STRONGER

State Review of Oil & Natural Gas Environmental Regulations

2019 New Mexico State Review Report

Environment Department
Air Quality Bureau
+
Energy, Minerals and Natural Resources Department
Oil Conservation Division

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Executive Summary

A multi-stakeholder review team completed an in-depth review of the New Mexico Environment Department Air Quality Bureau's upstream oil and gas regulatory program against the criteria of the 2019 Edition STRONGER Air Quality Guidelines. The review team also evaluated the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division's "resource waste" rules within the context of the review.

Review team members and official observers were granted full access to agency staff, and all questions were answered in a responsive and open manner.

This report is divided into two sections, the first addressing the Air Quality Bureau, and the second addressing the Oil Conservation Division. While STRONGER's Air Quality Guidelines are intended for state air quality control programs and do not include specific criteria for "resource waste" prevention by a state oil and gas regulator, they do speak generally to the interplay between such regulatory frameworks. Accordingly, the review team contemplated the relevant issues raised during an in-state interview of Division staff and in information provided by the Oil Conservation Division in the general context of the relevant Guidelines sections to develop their findings and recommendations for the Division. The review team identified a number of strengths that warrant special recognition, as well as recommendations for continuous improvement, for both the Air Quality Bureau and the Oil Conservation Division.

Introduction

In 1990, the Interstate Oil and Gas Compact Commission (IOGCC), and the U.S. Environmental Protection Agency (EPA) jointly published a Study of State Regulation of Oil and Gas Exploration and Production Waste[1], which contained Guidelines for the IOGCC member states' regulation of oil and gas exploration and production wastes (the "1990 Guidelines"). The 1990 Guidelines, developed by state, environmental, and industry stakeholders, provided the basis for the State Review process: a multi-stakeholder evaluation of state oil and gas waste management programs against the criteria of the 1990 Guidelines. The initial purposes of the state review process were to document the successes of states in regulating oil and gas wastes, to identify gaps in regulation, and to offer recommendations for program improvement.

In 1999, administration of the state review process shifted to a nonprofit, multi-stakeholder organization named State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER). Since 1999, STRONGER has expanded the scope of the 1990 Guidelines (since referred to as the "STRONGER Guidelines") to address additional issues including Stormwater Management, Hydraulic Fracturing, Air Quality, and Reused and Recycled Fluids. The purpose of the STRONGER State Review process is to document the status of state oil and gas environmental regulatory agencies, and to assist such agencies through an independent, multi-stakeholder evaluation of their programs that identifies strengths and provides recommendations for continuous improvement.

On January 29, 2019, New Mexico Governor Michelle Lujan Grisham signed Executive Order 2019-003 addressing climate change and energy waste prevention. Per the order, New Mexico joined the U.S. Climate Alliance, pledging to reduce greenhouse gas emissions at least 45% by 2030 as compared to 2005 levels. In addition, the Governor established a New Mexico Climate Change Task Force, led by the secretaries of the Environment Department (NMED) and Energy, Minerals, and Natural Resources Department (EMNRD). In February 2019, NMED Secretary James Kenney and EMNRD Secretary Sarah Cottrell Propst volunteered for a STRONGER review of New Mexico's existing oil and natural gas regulatory framework as it applies to the upstream oil and gas sector. As part of the review, at the request of NMED and EMNRD, STRONGER examined the interplay between the statutory authority of NMED to regulate air emissions through the Air Quality Bureau (AQB, or "the Bureau"), and of EMNRD to regulate "resource waste" prevention through the Oil Conservation Division (OCD, or "the Division").

STRONGER's Waste Management Guidelines pertain to solid waste generated during the drilling process, whereas OCD's "resource waste" prevention rules pertain to minimizing waste of the resource itself. STRONGER's Air Quality Guidelines are written for state air quality control programs and do not include specific criteria for "resource waste" prevention by a state oil and gas regulator. However, the Air Quality Guidelines do speak to the interplay between such

[1] For additional background on EPA's regulatory determination(s) for oil and gas waste see 1.1 of EPA's report, "*Management of Oil and Gas Exploration, Development and Production Wastes: Factors Informing a Decision on the Need for Regulatory Action*."

regulatory frameworks generally in Section 10.3.2. regarding source-specific requirements[2]. The Guidelines also recognize that regulatory programs can vary within regions of a state to accommodate differences such as geology, hydrology, and operational methods. The process by which the criteria of the Guidelines are incorporated into state programs is a function of, and within the discretion of, the responsible state agency[3].

The STRONGER review team included Sean Hackett, Colorado Department of Public Health and Environment, representing the state stakeholders; Jesse Sandlin, Devon Energy, representing the industry stakeholders; and Jon Goldstein, Environmental Defense Fund, representing the environmental stakeholders.

Official Observers included Megan Garvey, US EPA; Bruce Baizel, Earthworks; Lisa Winn, XTO Energy/ExxonMobil; Patrick Padilla, EOG Resources; John Thomas, Robert L. Bayless Producer; Noah Long, Natural Resources Defense Council; Jordan Kessler, New Mexico State Land Office, and Jordan Smith, Climate Advocates Voces Unidas.

The review began with a questionnaire based on the 2019 Edition STRONGER Air Quality Guidelines, which was completed by the AQB. Supplemental information on OCD's "resource waste" prevention rules was provided by OCD. On May 15, 2019 the review team conducted an interview with AQB and OCD staff at the EMNRD offices in Santa Fe, New Mexico.

The review team evaluated AQB's program against the criteria of the Air Quality Guidelines. A similarly strict evaluation of OCD's program was not possible due to the lack of specific "resource waste" prevention criteria in the Guidelines. Therefore, the review team's analysis of OCD's program is more generalized, based on issues raised during the interview and a broader contemplation of relevant concepts in the Guidelines.

Following the interview, and after review of the written materials provided by AQB and OCD and comments provided by the Official Observers, the review team members developed this report. This report is intended to capture a "snapshot in time" of New Mexico's oil and natural gas regulatory framework related to both AQB's air emission rules and OCD's "resource waste" prevention rules. Note that this report is divided into two sections. The first section relates to AQB, and the second section relates to OCD.

This report is ordered according to the structure of the 2019 Edition STRONGER Air Quality Guidelines. Each section contains a summary of relevant information, followed by the review team's findings and recommendations. Topic headings, findings, and recommendations are denoted in a numbered format that corresponds to the relevant section of the Guidelines. The "*a,b,c*..." suffix is added where there is more than one finding or recommendation in a given section. An additional suffix "(AQB)" or "(OCD)" is added to findings and recommendations to

[2] "The state air quality regulator should coordinate with the state oil and gas conservation regulator to develop a process to quantify and minimize the flaring, and prohibit the venting of, associated gas from oil wells. Such a process should contemplate both the air quality concerns and financial loss to the state, royalty owners, and operators of wasted gas from drilling operations."
[3] STRONGER Guidelines Section 3.3.

indicate the respective agency. Where available, hyperlinks to external documentation[4] are included.

Appendix A contains a glossary of acronyms used in this report. Appendix B contains the list of attendees at the interview in Santa Fe. Appendix C contains AQB's response to the questionnaire. Appendix D contains OCD's supplemental information on the Division's "resource waste" prevention rules. Appendix E contains NMED's letter to EPA requesting to join the Ozone Advance Program. Appendix F contains NMED's responses to recommendations in this report. Appendix G contains the 2019 Edition STRONGER Guidelines.

[4] Links to external documentation were active at the time this report was published. STRONGER is not responsible for external documents and cannot guarantee that the locations of the documents referenced within this report will not change in the future.

Section 1: New Mexico Environment Department Air Quality Bureau

Key Findings

Finding 10.2.2 (AQB)
The review team finds AQB does not meet the criteria for this section of the Guidelines with respect to cooperation between AQB and OCD. Although AQB and OCD have begun meeting on a regular basis in order to implement Executive Order 2019-003, neither agency has formal mechanisms in place to avoid duplication, regulatory gaps, or inconsistent requirements.

Finding 10.2.4*a* (AQB)
The review team commends AQB for its efforts to make the AQBCR fully operational this year.

Finding 10.2.6 (AQB)
The review team finds AQB has not received the necessary legislative authorization to hire the additional FTE needed to fulfil their mandated requirements.

Finding 10.2.8*a* (AQB)
The review team commends AQB for having a public participation guidance document in place that also incorporates considerations for issues of environmental justice and diversity.

Finding 10.3.2*b* (AQB)
The review team commends AQB for beginning efforts to develop a plan to reduce ozone precursors for counties where the design value exceeds 95% of the 2015 ozone NAAQS.

Key Recommendations

Recommendation 10.2.2 (AQB)
In order to avoid duplication, regulatory gaps, or inconsistent requirements, the review team recommends AQB and OCD evaluate their options for improving coordination between the agencies. Such options could include entering into a memorandum of understanding (MOU) that clearly defines the roles and responsibilities of the respective agencies and establishing a fulltime interagency liaison position within NMED. An MOU could help to formalize the cooperative relationship between AQB and OCD, including with regard to the minimization of waste from venting and flaring and methane emissions. Among other things, it could provide communication and information exchange protocols; as well as a framework for joint training, inspections, public stakeholder meetings, and administrative hearings, where appropriate. An interagency liaison could serve as NMED's primary point of contact for oil and gas issues and facilitate interagency planning efforts.

Recommendation 10.2.6 (AQB)
AQB should request a legislative authorization for the additional FTE needed to fulfil their mandated requirements.

Recommendation 10.2.8*b* (AQB)
As part of the NMED's efforts for coordination with EMNRD under Executive Order 2019-003, AQB should evaluate if opportunities exist to synchronize public participation with OCD in complementary regulatory processes.

Recommendation 10.3.1*b* (AQB)
The review team recommends AQB consider including greenhouse gasses in the 2020 inventory as information about these emissions could assist AQB with their planning and analysis under Executive Order 2019-003. AQB should consider stakeholder input in determining the methodology for such an expansion of the inventory.

10.2 Administrative

As it pertains to regulation of the oil and gas industry, the NMED promulgates and implements regulations through the AQB and the Environmental Improvement Board (EIB), who are likewise responsible for implementing the federal Clean Air Act (CAA) pursuant to the New Mexico Air Quality Control Act (AQCA). The duties of the aforementioned regulatory bodies are set forth at:

· Clean Air Act (42 U.S.C.A. §§ 7401—7642)
· New Mexico Air Quality Control Act (74-2-1 NMSA)

Finding 10.2 (AQB)
The review team finds NMED meets the criteria of this section of the Guidelines.

10.2.1 Scope of Authority

NMED's statutory authority is detailed in New Mexico Statutes Annotated (NMSA) Section 74-1-6 (Environmental Improvement Act); EIB's statutory authority is detailed in NMSA Section 74-2-5.1 (AQCA); and AQB's authority is detailed in NMSA Section 74-2-5.2 (AQCA). The Air Quality Control Act provides NMED authority to "develop and present to the [EIB]…for the regulation, control, prevention or abatement of air pollution[5]," and it serves as "the state air pollution control agency for all purposes under federal legislation relating to air pollution.[6]" This authority includes the ability to adopt a plan to control emissions of oxides of nitrogen (NOx), and volatile organic compounds (VOC) to provide for the attainment and maintenance of the ozone standard in those areas of the state where ozone concentrations exceed 95% of the National Ambient Air Quality Standard (NAAQS)[7].

NMSA 74-2-5 authorizes the EIB to adopt regulations to protect visibility in mandatory Class I areas to prevent significant deterioration of air quality and to achieve the NAAQS in nonattainment areas. These regulations must be no more stringent than, but at least as stringent as required by the CAA and federal regulations pertaining to visibility protection in mandatory Class I areas, pertaining to prevention of significant deterioration and nonattainment areas. Otherwise, NMSA 74-2-5 limits standards of performance and standards for hazardous pollutants to be no more stringent than, but at least as stringent as required by federal standards of performance.

Notwithstanding the limitation in NMSA 74-2-5, NMSA 74-2-5.3.B authorizes the EIB to adopt standards of performance for sources of emissions for which no federal standard of performance has been adopted, and to adopt standards of performance more stringent than

[5] NMSA 74-2-5.1
[6] NMSA 74-2-5.1
[7] NMSA 74-2-5.3

federal standards if the board determines that that: (1) emissions in a particular area cause or contribute to ozone concentrations in excess of 95% percent of the current ozone NAAQS; and (2) the federal standards do not reflect the degree of emissions limitation achievable through the application of reasonably available control technology.

In establishing its regulations, EIB considers the "technical practicality and economic reasonableness of reducing or eliminating air contaminants[8]" and it has the authority to exempt de minimis facilities or sources (e.g. 20.2.72.202 New Mexico Administrative Code (NMAC) exempts "any emission unit, operation, or activity that has a potential emission rate of no more than one-half ton per year of any pollutant for which a national or New Mexico ambient air quality standard has been set or one-half ton per year of any VOC.")

The EPA has authorized NMED to accept delegation of authority to implement federal air quality programs specific to upstream operations. NMED periodically requests hearings before the EIB to adopt by reference new and revised federally promulgated New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP) and Maximum Achievable Control Technology (MACT) standards. NMED has incorporated by reference all NSPS, NESHAP, and MACT related to oil and gas production and development as amended through January 15, 2017. This includes the most recent standards, NSPS OOOO and OOOOa, for the regulation of VOCs and methane from the oil and natural gas sector.

Statutory definitions are found in NMSA 74-2-2 (Environmental Improvement Act) and NMSA 74-2-2 (AQCA). Regulatory definitions are found throughout NMAC Title 20, Chapter 2 (e.g. 20.2.2 NMAC – Definitions, 20.2.75.7 NMAC – Natural Gas Processing Plant – Sulfur, and 20.2.38.7 NMAC – Hydrocarbon Storage Facilities).

AQB's budget consists of annual Title V and new source review (NSR) fees, which are tied to the Consumer Price Index (CPI). AQB also receives EPA grant funding, but they do not rely on any General Fund allocations. NMSA 74-2-7(B)(6) and (7) authorize EIB to collect and revise fees such that they are sufficient to cover the reasonable costs of reviewing and acting upon any permit application and implementing and enforcing the terms and conditions of the permit excluding any court costs or other costs associated with an enforcement action. Furthermore, NMSA 74-2-7 directs NMED to develop a state air quality fund for depositing fees collected pursuant to NMSA 74-2-7. Money in the air quality permit fund is appropriated to NMED for the purpose of paying the reasonable costs of reviewing and acting upon any permit application, implementing and enforcing the terms and conditions of the permit excluding any court costs or other costs associated with any enforcement action, emissions and ambient monitoring, preparing generally applicable regulations or guidance, modelling, analysis, demonstrations, preparing inventories, and tracking emissions.

While AQB does not proscriptively require or specify criteria for air emission controls instead relying upon the permit applicant to specify the proposed process and control devices, the

[8] NMSA 74.2.5.E.(3)

agency does provide technical criteria for air emission controls. In particular, AQB permit specialists review the manufacturer's specifications of a particular control technology to determine the uncontrolled emissions and apply the control device manufacturer's control efficiencies to calculate the controlled emissions. Once the permit specialist has verified the predicted emissions, modelling must verify compliance with the NAAQS before a permit can be issued.

Finding 10.2.1 (AQB)
The review team finds AQB meets the criteria of this section of the Guidelines.

Finding 10.2.1.9 (AQB)
Although the AQB meets the criteria of this section of the Guidelines, the process for encouraging and accommodating advancements in technology is ad hoc and informal.

Recommendation 10.2.1.9 (AQB)
The review team recommends the AQB develop a written policy and consider including in regulation a pathway for operators or technology providers to submit new technologies and methodologies to AQB for approval. Such regulation should specify a data-driven and transparent process with objective verification by the agency for evaluation of proposed alternative technologies and methodologies.[9] ABQ should coordinate closely with EPA on any such policies or regulations to ensure that alternative technologies and methodologies achieve emissions reductions at least equivalent to the reductions required under applicable state or federal standards.

10.2.2 Jurisdiction and Cooperation Between Agencies

The EPA has delegated authority to New Mexico to implement and enforce NSPS, NESHAP, and MACT standards. The most recent EPA approval of a NMED delegation request occurred in 2018[10], and NMED plans to request an EIB hearing in 2019 to update the incorporation by reference. NMED has incorporated by reference all federal oil and gas related NSPS[11], NESHAP[12] and MACT[13] standards as amended in the Federal Register through January 15, 2017. This includes the most recent standards, NSPS OOOO and OOOOa, for the regulation of VOCs and methane from the oil and natural gas sector.

In addition to implementing these delegated authorities, AQB is in the early planning stages for the control of ozone precursors in areas of the State that exceed 95% of the ozone standard. After lowering the ozone NAAQS from 75 parts per billion (ppb) to 70 ppb in 2015, EPA designated portions of Doña Ana County near Sunland Park (in southern NM) as nonattainment

[9] Colorado Air Quality Control Commission Regulation Number 7, Section XVII.D.2.b. may be instructive.
[10] 83 Fed. Reg. 46107
[11] 20.2.77 NMAC
[12] 20.2.78 NMAC
[13] 20.2.82 NMAC

on June 4, 2018. Additionally, due to recent ozone exceedances at the Hobbs and Carlsbad monitors, the initial design value for 2017-2019 anticipates nonattainment in Lea and Eddy Counties. AQB is currently developing an emissions inventory for the nonattainment area to be submitted to EPA by August 3, 2020. As part of its efforts to preserve or improve air quality, AQB submitted a letter[14] to EPA on April 22, 2019 expressing its intent to participate in EPA's Ozone Advance Program with respect to San Juan, Lea, Eddy and Doña Ana Counties (excluding the Sunland Park nonattainment area in Doña Ana County).

Although New Mexico does not have jurisdiction over air pollution sources on tribal lands, AQB seeks to coordinate with EPA and tribal agencies on areas of shared interest concerning air quality and oil and gas development through various channels, including the Four Corners Air Quality Group.

The New Mexico legislature granted EMNRD authority over all matters relating to the conservation of oil and gas as part of the New Mexico Oil and Gas Act, including the authority to adopt regulations necessary to prohibit "resource waste" from oil and gas production[15]. The New Mexico legislature granted the EIB the authority to prevent or abate air pollution[16]. As a result, there historically has not been much coordination between AQB and OCD on air quality regulation. Since February 2019 the agencies have been meeting weekly to work collaboratively and develop a regulatory framework, which recognizes the distinctions in each agency's authority, to address climate change, and to prevent "resource waste" in accordance with Executive Order 2019-003.

Finding 10.2.2 (AQB)

The review team finds AQB does not meet the criteria for this section of the Guidelines with respect to cooperation between AQB and OCD. Although AQB and OCD have begun meeting on a regular basis in order to implement Executive Order 2019-003, neither agency has formal mechanisms in place to avoid duplication, regulatory gaps, or inconsistent requirements.

Recommendation 10.2.2 (AQB)

In order to avoid duplication, regulatory gaps, or inconsistent requirements, the review team recommends AQB and OCD evaluate their options for improving coordination between the agencies. Such options could include entering into a memorandum of understanding (MOU) that clearly defines the roles and responsibilities of the respective agencies and establishing a fulltime interagency liaison position within NMED. An MOU could help to formalize the cooperative relationship between AQB and OCD, including with regard to the minimization of waste from venting and flaring and methane emissions. Among other things, it could provide communication and information exchange protocols; as well as a framework for joint training, inspections, public stakeholder meetings, and administrative hearings, where appropriate. An interagency liaison could serve as NMED's primary point of contact for oil and gas issues and facilitate interagency planning efforts.

[14] See Appendix E.
[15] NMSA §§ 70-2-6(A), 70-2-2
[16] (NMSA § 74-2-5(A)

10.2.3 Permits, Authorizations, and Exemptions

AQB has been delegated the authority to implement the requirements of the Clean Air Act as detailed in the State Implementation Plan approved by EPA. Under that authority, the AQB has the responsibility for granting permits under the Major Source Section, the Minor Source Section, and the Technical Services Section. The Major Source Section includes both Title V and Prevention of Significant Deterioration (PSD) Permits. The Minor Source Section processes the majority of minor source construction permits. The Technical Services Section processes general construction permits and Notices of Intent (NOI) for oil and gas sources.

PSD Construction Permits, as directed by 20.2.74 NMAC are required for PSD Major Stationary Sources prior to construction or modification. PSD permits are required for facilities listed under the PSD Source Categories in 20.2.74.501 NMAC, if they have a potential to emit greater than 100 tons per year (tpy) of any regulated air pollutant, or if not within the source categories listed, greater than 250 tpy of any regulated pollutant. Typically, oil and gas production facilities would not fall within the PSD limits.

Title V operating permits may be required for large oil and gas facilities. For stationary sources that have actual or potential emissions greater than 100 tpy of any regulated pollutant, or have actual or potential emissions for any Hazardous Air Pollutant (HAP) of greater than 10 tpy, or a combination of HAPs totaling 25 tpy, Title V permits are required according to 20.2.80 NMAC.

Minor Source construction permits, as described by 20.2.72 NMAC are required for facilities with potential emissions greater than 10 pounds per hour (pph) or 25 tpy for pollutants with a federal or state ambient air quality standard. Minor Source Permits are also required for facilities that emit New Mexico Toxic Air Pollutants at certain pph levels according to the table at 20.2.72.502 NMAC. Determination of minor source status incorporates an emissions calculation, which relies on the potential emissions rate (PER). The PER may include an assumption of compliance with the federal regulation, for example, NSPS OOOOa for storage vessels. However, the minor source permit implements an enforceable limitation that may be used to determine if the storage vessel is an NSPS OOOOa affected facility.

PSD, Title V, and Minor Source permits are submitted via a regular permit on the Universal Application Form. The applicant must specify the facility's emissions calculations and after review and consultation with a permit specialist, the emission factors are verified, a safety factor may be applied, and modeling is alerted to begin their modeling review. The modeling section of AQB evaluates the facility's potential impacts on the state and national ambient air quality standards and makes a determination of whether a permit may be issued, so long as it doesn't contribute to an exceedance of those standards. For certain types of facilities, the applicant must submit the facility's emissions as calculated using the AQB's approved emissions calculation methodology, as provided within the AQB's Air Emissions Calculation Tool (AECT). The tool has calculation methodologies that are explained for each type of calculation but that are not editable by the user.

The AQB also has general permits. The GCP-O&G covers general construction permits for oil and gas operations and includes provisions that were previously part of GCP-1 and GCP-4. GCP-6 covers storage vessel facilities that meet the requirements of the permit and provides federally enforceable conditions to reduce and limit VOC emissions from storage vessels. Additionally, GCP-TC-Minor and GCP-TC-Major under 20.2.72 NMAC provide a general permit to install flares at facilities that are temporarily controlling VOC emissions.

To provide the opportunity for operators to amend permits after construction, 20.2.72.219.B(1)(e) NMAC allows the technical revisions process to make adjustments to emissions limitations based on the results of the initial compliance test.

Additionally, for areas that have at least one national or state ambient air quality standard that is not being met, an additional Nonattainment Construction Permit is required by 20.2.79 NMAC.

An NOI is required for facilities with potential emissions greater than 10 tons per year of any regulated air contaminant or 1 ton per year of lead. An NOI itself is not a permit, but information on NOIs is used in the AQB's emissions inventory. NMAC 20.2.73.200 sets forth the conditions under which a NOI may be accepted. An NOI must contain "…the nature and quantities of any regulated air contaminants the new source or modification will emit, including all calculations utilized to estimate emissions," and, "...a description of any air pollution control device or method to be utilized, including the basis for the estimated control efficiency." Construction of a facility may not begin until the AQB has evaluated the submission and determined that the facility meets the NOI emissions thresholds. If the AQB determines that the facility does not meet those thresholds, the operator is notified that a construction permit is required.

The AQB has taken strides to implement program changes to encourage efficiency, which has helped them maintain a near perfect record of issuance or denial within the requirements of state regulations. AQB has published templates, protocols, conditions documents, fact sheets, guidance documents and permit procedures on their website for the regulated community, and for public information and education. Internally, there are guidance documents focused on permit processing in an expedient manner, while still maintaining high quality permit evaluation.

Finding 10.2.3*a* (AQB)
The review team finds the AQB meets the criteria of this section of the Guidelines.

Recommendation 10.2.3*a* (AQB)
While the AQB meets the criteria of this section of the Guidelines, the review team recommends that AQB interface with EPA to evaluate its minor source permitting to ensure that the requirements and limits of minor source permits harmonize with Federal requirements, to avoid possible confusion, and to ensure legal and practical enforceability.

Finding 10.2.3*b* (AQB)
The review team commends the AQB for the creation and implementation of the Air Emissions Calculation Tool. Not only does the tool provide additional efficiency for the AQB, the consistency gained across different operators and different facilities provides the AQB with a better methodology for gathering and evaluating data.

Recommendation 10.2.3*b* (AQB)
The review team recommends AQB explore the feasibility of allowing third-party data import in the AECT. Such a feature could enhance the effectiveness and accuracy of the AECT by allowing facility engineers to export their emissions modeling data directly from their software.

10.2.4 Compliance Monitoring, Demonstration, and Assurance

Per NMSA 74-2-13 and the CAA, the AQB has the authority to conduct unannounced inspections and sample, monitor or otherwise determine compliance. The statute states that the AQB has a right of entry to, upon or through any premises on which an emission source is located or on which any records required to be maintained by regulations of the EIB, the local board, or by any permit condition are located. AQB may at reasonable times have access to, and copy, any records required to be established, inspect any monitoring equipment and method required by regulations, and sample any emissions that are required to be sampled pursuant to regulation or permit condition.

The AQB has the authority to require recordkeeping, reporting, sampling, stack testing, and compliance certification to verify compliance under NMSA 74-2-5; EIB; local board, Section C(6)(b) through (e); and NMSA 1978, AQCA.

While the AQB's Compliance Reports Group maintains standard operating procedures for receipt, retention, and evaluation of Title V Annual Compliance Certificate (ACC) and Semi-Annual Compliance Monitoring Reports (SEMI), as well as NSPS, MACT, permit specific notifications, startup notifications, decommissioning notifications, stack test notifications, and Excess Emission Reporting (EER) for both major and minor sources, the majority of reports are currently received as hardcopy submittals and entered into the Tools for Environmental Management and Protection Organizations (TEMPO) Database by AQB staff.

The AQB is developing electronic reporting in the Air Quality Bureau Compliance Reporting System (AQBCR) which is currently accepting 100% of EER electronically as well as routine reports including ACC, SEMI, NSPS, and MACT reports for a small number of Title V sources to test the system. The AQB expects the AQBCR to be fully operational this fiscal year.

Due to staffing constraints, the AQB is currently unable to review each EER as it is received. AQB has only one staff member dedicated to looking at root causes and affirmative defenses for EER. The AQB reports it received 2,946 EER in calendar years 2017 and 2018. Sources covered under NOI are not currently required to file EER.

AQB reports that sources that fall beneath its general permitting threshold of 25 tpy are not routinely targeted for compliance inspections, and that these sources are typically only inspected in response to citizen complaints. AQB also reports that of the 168 complaints received in 2018, 67 (40%) were due to methane.

AQB reports that it intends to refocus to better ensure compliance at minor sources and will seek an alternative Compliance Monitoring Strategy (CMS) from EPA to facilitate this. However, AQB also reports that it is currently falling far short of its existing goal of inspecting 100% of Title V sources every two years and sources covered under general permits every five years. AQB is currently only inspecting about half of these sites in a timely manner. Meanwhile, the number of these sources is also growing rapidly, with Title V sources growing from 150 to 170 and general permit sources growing from 120 to 370 over the last ten years.

Finding 10.2.4*a* (AQB)
The review team commends AQB for its efforts to make the AQBCR fully operational this year.

Finding 10.2.4*b* (AQB)
Although the AQB Compliance and Enforcement Section's work is primarily focused on implementing and enforcing oil and gas regulations, AQB does not have a team within the Section purely dedicated to oil and gas compliance and enforcement.

Recommendation 10.2.4*b*
AQB should evaluate if the current de facto oil and gas focus of the Compliance and Enforcement Section is the most effective organizational structure.

Finding 10.2.4*c* (AQB)
Due to staffing constraints and a rapidly increasing number of sites, AQB does not currently have sufficient Compliance and Enforcement staff to meet its mandated requirements or the criteria of Section 10.2.4.

Recommendation 10.2.4*c* (AQB)
The review team recommends that NMED increase staffing in the Compliance and Enforcement Section of AQB so that the agency can fulfill its mandated requirements.

10.2.5 Enforcement

AQB's Enforcement Section determines compliance or noncompliance with air quality regulations and permit conditions by evaluating areas of concern identified in facility inspection reports, compliance reporting submittals for state and federal air regulations, complaint findings, excess emission evaluations, and facility self-reporting.

AQB has several enforcement tools that are used on a regular basis. The AQB Civil Penalty Policy (CPP) provides guidance for settling cases where the statutory maximum penalty is not being pursued. Operators report excess emissions via AQB's online Compliance Reporting System, and that information is used by the Enforcement Section in developing cases. The Enforcement Section utilizes templates and standard operating procedures (SOP) to enhance consistency in case development and execution.

Fines for violations of the Air Quality Control Act and its regulations were set in statute in 1978 at $15,000 per violation per day. There is no statutory cap on total penalties that can be assessed. AQB reports that these penalties are currently set at the appropriate level to ensure compliance.

AQB may adjust civil penalties for violations identified during voluntary environmental self-evaluations pursuant to the CPP Appendix D, or through new mitigating information presented during settlement.

Finding 10.2.5
The review team finds AQB meets the criteria of this section of the Guidelines with regards to the Bureau's framework of enforcement tools and penalty options, including a self-disclosure policy. However, as discussed in Sections 10.2.4 and 10.2.6, the Bureau lacks adequate staff to fulfill its inspection duties, which can create challenges in determining compliance.

Recommendation 10.2.5
The review team recommends that AQB evaluate its voluntary environmental disclosure policy to determine if it adequately incentivizes operators to self-audit their facilities. A robust self-audit program should encourage operators to voluntarily disclose and correct violations and could increase compliance while transferring some of the inspection burden to the regulated community.

10.2.6 Staffing and Training

AQB currently has 70 full-time employees (FTE), and nine vacant positions in various stages of recruiting. AQB has had multiple expert level staff retire in the last two years, and 23 of AQB's current staff have less than two years of experience in air quality, creating a void of senior air quality expertise in the Bureau. AQB does not have a team dedicated solely to permitting and inspections of the oil and gas industry. In addition to providing internal technical air quality training to staff each week, AQB spends more than $20,000 per year to send staff to Western States Air Resources Council (WESTAR) and EPA trainings around the country. AQB also recently engaged the expertise of EPA to conduct side-by-side inspections for field training and requested additional classroom training from EPA.

AQB provides adequate training opportunities for staff, offers flexible and telework schedules, and provides opportunities for advancement. However, like many government agencies, staff

turnover and the state personnel system present a challenge for AQB. The compliance and enforcement unit has the highest turnover rate. Possible explanations for this turnover include the demanding nature of travel and field inspections, the high level of technical expertise and regulatory knowledge field staff must maintain, difficulty recruiting staff in rural parts of the state, and funding constraints that prevent AQB from offering a salary level that is competitive with the private sector.

With the expansion of oil and gas exploration and production activity in the Permian Basin, AQB has implemented strategies to increase efficiency and meet the growth in demand in permitting and enforcement. While AQB has mechanisms in place to generate permit fees through their new source review and Title V programs, they have not received the necessary legislative authorization to hire the additional FTE needed to accomplish all of their assigned duties.

Finding 10.2.6 (AQB)
The review team finds AQB has not received the necessary legislative authorization to hire the additional FTE needed to fulfil their mandated requirements.

Recommendation 10.2.6 (AQB)
AQB should request a legislative authorization for the additional FTE needed to fulfil their mandated requirements.

10.2.7 Data Management

The AQB maintains a database of all information associated with the permitting of each facility. Each section has access to each portion of that database. The permitting section of the AQB is tasked with the data management and input for each of the data sets that are stored electronically within the database, and each facility has data for emissions on an equipment basis, source classification, applicable regulations, source type, and facility-wide potential emissions. The database is then used by the inventory staff to inventory data reported by each facility. The modeling section also uses the data near existing facilities for which permit applications are being reviewed to perform surrounding source modeling for each new permit.

Compliance and Enforcement also has access to the database and stores compliance reports submitted by regulated entities. This includes compliance evaluations, enforcement activity, and other operator submitted data. They are currently developing a system for specific applications, including stack test reporting, compliance reporting, and excess emission reporting that interacts with the main TEMPO database.

Most data submissions are entered into the TEMPO data management system by AQB staff, including permit applications, initial reports, compliance reports, and other relevant documents. Each hard copy is numbered by the permit number, and coded by permit type,

logged, and distributed to permitting. Emissions Inventory data is currently submitted electronically.

The permitting program maintains a geographic information system (GIS) based map that links all permitted facilities with the technical documents associated with each facility, and is available to the public. For each permitted well, information is provided on the permit type, federal regulations to which the permitted facility is subject, emissions rates for criteria pollutants, HAP and VOC, and the source category and site identification information. Additionally, AQB posts all active permitted facilities, public notices, and applications for permits with a significant public interest to the permitting website, as designated by the Secretary. AQB also maintains what a methane mapping tool to provide the public with information for permitted methane emissions from each permitted source. This includes both active and inactive wells, and a link to OCD permitting information for each facility on the map. It also highlights excess emissions events from facilities.

Additionally, air quality monitoring data and contemporaneous emissions monitoring data are posted to a separate public database. Each monitor shows relevant readings for ozone, particulate matter, and nitrogen dioxide.

Finally, the enforcement section posts all settled enforcement actions and compliance orders to the AQB website on a spreadsheet. This spreadsheet lists the Notice of Violation (NOV) number for each violation, the facility name and classification, and a link to the settlement agreement for each enforcement order.

Finding 10.2.7*a* (AQB)
The review team finds AQB meets the criteria of this section of the guidelines.

Finding 10.2.7*b* (AQB)
The review team commends AQB for its efforts to share relevant data with partner state and federal agencies and the public, such as the Bureau's interactive methane mapping tool.

Finding 10.2.7*c* (AQB)
The review team finds there are some data that could be submitted to AQB electronically, rather than via manual entry. While the STRONGER guidelines to not require electronic submittal of data, it is encouraged to improve efficiency.

Recommendation 10.2.7*c* (AQB)
The review team suggests that AQB evaluate the benefits of developing electronic submission capabilities for permitting and applications. Electronic submission could improve efficiency and eliminate a potential source of data error. An electronic program could also facilitate data analysis and trend-spotting that could be informative for compliance and enforcement.

10.2.8 Public Involvement

NMSA 74-2-6 outlines EIB's stakeholder engagement process. It requires EIB provide notice of a hearing at least 30 days prior to the hearing date. It also requires EIB to allow interested persons reasonable opportunity to submit data, provide arguments orally or in writing, and to examine witnesses testifying at the hearing. AQB holds multiple public meetings around the state for certain permitting actions, regulatory projects, and rulemakings throughout the lifetime of the project or rule development to allow for coordination amongst stakeholders. Proposed rulemakings are published on AQB's website and stakeholders have the option of signing up for an email listserv to receive direct communications. AQB also participates in the Four Corners Air Quality Group, which provides an annual forum for individuals interested in air quality to meet, learn about current conditions, review processes on mitigation of air quality impacts, and generally contribute to the clean air discussion in the Four Corners area.

NMED Policy 07-13 – Public Participation "provides guidance for ensuring that public participation opportunities related to NMED activities and proceedings are adequate based upon the specific circumstances and are in accordance with Title VI of the Civil Rights Act of 1962, 42 U.S.C. § § 2000d to 2000d-7 and the EPA regulations at 40 C.F.R. Parts 5 and 7. AQB reports that the policy is written to assist NMED staff, the regulated community, and the public in understanding requirements related to public participation.

AQB's three permitting paths for oil and gas facilities entail different public notice requirements. For a "regular permit" on the Universal Application Form under 20.2.72.200 NMAC, full public notice is required consistent with AQB's Public Notice Guidance. For a GCP under 20.2.72.220 NMAC or a streamline permit under NMAC 20.2.72.300, only newspaper and facility posting are required. For Title V permits, a public notice is printed in the newspaper and separate notification is given to local governments and tribes. If significant public interest is received, a public hearing can be held at the discretion of the Secretary. There is no public notice requirement for sites covered by a NOI.

During the development of each GCP, public notices are sent to tribal, local, county, and city officials, industry trade groups, and environmental and public interest groups; several public meetings are held in locations around the state; notices are posted in newspapers announcing the public hearing as well as mailed and emailed to all stakeholder groups; and finally, a public hearing is held which may be attended by anyone from the public.

Finding 10.2.8*a* (AQB)
The review team commends AQB for having a public participation guidance document in place that also incorporates considerations for issues of environmental justice and diversity.

Finding 10.2.8*b* (AQB)
The review team finds AQB is currently providing opportunities for public involvement and participation during the GCP development process.

Recommendation 10.2.8*b* (AQB)
As part of the NMED's efforts for coordination with EMNRD under Executive Order 2019-003, AQB should evaluate if opportunities exist to synchronize public participation with OCD in complementary regulatory processes.

Finding 10.2.8*c*
Public notice is not required for sites covered by a NOI, and limited public notice is required for sites under a GCP or streamline permit.

Recommendation 10.2.8*c*
The review team recommends that AQB evaluate if there are circumstances that could necessitate additional public notice requirements for sites under GCP and streamline permits, and NOI.

10.2.10 Strategic Program and Resource Planning (AQB)

AQB has a Planning Section consisting of a control strategies group, emissions inventory, and small business assistance program. AQB's Planning Section continually reviews the State's air quality planning needs and develops proposals to meet them. It reviews and tracks requirements under the CAA, including nonattainment planning, Regional Haze Planning, State Implementation Plan (SIP) requirements, and interstate transport requirements. The Planning Section also monitors trends in air quality monitoring data, proposed federal regulations, and tracks state regulations that are outdated or need updating in order to align with current requirements. As part of this effort, the Planning Section provides technical and regulatory review of state regulations for appropriate language, ambiguity, and overall effectiveness. Additionally, it monitors proposed regulations and revisions to existing regulations in order to provide comments to EPA and gauge long-term resource requirements.

Finding 10.2.10 (AQB)
The review team finds AQB meets the criteria of this section of the Guidelines.

10.3.1 Delineation of Sources (AQB)

AQB requires annual emissions inventories for emissions from major sources of air pollutants[17]. AQB has authority to require the submission of emissions inventories from minor sources, but it has not done so for several years. AQB's inventory currently includes criteria pollutants but could also include greenhouse gases in the future. The next minor source emissions inventory is planned for calendar year 2020. AQB works with WESTAR and the Western Regional Air Partnership (WRAP). These organizations collaborate with the western states to develop,

[17] 20.2.73 NMAC

maintain, and share databases including air quality data to help member states evaluate and plan for air quality issues within their borders. Both WESTAR and WRAP maintain data about emissions sources below the major and minor source threshold.

Finding 10.3.1*a* (AQB)
The review team finds AQB meets the criteria of this section of the Guidelines.

Finding 10.3.1*b* (AQB)
The review team finds AQB maintains an adequate emissions inventory and commends AQB for its planned 2020 inventory that will be more comprehensive.

Recommendation 10.3.1*b* (AQB)
The review team recommends AQB consider including greenhouse gasses in the 2020 inventory as information about these emissions could assist AQB with their planning and analysis under Executive Order 2019-003. AQB should consider stakeholder input in determining the methodology for such an expansion of the inventory.

10.3.2 Source Specific Requirements

AQB is in the process of implementing new policies to cover additional emissions inventory and specific source requirements. They are also in the process of developing a plan to reduce ozone precursors for counties where the design value exceeds 95% of the 2015 ozone NAAQS. Additionally, they participate in a number of regional workgroups and committees within WESTAR and WRAP. In 2005, in conjunction with the Colorado Department of Public Health and Environment (CDPHE), NMED convened the Four Corners Air Quality Task Force, which brought together the Navajo Nation EPA; the Southern Ute Indian Tribe's Air Quality Program; the U.S. EPA, the U.S. Department of the Interior; Bureau of Land Management and National Park Service; the U.S. Department of Agriculture, Forest Service; the U.S. Department of Energy; and the State of Utah. The Task Force continues to meet on an annual basis to review air quality progress.

Within the permitting program, under both the GCP for oil and gas and the minor and major source programs, AQB requires operators take specific actions for individual equipment. These specific requirements are for heaters, reboilers, glycol dehydrators, tanks, truck loading, flares, combustion devices and thermal oxidizers, vapor recovery units, amine units, and for all equipment subject to 40 CFR 60 subpart HH, GG, KKK, OOOO, and OOOOa. Additionally, each facility must report certain types of unplanned and episodic emissions to AQB, in a process defined in 20.2.7 NMAC. These excess emissions data are organized by facility and prioritized and enforced under the Civil Penalty Policy.

There are numerous opportunities for voluntary emissions reduction efforts in New Mexico that extend beyond federal regulatory requirements, such as the Environmental Partnership, ONE Future, the Oil and Gas Climate Initiative, and the Methane Challenge. AQB reports that it has

historically been supportive of such voluntary efforts. AQB also reports that it is currently developing new air quality permit conditions that would allow operators to voluntarily reduce emissions from oil and gas facilities.

Finding 10.3.2*a* (AQB)
The review team finds AQB meets the criteria of this section of the Guidelines.

Finding 10.3.2*b* (AQB)
The review team commends AQB for beginning efforts to develop a plan to reduce ozone precursors for counties where the design value exceeds 95% of the 2015 ozone NAAQS.

Finding 10.3.2*c* (AQB)
The review team commends AQB for encouraging participation voluntary emissions reduction programs, and for beginning development of permit conditions that would allow operators to voluntarily reduce emissions.

