room visits	134
Acute bronchitis events	48
Upper & lower respiratory symptom events	1,540
Exacerbated asthma events	32,200
Missed work & school days	26,320
Restricted activity days	86,800

Table 7: Summary of Total Number of Annual Ozone and PM-Related Premature Mortalities and Premature Morbidity: 2025 National Benefits (adapted from EPA, 2015 RIA, p. ES-16).

Table 7, which represents a simple population based conservative estimate, demonstrates that there is a serious cost of nonattainment to New York State residents. The NYMA experiences some of the highest ozone levels in the nation outside of California and will greatly benefit from lowered ozone levels.

### Impact on Jobs

New York State Department of Labor (NYSDOL) lists employment in New York State by standard occupational classification (SOC) codes. The SOC code for extraction in the oil and natural gas industry is 47-5000. According to NYSDOL data, there are 2,280 jobs with this SOC code in New York State.

<sup>41</sup> U.S. Census Bureau, “State Population Totals and Components of Change: 2010-2017.” <https://www.census.gov/data/tables/2017/demo/popest/state-total.html>.

The Department relied on a larger assessment conducted by the California Air Resources Board (CARB) to evaluate economic impacts of an oil and natural gas regulation. CARB used a computational general equilibrium model called the Regional Economic Models, Inc. (REMI). The REMI model generates year-by-year estimates of the total regional effects of a policy or set of policies. CARB used the REMI Policy Insight (REMI PI+) model for their analysis.<sup>42</sup>

Based on that analysis, CARB determined that its regulation would have a very small impact on employment growth each year. Their results show the initial small increase in employment growth primarily due to the increased demand for capital and components for secondary industries and increases in other employment due to the induced and indirect effects of the regulation. After that initial small increase, employment is expected to go back to baseline and perhaps decline.<sup>43</sup>

The Department believes that in New York there will also be an initial slight increase in jobs due to the need for services like leak detection and repair (LDAR) and reporting requirements. After the initial increase, there will still be a need for LDAR staffing and it is expected that those jobs will remain, not decrease.

#### Costs to the Department and State

The authority and responsibility for implementing Part 203 lies solely with the Department. Each subject source with a Title V facility permit under 6 NYCRR Subpart 201-6 or State Facility Permit under 6 NYCRR Part 201-5 will require permit revisions to account for the requirements of Part 203 and the revised permit conditions will be incorporated into each relevant permit by DEC staff.

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<sup>42</sup> CARB Regulation for Reduction of Greenhouse Gas Emissions from Crude Oil and Natural Gas Operations, Standardized Regulatory Impact Assessment.

<sup>43</sup> Table E-7, CARB Regulation for Reduction of Greenhouse Gas Emissions from Crude Oil and Natural Gas Operations, Standardized Regulatory Impact Assessment.

Each subject source will need to submit component data. The Department must review and determine the sufficiency of all the reports that will be submitted by the source owner. The review of the initial reporting will require DEC staff time. It is estimated that this rulemaking and ongoing support will require 1.5 full time equivalent (FTE) or \$237,500<sup>44</sup> during the first year and 1 to 3 FTE annually thereafter to implement and enforce.

This proposal may also impact other Departments such as the Department of Public Service (DPS) and will likely result in additional workload for that agency. It is unknown exactly how many FTE's will be required to support any requests for rate cases from the impacted sources or other additional workload that may result from this proposal.

#### Potential costs to rate payers

Impacted gas utilities may submit rate cases to DPS which could result in increased rates for natural gas to end use customers. It is unknown if an increase would be approved or, if approved, how much of an increase would be expected.

#### Local government mandates

The proposed regulation does not impose a mandate on local governments. Local governments have no additional compliance obligations as compared to other subject entities.

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<sup>44</sup> Assumptions: Grade 24 pay rate of \$97,448 per year and an overhead rate of 62.48 percent. Per: <https://www.osc.state.ny.us/agencies/guide/MyWebHelp/#VII/9/9.htm>.



It is worth noting that the Department has been contacted by several local governments including Towns of Lewisboro, North Salem, Southeast, Somers, & Bedford, the City of White Plains, and Westchester County asking the Department to reduce emissions from compressor stations and from the natural gas sector generally.

