OCS EIS/EA
BOEM 2018-049

Air Quality Control, Reporting, and Compliance

30 CFR Part 550 – Subparts A, B, C, and J

Environmental Assessment

March 2020

U.S. Department of the Interior
Bureau of Ocean Energy Management
Sterling, VA

THIS PAGE INTENTIONALLY LEFT BLANK

FINDING OF NO SIGNIFICANT IMPACT

Implementation of the Final Rule for Air Quality Control, Reporting, and Compliance, 30 CFR Part 550

The Bureau of Ocean Energy Management (BOEM) proposes to promulgate the *Final Rule for Air Quality Control, Reporting, and Compliance 30 CFR Part 550* (Final Rule).

BOEM prepared an Environmental Assessment (EA) to evaluate whether this Final Rule would result in significant environmental impacts on the human, biological, or physical environment. The considerations summarized below are based on conclusions presented in the attached EA.

This Final Rule (Alternative F - the Preferred Alternative) would change 30 C.F.R. 550.303 and 304 to incorporate SLs values from USEPA's SLs presented at 40 CFR 51.165(b)(2)(2018), while maintaining the current reference to the NAAQS. The alternative would make additional changes in definitions and conforming text with no environmental impact consequences. The SLs currently written into BOEM regulations were those being used in 1980. This change in the SLs is distinct from Alternative B (Proposed Action), which would cross reference USEPA's rule, and thereby update BOEM's regulations when USEPA promulgates new SLs.

In the immediate future, the change in SLs could have either a positive or a neutral impact. The change may result in reduced emissions from some OCS facilities. Under certain circumstances, provisions (such as § 550.303) BOEM's regulations become slightly more protective of air quality. It is possible this will prevent OCS emissions from causing or contributing to NAAQS exceedances. However, because current information indicates that facilities do not generally generate emissions that cause impacts exceeding USEPA's current significance levels, and trigger mitigation requirements, these changes are unlikely to result in lower emissions.

Moreover, implementation of the Final Rule will not require operators to engage in additional activities that could significantly affect any environmental resource.

Since BOEM finds that the Final Rule does not constitute a major Federal action significantly affecting the human, biological, or physical environment, with regard to Section 102(2)(C) of the National Environmental Policy Act, and does not require preparation of an Environmental Impact Statement.

Jill K. Lewandowski
Chief, Division of Environmental Assessment

Date

TABLE OF CONTENTS

LIST OF ACRONYMS

AAQSB	ambient air quality standards and benchmarks
AOCSR	Alaska Regional Office
BACT	Best Available Control Technology
BOEM	Bureau of Ocean Energy Management
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CO	carbon monoxide
DOCD	Development Operations Coordination Document
DPP	Development and Production Plan
EA	environmental assessment
EET	emissions exemption threshold
ERM	emissions reduction measures
EP	Exploration Plan
GOMR	Gulf of Mexico Region
NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
O_3	ozone
OCS	outer continental shelf
OCSLA	Outer Continental Shelf Lands Act of 1953
Pb	lead
PM	particulate matter
$PM_{2.5}$	fine particulate matter
PM_{10}	course particulate matter
ROW	Right-of-Way
RUE	Right-of-Use and Easement
SIL	Significant Impact Level
SL	Significance Level
SO_2	sulfur dioxide
SSB	state seaward boundary
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