10.3.3 Air Quality Monitoring Networks (AQB)

AQB operates an air quality monitoring network to collect ambient air quality data in order to determine compliance with State and Federal NAAQS. The monitors in the network are required by federal air monitoring requirements under 40 CFR 58 Ambient Air Quality Surveillance. AQB monitors for Nitrogen Dioxide (NO2), Ozone (O3) and Sulfur Dioxide (SO2). Additionally, AQB monitors for particulate matter PM10 (≤10 microns in aerodynamic diameter) as well as PM2.5 (≤2.5 microns in aerodynamic diameter). Both continuous and non-continuous samplers are used. There are monitoring sites located in the vicinity of oil and gas stationary sources (such as sites located in Hobbs, Carlsbad, and three in San Juan County).

The table below is a complete listing of the ambient air quality monitoring conducted at each site:

NMED Site Designation	Air Quality Monitoring
1H - Sub Station	NO2, Ozone, SO2, PM10 (continuous)
1ZB - Bloomfield	NO2, Ozone, SO2
1NL - Navajo Lake	NO2, Ozone
2LL - Los Lunas	Ozone
2ZJ - Bernalillo	Ozone
3CRD - Coyote Ranger District	Ozone
3SFA - Santa Fe Airport	Ozone, PM2.5 (continuous)
3ZD - Taos	PM2.5 (continuous)

5ZR - Carlsbad	NO2, Ozone
5ZS - Hobbs Jefferson	NO2, Ozone, PM2.5 (continuous)
6CM - Anthony	PM2.5, PM10 (continuous, non-continuous)
6O - La Union	Ozone
6Q - Las Cruces Office	PM2.5 (continuous)
6WM - West Mesa	PM10 (continuous)
6ZL - Holman Road	PM10 (continuous)
6ZK - Chaparral	Ozone, PM10 (continuous)
6ZM - Desert View	NO2, Ozone, PM10 (continuous), PM2.5 (non-continuous)
6ZN - Santa Teresa	NO2, Ozone, PM2.5 (continuous)
6ZQ - Solano	Ozone
7E - Deming Airport	PM10 (continuous)

AQB makes real-time data obtained from continuous monitors in the air monitoring network available to the public via EPA's AirNow website and AQB's Air Quality Index and Monitoring Data website.

Finding 10.3.3 (AQB)
The review team finds AQB meets the criteria of this section of the Guidelines.

Recommendation 10.3.3*a* (AQB)
While AQB meets the criteria of this section of the Guidelines and the Bureau's monitoring network satisfies Federal requirements, given the rapid pace of oil and gas development in southeast New Mexico the review team recommends that AQB work with EPA to evaluate if additional monitoring may be beneficial in that portion of the state.

Recommendation 10.3.3*b* (AQB)
AQB should consider a mobile monitoring lab to measure site-specific oil- and gas-related compounds and facilitate complaint response. While there are several potential options, the following mobile monitoring programs may be instructive: EPA National Enforcement Investigations Center's (NEIC) Geospatial Measurement of Air Pollution (GMAP) unit[18]; CDPHE's Colorado Air Monitoring Mobile Laboratory (CAMML)[19]; Colorado State University's (CSU) Mobile Plume Tracker[20]; and the University of Wyoming Department of Atmospheric Science's Mobile Research Laboratory.[21]

[18] The GMAP unit is a mobile air monitoring vehicle that is equipped with analyzers for methane; benzene, toluene, ethylbenzene and xylene (BTEX); VOCs; and meteorological and global positioning system (GPS) equipment. https://www.epa.gov/sites/production/files/2018-05/documents/factsheet-neic-fb-advmonitoring.pdf
[19] The CAMML is a mobile laboratory housed within a custom aluminum trailer. It is capable of running off a diesel generator or line power. It collects air quality data in real time and can measure: components of natural gas including methane, ethane, butane and propane; VOCs such as benzene, toluene, ethylbenzene, xylene and others; greenhouse gases including ozone, carbon dioxide, carbon monoxide, and NOx; and particulate matter. https://drive.google.com/file/d/1jJfdlZv0pMQdYyjLvocGKQETu6saSl5E/view.
[20] CSU's Mobile Plume Tracker is a vehicle-based mobile tracker that can follow and measure an emissions plume. It is equipped with an analyzer for real-time measurement of methane and other oil- and gas-related compounds as well as a remote canister triggering system. http://collett.atmos.colostate.edu/OnGProjects.html
[21] http://www.uwyo.edu/atsc/index.html

10.3.4 Reporting, Emission Inventories & Recordkeeping

AQB's inventory reporting requirements are driven by 20.2.73 NMAC, requiring each permit to contain specific monitoring, recordkeeping, and reporting requirements for all conditions of the permit. Additionally, monitoring protocols are developed for the most common equipment in the oil and gas exploration and production industry including tanks, engines, turbines, heaters, separators, control devices, and dehydrators. These emissions inventories submitted by operators are available to the public through AQB's Emission Inventory Retrieval webpage.

These inventories also inform other emissions projections related to oil and gas exploration and production. The information submitted is used to inform both activities through WESTAR and WRAP, EPA's Oil & Gas Workgroup, and the National Oil & Gas Emissions Committee. In 2014 WRAP conducted a Bureau of Land Management (BLM) funded emissions inventory project for the San Juan and Permian Basins that included projections out to 2028. The EPA workgroup that AQB contributes information to works to prepare inventories for air quality planning and modeling, and to develop projections from its 2016 inventory through 2023 and 2028. This information is not yet available to the public.

Finding 10.3.4 (AQB)
The review team finds AQB meets the requirements of this section of the Guidelines.

Finding 10.3.4 (AQB)
During the interview, AQB staff noted that the QA/QC evaluation process is placing a strain on employee resources that is not sustainable. As mentioned in Section 10.2.6, AQB would benefit significantly from filling necessary staff positions.

10.3.5 Corrective Action & Emergency Response

Excess emission reporting requirements are identified in 20.2.7 NMAC. Excess emissions are defined as the emission of an air contaminant, including a fugitive emission, in excess of the quantity, rate, opacity or concentration specified by an air quality regulation or permit condition.

NMED maintains several staff dedicated to responding to emergencies in the State. The Department’s Emergency Response Team works in conjunction with the Office of the Governor, Department of Public Safety, Department of Health, Department of Transportation, local and state police and other law enforcement agencies, and any other agencies with a nexus to the particular emergency.

The emergency response team holds periodic mock emergencies to determine the adequacy and timeliness of the agencies' responses.

For each actual emergency response, briefing calls are held several times throughout the day with all associated agencies, and debriefing calls and meetings are held post-response to discuss specific challenges, successes, opportunities for improvement, and strengths and weaknesses of the response.

Finding 10.3.5 (AQB)
The review team finds AQB meets the criteria of this section of the Guidelines.

10.3.6 Long-Term Planning, Prioritization & Evaluation

The data collected by AQB from monitors and inventories allow the agency to have access to sufficient information to quantify and assess air emissions from oil and gas operations and evaluate emissions reduction strategies. AQB is currently undergoing a long-term strategic planning process in order to identify long-term goals for the agency and to ensure appropriate resources will be available to implement those goals. The development of these goals is based upon a careful analysis of current and future agency needs, including budgetary priorities, staff training, and retention.

Finding 10.3.6 (AQB)
The review team finds AQB currently meets the criteria of this section of the Guidelines.

Section 2: New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division

Introduction

The interplay between the statutory authority and regulations of AQB and OCD in the context of Executive Order 2019-003 was a key element of this review. OCD does not have authority to regulate "air quality" or "emissions". OCD's mandate is to prevent "resource waste". As discussed previously in this report, while the Guidelines do not include specific criteria for "resource waste" prevention by a state oil and gas regulator, they do speak to the interplay between such regulatory frameworks generally in Section 10.3.2. regarding source-specific requirements[22]. This general guidance was the lens through which the review team conducted its evaluation of OCD's program. General concepts within the Guidelines can be illuminative of responsibilities of other agencies outside an air quality program. The findings and recommendations for OCD's program are therefore based on issues raised during the interview and a contemplation of relevant concepts in the Guidelines in a broad sense.

When evaluating a state air quality program, the STRONGER guidelines expect that a state agency be granted statutory authority to promulgate rules under an air quality provision, that the state agency has then followed this authority to promulgate rules under that authority, and finally that a state manage data and compliance in a method adequate to enforce the rules promulgated under that authority. Similarly, with respect to OCD's waste minimization rules, this section of this report evaluates whether: (1) OCD has been granted statutory authority to promulgate rules for the minimization of waste and the extent of that authority as it relates to venting and flaring from oil and gas production facilities; (2) OCD has promulgated rules consistent with its statutory delegation of authority; and (3) OCD has sufficient systems in place to enforce existing rules.

Key Findings

Finding 10.2.3*a* (OCD)
The review team finds OCD has established rules to prevent waste of natural gas from oil and natural gas production facilities; however, OCD lacks clear criteria for exemptions and Application for Exception to No-Flare Rule (Form C-129) review.

Finding 10.2.5*b* (OCD)
The review team commends OCD staff and agency leadership for their successful efforts to restore administrative enforcement authority to the agency.

[22] "The state air quality regulator should coordinate with the state oil and gas conservation regulator to develop a process to quantify and minimize the flaring, and prohibit the venting of, associated gas from oil wells. Such a process should contemplate both the air quality concerns and financial loss to the state, royalty owners, and operators of wasted gas from drilling operations." – STRONGER Guidelines Section 10.3.2.

Finding 10.2.6*a* (OCD)
The review team finds OCD does not have sufficient staff to accomplish the agency's responsibilities, notably including compliance and enforcement requirements and regulatory development efforts. This may complicate OCD's ability to develop an appropriate regulatory framework in accordance with Executive Order 2019-003.

Key Recommendations

Recommendation 10.2.3*a* (OCD)
OCD should develop new regulations with clear and consistent criteria for what is and is not allowable under their rules with regards to the waste of methane and natural gas. Such rules should recognize differences in production throughout the state and the jurisdictional authority of AQB to regulate air quality.

Recommendation 10.2.6*a* (OCD)
OCD should request the Legislature authorize both funding for the additional FTE necessary to accomplish the agency's responsibilities, and flexibility in state hiring practices to allow OCD to acquire and retain an effective workforce.

10.2.1 Scope of Authority

The New Mexico Oil and Gas Act, initially enacted in 1935, provides authority to OCD to protect correlative rights and prevent waste under NMSA 70-2-11, wherein:

> *A. The division is hereby empowered, and it is its duty, to prevent waste prohibited by this act and to protect correlative rights, as in this act provided. To that end, the division is empowered to make and enforce rules, regulations and orders, and to do whatever may be reasonably necessary to carry out the purpose of this act, whether or not indicated or specified in any section hereof.*
>
> *B. The commission shall have concurrent jurisdiction and authority with the division to the extent necessary for the commission to perform its duties as required by law.*

Under NMSA 70-2-2, "The production or handling of crude petroleum oil or natural gas of any type or in any form, or the handling of products thereof, in such manner or under such conditions or in such amounts as to constitute or result in waste is each hereby prohibited." Types of waste are defined in NMSA 70-2-3. With respect to the waste, through venting or flaring of natural gas, the relevant portions of the definition are (B) and (E):

> *B. "surface waste" as those words are generally understood in the oil and gas business, and in any event to embrace the unnecessary or excessive surface loss or destruction*

without beneficial use, however caused, of natural gas of any type or in any form or crude petroleum oil, or any product thereof, but including the loss or destruction, without beneficial use, resulting from evaporation, seepage, leakage or fire, especially such loss or destruction incident to or resulting from the manner of spacing, equipping, operating or producing, well or wells, or incident to or resulting from the use of inefficient storage or from the production of crude petroleum oil or natural gas in excess of the reasonable market demand;

E. the production in this state of natural gas from any gas well or wells, or from any gas pool, in excess of the reasonable market demand from such source for natural gas of the type produced or in excess of the capacity of gas transportation facilities for such type of natural gas. The words "reasonable market demand," as used herein with respect to natural gas, shall be construed to mean the demand for natural gas for reasonable current requirements, for current consumption and for use within or outside the state, together with the demand for such amounts as are necessary for building up or maintaining reasonable storage reserves of natural gas or products thereof, or both such natural gas and products;

Finding 10.2.1 (OCD)
The review team finds EMNRD, through the OCD, has been granted the statutory authority to prevent the waste of natural gas.

10.2.2 Jurisdiction and Cooperation Between Agencies

Jurisdiction, cooperation, and coordination between OCD and AQB are discussed in Section 1 of this report. The jurisdictional questions between AQB and OCD in regulating resource molecules released or combusted to the atmosphere (“emissions” for AQB, “waste” for OCD) were a key topic of discussion in this review. Both agencies should move expeditiously to obtain the necessary legal opinions and agreements that will allow them to implement the suggestions of Recommendation 10.2.2 (AQB) and the requirements of the Executive Order.

10.2.3 Permits, Authorizations and Exemptions

Section 10.2.3 of the STRONGER Guidelines outlines guidance by which an agency should authorize certain activities via permits, formal authorizations, and exemptions. As a general rule, OCD has established a prohibition against venting or flaring, under 19.15.18.12 NMAC: "An operator shall not flare or vent casinghead gas produced from a well after 60 days following the well’s completion."

OCD may allow flaring under certain conditions, should the operator seek an exemption. 19.15.18.12(B) NMAC states: “An operator seeking an exception to Subsection A of 19.15.18.12 NMAC shall file an application for an exception on form C129 with the appropriate division

district office. The district supervisor may grant an exception when the flaring or venting casinghead gas appears reasonably necessary to protect correlative rights, prevent waste or prevent undue hardships on the applicant. The district supervisor shall either grant the exception within 10 days after the application's receipt or refer it to the director who shall advertise the matter for public hearing if the applicant desires a hearing."

Form C-129 lays out information that should be provided to OCD for evaluation of an exemption to the prohibition on venting and flaring. Form C-129 requires the applicants name, contact information, duration of exemption, location of the facility, name of the lease, name of the pool, number of wells producing into the facility, production of oil from the facility, an estimate of gas to be flared, the value of that flared gas, the location of the nearest gas gathering facility, the cost for connection to that facility if a connection is not already made, and the justification for the exemption request.

Additionally, as a part of a specific facility's monthly report, the C-115, OCD requires the amounts of gas vented or flared to be reported. Finally, the rules under 19.15.18.12(F) NMAC require gas that is subject to an exemption under 19.15.18.12(A) NMAC must be flared instead of vented. OCD staff report that they have no written criteria to govern the review of these exception applications, and that they are currently approved under inconsistent criteria at the district office level.

To further address the waste of natural gas from production facilities, OCD implemented a new program that encourages, but does not require, operators to submit Gas Capture Plans with permitting for new drilling and recompletions. Under each Gas Capture Plan, the operator outlines actions to be taken to reduce well and production facility flaring and venting for new completion activity. The Gas Capture Plan also requires a flowback strategy to ensure gas is routed to gas capture once possible, and allows for alternative uses for the gas on site to potentially reduce the amount of gas flared, including on-lease power generation, on-lease compression, and natural gas liquids removal.

The Gas Capture Plan has a section titled, "Gathering System and Pipeline Notification" which states that wells must be connected to a production facility after flowback operations are complete, if a gas transporter is in place. That gas is then dedicated to the gas transporter in place, which must be noted in the plan. The plan outlines the distance of pipe required to make the connection to the gathering system. Additionally, the Plan requires the operator to provide estimated drilling, completion, and production dates to the gas transporter, and communicate periodically in conference call to discuss any changes to those estimated schedules. OCD staff currently request gas capture plans be submitted with applications for permits to drill, but these documents are not required, and both their submission and any information included in them is unenforceable.

Finding 10.2.3*a* (OCD)
The review team finds OCD has established rules to prevent waste of natural gas from oil and natural gas production facilities; however, OCD lacks clear criteria for exemptions and Form C-129 review.

Recommendation 10.2.3*a* (OCD)
OCD should develop new regulations with clear and consistent criteria for what is and is not allowable under their rules with regards to the waste of methane and natural gas. Such rules should recognize differences in production throughout the state and the jurisdictional authority of AQB to regulate air quality.

Finding 10.2.3*b* (OCD)
The review team commends OCD for encouraging operators to submit Gas Capture Plans.

Finding 10.2.3*c* (OCD)
While permits are rarely granted without an associated Plan, submitting a Plan is not required by regulation for permit approval.

Recommendation 10.2.3*c* (OCD)
OCD should evaluate the benefit of making Gas Capture Plans required by regulation for certain types of well, or establishing official guidance pertaining to their use.

Section 10.2.4 Compliance Monitoring, Demonstration, and Assurance

Section 10.2.4 of the STRONGER Guidelines provide guidance for compliance monitoring, demonstration and assurance that operators and other parties are meeting their duties as required by agency rules, permits, and authorizations. The requirements of the Gas Capture Plans, C-129 flaring approvals, and C-115 monthly reports as outlined above provide mechanisms by which OCD can monitor the volumes of natural gas flared from production facilities, when those plans and required forms are compared against inspections from OCD staff. However, OCD has found inspection frequency to be a challenge, given the high (40%) vacancy rate of field compliance and inspection professionals. This vacancy rate is caused both by state hiring practices and policies, and a lack of interested candidates due to competition with other agencies and industry, as discussed in Section 1 of this report. Additionally, the staff that OCD does have that could otherwise be used to address compliance assurance and demonstration is currently dedicated to other tasks which are required due to the lack of resources. Many forms are currently scanned and processed by hand, which requires much more time from OCD staff than would be required with an updated data management system.

OCD is evaluating other creative mechanisms to more efficiently use the resources they do have. Updating data management systems, centralizing approvals and evaluations of exemption requests, providing a mechanism for joint inspections with AQB and/or BLM and the State Land

Office, and making more reporting electronic are some of the areas that were discussed during the interview.

SB 553, “Oil Conservation Commission Fees,” was introduced at the Governor’s request to establish a fee schedule at the OCD and received widespread industry support. The law establishes a fees schedule that largely mirrors the fees schedule in Texas and creates a non-reverting Oil Conservation Division Systems and Hearings Fund that allows the OCD to initiate multi-year projects to modernize its technological and business systems. Specific projects could include updating OCD online to allow all applications to be submitted electronically, updating OCD’s public information server to allow greater transparency to industry and the public, and developing a case management system for administrative hearings.

Finding 10.2.4*a* (OCD)
The review team finds OCD has rules in place to allow the agency to enforce compliance with its waste prevention rules; however, resource constraints have severely hindered OCD’s ability to adequately evaluate compliance.

Recommendation 10.2.4*a* (OCD)
OCD should evaluate the full range of possible actions that would allow it to enforce compliance. Such actions could include seeking additional funding from the legislature for staffing, updating data management systems to allow current staff to take on more responsibility for compliance assurance, and establishing a joint inspection and cross-training MOU with AQB, or other co-regulators.

Section 10.2.5 Enforcement

The STRONGER guidelines provide that a state agency tasked with implementing a regulatory structure under statutory authority should have the ability to issue notices of violations, restrain certain activity, and levee penalties against operators found to be out of compliance. Under statute in New Mexico, OCD has the authority to issue either a formal letter of violation (LOV), a noncompliance letter (LET) or a field visit inspection letter (FVI) for violations of decreasing severity. More recently, after the passage of New Mexico House Bill 546, OCD has the authority to levy penalties against operators that are not in compliance with the Oil and Gas Act, up to $2,500 per day per violation, with a limit of $10,000 per day per violation if the violation, "presents a risk either to the health or safety of the public or of causing significant environmental harm, or unless the noncompliance continues beyond a time specified in the notice of violation or order issued by the division, commission or court." These penalties must not exceed $200,000 unless assessed by a court order. OCD reports it will develop rules to implement the penalties as authorized by House Bill 546 which goes into effect on January 1, 2020.

Additionally, outside of fines, OCD has the authority to shut in wells, curtail production, cancel permits and authorizations, and force forfeiture of financial assurance subject to 70-2-14 NMSA 1978. In order to assert this authority, OCD must go through a hearing process.

Finding 10.2.5*a* (OCD)
The review team finds OCD currently has the mechanisms for enforcement as outlined in the STRONGER Guidelines section 10.2.5.1. However, House Bill 546 does not go into effect until January 1, 2020; therefore, evaluating OCD's enforcement of penalties under that law would be premature at this time.

Recommendation 10.2.5*a* (OCD)
The review team recommends that OCD should develop rules that include more detail around the criteria in 10.2.5.2 & 10.2.5.3 with respect to how penalty frameworks should encourage voluntary disclosure, provide consistency and transparency, provide for defensible assessments, and provide for the right of appeal.

Finding 10.2.5*b* (OCD)
The review team commends OCD staff and agency leadership for their successful efforts to restore administrative enforcement authority to the agency.

10.2.6 Staffing and Training

OCD currently has 66 FTE and over a 40% vacancy rate. The vacancy rate is highest in district offices. OCD has contemplated a reorganization that would consolidate staff in Santa Fe to address challenges with staffing the district offices. OCD does not have staff dedicated exclusively to regulatory development and policymaking.

Turnover and the state personnel system present staffing challenges for OCD. Possible explanations for OCD's high vacancy and turnover rate include the demanding nature of travel and field inspections, the high level of technical expertise and regulatory knowledge staff must maintain, difficulty recruiting staff in rural parts of the state, and funding constraints and state hiring practices that prevent OCD from offering a benefits package competitive with the private sector.

Finding 10.2.6 (OCD)
The review team finds OCD does not have sufficient staff to accomplish the agency's responsibilities, notably including compliance and enforcement requirements and regulatory development efforts. This may complicate OCD's ability to develop an appropriate regulatory framework in accordance with Executive Order 2019-003.

Recommendation 10.2.6*a* (OCD)
OCD should request the Legislature authorize both funding for the additional FTE necessary to accomplish the agency's responsibilities, and flexibility in state hiring practices to allow OCD to acquire and retain an effective workforce.

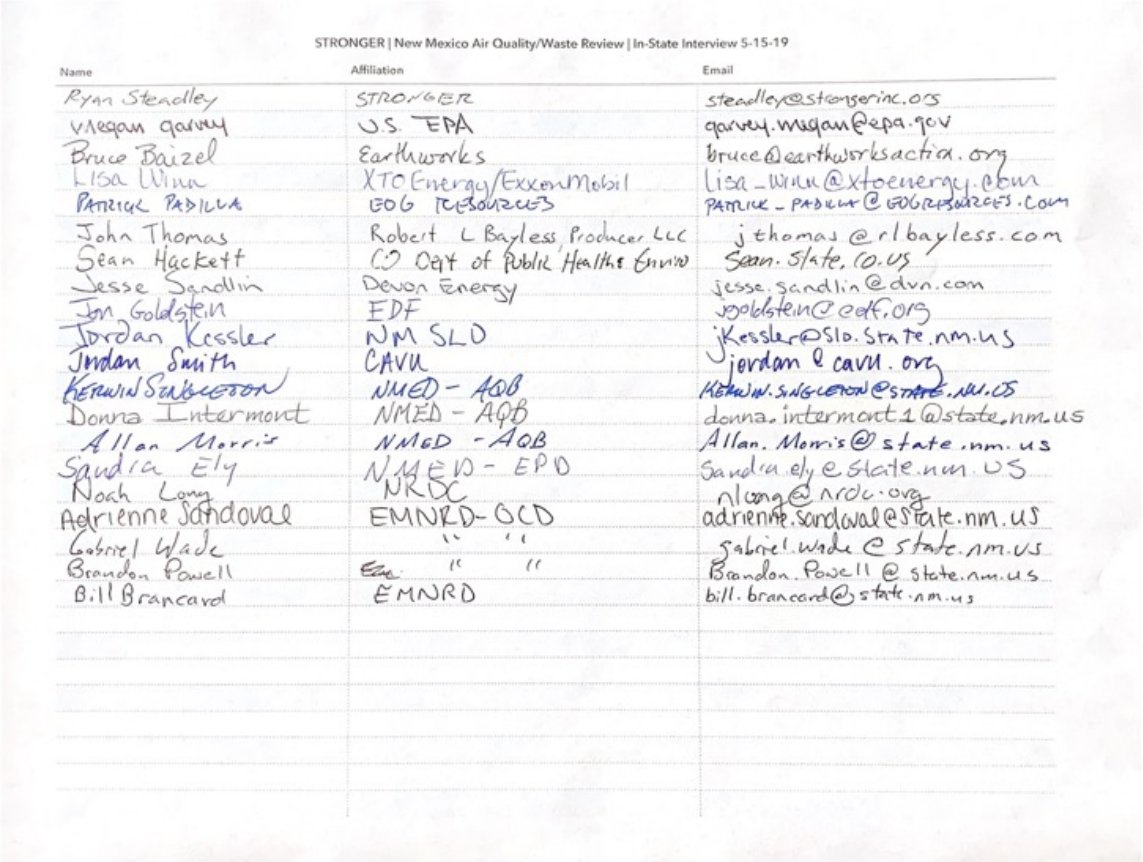
Recommendation 10.2.6*b* (OCD)
OCD should consider establishing a section dedicated exclusively to regulatory development and policymaking.

Appendix A – Glossary of Acronyms

Acronym	Definition
ACC	Annual Compliance Certificate
AECT	Air Emissions Calculation Tool
AQB	New Mexico Environment Department Air Quality Bureau
AQBCR	Air Quality Bureau Compliance Reporting System
AQCA	New Mexico Air Quality Control Act
BLM	Bureau of Land Management
CAA	Clean Air Act
CAMML	Colorado Air Monitoring Mobile Laboratory
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CMS	Compliance Monitoring Strategy
CPI	Consumer Price Index
CPP	Civil Penalty Policy
CSU	Colorado State University
EER	Excess Emissions Reporting
EIB	Environmental Improvement Board
EMNRD	New Mexico Energy, Minerals, and Natural Resources Department
EPA	United States Environmental Protection Agency
FTE	Full-Time Employee/Equivalent
FVI	Field Visit Inspection Letter
GCP	General Construction Permit
GIS	Geographic Information System
GMAP	Geospatial Measurement of Air Pollution
HAP	Hazardous Air Pollutant
HB	House Bill
IOGCC	Interstate Oil and Gas Compact Comission
LET	Noncompliance Letter
LOV	Letter of Violation
MACT	Maximum Achievable Control Technology
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEIC	EPA National Enforcement Investigations Center
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMED	New Mexico Environment Department
NMSA	New Mexico Statues Annotated
NO2	Nitrogen Dioxide

NOI	Notice of Intent
NOV	Notice of Violation
Nox	nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
O&G	Oil and Gas
O3	Ozone
OCD	New Mexico Energy, Minerals, and Natural Resources Department Oil Conservation Division
PER	Potential Emissions Rate
PM10	Particulate Matter ≤10 microns in aerodynamic diameter
PM2.5	Particulate Matter ≤2.5 microns in aerodynamic diameter
ppb	Parts Per Billion
pph	Pounds Per Hour
PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance/Control
SB	Senate Bill
SEMI	Semi-Annual Compliance Monitoring Report
SIP	State Implementation Plan
SO2	Sulfur Dioxide
SOP	Standard Operating Procedures
STRONGER	State Review of Oil and Natural Gas Environmental Regulations, Inc.
TEMPO	Tools for Environmental Management and Protection Organizations
tpy	Tons Per Year
VOC	volatile organic compounds
WESTAR	Western States Air Resources Council
WRAP	Western Regional Air Partnership

Appendix B – Interview Attendees



STRONGER | New Mexico Air Quality/Waste Review | In-State Interview 5-15-19

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Appendix C – AQB Questionnaire Response

STRONGER Air Quality Guidelines Questionnaire

State: New Mexico

Delivered: 3/21/19

Contact: Elizabeth Bisbey-Kuehn
Elizabeth.Kuehn@state.nm.us

Return to STRONGER by: 4/22/19

Instructions

This questionnaire is based on the STRONGER Guidelines for State Review of Oil and Natural Gas Environmental Regulatory Programs, Air Quality Section, 2019 Edition. The purpose of this questionnaire is to obtain information that will provide a fair and balanced characterization of a state's regulatory program(s). Terms used in this questionnaire have meanings consistent with those contained in the Guidelines. Numbers following each question (e.g., 5.3) refer to the applicable section(s) of the Guidelines.

Please respond in a manner that sufficiently addresses the criteria of the relevant Guidelines section and describes the state's program or requirements, but does not go into excessive detail. During the interview the Review Team will ask for additional detail or clarification on points which they feel need further discussion. To the extent possible, provide hyperlinks to state web pages where the Review Team can access statutes, rules, policies, guidance, reports, and other related information used to support the responses to this questionnaire.

Multiple agencies may have jurisdiction over different aspects of oil and gas regulation. The intent of the review process is to develop as complete a picture of a state's oil and gas environmental regulatory environment as possible; however, not all agencies with jurisdiction may choose to participate in the Review. If a question requires a response from an agency not participating in the Review, please indicate the agency with jurisdiction, but do not answer on their behalf.

Identify the state agency or agencies with jurisdictional responsibilities for air quality related to upstream oil and gas exploration and production operations, and provide the information requested below.

1. What is the agency's statutory authority detailing powers and duties? (10.2.1.1)

   The Department's statutory authority is detailed in NMSA Section 74-1-6 – *Department; powers*; NMSA, 1978 Section 74-2-5.1- *Duties and powers of the department and the local agency*; and NMSA, 1978 Section 74-2-5.2 – *State air pollution control agency; specific duties and powers of the department*.

   An attachment of the NMSA is provided with this document, as the State's website does not allow hyperlinking to the Statute.

2. Does the agency have authority for oversight and ability to develop regulations to meet state obligations under federal law? (10.2.1.2)

   Yes, in accordance with NMSA Section 74-2-5.1 – Duties and powers of the department and the local agency, the department shall "..develop and present to the environmental improvement board (EIB)…for the regulation, control, prevention or abatement of air pollution.." and NMSA, 1978 Section 74-2-5.2 – State air pollution control agency; specific duties and powers of the department, "The department is the state air pollution control agency for all purposes under federal legislation relating to air pollution."

3. Does the agency have authority to promulgate more stringent than federal regulations as necessary to protect public health and the environment? Has the State developed any such regulations to prevent the contamination of air from pollutants such as nitrogen oxides (NOx), volatile organic compounds (VOC), carbon monoxide (CO), methane, hydrogen sulfide (H2S); and air toxics or hazardous air pollutants (HAP) such as sulfur dioxide (SO2), benzene, normal hexane (N-Hexane), and formaldehyde? (10.2, 10.2.1.3)

   NMSA Section 74-2-5.3 – *Duties and powers of environmental improvement board and local board for attainment for ozone* authorizes the adoption of a plan to control emissions of NO_X and VOCs to provide for the attainment and maintenance of the ozone standard in those areas of the state where ozone concentrations exceed 95% of the NAAQS.

   NMSA Section 74-2-5.3.B authorizes the EIB to adopt standards of performance for sources of emissions for which no federal standard of performance has been adopted, and to adopt standards of performance more stringent than federal standards if the board determines that the federal standards do not reflect the degree of emissions limitation achievable through the application of reasonably available control technology.

   NMSA Section 74-2-5 – *Duties and powers; environmental improvement board; local board* authorizes the EIB to adopt regulations to protect visibility in mandatory Class I areas to prevent significant deterioration of air quality and to

achieve the NAAQS in nonattainment areas, but such regulations cannot be more stringent than, but must be at least as stringent as, required by federal regulations pertaining to visibility protection in mandatory Class I areas, pertaining to prevention of significant deterioration and nonattainment areas. Otherwise, this Section limits standards of performance to be no more stringent than but at least as stringent as required by federal standards of performance.

Rules adopted that may apply to O&G operations include: 20.2.35 NMAC – Natural Gas Processing Plant – Sulfur http://164.64.110.134/parts/title20/20.002.0035.html; 20.2.38 NMAC – Hydrocarbon Storage Facilities http://164.64.110.134/parts/title20/20.002.0038.html; 20.2.39 NMAC – Sulfur Recovery Plant http://164.64.110.134/parts/title20/20.002.0039.html; and 20.2.40 NMAC – Sulfuric Acid Production Units – Sulfur Dioxide, Acid Mist and Visible Emissions. http://164.64.110.134/parts/title20/20.002.0040.html

NMED has limited authority to control toxic pollutants pursuant to 20.2.72.400 – 502 NMAC: http://164.64.110.134/parts/title20/20.002.0072.html

The AQB is in the early Planning stages for the control of ozone precursors in areas of the State that exceed 95% of the ozone standard. One or more monitors in the following counties have design values that currently exceed 95% of the O_3 NAAQS: San Juan, Eddy, Lea, and Doña Ana. In addition, the Sunland Park area of Doña Ana County has been designated nonattainment for the 2015 O_3 NAAQS. Because there is not a NAAQS or NMAAQS for VOCs, they are not currently regulated unless a source exceeds the major source threshold for VOCs.

The AQB is also working towards the development of a revised Regional Haze SIP, which will likely result in mandatory reductions of SO_2/SO_4 and NO_X to meet visibility milestones at mandatory Class I areas.

4. Does the agency have authority to accept delegation of federal air programs for upstream oil and gas operations? (10.2.1.4)

   Yes, NMED periodically (typically annually) requests hearings before the EIB to request adoption by reference new and revised federally promulgated New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants, and Maximum Available Control Technology rules. Certain upstream sources may not be required to obtain a construction permit from NMED pursuant to 20.2.72 NMAC – Construction Permits.

5. Does the agency have authority to consider cost effectiveness in setting standards, and authority to exempt de minimus facilities or sources? (10.2.1.5)

Yes, the EIB considers the "..technical practicability and economic reasonableness of reducing or eliminating air contaminants from the sources involved…" (NMSA 1978, 74.2.5.E.(3).

Exemptions to the construction permit requirements are detailed in 20.2.72.202 NMAC – Exemptions. In addition, exemptions to other air quality rules are addressed in the Applicability section of the particular rule.

6. Do the statutes and regulations use clearly defined terminology? (10.2.1.6)

   Typically. Where definitions are necessary, they are included as sections within rules: see 20.2.1.115 – Confidential Information Protection; 20.2.2 NMAC – Definitions; 20.2.5.7 NMAC; 20.2.7.7 NMAC; 20.2.8.7 NMAC; 20.2.35.7 NMAC; 20.2.38.7 NMAC; 20.2.39.7 NMAC; 20.2.40.7 NMAC; 20.2.43.7 NMAC; 20.2.61.7 NMAC; 20.2.70.7 NMAC; 20.2.72.7 NMAC; 20.2.73.7 NMAC; 20.2.74.7 NMAC; 20.2.75.7 NMAC; and 20.2.79.7 NMAC.

7. Does the agency have adequate funding for staff and equipment to carry out its duties and meet its objectives? (10.2.1.7)

   The AQB has sufficient funding for staff and equipment to carry out its duties and meet objectives. The AQB's budget is composed of permit fees, which are indexed to the CPI as well as federal EPA grant funding. The AQB does not rely on any General Fund dollars. However, penalties received from enforcement actions are deposited in to the State's General Fund.

   The AQB has had three positions eliminated over the last several years despite steep increases in permitting activity, new federal regulations to implement, and an increase in the number of sources that are required to have Full Compliance Evaluations conducted, which is required by EPA. The AQB is authorized for 79 total FTE. Only the State's legislature can authorize increases in FTE and this authorization must be passed during the legislative session, which rotates between 30 and 60 day sessions. 2019 was a 60-day session, and 2020 will be a 30-day session.

8. Does the agency have mechanisms for coordination among stakeholders? (10.2.1.8)

   The AQB has multiple mechanisms for coordination among stakeholders. Many regulations require that AQB conduct outreach regarding permitting projects and regulatory projects to the public, federal land managers, state agencies, surrounding states, tribal entities, and to a list maintained by AQB of individuals, trade organizations, and NGOs that have asked to be notified of projects or permitting activities.

   The AQB hosts public meetings and listening sessions for regulatory projects, rulemakings and for permits with significant public interest.

For regulatory projects and rulemakings, the AQB holds multiple public meetings around the state throughout the lifetime of the project or rule development. There are opportunities throughout these projects for public and stakeholder involvement.

9. Does the agency have technical criteria for air emission controls? (10.2.1.9)

   The AQB is not proscriptive in requiring or specifying air emission controls. The permit applicant specifies the proposed process and proposed control devices. AQB staff rely on manufacturers' specifications to determine the uncontrolled emissions and apply the control device manufacturer's control efficiencies to calculate the controlled emissions. Once the permit specialist has verified the predicted emissions, modelling must verify compliance with the Ambient Air Quality Standards prior to issuance of a permit.

10. Are the emissions control criteria flexible and does the agency encourage advancements in control technology? (10.2.1.9)

    The AQB does require the applicant use the manufacturer's specified emissions control efficiencies. If the AQB knows a more effective control technology is available, it may alert the applicant, but the AQB is not proscriptive, nor has the authority to, specify any particular control technology.

11. Provide reference to any oil and gas exploration and production related NAAQS non-attainment areas and related SIP approval status. (10.2.2)

    None. The Anthony PM_{10} nonattainment area is due to high wind dust events, not O&G E&P activities. A previously conducted photochemical modeling project in southern New Mexico (in which the Sunland Park O_3 nonattainment area is located) demonstrates that high levels of O_3 are a result of international transport (Mexico) and mobile source emissions, not O&G E&P activities.

12. Describe the level of federal delegation of air quality requirements related to oil and gas exploration and production. (10.2.2)

    Unless otherwise provided, NMED has incorporated by reference federal all NSPS, NESHAP and MACT standards as amended in the Federal Register through January 15, 2017. The most recent EPA approval of NMED delegation request is contained in 83 F.R. 46107, 09/12/18. NMED plans to request an EIB hearing in 2019 to update the incorporation by reference.

13. Describe the permitting program and the process by which emissions are estimated during the permitting process. (10.2.3)

    The Permit Programs Section is divided into three sections, the Major Source Section (10 FTE, incl. 3 mgrs.), the Minor Source Section (7 FTE, incl. 1 mgr.), and the Technical Services Section (6 FTE, incl. 1 mgr.). The Major Source Section is further divided into the TV Section and the PSD Section. The Minor Source Section processes the majority of minor source construction permits. The

Technical Services Section processes general construction permits and NOIs, but also is responsible for using technology to enhance the effectiveness of the entire Permit Programs Section. The goal is to have all staff cross trained to handle any type of permitting action to handle overflow workload as necessary. This cross-distribution of workload is a fairly common occurrence.

Minor source construction permits, PSD permits, and TV Permits are all submitted on the Universal Application Form. The applicant must specify the facility's emission calculations and results in the form. The calculations are reviewed and verified by the permit specialist, often after numerous back and forth phone calls and e-mails to clarify the applicant's intent, reasoning, emission factors, and methodology. Emission factors are verified. Safety factors are assessed for reasonableness (25% max). Once the emissions and their characteristics are verified, Modeling is alerted that they may begin their modeling review.

The AQB has developed a user-friendly software Air Emissions Calculation Tool (AECT) that uses Department approved emissions calculation methodology. The calculation engine is hidden from editing by the user but is fully explained for each type of calculation. The user simply identifies the types of emission units at the facility, inputs the required input fields, and the AECT calculates the emissions for each unit and summarizes the total for the facility. As the resulting emissions are calculated to NMED specifications, this tool saves both the applicant and NMED staff a huge amount of calculation time and review time.

Applicable regulations are assessed, and our well-established monitoring protocols are applied to individual emission units. Our permit templates are divided into two sections, the first of which is highly customized and addresses the specifics of the facility, while the second (General Conditions) includes conditions that apply to all facilities.

14. Describe any permit exemption criteria. (10.2.3)

    Our construction permit rule 20.2.72 NMAC, contains Section 202, Exemptions, http://164.64.110.134/parts/title20/20.002.0072.html which specifies three types of exemptions, the first of which typically are not integrally related to the industrial process of the facility and are not to be reported in the permit application. The second type of exemptions are related to the purpose of the industrial process but are small enough that they only need to be reported in the application. The third type are relocation notifications of previously permitted portable sources.

15. Does the agency employ general permits or permits by rule that also serve as final permits to operate? (10.2.3)

    Yes, we have nine general permits, eight construction general permits and one TV general operating permit. https://www.env.nm.gov/air-quality/air-quality-permit-applications-forms-and-related-information/

16. Does the agency have mechanisms that allow operators to construct and operate sources for a limited time in order to determine actual facility emissions prior to permitting? (10.2.3)

    No, but 20.2.72.219.B(1)(e) NMAC allows the technical permit revision process to be used to make adjustments to emissions limitations based on the results of the initial compliance test.

17. Describe how the permitting process is protective of human health and the environment. (10.2.3.1)

    After a regulatory review of a permit application, the emission calculations are verified. Upon verification, the Modeling Section is alerted that modeling can begin. The Modeling Section performs a full evaluation of the facility's impacts on the State and National Ambient Air Quality Standards. A permit may not be issued unless the modeling demonstrates that the facility's operation does not cause or contribute to any exceedance of the state or National Ambient Air Quality Standards. The permit specialist works closely with their supervisor to complete the review process, which involves extensive documented dialog with all stakeholders. The draft (and proposed, if appropriate) permits are presented to EPA-R6 (major sources only). Upon receipt of Modeling's approval to issue (with conditions), the permit proceeds through two additional levels of management review prior to being issued.

18. Does the permitting process avoid duplicative or confusing requirements? (10.2.3.3)

    Yes, these are assessed and eliminated in the review process.

19. Does the permitting process allow the agency to develop additional requirements to address state-specific air quality issues? (10.2.3.4)

    No, all requirements must be based upon regulatory requirements.