### Paperwork

In general, this proposal requires impacted sources to maintain records for five years and submit records within 60 days of certain events and annually for maintenance.

More specifically, reciprocating natural gas and centrifugal compressors must maintain, for at least five years:

- from the date of each leak concentration measurement, a record of each rod packing leak concentration measurement found above the minimum leak threshold.
- from the date of each emissions flow rate measurement, a record of each rod packing emission flow rate measurement.
- a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the rod packing leak concentration or emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection (reciprocating compressors only).
- records that provide proof that parts or equipment required to make necessary repairs have been ordered.

Natural Gas actuated Pneumatic Devices must maintain, for at least five years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement.

LDAR records must be maintained for at least five years:

- from each inspection, a record of each leak detection and repair inspection.
- the date of each inspection, component leak and repair documentation.
- proof that parts or equipment required to make necessary repairs have been ordered.
- gas service utility records that demonstrate that a system has been temporarily classified as critical to reliable public gas operation throughout the duration of the classification period.

Vapor Collection System and Vapor Control Devices must maintain records for at least five years that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

In addition to the regular paperwork described above, the proposal requires documentation of:

- Planned and unplanned blowdowns
- Pigging activities

Furthermore, all impacted sources are required to submit a component inventory in the first year after adoption or, for future sources, the first year that a source begins activity. This inventory will only need to be submitted once unless equipment is changed or added.

### Other State Programs

The Department worked with DPS to ensure that there was consistency in the terminology and that there was no duplication in requirements between their requirements and what is being proposed here. Some affected

sources are required to report to other entities, but the Department does not anticipate that the proposal results in any duplication in reporting.

Within the Department, the Division of Mineral Resources (DMN) has historically regulated well operators. Since this proposal is to regulate emissions at well sites the Division of Air Resources has worked with DMN to ensure there is no duplication of requirements or paperwork. The Divisions took steps to ensure that the initial inventory submittal in this proposal corresponds with the annual well report requirement so that the impacted sources will only have to reply to one request.

### Alternatives

Alternative #1 – No Action: If the Department chooses to not act, this will constitute a violation of the Clean Air Act. EPA’s publication of the CTG requires that New York develop a regulation for this sector that is at least as stringent as the requirements of the CTG. Furthermore, the Department believes that the reductions resulting from this proposal are beneficial to the health and welfare of New Yorkers. The Department did not choose this option.

Alternative #2 – Include Required Continuous Emission Monitoring at all sites: The Department considered the requirement of continuous emissions monitoring at all oil and natural gas sources to continuously monitor for CH<sub>4</sub>. At the time of the development of this proposal, the Department does not believe that the technology is readily available to support this requirement. However, the Department did add this option as an alternative technology because it anticipates this technology to become more readily available in the coming years.

Alternative #3 – Remove LDAR requirements: The Department understands that LDAR is a technology that some in the oil and natural gas sector are not familiar with and as a result researched the implications of removing these requirements. The research clearly demonstrated that significant reductions are achieved through LDAR and because of this the Department chose to keep the LDAR requirements.

### Federal standards

The EPA has a NSPS which places requirements on this sector. The NSPS has been subject to stays and rollbacks and has created uncertainty with regulators and the regulated community. In addition, EPA published a CTG which requires the Department to develop a regulation for existing sources for VOCs only. This proposal satisfies the CTG requirement while addressing the State's commitment to reduce GHG emissions under the CLCPA. In addition to satisfying certain Federal requirements and seeking GHG emission reductions, this proposed regulation aims to achieve VOC reductions that are necessary to achieve ozone NAAQS attainment. Furthermore, this regulation is protective of public health and the environment in an area where Federal regulations are uncertain.

### Compliance schedule

The Department is proposing an initial compliance date of January 1, 2023 so that the industry has time to comply with the requirements of the proposed regulation. The first report forms must be submitted by March 31, 2023.