1.1 Background and Overview

The Outer Continental Shelf Lands Act of 1953 (43 U.S.C. §§ 1331 *et seq*.) (OCSLA) authorizes the Secretary, Department of the Interior (Secretary) to prescribe and amend regulations as necessary to manage the orderly leasing, exploration, development, and production of mineral resources on the Outer Continental Shelf (OCS). Specifically, section 5(a) (8) of OCSLA (43 U.S.C. §1334(a) (8)) directs the Secretary to prescribe regulations to control air emissions from proposed OCS activities "for compliance with the national ambient air quality standards pursuant to the Clean Air Act (CAA) (42 U.S.C. §§7401 *et seq*.) to the extent activities authorized under OCSLA significantly affect the air quality of any State." Regulatory responsibility for ensuring compliance with section 5(a) (8) of OCSLA has been delegated to the Bureau of Ocean Energy Management (BOEM) and regulations promulgated pursuant to that authority are codified at 30 C.F.R. Part 550 subpart B "Plans and Information," and subpart C "Pollution Prevention and Control." The air emissions regulations under subpart C have remained fundamentally unchanged since promulgated in 1980, and were at the time applicable to all OCS activities authorized under OCSLA.

The 1990 amendments to the CAA (Pub. L. 101-549) included a new section 328(a) & (b) (42 U.S.C. §7627(a) & (b)) which redefined the area subject to the Secretary's jurisdiction to control air emission sources on the OCS. The revision limited the Secretary's jurisdiction to only areas westward of longitude 87 degrees and 30 minutes (central and western Gulf of Mexico), where compliance management responsibilities rest with the BOEM Gulf of Mexico Region (GOMR). The 1990 revision of the CAA (section 328(a) & (b)) placed all other OCS areas, including offshore Alaska, under the authority and jurisdiction of the U.S. Environmental Protection Agency (USEPA).

On December 23, 2011, the enactment of the "Consolidated Appropriations Act, 2012" (Pub. L. 112-74) again revised section 328(a) and (b) of the CAA and restored responsibility for regulating air emissions for a portion of Alaska OCS planning areas to the Secretary. Specifically, the Secretary's jurisdiction now includes the OCS planning areas adjacent to Alaska's North Slope Borough (the Beaufort Sea OCS and the Chukchi Sea OCS Planning Areas (Arctic OCS) and a small portion of the Hope Basin OCS Planning Area. Air quality management responsibilities for the Arctic OCS rest with the BOEM Alaska Regional Office (AOCSR).

The BOEM is revising portions of the existing subparts B and C of 30 C.F.R. Part 550 to update the OCS air emissions regulations for implementation by the GOMR and the AOCSR. The revisions relate to air emissions data required for OCS plans (Exploration Plan (EP), Development and Production Plan (DPP), Development Operations Coordination Document (DOCD), and cross- referencing the appropriate updated National Ambient Air Quality Standards (NAAQS) established by the USEPA.

The promulgation of the rule will enhance BOEM's ability to carry out its responsibilities under section 5(a)(8) of OCSLA. BOEM has evaluated the changes to determine whether

promulgation of the rule could result in potential significant environmental impacts to the human, biological, or physical environment.

This environmental assessment (EA) is being prepared under the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 *et seq*.,) in accordance with its implementing regulations promulgated by the Council on Environmental Quality (CEQ) (40 C.F.R. Parts 1500 to 1508), an office within the Executive Office of the President. This EA evaluates the potential environmental effects, if any, of the proposed action and alternatives and will assist the Secretary in determining whether promulgation of the rule and the associated implementation has the potential to significantly affect the quality of the human environment.

1.2 Purpose and Need

The authority to promulgate rules and revise existing regulations governing air emissions from BOEM approved activities is provided by section 5(a) of OCSLA and the jurisdictional boundaries for application of such regulations is provided by CAA section 328(b). The proposed action's purpose is to ensure BOEM's air quality regulations enable the bureau to best meet its obligations under section 5(a)(8) when it authorizes activities on the OCS, making certain the impact of such activities does not cause the air quality of any State to exceed the NAAQS.

There have been no substantive changes to the air quality rules and regulations established under OCSLA since their promulgation in 1980. During the ensuing40 years, the USEPA has updated the CAA air regulations for ensuring compliance with the NAAQS, but BOEM and its predecessors have not updated the existing OCSLA regulations to accommodate the changes that USEPA has made. As a result, the BOEM regional offices have used informal guidance to review and approve plans consistent with the requirement of 5(a)(8) to ensure that activities it approves do not violate the USEPA's NAAQS. Consequently, the proposed action is needed for the regulations to remain consistent with the current NAAQS and SLs and to update requirements for lessees to calculate their projected emissions.