20. Is the permitting process efficient? What measures are used to evaluate efficiency? (10.2.3.5-6)

    Yes, highly; we have an essentially perfect record of issuance or denial within the requirements of the regulations. Efficiency is enhanced through the extensive use of permit template language, monitoring protocols, tabularized permit conditions (with fields for requirements, monitoring, recordkeeping, and reporting), public guidance documents, and permit procedures. All of these are published on our website and industry and public comment is encouraged as part of the stakeholder process. We also have internal guidance documents essentially focused on permit processing.

    However, although efficiency is highly sought after, it not the primary goal. High quality is the essential goal. In the complex industrial environment, nimble permit customization to fit the particular situation is essential. This is primarily achieved

through systematic application of the monitoring protocols and close collaboration with management to write custom conditions to fit unforeseen situations. Federal enforceability of custom conditions is enhanced through the use of our tabular (Requirement + MRR) formatted conditions.

If it is likely the situation will be repeated, anyone in the Bureau can suggest changes to any standard Permit document by submitting the suggestion to the Document Change Request System.

21. Describe any supporting documentation, guidance on modeling requirements, and permit application assistance tools provided by the agency. (10.2.3.8-10)

    The AQB publishes extensive modeling and permitting documentation on its website, including modeling requirements, permit templates, monitoring protocols, guidance documents, and procedures. We also publish a contact list that provides anyone with the in-house expert on any subject. This is very useful as it allows anyone to look up any subject and find the name, e-mail address, and phone number of the person most likely to be able to answer the question.

    https://www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/

    https://www.env.nm.gov/air-quality/modeling-publications/

22. What are the agency's procedures for receipt, evaluation, retention and investigation of notices and reports? (10.2.4.1)

    The AQB's Compliance Reports Group maintains standard operating procedures for receipt, retention, and evaluation of Title V Annual Compliance Certificate (ACC) and Semi-Annual Compliance Monitoring Reports (SEMI), as well as NSPS, MACT, permit specific notifications, startup notifications, decommissioning notifications, stack test notifications, and Excess Emission Reporting (EER) for both major and minor sources.

    The majority of reports are currently received as hardcopy submittals and entered into the TEMPO Database by AQB staff and retained in TEMPO and hardcopy format. The AQB is developing electronic reporting in the Air Quality Bureau Compliance Reporting System (AQBCR) which is currently accepting 100% of EERs electronically as well as routine reports including ACC, SEMI, NSPS, and MACT reports for a small number of Title V sources to test the system. Stack Test Notifications and Reports are currently received via email through a dedicated account.

    Evaluation of routine reports is completed by both the Compliance Reports Group and the Inspections Team during completion of Full Compliance Evaluations (FCE). Each section maintains a standard operating procedure for evaluation of compliance as appropriate to the depth of review. The Compliance Reports Group is assigned review of approximately 50% of major source facility reports per year. Completion of reviews assigned is highly variable based on low staff retention as well as complexity of the source or review.

23. Does the agency employ electronic reporting systems? What measures are used to determine the efficiency of the agency's reporting systems? (10.2.4.1)

    The AQB is currently developing the Air Quality Bureau Compliance Reporting System (AQBCR). As discussed under question 22, this system is currently being utilized by a select number of major source facilities for routine report submittal and is fully functional for receipt of all EER reports for major and minor sources. Efficiency of the AQB's reporting systems is evaluated continuously, and improvements discussed weekly during Reports Group meetings.

    General Information Website Link: https://www.env.nm.gov/air-quality/excess-emissions-reporting/

    See also: https://www.env.nm.gov/air-quality/compliance-submittal-forms/

24. Describe the inspection and monitoring procedures used to determine compliance. (10.2.4.2)

    The Compliance and Enforcement Section consists of three sections: Compliance Reporting, Compliance Inspections, and Enforcement. There is one Section Chief responsible for oversight of the duties of this Section. There are three staff managers that report to the Section Chief, and each manager is responsible for the oversight of their section's duties. The Compliance Inspection Section consists of seven FTE that conduct inspections, the Compliance Reports Section consists of six FTE that review compliance and stack test reports, and the Enforcement Section consists of five FTE that review areas of concern received from the Compliance Sections and develop and issue Notices of Violation and enforcement cases when noncompliance is identified that warrants enforcement action.

    These three programs conduct the work that is essential to ensuring facilities are in compliance with air quality permits and regulations, and those that are found to be in non-compliance are identified and appropriate enforcement action is taken to ensure the program is successfully deterring non-compliance. There are multiple types of inspections and monitoring procedures undertaken by the AQB to identify potential areas of concern or non-compliance with regulations and permits.

    The Compliance Inspection Section performs full compliance evaluations, partial compliance evaluations, and responds to complaints received by the AQB. Prior to the actual inspection, the inspection staff review the past two years of compliance reports to determine any potential issues at the facility. They also review stack test reports and notifications and reports submitted for applicable state and federal regulations and permit requirements. This review is part of the pre-inspection process, and inspectors review this data to identify potential areas of concern prior to the inspection.

25. Do the inspection and monitoring procedures rely on information supplied by the regulated entity? If so, to what degree? (10.2.4.2)

    The inspection and monitoring procedures do rely upon information submitted as required by semi-annual and annual compliance certifications, stack test reports, excess emissions reports, notifications and reports submitted under various state regulations, NSPS, NESHAP, and MACT requirements, as well as records submitted under various permitting requirements. This is the primary method of receiving information by the permittee, and as the C&E Section must balance available resources to meet federally mandated requirements, records review is an important component of the Section's overall framework.

    Inspection and Reports staff verify compliance with state and federal air quality regulations and permit conditions by both reviewing the above-mentioned information provided by the regulated entity and by observing operations first hand during onsite full compliance evaluations. Staff have the authority to observe stack tests that are conducted by the regulated community, and the Section does periodically send staff out to make these observations.

26. Describe the frequency of inspections, and the methodology used to determine inspection frequency. (10.2.4.2.c)

    The requirements for inspection frequency are established by the EPA. Title V facilities are required to be inspected every two years, Synthetic Minor 80 sources are required to be inspected every five years, and Title V sources categorized as mega-sites receiving annual partial compliance evaluation (PCE) culminating in a full compliance evaluation during the 4th year. In addition, inspections may be conducted in response to complaints submitted by the public as part of a follow up on that complaint.

27. Describe the agency's procedures for receipt and evaluation of information submitted by the public. (10.2.4.3)

    Public comment on permit applications and the permitting process is required by regulation to be submitted in writing in order to trigger a second public comment period and also to qualify the person to be a legal party of record in cases of appeal. Otherwise all public comments are treated with equal weight, are documented in the physical and electronic permit records, are mentioned in the SOB, and are considered in any public meeting or public hearing decision.

28. Does the agency have authority to conduct unannounced inspections and inspect, sample, monitor or otherwise determine compliance? (10.2.4.4)
    Per the NMSA, Section 74-2-13 and the CAA, the AQB has the authority to conduct unannounced inspections and inspect, sample, monitor or otherwise determine compliance. The statute states that the AQB has a right of entry to, upon or through any premises on which an emission source is located or on which any records required to be maintained by regulations of the EIB, the local board or by any permit condition are located, and may at reasonable times have access to and copy any records required to be established, inspect any

monitoring equipment and method required by regulations, and sample any emissions that are required to be sampled pursuant to regulation or permit condition.

29. Does the agency have authority to obtain records? (10.2.4.5)

    Per the NMSA, Section 74-2-13 and the CAA, the AQB may at reasonable times have access to and copy any records required to be established and maintained by regulations of the EIB or the local board or any permit condition.

30. Describe the procedures that ensure that documents and evidence are managed in a manner that will permit their use during enforcement proceedings. (10.2.4.6)

    The Enforcement Section follows Standard Operating Procedures (SOPs) to maintain and preserve case files to ensure all pertinent information is available during enforcement proceedings. When a case is created, the case file includes sections to track associated materials such as Inspection Reports, Potential Violations (Areas of Concern), Permits, the Notice of Violation, Corrective Action Verification, Penalty Calculations, Correspondence, Meeting Notes, Supplemental Environmental Project information, and any Legal documentation related to the case. In addition to organization of case files and compilation of all related information, Enforcement staff utilize a case tracking form that tracks all dates and deadlines of a case from the drafting of the Notice of Violation (NOV) to settlement and case closure.

    The AQB has an organized filing system found on the TEMPO database. Each regulated facility is on this database, and Enforcement staff have access to all pertinent information related to each facility including permits, permit applications, regulatory report submittals (e.g., TV submittals), modeling results, and additional supporting technical and regulatory information. The Enforcement Manager also tracks individual case progress in a separate NOV database specific to Enforcement section cases. Case summary reports are reviewed on a weekly basis with individual Enforcement staff to track progress.

31. Is there a clear understanding that records obtained by the agency are accessible to the public, and operators are obligated to identify and safeguard confidential business information that may be present? (10.2.4.6.a)

    The term ‘operators’ is a bit ambiguous. This response will assume it means staff of the AQB. We have specific guidance, permitting SOP, and staff training to deal with confidential information. Hard copies of confidential information are placed in a separate manila envelope that is clearly labelled “Confidential” before it is included in the permit file. Electronic confidential records are separated inside the electronic permit record and clearly labeled “Confidential” in their electronic document names.

32. How does the agency evaluate claims of confidential business information? (10.2.4.6.a)

All claims of confidential business information are initially labeled as such before being separately and systematically evaluated by our Office of General Counsel before being officially designated as such in the public record. The process to evaluate claims of CBI is located at 20.2.1.115 NMAC. http://164.64.110.134/parts/title20/20.002.0001.html

33. Does the agency have authority to require stack testing to establish or verify compliance? (10.2.4.7)

    Yes, the AQB has the authority to require stack testing to verify compliance under NMSA Section 74-2-5 Duties and powers; EIB; local board, Section C(6)(b), NMSA 1978, the Air Quality Control Act (http://public.nmcompcomm.us/nmpublic/gateway.dll/?f=templates&fn=default.htm).

    See also New Mexico Administrative Code (NMAC) 20.2.70 Operating Permits, Section 20.2.70.302 Permit Content, Section C Monitoring (http://164.64.110.134/parts/title20/20.002.0070.html); 20.2.72 Construction Permits, Section 20.2.72.210 Permit Conditions, Section 20.2.72.213 Startup and Follow-up Testing, 20.2.72.220.A(2)(c) General Permits, 20.2.72.305 General Requirements (http://164.64.110.134/parts/title20/20.002.0072.html) 20.2.74 Permits – Prevention of Significant Deterioration (PSD), Section 20.2.74.306 Monitoring Requirements, 20.2.74.320 Actuals Plantwide Applicability Limits, sections L (http://164.64.110.134/parts/title20/20.002.0074.html), and 20.2.79 Permits - Nonattainment Areas, Section 20.2.79.120 Actuals Plantwide Applicability Limits, sections L (http://164.64.110.134/parts/title20/20.002.0079.html).

    General Information Website Link: https://www.env.nm.gov/air-quality/testing/

34. Does the agency have authority to establish requirements for recordkeeping, reporting, sampling, stack testing, and compliance certification, and other information to determine compliance? (10.2.4.8.a-h)

    Yes, the AQB has the authority to require recordkeeping, reporting, sampling, stack testing, and compliance certification to verify compliance under NMSA Section 74-2-5 Duties and powers; EIB; local board, Section C(6)(b) through (e), NMSA 1978, the Air Quality Control Act (http://public.nmcompcomm.us/nmpublic/gateway.dll/?f=templates&fn=default.htm).

    See also New Mexico Administrative Code (NMAC) 20.2.70 Operating Permits, Section 20.2.70.302 Permit Content, Section C Monitoring, Section D Recordkeeping, and Section E Reporting (http://164.64.110.134/parts/title20/20.002.0070.html); 20.2.72 Construction Permits, Section 20.2.72.210 Permit Conditions, Section 20.2.72.213 Startup and Follow-up Testing, 20.2.72.220.A(2)(c) General Permits, 20.2.72.305 General Requirements (http://164.64.110.134/parts/title20/20.002.0072.html) 20.2.74 Permits – Prevention of Significant Deterioration (PSD), Section 20.2.74.306

Monitoring Requirements, 20.2.74.320 Actuals Plantwide Applicability Limits, sections L - M (http://164.64.110.134/parts/title20/20.002.0074.html), and 20.2.79 Permits - Nonattainment Areas, Section 20.2.79.120 Actuals Plantwide Applicability Limits, sections L - M (http://164.64.110.134/parts/title20/20.002.0079.html).

35. Describe the agency's enforcement program, including the available enforcement tools and the relative frequency of their use. (10.2.5.1.1-8)

    The AQB is the delegated agency to implement the requirements of the Clean Air Act (CAA) in all areas of New Mexico, except for Bernalillo County and Tribal Lands. This regulatory authority is detailed in the state's Air Quality Control Act and the State Implementation Plan (SIP) approved by EPA (NMSA 74-2, NMAC 20.2). The AQB Enforcement section determines compliance or noncompliance with air quality regulations and permit conditions by evaluating areas of concern identified in facility inspection reports, compliance reporting submittals for state and federal air regulations, complaint findings, excess emission evaluations, and facility self-reporting.

    Standard Operating Procedures (SOPs) and guidance are available to all Enforcement staff to determine the course of action in pursuing enforcement cases. The Enforcement section most commonly pursues enforcement cases by issuing Notices of Violation (NOV); engaging in settlement negotiations that include penalty, corrective action, and possibly beneficial or supplemental environmental projects; and lastly reaching an agreed upon settlement that is reviewed and issued by the Department Secretary. The Enforcement section advises with the Office of General Counsel (OGC) to discuss options for managing larger or more difficult cases.

    Compliance Orders have been issued on a yearly basis for several companies that have not paid annual permit fees and are occasionally used for other cases in which companies are not cooperative.

    The AQB has several enforcement tools that are used on a regular basis. The AQB Civil Penalty Policy (CPP) provides guidance for settling cases where the statutory maximum penalty is not being pursued. The online AQB Compliance Reporting System is used by industry to report excess emissions and is accessed by the Enforcement Section in developing cases. The Enforcement section utilizes templates and SOPs to enhance consistency in case development and execution.

    The AQB Civil Penalty Policy can be found here: https://www.env.nm.gov/air-quality/civil-penalty-policy/

    The online AQB Compliance Reporting System can be found here: https://www.env.nm.gov/air-quality/excess-emissions-reporting/

36. Does the agency employ informal compliance resolution? (10.2.5.1.9)

The Enforcement Section employs informal compliance resolution consistent with NMSA Section 74-2-17, the CPP, and the Enforcement Section's SOPs. This process includes issuing notices of violation and subsequent settlement agreements as described in the CPP and where civil penalties are sought. The CPP allows for reduction in penalties in certain cases of self-reporting by the facility.

The agency uses voluntary environmental audits as a method to achieve compliance. Frequently in the E&P sector, companies buy existing facilities from another company and then through an internal audit identify issues of non-compliance. Companies may then make corrections to those facilities within a schedule negotiated with the AQB Enforcement Section. Further details on this policy can be found in the CPP, Appendix D.

For small businesses, the agency has a Small Business Compliance Assistance Policy that offers free assistance to small businesses who want help in identifying potential air quality violations. The program allows for a small business to voluntarily disclose the violation(s) to the AQB and correct them within a specified timeframe.

For informal cases where a penalty is not typically warranted, resolution is achieved through warning letters such as notices of corrective action and notices of deficiency.

The AQB Civil Penalty Policy can be found here: https://www.env.nm.gov/air-quality/civil-penalty-policy/

The Small Business Compliance Assistance Policy can be found here: https://www.env.nm.gov/aqb/enforce_compliance/documents/SmallBusinessComplianceAssistancePolicy2017_Signed.pdf

37. Does the agency employ enforcement incentives such as penalty mitigation for self-audit/disclosure, or other alternative enforcement pathways? (10.2.5.1)

The AQB may adjust civil penalties for violations identified during voluntary environmental self-evaluations pursuant to the CPP Appendix D, or through new mitigating information presented during settlement.

In addition, with prior approval from the Cabinet Secretary, the AQB will allow the use of a supplemental environmental project (SEP) in lieu of a portion of a civil penalty, when the AQB determines that such a project meets the requirements of the CPP. NMED may not propose a SEP. Companies may propose a SEP to NMED, and NMED evaluates and, if appropriate, may approve the project, provided it meets the criteria outlined in the CPP (see the Civil Penalty Policy, Section VIII).

The AQB Civil Penalty Policy can be found here: https://www.env.nm.gov/air-quality/civil-penalty-policy/

38. Provide any penalty calculation guidance. (10.2.5.2.1-3)

The AQB Civil Penalty Policy (CPP) guides the Enforcement Section in determining the amount of a civil penalty for violation of an air quality regulation or permit condition. The CPP is consistent with the EPA Clean Air Act Stationary Source Civil Penalty Policy and other guidance in the EPA Clean Air Act Enforcement Compendium.

The CPP establishes a five-step process for determining the civil penalty amount:

1. Determines the gravity factors: a) Potential for Harm and b) Extent of Deviation;
2. Determines the number of claims, including the multiple day component;
3. Determines the adjustment factors;
4. Calculates the Gravity Component of the penalty; and
5. Adding the economic benefit of noncompliance.

In lieu of this five-step process, the Enforcement Section may calculate penalties according to CPP Appendix F, Table 3 for emissions of an air contaminant in excess of the rate specified by an air quality regulation or permit condition.

The civil penalty shall not exceed the statutory maximum per violation per day ($15,000) as specified by the NMSA Section 74-2-12(8). The statutory maximum may constitute the appropriate civil penalty for violations involving actual harm to human health or environment, willful violations, and other violations as determined by the sole discretion of the AQB.

39. How does the agency's penalty program ensure that operators do not benefit financially from unlawful conduct? (10.2.5.2)

The AQB Enforcement Section issues civil penalties to act as a deterrent for future violations. The CPP by design, either by using the five-step process or Appendix F, Table 3 as described above in Question 38, is used to ensure operators do not benefit financially from unlawful conduct.

A specific tool that may be used during civil penalty calculations is to assess any economic benefit for violations in which companies have benefited from delayed and avoided costs of noncompliance. When violations are determined to include an economic benefit, the estimated amount is calculated using existing software and added to the total penalty to account for any economic benefit a company may have profited from by delaying or avoiding compliance. Enforcement staff currently use the EPA BEN Model software, as appropriate to calculate economic benefit (Civil Penalty Policy Section VI.C.4).

Some violations have no or minimal economic benefit to the violator. In the interest of simplifying and expediting enforcement, the Enforcement staff may decline to calculate the economic benefit of noncompliance for such violations.

The AQB Civil Penalty Policy can be found here: https://www.env.nm.gov/air-quality/civil-penalty-policy/

Settled enforcement actions can be found here: https://www.env.nm.gov/air-quality/settlement-agreements-compliance-orders/

40. How does the agency evaluate its enforcement options and policies? (10.2.5.2)

Training of Enforcement staff to the current program directed by regulations and policies described in the response to Question 38 enables staff to know which policies will guide enforcement actions and which options are available to pursue those actions. Potential violations are referred to the Enforcement section. Each case that is created is evaluated for enforceability of permit conditions and regulations based on the information gathered. SOPs and guidance documents are available to all Enforcement staff to develop and complete cases. The goal of the Enforcement Section is to ensure compliance and to issue civil penalties appropriate for identified violations. Most cases are resolved informally through a NOV, SO with penalty negotiation, and SASFCO process. More formal methods include compliance orders and Consent Orders or Decrees. In cases where a penalty is not warranted, resolution may be achieved through a field citation warning, or if corrective action compliance tracking is desired, a Notice of Corrective Action.

AQB policies and standard operating procedures (SOPs) are revised as needed. The CPP was last revised in 2016, and most SOPs were updated in 2018. New SOPs are developed as needed.

41. Describe the appeal or review rights afforded to persons aggrieved by an action of the agency. (10.2.5.3)

Any action by the Department is subject to appeal by any affected party.

42. Describe the agency's staffing patterns, training opportunities provided to staff, and methods used to assess and retain staff. (10.2.6.1-8)

The Bureau has 79 FTE and maintains an average of between 10-15% vacancy rate. The Bureau currently has 70 FTE, and 9 vacant positions in various stages of recruiting. 23 of the Bureau's current staff have less than 2 years of experience in air quality. The Bureau has had multiple expert level staff retire in the last two years, creating a void of senior air quality expertise in the Bureau.

The Bureau brings two week-long air quality technical trainings to Santa Fe each year. These trainings are sponsored by WESTAR, and the Bureau selects a priority training from each section each year.

The Bureau provides internal technical air quality training to staff each week. These trainings are prepared by Bureau staff and cover pertinent regulatory, procedural, and applied technology trainings.

Each year, the Bureaus sends staff to trainings around the country. More than $20,000 is spent sending staff to Westar and EPA sponsored trainings. We encourage staff to identify courses that teach core air quality technical training and ensure there is a robust training fund available to send them to these trainings.

NMED offers flexible and telework schedules to help retain staff. In addition, there are many opportunities for advancement within the Bureau, and many staff are promoted within a few years of their initial hire date.

43. Does the agency have sufficient staff to accomplish its duties? (10.2.6)

    The AQB would need a minimum of 20 additional FTE to accomplish all of its assigned duties. The AQB currently has 79 authorized FTE. The AQB had 3 positions eliminated over the last several years due to the State's budget crisis. Each section has seen an increase in workload over the last 10 years. The increase is due to an increase in oil and gas production activity, increase in permitting workload, and the resulting increase in the number of facilities that are required to have an FCE conducted, which is mandated by EPA.

44. Describe the agency's data management program, including access to data systems in other programs containing inventories of facilities. (10.2.7)

    The NMED utilizes an oracle-based database to manage the data related to each regulated facility. All sections within the AQB have access to the database. The Permitting Section enters all technical information related to each regulated facility at a facility wide level. Entered in to the database is emissions information for each piece of regulated equipment, and facility information such as source classification, applicable regulations, source type, and annual PTE.

    The database is utilized by the Emissions Inventory staff to manage annual emissions inventory data reported by facilities. Modeling Section staff retrieve emission rate data from equipment and facilities to perform surrounding source modeling for new proposed regulated sources. The Modeling Section also uses tempo to track and manage PSD increment for the State.

    The Compliance and Enforcement Section uses the database to track and house all compliance reports submitted by regulated entities, all information related to full and partial compliance evaluations, and all information related to enforcement case development and case activity. The C&E Section is also developing software for specific applications, including stack test reporting, compliance reporting, excess emission reporting that interacts with tempo.

45. Describe how information is made available to the public, including procedures for quality assurance. (10.2.7)

The Permitting Program maintains a GIS-based map that links all permitted facilities with the technical documents, including permits, statement of basis (SOB), and the database summary (DBS). https://air.net.env.nm.gov/rsmt/

The Permitting Program also posts all active permitted facilities, public notices, and applications for permits with significant public interest to the permitting website.

All permitting information, including permits, SOB, and the DBS are reviewed and approved prior to being posted on the website. https://www.env.nm.gov/air-quality/aqb-p_current_permitting_activites/

The monitoring network and all contemporaneous emissions monitoring data are posted on the network website and are available to the public. http://nmaqinow.net/

The Enforcement Section posts all settled enforcement actions and compliance orders to the website. https://www.env.nm.gov/air-quality/settlement-agreements-compliance-orders/\

46. Describe the agency's public involvement provisions. (10.2.8, 10.2.3.7)

NMSA Sections 74-2-6.C. and 74-2-6.D. require that notice of hearing be given at least 30 days prior to the hearing date and a requirement that the EIB allow interested persons reasonable opportunity to submit data, provide arguments orally or in writing and to examine witnesses testifying at the hearing, respectively.

Public involvement is also addressed in NMSA §§14-4-5.2 – Notice of proposed rulemaking and 14-4-5.3 – Public participation, comments and rule hearings.

Public involvement procedures are also contained in 20.1.1 NMAC – Rulemaking Procedures – Environmental Improvement Board.

http://164.64.110.134/parts/title20/20.001.0001.html

NMED Policy 07-13 – Public Participation "provides guidance for ensuring that public participation opportunities related to NMED activities and proceedings are adequate based upon the specific circumstances and are in accordance with Title VI of the Civil Rights Act of 1962, 42 U.S.C. § § 2000d to 2000d-7 and the EPA regulations at 40 C.F.R. Parts 5 and 7. The policy is written to assist NMED staff, the regulated community and the public in understanding requirements related to public participation.

https://www.env.nm.gov/wp-content/uploads/2018/02/NMED-Policy-and-Procedure-07-13.pdf

47. Describe any outreach efforts conducted by the agency. (10.2.8)

Actual outreach efforts vary depending on the subject and anticipated degree of public involvement. For the development of air quality plans and regulations, the Planning Section adheres to the Systematic Development of Informed Consent (SDIC) developed by the Institute for Participatory Management and Planning (www.ipmp-bleiker.com). The citizen participation objectives of SDIC are as follows:

- Establish the legitimacy of the agency and the project;
- Maintain the legitimacy of the agency and the project;
- Establish the legitimacy of the problem-solving and decision-making process;
- Maintain the legitimacy of the problem-solving and decision-making process;
- Establish and maintain the legitimacy of earlier decisions and assumptions;
- Get to know the Potentially Affected Interests (i.e., the public/groups that may be affected by the project);
- Get to see the project through their eyes;
- Identify and understand problems;
- Generate alternative solutions;
- Articulate and clarify the key issues;
- Protect and enhance our credibility;
- Have all the information needed to communicate to the various Interests received by them and understood by them;
- Receive and understand all the information that the various PAIs need to communicate to you' de-polarize PAIs who are polarized because they have diametrically opposed values; and
- De-polarize interest who are polarized for some other reason.

All such projects are initiated with the intent of achieving informed consent, which differs from consensus in that our goal is to get all potentially affect interests to agree that although they may not totally agree with the Department, the path chosen is the best for all concerned. Achieving each of the above objectives maximizes the chances of achieving informed consent.

48. Does the agency have advisory groups or committees? If so, describe the stakeholder composition. (10.2.8)

    Currently, no, but such groups/committees are considered during the identification and prioritization of citizen participation needs.

49. Describe the agency's strategic and resource planning processes. (10.2.10)

    The AQB's Planning Section is involved in reviewing the State's air quality planning needs and developing proposals to meet those needs. The Section reviews and tracks requirements under the CAA including non-attainment planning, Regional Haze Planning, SIP requirements, and interstate transport requirements. The Planning Section monitors trends in air quality monitoring

data, proposed federal regulations, and tracks state regulations that are outdated or need updating in order to align with current requirements.

The Planning Section provides technical and regulatory review of state regulations for appropriate language, ambiguity, and overall effectiveness.

The Planning Section monitors proposed regulations and revisions to existing regulations and provides comments to EPA on those proposals and gauges long-term resource requirements in order to implement new regulations.

50. Describe the agency's funding mechanisms. (10.2.10)

The AQB relies upon permit fees and federal EPA grants to fund the program. No funding is obtained from the State's General Fund. The AQB assesses annual Title V and NSR fees for each active permit. Permit application technical review fees are invoiced for new applications and revisions to existing permits.

51. Does the agency have sufficient funding to accomplish its duties? (10.2.10)

NMSA 74-2-7(B)(6) and (7), excerpted below, authorizes the agency to collect and revise fees such that they are sufficient to accomplish the required duties of the agency.

(6) a schedule of construction permit fees sufficient to cover the reasonable costs of:
(a) reviewing and acting upon any application for such permit; and
(b) implementing and enforcing the terms and conditions of the permit, excluding any court costs or other costs associated with an enforcement action;
(7) a schedule of emission fees consistent with the provisions of Section 502(b)(3) of the 1990 amendments to the federal act;

NMSA 74-2-15 also directs the agency to develop a state air quality fund for monies collected pursuant to 74-2-7 NMSA to fund additional tasks required by the agency.

74-2-15. State air quality permit fund.
A. There is created in the state treasury the "state air quality permit fund" to be administered by the department. All fees collected by the department pursuant to Section 74-2-7 NMSA 1978 shall be deposited in the state air quality permit fund.
B. Money in the state air quality permit fund is appropriated to the department for the purpose of paying the reasonable costs of:
(1) reviewing and acting upon any application for a permit;
(2) if the owner or operator receives a permit, implementing and enforcing the terms and conditions of such permit not including any court costs or other costs associated with any enforcement action;
(3) emissions and ambient monitoring;
(4) preparing generally applicable regulations or guidance;
(5) modeling, analysis and demonstrations; and

(6) preparing inventories and tracking emissions.

The AQB has sufficient funding to accomplish its current assigned duties. The fees collected by the AQB are indexed with the CPI. If the AQB were to add additional staff, the AQB would need to assess the salary and benefit requirements of that new staff and either potentially increase fees collected and/or increase funding requests from federal grants.

52. Describe the agency's inventories of oil and gas sources and operations. (10.3.1)

The AQB requires annual emissions inventories from major sources of air pollutants. The AQB has regulatory authority to require the submission of emission inventories from minor sources, but this has not been conducted for several years. We are currently planning to require a minor source emissions inventory for calendar year 2020.

53. Has the agency developed any source-specific requirements that are more stringent than existing federal requirements? (10.3.2)

No, although the AQB is early in the process of developing a plan to reduce O_3 precursors in those counties where the design value exceeds 95% of the 2015 O_3 NAAQS.

54. Has the agency interfaced with air agencies from other states on shared issues to develop or share solutions to specific issues? (10.3.2)

The AQB actively participates in a number of regional work groups and committees under the auspices of WESTAR/WRAP.

NMED CDPHE convened the Four Corners Air Quality Task Force in 2005 that brought together a diverse group of interested parties to learn about and discuss air quality issues in the Four Corners Area. Other participating agencies include the Navajo Nation EPA; the Southern Ute Indian Tribe's air Quality Program; the USEPA, the U.S. Department of the Interior; Bureau of Land Management and National Park Service; the U.S. Department of Agriculture, Forest Service; the U.S. Department of Energy; and the State of Utah. The Task Force Report was completed in 2007. Due to the level of interest in air quality issues addressed by the Task Force, the members and other interested parties continue to meet on an annual basis to review air quality progress as the Four Corners Air Quality Group.

NMED is also an active participant in the Joint Advisory Committee, which serves as the local community-based organization overseeing the process to achieve cleaner air for the Paso del Norte Region under the La Paz Agreement. The Paso del Norte Region includes the Ciudad Juarez, Chihuahua/El Paso, TX/Doña Ana County, NM air basin.

55. Describe how the agency addresses reporting and correction of unplanned and episodic emissions. (10.3.2)

Excess emission reporting, affirmative defense requirements, and root cause and corrective action analysis procedures are defined at 20.2.7 NMAC. (http://164.64.110.134/parts/title20/20.002.0007.html).

Each facility must report unplanned episodic (excess) emissions to the online Air Quality Bureau Compliance Reporting System, per 20.2.7 NMAC. For excess emissions, the Enforcement Section downloads data from the online AQB Compliance Reporting System every four months. The excess emission data are organized by facility, and based on existing staff workload, the cases are prioritized and selected, normally by the number of pounds reported. These cases are then enforced consistent with AQB regulations and the Civil Penalty Policy.

General Information Website Link: https://www.env.nm.gov/air-quality/excess-emissions-reporting/

56. Has the agency interfaced with the oil and gas conservation agency on wasted gas from venting and flaring? If yes, describe the approaches and solutions that have been developed. (10.3.2)

    The Oil Conservation Division within the Department of Energy, Mineral, and Natural Resources (EMNRD) is responsible for oversight of wasting and venting of natural gas. The Governor of New Mexico recently issued an Executive Order on Climate Change and Energy Waste Prevention, and within that EO directed NMED and EMNRD to work collaboratively and develop a regulatory framework to reduce waste and secure reductions in methane emissions from the oil and gas industry.

    The Departments are in the process of developing those regulatory frameworks and will have an update to the Governor in September 2019.

57. Does the agency encourage awareness of, and/or participation in, voluntary emissions reduction efforts? (10.3.2)

    NMED is in the process of developing voluntary emission reduction strategies. NMED and oil and gas operators in the state participated in the EPA's Natural Gas Star program, which resulted in decreased venting and flaring emissions.

58. Describe the agency's air quality monitoring network as it relates to oil and gas exploration and production operations. Include the following: (10.3.3)

    The AQB operates the air monitoring network to collect ambient air quality data in order to determine compliance with State and Federal National Ambient Air Quality Standards. The monitors in the network are required by federal air monitoring requirements under 40 CFR 58 Ambient Air Quality Surveillance. https://ecfr.io/Title-40/pt40.6.58 New Mexico monitors NO_2, O_3, particulate

matter (PM_{10} and $PM_{2.5}$), and SO_2. Deviations from these monitoring requirements must be approved by the EPA Regional Administrator.

Southern and Northern air monitoring sites are located in the vicinity of oil and gas stationary sources (such as sites located in Hobbs, Carlsbad, and three in San Juan County).

a. The number and location of monitors and frequency of monitoring

Currently the Air Quality Bureau has 20 air quality monitoring sites located in several counties throughout New Mexico. The table below is a complete listing of the monitoring sites and their respective location. All gaseous monitors in the network operate continuously. All BAM-1020 particulate sampler (13 in total) whether PM10 or PM2.5 also operate continuously. The four (4) Federal Reference Method (FRM) Partisol particulate samplers (non-continuous) operate on a 1 in every 3-day schedule with the exception of the Anthony site PM10 FRM sampler which operates on a 1 in every 6-day schedule. The FRM sample filters are sent to and analyzed by the State Laboratory Division in Albuquerque for gravimetric analysis.

NMED Site Designation	Location
1H - Sub Station	San Juan County Shiprock Electrical Substation, Waterflow
1ZB - Bloomfield	San Juan County - 2200 N 1st Street, Bloomfield NM
1NL - Navajo Lake	San Juan County - 423A Highway 539, Navajo Dam NM
2LL - Los Lunas	Valencia County - 1000 W. Main St, Los Lunas NM
2ZJ - Bernalillo	Sandoval County - 600 Oak Street, Bernalillo NM
3CRD - Coyote Ranger District	Rio Arriba County - 21 New Mexico 96, Coyote NM
3SFA - Santa Fe Airport	Santa Fe County - 2001 Aviation Dr, Santa Fe NM
3ZD - Taos	Taos County - 123 Camino de Santiago, Taos NM
5ZR - Carlsbad	Eddy County - 2811 Holland St., Carlsbad NM
5ZS - Hobbs Jefferson	Lea County - 2320 N. Jefferson St., Hobbs NM
6CM - Anthony	Doña Ana County - 705 Church St., Anthony NM
6O - La Union	Doña Ana County - 7048 McNutt, La Union NM
6Q - Las Cruces Office	Doña Ana County - 2301 Entrada del Sol, Las Cruces NM
6WM - West Mesa	Doña Ana County - West Mesa Well #46, Las Cruces NM
6ZL - Holman Road	Doña Ana County - Las Cruces Well #41, Las Cruces NM
6ZK - Chaparral	Doña Ana County - 680 McCombs, Chaparral NM
6ZM - Desert View	Doña Ana County - 5935A Valle Vista, Sunland Park NM
6ZN - Santa Teresa	Doña Ana County - 104-2 Santa Teresa Int'l. Blvd., Santa Teresa
6ZQ - Solano	Doña Ana County - 750 N. Solano Drive, Las Cruces NM
7E - Deming Airport	Luna County - 3412 Raymond Reed Blvd., Deming NM

b. Ambient air quality monitoring

The AQB monitors for 3 of the 4 criteria gaseous pollutants: Nitrogen Dioxide (NO2), Ozone (O3) and Sulfur Dioxide (SO2). We do not monitor for Carbon

Monoxide (CO). Additionally, AQB monitors for particulate matter PM10 (≤10 microns in aerodynamic diameter) as well as PM2.5 (≤2.5 microns in aerodynamic diameter) both continuous and non-continuous samplers are used.

The table below is a complete listing of the ambient air quality monitoring conducted at each site.

NMED Site Designation	Air Quality Monitoring
1H - Sub Station	NO2, Ozone, SO2 and Particulate PM10 (continuous)
1ZB - Bloomfield	NO2, Ozone, and SO2
1NL - Navajo Lake	NO2, and Ozone
2LL - Los Lunas	Ozone
2ZJ - Bernalillo	Ozone
3CRD - Coyote Ranger District	Ozone
3SFA - Santa Fe Airport	Ozone, and Particulate PM2.5 (continuous)
3ZD - Taos	Particulate PM2.5 (continuous)
5ZR - Carlsbad	NO2, and Ozone
5ZS - Hobbs Jefferson	NO2, Ozone, and Particulate PM2.5 (continuous)
6CM - Anthony	Particulate PM2.5 and Particulate PM10 (continuous and non-continuous)
6O - La Union	Ozone
6Q - Las Cruces Office	Particulate PM2.5 (continuous)
6WM - West Mesa	Particulate PM10 (continuous)
6ZL - Holman Road	Particulate PM10 (continuous)
6ZK - Chaparral	Ozone and Particulate PM10 (continuous)
6ZM - Desert View	NO2, Ozone, Particulate PM10 (continuous) and Particulate PM2.5 (non-continuous)
6ZN - Santa Teresa	NO2, Ozone and Particulate PM2.5 (continuous)
6ZQ - Solano	Ozone
7E - Deming Airport	Particulate PM10 (continuous)

c. Emergency response monitoring equipment

The AQB maintains E-BAMs (Environmental - Beta Attenuation Monitors), which are used to monitor particulate matter of either PM10 or PM2.5 for wildfire events or controlled burns conducted by the Forest Service. The AQB does not maintain other emergency response equipment to monitor other air pollutants.

d. Sharing air quality monitor data

The AQB makes available to the public real-time data obtained from continuous monitors in the air monitoring network via the EPA's AirNow Website (https://www.airnowtech.org/index.cfm) and the AQB's Air Quality Index and Monitoring Data Website (http://nmaqinow.net/). After monitoring data is reviewed and validated by AQB staff, it is submitted to the EPA via its AQS system. The validated data in AQS can be obtained by the public at https://www.epa.gov/outdoor-air-quality-data. Specific monitoring data sets can also be obtained from our data acquisition system by submitting a request to AQB.

59. Describe the reporting, emissions inventory, and recordkeeping requirements applicable to oil and gas exploration and production operations. (10.3.4)

    Each permit contains specific monitoring, recordkeeping, and reporting requirements for each and all requirements of the permit. Monitoring protocols are developed for the most common equipment in the oil and gas production industry. Protocols have been developed for tanks, engines, turbines, heaters, separators, control devices, and dehydrators. The following links to the AQB's monitoring protocols:
    https://www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/

    20.2.73 NMAC requires specific emissions inventory requirements.

60. Has the agency developed any emissions estimation techniques more advanced than those available from EPA? (10.3.4)

    No.

61. Describe agency's methods for developing air quality emission projections related to oil and gas exploration and production. (10.3.4)

    AQB staff participate in the WESTAR/WRAP Oil & Gas Work Group, the EPA-led Oil & Gas Work Group for the 2016 Emissions Modeling Platform, and the National Oil & Gas Emissions Committee.

    The WESTAR/WRAP O&G Work Group's responsibilities include addressing the data and analysis elements, topics, and issues under the Oil and Gas section of the WRAP Workplan (see https://www.wrapair2.org/OGWG.aspx), and providing oversight and coordinating efforts with projects and activities across the WRAP and with other groups related to O&G. This group conducted a 2014 emissions inventory project for the San Juan and Permian Basins that included 2028 future projections. This project was funded by the BLM and is available at https://www.wrapair2.org/SanJuanPermian.aspx. Updated information and draft project methodologies for all Western Basins are under preparation for regional haze planning. A future year O&G 2023/2028 WRAP inventory is being drafted. The report is scheduled to be completed by the end of summer 2019.

    The responsibilities of the EPA O&G Work Group include: a determination of the methodology and preparation of emissions inventories for air quality planning modeling to best represent actual 2016 O&G emissions point and nonpoint source equipment and processes; developing project approaches and project emissions from the 2016 data to 2023 and 2028, including equipment and process changes, and ranges of activity forecasts and emissions control stringency; and developing and/or collecting ancillary data needed to prepare the inventories for photochemical grid models. The 2016 beta and v.1 inventories have been completed but are not yet available to the public. Future year methodologies and some estimates (draft/beta) for US O&G point and non-point emissions are available on the following wiki page:

http://views.cira.colostate.edu/wiki/Attachments/Inventory%20Collaborative/oilgas_files/UpdateOnFutureYrProj_2016beta.19Mar11.pdf

62. Describe the emission inventory and projection information available to the public. (10.3.4)

    Emissions Inventories submitted to the AQB are available to the public at the Bureau's Emission Inventory Retrieval webpage. Publicly available links to O&G emissions inventories and projects performed through WESTAR/WRAP or EPA are included in the response to #61, above.

63. Describe the criteria used for the reporting of significant releases to the air. (10.3.5)

    Excess emission reporting requirements are identified in 20.2.7 NMAC. Excess emissions are defined as the emission of an air contaminant, including a fugitive emission, in excess of the quantity, rate, opacity or concentration specified by an air quality regulation or permit condition.
    http://164.64.110.134/parts/title20/20.002.0007.html

64. Describe the agency's required emergency response reports and actions. (10.3.5)

    NMED maintains several staff dedicated to responding to emergencies in the State. The lead staff for NMED is Steve Connolly, Incident Response Coordinator, within the Hazardous Waste Bureau. The Emergency Response Team works in conjunction with the Office of the Governor, Department of Public Safety, Department of Health, DOT, local and state police and other law enforcement agencies, and any other agencies with a nexus to the particular emergency.

    The Team holds periodic mock emergencies in order to determine adequacy of the State agencies response and timeliness of response.

    For each actual emergency response, briefing calls are held several times throughout the day with all associated agencies, and debriefing calls and meetings are held post-response to discuss specific challenges, successes, opportunities for improvement, and strengths and weaknesses of the response.