## 6 NYCRR Part 203, Oil and Natural Gas Sector

### 6 NYCRR Part 200, General Provisions

#### Job Impact Statement

The New York State Department of Environmental Conservation (DEC or Department) is proposing new 6 NYCRR Part 203, “Oil and Natural Gas Sector” and Part 200 and attendant revisions to 6 NYCRR Part 200, “General Provisions.” (collectively, Part 203). The primary need for this rulemaking is to protect the health and welfare of New York residents and resources by: 1) reducing methane (CH<sub>4</sub>), a greenhouse gas, in support of the goals of the Climate Leadership and Community Protection Act (CLCPA), 2) reducing associated volatile organic compounds (VOCs), an ozone precursor, and 3) fulfilling the requirements of the United States Environmental Protection Agency’s (EPA) 2016 Control Techniques Guidelines (CTG) for the oil and gas industry.<sup>1</sup>

#### NATURE OF IMPACT

The Department relied on a larger assessment conducted by the California Air Resources Board (CARB) to evaluate economic impacts of an oil and natural gas regulation. CARB used a computational general equilibrium model called the Regional Economic Models, Inc. (REMI). The REMI model generates year-by-year estimates of the total regional effects of a policy or set of policies. CARB used the REMI Policy Insight (REMI PI+) model for their analysis.<sup>2</sup>

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<sup>1</sup> 81 FR 74798 (October 27, 2016).

<sup>2</sup> CARB Regulation for Reduction of Greenhouse Gas Emissions from Crude Oil and Natural Gas Operations, Standardized Regulatory Impact Assessment.

Based on that analysis, CARB determined that their regulation would have a very small impact on employment growth each year. Their results show the initial small increase in employment growth primarily due to the increased demand for capital and components for secondary industries and increases in other employment due to the induced and indirect effects of the regulation. After that initial small increase, employment is expected to go back to baseline and perhaps reduce.<sup>3</sup>

The Department believes that in New York there will also be an initial slight increase in jobs due to the need for services like leak detection and repair (LDAR) and reporting requirements. After the initial increase, there will still be a need for LDAR staffing and it is expected that those jobs will remain, not decrease.

#### CATEGORIES AND NUMBERS AFFECTED

There are 32 permitted compressor stations with a total of 117 permitted compressors in New York State. New York also has 27 underground natural gas storage sources. While the proposal establishes requirements for metering and regulating stations actual counts for these stations is not well-established. It has been estimated that there may be somewhere between 3,000 and 4,000 metering and regulating stations in New York. In 2018 there were 3,411 active oil wells and 6,729 active gas wells. In 2018, 10.6 billion cubic feet (bcf) of natural gas and 224,717 barrels (bbl) of oil were extracted in New York.

New York State Department of Labor (NYSDOL) lists employment in New York State by standard occupational classification (SOC) codes. The SOC code for extraction in the oil and natural gas industry is 47-5000. According to NYSDOL data, there are 2,280 jobs with this SOC code in New York State.

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<sup>3</sup> Table E-7, CARB Regulation for Reduction of Greenhouse Gas Emissions from Crude Oil and Natural Gas Operations, Standardized Regulatory Impact Assessment.

## REGIONS OF ADVERSE IMPACT

This is a statewide proposal and will apply throughout New York State. Most of the sources exist in western New York and the Southern Tier. These are primarily well sites and natural gas storage sites. Compressor stations are located throughout the state.

## MINIMIZING ADVERSE IMPACT

This proposal impacts natural gas transmission to end users and the Department recognizes the importance of assuring that residents receive this fuel to heat homes in the winter. In addition, it is imperative that electricity generating sources receive this fuel to ensure that the grid continues to operate reliably. As a result, the Department has included feasibility and safety provisions in the proposal to ensure that fuel resources are available as needed for heat and electricity reliability. Specifically, the proposal includes a Subpart (203-9) which allows for delays of required repairs if that repair is not safe or feasible by the Public Service Commission or other state or federal agency responsible for safety, feasibility or reliability.

## SELF EMPLOYMENT OPPORTUNITIES

The Department anticipates that the requirements of Part 203 will result in new LDAR jobs which may materialize as self-employment opportunities or added positions in already established businesses.

## INITIAL REVIEW

The initial review of this rule shall occur no later than in the third calendar year after the year in which the rule is adopted.