2.0 PROPOSED ACTION AND ALTERNATIVES

The proposed action is a rulemaking amending BOEM's regulations on air quality, and the proposed rule was published on April 5, 2016. 81 Fed. Reg. 19717. The CEQ regulations state alternatives are the heart of the NEPA environmental review. As such, the regulations require the Federal decision-maker to perform the following tasks:

- Assess and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from the detailed study, briefly discuss the reasons for their having been eliminated; and
- Disclose the potential environmental consequences for each alternative, including a No-Action Alternative, to inform decision-makers and the public regarding their comparative effects.

The CEQ regulations and guidelines concerning the environmental review process require an agency to identify and evaluate a reasonable range of alternatives that could accomplish the objectives outlined in the discussion of the purpose and need for the proposed action. BOEM

has identified and evaluated alternatives to the proposed action, which could meet and satisfy the purpose and need of this proposed action as well as a no action alternative.

Section 2 presents a discussion of six alternatives, with Alternative B representing the proposed action and Alternative A representing the no action alternative. Alternatives C, D, E, and F examine additional options for rulemaking, which would omit specific provisions of the proposed action, maintaining certain aspects of the current regulation. This section also provides the rationale for why other alternatives were considered, but not analyzed.

2.1 Alternative A: No Action Alternative

The No-Action Alternative is to make no amendments to subparts A, B, C and J of 30 C.F.R. Part 550. Under this alternative, BOEM would take no action to amend existing BOEM air emissions regulations.

Under the No-Action alternative, the rules and regulations for the protection of coastal States' air quality from OCS sources of emissions under **30 C.F.R. Part 550**:

- Would not address attributing emissions from support vessels and offshore vehicles, nor would it set detailed requirements for modeling.
- Would not cross-reference the updates and revisions to the USEPA ambient air quality standards and benchmarks (AAQSB); thus, some plans may be approved under circumstances where although they comply with the 1980 standards, they would not comply with the USEPA's current SLs or AAIs.
- Would retain certain unclear or ambiguous language. As such, the BOEM regional offices would continue to expend valuable time explaining the rules and regulations to lessees, particularly for those lessees unfamiliar with the procedures in the AOCSR.
- Would maintain the practice of evaluating the impact of air emissions at the shoreline, instead of at the state seaward boundary (SSB).
- Would not require operators to resubmit their plans every ten years to demonstrate compliance with the regulations.
- Would not require modeling of O_3 and PM formation.
- Would not require vessel emissions be modeled more realistically.
- Would not require evaluating lead and ammonia emissions.

2.2 Alternative B: The Proposed Rule (Proposed Action)

The proposed action is the promulgation of the *Air Quality Control, Reporting, and Compliance* rule, to update the requirements under 30 C.F.R. Part 550 Subparts A, B, C and J, clarifying policy and procedures and incorporating improved air emissions reporting and monitoring. In summary, the proposed action would:

1) Change terminology by either adopting it from the USEPA, current usage in practice, or creating new or modified terminology for:

1. Air pollutant
2. Air quality control region
3. Ambient air increment
4. Ambient air quality standards and benchmarks
5. Attainment area
6. Attributed Emissions
7. Background concentration
8. Baseline concentration
9. Best Available Control Technology
10. Cause or contribute to the exceedance of the NAAQS
11. Class I and II Areas
12. Criteria air pollutant
13. Design concentration
14. Dispersion modeling
15. Emission exemption threshold
16. Emissions factors
17. Emission reduction measures
18. Emissions control efficiency
19. Emissions credits
20. Emissions source
21. Existing facility
22. Facility
23. Facility emissions
24. Federal land manager
25. Flaring
26. Fugitive emissions
27. Long-term facility
28. Major precursor pollutant
29. MARPOL-certified engine
30. Maximum rated capacity
31. Minerals
32. Mobile support craft
33. National ambient air quality standards
34. Nonattainment area
35. Operational limitation
36. Outer Continental Shelf region
37. Offshore vehicle
38. Particulate matter
39. Plan
40. Potential to emit
41. Precursor air pollutant
42. Projected emissions
43. Right of use and Easement
44. Short-term facility
45. Significant Impact Level