65. Describe the agency's long-term planning and prioritization process. (10.3.6)

    The AQB is currently undergoing a long-term strategic planning process in order to identify long-term goals (5-year, 10-year 15-year goals) for the agency and to ensure appropriate resources will be available to implement those goals.

    Essential to the planning process is understanding future agency needs, determining how to train and retain existing and future staff, understanding budgetary requirements to implement new requirements, and ensuring there are

sufficiently trained senior level staff to manage the agencies programmatic responsibilities.

66. Describe the agency's performance metrics and evaluation process. (10.3.6)

    The AQB's performance measurements are based on two metrics. The first is the percent of enforcement cases brought against companies within one year of inspection or documentation of the violation. The AQB consistently meets 100% of these deadlines. The second metric is the percent of facilities taking corrective action to mitigate air quality violations within 30 days of the facility receiving notice of violation. The AQB consistently meets 100% of that metric.

67. Describe any focuses or issues of particular interest to the agency, within the scope of the Guidelines, that would be beneficial to discuss during the interview.

    Identification of gaps in regulatory authority between the two Departments.
    Identification of opportunities that complement the two programs that increase efficiencies within the permitting and compliance programs.
    Identification of regulatory tension between the two programs, and propose solutions on how to manage that tension, such that requirements under CAA regulations can be authorized and potentially not constitute violations under the New Mexico Oil and Gas Act and vice versa.
    Recommendations on enhanced use of remote surveillance to minimize staff resource requirements in the field.
    Recommendations on increasing the agency's overall effectiveness, based on current staffing levels and responsibilities.
    Recommendations on innovative enforcement strategies and technologies to reduce emissions from the E&P sector.

68. Provide any additional information pertaining to the agency's oversight of oil and gas exploration and production emissions that you feel would be beneficial for the Review Team to be aware of during the interview.

    There are over 60,000 active oil and gas wells in New Mexico. Not all of these facilities are regulated by the NMED AQB, and many are authorized under Notice of Intent (NOI) registrations. NOIs are not permits but are registrations of emissions from sources emitting greater than 10 tpy of any regulated air contaminant.

    Construction permits are required for facilities emitting greater than 10 lb/hr or 25 tpy of a criterial pollutant (excluding VOC). Thus, sources may emit up to 100 tpy of VOC before triggering a Title V permit. Many of the regulated oil and gas production facilities operate under a NOI and emit emissions very close to Title V thresholds. Because NOIs are not permits, they do not contain monitoring, recordkeeping, and reporting requirements.

69. Describe any 'above and beyond' initiatives, efforts, or functions of the agency.

The agency is continuously undergoing process improvement efforts in order to improve the agency's overall effectiveness with static resource levels and funding. Each section is challenged by their current workload and amount of responsibility, and each section is tasked with coming up with creative solutions to improve the overall efficiency of the work, while continuing to provide high-quality work products that meet the requirements of the program.

Appendix D – OCD Supplemental Information

Background Notes for STRONGER Review Team

Under the Oil and Gas Act, the New Mexico Energy Minerals & Natural Resources Department's (EMNRD's) Oil Conservation Division (OCD) and Oil Conservation Commission (OCC) have several responsibilities. This white paper is provided to the STRONGER Review Team as background for our discussion on May 15, 2019.

The Oil and Gas Act prohibits "waste" from oil and gas production. ("The production or handling of crude petroleum oil or natural gas of any type or in any form, or the handling of products thereof, in such manner or under such conditions or in such amounts as to constitute or result in waste is each hereby prohibited.") NMSA 1978, §70-2-2. (1935) The Act requires the OCC and OCD to "prevent waste prohibited by this act." NMSA 1978, §70-2-11(A).

"Waste" of oil or gas is defined, in part, as:

> "Waste", in addition to its ordinary meaning, shall include:
>
> "surface waste" as those words are generally understood in the oil and gas business, and in any event to embrace the *unnecessary or excessive surface loss or destruction without beneficial use, however caused*, of gas of any type or in any form, or crude petroleum oil, or any product thereof, but including the loss or destruction, without beneficial use, resulting from evaporation, seepage, leakage or fire, especially such loss or destruction incident to or resulting from the manner of spacing, equipping, operating or producing a well or wells, or incident to or resulting from the use of inefficient storage or from the production of crude petroleum oil or gas, in excess of the reasonable market demand.
>
> NMSA 1978, §70-2-3.

To prevent waste of gas resources, the OCD has a "no vent or flare" rule.

Rule 19.15.18.12(A) NMAC, titled "Casinghead Gas" states:

> An operator shall not flare or vent casinghead gas produced from a well after 60 days following the well's completion.

If an operator does vent or flare after 60 days, the OCD ". . .shall suspend the allowable assigned to the well if the operator flares or vents gas from a well in violation of 19.15.18.12 NMAC." 19.15.18.12(C)

Rule 19.15.18.12 (F) reinforces this rule by appearing to require flaring only:

> Pending connection of a well to a gas-gathering facility, or when a well has been excepted from the provisions of Subsection A of 19.15.18.12 NMAC, the operator shall *burn* all gas produced and not used, and report the estimated volume on form C-115.

Rule 19.15.18.12 (B) provides an exception to the no vent/flare rule.

> An operator seeking an exception to Subsection A of 19.15.18.12 NMAC shall file an application for an exception on form C-129 with the appropriate division district office. The district supervisor may grant an exception when the flaring or venting casinghead gas appears reasonably necessary to protect correlative rights, prevent waste or prevent undue hardships on the applicant. The district supervisor shall either grant the exception within 10 days after the application's receipt or refer it to the director who shall advertise the matter for public hearing if the applicant desires a hearing.

Rule 19.15.7.37, titled "Application for Exception to No Flare" (Form C-129) states:

> An operator shall file form C-129 when applicable, in accordance with 19.15.18.12 NMAC.

The C-129 requires operators report by lease the estimated volume of gas to be vented or flared based on the production of barrels of oil.

Along with C-129 reporting, Rule 19.15.7.24, titled "Operator's Monthly Report" (Form C-115) requires amounts of gas vented or flared to be reported monthly, and states:

> An operator shall file a form C-115 for each non-plugged well completion for which the division has approved a form C-104 and for each secondary or other enhanced recovery project or pressure maintenance project injection well or other injection well within the state, setting forth complete information and data indicated on the forms in the order, format and style the director prescribes. The operator shall estimate oil production from wells producing into common storage as accurately as possible on the basis of periodic tests. 19.15.7.24(A)

The C-115 requires operators to report volumes of gas produced, transported, or otherwise disposed of including loss, vented, flared, spilled or used on property.

Appendix E – NMED Ozone Advance Program Request to EPA

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
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Telephone (505) 827-2855
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Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

April 22, 2019

Advance Program
c/o Laura Bunte
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards, C304-01
Research Triangle Park, NC 27711

Dear Ms. Bunte:

The New Mexico Environment Department would like to participate in the Ozone Advance Program with respect to three counties and one partial county in New Mexico. These counties are San Juan, Lea, Eddy and Doña Ana (partial). We wish to join this partnership with EPA to preserve or improve the air quality in these areas. The basic program eligibility criteria are met as follows:

1. **The areas are not designated nonattainment for an ozone National Ambient Air Quality Standard (NAAQS)**
   None of the proposed subject areas are currently designated nonattainment for any ozone NAAQS. New Mexico currently has one small nonattainment area for the 2015 8-hour Ozone NAAQS located in Doña Ana County and this area will be excluded from the Ozone Advance Program.

2. **The State must identify the areas with respect to which they would like to participate**
   The candidate areas for the Ozone Advance Program consist of the following counties and partial county:
   a. San Juan (northwest NM);
   b. Lea (southeast NM);
   c. Eddy (southeast NM); and
   d. Doña Ana, excluding the Sunland Park nonattainment area (south central NM).

3. **The State should identify the air monitors that reflect the air quality in the areas**
   The following air monitors reflect the air quality in these counties:
   a. 1H San Juan Substation (EPA-AQS ID# 35-045-1005);
   b. 1NL Navajo Lake (EPA-AQS ID# 35-045-0018);

c. 1ZB Bloomfield (EPA-AQS ID# 35-045-0009);
d. 5ZR Carlsbad (EPA-AQS ID# 35-015-1005);
e. 5ZS Hobbs Jefferson (EPA-AQS ID# 35-025-0008);
f. 6O La Union (EPA-AQS ID# 35-013-0008);
g. 6ZK Chaparral (EPA-AQS ID# 35-013-0020);
h. 6ZN Santa Teresa (EPA-AQS ID# 35-013-0022); and
i. 6ZQ Solano Drive (EPA-AQS ID# 35-013-0023).

4. **The State's reporting obligations for the National Emissions Inventory must be met prior to an area joining Ozone Advance**
   Existing emissions inventory reporting requirements have been met. The 2017 Emissions Inventory submission was completed by September 2018.

We understand that our efforts under Ozone Advance may benefit these areas by potentially:

- reducing air pollution in terms of ozone as well as other air pollutants;
- ensuring continued healthy ozone levels;
- maintaining the ozone NAAQS and helping the Sunland Park Nonattainment Area attain the 2015 Ozone NAAQS within the required timeframe;
- helping avoid violations of the NAAQS that could lead to a future nonattainment designation;
- increasing public awareness about ozone as an indirect air pollutant; and
- targeting limited resources toward actions to address ozone problems quickly.

Our goal is to implement measures and programs to reduce ozone in the near term. We agree that it is in our best interest to work together and in coordination with stakeholders and the public to proactively pursue this goal.

Should you have any questions regarding this request, please contact Elizabeth Bisbey-Kuehn, Chief, Air Quality Bureau at (505) 476-4305 or by email at Elizabeth.Kuehn@state.nm.us.

Sincerely,

James C. Kenney
Cabinet Secretary, New Mexico Environment Department

cc: advance@epa.gov
Carrie Paige, EPA Region 6
Elizabeth Bisbey-Kuehn, Chief, Air Quality Bureau

Appendix F – NMED Responses to Recommendations

Recommendations	NMED Comments
<u>Recommendation 10.2.2 (AQB)</u> In order to avoid duplication, regulatory gaps, or inconsistent requirements, the review team recommends AQB and OCD evaluate their options for improving coordination between the agencies. Such options could include entering into a memorandum of understanding (MOU) that clearly defines the roles and responsibilities of the respective agencies and establishing a fulltime interagency liaison position within NMED. An MOU could help to formalize the cooperative relationship between AQB and OCD, including with regard to the minimization of waste from venting and flaring and methane emissions. Among other things, it could provide communication and information exchange protocols; as well as a framework for joint training, inspections, public stakeholder meetings, and administrative hearings, where appropriate. An interagency liaison could serve as NMED's primary point of contact for oil and gas issues and facilitate interagency planning efforts.	NMED appreciates the STRONGER review team's recognition and awareness of the complexity and inherent differences between NMED and EMNRD's regulatory and statutory authority with respect to the oil and gas industry. To help address the potential for regulatory gaps and/or duplicative requirements, NMED and OCD are meeting on a weekly basis to discuss issues related to statutory authority and regulatory oversight and where there are opportunities to reduce duplicative requirements, help to clarify each agency's role and responsibilities, and to maximize resources and efforts to improve the effectiveness of each agency's oversight and obligations. NMED agrees improved coordination with OCD will help avoid duplication and regulatory gaps as the agencies undergo rulemaking and in their continued oversight of the oil and gas industry. NMED will continue to evaluate options for better clearly defining each agency's roles and responsibilities. NMED will endeavor to identify duplicate efforts, regulatory gaps and opportunities for joint enforcement, data sharing, and other process improvements to improve the coordination between, and efficiency of, the agencies. Frequent interagency communication, and formal meetings on a semi-annual basis, will assist in identifying and resolving issues contemporaneously. NMED will work with OCD on coordinating this effort with the appropriate staff. NMED recognizes that an MOU and/or an interagency liaison may be a valuable tool to help improve coordination among agencies and will consider whether an MOU and/or liaison would be a constructive and productive tool in the rulemaking process.

	As identified in the recommendations and throughout this document, each agency is tasked with fulfilling specific statutory mandates and requirements, which may contain overlapping requirements, and it is unknown if an MOU and/or liaison would be the appropriate mechanism for addressing overlapping requirements or regulatory gaps. NMED may consider the option to revise the current statutes to clearly define each agency's roles, and distinguish between the two agency's regulatory responsibilities, as other states have done.
<u>Recommendation 10.2.6 (AQB)</u> AQB should request a legislative authorization for the additional FTE needed to fulfill their mandated requirements.	NMED appreciates the STRONGER review team's recognition of the need for additional staffing to fully implement the requirements of the Clean Air Act, and specifically in regard to compliance inspections of regulated sources. To help ensure NMED is prepared for the upcoming legislative session, NMED is in the process of preparing a Bureau expansion request with a request for 12 additional FTE for the AQB at the next legislative session. Because additional funding will be necessary to fund the additional staff, NMED is also contemplating revisions to the fee regulations to ensure the program is properly funded. If the request for increased funding is successful, NMED may seek an additional 8 staff in the future. At this time, however, the request is seeking 12 additional FTE. In addition, the effectiveness of NMED's regulatory responsibilities can only be successful with a well-trained, knowledgeable, and proficient staff who have the technical and regulatory expertise required to fully perform their job duties. NMED is currently evaluating ways to ensure staff receive the necessary regulatory and technical training so staff are able to competently and confidently carry out their duties and that they are receiving salaries

	that are market based, competitive, and help retain both expert level and lower level staff.
Recommendation 10.2.8*b* (AQB) As part of the NMED's efforts for coordination with EMNRD under Executive Order 2019-003, AQB should evaluate if opportunities exist to synchronize public participation with OCD in complementary regulatory processes.	NMED appreciates the STRONGER review team's recommendation for a robust public involvement process and to coordinate those efforts with OCD. NMED and EMNRD have held several joint public stakeholder outreach meetings over the last two months and we intend to continue to engage in joint public outreach efforts.
Recommendation 10.3.1*b* (AQB) The review team recommends AQB consider including greenhouse gasses in the 2020 inventory as information about these emissions could assist AQB with their planning and analysis under Executive Order 2019-003. AQB should consider stakeholder input in determining the methodology for such an expansion of the inventory.	NMED appreciates the STRONGER review team's recommendation and the acknowledgement of the importance of an inventory of greenhouse gas emissions as part of the minor source inventory. NMED is reviewing the possibility of including greenhouse gases in the 2020 inventory and will likely require that those emissions be included. NMED has sent notices to all affected permittees, and several companies are beta testing the existing database for submittal. NMED welcomes feedback on the inventory effort.
Recommendation 10.2.1.9 (AQB) The review team recommends the AQB develop a written policy and consider including in regulation a pathway for operators or technology providers to submit new technologies and methodologies to AQB for approval. Such regulation should specify a data-driven and transparent process with objective verification by the agency for evaluation of proposed alternative technologies and methodologies. AQB should coordinate closely with EPA on any such policies or regulations to ensure that alternative technologies and methodologies achieve emissions reductions at least equivalent to the reductions required under applicable state or federal standards.	NMED appreciates the STRONGER review team's efforts to advance innovation and technology in rulemakings. This is a subject of extreme importance and that is under current review by NMED. As part of current air quality permits, to the extent possible, NMED allows permittees to propose new technologies and methodologies, and authorizes the use of alternatives, with NMED approval. As part of the current rule making efforts, NMED is reviewing how emerging technologies and methodologies may be authorized in the regulatory context. Important to note is that NMED is not specifically authorized by regulation or statute to require specific control technologies or methodologies in regulation. That NMED is prohibited from enacting alternative and emerging technologies limits the NMED's authority to do so, but there are potential solutions that would give NMED the authority to establish such requirements,

	including supporting changes to the statute that provide for this authority. Broad stakeholder support will help to assist in any efforts to revise the statute, which may be controversial. Proposing new requirements in state regulation without making appropriate revisions to the federal regulatory requirements furthers a dual regulatory scheme that can be challenging for the regulated community to comply with. NMED urges stakeholder groups that are supportive of innovation and emerging technologies to seek approval from US EPA of state equivalency programs, especially in light of the numerous states developing regulatory schemes that go beyond existing federal requirements but that are unable to satisfy those federal requirements under the existing regulatory structure. NMED believes that there are significant opportunities to be realized if state equivalency programs were in place within the oil and gas sector.
<u>Recommendation 10.2.2 (AQB)</u> In order to avoid duplication, regulatory gaps, or inconsistent requirements, the review team recommends AQB and OCD evaluate their options for improving coordination between the agencies. Such options could include entering into a memorandum of understanding (MOU) that clearly defines the roles and responsibilities of the respective agencies and establishing a fulltime interagency liaison position within NMED. An MOU could help to formalize the cooperative relationship between AQB and OCD, including with regard to the minimization of waste from venting and flaring and methane emissions. Among other things, it could provide communication and information exchange protocols; as well as a framework for joint training, inspections, public stakeholder meetings, and administrative hearings, where appropriate.	NMED appreciates the STRONGER review team's recognition and awareness of the complexity and inherent differences between NMED and EMNRD's regulatory and statutory authority with respect to the oil and gas industry. To help address the potential for regulatory gaps and/or duplicative requirements, NMED and OCD are meeting on a weekly basis to discuss issues related to statutory authority and regulatory oversight and where there are opportunities to reduce duplicative requirements, help to clarify each agency's role and responsibilities, and to maximize resources and efforts to improve the effectiveness of each agency's oversight and obligations. NMED agrees improved coordination with OCD will help avoid duplication and regulatory gaps as the agencies undergo rulemaking and in their continued oversight of the oil and gas industry.

An interagency liaison could serve as NMED's primary point of contact for oil and gas issues and facilitate interagency planning efforts.	NMED will continue to evaluate options for better clearly defining each agency's roles and responsibilities. NMED will endeavor to identify duplicate efforts, regulatory gaps and opportunities for joint enforcement, data sharing, and other process improvements to improve the coordination between, and efficiency of, the agencies. Frequent interagency communication, and formal meetings on a semi-annual basis, will assist in identifying and resolving issues contemporaneously. NMED will work with OCD on coordinating this effort with the appropriate staff. NMED recognizes that an MOU and/or an interagency liaison may be a valuable tool to help improve coordination among agencies and will consider whether an MOU and/or liaison would be a constructive and productive tool in the rulemaking process. As identified in the recommendations and throughout this document, each agency is tasked with fulfilling specific statutory mandates and requirements, which may contain overlapping requirements, and it is unknown if an MOU and/or liaison would be the appropriate mechanism for addressing overlapping requirements or regulatory gaps. One additional option would be to revise the current statutes to clearly define each agency's roles, and distinguish between the two agency's regulatory responsibilities, as other states have done.
<u>Recommendation 10.2.3*a* (AQB)</u> While the AQB meets the criteria of this section of the Guidelines, the review team recommends that AQB interface with EPA to evaluate its minor source permitting to ensure that the requirements and limits of minor source permits harmonize with Federal requirements, to avoid possible confusion, and to ensure legal and practical enforceability.	NMED appreciates the STRONGER review team's recommendation to review its program to ensure requirements are legally and practically enforceable. As part of our engagement efforts with EPA, NMED sends a notification to EPA R6 of all pending minor source permit applications and draft permits. Also, during the development or revision of a general construction permit, NMED notifies EPA of the effort and provides opportunities

	for review of the permit and the submittal of written comments and proposed revisions.
Recommendation 10.2.3*b* (AQB) The review team recommends AQB explore the feasibility of allowing third-party data import in the AECT. Such a feature could enhance the effectiveness and accuracy of the AECT by allowing facility engineers to export their emissions modeling data directly from their software.	NMED appreciates the STRONGER review team's recommendation on enhancing this AECT to authorize third-party data import. NMED agrees with the recommendation. It is the intent of NMED to include this functionality in upcoming releases of the AECT.
Recommendation 10.2.4*b* (AQB) AQB should evaluate if the current de facto oil and gas focus of the Compliance and Enforcement Section is the most effective organizational structure.	NMED thanks the STRONGER review team for this comment. The overwhelming majority of regulated facilities within NMED's jurisdiction are within the oil and gas sector. Thus, both the Permitting and Compliance and Enforcement section staff work primarily on oil and gas production, midstream, and processing facilities, permits, and regulations, and, thus, spend the majority of their time implementing and enforcing oil and gas regulations.
Recommendation 10.2.4*c* (AQB) The review team recommends that NMED increase staffing in the Compliance and Enforcement Section of AQB so that the agency can fulfill its mandated requirements.	NMED thanks STRONGER's review team for this important recommendation regarding the need for additional staffing resources and specifically increased compliance staffing to ensure NMED is able to fulfill its federally mandated requirements. NMED agrees that additional staffing resources are critical to meeting these requirements and that retaining an experienced and well-trained team is also necessary to fully implement a robust compliance program. To aid in this effort, NMED is in the process of requesting 12 additional FTE for the Bureau, including 4 additional FTE in the C&E Section. In addition, NMED is actively looking into ways to improve staff retention and lower vacancy rates. Essential to improving staff retention and lowering vacancy rates is offering competitive salaries, ensuring staff are equipped with state-of-the-art information technology and tools to increase the efficiency of the program, and ensuring that staff are well-trained and qualified to perform their essential job duties. The

	success of NMED's staffing request is partly dependent upon broad stakeholder support and, thus, NMED greatly appreciates any efforts undertaken by stakeholders to lend support to this request.
Recommendation 10.2.5 (AQB) The review team recommends that AQB evaluate its voluntary environmental disclosure policy to determine if it adequately incentivizes operators to self-audit their facilities. A robust self-audit program should encourage operators to voluntarily disclose and correct violations and could increase compliance while transferring some of the inspection burden to the regulated community.	NMED appreciates the STRONGER review team's recommendation to review the voluntary disclosure policy. This policy is a successful tool to bring facilities into compliance and has been used for over two thousand small oil and gas facilities. The policy emphasizes compliance and reducing regulated air emissions, which has had a positive impact on the environment by reducing harmful air emissions.
Recommendation 10.2.6 (AQB) AQB should request a legislative authorization for the additional FTE needed to fulfil their mandated requirements.	NMED thanks the STRONGER review team for this important recommendation regarding the need for additional staffing resources to ensure NMED is able to fulfill its federally mandated requirements. NMED agrees that additional staffing resources are critical to meeting these requirements and that retaining an experienced and well-trained team is also necessary to fully implement a robust compliance program. To aid in this effort, NMED is in the process of requesting 12 additional FTE for the Bureau, including 4 additional FTE in the C&E Section. In addition, NMED is actively looking into ways to improve staff retention and lower vacancy rates. Essential to improving staff retention and lowering vacancy rates is offering competitive salaries, ensuring staff are equipped with state-of-the-art information technology and tools to increase the efficiency of the program, and ensuring that staff are well-trained and qualified to perform their essential job duties. The success of NMED's staffing request is partly dependent upon broad stakeholder support and, thus, NMED greatly appreciates any efforts undertaken by stakeholders to lend support to this request.

Recommendation 10.2.7*c* (AQB) The review team suggests that AQB evaluate the benefits of developing electronic submission capabilities for permitting and applications. Electronic submission could improve efficiency and eliminate a potential source of data error. An electronic program could also facilitate data analysis and trend-spotting that could be informative for compliance and enforcement.	NMED appreciates the STRONGER review team's recommendation regarding electronic submittal of permitting data. NMED is excited to report that we are currently developing an online air quality permit application (AQPA) system that will allow for electronic submittal of permitting data and anticipates being in full production in Spring 2020. While NMED is working expeditiously to role out the new online permit application, there is and will be an ongoing need for maintenance and enhancements to existing and new databases. NMED is continuously improving and upgrading technology in response to new and more complex federal reporting requirements, an increase in the number of facilities regulated, and an associated increase in the number of compliance report submittals that are required to be sent to NMED for processing and review. As a result, NMED is actively researching how to transition from old inefficient databases and technology to new and more sophisticated databases and software that can streamline the administrative and technical review of the thousands of compliance and stack test reports received each year. Additional resources to support that effort are needed to fulfill this transition, and support from stakeholders for those additional resources is paramount to transitioning NMED to new technologies. Similar to Permitting, the C&E Section has developed databases for online submittals of Title V annual and semi-annual compliance reports, excess emission reports, and stack testing reports. NMED agrees that these databases could be enhanced to assist in trend spotting and is working on those enhancements.

Recommendation 10.2.8*b* (AQB) As part of the NMED's efforts for coordination with EMNRD under Executive Order 2019-003, AQB should evaluate if opportunities exist to synchronize public participation with OCD in complementary regulatory processes.	NMED appreciates the STRONGER review team's recommendation for a robust public involvement process and to coordinate those efforts with OCD. NMED and EMNRD have held several joint public stakeholder outreach meetings over the last two months and we intend to continue to engage in joint public outreach efforts.
Recommendation 10.2.8*c* (AQB) The review team recommends that AQB evaluate if there are circumstances that could necessitate additional public notice requirements for sites under GCP and streamline permits, and NOI.	NMED greatly appreciates the STRONGER review team's recommendation for a robust public involvement process for sites covered under GCP and NOI. The Department will assess the opportunities for and value added by additional public outreach for these types of activities. Please note that NMED is committed to providing a robust public involvement process and strives to ensure that information be made available on the website and accessible to the public in a meaningful and valuable way. NMED has developed public involvement policies that go beyond the regulatorily mandated public outreach requirements to make a good faith effort in making information available and easily accessible. NMED offers the following additional explanation regarding GCP development that may be useful for the panel to consider. GCP are General Construction Permits issued by NMED for similar sources and equipment subject to similar state and federal regulatory requirements. GCPs require a very specific process for development with an extensive public outreach process. The regulations that govern GCP development contain a robust public involvement phase during the development of the permit and a separate public notice requirement prior to construction of individual sites. During the development of each GCP, public notices are sent to tribal, local, county, and city officials, industry trade groups, and environmental and public interest groups; several public meetings are held in locations around the state; notices are posted in newspapers

	announcing the public hearing as well as mailed and emailed to all stakeholder groups; and finally, a public hearing is held which may be attended by anyone from the public. Prior to constructing a new facility under a GCP, a legal notice must be published in a newspaper of general circulation and the public notice must be posted at the proposed site until the permit is either granted or denied. NMED would like to provide additional clarification regarding the process for approval of a NOI and the underlying regulatory purpose of such notifications. The NOI is a submittal to the Department of smaller sources that are not required to obtain an air quality permit. The purpose of the NMED review is to ensure that the facility's operations do not require an air quality permit to construct and operate. Note that virtually no facilities operating under a NOI are determined to require an air permit, either during the review of the notification or during the lifetime of the facility operations. Thus, NOI notifications have a different purpose than an air quality permit and may not necessarily warrant additional action beyond what is currently required by regulation.
<u>Recommendation 10.3.1*b* (AQB)</u> The review team recommends AQB consider including greenhouse gasses in the 2020 inventory as information about these emissions could assist AQB with their planning and analysis under Executive Order 2019-003. AQB should consider stakeholder input in determining the methodology for such an expansion of the inventory.	NMED appreciates the STRONGER review team's recommendation and the acknowledgement of the importance of an inventory of greenhouse gas emissions as part of the minor source inventory. NMED is reviewing the possibility of including greenhouse gases in the 2020 inventory and will likely require that those emissions be included. NMED has sent notices to all affected permittees, and several companies are beta testing the existing database for submittal. NMED welcomes feedback on the inventory effort.
<u>Recommendation 10.3.3*a* (AQB)</u> While AQB meets the criteria of this section of the Guidelines and the Bureau's	NMED thanks the STRONGER review team's recommendation that NMED review its existing monitoring network to determine if

monitoring network satisfies Federal requirements, given the rapid pace of oil and gas development in southeast New Mexico the review team recommends that AQB work with EPA to evaluate if additional monitoring may be beneficial in that portion of the state.	the current network is adequate. NMED would like to provide additional clarification regarding how air monitoring networks are authorized, how monitoring site locations and the number of monitors is determined, how specific pollutants are determined to be monitored, and the review and approval process for making changes to a State's monitoring network. NMED operates an extensive ambient air monitoring network to collect ambient air data to determine compliance with State and National Ambient Air Quality Standards. NMED has developed and operates the ambient air monitoring network in accordance with 40 CFR Part 58, Network Design Criteria for Ambient Air Quality Monitoring Appendix D, and Part 58.1 Subpart A General Provisions. The determination of the appropriate number of ambient air monitors in a particular area is based on population. For example, Ozone (O3) design criteria states: "State, and where appropriate, local agencies must operate O3 sites for various locations depending upon area size (in terms of population and geographic characteristics) and typical peak concentrations." Reviewing EPA's Metropolitan Statistical Area (MSA) guidance, New Mexico's Lea & Eddy Counties are within the MSA of 350,000 to < 4 million and, thus, NMED is required to have up to two O3 monitors within that MSA. NMED has two monitors within the MSA of Lea and Eddy counties, thereby satisfying the Federal requirement. NMED is confident in the adequacy of the current network and wants to assure the STRONGER review team that the current air monitoring network meets federal requirements for the appropriate location and number of monitors and for the specific pollutants that are monitored in the network. Thus, NMED finds that additional monitors are not required at this time. Absent a compelling scientific basis for additional

	monitors in the State, NMED does not support the recommendation for additional monitors. EPA reviews NMED's Annual Network Review Report and governing federal regulations and makes recommendations to the Report. EPA has approved the current Report and its current configuration. Deviations from current monitoring requirements and the network must be approved by the EPA Regional Administrator.
<u>Recommendation 10.3.3*b* (AQB)</u> AQB should consider a mobile monitoring lab to measure site-specific oil- and gas-related compounds and facilitate complaint response. While there are several potential options, the following mobile monitoring programs may be instructive: EPA National Enforcement Investigations Center's (NEIC) Geospatial Measurement of Air Pollution (GMAP) unit18; CDPHE's Colorado Air Monitoring Mobile Laboratory (CAMML)19; Colorado State University's (CSU) Mobile Plume Tracker20; and the University of Wyoming Department of Atmospheric Science's Mobile Research Laboratory.	NMED appreciates the STRONGER review team's recommendation to consider the use of mobile monitoring to measure oil and gas emissions. Currently, the only mobile monitoring equipment in use for the ambient air monitoring is used for emergency response. These mobile units are E-BAM (Environmental - Beta Attenuation Monitors) which are used to monitor particulate matter of either PM10 or PM2.5 and are typically used during wildfire events or controlled burns conducted by the Forest Service. NMED does not have mobile equipment that monitors air pollutants during or after an oil and gas emergency event but may consider this type of equipment in the future. NMED would need to consider a request for funding through a Federal EPA grant for mobile equipment, research the possible vendors for such equipment, including training, and also consider the labor and resources involved with the maintenance and operation of mobile monitoring equipment.

Appendix G – 2019 Edition STRONGER Guidelines

Guidelines for the Review of State Oil and Gas Environmental Regulatory Programs

2019 Edition

STATE REVIEW OF OIL AND NATURAL GAS ENVIRONMENTAL REGULATIONS, INC.
www.strongerinc.org

SECTION 1 | Introduction

1.1 Background

The 1980 amendments to the Resource Conservation and Recovery Act (RCRA) created an exemption to the federal hazardous waste program for oil and gas exploration and production (E&P) wastes pending completion of a study by the U.S. Environmental Protection Agency (EPA). In 1988, EPA completed its study and determined that these wastes should not be regulated as hazardous wastes. EPA's regulatory determination concluded that existing state and federal regulations were generally adequate, but that some regulatory gaps existed and that enforcement of existing regulations was inconsistent. EPA proposed a three-pronged approach to address these concerns that included working with the states to encourage improvement in state regulations and enforcement programs. Further discussion of the regulatory determination follows in section 1.2.

In 1989, the Interstate Oil and Gas Compact Commission ("IOGCC") responded by offering to assist EPA by creating a state regulatory review process. The IOGCC created the Council on Regulatory Needs, bringing together state, environmental, and industry representatives to develop national guidelines for state oil and gas programs. In early 1990, the Council released a document entitled "EPA/IOCC Study of State Regulation of Oil and Gas Exploration and Production Waste". This document established guidelines that represented recommended criteria for regulatory programs. The Council also proposed to implement a process by which state oil and gas programs were reviewed in comparison with those guidelines.

In 1990, EPA provided a grant to the IOGCC to initiate state regulatory program reviews in comparison with the guidelines. Review teams were comprised of state regulatory officials, environmental representatives, and industry representatives. Representatives of other interested parties, such as federal agencies and tribal governments, were invited to observe the process. State reviews were conducted in states that volunteered for review. Recommendations were offered as blueprints for change to be considered by state legislators and regulators.

The Council recommended that the guidelines be reviewed and updated every three years. In 1994, the Council updated the guidelines and added sections regarding naturally occurring radioactive material (NORM) and abandoned wells.

In 1999 a multi-stakeholder organization was formed by the state review program participants to revitalize and carry the state review program forward. This organization is called State Review of Oil and Natural Gas Environmental Regulations, Inc. ("STRONGER"). STRONGER is a non-profit corporation that has been formed to educate regulators and the public as to the appropriate elements of a state oil and gas exploration and production regulatory program, and to compare various state programs against the guidelines developed by STRONGER and for the protection of public health, safety and the environment.

In 1999, STRONGER established five committees to review and update the 1994 version of the Guidelines. STRONGER incorporated the consensus recommendations of the committees, including a new section on performance measures in the 2000 Guidelines update. STRONGER again initiated revision and updating of the Guidelines in 2004, which resulted in the 2005 Guidelines. The 2005 Guidelines incorporate spill prevention and performance measures into the administrative criteria section, and were expanded to include a new section on stormwater management.

In 2009 STRONGER formed a workgroup that developed guidelines for hydraulic fracturing that were finalized in 2010, and updated in 2013. STRONGER adopted guidelines for Air Quality in 2014, and updated the Air Quality Guidelines to address methane emissions in 2019. In 2015 STRONGER adopted guidelines for Reused & Recycled Fluids, as well as making minor updates to the General Criteria, Administration, Technical Criteria, NORM, and Hydraulic Fracturing sections. In 2017 STRONGER developed additional reused and recycled fluids guidance pertaining to pipelines used to transport produced water.

Since 1990, 40 initial, follow-up, and single-topic state reviews have been conducted against the guidelines criteria: 12 under the 1990 edition guidelines, 5 under the 1994 edition guidelines, 11 under the 2000 edition guidelines, 2 under the 2005 edition guidelines, 7 single-topic reviews on hydraulic fracturing, 2 single-topic reviews on air quality, and 1 follow-up review under the 2015 edition guidelines. These volunteer states represent over 94% of all domestic, onshore oil and gas production. These states have implemented many of the recommendations from their respective state reviews, as documented in STRONGER's report entitled "A Report and History on the STRONGER State Review Process" (June, 2015).

1.2 EPA's Regulatory Determination for E&P Waste

The 1980 amendments to the RCRA required EPA to conduct a study of the environmental and potential human health impacts associated with E&P wastes and their associated waste management practices. EPA completed its two-year study in 1987. Based on the findings in the Report to Congress, and on oral and written comments received during public hearings in the spring of 1988, on June 30, 1988, EPA decided not to recommend federal regulation of E&P wastes as hazardous wastes under Subtitle C of RCRA (EPA 1988). The Agency gave the following reasons for its determination:

a. "Subtitle C does not provide sufficient flexibility to consider costs and avoid the serious economic impacts that regulation would create for the industry's exploration and production operations;

b. "Existing state and federal regulatory programs are generally adequate for controlling oil, gas, and geothermal wastes. Regulatory gaps in the Clean Water Act and UIC (Underground Injection Control) program are already being addressed, and the remaining gaps in state and federal regulatory programs can be effectively addressed

by formulating requirements under Subtitle D of RCRA and by working with the States;

c. "Permitting delays would hinder new facilities, disrupting the search for new oil and gas deposits;

d. "Subtitle C regulation of these wastes could severely strain existing Subtitle C facility capacity;

e. "It is impractical and inefficient to implement Subtitle C for all or some of these wastes because of the disruption and, in some cases, duplication of state authorities that administer programs through organizational structures tailored to the oil and gas industry; and

f. "It is impractical and inefficient to implement Subtitle C for all or some of these wastes because of the permitting burden that the regulatory agencies would incur if even a small percentage of these sites were considered Treatment, Storage, and Disposal Facilities (TSDFs)." (53 FR 25456, July 6, 1988).

In the determination, EPA found that "existing state and federal regulations are generally adequate...Certain regulatory gaps do exist and enforcement of existing regulation in some states is inadequate." To address those concerns, EPA announced a three-pronged approach that consists of:

- "Improving federal programs under existing statutory authorities in RCRA Subtitle D, the Clean Water Act, and the Safe Drinking Water Act;
- "Working with states to encourage improvements in the states' regulations and enforcement of existing programs; and
- "Working with Congress to develop any additional statutory authority that may be required."

1.3 State and Federal Relations

Periodic evaluations of state and federal E&P waste management programs have proven useful in improving the effectiveness of those programs and increasing cooperation between federal and state regulatory agencies. Stakeholder review mechanisms have demonstrated the need for establishment of a performance baseline against which E&P waste management programs can be evaluated. Those mechanisms have led to the identification of strategies that will improve communication and program understanding between the states and the federal government.

1.3.1 Strategies for Maintaining a Successful Relationship Between State and Federal

Agencies

As stated in EPA's regulatory determination for E&P waste, "…existing state and federal regulations are generally adequate to control the management of oil and gas wastes. Certain regulatory gaps do exist, however, and enforcement of existing regulations in some states is inadequate." The key is that overall state programs are adequate, and have improved since 1990 through adoption of recommendations from reviews, information sharing among the states and self-initiated program improvements. To address remaining gaps and build upon the success of the state review program, the focus of future efforts should be to utilize information developed from the reviews already conducted, augmented by new information developed by the stakeholders, to improve the performance of state regulatory programs.

The stakeholders — oil and gas producing states, public interest representatives, and industry representatives — have identified ten related strategies that enhance state and federal relationships.

a. Commitment to Work Cooperatively. The states and federal agencies should maintain a commitment to work cooperatively to improve the design, implementation, and enforcement of state and federal programs for managing E&P wastes. State and federal agencies should take steps to encourage open communications among state and federal agencies, the regulated industry, and other interested parties pertaining to the management and regulation of E&P wastes.

b. Recognition of Different Priorities. States should recognize the interest of federal agencies in achieving national goals and objectives and assuring adherence to federal statutory and regulatory requirements. At the same time, federal agencies should recognize the authorities, responsibilities, and capabilities of states to regulate certain activities within their borders.

c. Recognition of Different Statutory Objectives. Several of the federal statutes governing protection of the environment (*e.g.,* RCRA, Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Clean Air Act (CAA)) provide for state implementation of certain elements with federal oversight. The objectives of and authorities granted by each statute differ. As such, it should be recognized that federal and state authorities and implementation approaches may differ.

d. Recognition of Regional Diversity. As discussed in the Report to Congress and the legislative history of the SDWA, variable approaches to the management of E&P wastes are necessary. These variable approaches are partly a result of the different geologic, hydrologic, or historic conditions in states and areas within a state, the diverse characteristics of oil and gas activities, and differences in state government structures among the producing states. Guidelines or criteria, whether issued by a federal agency such as EPA or as advocated by STRONGER, should be sufficiently flexible to permit states to take into account these varying conditions.

e. Baseline of Performance. The criteria adopted by STRONGER should be used by

federal or state agencies that are responsible for any portion of an E&P waste management program. These criteria should serve as a baseline of performance by which the effectiveness of programs can be judged. The criteria provide states flexibility to address unique conditions while accomplishing the goals set forth in Section 3.

f. State Responsibility for Enforcement. Enforcement is a critical component of a state E&P waste management program. Federal government involvement should occur only if the state agency fails to enforce the requirements or requests federal assistance.

g. State Program Review Process. The state program review process should continue to provide states with an independent evaluation of their E&P waste management programs using criteria adopted by the IOGCC and STRONGER.

h. Resolving Conflicts/Building Consensus. Where there are unresolved national issues or concerns regarding E&P waste management, a task force should be created which is similar in makeup and form to that established for the EPA's Office of Drinking Water Mid-Course Evaluation of Class II UIC programs. The creation of this task force would bring knowledgeable federal and state regulators together to discuss issues, to ascertain whether problems associated with these issues are real or perceived, and to decide how best to address the issues. This process should be based on the best available information and could be initiated by either the federal government or the states.

i. Effective Multi-Agency Coordination. Coordination among the state agencies is addressed in more detail in section 4.4. However, each state should recognize that coordination among various agencies is necessary for building and maintaining trust between the state agencies and the federal agency that has oversight responsibilities.

j. Technical and Financial Assistance. The federal government should provide technical and financial assistance to states to improve the design, implementation, and enforcement of state E&P waste management programs. Such assistance may be in the areas of training, enforcement, and data management.