## 6 NYCRR Part 203, Oil and Natural Gas Sector

### 6 NYCRR Part 200, General Provisions

#### Rural Area Flexibility Analysis

The New York State Department of Environmental Conservation (DEC or Department) is proposing new 6 NYCRR Part 203, “Oil and Natural Gas Sector” and Part 200 and attendant revisions to 6 NYCRR Part 200, “General Provisions.” (collectively, Part 203). The primary need for this rulemaking is to protect the health and welfare of New York residents and resources by: 1) reducing methane (CH<sub>4</sub>), a greenhouse gas, in support of the goals of the Climate Leadership and Community Protection Act (CLCPA), 2) reducing associated volatile organic compounds (VOCs), an ozone precursor, and 3) fulfilling the requirements of the United States Environmental Protection Agency’s (EPA) 2016 Control Techniques Guidelines (CTG) for the oil and gas industry.<sup>1</sup>

#### TYPES AND ESTIMATED NUMBERS OF RURAL AREAS AFFECTED

Most of the sources impacted by this proposal are located in rural areas in Western New York and the Southern Tier. There are 32 permitted compressor stations with a total of 117 permitted compressors located throughout New York State primarily in rural areas. New York also has 27 underground natural gas storage sources located primarily around the Finger Lakes region. While this proposal establishes requirements for metering and regulating stations actual counts for these stations are not well-established and the Department believes them to be located throughout the state. It has been estimated that there may be somewhere between

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<sup>1</sup> 81 FR 74798 (October 27, 2016).

3,000 and 4,000 metering and regulating stations in New York. In 2018 there were 3,411 active oil wells and 6,729 active gas wells that are primarily located in Western New York and the Southern Tier in rural areas.

## REPORTING, RECORDKEEPING AND OTHER COMPLIANCE REQUIREMENTS; AND PROFESSIONAL SERVICES

### Reporting & Recordkeeping:

In general, this proposal requires impacted sources to maintain records for five years and submit records to the Department within 60 days of certain events and annually for maintenance. These requirements apply to all applicable sources, whether they are located in rural areas or not.

More specifically, reciprocating natural gas and centrifugal compressors must maintain, for at least five years:

- from the date of each leak concentration measurement, a record of each rod packing leak concentration measurement found above the minimum leak threshold.
- from the date of each emissions flow rate measurement, a record of each rod packing emission flow rate measurement.
- a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the rod packing leak concentration or emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection (reciprocating compressors only).
- records that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

Natural Gas actuated Pneumatic Devices must maintain, for at least five years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement.

Leak Detection and Repair records must be maintained for at least five years:

- from each inspection, a record of each leak detection and repair inspection.
- the date of each inspection, component leak and repair documentation.
- proof that parts or equipment required to make necessary repairs have been ordered and installed.
- gas service utility records that demonstrate that a system has been temporarily classified as critical to reliable public gas operation throughout the duration of the classification period.

Vapor Collection System and Vapor Control Devices must maintain records for at least five years that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

In addition to the regular paperwork described above, the proposal requires all impacted sources to submit a component inventory by March 31, 2023 or, for future sources, by March 31<sup>st</sup> immediately following the first year that a source begins activity. This inventory will only need to be submitted once unless equipment is changed or added.

Compliance Requirements:

Impacted sources are required to submit a component inventory to the Department. This is expected to be submitted by March 31, 2023. Beginning January 1, 2023, impacted sources are required to complete leak detection and repair (LDAR) on equipment either bi-annually or quarterly. Reciprocating compressors are required to change the rod packing on the equipment every 26,000 hours of operation. Centrifugal compressors

with wet seals are required to either convert to dry seal or to capture vented natural gas for reuse or destruction. Storage vessels with a potential to emit greater than six tons per year of VOCs must capture those emissions with an efficiency of ninety-five percent. If a blowdown occurs and is greater than ten thousand cubic feet, then it must be reported ahead of the blowdown if planned and within thirty minutes, or as soon as safely feasible, for an unplanned blowdown.

#### Professional Services:

Professional services likely to be needed to meet the requirements of this proposal are primarily LDAR services and services associated with vapor control and recovery.

#### COSTS

While most of the sources are located in rural areas, the costs are spread throughout the state and do not apply only to rural sectors. The nature of this industry is that the production of natural gas and oil and transmission of natural gas are located in mostly rural areas, the end product is found throughout the state.