46. State
47. Stack testing
48. Venting

2) Allow Regional Directors to require lessees submit a revised plan, based on periodic review, if applicable air standards change.
3) Require the use of air quality models that are approved by BOEM, the USEPA, or a Federal Land Manager.
4) Specify that when modeling is required, it must follow USEPA approved guidelines.
5) Provide for sharing of data, needed for reviewing Class I areas' air quality with Federal Land Managers.
6) Accommodate Federal Land Manager input on certain plan approvals.
7) Allow BOEM to require additional information and, if it determines there is a significant potential impact to a State's air quality, based either upon information available to DOI or on objections from States and Tribes, require additional modeling or emissions reduction measures.
8) Cross-reference new or updated USEPA standards, so any future changes would immediately apply to all new or revised OCS exploration or development plans, except in limited circumstances where the BOEM grants a deferral for individual facilities.
9) Require emission reduction measures (ERM) any time projected emissions would cause an exceedance of USEPA defined Significant Impact Level (SIL) and requiring Best Available Control Technology (BACT) only when long-term facilities would cause an exceedance of a SIL.
10) Refine emissions monitoring requirements and imposes requirements related to the collection of fuel log and operational activity data.
11) Require operators to provide updated information every 10 years to facilitate a periodic review of OCS operations conducted under approved plans by BOEM.
12) Change the definition of facility to include artificial islands and equipment used to transport oil and gas.
13) Modify attributed emissions:

    a. The rule adds a provision limiting the calculation of attributed emissions to those sources whose support of a facility occurs within the same OCS region as the facility and within BOEM's air quality jurisdiction;
    b. The scope of attributed emissions considered in the regulation of facilities would be defined to include support vessels and offshore vehicles while operating in support of a facility, regardless of distance;
    c. The proposed action would require that the plan evaluation would apply to all criteria and precursor air pollutants emitted from any support vessel or offshore vehicle on the OCS or State submerged lands;
    d. With respect to mobile support craft, emissions would be modeled at locations where they actually occur; and,
    e. The rule spells out circumstances under which aircraft emissions are required to be reported, and are included in attributed emissions calculations.

14) Adjust Plan Reporting requirements as follows:
    a. Requires emissions be estimated utilizing the best available and most accurate emissions factors available;

b. Continues to allow EPA or FAA models of emissions factors and manufacturer certified emissions factors to be used;
c. Allows operators to utilize alternative emissions factors, provided that the operator could demonstrate the accuracy and reliability of the estimates; and,
d. Change engine unit of measurement from horsepower to kilowatt hour.