SECTION 2 | Scope of the Criteria

2.1 General

a. These criteria are intended to guide states in assessing and improving their regulatory programs for E&P waste management, abandoned sites, naturally occurring radioactive materials (NORM), storm water management, hydraulic fracturing, air quality, and reused & recycled fluids. This document, therefore, sets out the elements of an effective program using "should" rather than the mandatory "shall", and “are encouraged to” for elements which are desirable, but which are not necessary for an effective program.

b. These criteria address waste management practices that are unique to E&P operations and wastes that were determined by EPA to be exempt from the hazardous waste management requirements of Subtitle C of RCRA. These narrowly defined wastes include drilling muds and cuttings, produced water and other wastes associated with E&P activities. The chemical and radiological characteristics of these wastes and the management practices associated with the storage, treatment, and disposal of these wastes are covered by these criteria. Wastes that are uniformly regulated by RCRA hazardous waste management requirements, as well as general industrial wastes such as solvents, off-specification chemicals, commercial products, household wastes, and office refuse are not addressed by these criteria.

c. These criteria apply to all new and currently operating E&P waste management facilities. In addition, the criteria in Section 6 apply to abandoned sites, the criteria in Section 7 apply to NORM, the criteria in Section 8 apply to storm water management, the criteria in Section 9 apply to hydraulic fracturing, the criteria in Section 10 apply to air quality, and the criteria in Section 11 apply to reused and recycled fluids.

d. These criteria do not address disposal of E&P wastes by injection or surface discharge when those waste management practices are regulated by EPA or by the states under authority of the federal SDWA and federal CWA, respectively. Brief descriptions of the regulatory frameworks authorized by those laws follow in Sections 2.2. and 2.3.

e. In addition to a review of provisions of the SDWA and CWA that are applicable to E&P wastes, this section also contains federal definitions of solid wastes and hazardous wastes and reviews EPA's waste mixture rule; lists examples of exempt and non-exempt E&P wastes; and describes general requirements for the management of non-exempt wastes. States may have different definitions for solid and hazardous wastes.

2.2 Class II Injection Wells

The SDWA is the primary federal statute that governs injection wells. The SDWA required the EPA to promulgate regulations to protect drinking water sources from contamination through underground injection, but directed the Agency not to prescribe requirements that

would impede oil and gas production. EPA established five classes of injection wells, categorized by purpose, potential for endangering drinking water, depth of injection, and characteristics of their injectate quality. Class II injection wells are broadly defined as related to oil and gas injection activities. Activities in this class relate to the disposal of fluids associated with oil and gas exploration and production, enhanced recovery operations, and the storage of liquid hydrocarbons.

Enhanced recovery describes all efforts to increase ultimate production of oil and gas from a reservoir, and this terminology will be considered to encompass other nomenclature in common usage such as pressure maintenance, secondary recovery, and tertiary recovery. All enhanced recovery techniques include methods for supplementing natural reservoir forces and energy, or otherwise increasing ultimate recovery. Such techniques include water injection, gas injection, gas cycling, and miscible chemicals and thermal processes.

Class II UIC programs are administered by the States where EPA has approved primary enforcement authority (primacy), or are directly implemented by EPA where the States have not sought or received approval for their UIC program. Amendments to the SDWA in 1980 further allowed a State with an existing regulatory program to obtain primary enforcement authority from EPA as long as the State was able to demonstrate that its program was effective in protecting underground sources of drinking water (USDWs), rather than adopting the complete set of Federal requirements. States with UIC program primacy receive federal funding for program implementation.

In general, EPA determines which fluids may be injected into Class II wells in direct implementation UIC programs. Primacy States follow their EPA-approved primacy agreements in ascertaining whether specific fluids are qualified for injection into their Class II wells.

Among the minimum requirements for Class II wells are:

a. Only approved fluids may be injected,

b. No injection may endanger a USDW,

c. No well may be used for injection without a permit, unless authorized by rule.

d. All injection wells must demonstrate mechanical integrity at least once every 5 years.

2.3 NPDES-Permitted Discharges

All point-source discharges of pollutants to surface waters of the United States must comply with the requirements of permits issued under the National Pollutant Discharge Elimination System (NPDES). The NPDES program is administered by EPA under the authority of the federal CWA or by the states through programs delegated by EPA. NPDES permits establish effluent limitations and monitoring requirements for discharges.

Effluent limits are based upon the more stringent of levels which can be achieved through the use of available technology, and levels necessary to meet EPA-approved state water quality standards.

The CWA requires NPDES permits for E&P waste discharges to surface water. Currently, effluent guidelines prevent most discharge to surface waters except the following categories:

a. Discharges to certain coastal areas;

b. Discharges of low-salinity produced waters which are of beneficial use in arid regions west of the 98th meridian; and

c. Discharges from stripper oil wells in certain areas.

2.4 Federal Definition of Solid Waste

a. In simplest terms, a solid waste is any material that is discarded or intended to be discarded. According to RCRA, solid wastes may be solid, semi-solid, liquid, or contained gaseous material. Commercial products are not solid wastes unless, and until, they are discarded. Commercial products and their releases may also be regulated under other statutes such as the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Toxic Substances Control Act (TSCA), Superfund Amendments and Reauthorization Act (SARA), and the Occupational Safety and Health Act (OSHA).

b. EPA has also determined that produced water injected for enhanced recovery is not a waste for purposes of RCRA Subtitle C or D, since produced water used in enhanced recovery is beneficially recycled and is an integral part of some crude oil and natural gas production processes.

2.5 Hazardous Waste

Under RCRA, a solid waste may be designated as hazardous waste if it is specifically listed as a hazardous waste or if it exhibits one or more of the characteristics of hazardous wastes. (See 40 CFR 261).

2.5.1 Listed Hazardous Waste

a. EPA has listed numerous types or classes of solid wastes as hazardous waste because they typically exhibit one or more of the characteristics of hazardous waste, or have been shown to exceed certain human toxicity criteria, or contain any one of the chemical compounds or substances that are listed as hazardous constituents. (see 40 CFR 261 APP VIII.)

b. EPA's regulations contain four lists of hazardous wastes: 1) hazardous waste from non-specific sources; 2) hazardous waste from specific sources; 3) commercial chemical products that become acutely hazardous waste when disposed; and 4) commercial chemical products that become toxic wastes when disposed.

2.5.2 Characteristically Hazardous Waste

a. EPA considers any solid waste to be a hazardous waste if it exhibits any one of the characteristics of ignitability, corrosivity, reactivity, or toxicity.

b. The toxicity characteristic is determined by the toxicity characteristic leaching procedure (TCLP). The list of constituents includes eight heavy metals and thirty-two organic compounds

2.6 EPA's Identification of Exempt Exploration and Production Wastes

The list below identifies many, but not all, exempt wastes. In general, E&P exempt wastes are generated in "primary field operations" and are unique or intrinsic to exploration and production activities (e.g., drilling for, producing, and purifying crude oil and natural gas), and not as a result of maintenance or transportation activities.

All wastes generated in transportation and refining are non-exempt. EPA's regulatory determination for E&P wastes (see 53 FR 25453, July 6, 1988) found that the following wastes are exempt from RCRA hazardous waste management requirements:

- "Produced water;
- "Drilling fluids;
- "Drill cuttings;
- "Rig wash;
- "Drilling fluids and cuttings from offshore operations disposed of onshore;
- "Well completion, treatment, and stimulation fluids;
- "Basic sediment and water, and other tank bottoms from storage facilities that hold product and exempt waste;
- "Accumulated materials such as hydrocarbons, solids, sand, and emulsion from production separators, fluid treating vessels, and production impoundments;
- "Pit sludges and contaminated bottoms from storage or disposal of exempt wastes;

- "Workover wastes;
- "Gas plant sweetening wastes for sulfur removal, including amine, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge;
- "Cooling tower blowdown;
- "Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste stream);
- "Packing fluids;
- "Produced sand;
- "Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation;
- "Hydrocarbon-bearing soil;
- "Pigging wastes from gathering lines;
- "Wastes from subsurface gas storage and retrieval, except for the listed non-exempt wastes;
- "Constituents removed from produced water before it is injected or otherwise disposed of;
- "Liquid hydrocarbons removed from the production stream but not from oil refining;
- "Gases removed from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons;
- "Materials ejected from a producing well during the process known as blowdown;
- "Waste crude oil from primary field operations and production; and
- "Light organics volatilized from exempt wastes in reserve pits or impoundments or production equipment."

On March 22, 1993, EPA provided "clarification" regarding the scope of the E&P waste exemption. (see 58 FR 15284-15287.) EPA clarified the concept of primary field operations for crude oil and natural gas production. To fall under the scope of the exemption, an E&P waste must be generated in primary field operations and be unique or intrinsic to the production process. In addition, EPA stated that certain waste streams generated by oil and gas service companies may be "uniquely associated" with primary

field operations and as such are within the scope of the RCRA Subtitle C exemption. EPA further clarified that an exempt waste remains exempt regardless of the waste's custody transfer, and that the residual waste from the treatment of an exempt waste remains exempt (e.g., residual sediment and water from crude oil reclamation from exempt tank bottoms). EPA's clarification cautioned, however, that exempt crude oil reclamation and service-company wastes may not remain exempt if they are mixed with non-exempt materials or wastes. States should carefully review EPA's clarification along with EPA publication EPA530-K-01-004 (October 2002). (found at http://www.epa.gov/epaoswer/other/oil/oil-gas.pdf). EPA periodically issues interpretive letters regarding the oil and gas exemption. One such letter was issued in November 1993 and is referred to in EPA publication EPA530-K-01-004.

2.7 EPA's Identification of Non-exempt Exploration and Production Wastes

Non-exempt wastes include wastes that are not unique to E&P and wastes generated by transportation (pipeline and trucking) and service activities. While the following wastes are non-exempt, their regulatory status as "hazardous wastes" is dependent upon whether they are listed as hazardous waste or they exhibit a hazardous waste characteristic. Non-exempt wastes should be managed as described under Section 2.8. EPA's 1988 regulatory determination lists the following wastes as non-exempt:

- "Unused fracturing fluids or acids;
- "Gas plant cooling tower cleaning wastes;
- "Painting wastes;
- "Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids;
- "Vacuum truck and drum rinsate from trucks and drums transporting or containing non-exempt waste;
- "Refinery wastes;
- "Liquid and solid wastes generated by crude oil and tank bottom reclaimers;
- "Used equipment lubrication oils;
- "Waste compressor oil, filters, and blowdown;
- "Used hydraulic fluids;
- "Waste solvents;

- "Waste in transportation pipeline-related pits;
- "Caustic or acid cleaners;
- "Boiler cleaning wastes;
- "Boiler refractory bricks;
- "Incinerator ash;
- "Laboratory wastes;
- "Sanitary wastes;
- "Pesticide wastes;
- "Radioactive tracer wastes; and Drums, insulation, and miscellaneous solids."

EPA did not specifically address, in its 1988 regulatory determination, the status of hydrocarbon-bearing material that is recycled or reclaimed by re-injection into a crude stream. However, under existing EPA regulations, recycled oil, even if it were otherwise hazardous, could be reintroduced into the crude steam, if it is from normal operations and is to be refined along with normal process streams at a petroleum refinery facility. Regulations addressing an exclusion for used oil are at 40 C.F.R 261.6(a)(4), and regulations addressing an exclusion for recovered oil are at 40 C.F.R. 261.4(a)(12) as revised.

2.8 Requirements for Non-exempt Wastes

a. EPA's hazardous waste regulations require that a hazardous waste determination be made for any non-exempt E&P waste. The determination may find the non-exempt waste either to be listed as a hazardous waste or to exhibit a hazardous waste characteristic. If a non-exempt waste is found not to be listed as a hazardous waste or not to exhibit a hazardous waste characteristic, it is a non-exempt non-hazardous waste.

b.If a non-exempt waste is not a listed hazardous waste, it should be tested whenever there is reason to believe it may exhibit one or more of the hazardous waste characteristics. Alternatively, a hazardous waste determination may be made based on knowledge of the process by which the waste is produced. Although there is no requirement that a non-exempt waste be tested to determine if it is hazardous, civil and criminal penalties may be imposed if the waste is not managed in a safe manner and according to regulations.

c. Depending on the actual hazardous waste quantity generated and accumulated on-site, RCRA hazardous waste management standards for generators may apply.

Additionally, treatment, storage, or disposal activities on-site may be subject to more stringent RCRA Subtitle C requirements, such as permitting and corrective action.

d. Non-exempt waste should also be segregated whenever possible from exempt waste. If the non-exempt waste was a listed hazardous waste, its mixture with an exempt waste could make the entire commingled waste stream subject to stringent RCRA Subtitle C requirements, including the requirement that the waste be disposed at a hazardous waste facility. When segregation is not practical, the non-exempt waste should be examined closely to assure that it is not a hazardous waste. See Section 2.9 for additional discussion of waste mixtures.

e. Some states have adopted hazardous waste regulations and have obtained authority from EPA to administer the federal hazardous waste regulations. Those state programs' regulations may differ from those that EPA has promulgated; however, by law, the states' regulations must be at least as stringent as the federal programs.

2.9 Waste Mixtures

EPA's RCRA regulations provide that the commingling of any listed hazardous waste with a non-hazardous waste generally renders the entire mixture a hazardous waste. The intent of this mixture rule is to prevent avoidance of hazardous waste regulations through dilution. For example, discarding a listed hazardous waste (e.g., a half-empty container of a listed solvent) in a reserve pit could cause the otherwise exempt pit contents to become a hazardous waste and result in the expensive closing of the reserve pit under RCRA hazardous waste regulations. Likewise, the mixing of a characteristic hazardous waste with an exempt waste could render the entire mixture a hazardous waste. Also, in those cases where the mixture is no longer considered a hazardous waste, the process of rendering the hazardous waste non-hazardous could be considered treatment of a hazardous waste and RCRA Subtitle C would apply.

Unused commercial products are not exempt wastes when disposed and, if hazardous (or potentially hazardous), should not be disposed with exempt E&P waste. All reasonable efforts should be made to completely use commercial products, return them to their vendor if they are not fully used, or segregate them from other waste for management and disposal.

SECTION 3 | General Criteria

3.1 General

An effective program for the regulation of E&P activities should include, at a minimum:

a. Statutory authority that adequately details the powers and duties of the regulatory body;

b. Statutory authority to promulgate appropriate rules and regulations;

c. Statutes and implementing regulations which adequately define necessary terminology;

d. Provisions to adequately fund and staff the program;

e. Mechanisms for coordination among the public, government agencies, and regulated industry; and

f. Technical criteria for E&P environmental management practices.

3.2 Goals

An effective state program should contain a clear statement of the program's goals and objectives. Such goals should include, at a minimum, protecting human health and the environment from the mismanagement of E&P activities while recognizing the need for an economically viable oil and gas industry. When establishing regulations and policies for E&P waste management, states should use the waste management hierarchy set forth in Section 5.3 to encourage waste minimization and source reduction.

3.3 State/Regional Variations in Criteria

These criteria are intended to provide guidance to the states in the formulation, development, and evaluation of oil and gas environmental regulatory programs. Fundamental differences exist from state to state, and within regions within a state in terms of climate, meteorological patterns, air quality compliance status, hydrology, geology, economics, and method of operation, which may impact on the manner in which oil and gas exploration, development, and production is performed. State oil and gas programs can and should vary from state to state and within portions of a state. The process by which these criteria are incorporated into state programs is a function of, and within the discretion of, the responsible state agency. It is recognized that state programs must vary in order to accommodate differences in climate, hydrology, geology, economics, and method of operation or to accommodate individual differences in state administrative procedures or law. Furthermore, in some instances, in order to accommodate regional, area-wide, or individual differences within a state, it is appropriate for site-specific waivers or variances to be allowed for good cause shown. All such variations should be consistent

with the goals of Section 3.2.

SECTION 4 | Administrative Criteria

4.1 Basic Requirements

Various federal regulations applicable to the delegation to states of federal environmental programs provide a useful framework for the development of criteria for an effective state program. Environmental regulatory programs for E&P activities should, at a minimum, include provisions for permitting, compliance evaluation, and enforcement.

4.1.1 Permitting

A state should have a regulatory mechanism to assure that E&P activities are conducted in an environmentally responsible manner. A program to achieve that objective may rely on one or more mechanisms, including issuance of individual permits, issuance of permits by rule, establishment of regulatory requirements by rule, issuance of general permits, registration of facilities, and/or notification of certain activities undertaken pursuant to general regulations. State agencies should have authority to refuse to issue or reissue permits or authorizations if the applicant has outstanding, finally determined violations or unpaid penalties, or if a history of past violations demonstrates the applicant's unwillingness or inability to comply with permit requirements. Where the operator responsible for E&P activities changes, state requirements should address the new operator's financial responsibility and compliance history. An effective state program should provide that a state permit does not relieve the operator of the obligation to comply with federal, local, or other state permits or regulatory requirements.

Individual permits for specific facilities or operations should be issued for fixed terms. In the case of commercial or centralized facilities, permits generally should be reviewed and revised, if necessary, no less frequently than every five years. Where two or more regulatory programs mandate similar requirements, those requirements should be combined where feasible. The process for obtaining permits and other authorizations should also involve prompt consideration and response to applications while preserving the integrity of the permit review process, including appropriate public participation. For the purposes of these guidelines, the terms "license" or "licensing" as used in Section 7 of these guidelines, criteria for the management of E&P NORM, will be synonymous with the terms "permit" or "permitting" as they are used throughout these guidelines.

4.1.2 Compliance Evaluation

4.1.2.1

State programs should contain the following compliance evaluation capabilities:

a. Procedures for the receipt, evaluation, retention, and investigation for possible enforcement action of all notices and reports required of permittees and other regulated persons. Investigation for possible enforcement action should include determination of

failure to submit these notices and reports. Effective data management systems as prescribed in Section 4.2.7. can be used to track compliance.

b. Inspection and surveillance procedures that are independent of information supplied by regulated persons and which allow the state to determine compliance with program requirements, including:

   i. The capability to conduct comprehensive investigations of facilities and activities subject to regulation in order to identify a failure to comply with program requirements by responsible persons;

   ii. The capability to conduct regular inspections of regulated facilities and activities at a frequency that is commensurate with the risk to the environment that is presented by each facility or activity; and

   iii. The authority to investigate information obtained regarding violations of applicable program and permit requirements.

c. Procedures to receive and evaluate information submitted by the public about alleged violations and to encourage the public to report perceived violations. Such procedures should not only involve communications with the public to apprise it of the process to be followed in filing reports or complaints, but should also communicate how the state agency will assure an appropriate and timely response.

d. Authority to conduct unannounced inspections of any regulated site or premises where E&P activities are being conducted, including the authority to inspect, sample, monitor, or otherwise investigate compliance with permit conditions and other program requirements.

e. Authority to enter locations where records are kept during reasonable hours for purposes of copying and inspecting such records.

f. Investigatory procedures that will produce a paper trail to support evidence which may be admitted in any enforcement proceeding brought against an alleged violator, including clear inspection and inspection reporting procedures.

4.1.3 Enforcement

4.1.3.1

With respect to violations of the state program, the state agency should have effective enforcement tools, which may include the following actions[1]:

[1] *In some states, enforcement remedies include authorities to cause cessation of production or transportation of product, and/or seizure of illegal product.*

a. Issue a notice of violation with a compliance schedule;

b. Restrain, immediately and effectively, any person by order or by suit in state court from engaging in any impending or continuing unauthorized activity which is causing or may cause damage to public health or the environment;

c. Establish the identity of emergency conditions which pose an imminent and substantial human health or environmental hazard that would warrant entry and immediate corrective action by the state agency after reasonable efforts to notify the operator have failed;

d. Sue or cause suit to be brought in courts of competent jurisdiction to enjoin any impending or continuing violation of any program requirement, including any permit condition, without the necessity of a prior revocation of the permit;

e. Require, by administrative order or suit in state court, that appropriate action be undertaken to correct any harm to public health and the environment that may have resulted from a violation of any program requirement, including, but not limited to, establishment of compliance schedules;

f. Revoke, modify, or suspend any permit upon a determination by the state agency that the permittee has violated the terms and conditions of the permit, failed to pay an assessed penalty, or used false or misleading information or fraud to obtain the permit; or

g. Assess administrative penalties or seek, in court, civil penalties or criminal sanctions including fines and/or imprisonment.

h. Forfeiture of financial assurance instruments.

4.1.3.2

States should develop guidance for calculations of penalties that include factors such as the economic benefit resulting from the violation, willfulness, harm to the environment and the public, harm to wildlife, fish or aquatic life or their habitat, expenses incurred by the state in removing, correcting or terminating the effects of the unauthorized activity, conservation of the resource, timeliness of corrective action, notification of appropriate authority, and history of violations. Benefits of guidance for calculation of penalties include consistency in the assessment of penalties and development of readily defensible assessments. Penalties should be such that an operator does not benefit financially from unlawful conduct, and should provide compliance incentive to other operators. States should evaluate their enforcement options and policies to assure that the full range of actions available are effectively used.

4.1.3.3

The right to appeal or seek administrative and/or judicial review of agency action should be

available to any person having an interest which is or may be adversely affected, or who is aggrieved by any such action.

4.2 Additional Program Requirements

Beyond basic requirements, an effective state program should also include a variety of other administrative requirements as discussed below.

4.2.1 Contingency Planning and Spill Risk Management

4.2.1.1 State Contingency Program

a. The state should develop and adopt a state contingency program for preventing and responding to spills and unauthorized releases to land, water, or air from E&P facilities. The state program need not duplicate applicable federal regulations for contingency planning and spill risk management. The state's contingency program may include a state contingency plan, or may consist of a set of regulations or operator contingency plan requirements. The program should define the volume of a spill or release of a petroleum product or waste and the level of risk to various receiving environments that triggers implementation of the spill contingency plan and response requirements.

b. The state contingency program should also contain funding provisions which enable the state agency to undertake immediate response actions for significant spills or releases which constitute a threat to human health or the environment in the event that a responsible operator cannot be located or is unwilling or unable to respond to the spill or release in a timely manner.

4.2.1.2 Reporting capabilities

The state should provide mechanisms for operators or the public to report spills and unauthorized releases. These mechanisms should include telephone access 24 hours a day, 7days a week. A single point of contact 1-800 telephone number should be considered. Telephone answering capabilities should include provisions for the prompt notification of appropriate state agency personnel.

4.2.1.3 Interagency coordination

The state should provide for coordination of actions between appropriate agencies that have jurisdiction for the management of risks from spills and unauthorized releases from E&P facilities. This includes clear designation of onsite spill responsibilities.

4.2.1.4 Operator Prevention of, and Response to, Spills and Releases

The state agency should require an operator to take measures to prevent, and prepare to

respond to, spills or unauthorized releases of petroleum products or waste that may occur at an E&P facility. These requirements can be spelled out in regulations or guidance, or they may be included in operator-specific or site-specific plans.

4.2.1.4.1 General

a. State contingency programs should address the following:

i. E&P facilities, equipment at those facilities, and materials found at E&P sites that may pose a significant threat to human health and/or the environment;

ii. The various types of receiving environments, including water (surface and groundwater) and land (environmentally sensitive areas, special soil or geological conditions, urban areas, cultural and special resource areas); and

iii. Public and responder safety concerns, including training for response personnel.

b. The state program should require the operator to identify the following:

i. The operator's incident command structure, including emergency contact information for key personnel.

ii. Equipment, manpower, contracted services, and other logistical support necessary for response to spills and unauthorized releases.

iii. Opportunities for coordination of joint response actions, manpower or equipment, with nearby well sites or other facilities of the operator or other operators.

iv. Procedures for identification of and communication with parties impacted or threatened by spills or unauthorized releases.

v. Acceptable methods of containment of spills and unauthorized releases.

vi. Acceptable disposal methods, such as on-site remediation, approved disposal facilities, and waste haulers, for materials of concern.

c. The State program should require responder training to assure that personnel are prepared to respond efficiently and effectively.

4.2.1.4.2 Prevention measures

Where spills and unauthorized releases pose a significant risk to human health and/or the environment, the State should require prevention measures that may include:

a. Secondary containment such as dikes, berms and firewalls, or equivalent measures.

b. Tertiary containment and/or monitoring systems in high-risk areas.

c. Inspection, testing, and maintenance schedules and procedures for facilities and equipment.

d. Site security measures as necessary.

e. Periodic review of spill histories to identify opportunities to reduce future spills and unauthorized releases.

4.2.1.4.3 Response Measures

a. A State program should include reporting and notification procedures to be used in the event of a spill or unauthorized release. These should include:

i. Agencies and parties to be notified with contact information.

ii. The type of reporting (verbal, written) required for various incidents.

iii. Reporting time requirements.

iv. Reporting thresholds.

v. Operator reporting information, such as the name of the operator and the operator's representative reporting the incident; a description of the incident, including the date and time of the incident and its discovery; the type and volume of material released; the location of the incident; the apparent extent of the release; damage or threat to groundwater, surface water, land, and/or air; and weather conditions.

b. States should provide guidance for containment, abatement, and remediation, including:

i. Cleanup standards;

ii. Required sampling and analyses; and

iii. Where appropriate, approved non-mechanical response actions, such as the use of dispersants and in-situ remediation, including identification of the agencies that must provide approval of these operations.

c. The state should specify any requirements for final reporting, site monitoring, and necessary agency approvals. Any final report required should identify the cause of the incident and actions taken to prevent or minimize the likelihood of a recurrence.

4.2.1.5 Follow-up actions

The state program should provide for enforcement, as described in Section 4.1.3. of these Guidelines, for the failure of an operator to report or respond to spills and unauthorized releases as required. The state program should also consider provisions for the assessment of damages caused by an incident. A state program should contain provisions allowing the state to pursue a responsible operator for reimbursement of state monies expended in responding to such a spill or release.

4.2.1.6 Database

The state data management program, as described in Section 4.2.7. of these Guidelines, should include information on spills and unauthorized releases. This data should be analyzed periodically as part of a program effectiveness evaluation as described in Section 4.2.3, Program Planning and Evaluation, of these Guidelines.

4.2.2 Public Participation

4.2.2.1 Notice and Records

State program legislation or regulations should require that the affected public be provided with adequate notice of the agency's intention to issue a permit or license that addresses E&P activities. The public should be provided with an appropriate opportunity to comment on a permit or license prior to issuance. Wherever possible, this notice should be coordinated with the notice requirements of other concurrently applicable state or federal programs. For commercial or centralized disposal facilities, the operator should also be required to provide written notice to adjacent landowners of record for such area and in such manner as may be prescribed by the state agency.

Agency records related to this program should generally be available for review by the public. Such records are to include waste disposal and pit locations and any required analytical data. Where information submitted by an operator is of a "confidential business" nature, an agency should have procedures for segregating that information and protecting it from disclosure. In all cases, spill and violation records should be available to the public. Agencies should establish a minimum record keeping time period of three years that should be automatically extended while any unresolved enforcement action regarding the regulated activity is pending.

4.2.2.2 Program Information

States should provide for the dissemination of program information to the regulated industry and the public. Such educational materials should include information or guidance on contingency planning, spill response, permitting, operating, monitoring and other requirements. Such efforts should be part of an ongoing process through which information is exchanged in an open forum. Because E&P environmental requirements are undergoing numerous changes, states have the obligation to inform the regulated industry and the public of changes. Industry associations and other organizations may

provide a convenient and effective mechanism for dissemination of information. States should actively make use of seminars, newsletters, special mailings, association committees, incentive programs and other mechanisms.

4.2.2.3 Advisory Groups

States should use advisory groups of industry, government, and public representatives, or other similar mechanisms, to obtain input and feedback on the effectiveness of state programs for the regulation of E&P activities. Provision should be made for education or training as is appropriate to give such advisory groups a sound basis for providing input and feedback.

4.2.3 Program Planning and Evaluation

4.2.3.1 Program Planning

States should have a sound regulatory development process which includes both short-term and long-term strategic planning for defining goals and objectives, setting priorities, and evaluating the clarity, efficiency, and effectiveness of the E&P environmental regulatory program. In formulating environmental regulatory programs, states should use the best available scientific and technical information and should consider the environmental, economic and energy impacts of the regulations.

4.2.3.2 Program Evaluation

a. General

Beyond the general, technical and administrative criteria set forth elsewhere in this guidance document, a program for the regulation of E&P activities should evaluate how well the program protects human health and the environment while recognizing the need for an economically viable oil and gas industry.

Program evaluation measures may be of a wide variety and include positive indicators (what's working) as well as negative indicators (what's not working). Some administrative aspects of program performance can be evaluated by examining how well the program enables the industry, the public, and the regulators themselves to function. Environmental aspects can be evaluated by assessing some combination of preventive measures, the qualities and characteristics of E&P wastes the severity of impact from a spill or unauthorized release, and the timeliness of remediation. While it is important for the program to have adequate rules, performance evaluation indicates to what extent the implementation of a rule or practice of the program brings about environmental protection.

Although a formal evaluation of program performance might occur at periodic intervals, the monitoring of activities and the modifications to the program form an ongoing, cyclic

process as outlined in Figure 4.1. The process has no specific beginning or ending point. Rather, the steps in the process form a continuous progression that should be examined during performance review.

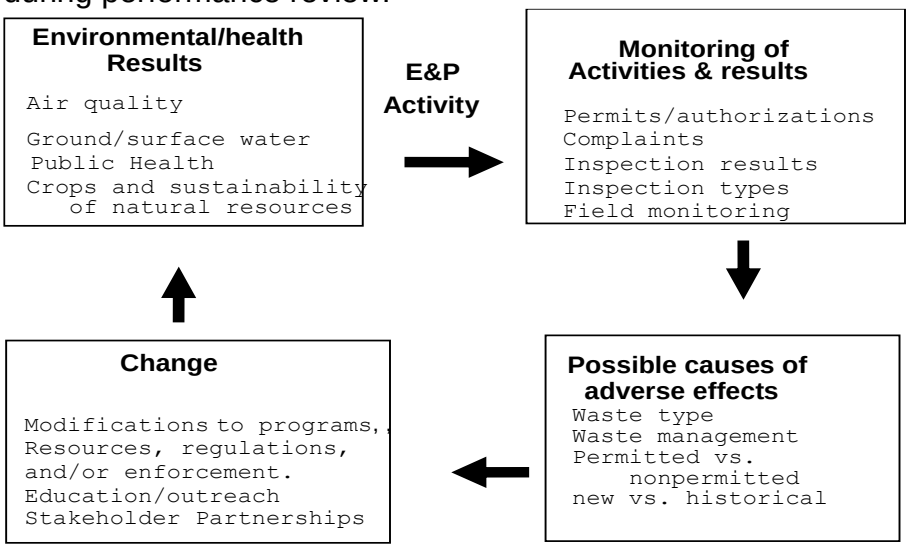


Figure 4.1. Performance review cycle.

A state should select parameters that are appropriate for use in measuring the effectiveness of its E&P regulatory program. Documentation of the selected parameters and the ability to acquire, assess, and present the relevant data are critically important to evaluation of performance. This requires establishing a definition of the parameters being evaluated and specifying the technical measurements to be made or the technical data to be examined. In addition, it requires installation and use of a data management system that facilitates review and evaluation. Program performance should be evaluated periodically, using measures that can be applied consistently from one evaluation period to another, although the measures may evolve and improve in time. If a database of releases, regulatory activities, remediation sites, or other information is used for performance evaluation, it should, if possible, extend backward in time so as to enable a measure of progress on historical problems.

b. Qualities of Performance Measures

In evaluating its performance, a program should have data management capabilities to enable assessment of program effectiveness and timeliness. Evaluation measures should:

- be quantitative, whenever possible;
- allow consistent evaluation across time;
- be available to program personnel, the industry, and the public;
- document significant trends;

- summarize an evaluation of the nature and extent of contamination [Section 5.2], abandoned wastes, and abandoned facilities [Section 6] as they occur across the state; NORM [Section 7], stormwater management [Section 8], hydraulic fracturing [Section 9], air quality [Section 10], and reused & recycled fluids [Section 11].

- include identification and priority of outstanding environmental threats, so as to aid the program in targeting its efforts;

- enable evaluation of whether the program's responses to violations encourage compliance.

Evaluation of performance may include, as an example:

- Contamination: the state-wide nature and extent of environmental contamination by E&P wastes;

- Trends: whether the extent of contamination by E&P wastes is increasing or decreasing, and the reasons why;

- Prevention: the effectiveness of the program's efforts in preventing releases of E&P wastes to the environment;

- Timeliness: the timeliness of agency actions in controlling the impacts of E&P wastes released to the environment;

- Abatement: the effectiveness of agency actions in abating pollution by E&P wastes, or in causing pollution to be abated; and

- Enforcement: the effectiveness of the agency's administrative controls in the prevention or abatement of pollution by E&P wastes [Section 4.1].

c. Examples of program evaluation

i. Assessment of impacts

A state could identify documented cases that demonstrate reasonably clear links of cause and effect between operational practices and resulting environmental impacts. Such impacts might be human health effects, ecological effects, effects on wildlife or livestock, or effects on natural resources.

From examination of documented cases, a state could determine whether those cases were the result of violations of existing program requirements, insufficient programmatic enforcement of the requirements, other causes, or whether the cases suggest that the requirements should be revised.

A case could be documented if impacts are found to exist as part of the findings of a scientific study. Such studies could be formal investigations supporting litigation

or a state enforcement action, or they could be the results of technical tests (such as monitoring of wells) if such tests (a) were conducted with state-approved quality control procedures, and (b) revealed contamination levels in excess of an applicable state or federal standard or guideline (such as a drinking water standard or water quality criteria).

Possible impact indicators might be:

- The area or other measure of contaminated or affected ground or surface water, tracked periodically over time.

- A histogram of the number of releases versus time, amount of produced resource and number of wells in the state. Releases might be grouped by material released, such as crude oil, produced water, etc.

- A histogram of the number of releases of a given material versus the approved time to completion of remediation.

- The time elapsed between an agency's receipt of a remediation proposal or related correspondence, and the agency's response to that proposal or correspondence.

ii. Analysis of activities and results

Activity and results analysis comprises administrative measures of program goals, plans, and operations. These measures focus on prevention of pollution, efficiency of operations, priorities, and the allocation of resources within the program.

The following are examples of activities:

- The development of a strategic plan with goals, milestones, and establishment of priorities [Sections 3.2, 4.2.3]. The plan should be based on anticipated threats and/or known impacts, as well as budget and administrative factors that may be beyond the control of the agency.

- The development of a program promoting use of the waste management hierarchy [Section 5.3].

- A review of the number of stream miles listed as impaired by oil and gas activities in the state biennial Integrated Water Quality Monitoring and Assessment Report required under Sections 305(b) and 303(d) of the federal Clean Water Act.

- An evaluation of the number of wells abandoned without being properly plugged compared to levels of financial assurance or other program measures to address orphan wells.

- Evaluation of the results of surveys to determine the satisfaction of permit recipients and other customers with program implementation.

- The development of a program, including time and activity tracking, to conduct efficiency studies of average time to issue permits, conduct inspections and perform other required activities.

- A documented process for obtaining input from within the agency, from the public, and/or from an advisory group for identification of program strengths and deficiencies [Section 4.2.2.3].

- Evaluation of the results of a training, educational, or outreach program [Section 4.2.2].

- Evaluation of the effectiveness of the agency's enforcement program. [Sections 4.1.2, 4.1.3, 4.2.1.2].

The following are examples of results:

- The number of inspections by the agency.

- The number, type and causes of spills, accidents and safety incidents reported to the agency.

- The number of operations witnessed by the agency.

- The number, type, frequency and cause of violations detected by inspectors [Section 4.1.2].

- The number, type, frequency and cause of complaints by the public, and the time required to resolve those complaints [Section 4.2.2.1].

- The number of violations, the time to resolve those violations, and the number unresolved [Section 4.1.2].

- The number of actions going to hearing, enforcement, and/or fines [Section 4.1.3].

d. Baselines and Follow-up

A state agency should regularly evaluate its effectiveness in attaining the goals set forth in Section 3.2 in a way that will create a baseline against which to compare the program's performance in the future.

A state agency is encouraged to conduct periodic self-assessments in addition to the assessments conducted in the State Review Process. These self-assessments should

document successes and should identify areas for improvement. This will allow continual improvement of a state's program while recording its successes

The utilization of performance evaluations and a continual improvement process will demonstrate the state's efforts to adapt to changes in technology, concerns of the public and regulated community, and to provide both for the documentation of successes and identification of areas requiring improvement.

4.2.4 Financial Assurance

All states should have an adequate financial assurance program to provide resources to the state to close or remediate a site should an operator fail to meet its obligations under the law. The goal of any financial assurance program should be to avoid passing on the responsibility for closure and remediation costs to the citizens of the state. An adequate financial assurance program should be supported by the following elements: frequent site inspections; strict permit enforcement; and appropriate regulations governing and monitoring "inactive status" of covered facilities.

States should identify activities such as closure and remediation and other relevant activities for which criteria have been set forth in Section 5 that need to be covered by financial assurance. Some states require financial assurance for inactive wells, some for drilling and/or plugging, some for waste disposal facilities, and some for the life of the well.

States should determine the types of financial assurances that will provide reliable monetary resources to the state and will facilitate an operator's compliance with permit requirements. Types of financial assurance include surety bonds; self-bonding; letters of credit; certificates of deposit; cash, federal, state, or municipal bonds; and other forms of collateral. Some states require performance bonds and some states require penal bonds. Some states accept a nonrefundable fee to be paid into the well plugging fund in lieu of a bond. Some states allow phased payments of collateral into a fund so that small operators can develop a collateral bond over a specified period of time. States should develop financial assurance options that facilitate an operator's compliance with bonding requirements. In addition to single well bonds, many states allow blanket bonds. This allows operators to assure that an established minimum level of financial assurance is provided without the commitment of an unnecessary amount of operating funds.

States should periodically review the amount of assurance required to determine if the amount is adequate to provide incentive for proper plugging of a well and reclamation of a site, and to assure proper management of E&P wastes.

In the case of commercial and centralized facilities as defined in Section 5.10, including those that manage E&P NORM, state financial assurance requirements should be sufficient to cover the costs of appropriate facility decontamination, reclamation, and closure, and should extend through any post-closure care, monitoring, or control period. (see Section 5.10.2.2.e.)

States should develop appropriate procedures to access an operator's financial assurance

when the operator does not meet the obligations covered by the financial assurance. These procedures should include provisions for notice, hearings, and forfeiture.

Some states have special funds, such as well-plugging funds, that are available for state use to correct problems where an operator does not comply with state requirements. Although the availability of such funds may be a consideration in some states when determining bond coverage amounts, special funds should be used to supplement rather than completely take the place of other forms of financial assurance provided by the operator. The use of special funds should be limited to instances where the responsible operator cannot be determined or is unavailable. These special funds can be generated by taxes, fines, forfeitures, or fees.

4.2.5 Waste Hauler Certification

The appropriate state agency should have authority to require the training of drivers of trucks that are involved in the commercial transportation of E&P waste to a commercial or centralized disposal facility. Such training should include, among other things, emphasis on proper record keeping, the need to deliver the waste to the designated facility and emergency response and notification procedures. The appropriate state agency should also have authority to require the registration of all vehicles used to commercially transport the waste and of all commercial waste haulers.

4.2.6 Location of Closed Disposal Sites

A state program should contain authority with respect to disposal site closure, including authority to identify the location of the disposal site and for such information to be permanently maintained by the state agency for public review. Whether the location of a waste disposal site is disclosed in the public land records is a matter that is within the discretion of the state.

4.2.7 Data Management

4.2.7.1 General

Effective data management systems should be maintained due to the amount of information that states compile. Such systems should include permitting, operating, spill, remediation, and monitoring information and should include those data elements that an individual state finds are necessary to make cost-effective, risk-based decisions. Data should be maintained on as detailed a level as is necessary for the agencies to conduct their regulatory reviews. States and the federal government should undertake efforts to facilitate the sharing of data among responsible agencies, the public, and other users. States should develop policies for data access, data dissemination, and the allocation of cost of services to governmental and non-governmental users.

4.2.7.2 Electronic Data Management

Electronic filing, permitting, imaging, geographic information systems and internet data transfer and access are technologies that can contribute to program efficiency and data accessibility, although they are not required for effective waste management. However, because of the efficiencies of electronic data management and enhanced accessibility of electronic data to regulators, the industry and the public, agencies are encouraged to develop systems for the electronic submittal, storage and retrieval of agency data. States are encouraged to implement electronic data management systems to improve program efficiency, data access, and data security to the extent they are appropriate to the State's regulatory program.

4.2.7.3 Program Elements

Agencies should provide for the capture of data and images as appropriate, and for both protecting the quality of data collected and the long-term protection and backup of captured information through measures such as off-site duplicate storage, archiving, and/or data retention and destruction policies. Agencies should include public and industry access in their data management systems.

Most program data are available to the public under various sunshine rules. Some records may be retained as confidential files for a defined period of time. Certain confidential types of data may also be discoverable. States should develop policies that define data sets to be made available to the public and/or industry.

4.3 Personnel and Funding

4.3.1 Personnel

For a state program to function effectively, sufficient, properly trained personnel to accomplish the goals and objectives of the program are necessary.

In determining its personnel needs, a state agency should consider not only the number of activities that it must regulate and inspect, but also the accessibility of those activities to agency personnel. Accessibility will be heavily influenced by the size of the area to be regulated, the local terrain, and road conditions. In addition, a state agency should evaluate how its personnel needs will be affected by activities occurring in environmentally sensitive areas (e.g., in close proximity to surface water and groundwater).

Generally, personnel needs should be evaluated in each of the categories of administration, legal, technical, and field inspectors. In each case, a state agency should define the areas of responsibility for the position, as well as any prerequisite experience and background. In addition, the state agency should provide for the continuing training of

personnel to keep them abreast of changes in regulations, policy and technical issues, and to increase professionalism. This training can be accomplished through such means as seminars and university short courses. The following discussion addresses these issues in each of the major personnel categories:

4.3.1.1 Administration

The elements of the administration of a state program should include traditional administrative functions such as program planning and evaluation, budgeting, and personnel. In addition, administration should be responsible for such programmatic functions as permitting, licensing, financial assurance, and ownership transfer. Public involvement and data collection management are also key elements of program administration. The conduct public hearings, the coordination of enforcement activities, and the referral of cases to legal personnel for follow-up action should also be administrative functions.

4.3.1.2 Legal

Legal support for an E&P environmental regulatory program can be provided by in-house state agency lawyers through the support of the attorney general's office or through independent counsel. In any case, sufficient legal support should be provided to a state agency to assure that the regulatory program has an effective capability to pursue appropriate enforcement actions in a timely manner against violators of program requirements. A critical element of this capability is that the program's legal element be capable of directing the preparation of enforcement cases and providing guidance and direction to field inspectors and others involved in case preparation. The legal element of a program should also be involved in both the procedural and substantive aspects of rulemaking.