Storage Vessels: The proposal requires controls for storage vessels which have a potential to emit (PTE) greater than 6 tpy of VOCs. It is not expected that there are many, if any, storage vessels within New York that will be above the threshold, however, the Department included this requirement in the proposal to ensure that all storage vessels are reviewed and that those that exceed the threshold are controlled. The 2016 EPA CTG lists capital costs to install vapor recovery at \$171,538 and annual costs at \$28,230.

Compressors – Reciprocating: Gas Science to Achieve Results (STAR) data results show that rings (the compressor packing) cost between \$300 and \$600 per cylinder and \$1,000 to \$2,500 per compressor to install.<sup>2</sup> Assuming \$2,500 per compressor, the cost to change the rod packing for all 77 permitted reciprocating compressors is \$192,500 for each 26,000 hours of operation. Based on typical operation, EPA estimates the cost to be \$2,153 per compressor per year<sup>3</sup> which translates into \$165,781 per year for all 77 reciprocating compressors.

Compressors – Wet Seal Centrifugal: This proposal allows for two compliance mechanisms for high emitting wet seal centrifugal compressors; convert to dry seal or capture the gas. The 2014 Environmental Defense Fund (EDF) report estimated that converting a wet seal system to a dry seal system costs approximately \$300,000 and would likely not be the choice for most impacted sources even though the EPA Gas STAR program estimated that the cost of conversion would pay for itself within a year with natural gas savings.<sup>4</sup> The other option, to capture the natural gas, is less costly and savings may be realized by generating additional gas sales if the natural gas is rerouted to the compressor inlet, or if the recovered gas is used for site fuel. The capital cost to retrofit a gas capture system is estimated in the EDF 2014 report at \$50,000 for a 95% reduction of natural gas loss. A survey of the 40 centrifugal compressors permitted in New York indicates that most already have a dry seal, so the Department does not expect high costs associated with this requirement.

Leak Detection and Repair: This proposal requires LDAR at well sites (semiannually), gathering and boosting sources (quarterly), transmission compressor stations (bimonthly), storage facilities (bimonthly), and the Citygate (quarterly).

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<sup>2</sup> EPA Gas Star program, “Reducing Methane Emissions From Compressor Rod Packing Systems”  
[https://www.epa.gov/sites/production/files/2016-06/documents/ll\\_rodpack.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/ll_rodpack.pdf)

<sup>3</sup> EPA 2016 CTG, Table 5-5.

<sup>4</sup> EPA Gas Star program, [https://www.epa.gov/sites/production/files/2016-06/documents/ll\\_wetseals.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/ll_wetseals.pdf).

The capital cost for semiannual LDAR at well sites is estimated at \$801 for up to 22 wells to develop an LDAR plan. Annual costs for LDAR personnel or consultants and repairs are estimated at \$2,285, ICF estimated this cost to be \$2,006.<sup>5</sup> There are 3,411 producing oil wells and 6,729 producing natural gas wells in New York. Assuming groupings of 22 wells, the initial capital cost for LDAR is \$369,261 and the recurring annual cost is estimated at between \$924,766 and \$1,053,385.

EPA estimates a capital cost for semiannual LDAR at gathering and boosting stations of \$2,393 and annual costs at \$13,534.<sup>6</sup> However, EDF estimates an annual cost of \$6,017 for quarterly LDAR, for gathering and boosting stations and transmission compressor stations.<sup>7</sup> To account for the costs of performing bimonthly LDAR, quarterly LDAR costs are multiplied by 1.5 (50% increase), resulting in an annual cost estimate of \$9025.5 (EDF) or \$20,301 (EPA). There are 32 compressor stations permitted in New York with 117 compressors. Based on this information, the range of annual costs for LDAR at these compressor stations is between \$288,816 and \$649,632.

There is also a cost to the Department. Each subject source will need to submit component data. The Department must review and determine the sufficiency of all the reports that will be submitted by the source owner. The review of the initial reporting will require DEC staff time. It is estimated that this rulemaking and ongoing support will require 1.5 full time equivalent (FTE) or \$237,500<sup>8</sup> during the first year and 1.0 FTE annually thereafter.

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<sup>5</sup> ICF, 2014, Table 3-4.

<sup>6</sup> EPA CTG, 2016, Table 9-26.

<sup>7</sup> ICF, 2014, Table 3-4.