4.3.1.3 Technical

All program elements require adequate technical support. In supporting administrative functions, technical personnel should provide geologic and engineering evaluation, and technical specifications on such matters as cementing and casing. Technical support to the legal and field personnel is necessary for the development and implementation of rules and in the preparation of enforcement cases. In support of field inspectors, technical personnel should be capable of mapping hydrologically sensitive areas and areas containing treatable water, and provide support in determining pit construction requirements and guidance in waste handling. Key technical personnel should have a bachelor of science degree in geology, engineering, hydrology, earth science, environmental science, or a related field, or possess equivalent experience. Technical personnel should be subject to continuing education in such areas as ongoing development of rules, policies, and technological changes.

4.3.1.4 Field Personnel

Field personnel should be responsible for conducting routine inspections of regulated facilities and activities to assure compliance with program requirements. In addition, field personnel should be among the state agency's on-site representatives to witness critical regulated activities and to observe or supervise clean-up or remedial actions. Field personnel also should be involved in the assembly of evidence for enforcement actions and in the state agency's community relations. Field personnel generally should be high school graduates or have equivalent experience, and should otherwise be knowledgeable about oil and gas field-related work and waste management practices. The ongoing training of field personnel should emphasize the range of chemical and radiological constituents in E&P wastes and at E&P sites, sampling and investigative procedures associated with enforcement proceedings, and a thorough understanding of current rules and policies of the program, as well as sound environmental practices. Field personnel should be provided with training in NORM identification and management, where appropriate. In addition, field personnel should be skilled in the handling of hazardous materials and in all aspects of personnel safety. They should also be trained in the identification of abandoned sites and the abandoned site remediation program, storm water management practices and requirements, and hydraulic fracturing processes.

4.3.1.5 Training Requirements

State programs should provide for adequate and effective training of state agency personnel regarding the regulations, policies, and criteria applicable to E&P activities. These programs should include training for agency personnel on such issues as site maintenance, contingency planning and spill response, permitting requirements and standards, compliance requirements and criteria, data management, enforcement procedures, investigative procedures, court preparation, report writing, sampling and analysis, and such other issues relating to proper E&P environmental regulation as may be necessary. Training programs should be incorporated as an on-going activity to encourage consistent enforcement of regulation throughout the state.

4.3.2 Funding

An effective E&P environmental regulatory program should be funded at a level sufficient to allow it to accomplish its environmental protection goals and objectives. While many state agencies are funded through a general appropriation from that state's legislature, each state agency should evaluate other sources of funding such as user fees, special levies on production, the dedication of fees and penalties to special accounts, and grants from various sources.

4.4 Coordination Among Agencies

Many state programs regulating E&P activities have their roots in oil and gas conservation programs that were established during the early part of the last century. In most cases,

these programs have evolved to accommodate other state and federal objectives such as protection of human health and the environment.

In most states, multiple agencies are involved in the management of E&P activities. Different agencies are often responsible for the regulation of oil and gas wells, pits and impoundments, disposal wells, surface water discharges, spill prevention and response, and disposal of drill cuttings and muds. Each agency has its own administrative requirements relating to permitting, operational requirements, and financial assurance, and develops its own budget priorities. Each has its own inspection and enforcement authorities. Unless a high level of formal interagency coordination exists, such unilateral program development and implementation can lead to duplication of personnel effort, duplication of regulation with sometimes conflicting standards for the industry, and duplication of funding. Duplication of programs often diminishes the effectiveness of spill response, permitting, inspection, enforcement, training, and other regulatory activities. Where multiple state agencies have jurisdiction over the management of E&P activities, budget development should be coordinated and the agencies should develop formal coordination procedures, such as the development of interagency Memoranda of Agreement, interagency task forces with periodic meetings, and/or interagency legislative and regulatory review panels to ensure jurisdictional clarity and regulatory consistency.

Additionally, states should review existing agreements to assure that they are current and effective. Finally, interagency mechanisms should be developed to facilitate the sharing of information among and between involved agencies so that each agency can carry out its program responsibilities.

SECTION 5 | Technical Criteria

5.1 General

These technical criteria for E&P waste management practices address waste characterization, waste management hierarchy, pits, land applications, tanks and centralized and commercial facilities. In most cases, these criteria are general in scope. States should establish and implement specific performance standards and design specifications based on site-specific or regional differences in geology, hydrology, climate, and waste characteristics. State E&P waste management programs should include the following general provisions as requirements:

a. Facilities and sites used for the storage or disposal of wastes derived from the exploration and production of oil and natural gas should be operated and managed at all times to prevent contamination of groundwater, surface water, soil, and air with the goal of, protecting public health and safety, the environment, and preventing property damage.

b. Facilities and sites operated specifically for the storage or disposal of exempt E&P wastes should not receive, collect, store, or dispose of any wastes that are listed or defined as hazardous wastes and regulated under Subtitle C of RCRA, except in accordance with state and federal hazardous waste laws and regulations.

c. Disposal of E&P wastes into landfills may be considered. If such disposal is allowed, it should only be allowed where the landfill is designed to contain such wastes, and the E&P wastes contain no free liquids and are not mixed with non-exempt wastes prior to disposal.

d. Technical criteria for siting, construction, and operation of E&P waste disposal facilities should be flexible enough to address site-specific or regional conditions based on findings by the regulatory agency.

e. Siting Criteria

i. States should incorporate siting requirements in statewide rules for pits, landspreading, landfilling and burial, and waste reclamation facilities. Area-wide rules or site-specific permits may contain additional siting conditions.

ii. No E&P waste management facility should be located in a flowing or intermittent stream.

iii. Where necessary to protect human health, new E&P waste management facilities should not be located in close proximity to existing residences, schools, hospitals or commercial buildings. The need for minimum distance criteria from residences or other buildings to the boundary of E&P waste management facilities should be

considered.

iv. Generally, applicable siting requirements should address such factors as depth to and quality of groundwater, wetlands, floodplains, topography, proximity to existing drinking water supplies and wells, geology, geologic hazards, and other environmentally sensitive areas.

v. Siting of E&P waste management facilities should be consistent with applicable land-use requirements.

5.2 Waste Characterization

5.2.1 Purposes

Waste characterization should support at least the following functions of a state's E&P waste management program:

a. ensuring E&P waste management practices are suited to the particular wastes involved and in compliance with applicable program requirements; and

b. ensuring commercial E&P waste facilities are managing only wastes they are authorized to handle.

5.2.2 Sampling and Analysis

a. State waste characterization requirements should include appropriate testing of E&P wastes prior to disposal for such characteristics as organic content, pH, salinity, and sulfur compounds, including hydrogen sulfide content. Testing must be appropriate for the type of waste, method of disposal, and the potential for adverse health and environmental effects. In addition, while nothing in these criteria mandates testing for every hazardous constituent in E&P wastes, it is recognized that waste management practices and regulatory requirements would be improved by obtaining a more complete knowledge, through sampling and analysis, of the range of hazardous and toxic constituents in E&P wastes. Accordingly, waste characterization requirements should provide data necessary to meet the purposes of waste characterization described in section 5.2.1 and to administer and enforce state program requirements effectively.

b. State requirements for the assessment of E&P wastes for Naturally Occurring Radioactive Material (NORM) should meet the criteria of this section and of sections 7.3.3. and 7.3.9. Such requirements should address all types of radiation expected in E&P wastes.

c. These guidelines do not address all the details of a waste characterization program, such as testing methods, frequencies, or parameters. The details are expected to vary

depending upon the waste, the proposed management practice, and other state program requirements.

5.2.3 Quality Control

a. State programs should contain provisions that any required waste sampling follow appropriate sampling procedures, and any required laboratory analysis be performed by qualified laboratories in order to produce valid and reliable results. A state may rely on field testing to satisfy waste characterization requirements where it can be determined that such testing will produce valid and reliable results.

b. Testing methods should produce data that are valid for the purpose intended. By example, EPA's Toxicity Characteristic Leaching Procedure (TCLP) may not accurately predict the leachability of oily E&P wastes.

5.3 Waste Management Hierarchy

As in any aspect of waste management, there are some general, sound practices that should be employed. These practices, which emphasize waste minimization, not only serve to protect human health and the environment, but also tend to protect waste generators from long-term liabilities associated with waste disposal. Additionally, waste minimization may reduce regulatory compliance concerns for E&P operators and result in cost savings. Generally, the choice of an E&P waste management option should be based upon the following hierarchy of preference:

a. Source Reduction: Reduce the quantity and/or toxicity of the waste generated;

b. Recycling: Reuse or reclaim as much of the waste generated as possible, and whenever possible, combine hydrocarbons with crude oil, condensate, or natural gas liquids;

c. Treatment: Employ techniques to reduce the volume or the toxicity of waste that has been unavoidably generated.

d. Proper Disposal: Dispose of remaining wastes in ways that minimize adverse impacts to the environment and that protect human health.

5.3.1 Source Reduction Opportunities

There are significant source reduction opportunities in E&P waste management. State programs have a variety of available resources which provide proven source reduction techniques. Categories of source reduction opportunities and examples include:

a. Equipment Modifications: Many technically and economically feasible equipment

modifications are available. For example, retrofitting glycol dehydration units with volatile organic vapor recovery units can result in the recovery, in certain circumstances, of economically viable quantities of volatile hydrocarbons that would otherwise be released to the atmosphere. In addition, compliance concerns regarding air emission regulations may be reduced considerably.

b. Procedure Changes: Many times a simple change in the procedure used in an operation can result in significant source reduction. A simple example with significant results is the change one operator made in produced water filter replacements in an EOR project. The original procedure of bi-monthly filter replacements was changed to a procedure based on filter differential pressure. The result was a 98% reduction in the quantity of generated waste filters. At production sites where NORM-scale formation is expected, implementing a procedure of scale inhibitor injection may reduce its occurrence.

c. Product Substitution: The careful selection of chemical products used in exploration and production can reduce the toxicity of E&P wastes. Potential product substitution candidates include biocides, coagulants, dispersants, emulsion breakers, scale and corrosion inhibitors, gas sweetening and dehydration agents, catalysts, and pipe dope. In particular, many substitute drilling fluids have been developed to replace oil-based drilling fluids.

d. Reduction in the Use of Fresh Water: A significant example of the reduction of fresh water use is the use of produced water for EOR whenever possible. Another simple example is the use of high-pressure, low-volume nozzles on rig wash hoses.

e. Good Housekeeping and Preventive Maintenance: In addition to product substitution, source reduction can be achieved by minimizing the generation of clean-up wastes from production facilities and waste management facilities. An evaluation of potential spills and mitigation measures may identify effective spill and release prevention techniques. These techniques include good housekeeping practices, routine inspections of equipment, equipment innovations, and containment systems. Radiation surveys of equipment and sites can be helpful in preventing or minimizing the spread of above-background levels of E&P NORM that may be encountered during routine equipment maintenance and servicing and site cleanup.

f. Planning: The first opportunity to accomplish source reduction is in the planning stage of an operation. For example, careful planning of a well stimulation can result in the reduction of left over chemical that may be disposed. Also, careful planning of a drilling site's construction to control stormwater runoff may reduce the quantity of contaminated stormwater that may be generated as waste.

g. Training: Training is possibly the most important source reduction opportunity. Personnel in the E&P conduct the activities that generate waste. Training in waste identification, classification, and source reduction techniques provides the field personnel with the tools necessary to effectively reduce waste generation.

h. Selection of Contractors: Service companies perform a wide variety of functions in the E&P on behalf of E&P operators. An important source reduction opportunity for

operators is the selection of service companies that implement source reduction opportunities as a business practice.

5.3.2 Recycling and Reduction Opportunities

Many opportunities now exist to recycle E&P wastes. State programs are encouraged to develop or coordinate with recycling programs developed by other agencies responsible for waste management. For example, many states' agencies provide listings of companies that recycle wastes common to E&P and, in some instances, operate waste exchange programs.

Wastes generated at E&P facilities that may be recycled include drilling fluids, used lubricating oil, used lubricating oil filters, antifreeze, wooden pallets, spent solvents, unused chemicals, liners, aggregate, and scrap metal. Also, recycling opportunities include the use of produced water for enhanced recovery, and the recovery of hydrocarbons in crude oil tank bottoms, skim oils, gas pipeline drips, slop oil emulsions solids and sludges, and other oily sludges.

Recycling also includes reuse of materials that would otherwise be managed as waste. For example, a natural gas company found that partially spent caustic sweetening solution was suitable for use as reagent in sulfur dioxide scrubber units at a natural gas processing plant.

See Section 11 for guidance specific to the reuse and recycling of fluids generated during the drilling, completion (e.g. hydraulic fracturing flowback), and production stages of a well.

5.3.3 State Program Elements

State programs should contain mechanisms to encourage waste management consistent with the hierarchy of this section. A variety of mechanisms may be used, such as:

a. Program requirements or policies that encourage source reduction and recycling;

b. Improved training of state personnel so they can identify source reduction opportunities;

c. Technical assistance or incentives to operators; and

d. Educational activities aimed at informing facility operators of the options available.

The waste management hierarchy should be integrated into the other elements of a state program. For example, spill and release prevention should be incorporated into facility management regulations. Similarly, state requirements should address the segregation of waste streams that have a higher pollution potential from those with a lower pollution potential. State information program elements should include a component related to hierarchy planning and implementation.

State program planning activities should include goals and objectives that provide for substantial progress in this area over a reasonable time. States should have sufficient information to evaluate whether the mechanisms used to encourage source reduction and recycling are achieving those goals and objectives. State program requirements should be reviewed for consistency with the waste management hierarchy and the established goals and objectives. State agencies should also coordinate their efforts with other agencies that are responsible for waste management.

5.4 Quantitative Elements

Specific quantitative guidelines have been included for some waste management practices. The numbers cited are considered to be conservative values for protection of human health and the environment. However, they are not intended to be the basis for nationwide standards. Regulatory agencies may approve either less stringent or more stringent requirements where circumstances warrant as long as they afford the protection described in Section 5.1.a, and in the goals statement of Section 3.2.

5.5 Technical Criteria for Pits

5.5.1 Definitions

a. Reserve Pits

Pits used: (a) to store additional drilling fluids for use in drilling operations; and/or (b) to dispose of wastes generated by drilling operations and initial completion procedures.

b. Production Pits

i. Skimming/Settling: Pits used to provide retention time for settling of solids and separation of residual oil.

ii. Produced Water: Pits used for storage of produced water prior to injection for enhanced recovery or disposal, off-site transport, or surface-water discharge.

iii. Percolation: Pits used to dispose of waste liquids via drainage or seepage through the bottom and/or sides of the pits into surrounding soils.

iv. Evaporation: Lined pits used to contain produced waters which evaporate into the atmosphere by natural thermal forces.

c. Special Purpose Pits

i. Blowdown: Pits used for collecting material resulting from the emptying or depressurization of wells or vessels.

ii. Flare Pits: Pits used exclusively for flaring gas.

iii. Emergency Pits: Pits used to contain liquids on a temporary basis due to process upset conditions.

iv. Basic Sediment: Lined pits used for temporary storage of production wastes from tank batteries or production vessels which may contain residual oil.

v. Workover: Pits used to contain liquids during the performance of remedial operations on a producing well in an effort to increase production.

5.5.2 Permitting

a. A permitting or review process should be in place for all pits. Pits may be authorized by rule, general permit, individual permit, or as a part of an operational permit or program.

b. Pits may be permitted by rule based upon specific requirements in areas where geologic, topographic, hydrologic or other conditions are similar.

c. Authorization for a pit may be included in operational, facility, or other environmental permits (e.g., drilling, workover, gas plant, NPDES discharge). The permit application process may have to be expanded to include certain additional information concerning the pit (i.e., intake volume, soil type, fluid makeup, topography, geology, hydrology, climatology, and such other factors as may be necessary to protect human health and the environment).

d. Construction and use of rule-authorized pits should require prior notification of the appropriate regulatory agency to ensure that proper construction, operation, and closure methods are used to protect human health and the environment.

e. State programs should include provisions to accommodate approval of pits for emergency situations.

5.5.3 Construction

General standards for construction of pits should be included in area or statewide regulations and should address the following items:

a. Size should be sufficient to ensure adequate storage until closure, taking into account historical precipitation patterns.

b. Depth should be such that the bottom does not penetrate groundwater or such that the pit contents do not adversely impact groundwater or surface water. A review of available information or a study should be made of the area where the pit is to be

located to determine if aquifers are present and should be protected.

c. Berm height, slope, and material should be such that the pit is structurally sound and that pit integrity is not compromised by terrain or breached by heavy rains, winds, seepage, or other natural forces.

d. If a salt section is anticipated or oil-based muds are used during a drilling program, reserve pits should be designed to accommodate those fluids.

e. Construction standards for pits may differ depending upon the wastes they receive, the length of time they are used, and site-specific conditions.

i. The use of production pits is declining nationally because of concerns about potential contamination of air, soils, and groundwater. In many instances, equipment consolidation, process modifications, or tanks can be used in lieu of pits. The use of alternatives is generally encouraged. Where production pits are used, they should generally be lined, except as provided below in subsection 5.5.3.e.v.

ii. In the case of reserve and workover pits, liners should be required in certain instances based upon fluid type and site-specific characteristics (e.g., unconsolidated soils and/or hydro-geologic conditions that create a potential for adverse impact to surface water or groundwater, and proximity to environmentally sensitive areas).

iii. Special purpose pits and other pits such as dehydration, tank drain, pipeline drip collector, and compressor scrubber pits should be lined.

iv. Blowdown, flare and emergency pits may be unlined where the removal requirement of Section 5.5.4.k. will prevent adverse groundwater quality impacts.

v. Variances to the above liner requirements should only be provided, and percolation pits should only be used, where it is clearly demonstrated there is minimal potential to affect adversely groundwater quality.

vi. Liners can consist of natural or synthetic materials, should meet accepted engineering practices, and should be compatible with expected pit contents.

f. Requirements for fencing, netting, and caging, or any other method to secure a pit, should be set by area or statewide regulations, as necessary, to protect the public, domestic animals, and/or wildlife. Netting of a pit is recommended as the preferred method to protect wildlife in circumstances, among others, where pits have oil on the surface, where pits are used for long periods, and/or where pits are located in areas with arid climates.

g. Where feasible, reserve pits should be placed to directly receive the discharge from solids separation equipment and to collect rigwash water, spills, and leaks from drilling equipment.

5.5.4 Operational Requirements

a. Specific restrictions on the type of wastes that can be placed in the different types of pits should be included in area or statewide regulations. Restrictions should consider salinity, hydrocarbon content, pH, radionuclides associated with E&P NORM, or other characteristics that may be detrimental to the environment.

b. General security guidelines should protect the public, the environment, and wildlife.

c. Liquids should be maintained at a freeboard level determined by the state that takes into account extreme precipitation events or other possibilities and prevents overtopping or un-permitted discharges.

d. Lined pits should be operated in a manner that ensures liner integrity.

e. Inspections and monitoring should be conducted at regular intervals or as necessary to ensure that pits meet all operating and structural integrity requirements and to ensure that pit contents do not adversely impact groundwater or surface water.

f. Hydrocarbons that inadvertently accumulate in an unlined reserve pit should be skimmed off the pit at the cessation of drilling and completion operations.

g. Separated oil or accumulated wastes should be periodically removed from unlined skimming/settling pits.

h. Produced water pits should be used only for storage of produced water prior to injection or off-site transport.

i. Percolation pits should be used only for disposal of produced waters and only when area or statewide restrictions established under Section 5.5.4.a. above are met.

j. Evaporation pits should be periodically inspected for compliance with permitted input volumes and liner integrity. Evaporation pits should be skimmed as necessary to maintain an optimum evaporation rate.

k. Blowdown, flare, and emergency pits should not be used for long-term storage or disposal. The regulatory agency should be notified promptly of the use of emergency pits. Fluids diverted to emergency pits should be removed as quickly as practical following the end of the emergency.

l. Unlined basic sediment pits should not be used for storage of oily wastes; they should be replaced by lined pits or tanks.

m. Workover pits should be open only for the duration of workover operations and should be closed within 120 days after workover operations are complete.

n. Pit wastes that exhibit oilfield NORM above regulatory action levels should be managed

in accordance with the criteria of Section 7 and any other applicable criteria of these guidelines.

5.5.5 Closure

a. Pits should be closed in accordance with local, state, and federal regulations and, if on private property, consistent with lease obligations.

b. Reserve pits should be closed as soon as practical but no later than 12 months after cessation of drilling operations. However, the closure of reserve pits beyond 12 months after cessation of drilling operations may be allowed in unusual circumstances if good cause can be demonstrated.

c. Pit liquids should have free oil removed and, when appropriate, should be sampled prior to closure for salinity, hydrocarbon content, pH, radionuclides associated with E&P NORM, or other characteristics which may be detrimental to the environment. On-site disposal of pit contents should be conducted in accordance with the landspreading, burial, and landfilling criteria of Sections 5.6. and 5.7, or by NPDES or UIC permit.

d. Liquid and nonliquid materials not satisfying the on-site criteria for landspreading or burial (Sections 5.6. and 5.7.) should be disposed in federal or state approved disposal facilities.

e. Pit sites should be capped, compacted, contoured, and vegetated where necessary, and in accordance with applicable state or area regulations to ensure ground support stability and to prevent erosion and ponding.

f. Records should be permanently kept by the regulatory agency of all pit locations and should be available to the public for inspection and copying. A permit to drill may serve as adequate record keeping for the location of all pits within 200 feet of the well location.

5.6 Technical Criteria for Landspreading

5.6.1 Definition and Applicability

a. Landspreading is a method of treatment and disposal of low toxicity wastes in which the wastes are spread upon and sometimes mixed into soils to promote reduction of organic constituents and the dilution and attenuation of metals. Landfarming or multiple applications are covered under Section 5.10.

b. These criteria apply to waste disposal at or near E&P locations and do not apply to commercial disposal operations. Commercial facilities used for disposal of E&P wastes are covered in Section 5.10.

c. On-site landspreading of E&P wastes containing NORM above regulatory action levels

should be prohibited.

5.6.2 Regulatory Requirements

When landspreading practices are used at E&P sites, they should be conducted consistent with local, state, and federal regulations, and lease and landowner obligations. General standards for landspreading should be included in area or state regulations and should address the operational requirements of Section 5.6.3.

5.6.3 Operational Requirements

a. Free oil should be removed from the wastes by mechanical means such as skimming or filtration before the wastes are landspread.

b. Landspread liquids should have a pH of 6 to 10 S.U. Where needed, liquids should be neutralized to obtain this range.

c. Solid wastes should be spread evenly and disked into the soil.

d. E&P wastes should be subject to loading rates, location restrictions, and/or other appropriate requirements that promote biodegradation of organic constituents; will not result in waste pooling, ponding, or runoff; will prevent the contamination of groundwater or surface waters; and will protect air quality.

e. Where enhancement of biodegradation is desired, nitrogen and other nutrients should be added to the soil before disking. Nutrient application can be repeated over time.

f. Amounts of waste added to soil during landspreading are generally limited by the electrical conductivity (EC), exchangeable sodium percentage (ESP), and sodium absorption ratio (SAR). The state should determine its criteria based on site-specific and waste-specific conditions. For example, some plants tolerate higher or lower salt levels, higher rainfall areas encourage salt movement out of the root-zone, or shallow groundwater may severely limit application.

g. After landspreading of hydrocarbon containing waste, the waste-soil mixture should not exceed one percent by weight oil and grease, unless the state regulatory agency approves a less or more stringent requirement where circumstances warrant.

h. Salt- and hydrocarbon-loading criteria apply to the final waste-soil mixture and are not an application standard. The operator should be required to demonstrate that these criteria are met within 12 months of cessation of drilling or production. If these criteria are not met, remediation will be required. Nothing in this paragraph is intended to delay any requirement for erosion control and/or site reclamation or re-vegetation.

i. Soil analyses should be performed prior to landspreading and again upon closure of the

site. Upon site closure, waste constituents should not be present at levels that pose a significant risk to human health and the environment.

j. Enhanced techniques, such as repetitive disking and nutrient addition, may be needed to meet the salt and hydrocarbon criteria of the final waste-soil mixture.

k. Under special or abnormal conditions, additional limitations and analysis requirements should be considered for wastes that may contain toxic constituents derived from formation liquids, cuttings, drilling muds, or drilling-mud activities. Records should be permanently maintained by the agency of all waste analyses conducted pursuant to such additional requirements.

5.7 Technical Criteria for Burial and Landfilling

5.7.1 Definitions and Applicability

a. Burial of wastes involves placing the wastes in an excavation and covering the wastes with a layer of soil.

b. Landfilling of wastes involves placing the wastes on the ground and covering them with a layer of soil.

c. These criteria apply to waste disposal at or near E&P sites and do not apply to commercial disposal facilities. Criteria for commercial disposal facilities are contained in Section 5.10.

5.7.2 Regulatory Requirements

When burial or landfilling is used at E&P sites, either should be conducted consistent with lease and landowner obligations and with local, state, and federal regulations. General standards for burial or landfilling should be included in area or statewide regulations and should address the operational requirements in Section 5.7.3.

5.7.3 Operational Requirements

a. Wastes or waste-soil mixtures may be buried or landfilled without a protective bottom liner only when they meet the landspreading criteria of Section 5.6 prior to burial. The contents of such waste or waste-soil mixtures should be limited to materials such as fresh water-based drilling muds, drill cuttings, spent iron sponge, gas plant catalyst, or molecular sieve. Closure should be consistent with Sections 5.5.5.a and 5.5.5.e.

b. A protective bottom liner, solidification, fixation, or encapsulation should be required for burial or landfilling of wastes whose salt and/or hydrocarbon content exceeds the

landspreading criteria of Section 5.6.3. A protective bottom liner, solidification, fixation, or encapsulation should be required for burial or landfilling of E&P wastes containing NORM above regulatory action levels. The regulatory agency may grant a variance from this requirement for fields or portions of fields, upon a showing by the operator that groundwater either is not present beneath the waste site or is naturally protected from the threat of contamination.

c. Agency records should be permanently maintained for any required analytical data taken, sites used, and types and quantities of waste disposed. Site locations should be located on plat maps.

5.8 Technical Criteria for Roadspreading

5.8.1 Definition

Roadspreading is the placement on roads of E&P wastes that exhibit properties similar to commercial road oils, mixes, dust suppressants, or road compaction or deicing materials. Roadspreading of E&P wastes that do not exhibit such properties should be prohibited. Roadspreading of E&P wastes containing NORM above regulatory action levels should be prohibited.

5.8.2 Regulatory Requirements

When roadspreading is used, it should be conducted consistent with lease and landowner obligations and local, state, and federal regulations. General standards for roadspreading should be included in area or state regulations and address the operational requirements in Section 5.8.3.

5.8.3 Operational Requirements

a. Exempt wastes such as tank bottoms, emulsions, heavy hydrocarbons, and crude oil-contaminated soil may be used for road oil, road mix, or asphalt if they are not ignitable and have a mixed density and metal content consistent with approved road oils or mixes.

b. Roadspreading should be subject to loading rates and/or other appropriate requirements that prevent pooling, ponding, or runoff; prevent the contamination of groundwater and surface water; and protect air quality.

c. Roadspreading should be subject to appropriate buffer zones established to protect waters of the state, water wells, and wetlands.

d. Produced water should be tested and should exhibit properties similar to commercial roadspreading products that are regulated by federal, state, or local agencies.

5.9 Technical Criteria for Tanks

5.9.1 Scope

a. This section applies to permanently installed E&P waste tanks and to produced water storage tanks located at enhanced recovery operations. Where some waste tanks are regulated under the Spill Prevention Control and Countermeasures (SPCC) requirements of the federal Clean Water Act, states may defer to the SPCC requirements for those tanks.

b. Except as provided in Section 5.9.3.b., this section does not apply to:

i. condensate and crude oil tanks;

ii. process vessels, such as separators, heater treaters, dehydrators or freewater knockouts, except that stacks or vents on such vessels should be equipped, where necessary, to protect migratory birds and other wildlife; and

iii. tanks used temporarily in drilling and workover operations.

c. The regulatory agency may adjust or exempt from the requirements of this section small-capacity tanks.

5.9.2 General Requirements

a. States should have information, where available, on the locations, use, capacity, age and construction materials (e.g., steel, fiberglass, etc.) of tanks as needed to administer and enforce state program requirements effectively. Such information may be obtained through registrations, inventories, or other appropriate means.

b. Tanks covered by this section should not be located in a flowing or intermittent stream and should be sited consistent with applicable local land-use requirements.

c. Tanks should be subject to spill-prevention, preventive maintenance and inspection requirements, including those of Sections 5.3.1.c. and 5.3.3. of these guidelines.

5.9.3 Construction and Operation Standards

a. A principal goal of construction and operation standards for tanks is to minimize the occurrence of and the environmental impacts from spills and leaks.

i. New tanks should be constructed in a manner that provides for corrosion protection consistent with the intended use of the tanks. All tanks covered by this section should be operated in a manner that provides for corrosion protection consistent with the use of the tanks.

ii. Tanks should exhibit structural integrity consistent with their intended use. Wooden tanks should receive increased scrutiny in this regard.

iii. Tanks should be operated in a manner that protects against overtopping.

iv. Secondary containment systems or other appropriate means, such as leak detection, should be employed to minimize environmental impacts in the event of releases.

b. Covered tanks are preferred to open tanks. Open E&P waste and product tanks should be equipped to protect migratory birds and other wildlife in a manner consistent with the wildlife-protection criterion of Section 5.5.3.f.

c. Tanks located in populated areas where emissions of hydrogen sulfide can be expected should be equipped with appropriate warning devices.

5.9.4 Tank Removal and Closure

a. Tanks should be emptied prior to their retirement and the resulting materials should be managed properly.

b. Tanks and associated above ground equipment should be removed upon cessation of operations. For good cause, a state may allow tanks to be removed as soon as practical thereafter. Site reclamation should meet all landowner and lease obligations and any other applicable requirements.

c. Prior to removal, closure, or release for unrestricted use, tanks and associated piping and equipment should be surveyed for NORM as provided for in Section 7. When regulatory action levels are exceeded, NORM and the equipment containing NORM should be managed in accordance with the state's NORM regulatory program (see Section 7 of these guidelines).

5.10 Technical Criteria for Commercial and Centralized Disposal Facilities

5.10.1 Definitions and Exemptions

a. Commercial Disposal Facility: A facility whose owner(s) or operator(s) receives compensation from others for the temporary storage, reclamation, treatment, and/or disposal of produced water, drilling fluids, drilling cuttings, completion fluids, and any other RCRA exempt E&P waste, and whose primary business objective is to provide

these services. These facilities may, under certain circumstances, also accept non-exempt, non-hazardous wastes generated from E&P operations. This definition also includes facilities whose owner(s) or operator(s) receives compensation from others for E&P NORM-related storage, decontamination, treatment, or disposal.

b. Centralized Disposal Facility: A facility, other than a commercial disposal facility, that is: (1) used exclusively by one owner or operator; or (2) used by more than one operator under an operating agreement and which receives for collection, treatment, temporary storage, and/or disposal of produced water, drilling fluids, drill cuttings, completion fluids, and any other RCRA exempt E&P wastes that are generated from two or more production units or areas or from a set of commonly owned or operated leases. These facilities may, under certain circumstances, also accept non-exempt, non-hazardous wastes generated from E&P operations. This definition covers the surface storage and disposal facilities that are present at Class II disposal well sites. This definition also covers E&P NORM related storage, decontamination, treatment, or disposal.

c. Exemptions: The definitions and technical criteria of Section 5.10 do not apply to Class II injection wells or to enhanced oil recovery projects. The definitions and technical criteria of Section 5.10 are not intended to apply to emergency cleanup situations at a Class II injection facility. The regulatory agency may adjust or exempt from the standards and requirements of this section (Sections 5.10), centralized facilities that receive a limited number of substantially similar waste streams and limited volumes of wastes, or commercial or centralized tank-only facilities.

5.10.2 Technical Standards and Regulatory Requirements

Commercial and centralized off-site disposal facilities should meet the technical and regulatory requirements of this section and the general standards of Section 5.1 of these criteria. Compliance with these requirements should be demonstrated in the permit application required in subsection 5.10.2.a. Because commercial disposal facilities use advanced methods of *waste* treatment and disposal, the regulatory agency should establish, where applicable, numerical requirements for the design of pond liners and leachate collection systems, for landfarming operations (i.e., repeated land applications), and for E&P waste reclamation facilities. The requirements of this section are intended to furnish the regulatory agency with sufficient and meaningful information such that permitting decisions will lead to no environmental impact or public health impact once the facility has commenced operations and following its closure.

The regulatory agency may adjust or exempt from these requirements centralized facilities that receive a limited number of substantially similar waste streams and limited volumes of waste, such as the consolidated produced water disposal facilities in a large multi-operator field. Administrative criteria for centralized facilities also may be less extensive than those for commercial facilities.

5.10.2.1 Regulatory Agency Responsibilities in Permitting

a. Permits. The regulatory agency should authorize off-site commercial and centralized disposal facilities for E&P wastes by permit. A permit should be in force for a finite period to be determined by the agency. The agency should use the data and information required by the technical standards of this section to approve or deny applications for permits, to ensure compliance with permit conditions, to order corrective actions in order to prevent or abate violations of the standards, or for any other purpose deemed necessary by the agency.

b. Acceptable Wastes. The agency should prescribe the range of E&P wastes that can be disposed at commercial and centralized facilities and at municipal solid-waste landfills.

c. Waste Characteristics and Disposal. The agency should identify the chemical characteristics of wastes likely to be disposed at commercial and centralized facilities on the basis of published scientific data and on knowledge about regional or site-specific waste characteristics. The agency should consider the types of waste management appropriate for each waste type, and the extent to which additional protective measures (e.g., leachate collection) are needed to protect groundwater, surface water and air. The agency should prescribe these waste disposal facilities and waste stream relationships by rule or in the permitting process and ensure that operators of commercial or centralized facilities comply with them. For sampling and testing, refer to Section 5.10.2.2.c.v. and vi. For determining radiological content, refer to Sections 7.3.3 and 5.2.2.b.

5.10.2.2 Permitting Requirements

a. Any new or existing commercial or centralized facility should be required to obtain a permit from the regulatory agency to commence operation or to continue to operate. An individual permit should be required for E&P waste reclaimers and other commercial facilities where waste is placed on the land (e.g., in pits and in landfarms). A permit should be issued only upon compliance with the general requirements of Section 5.1 and the technical requirements of this section, and upon submittal and approval of an application that contains a Siting Plan, Construction Plan, Operating Plan, and Closure Plan. Operation of a facility should comply with the terms and conditions of the permit. The regulatory agency may tailor the technical requirements for all existing facilities and for centralized disposal facilities to the conditions present at the locations of such facilities. In the case of centralized facilities, the regulatory agency may adjust the requirements of Section 5.10.2.2.a. b. and c. in the light of the volume and characteristics of wastes received by the facility.

b. Siting Plan. The specific site for a commercial facility and, to the extent possible, the site for a centralized facility, should have natural features that prevent or minimize release of pollutants to waters, land, and air. Those natural features could include isolation from or considerable depths to groundwater, protection against flooding, the presence of low permeability soils, and topography conducive to protection against erosion. Additional safeguards may be required by the regulatory agency for centralized facilities that are located on sites that do not exhibit natural protective features or are located in close proximity to residences, schools, hospitals or commercial buildings. An application for a

permit for a commercial or centralized facility should, at a minimum, contain the following information:

i. Names, addresses, and telephone numbers of owner(s) and the operator(s) of the facility, the owner(s) and occupant(s) of properties within close proximity of the site, or any nearby person who may reasonably be adversely affected by release from the site;

ii. Topographic map showing the location of the site and any highways or roads that abut or traverse the site and depicting all water courses, flood plains, water wells, pipelines, and dwellings located within one mile of the site;

iii. Geologic, hydrologic, engineering, chemical, and any other data or information that demonstrate disposal of wastes and operation of the facility will not contaminate fresh water, the surrounding soils or air, endanger public health, safety or the environment, or cause property damage;

iv. Average annual precipitation and evaporation rate at the disposal site;

v. Nature and permeability of vadose zone; description of the subsurface strata, identification of the areal extent of underlying aquifer(s), and depth to groundwater; direction of groundwater movement; baseline data on water quality of nearby surface waters, underlying aquifer(s) and soils prior to commencement of operations; and points of past or current use of surface water or groundwater;

vi. Proof that all public notice requirements have been met; and

vii. Certification by an authorized representative of the applicant that information submitted in the application is true, accurate, and complete to the best of the applicant's knowledge.

c. Construction Plan. In general, commercial and centralized disposal facilities should be constructed to prevent or minimize releases of wastes or waste byproducts to surface water, groundwater, soils, and air. Design should allow for the segregation, separation and containment of free oil to minimize emissions, where appropriate. The need for additional protective measures (e.g., barriers) at facilities in close proximity to residences, schools, hospitals, or commercial buildings should be considered. Pits at these facilities should at least meet the construction requirements of Section 5.5.3.e. In the case of E&P waste reclamation facilities, construction requirements to prevent or minimize releases should also apply to wastes stored before and after reclamation. For commercial facilities, detailed engineering drawings and diagrams of engineered disposal facilities should be required; for centralized or one-owner facilities, such extensive construction details may not be needed. Construction should follow guidelines and rules adopted by the regulatory agency.

d. Operating Plan. Applications for permits for existing or new facilities should be accompanied by an Operating Plan that describes the wastes that will be accepted at the facility and the methods by which those wastes will be managed and disposed. The

need for groundwater, air, or other monitoring at commercial or centralized disposal facilities where wastes are placed on the land should be evaluated by the state as part of this program development and implementation, and should depend upon the nature and size of the disposal activities. At facilities that manage E&P NORM, monitoring should be sufficient to determine compliance with maximum permissible doses to workers and to members of the public in unrestricted areas. The Operating Plan should contain the following information:

i. Volume, rate of application, and type of material to be disposed at the facilities and the facilities that will be used to dispose of each waste stream (i.e., unlined or lined pits, above- or below-grade tanks, etc.);

ii. Contingency plan for reporting, responding to and cleaning up spills, leaks, and releases of wastes or waste byproducts, including provisions for notifying emergency response authorities and for taking operator-initiated emergency response actions;

iii. Plan for routine inspection, maintenance, and monitoring to ensure and demonstrate compliance with permit requirements. At commercial and centralized facilities where wastes are placed on the land, such as in pits or landfarms, groundwater monitoring should be required in the absence of site-specific or facility-specific conditions that minimize the potential for adverse impacts to groundwater. Specific plans for preventing or minimizing air emissions from sources such as (1) the volatilization of organic materials in the waste; (2) particulate matter (dust) carried by the wind; and (3) chemical reactions (e.g., production of hydrogen sulfide from sulfur-bearing wastes) should be considered. Monitoring to ensure organic wastes are treated effectively should also be required for landfarming operations.

iv. Waste acceptance policy for the facility that details the types of wastes that the facility will accept(exempt E&P wastes and/or non-exempt, non-hazardous wastes from E&P operations), how the facility will determine whether a shipment of wastes meets its acceptance criteria including whether on-site sampling and testing will be employed, and the procedures that will be followed if unacceptable wastes arrive at the facility;

v. Plan to characterize wastes received for disposal. Waste characterization requirements for small centralized facilities may be more limited, based on the limited types and volumes of wastes received. At a minimum, waste characterization should comply with the requirements of Section 5.2. States should determine additional minimum testing criteria applicable to their regions;

vi. Plan for periodic removal and subsequent handling of free oil;

vii. Security plan for the facility;

viii. In the case of landfarming operations, loading rates, location restrictions, and/or other appropriate requirements that ensure the treatment of organic constituents, prevent the contamination of groundwater or surface waters, and protect air quality. Operations should comply with the requirements of Section 5.6.3;

ix. A community relations or public information plan should be considered; and

x. Environmental, Health, and Safety Plan. Where applicable, an environmental, health, and safety plan should be developed for commercial disposal facilities. Such plan should describe site sampling methods and procedures to determine the potential risks to human health and the environment posed by the site. State regulatory programs should take into consideration the size and nature (treatment and disposal processes) of each facility when determining whether or not this environmental, health, and safety plan is applicable.

e. Closure Plan.

i. Applications for permits for existing or new facilities should be accompanied by a Closure Plan that describes the methods to be used to reclaim the facility following the cessation of operations. Closure should comply with the general requirements of Section 5.1 and with any other requirements established by the regulatory agency.

ii. For commercial disposal facilities and centralized disposal facilities of comparable nature or size, the plan should describe the site sampling methods that will be used to determine the risks to human health and the environment posed by the site, if any, once closure is completed; and any further measures that may be necessary to address remaining site contamination at that time. The plan should also include post-closure monitoring and maintenance requirements where the wastes remaining on-site after closure may adversely affect groundwater or surface waters, or otherwise pose a significant risk to human health and the environment. The duration of the post-closure care period and the nature of the post-closure requirements should correspond to the continuing risks posed by the facility after closure.

iii. The plan should include a closure schedule, a cost estimate for reclamation, and a schedule for authorized financial assurance instrument. The cost estimate and authorized financial assurance instrument schedule should be used to establish a financial surety level for the facility prior to permit approval. The level of financial surety requested should cover the full estimated cost of facility closure and reclamation.