<sup>8</sup> Assumptions: Grade 24 pay rate of \$97,448 per year and an overhead rate of 62.48 percent. Per: <https://www.osc.state.ny.us/agencies/guide/MyWebHelp/#VII/9/9.htm>.

This proposal may also impact other Departments such as the Department of Public Service (DPS) and will likely result in additional workload for that Agency. It is unknown exactly how many FTE's will be required to support any requests for rate cases from the impacted sources or other additional workload that may result from this proposal.

#### MINIMIZING ADVERSE IMPACT

The smaller rural sources are primarily natural gas and oil wells. Larger compressor stations are accustomed to regulation by the Department. To minimize adverse impact the Department met with the Independent Oil and Gas Association of New York (IOGA-NY) to develop the best method to ask for information from that community. The proposal also provides alternative compliance methods, upon approval by the Department, for alternative LDAR techniques in anticipation of alternative, lower cost, techniques becoming available.

#### RURAL AREA PARTICIPATION

The Department met with IOGA-NY three times and presented at the IOGA-NY annual meeting twice prior to the proposal of this regulation to allow rural participation. In addition, the Department posted a stakeholder outline on the DEC website to encourage stakeholder participation and comment.<sup>9</sup>

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<sup>9</sup> <https://www.dec.ny.gov/chemical/113887.html>.

## INITIAL REVIEW

The initial review of this rule shall occur no later than in the third calendar year after the year in which the rule is adopted.



## 6 NYCRR Part 203, Oil and Natural Gas Sector

### 6 NYCRR Part 200, General Provisions

#### Regulatory Flexibility Analysis for Small Businesses and Local Governments

The New York State Department of Environmental Conservation (DEC or Department) is proposing new 6 NYCRR Part 203, “Oil and Natural Gas Sector” and Part 200 and attendant revisions to 6 NYCRR Part 200, “General Provisions.” (collectively, Part 203). The primary need for this rulemaking is to protect the health and welfare of New York residents and resources by: 1) reducing methane (CH<sub>4</sub>), a greenhouse gas, in support of the goals of the Climate Leadership and Community Protection Act (CLCPA), 2) reducing associated volatile organic compounds (VOCs), an ozone precursor, and 3) fulfilling the requirements of the United States Environmental Protection Agency’s (EPA) 2016 Control Techniques Guidelines (CTG) for the oil and gas industry.<sup>1</sup>

#### EFFECT OF RULE

The types of small businesses that are impacted by this proposal are the operators and owners of wells and leak detection and repair (LDAR) companies. Well owners and operators will be subject to regulation that they have not been subject to in the past and will incur additional expenses due to the LDAR requirements. LDAR companies will likely see an increase in business due to the additional LDAR requirements in this proposal. In 2018 there were 3,411 active oil wells and 6,729 active gas wells in New York State. In 2018, 10.6 billion cubic feet (bcf) of natural gas and 224,717 barrels (bbl) of oil were extracted from New York’s wells.

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<sup>1</sup> 81 FR 74798 (October 27, 2016).

The proposed regulation does not contain a mandate on local governments. Local governments have no additional compliance obligations.

## COMPLIANCE REQUIREMENTS

Oil and gas well sites in New York are simpler configurations than those found in other regions of the United States because most of the natural gas extracted in New York is very dry. This dry gas does not have to be processed to the extent required in other regions before it can enter a natural gas transmission pipeline. Therefore, natural gas extraction in New York State does not require the level of storage vessels or tanks that are found in other natural gas extraction regions around the country. However, there may be storage vessels, or tanks, at well sites which may contain produced water, separation products or other fluids. These storage vessels may emit VOCs and CH<sub>4</sub>. If a VOC potential to emit (PTE) threshold of 6 tpy is exceeded, storage vessels at well sites are required to install a vapor recovery system which is subject to LDAR requirements. A finished and producing natural gas well will also include flow lines and gathering lines and may include heater separators. Pneumatic devices may be used for maintaining process conditions. The wellhead, piping, heater separators and pneumatic devices will all be subject to the LDAR requirements in the proposal.

In general, this proposal requires impacted sources to maintain records for five years and submit records within 60 days of certain events.

Natural Gas actuated Pneumatic Devices must maintain, for at least five years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement.