5.10.2.3 Waste Tracking Requirements

To assure that only acceptable wastes are disposed of at commercial or centralized facilities, a waste tracking system that documents the movement of wastes from the site of their origin to their final disposition should be implemented. The following elements should be included in the waste tracking system:

a. Multi-Part Form or Equivalent Documentation: State regulatory programs should require operators to use a multi-part form or equivalent documentation that contains the names, addresses, and phone numbers of the generator (producer), hauler, and disposal facility operator; a description of the waste; the time and date it was collected, hauled, and

deposited at the disposal facility; and the volume of the waste hauled.

b. Maintenance of Waste Tracking Information: The waste tracking information should be maintained by the generator, hauler, and operator of the disposal facility for inspection by the regulatory agency for a period of three years after the shipment date. This record retention period should be automatically extended for any person who is the subject of an unresolved enforcement action regarding the regulated activity from the date such person receives notice of the enforcement action until it is resolved.

c. Attest to No Illegal Dumping: The waste hauler should certify in writing that no unauthorized wastes were dumped illegally or at a location or facility not designated by the generator and that no unauthorized wastes were mixed with the exempt wastes during transport. The disposal facility operator should certify in writing that the facility is authorized to receive the waste for disposal.

d. Reporting of Discrepancies: The operator of the disposal facility should immediately report to the regulatory agency and the generator, any discrepancy in waste descriptions, volumes, or place of origin based on personal observations or documentation.

e. Permitting of Waste Haulers: Waste-hauling companies should be permitted by the regulatory agency based on a showing of basic knowledge about the regulatory requirements for disposition of E&P wastes transported from their point of generation to their final disposal site. The regulatory agency may issue permits to individual waste haulers or to waste hauling firms.

5.10.2.4 Applicability of Waste Tracking Criteria

These waste tracking requirements do not apply to wastes moved by pipeline. Operators who transport wastes by pipeline should periodically report waste quantities to the regulatory agency.

SECTION 6 | Abandoned Sites

6.1 Abandoned Oil and Gas Sites Introduction

States with current or historic oil and gas operations should develop and implement a program to inventory, prioritize, and remediate, as necessary, abandoned sites. The purpose of this section is to provide guidance for that program. It is not the intent of these guidelines to preclude an abandoned site from being returned to operation in accordance with state requirements.

6.2 Definition of "Oil and Gas Site" and "Abandoned Site"

The terms "Oil and Gas Site" and "Abandoned Site," as used herein, have the following meanings:

a. An Oil and Gas Site is land or equipment, including a wellbore, that is now or has been used primarily for oil or gas exploration or production, or for the management of oil and gas wastes from exploration and production.

b. An Oil and Gas Site is considered an Abandoned Site if the site:

i. Was not adequately plugged or closed at conclusion of operations such that it constitutes or may constitute a threat to public health or the environment; and

ii. Has no owner, operator, or other responsible person (hereinafter called "responsible party") who can be located, or such responsible party has failed or refused to undertake actions, where required by law, to abate the threat. A responsible party cannot be located, among other circumstances, where no liability for remedial actions is imposed by the state upon past or current owners and operators.

6.3 Identification of Abandoned Sites

A state should have a procedure for identifying sites that may constitute a threat to public health or the environment and for determining whether a responsible party exists. The state should develop and maintain an inventory of abandoned sites. Examples of elements that may be considered in identifying sites that may constitute a threat to public health or the environment include agency reviews or inspections, referrals by other agencies, or citizen or landowner inquiries. Classifications or rankings may be used to separate these sites into relative risk categories. Examples of elements that may be considered in determining whether a responsible party exists include the failure to file required data or reports, the failure to respond to agency inquiries, tax defaults, information in public records, or landowner or public inquiries. In developing an inventory of abandoned sites, the state should have procedures for attempting to notify the last known responsible party,

and providing legal notice.

Emergency protocols should be included, so that remedial action can be initiated prior to legal notice on sites that are judged to present an immediate threat to the public health or environment. Where there are agencies with overlapping jurisdiction for abandoned sites, inventory procedures should be coordinated among these agencies as further discussed in Section 4.4 of these guidelines.

6.4 Funding for Abandoned Site Remediation

An effective state program to address abandoned sites should have adequate funds available to permit the state to undertake any necessary assessment, plugging, closure, or remediation of such sites.

Adequate funding involves the development of a financial assurance program as provided in Section 4.2.4. To ensure the continuity of financial assurance in the event of a change of operator, notice to the state of any such change should be required. Any financial assurance provided by the previous operator should remain in effect until the new operator's compliance with the state's financial assurance program is verified.

Section 4.2.4 describes some of the types of financial assurance a state should consider in designing a program to provide it with the necessary economic resources while facilitating operator compliance. As part of a financial assurance program, a state should consider establishing a special purpose fund to plug, close, or remediate an abandoned site. The state should have the authority to recover costs from the responsible party, where such party exists. The state should evaluate its needs and establish such funding mechanisms as are appropriate to satisfy those needs. A wide variety of funding mechanisms have been employed to support existing special purpose funds in various states. Those mechanisms include bond forfeitures; legislative appropriations to the responsible state agency; a percentage of the taxes on oil and gas production; fines and penalty assessments; equipment salvage; and a host of fees, among them fees or charges based on the value of oil and gas, fees or charges based on units of production of oil and gas, operator fees, supplemental fees in lieu of bonds, inactive well fees, permit fees, and waste generation fees.

6.5 Criteria for Prioritizing Remediation

The state program should include criteria for determining whether an abandoned site constitutes a threat to public health or the environment and the site's priority for remediation. Among other things, the following criteria may be used: (1) the occurrence of or potential for an imminent release from the site; (2) the nature, extent, and degree of contamination; (3) the proximity of the site to populated areas, surface water, and/or groundwater; (4) whether the site is in an environmentally sensitive area; and (5) wellbore lithology and condition. Where appropriate, the state should perform a more detailed site evaluation. The state agency should have flexibility and discretion to consider the factors

associated with the individual sites, including cost savings associated with simultaneous remediation of multiple sites that otherwise would have different priorities or similar financial considerations, in assigning them a priority on the inventory of abandoned sites.

6.5.1 Goal for Remediation

A goal of the state program should be to remediate the abandoned sites on its inventory in a manner that assures that reasonable and measurable progress is made.

6.5.2 Liability for Remediation

The state should establish a liability scheme that will ensure that the goals of its abandoned sites program will be achieved. States should consider a range of options with respect to liability for remediation, which may include among others: (1) liability for all current and past owner(s) and operator(s); (2) liability for the owner(s) and operators(s) found to be responsible for the contamination at an abandoned site; or (3) no liability for past or current owner(s) and operator(s) should the state choose to finance the abandoned sites program.

Any liability scheme established by a state should clearly define the responsibility for remediation. A state should allow remediation of an abandoned site by a party that would not otherwise be responsible for the remediation.

6.6 Standards for Remediation

The state should ensure that abandoned sites, including well bores, be plugged or closed in a cost-effective manner that minimizes or removes the threat to public health and the environment and that restores the land to an environmentally stable condition.

6.6.1 Well bore Remediation

The state should consider existing rules and regulations when determining proper plugging procedures for abandoned sites. However, the state should have the flexibility to modify those plugging procedures, while maintaining mechanical integrity of the well bore adequate to ensure that public health and the environment are protected.

In carrying out well bore remediation, the state should use existing information from well records including depth of well, depth of any old plugs, presence of casing and tubing and depths set, perforations, existence of groundwater and hydrocarbon-bearing zones, existence of over-pressured zones, and any junk in the hole to determine the condition of the well and the proper plugging procedure. In the absence of the above information, data such as existing geological and engineering field studies, water well records, interviews with nearby landowners, corporate records, and historical literature can be reviewed.

6.6.2 Site Remediation

The extent of surface remediation of an abandoned site should be determined based on surface and subsurface resources and land use. Consultation by the state regulatory agency with the surface owner, surface tenant, and other federal, state and local agencies, as appropriate, should take place prior to remediation.

As appropriate, abandoned sites should be re-vegetated in accordance with state regulatory agency rules, and with consideration given to recommendations from the surface owner, surface tenant, and federal and local agencies. As appropriate, soil should be evaluated to determine if hydrocarbons, chemicals, or NORM were spilled or leaked, and to determine remediation.

Surface equipment or materials on an abandoned site should be removed, and salvaged when possible, unless the state determines otherwise. Procedures should be identified for handling NORM, if present. Due to the expense and potential damage to the land, there may be situations where equipment or materials would not be removed, e.g., a gathering system might be abandoned in place with appropriate protection. When reclaiming a pit, the state should determine the contents of the pit and how the pit can best be remediated. Once emptied, cleaned and tested as appropriate, pits should be backfilled and contoured to prevent erosion from or ponding of surface water. Monitoring wells at an abandoned site should be as necessary to protect groundwater resources. The state should develop additional remediation criteria for commercial disposal sites, as appropriate.

6.6.3 Record of Remediation

Once remediation of an abandoned site has been completed, reports on how the site was remediated should be maintained by the regulatory agency.

6.7 Public Participation

The state abandoned sites program should provide for public participation. At a minimum, the public should have: (1) access to information about the program; (2) the opportunity to participate in any rulemakings associated with the program; and (3) a statutory or regulatory mechanism to petition the state agency to change a site's status on the inventory and/or the level of remediation required on a site.

6.7.1 Access to Information

The state should maintain and make available to the public, records related to the abandoned sites inventory, including: (1) the location of an abandoned site; (2) the extent and degree of contamination of the abandoned site; and (3) the method of remediation that

has been or will be required for an abandoned site. In addition, the state should maintain public records on the state's progress with respect to implementing the abandoned sites program.

6.7.2 Participation in Rulemaking

The state program should provide an opportunity for the public to participate in any rulemakings associated with the program.

6.7.3 Participation Regarding Priority on the Inventory and Level of Remediation

The state program should include a mechanism by which an affected person could petition the state to: (1) add a site to the abandoned sites inventory; (2) change the priority for remediation of a site on the inventory; and (3) conduct or require additional remediation of a site.

6.8 Avoid Future Abandoned Site Problems

Since abandoned sites may constitute a threat to public health and the environment, the state should:

a. Establish and implement an abandoned site program consistent with the guidance in this section; and

b. Enforce its existing regulatory program, with modifications, if necessary, consistent with this guidance.

c. Evaluate its programs for financial assurance, inspection, compliance tracking, and monitoring of inactive sites to determine whether or not the state should make adjustments to prevent an increase in abandoned sites.

SECTION 7 | Naturally Occurring Radioactive Materials

7.1 Background

Naturally occurring radioactive material (NORM) is present above background levels at some oil and gas E&P facilities and E&P service company locations. NORM found in E&P operations originates in subsurface oil and gas formations and is typically transported to the surface in produced waters. NORM may deposit in well tubulars, surface piping, vessels, tanks, pumps, valves, and other producing or processing equipment and may be found in scales, sludges, contaminated soil, and other associated E&P wastes. NORM is also referred to as Technologically Enhanced Naturally Occurring Radioactive Material or TENORM.

7.2 General

States should adopt an E&P NORM regulatory program that addresses identification, use, possession, transport, storage, transfer, decontamination, and disposal to protect human health and the environment. States may choose not to adopt such a program if they find, based on field monitoring data and other scientific information, that no NORM is present in oil and gas operations in the State, or that the levels of NORM present in oil and gas operations in the State do not present such a risk to human health or the environment to warrant a regulatory program. States that make such a finding should periodically reevaluate the basis for the determinations.

If a state determines that a regulatory program is necessary, it should tailor its program to NORM occurrence in the oil and gas E&P industry and an assessment of risks to human health and the environment. The program should include the elements listed in Section 7.3. E&P NORM should be managed in accordance with the pollution prevention and waste management hierarchy provisions of these guidelines. In addition, the other sections of these guidelines apply, where applicable, to NORM as a constituent of E&P waste.

7.3 Elements of an E&P NORM Program

7.3.1 Definition

States should develop a definition for NORM that is consistent with that which occurs in the oil and gas E&P industry. For purposes of these guidelines, NORM is defined as any naturally occurring radioactive materials (not including byproduct, source or special nuclear material, or low level radioactive waste) not subject to regulation under the Atomic Energy Act, whose radionuclide concentrations have been enhanced by human activities such that potential risk to human health or the environment are increased.

7.3.2 Action Levels

States should establish risk-based numerical action levels above which NORM is regulated taking into consideration the risk of exposure to human health and the environment. Such action levels should also be used to regulate the transfer or release of equipment, materials, and sites.

7.3.3 Surveys

States should develop standards for survey instruments and procedures for identifying and documenting equipment, materials, and sites that may contain NORM above the action levels. States should consider the types of facilities to be surveyed, when surveys should be performed, when survey results should be reported to the state regulatory agency, and any necessary training of surveyors. State survey requirements should provide data necessary to meet the purposes described in Section 5.2.1 and to administer and enforce state program requirements effectively.

7.3.4 Worker Protection

State regulatory programs should include applicable state and federal standards for worker protection from exposure to radiation, including worker protection plans, and other standards necessary for the protection of workers from exposure to NORM. States should establish NORM training or certification requirements based upon E&P work related duties and their associated NORM exposure risk (i.e., NORM awareness training may be sufficient for many common E&P work activities).

States that have not implemented a Federal OSHA-Approved State Plan cannot enforce Federal OSHA standards for worker protection. In such “non-agreement” states, Federal OSHA administers job safety and health programs. States with Federal OSHA jurisdiction should be aware of the limitations this may place on worker protection programs implemented by the state, and should communicate with Federal OSHA to ensure that any worker protection program implemented by the state is enforceable under Section 18 of the OSH Act.

7.3.5 Licensing/Permitting

a. General licensing/permitting: Persons who possess E&P NORM in concentrations or at exposure rates that exceed state-adopted action levels should be generally licensed or permitted.

b. Specific licensing/permitting: Specific licenses or individual permits should be required for commercial storage, removal, decontamination, remediation, treatment or disposal of E&P NORM. A state may require specific licenses or individual permits for the

management of E&P NORM at centralized facilities as defined in Section 5.10.

7.3.6 Removal/Remediation

States should consider performance standards for removal, decontamination, and remediation that are protective of human health and the environment.

7.3.7 Storage

States should establish standards for storage of NORM that are protective of human health and the environment. NORM storage facilities should be constructed to prevent or minimize releases. Tanks used to store E&P NORM should meet the requirements of Section 5.9. A state should consider adoption of limits on the amount of time NORM that exceeds action levels can be stored, depending on factors such as quantity, radioactivity, climate, proximity to the public, and protective controls.

7.3.8 Transfer for Continued Use

State regulatory programs should allow for the transfer of land and equipment containing NORM for continued operations in the production of crude oil and natural gas, with appropriate notification to affected parties.

7.3.9 Release of Sites, Materials, and Equipment

State regulatory programs should address the levels below which, and conditions under which, equipment, materials, and sites containing NORM may be released. State regulatory programs should authorize the release of equipment, materials, and sites for unrestricted use only if NORM is below action levels. Such regulations should provide for appropriate notification to affected persons.

7.3.10 Disposal

State regulatory programs should authorize disposal alternatives within the state's jurisdiction for various E&P wastes containing NORM, including contaminated equipment, and should include regulatory requirements for NORM disposal that are protective of human health and the environment. Landowner or other notification may be required as a condition of disposal. Commercial and centralized NORM disposal facilities should meet the criteria of Section 5.10.

7.3.11 Interagency Coordination

State radiation programs, oil and gas programs, and waste management programs are frequently distributed among separate agencies. Therefore, in many states, multiple agencies may regulate NORM. The various agencies should coordinate their regulatory and enforcement activities under the guidance given in Section 4.4 of these guidelines.

7.3.12 Public Participation

State regulatory programs for NORM should meet the public participation guidelines established in Section 4.2.2.

7.4 Regulatory Development and Research

The Conference of Radiation Control Program Directors has prepared suggested state regulations for NORM, and a number of states have developed or are in the process of developing NORM regulations. States that are developing their own NORM programs are encouraged to consult these sources as well as applicable federal radiation guidance and requirements for information and assistance. In addition, states should encourage and keep abreast of ongoing and future research on NORM, including risk assessment.

SECTION 8 | Stormwater Management

8.1 General

Stormwater can become contaminated from contact with spilled or stored materials, from contact with E&P waste, or from the erosion of soils. E&P waste management practices that have a potential of contaminating stormwater include land application, landfarming and roadspreading. States usually have statutory authority for stormwater management programs through general pollution prevention or water pollution control legislation. States should implement programs to minimize the potential for contamination of surface water from sediment and other E&P contaminants contained in stormwater.

Stormwater management requirements should be adapted to regional characteristics. These characteristics include variations in topography, rainfall (annual average, episodic and seasonal), major soil types, proximity to surface waters, floodplains, seasonal and permanent swamps, wetlands and marshes, and vegetative cover.

States should adopt a stormwater management program based on the potential effects on human health and the environment. States may choose not to adopt such a program if they find, based on field monitoring data and other scientific information, that stormwater runoff does not pose a significant risk to human health or the environment. States that make such a finding should periodically reevaluate the basis for the determination. The state program need not duplicate applicable federal regulations for stormwater management.

Stormwater management regulatory activities should be coordinated with activities of other interested parties including landowners, soil conservation agencies, land management agencies, agencies with NPDES jurisdiction, and agencies with spill response authority.

8.2 State Regulatory Elements

The state agency with stormwater management or erosion control authority should require an operator to minimize environmental impacts caused by stormwater. These requirements should include a description of the action the operator will take to meet state program goals for the geographic location in which the activity will take place. These requirements may be spelled out in specific regulations or they may be required to be included in operator- or site-specific plans developed by operators. State program requirements should specify time frames when stormwater control measurements are to be in place and when any state notifications are to occur.

In regions where stormwater has a high potential for causing environmental degradation, states should consider the use of permits or other authorizations to assure that adequate measures will be put in place. Such permits or authorizations should conform to Section 4.1.1. (Permitting).

State stormwater management programs should contain compliance evaluation capabilities as outlined in Section 4.1.2. (Compliance Evaluation), contain enforcement capabilities as outlined in Section 4.1.3. (Enforcement), be applicable to responses to spills and releases as outlined in Section 4.2.1. (Contingency Planning and Spill Risk Management), and contain data management capabilities as described in Section 4.2.8. (Data Management).

States programs should provide for outreach and training on stormwater management requirements and practices for operators, landowners and the public. These activities should conform to Section 4.2.2.2. (Public Participation). Similarly, training should be provided for state agency personnel as outlined in Section 4.3.1.5. (Training Requirements). Where stormwater management and E&P regulatory authority reside in different agencies, oil and gas agency staff should be trained so that they can, as time and staffing patterns allow, provide information and referrals to operators.

State stormwater management programs should be evaluated periodically in accordance with Section 4.2.3 (Program Planning and Evaluation). Such evaluations should include an analysis of all aspects of the program, and procedures for making any necessary program changes identified during the evaluation.

8.3 State Agency Regulatory Program Criteria

8.3.1 Planning

Within the context of an E&P program, selection of the location for a well site, roadway, pipeline or other E&P facility is a critical component of a stormwater management program. Factors to be considered during the development of site requirements with respect to stormwater management include: minimization of the area to be disturbed, current land uses, site gradient, the type of facility to be constructed, springs and seeps, floodways, stream crossings, and the management of E&P wastes.

Other factors that should be considered in the development of stormwater management requirements include well density, distance between wells, existing roads, necessary temporary and permanent roads to be constructed, road alignment, slope, grade and length, the availability of vegetative filter strips, and the management or disposal of trees and stumps to be removed during construction.

8.3.2 Construction

The construction of well sites, access roads, pipelines, stream crossings and crossings of wetlands, swamps and marshes can result in the contamination of stormwater and/or adjacent surface waters. Consequently, state agencies should develop standards or management practices appropriate for these activities. Similar practices may be

necessary when responding to spills and releases when soils are disturbed or contaminants are mobilized by stormwater.

Standards or management practices should be appropriate for the region in which the construction activity will occur. Examples of such requirements include the construction of upgrade diversion channels and the collection of construction site runoff; the use of brush and other barriers and the stockpiling of topsoil and subsoil during clearing and grubbing; and the grading of cut and fill slopes, road embankments, road surfaces (crowned, insloping or outsloping) and roadside ditches to control water.

Similarly, requirements should be developed for bridges, causeways, cofferdams, fords and bank stabilization when surface waters are encountered. Requirements for temporary road or stream crossings and use of rock at construction entrances may be necessary.

Practices to be considered for stormwater controls during construction include drainage ditches, basins, sediment traps, berms, vegetative filter strips, sediment barriers, turnouts, culverts and cross-drains, broad-based dips and swales, waterbars, rock filters, straw bale barriers and fabric filter fence. Outlet protection should be provided for devices with outlets to surface waters.

Additional practices to be considered for pipeline construction include the use of ditchline barriers, timing of backfilling, materials used for trench backfill, location of staging areas, and the use of trench plugs. In fragile soil, wetland and marshy areas, and at stream crossings, construction mats, board roads or geo-textiles should be considered.

Criteria should be developed for temporary stabilization if permanent stabilization will be delayed. Temporary stabilization practices such as seeding with annual grasses and mulching, or seed/filter fabric combinations should be considered. Permanent stabilization can occur through the application of rock to well sites and roads, and achieving adequate growth of (or sodding with) permanent vegetation. Factors to be considered during revegetation include calculation of acreage, soil types and distribution, seed bed preparation, seed mixtures (temporary, permanent), soil amendments, and mulching and anchoring.

8.3.3 Operation and Maintenance

States should require that stormwater control measures be operated and maintained in a manner that will assure their effectiveness during site preparation, well drilling and production, and until the site is restored. These measures should be operated and maintained to control sediment as well as E&P waste and spills. Requirements regarding the frequency and type of inspection, preventative maintenance and repairs are appropriate.

8.3.4 Restoration and Reclamation

Where appropriate, states should incorporate stormwater management during the development of standards for site restoration and reclamation. These requirements should apply to the restoration of recently active sites, orphan sites, remediation sites, and sites where prior restoration efforts failed.

Where appropriate, stormwater management criteria should be developed for the removal of equipment, restoration of pits, disconnection and abandonment of pipelines, backfilling and grading, and access road reclamation.

SECTION 9 | Hydraulic Fracturing

9.1 Background

The practice of completing oil and gas wells through hydraulic fracturing, while not new, has evolved into a key technology in the development of unconventional oil and gas resources, such as coal bed methane or shale gas. This has resulted in questions about the potential impacts on water resources due to the volume of water needed for hydraulic fracturing, the potential impacts to groundwater by the hydraulic fracturing process, or the proper management or disposal of waste and other fluids associated with hydraulic fracturing.

9.2 General

States should evaluate potential risks associated with hydraulic fracturing, taking into account factors such as depth of the reservoir to be fractured, proximity of the reservoir to fresh water resources, well completion practices, well design, and volume and nature of fluids. Where necessary and recognizing the local and regional differences discussed in Section 3.3, states should have standards to prevent the contamination of groundwater and surface water from hydraulic fracturing. State programs for hydraulic fracturing should ensure establishment and maintenance of well control; protection of groundwater zones, other mineral resources.

9.2.1 Standards

State programs for hydraulic fracturing should include standards for casing and cementing to meet anticipated pressures and protect resources and the environment. The state should have the authority as necessary to require the performance and/or submittal of diagnostic logs or alternative methods of determining well integrity. The state program should address the identification of potential conduits for fluid migration in the area of hydraulic fracturing and the management of the extent of fracturing where appropriate. The program should require monitoring and recording of annular pressures during hydraulic fracturing operations. The program also should address actions to be taken by the operator in response to operational or mechanical changes that may cause concern, such as significant deviation from the fracture design and significant changes in annular pressures.

State programs for hydraulic fracturing should consider baseline groundwater monitoring protocols that address appropriate factors which may include distance/radius from the well, timing/frequency of testing, test parameters, reporting and management of and access to data, existing/new development or existing production in area, responsibility for sample collection, testing, cost, location/gradient, surface owner consent, laboratory accreditation, and remedial actions.

Surface controls, such as dikes, pits or tanks, should meet the criteria in Sections 5.5 and 5.9. In addition to pit technical criteria for authorization, construction, operation, pit integrity monitoring, and closure contained in Section 5.5, states should address unique characteristics of impoundments associated with hydraulic fracturing, including the use of centralized and commercial facilities, operatorship, size, location, duration, closure, retention for other use, and characteristics of contained fluids. States should consider erosion and safety issues such as embankment integrity associated with fresh water impoundments associated with hydraulic fracturing.

Contingency planning and spill risk management procedures that meet Section 4.2.1 should be required. Waste characterization should be consistent with Section 5.2. The waste management hierarchy contained in Section 5.3 (source reduction, recycling, treatment and disposal), including the provisions relating to toxicity reduction, should be promoted. The tracking of waste disposed at commercial or centralized facilities should meet the requirements of Section 5.10.2.3. Procedures for receipt of complaints related to hydraulic fracturing should be consistent with Section 4.1.2.1.

9.2.2 Reporting

The regulatory agency should require appropriate notification prior to, and reporting after completion of, hydraulic fracturing operations. Notification should be sufficient to allow for the presence of field staff to monitor activities. Reporting should include the identification of materials used, aggregate volumes of fracturing fluids and proppant used, and fracture pressures recorded.

State programs should contain requirements for public disclosure of information on type and volume of base fluid and additives, chemical constituents, and actual or maximum concentration of each constituent used in fracturing fluids. States are encouraged to require disclosure of such information online. State programs should contain mechanisms for disclosure of chemical constituents used in fracturing fluids to the state in the event of an investigation and to medical personnel on a confidential basis for diagnosis and/or treatment of exposed individuals. Where information submitted is of a confidential nature, it should be treated consistent with Section 4.2.2.

9.2.3 Staffing and Training

In addition to the personnel and funding recommendations found in Section 4.3, state staffing levels should be sufficient to receive, record and respond to complaints of human health impacts and environmental damage resulting from hydraulic fracturing. Staff should receive adequate training to stay current with new and developing hydraulic fracturing technology.

9.2.4 Public Information

State agencies should provide for dissemination of educational information regarding well construction and hydraulic fracturing to bridge the knowledge gap between experts and the public as provided in Section 4.2.2.2. This is especially important in areas where development has not occurred historically and in areas where high volume water use for hydraulic fracturing is occurring.

9.2.5 Coordination

In addition to coordination as contained in Section 4.4, states should consider interstate coordination of regional multi-state issues such as source water, transportation and waste management related to hydraulic fracturing.

9.3 Water and Waste Management

Fundamental differences exist from state to state, and between regions within a state, in terms of geology and hydrology. The state should evaluate and address, where necessary, the availability of water for hydraulic fracturing in the context of all competing uses and potential environmental impacts resulting from the volume of water used for hydraulic fracturing. The use of alternative water sources, including recycled water, acid mine drainage and treated wastewater, should be encouraged.

Waste associated with hydraulic fracturing should be managed consistent with Sections 4.1.1 and 7.

States should encourage the efficient development of adequate capacity and infrastructure for the management of hydraulic fracturing fluids/wastes, including transportation (by pipeline or otherwise), recycling, treatment and disposal. State programs should address the integrity of pipelines for transporting and managing hydraulic fracturing fluids off the well pad.

SECTION 10 | Air Quality

10.1 Background

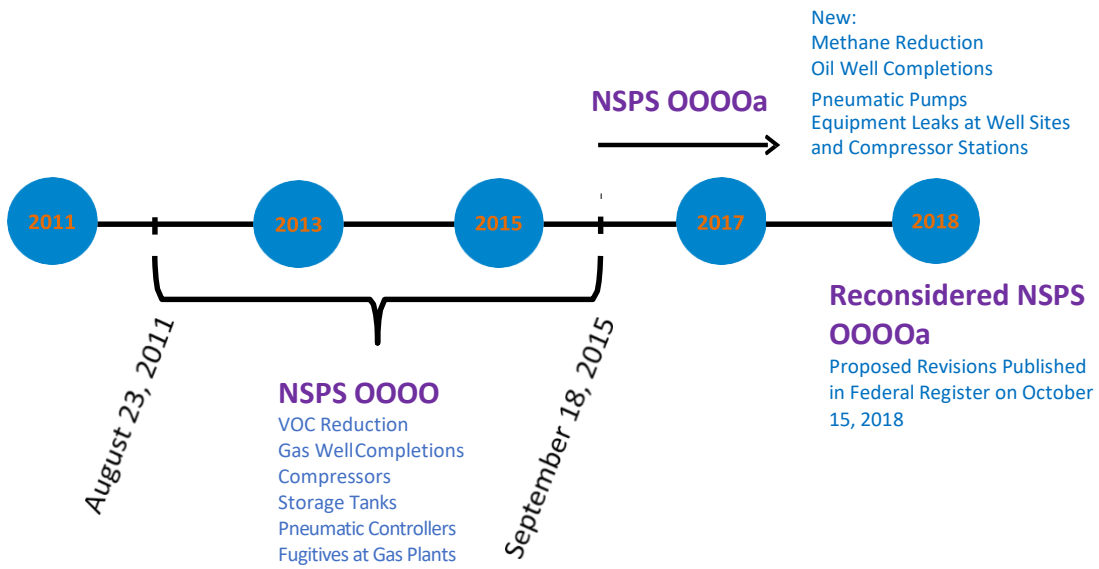
As a result of the increased development of oil and natural gas from shale formations, concerns about air emissions from the oil and gas sector have become more focused. The criteria of this Guidelines section are focused on air emissions from upstream oil and gas exploration and production (E&P) operations. The term “upstream” is used throughout to describe the full array of operations, activities, facilities, and sources in this sector.

On August 16, 2012, EPA published three final rules for the Oil and Natural Gas Sector: NSPS OOOO for the control of VOC and SO_2 emissions; and NESHAP HH/HHH for the control of hazardous air pollutant emissions. For VOC sources, NSPS OOOO applies to affected sources that are new, modified or reconstructed on or after August 23, 2011, and on or before September 18, 2015. NSPS OOOO requires that companies reduce completion flowback emissions from hydraulically fractured and refractured gas wells by employing reduced emissions completions (aka “green completions”), control emissions from storage vessels by 95%, use low or no bleed pneumatic controllers in the production segment, use no bleed controllers at gas plants, replace reciprocating compressor seals every 26,000 hours of operation or three years, reduce wet seal centrifugal compressor emissions by 95%, and implement more stringent NSPS Subpart VVa leak detection and repair (LDAR) programs at natural gas processing plants. NSPS OOOO also revised SO_2 emissions maximum control requirements for sweetening units affected facilities from 99.8 percent to 99.9 percent.

The NESHAP HH/HHH rules amended provisions to previously codified rules. In particular, the amendments set new standards for small glycol dehydrators, lowered the leak detection threshold at gas plants and amended the definition of “associated equipment” used in making major source determinations at well sites.

EPA published minor amendments to NSPS OOOO on September 23, 2013 and December 31, 2014. In response to petitions for administrative reconsideration of certain provisions in NSPS OOOO and in the amendments, EPA granted reconsideration for certain issues and subsequently proposed revisions to the rule on September 18, 2015. In the proposed rule, EPA revised the regulated pollutant to be both methane and VOC across the oil and natural gas source category (i.e., production, processing, transmission and storage). EPA also added control requirements for completion flowback emissions from hydraulically fractured and refractured oil wells, emissions from pneumatic pumps, and fugitive emissions from well sites and compressor station sites (LDAR). On June 6, 2016, EPA published a final NSPS OOOOa. The initial compliance date was August 2, 2016.

NSPS OOOO/OOOOa Applicability Timeline



New petitions for administrative reconsideration of certain provisions in NSPS OOOOa were filed and, after additional input from public and industry stakeholders, EPA published proposed revisions to NSPS OOOOa on October 15, 2018. EPA has not proposed removing any of the current regulated sources. EPA requested public comments on the proposed revisions and for questions the agency has asked in the preamble. A final revised NSPS OOOOa will likely be published in the second quarter of 2019.

10.2 Administrative

While state oil and gas regulatory agencies have many environmental responsibilities, air quality programs are typically administered by state environmental protection or health agencies and are given statutory and regulatory powers as described below.

Recognizing the local and regional differences discussed in Section 3.3, states should have standards to prevent the contamination of air from pollutants such as nitrogen oxides (NOx), volatile organic compounds (VOC), carbon monoxide (CO), methane, hydrogen sulfide (H2S); and air toxics or hazardous air pollutants (HAP) such as sulfur dioxide (SO2), benzene, normal hexane (N-Hexane), and formaldehyde.

10.2.1 Scope of Authority

An effective state program for the regulation of air emissions from upstream operations should include, at a minimum:

1. Statutory authority that adequately details the powers and duties of the respective regulatory body or bodies;

2. Statutory authority that grants the regulatory body or bodies the power to oversee air emissions from upstream operations such as production, gathering,

compression and processing. This authority should include the ability to promulgate appropriate rules and regulations and meet the state's obligations under federal law;

3. Statutory authority to promulgate specific requirements that are more stringent than required under the federal Clean Air Act, or regulations where necessary and appropriate to protect public health and the environment (for example, additional requirements on new and/or existing facilities or sources within ozone nonattainment areas);

4. Authority to accept delegation and authority for implementation of federal air quality programs specific to upstream operations;

5. Authority to consider cost effectiveness in setting air emission standards when appropriate, as well as to exempt facilities or sources based on criteria such as de minimis emissions, or by type of source or facility;

6. Statutes and implementing regulations which adequately and clearly define necessary terminology;

7. Provisions to ensure adequate funding for the staff and program to carry out its objectives and duties;

8. Mechanisms for coordination among stakeholders (including the public, federal and state agencies, and the regulated industry); and

9. Technical criteria for air emission controls that are flexible and forward-looking to encourage and accommodate advancements in technology.

10.2.2 Jurisdiction and Cooperation Between Agencies

The Clean Air Act establishes a dual federal/state system for establishing requirements to protect public health and the environment, and to oversee air pollution sources, including upstream oil and gas exploration and production operations. Under this framework, states are required to establish State Implementation Plans (SIPs) that contain sufficient requirements to attain and maintain compliance with National Ambient Air Quality Standards (NAAQS). Separate from the SIP process, states may, but are not required to, accept delegation of certain federal air quality requirements such as the preconstruction Prevention of Significant Deterioration (PSD) permitting program, the Title V permit program or New Source Performance Standards (NSPS). Even if a state does not accept delegation to implement and enforce a particular federal requirement, EPA retains responsibility for implementing and enforcing that requirement. Part of EPA's role is to ensure a level playing field across the country, therefore where a state accepts delegation of federal regulations, EPA continues to provide oversight to ensure adequate programmatic and compliance efforts across states.

Within states that accept delegation from EPA, jurisdiction over air quality issues related to upstream operations may be split between the state air quality agency, local air quality agencies and/or the agency with jurisdiction over oil and gas drilling and production. Because states do not have jurisdiction over air pollution sources on tribal lands, EPA or the tribes hold responsibility for implementation and enforcement of air quality requirements for upstream operations on these lands.

Where multiple state, federal or tribal authorities have jurisdiction over air quality issues in the same landscape, mechanisms should be in place to avoid duplication, regulatory gaps, or inconsistent air quality requirements or enforcement of such requirements. Consistent with EPA and state agency authority, such mechanisms could include formal Memoranda of Understanding, established interagency task forces, regular periodic meetings between agency staff, and joint inspections of facilities.

In addition to ensuring proper coordination, agencies should communicate with the regulated community and the public to make it clear which agency or agencies have jurisdiction over a particular area, or responsibility for enforcing a given set of air quality requirements.

10.2.3 Permits, Authorizations and Exemptions

The Clean Air Act prohibits the construction of a major source without a permit. State permits should clearly establish what performance standards and/or emission control requirements are required for each covered source. State programs should establish clear permit exemption criteria and employ construction general permits or permits by rule that also serve as final permits to operate.

When emissions are difficult to estimate due to uncertainty of source throughput and composition, states should consider mechanisms that allow operators to construct and operate certain source types for a limited but sufficient period of time to determine actual facility emissions prior to permitting (similar to federal rules such as the storage vessel provisions of OOOO and OOOOa that allow an established period for emissions determination before requiring control). Such mechanisms should be designed to ensure that permit conditions, including emission control requirements and Federal applicability, are properly informed, but that regulatory emissions thresholds are not exceeded during the evaluation period. States should have flexibility to re-visit emissions calculations as necessary.

States with approved Clean Air Act permitting authority should adopt a program for upstream emission sources that:

1. Is designed to protect human health and the environment;

2. Is legally and practicably enforceable;

3. Harmonizes with federal requirements to avoid confusing and duplicative requirements for operators; and

4. Allows the state to develop additional requirements beyond federal requirements to address state-specific air quality issues.

The permitting process should be efficient. Therefore, state air quality permitting programs should be:

5. Straightforward for operators to understand and implement;

6. Administratively efficient for the regulatory agency to minimize cost in time and resources; and

7. Transparent for public understanding.

To accomplish this, states are encouraged to simplify the application process by providing:

8. Accepted emission estimation methods and supporting documentation;

9. Guidance on air quality modeling requirements; and

10. Permit application assistance tools.

10.2.4 Compliance Monitoring, Demonstration & Assurance

State programs should contain the following compliance monitoring, demonstration and assurance capabilities:

1. Procedures for the receipt, evaluation, retention, and investigation of all notices and reports required of permittees and other regulated persons. These procedures should ensure that the notices and reports submitted are adequate in both content and frequency to assess compliance with applicable requirements. States should integrate electronic reporting systems to improve efficiency and timeliness of data received. Duplicative or unnecessary reporting should be minimized. Investigation for possible enforcement action should include determination of failure to submit complete notices and reports in a timely manner. Effective data management systems, as described in Section 4.2.7, should be used to track compliance.

2. Inspection and monitoring procedures that are independent of information supplied by regulated entities and which allow the state to determine compliance with program requirements, including:

    a. The capability to conduct comprehensive investigations, that may include advanced monitoring techniques as appropriate, of facilities and activities subject to regulation in order to assist with the evaluation of operational compliance;

b. The authority to obtain information from regulated entities and investigate information obtained regarding potential violations of applicable program and permit requirements; and

c. The capability to conduct regular inspections of regulated facilities and activities at a frequency that is commensurate with state priorities based on the protection of health, safety and the environment.

3. Procedures to receive and evaluate information submitted by the public about alleged violations and to encourage the public to report perceived violations. Such procedures should not only involve transparent communications with the public, (to apprise it of the process to be followed in filing reports or complaints) but should also communicate how the state agency will assure an appropriate and timely response.

4. Authority to conduct unannounced inspections at a reasonable time of any regulated site or premises where operations are being conducted, including the authority to inspect, sample, monitor, or otherwise investigate compliance with permit conditions and other program requirements, such as proper operation of control devices, process operating conditions and control device operating parameters.

5. Authority to enter locations where records are kept during reasonable hours for purposes of copying or obtaining electronic copies and inspecting such records.

6. Procedures to ensure that documents and other evidence are maintained and/or managed such that they can be admitted in any enforcement proceeding brought against an alleged violator, noting that some information may be entitled to confidential treatment.

   a. Operators and the state should presume that all records submitted to the state are public. It is the operator's obligation to identify which information is confidential business information, to take adequate steps to safeguard that information, and to demonstrate to the state that the release of such information would cause substantial harm.

7. Authority to require regulated persons to conduct stack testing or other measurements to establish or verify compliance with applicable requirements; to provide for state presence at such tests, be given adequate notice of the tests, and to conduct its own tests when deemed appropriate.

8. Authority to require, under statute, regulation or permit, regulated persons to:

   a. Establish and maintain records;

   b. Make reports;

   c. Install, use, and properly maintain monitoring equipment, and use audit

procedures, or methods;

d. Sample emissions in accordance with prescribed methods;

e. Provide stack test protocols and test reports;

f. Perform parametric monitoring where direct emissions measurement is impracticable;

g. Submit compliance certifications; and

h. Provide other information needed to determine compliance on a one-time, periodic or continuous basis.

10.2.5 Enforcement

10.2.5.1 Enforcement Tools

The state agency should have effective enforcement tools to address any violations of the state air program, which may include the following actions:

1. Issue a notice of violation;

2. Restrain, immediately and effectively, any person by order or by suit in state court from engaging in any impending or continuing unauthorized activity which is causing or may cause damage to public health or the environment;

3. Establish the identity of emergency conditions which pose an imminent and substantial human health or environmental hazard that would warrant entry and immediate corrective action by the state agency after reasonable efforts to notify the operator have failed;

4. Sue or cause suit to be brought in courts of competent jurisdiction to enjoin any impending or continuing violation of any program requirement, including any permit condition, without the necessity of a prior revocation of the permit;

5. Require, by administrative order or suit in state court, that appropriate action be undertaken to correct any harm to public health and the environment that may have resulted from a violation of any program requirement, including, but not limited to, establishment of compliance schedules or requiring the source to apply for and obtain permits for previously unpermitted emissions;

6. Encourage Beneficial Environmental Projects or Supplemental Environmental Projects to secure additional environmental benefits through enforcement settlements;

7. After administrative review, revoke, modify, or suspend any permit, or take other enforcement action deemed appropriate by the state, when the state agency determines that the permittee has violated the terms and conditions of the permit, failed to pay an assessed penalty, or used false or misleading information or fraud to obtain the permit;

8. Assess administrative penalties or seek, in court, civil penalties or criminal sanctions including fines and/or imprisonment; or

9. Resolve compliance issues informally, through mechanisms such as settlement agreements or warning letters, in lieu of a formal notice of violation, administrative order, or court order.

Complementing the enforcement tools identified above, state programs should have incentives (such as penalty mitigation and auditing/self-disclosure policies) to encourage operators to voluntarily disclose and correct violations.