Leak Detection and Repair records must be maintained for at least five years:

- from each inspection, a record of each leak detection and repair inspection.
- the date of each inspection, component leak and repair documentation.
- that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.
- gas service utility records that demonstrate that a system has been temporarily classified as critical to reliable public gas operation throughout the duration of the classification period.

Vapor Collection System and Vapor Control Devices must maintain records for at least five years that provide proof that parts or equipment required to make necessary repairs have been ordered and installed.

In addition to the regular paperwork described above, the proposal requires all impacted sources to submit a component inventory in the first year of adoption or, for future sources, the first year that a source begins activity. This inventory will only need to be submitted once unless equipment is changed or added.

## PROFESSIONAL SERVICES

The Department expects that well owners and operators are likely to hire professional service providers to comply with the LDAR requirements of this proposal.

## COMPLIANCE COSTS

Storage Vessels: The proposal requires controls for storage vessels which have a PTE greater than 6 tpy of VOCs. It is not expected that there are many, if any, storage vessels within New York that will be

above the threshold, however, the Department included this requirement in the proposal to ensure that all storage vessels are reviewed and that those that exceed the threshold are controlled. The 2016 EPA CTG lists capital costs to install vapor recovery at \$171,538 and annual costs at \$28,230.

**Leak Detection and Repair:** This proposal requires LDAR at well sites (semiannually).

The capital cost for semiannual LDAR at well sites is estimated at \$801 for up to 22 wells to develop an LDAR plan. Annual costs for LDAR personnel or consultants and repairs are estimated at \$2,285 by EPA, ICF estimated this cost to be \$2,006.<sup>5</sup> There are 3,411 producing oil wells and 6,729 producing natural gas wells in New York. Assuming groupings of 22 wells, the initial capital cost for LDAR is \$369,261 and the recurring annual cost is estimated at between \$924,766 and \$1,053,385.

## ECONOMIC AND TECHNOLOGICAL FEASIBILITY

Current technology is available and feasible for owners and operators to use in order to comply with the proposed requirements of Part 203. The leak detection techniques within this proposal have been used in the industry for many years. In addition, new techniques are continuously under development which may offer a more affordable pathway to compliance in the future. The Department included an alternative technology approval process in the proposal to accommodate changes over time.

This proposal imposes an economic burden on well owners and operators with the additional expense of LDAR and, if needed, vapor recovery on storage vessels. The result of repairing leaks of natural gas is recovery of the primary sales product of each well, so it is expected that a portion of added economic burden may be

offset by commodity recovery. The Department expects those costs not offset by recover to be relayed to consumers through increased natural gas costs.

## MINIMIZING ADVERSE IMPACTS

The Department is required to implement a regulation to address leaks at oil and natural gas wells as a result of the EPA published CTG, which provided minimum requirements for oil and gas wells. This proposal satisfies the requirements for the CTG. The Department minimized adverse impacts by reaching out to well owners and operators over the course of three years in order to obtain information to better inform the development of the proposal. The greatest impact expected from the proposal is the additional cost of LDAR. To help counter this the Department included alternative technology pathways so that impacted sources may use less expensive alternative methods as they become available.

## SMALL BUSINESS AND LOCAL GOVERNMENT PARTICIPATION

The Department met with the Independent Oil and Gas Association of New York (IOGA-NY) three times and presented at the IOGA-NY annual meeting twice prior to the proposal of this regulation to allow rural and local government participation. In addition, a posted a stakeholder outline was posted on the DEC website to encourage stakeholder participation and comment.<sup>2</sup>

## CURE PERIOD OR AMELIORATIVE ACTION

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<sup>2</sup> <https://www.dec.ny.gov/chemical/113887.html>.

No additional cure period or other opportunity for ameliorative action is included in proposed Part 203. This proposal will not result in immediate violations or impositions of penalties for existing facilities. To help reduce immediate impacts on affected sources, Part 203 requires a compliance plan due within a year of promulgation followed by LDAR and operational requirements that begin on January 1, 2023. This will allow owners and operators of affected sources time to comply with proposed Part 203.

#### INITIAL REVIEW

The initial review of this rule shall occur no later than in the third calendar year after the year in which the rule is adopted.