10.2.5.2 Penalties

States should develop clear guidance for calculations of penalties that include factors such as the economic benefit resulting from noncompliance, willfulness, harm to the environment and the public, duration of the violation, the operator's compliance history, and the operator's good faith efforts to comply. Some of the benefits of having guidance for calculation of penalties include:

1. An opportunity to encourage voluntary disclosure of violations;

2. Providing consistency and transparency in the assessment of penalties; and

3. Providing for the development of readily defensible assessments.

Penalties should be such that an operator does not benefit financially from unlawful conduct, and should deter noncompliance by other operators. States should evaluate their enforcement options and policies to assure that the full range of actions available to them are applied effectively and consistently.

10.2.5.3 Right of Appeal

The right to appeal or seek administrative and/or judicial review of agency action should be available to any person having an interest which is or may be adversely affected, or who is aggrieved by any such action.

10.2.6 Staffing and Training

In addition to the general personnel and funding recommendations found in Section 4.3,

state staffing levels should be sufficient to receive, record and respond to complaints of human health impacts and environmental damage resulting from air emissions. Staff should receive adequate initial and on-going training to stay current with federal and state air regulatory requirements, state airshed goals, and industry production practices and technology, especially new and developing emissions estimation methods, air pollution control and monitoring technology (e.g., gas detection technologies). This training should include an oil and gas industry overview to familiarize state agency staff with the equipment and processes typical to industry operations, the sources of air pollutants, and the pollution control equipment and monitoring equipment they will be regulating and inspecting. Training programs to accomplish these goals could include:

1. Training courses or resource materials available through EPA, multi-state air planning organizations, private sector, industry associations, consortiums and universities;

2. Field visits and tours to oil and gas facilities in the state;

3. Engagement with other state and EPA air regulatory programs;

4. Conference attendance; and

5. Coordination and frequent discussions with other state and federal agencies regulating oil and gas operations, including state oil and gas conservation commissions and divisions.

Additionally, agencies should have a mechanism to assess and implement strategies designed to recruit and retain key agency staff such as:

6. Maintaining competitive salary levels;

7. Creation of new technical positions (air specialists, oil and gas sector specialists, etc.) in the permitting and enforcement programs; and

8. Increasing staff responsibilities via promotion of staff to higher positions (project leaders, team leaders, etc.).

10.2.7 Data Management

In addition to the data management recommendations found in Section 4.2.7, states should ensure that appropriate data is shared between agencies as efficiently as possible. The air quality program should have electronic access to an inventory that includes the level of detail (locations of oil and gas facilities and a unique identifier for the regulated activity such as API well number) necessary to conduct an effective program. Some of the data gathered may be required to be reported electronically, e.g., EPA Central Data Exchange (CDX).

Emissions data and other information should be made available in user-friendly

electronic formats after thorough and appropriate quality assurance.

10.2.8 Public Involvement

State agencies should provide for the electronic dissemination of educational and other appropriate information regarding air emissions from oil and gas activities to bridge the knowledge gap between experts and the public. This should occur as part of an ongoing process through which information is exchanged in an open forum as provided in Section 4.2.2.2. This is especially important in areas where development has not occurred historically. The public should also have the ability to ask questions and receive responses through the agency website. States should also use advisory groups of industry, government, and public representatives, or other similar mechanisms, to obtain input and feedback on the effectiveness of state programs as provided in Section 4.2.2.3.

In addition to the public participation provisions found in Section 4.2.2, states should take measures, such as web postings, FAQs, and distribution of fact sheets, to ensure that the industry, other state agencies and the public are aware of the delineation of responsibilities between the air quality program and the oil and gas program. Provisions should also be made for the availability of speakers to make presentations to interested groups.

10.2.10 Strategic Program and Resource Planning

State air programs for oil and gas will require adequate resources to fulfill state and federal mandates to ensure healthy air quality while providing adequate response time to permit applications and other needs from industry. As with other growing sectors, the oil and gas industry's potential for rapid growth in production basins can challenge the planning process for air programs, since large numbers of facilities can be deployed in production basins and cumulative emissions from new and existing facilities can potentially have significant impacts on air quality.

To address these challenges, and as set forth in these guidelines, states should have adequate resources to conduct necessary regulatory development, permitting, enforcement, monitoring, modeling, inventory development and public outreach activities. Additionally, states should have strategic planning capabilities to ensure that these resources remain adequate in light of dynamic growth in the oil and gas sector and rapid evolution in production technologies.

10.3 Air Program-Specific Elements

10.3.1 Delineation of Sources

States should consider developing an inventory of sources and activities not previously

registered or permitted, for example grandfathered facilities and equipment, and non-permitted sources and activities, if information about emissions from those sources is critical for planning and analysis for agency priorities such as efficiently ensuring compliance with air quality standards. The inventory should be comprehensive; however, it should not capture inconsequential (de minimis) sources that do not impact air quality.

10.3.2 Source-Specific Requirements

A state's air quality program should identify emission source types that must be represented in applications for air quality permits or authorizations. Source types and activities may include stationary engines and turbines, well completions or recompletions, handling of associated gas from oil wells, venting and leaking gas from compressors, gas-powered pneumatic devices, dehydration units, gas processing plants, storage vessels and other hydrocarbon fluids handling, wellbore liquids unloading, produced water management facilities, sweetening units, flares, fugitive emissions from components at well sites, compressor stations and gas processing plants, and emissions from all other maintenance activities.

The state requirements for these emission source types should be as stringent as the Federal requirements, where such requirements exist, unless the state deems it necessary to establish additional, alternative, or more stringent requirements. When specific air issues demand more stringent requirements, states may consider adopting, as consistently as possible, provisions by other states or the EPA that have been successfully implemented to address similar air quality issues, to minimize the impact on state resources.

State air quality programs may want to address unplanned and episodic emissions due to such things as fugitive air emissions, abnormal process conditions or malfunctions, wellbore liquids unloading, well maintenance, third party equipment downtime, changes in third party product gathering pipeline capacity or business agreements, and equipment failure. The programs should require incident reporting and corrective actions where possible, to ascertain root causes and avoid incident recurrence. However, the state should also consider safety aspects when developing new requirements for unplanned emissions.

The state air quality regulator should coordinate with the state oil and gas conservation regulator to develop a process to quantify and minimize the flaring, and prohibit the venting of, associated gas from oil wells. Such a process should contemplate both the air quality concerns and financial loss to the state, royalty owners, and operators of wasted gas from drilling operations.

In addition to regulatory efforts, there are several voluntary programs that provide best practices and information sharing. Since 1993, industry partners in the EPA voluntary Natural Gas STAR Program have developed and employed a variety of innovative techniques for mitigating methane emissions in the oil and gas sector. In 2016, EPA

updated this program to include the Methane Challenge. The oil and gas industry has developed programs as well, including The Environmental Partnership, ONE Future, and the Oil and Gas Climate Initiative. The Environmental Council of the States (ECOS) has also developed an online Methane and Air Toxics Reduction Information Exchange (E-MATRIX) that provides information on state best practices and cost-effective technologies that reduce emissions at points along oil and gas systems. The state should encourage awareness of the programs.

10.3.3 Air Quality Monitoring Networks

Air quality monitoring is an essential tool both to determine compliance with NAAQS and to assess the impact of air pollution sources on air quality. State programs should have an air quality monitoring network in place that meets these needs. In developing an air quality monitoring network, states should consider several parameters, including but not limited to: the number of monitors, the types of pollutants to be monitored, the location of monitors, specific monitoring instrumentation to be used, frequency of monitoring, and appropriate QA/QC procedures. In placing air quality monitors, states should consider factors such as emission source location, population density, topography and meteorology.

Many of the air quality monitoring requirements for states are set forth in implementing regulations for the various NAAQS. Additionally, federal permitting requirements for major stationary sources include certain source specific monitoring requirements. States should have appropriate mechanisms in place to ensure that this source specific monitoring is conducted in accordance with established standards and methods.

States may also consider whether to conduct ambient air quality monitoring that goes beyond the standards established under federal law. While states should have considerable latitude in determining whether and how to conduct such additional monitoring, appropriate procedures should be established to ensure that such monitoring, if undertaken, accurately assesses ambient air quality levels. As part of this additional monitoring, states should consider, where possible, establishing baseline air quality levels in order to assess the impact of oil and gas development changes.

Areas with significant oil and gas production activity may have few or no regulatory air quality monitors, because these areas may not meet typical criteria for siting of monitors, such as population density. States should consider whether to add monitors in these areas to assess emissions from existing, or anticipated increases in, oil and gas activity.

States should have appropriate monitoring equipment necessary to support emergency response activities as discussed in Section 10.3.5. Monitoring data should be made available consistent with the criteria of 10.2.7.

10.3.4 Reporting, Emission Inventories & Recordkeeping

States should develop and periodically update accurate and robust emission inventories as necessary to conduct good air quality planning and program assessment. States should establish emission-reporting requirements for air pollution sources that adequately support their efforts to develop high quality emission inventories. As states review and update their inventories they should work with industry and other stakeholders to identify the types of oil and gas sources which can produce significant emissions, and determine when updates to inventories are needed due to new information, changes to emission inventory compilation methodologies, or changes in production or operational practices. Consistent calculations methods, based on the gas and oil/condensate compositions for specific formations and basins, should be applied. If included in SIPs, the public review process is a requirement for those current and projected inventories used for both nonattainment area inventories as well as demonstrating attainment through air quality modeling.

States should consider using the EPA's oil and gas emissions tool(s) for computing nonpoint emissions sources. EPA provides the tool, instructions, and other guidance for computing these emissions as part of its National Emissions Inventory (NEI) program available on the Clearinghouse for Inventories & Emissions Factors (CHIEF). The tool allows for local inputs to be added by states to improve their emissions estimates. EPA also develops projection methods available on the CHIEF Emissions Modeling Clearinghouse for use by states. States that have developed emissions estimation techniques beyond those currently available from EPA are encouraged to share their methods with EPA and other states and tribes though channels such as the National Oil and Gas Emission Inventory Committee and the ECOS Shale Gas Caucus.

Every three years, states are required to submit to EPA all sources of emissions of criteria pollutants and their precursors (Air Emissions Reporting Requirements, 40 CFR Part 51, Subpart A). This includes both point and nonpoint sources for the oil and gas sector.

States should also develop well-founded emission projections to ensure that air quality standards will continue to be met in the future. Best available data and methods should be used for these projections. Projections which consider emissions under a range of alternative future conditions, such as the effect of changing industry practices, regulations, and crude oil and gas pricing, will yield better results than those that are based on single factors.

After administrative review, emission inventories and projections and reported emission data should be readily available to the public, including documentation of methodology, data sources, and assumptions made in producing the inventory.

10.3.5 Corrective Actions & Emergency Response

State air quality programs should establish clear criteria for the emergency reporting of significant, non-routine releases. These criteria should consider factors such as the mass and type of constituents released and the proximity of the release to sensitive receptors.

Agencies responsible for receiving emergency notifications of reportable releases to air should be identified and be responsible for the coordination, as appropriate, of any necessary response action with the operator, state and local emergency responders, environmental and/or public health agency and any other agency responsible for public protection.

States should ensure that community residents are notified when potentially hazardous air releases occur and should ensure that operators and emergency responders take necessary actions to minimize public exposure.

States should require operators to submit reports that contain information on the cause of the release, the type(s) and amount(s) of pollutants released and the corrective actions the company implemented, to aid in the prevention of incident recurrence.

10.3.6 Long-Term Planning, Prioritization & Evaluation

The state should develop procedures for regular evaluation and consideration of the appropriateness and adequacy of its air quality regulatory program.

In addition to the program planning and evaluation provisions found in Section 4.2.3, states should have a good understanding of oil and gas operations, including exploration and production; gathering, boosting, processing, and transmission; and accurate inventories and projections of air emissions. Because emissions characteristics, operational requirements, and operational approaches can vary widely by basin, it is critical for regulators to involve stakeholders (including oil and gas producers, environmental and citizen groups, and local governments) in the planning and evaluation processes. Periodic analyses should be completed to ensure that air quality remain protective of public health and the environment, in accordance with state and federal statutes and regulations, as the oil and gas industry evolves and grows.

There are and will be a number of federal regulations applicable to oil and gas operations that must be assessed for state adoption, incorporated by reference into state regulations, or left to EPA for implementation. In most states, these federal regulations become the basis of the state air regulatory program. Airsheds with oil and gas basins that have measured or modeled concentrations of air pollutants near or above the NAAQS, considerable existing or planned development, and/or geographic conditions (topography and meteorology) that can create stagnant air, may require specific, specialized analyses to assess the short-term and long-term status of compliance with the NAAQS. Collaboration with industry and other stakeholders is important to ensure that analyses are comprehensive, scientifically sound, and adequately address the

relevant questions and issues. Technical collaborations may be more successful when accomplished within a structured process that clearly defines the roles and responsibilities of participants, procedures for disseminating analysis design, solicitation of comments, processes for responding to comments, and other opportunities for feedback.

Analyses of criteria pollutant trends, comprehensive emissions trends, and projections of pollutant concentrations, visibility, and deposition are important indicators for evaluation of state air programs. In the process of developing a strategic plan, states may develop specific airshed goals to reduce the impacts of pollutants. The development of these goals should be based upon careful analysis of state needs, priorities, available resources, and applicable state and federal regulations.

Additional program goals could include the following:

1. The development and implementation of an effective stakeholder outreach and education program;

2. The development of incentives for additional pollution control, such as streamlined permitting programs, permits by rule, and other permitting options that simplify the application and review process while promoting air pollution control;

3. The development and posting of guidelines, policies and report templates that result in efficiencies in the permitting and compliance assurance processes while encouraging good practice;

4. The creation of voluntary programs that recognize operators adopting additional air pollution measures; and

5. The development or improvement of an air monitoring network in areas with oil and gas activity, emissions inventories and calculation methods, and air modeling tools.

Regarding evaluation, performance metrics could include an evaluation of ambient pollutant concentrations, emissions trends, permit response time, appropriateness of permitting options, and clarity of conditions required for compliance. States should give consideration to the frequency of the evaluation of these types of metrics as well. Evaluation of emissions trends and modeling data may be more suited to an annual or periodic basis, whereas other metrics, such as stakeholder outreach and monitoring, may be done more frequently. The state agency should identify the set of metrics that is most applicable to its goal and then determine a schedule for program evaluation.

SECTION 11 | Reused and Recycled Fluids

11.1 Definitions

State regulatory programs should define fluids that may be reused and recycled. For the purposes of these guidelines, these are fluids that are generated during the drilling, completion (e.g. hydraulic fracturing flowback), and production stages of a well. The term "reused fluids" is commonly used to refer to fluids that require only minimal processing to remove suspended solids. The term "recycled fluids" is commonly used to refer to fluids that typically require more advanced treatment or processing to reduce the salinity of the recycled fluid. Reused and/or recycled fluids are used for well drilling (generally below the base of protected water), well workover, and completion.

11.2 Water Management Planning

Operators should be encouraged to develop Water Management Plans that consider reuse and recycling options. Water Management Plans should address all aspects of water management from acquisition through final disposition. Plans should be tailored to particular projects. State programs should recognize barriers that would limit an operator's ability to reuse or recycle fluids generated during drilling, completion, and production such as technological limitations, fiscal constraints, lease or surface use constraints, stage of development, fluid quality, and agency approval timeframes. States should encourage the use of fresh water alternatives for the drilling and completion of wells where available sources are feasible and where environmental risks can be adequately identified and controlled. See Section 9.3 for additional information concerning water and waste management related to hydraulic fracturing.

Where jurisdictional issues exist between multiple state agencies, river basin commissions, and other parties involved in the management of reused and/or recycled E&P fluids, coordination should be pursued as discussed in Section 4.4.

11.3 Waste Management

Fluids that are to be reused or recycled should be managed and regulated as a waste up to the point the fluids are used in the drilling, workover, or completion of a well. State programs should consider having a regulatory process to designate fluids as a non-waste when they are treated to a level satisfactory to the State and the fluid is reused or recycled. Regulatory responsibility for the reused or recycled fluids should lie with the operator of the facility that is storing, transporting, or processing the fluids. See Sections 5.1 – 5.3 for information concerning technical criteria of waste.

11.4 Transportation

The fluids to be reused or recycled are generally transported through pipelines or by truck.

11.4.1 Pipelines

11.4.1.1 Scope and Definition

a. The term, “pipeline” is used in this section to describe pipelines used to transport produced water and/or reused/recycled/treated water to or from various oil and gas facilities after separation from the oil and gas product. Such facilities may include, but are not limited to, the following:

   i. Water loading point
   ii. Point of discharge to a pit
   iii. Injection/disposal wellhead
   iv. Reuse/recycling/treatment facility
   v. Oil and natural gas well sites
   vi. CWA/NPDES/state permitted point of discharge to surface water

b. Where appropriate, states may consider adopting a definition for such pipelines that is consistent with the risk profile of the fluids being transported. States may consider several factors when determining a fluid’s risk profile, such as constituents of the fluid, potential release quantity, and potential impact to the environment.

11.4.1.2 Siting, Permitting, and Financial Assurance

a. States may address pipelines in facility and infrastructure permitting.

b. States should require operators to maintain information on the location, purpose, capacity, age, and material type of pipelines.

c. Pipeline siting should be designed to minimize or avoid impact on natural habitats and wildlife designated sensitive or protected.

d. Where appropriate, states should provide requirements for buried and aboveground pipelines, including requirements for repurposing.

e. States should ensure that their financial assurance requirements are sufficient to cover pipelines. For pipelines that would not be covered by existing facility and infrastructure permitting and financial assurance, states should add such pipelines to these existing programs, or create a separate program for those pipelines.

11.4.1.3 Construction and Operational Requirements

a. States should provide requirements for aboveground/overland/temporary lines and buried/permanent lines, including permanent and non-permanent buried lines.

b. Pipelines should be constructed, operated, and maintained in compliance with the manufacturer's specifications, the state's mechanical code, and other applicable industry standards.

c. Pipelines should be subjected to pre-operational hydrostatic integrity testing. Additional hydrostatic integrity testing should be required if the pipeline is moved, altered, repaired, or repurposed.

d. States should require integrity testing for pipelines after an appropriate duration of service, based on criteria such as the type and material of the pipeline, and the fluid being transported. The method of integrity testing should be appropriate for the type of pipeline. Testing methods include, but not limited to, the following:

    - Hydrostatic
    - Data metering
    - Visual inspection
    - Non-destructive testing

e. States should require operators to maintain documentation of integrity testing, and provide documentation upon request.

f. States should consider requiring depressurization and duration limits for pipelines not in continuous operation.

g. Pipelines left in place should be purged, physically disconnected, and capped when abandoned. Buried lines left in place should be cut off below ground.

h. States should ensure applicable OneCall legislation and damage prevention programs (to prevent damage to pipelines from excavators) are followed.

11.4.1.4 Spill Response and Remediation

a. There should be a means of accounting for and reporting leaks in accordance with state and EPA requirements.

b. Contingency planning and spill risk management should be addressed in accordance with the criteria of Section 4.2.1.

c. Site remediation should be addressed in accordance with state and EPA requirements.

11.4.2 Trucks

Truck transportation of fluids to commercial or centralized facilities should be addressed in accordance with the waste tracking and reporting provisions of Section 5.10.2.3. States should encourage operators to utilize smart truck routing to minimize traffic through residential areas, damage to roadways, and to avoid problems associated with spill exposure and complaints.

11.5 Treatment and Storage

Rules for the treatment and storage of fluids to be reused and recycled should be based on the potential risk presented by the treatment or storage of the fluid. Risk factors to consider include location and duration of fluid treatment or storage, chemical content and characteristics of the fluid and waste resulting from the treatment process, the volume of the fluid stored or treated, type of storage structure to be used (i.e. pits, tanks, or modular aboveground storage structures).

Permit processes for the storage of reused or recycled fluids should be streamlined and minimized for activities deemed to be of low risk. For example, the temporary storage and reuse of fluids on an Operator's lease might be approved during the well permitting process, or by other authorization, while facilities used for long-term storage and treatment of fluids may require separate prior authorization by the State.

Reporting requirements should include records of amounts of waste processed and, where appropriate, laboratory results for treated waste. See section 5.10.2.3 for more information on waste tracking requirements. Where appropriate, States should require groundwater monitoring consistent with the provisions of Section 9.2.1.

State regulatory programs should differentiate between centralized and commercial wastewater treatment facilities. See Section 5.10 for additional information regarding the permitting, construction, operation and closure of these facilities.

State regulatory programs should regulate the waste generated during the treatment of fluids in a manner as described in the technical criteria in Section 5. Those criteria address waste characterization, waste management hierarchy, pits, land application, tanks, and centralized and commercial facilities.

State regulatory programs should include a methodology for the determination of whether or not Naturally Occurring Radioactive Material (NORM) is present to the extent that it is regulated. See Section 7 for additional information on the identification, use, possession,

transport, storage, transfer, documentation, and disposal of materials containing NORM.

States should evaluate air emissions at facilities used for the storage and treatment facilities of fluids to be reused or recycled and determine whether a permit or exemption is required. See Section 10.2.3 for additional information regarding air quality permits, authorizations and exemptions.

APPENDIX A | References

REFERENCES

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APPENDIX B | Glossary of Terms

The following is a glossary of selected terms used in the Interstate Oil and Gas Compact Commission Environmental Guidelines for State Oil and Gas Regulatory Programs. The glossary is included only as an aid for the convenience of the reader. It is not intended as an exhaustive compilation of the terms used in the Report, nor are the definitions set forth intended to be preclusive of other potential meanings. Terms expressly defined in the text of the Report are not included in this glossary.

A

Acid: A chemical compound, one element of which is hydrogen, that dissociates in solution to produce free-hydrogen ions. For example, hydrochloric acid, HCI, dissociates in water to produce hydrogen ions - H^+, and chloride ions, CI^-.

Ambient Air Quality – The concentration of pollutants present in the portion of the atmosphere, external to buildings, to which the general public has access, measured in the form of mass of the pollutant per volume of air or as a certain number of parts of the pollutant per million (ppm) or per billion (ppb). *See generally* 40 C.F.R. § 50.1(e).

Aquifer: A geological formation, group of formations, or part of a formation that is capable of yielding water to a well or spring.

B

Barrel: A measure of volume for petroleum products. One barrel is equivalent to 42 U.S. gallons.

Basic Sediment and Water (BS&W): The water and other extraneous material present in crude oil.

Biodegradation: The process of breaking down matter into innocuous products by the action of living things, such as microorganisms.

Blowdown: The material discarded as a result of depressurizing a vessel or well.

Brackish Water: Water that contains relatively low concentrations of soluble solids. Brackish water has more total dissolved solids than fresh water, but considerably less than sea water.

Brine: Water that has a large quantity of salt, especially sodium chloride, dissolved in it; salt water and certain produced water are considered brines.

C

Characteristic Waste: Waste that is considered hazardous under RCRA because it exhibits any of four different properties: ignitability, corrosivity, reactivity, and toxicity.

Clean Air Act (CAA): The federal act that regulates air emissions from area, stationary, and mobile sources codified at 42 U.S.C. Ch. § 7401 *et seq*.

Clean Water Act (CWA): The act that sets the basic structure for regulating discharges of pollutants to surface waters of the United States. CWA imposes contaminant limitations or guidelines for all discharges of wastewater into the nation's waterways.

Climatology: The science that deals with climates (the prevailing influence or environmental conditions characterizing a group or period) and their phenomena.

Completion Fluid: A special fluid used when a well is being completed. It is selected, not only for its ability to control formation pressure, but also for its properties that minimize formation damage.

Completion Operations: Work performed in an oil or gas well after the well has been drilled to total depth. This work includes, but is not limited to, setting the casing, perforating, artificial stimulation, production testing, and equipping the well for production, all prior to the commencement of the actual production of oil or gas in paying quantities, or in the case of an injection or service well, prior to when the well is plugged and abandoned.

Corrosivity: The characteristic which identifies wastes that are acidic or basic (alkaline) and can readily corrode or dissolve flesh, metal, or other materials. The hazardous characteristic of corrosivity, for purposes of RCRA, is defined in 40 CFR 261.22, and generally includes aqueous solutions with a pH less than or equal to 2.0, or greater than or equal to 12.5, and/or liquids which corrode SAE 1020 steel at a rate greater than or equal to 6.35 mm per year.

Crude Oil: Unrefined liquid petroleum. It ranges in gravity from 9 to 55 API and in color from yellow to black, and it may have a paraffin, asphalt, or mixed base. If a crude oil, or crude, contains a sizable amount of sulfur or sulfur compounds, it is called a sour crude; if it has little or no sulfur, it is called a sweet crude. In addition, crude oils may be referred to as heavy or light according to API gravity, the lighter oils having the higher gravities.

D

Delegated Authority – A state's assumption, after US EPA approval, of partial or complete responsibility for administering EPA's CAA programs.

De-listing: A site-specific petition process whereby a handler can demonstrate to EPA that a particular waste stream generated at its facility that meets a listing description does not pose sufficient hazard to warrant RCRA regulation. Owners and operators can also use the de-listing process for wastes that are hazardous under the mixture and derived-from rules that pose minimal hazard to human health and the environment.

Derived-from Rule:A rule that regulates residues from the treatment of listed hazardous wastes. This rule is found at 40 CFR 261.3.

Disking: The process of using a tractor-pulled set of disks to mix surface soil with waste for the purpose of treating and/or disposing of E&P wastes.

Disposal Well: A Class II well permitted under the SDWA which is employed for the injection of produced water and certain other E&P wastes into an underground formation.

Drill Cutting: The formation rock fragments that are created by the drill bit during the drilling process.

Drilling Fluid: The circulating fluid used in the rotary drilling of wells to clean and condition the hole and to counterbalance formation pressure. Drilling fluids are circulated down the drill pipe and back up the hole between the drill pipe and the walls of the hole usually to a surface tank. Drilling fluids are used to lubricate the drill bit, to lift cuttings, to seal off porous zones, and to prevent blowouts. A water-based drilling fluid is the conventional drilling mud in which water is the continuous phase and the suspended medium for solids, whether or not oil is present. An oil-based drilling fluid has diesel, crude, or some other oil as its continuous phase, with water as the dispersed phase. Synthetic drilling fluid has a synthetic material such as esters or olefins as the continuous phase and water as the dispersed phase. In some circumstances air or another gas is used as a drilling medium.

E

Electrical Conductivity (EC): A numerical expression of the ability of a material to carry a current; the reciprocal of resistivity; normally expressed in milliohm/meter. It is frequently used in soil analysis to evaluate a soil's ability to sustain plant growth.

Emulsion: A mixture in which a liquid, termed the dispersed phase, is uniformly distributed (usually as minute globules) in another liquid, called the continuous phase or dispersion medium. In an oil-water emulsion, the oil is the dispersed phase and the water the dispersion medium; in a water-oil emulsion, the reverse holds. For example emulsions occur during production processes where crude oil is prepared for pipeline transportation.

Exploration: The search for reservoirs of oil and gas, including aerial and geophysical surveys, geological studies, core testing, and the drilling of exploratory wells, also known as wildcats.

Exchangeable Sodium Percentage (ESP): The extent to which the absorption complex of a soil is occupied by sodium.

$$ESP = \frac{\text{exchangeable sodium}}{\text{cation exchange capacity}} \times 100$$

Where the units for both the numerator and denominator are in milliequivalents per 100 grams of soil.

F

FAQs – “Frequently Asked Questions” reference document created, updated, and made publically available by a state that clarifies issues involving the delineation of responsibilities between a state’s air quality program and oil and gas program.

Field: A geographic area in which a number of oil or gas wells produce from a continuous reservoir. A field may refer to surface area only or to underground productive formations as well. In a single field, there may be several separate reservoirs at varying depths.

Formation: A bed or deposit composed throughout substantially the same kinds of rock; a lithologic unit. Each different formation is given a name, frequently as a result of the study of the formation outcrop at the surface and sometimes based on fossils found in the formation, and is sometimes based on electric or other bore-hole log characteristics.

Formation Water: The original water in place in a formation at the time production commences.

Fracturing: A method of stimulating production by increasing the permeability of the producing formation. Under hydraulic pressure, a fluid is pumped down the well and out into the formation. The fluid enters the formation and parts or fractures it.

Fracturing Fluids: The fluids used to hydraulically fracture a rock formation. In some cases, a proppant is deposited in the fractures by the fracturing fluid, which is subsequently pumped out and recovered.

G

Gas Processing Plant: A plant for the processing of natural gas, by other than solely mechanical means, for the extraction of natural gas liquids, and/or the fractionation of the liquids into natural gas liquid produces such as ethane, butane, propane, and natural gasoline.

Gas Treating Plant: A plant for the purification of natural gas (e.g., the removal of water and/or acid gases such as hydrogen sulfide) and recovery of condensate.

Generator:Any person whose act first creates or produces a waste.

Groundwater: Water below the land surface where there is sufficient water present to completely saturate the soil or rock.

Groundwater Monitoring: Sampling and analysis of groundwater for the purpose of detecting the release on contaminants.

H

Hazardous Waste: A waste with properties that make it dangerous or capable of having a harmful effect on human health and the environment. Under the RCRA program, hazardous wastes are specifically defined as wastes that meet a particular listing description or that exhibit a characteristic of hazardous waste.

Hydrocarbon: Organic compound 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. The smallest molecules of hydrocarbons are gaseous; the largest are solid.

I

Ignitability (RCRA): The characteristic which identifies wastes that can readily catch fire and sustain combustion. The hazardous characteristic of ignitability for purposes of RCRA is defined in 40 CFR 261.21 and is generally a liquid with a flash point less than 140 F., a non-liquid that causes fire under a friction condition, an ignitable compressed gas, or is an oxidizer.

L

Land Disposal: For purposes of RCRA Subtitle C regulation, placement in or on the land, except in a corrective action unit, and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation. underground mine or cave, or placement in a concrete vault or bunker intended for disposal purposes.

Landfill: For purposes of RCRA Subtitle C, a disposal unit where non-liquid hazardous waste is placed in or on the land.

Lease: A legal document executed between a landowner (or a lessor) and a company or individual as lessee, that grants the right to exploit the premises for minerals or other products. The lease is sometimes referred to as the area where production wells, stock tanks, separators, and production equipment are located.

Legally and Practicably Enforceable – All terms or conditions included in a permit issued under a federally approved program – including delegated authority – authorizing EPA to enforce such terms or conditions. Federally enforceable programs under the CAA include, but are not limited to, the New Source Review program, the New Source Performance Standards program under Section 111 of the CAA, the Title IV acid rain program, the National Emission Standards for Hazardous Air Pollutants program under Section 112 of the CAA, the Title V program, and state permit programs approved by EPA in the state's SIP.

Liner: Continuous layer of natural or synthetic materials, beneath and on the sides of a surface impoundment, landfill, or landfill cell, which restricts the downward or lateral escape of waste, waste constituents, or leachate.

Listed wastes: Wastes that are considered hazardous under RCRA because they meet specific listing descriptions.

Loading Criteria: A numeric level, normally expressed in pounds per acre, below which a specific chemical compound may be applied to the soil.

Location: Place at which a well is to be or has been drilled.

M

Mixture Rule: A rule that is intended to ensure the regulation of mixture of listed wastes with non-hazardous solid wastes.

Molecular Sieve: Absorbents that are used to remove small amounts of H_2S and/or water from natural gas, capable of being regenerated.

Municipal Solid Waste: Durable goods (e.g. appliances, tires, batteries), non-durable goods (e.g. newspapers, books, magazines), containers and packaging, food wastes, yard trimmings, and miscellaneous organic wastes from residential, commercial and industrial non-process sources.

N

National Ambient Air Quality Standards (NAAQS) – Nationwide air quality levels, promulgated pursuant to section 109 of the CAA ,42 U.S.C. § 7409, for six criteria pollutants – sulfur dioxide, particulate matter, nitrogen oxide, carbon monoxide, ozone, and lead – of which a state is responsible for achieving, maintaining, and enforcing pursuant to section 110 of the CAA, 42 U.S.C. § 7410, through its approved SIP for each given pollutant.

National Emissions Standards for Hazardous Air Pollutants – Nationally applicable standards under section 112(b) the CAA, 42 U.S.C. § 7412(b), for emissions of hazardous air pollutants listed under section 112(d) the CAA, 42 U.S.C. § 7412(d), that apply to major and area stationary sources as defined under section 112 of the CAA, 42 U.S.C. § 7412.

Natural Gas: Naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth's surface. The principal hydrocarbon constituent is methane.

New Source Performance Standards – Nationwide technology-based emissions standards for new or modified stationary sources in specified industrial source categories promulgated pursuant to section 111 the CAA, 42 U.S.C. § 7411. The standards reflect the degree of emission limitation achievable through the application of the best system of emission reduction, taking into account the cost of achieving such reduction and any health and environmental impact and energy requirements, that EPA determines is adequately demonstrated.

O

Operator: The person or company, either proprietor, contractor, or lessee, actually operating a well, lease, or disposal facility.

P

Permeability: The ability of a formation to transmit fluids.

pH: A measure of acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity.

Plug and Abandon (P&A or Plugging): The placement into a well of a plug or plugs designed to restrict the vertical movement of fluids after abandonment.

Process Upsets – unintended mode of operation of a unit which could result in impaired functionality.

Produced Sand: The formation solids which flow into the wellbore with the produced formation fluids. In general, the lower the formation competency, the greater the produced sand volumes.

Produced Water: The fluid brought up from the hydrocarbon-bearing strata during the extraction of oil or gas. It can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process.

Production: The phase of the petroleum industry that deals with bringing the well-fluids to the surface and separating them, and with storing, gauging, and otherwise preparing the product for sale.

Q

QA/QC – "Quality Assurance/Quality Control" are criteria and procedures that must satisfied to ensure the quality of data and the calibration, repair, and evaluation of air quality monitoring instruments.

R

Reactivity: The characteristic identifying wastes that readily explode or undergo violent reactions. The hazardous characteristic of reactivity for purposes of RCRA is defined in 40 CFR 261.23 and generally includes wastes with highly exothermic reactions or wastes which create toxic gases when mixed with water.

Reclaimed: For purposes of defining a material as a solid waste under RCRA Subtitle C, a material is reclaimed if it is processed to recover a usable product, or regenerated by processing it in a way that restores it to usable condition.

Reclamation: The process of returning a site or contaminated soil to an appropriate state of environmental acceptability.

Recycled: For purposes of defining a material as a solid waste under RCRA Subtitle C, a material is recycled if it is used or reused, or reclaimed.

Recycled Fluids: Commonly used to refer to fluids that typically require more advanced treatment or processing to reduce the salinity of the fluid prior to reuse in well drilling, workover, and completion.

Reused Fluids: Commonly used to refer to fluids that require only minimal processing to remove suspended solids prior to reuse in well drilling, workover, and completion.

Recycling: The separation and collection of wastes, their subsequent transformation or remanufacture into usable or marketable products or materials, and the purchase of products made from recyclable materials.

Reservoir: A subsurface, porous, permeable rock body in which oil or gas or both are stored. Most reservoir rocks are limestones, dolomites, sandstones, or a combination of these. The three basic types of hydrocarbon reservoirs are oil, gas, and condensate. An oil reservoir generally contains three fluids; gas, oil, and water-with-oil, the dominant product. In the typical oil reservoir, these fluids occur in different phases because of the variance in their gravities. Gas, the lightest, occupies the upper part of the reservoir rocks; water, the lower part; and oil, the intermediate section. In addition to occurring as a cap or in solution, gas may accumulate independently of the oil; if so, the reservoir is called a gas reservoir. Associated with the gas, in most instances, are salt water and some oil. In a condensate reservoir, the hydrocarbons may exist as a gas, but when brought to the surface, some of the heavier constituents condense to a liquid or condensate. At the surface, the hydrocarbons from a condensate reservoir consist of gas and a high-gravity crude (i.e., the condensate). Condensate wells are sometimes called gas-condensate reservoirs.

S

Safe Drinking Water Act (SDWA): The act designed to protect the nation's drinking water supply by establishing national drinking water standards (maximum contaminant levels, (MCL's), or specific treatment techniques), and by regulating UIC wells.

Salinity: The quantitative level of salt in an aqueous medium.

Salt Section: A formation, or part of a formation, which is predominately made up of salt; typically sodium chloride.

Sodium Absorption Ration (SAR): A ratio of the concentration of sodium to the square root of the sum of the concentrations of calcium and magnesium.

$$SAR = \frac{Na+}{-[Ca+ + Mg^{2}+]}$$

Where the cation concentrations are in millimoles per liter. It is a measurement frequently used in soil analysis to evaluate a soil's ability to sustain plant growth.

Solid Waste: Any garbage; refuse; sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility; and other discarded material, including solid, liquid, semisolid or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. For the purposes of hazardous waste regulation, a solid waste is a material that is discarded by being either abandoned, inherently waste-like, a certain waste military munition, or recycled.

Solids Separation Equipment: Equipment used in drilling and workover/completion operations to remove drill cutting or formation solids from the drilling or workover/completion fluid. May include liquid/solids separation devices such as shale shakers, hydrocyclones, centrifuges, and filtration units.

SPCC: Spill prevention Control and Countermeasures. Regulations establishing spill prevention procedures and equipment requirements for non-transportation related facilities with certain above-ground or underground storage capacities (e.g., crude oil tanks) that could reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines.

Spent Materials: Materials that have been used and can no longer serve the purpose for which they were produced without processing.

State Implementation Plan (SIP) – The body of air quality rules including, but not limited to, enforceable source-specific emissions limitations, monitoring plans, and permit programs established by each state which are designed to either attain or maintain the NAAQS and to implement other requirements established by the Clean Air. Each state's SIP must include, at a minimum, the elements prescribed under CAA section 110(a)(2), 42 U.S.C. § 7410(a)(2), and must be approved by EPA before it becomes effective.

Subtitle C: That portion of the Resource Conservation and Recovery Act (RCRA) which defines and legislates the management of hazardous wastes.

Sweetening – The removal of hydrogen sulfide and other organosulfur compounds from "sour" natural gas. Natural gas is considered "sour" if it contains hydrogen sulfide in amounts greater than 5.7 milligrams per normal cubic meters.

T

Tank Bottoms: Produced sand, formation solids, and/or emulsions that settle-out in production operation process vessels.

Title V Permit Program – A federally mandated operating permit program under the CAA that requires implementation by the states. *See generally* 42 U.S.C. §§ 7661-7661f; 40 C.F.R. Parts 70 and 71. The Title V permit program applies to: all "major sources" as that term is defined in CAA section 501(2), 42 U.S.C. § 7661(2); sources subject to a standard or regulation under the NSPS program, 42 U.S.C. § 7411, or the NESHAP program, 42 U.S.C. § 7412; "affected" sources under the Acid Rain Program; sources required to have a PSD or NSR permit; and any other sources as designated by EPA. *See* 40 C.F.R. § 70.3 (applicability of Title V program). Title V permits consolidate all of these applicable CAA requirements into one legally enforceable document.

Topography: The physical features of a district or region, such as are represented on maps, taken collectively; especially the relief and contour of the land.

Toxicity: The characteristic which identifies wastes that are likely to leak dangerous concentrations of toxic chemicals into groundwater. The hazardous characteristic of toxicity for purposes of RCRA is defined in 40 CFR 261.24 and includes eight metal and thirty-one organic compounds. The toxicity characteristic is determined in accordance with a prescribed test procedure (the toxicity characteristic leaching procedure -TCLP).

Toxicity Characteristic Leaching Procedure (TCLP):A lab procedure designed to predict whether a particular waste is likely to leach chemicals into groundwater at dangerous levels.

Transporter: A person engaged in the off-site transportation of waste.

Treatment: Any method, technique, or process designed to physically, chemically, or biologically change the nature of a hazardous waste.

Treatment, Storage and Disposal Facilities: Facilities engaged in the treatment, storage, or disposal of hazardous waste. These facilities are the last link in the cradle-to-grave hazardous waste management system.

U

Underground Source of Drinking Water (USDW): An aquifer which supplies drinking water for human consumption or for any public water system, or contains fewer than 10,000 mg per liter total dissolved solids, and does not contain minerals or hydrocarbons that are commercially producible, and is situated at a depth or location which makes the recovery of water for drinking water purposes economically or technologically practical. While EPA defines an USDW as containing less than 10,000 mg per liter TDS, certain states, such as California and Texas, have adopted a 3,000 mg per liter TDS definition for the Class II UIC injection well programs.

Universal Wastes: Commonly referred to as recycled wastes with special management provisions intended to facilitate recycling. There are three categories of universal wastes; hazardous waste batteries; hazardous waste pesticides that have been recalled or collected in waste pesticide collection programs; and hazardous waste thermostats.

Used Oil: Any oil that has been refined from crude or synthetic oil that has been used, and as a result of such use, is contaminated by physical or chemical impurities.

V

Vadose Zone: A subsurface soil zone that contains suspended water. The vadose zone is above the zone of continuous water saturation.

W

Waste Minimization: The reduction, to the extent feasible, in the amount of waste generated prior to any treatment, storage, or disposal of the waste. Because waste minimization efforts eliminate waste before it is generated, disposal costs may be reduced, and the impact on the environment may be lessened.

Waterflood: A method used to enhance oil recovery in which water is injected into a reservoir to remove additional quantities of oil that have been left behind after the primary recovery. Usually, a waterflood involves the injection of water into strategically placed wells so that it sweeps through the reservoir and moves remaining oil to the producing wells.

Workover: One or more of a variety of remedial operations performed on a producing well to try to increase production. Examples of workover operations are deepening, plugging back, pulling and resetting the liner, squeeze-cementing, perforating additional horizons, etc.

Workover Fluid: A special fluid used to keep a well under control when it is being worked over. A workover fluid is composed carefully so it will not cause formation damage. Also used to stimulate a well to enhance productive capacity such as a frac fluid, acid, etc.

Workover Wastes: Wastes resulting from well workover operations. The wastes usually include workover fluids, similar to drilling fluids and could include various small volume wastes such as tubing scale, wax/paraffin, and cleaning or painting wastes.