15) Authorize data collection for regional air emission inventories.
16) Require the use of SLs implemented by States or Tribes to determine whether a facility is causing a significant impact to a State if those SLs are stricter than USEPA's.
17) Modify emissions control requirements as follows:
    a. Lessee must notify BOEM and implement an equally or more effective alternative if any ERM or emissions control technology becomes non-functional or unavailable;
    b. Emissions credits or offsets may be generated by reductions in emissions from any source, provided that the source can be verified to maintain the corresponding reductions;
    c. Emissions credits or offsets, if proposed by a lessee or operator as an emissions reduction measure, must be of sufficient magnitude to bring the plan under the relevant air quality thresholds;
    d. Emissions credits may only be obtained from the same attainment or non-attainment area affected by the OCS emissions of a proposed facility; and,
    e. Additional emissions reduction measures (ERM) may be required if a cumulative impact study indicates the reductions are necessary to protect States' air quality.
18) Eliminate any exemptions from Air quality regulatory program (AQRP) for facilities constructed before 1980 and require operators to resubmit plans every ten years to ensure ongoing compliance if any ambient air quality standards and benchmarks (AAQSB) are changed by USEPA during the interim. The rule would allow the submission of modified, supplemental, or updated air plans to form the basis of this review and would allow a deferral of the ten year re-review any time such a plan is modified and re-approved.
19) Clarify how operators must conduct their analysis to determine whether they could cause an exceedance of the ambient air increments (AAIs).
20) For compliance, measures the impacts of emissions from facilities on air quality at the state seaward boundary (SSB), typically three nautical miles from the shoreline but may be up to nine nautical miles from the shoreline in certain States, such as Florida and Texas.
21) The current Emissions Exemption threshold formulas (EETs), which are currently based on the distance to the shoreline, will be revised in a future rulemaking to be evaluated at the SSB after the completion of studies currently evaluating the impact of emissions on States.
22) Expands air quality regulations to cover ROW and RUE applications.
23) Provide a list of de minimis activities and equipment, which can be excluded from air quality analyses.

2.3 Alternative C: Point of Impact Evaluation Unchanged

Alternative C is the promulgation of a rule as described in the proposed action with the exception of changing the point at which air quality impacts to the State air quality are evaluated. This would maintain the current policy of evaluating air quality impacts at the shoreline instead of the proposed change in Alternative B of evaluating such impacts at the SSB. The SSB is three nautical miles from most States' shorelines, with the exception of Texas and Florida, which are nine nautical miles from the shoreline (NOAA, 2015). Under Alternative C, impacts would be evaluated at the shoreline and points inland, where they are currently evaluated.

2.4 Alternative D: Resubmission of Air Emissions Plans Unchanged

Alternative D is the promulgation of a rule as described in the proposed action, with the exception of those parts requiring operators to resubmit their facility air quality plans every ten years if a relevant AAQSB is updated. Currently, operators are only required to update plans, for air quality reasons, if emissions will exceed the previously approved levels.

2.5 Alternative E: Not Attributing Vessel Emissions

Alternative E is the promulgation of the rule with the exception of those parts requiring the attribution and evaluation of air emissions of offshore support vessels, and if necessary, the modeling of any impacts of such emissions to the air quality of States. If BOEM selects this alternative, the bureau would not attribute emissions from vessels to facilities and the associated emissions would be excluded from exemption threshold calculations. This would be a change from current practice whereby BOEM considers the emissions of MSCs that occur within 25 miles of the proposed facility, but would not involve a change in the regulations.

2.6 Alternative F: Incorporating SL Values (Preferred Alternative)

Alternative F is the promulgation of the portions of the proposed rule which incorporates the values from USEPA's SLs presented at 40 CFR 51.165(b)(2)(2018), while maintaining the current reference to the NAAQS, along with other conforming and clarifying changes. Using USEPA's SLs is an appropriate way of implementing section 5(a) (8) of OCSLA so long as the standards are not out of date, such as BOEM's current regulations which utilize SLs being as they were in 1980. This is distinct from Alternative B (Proposed Action), which would cross reference USEPA's rule, in that it would not update BOEM's regulations should USEPA promulgate new SLs. In addition, under this proposal, BOEM would continue to use the same term in the current regulation, Significance Level (SL)so that its regulations use the same term as the USEPA's section 51.165(b)(2).

2.7 Alternatives Considered But Not Analyzed

Several other alternatives were considered, but they were rejected for the reasons given below. They are as follows:

1) The air emissions of all onshore vehicles and support facilities operating in support of offshore facilities would be attributed to the facility, in addition to attributing air emissions from offshore vehicles and vessels. This was not examined because while it is possible to allocate emissions from offshore vehicles to individual OCS facilities based

on the description in a plan, it would be extremely difficult to allocate the use of onshore vehicles and support facilities to activities described in a plan. Further, even if it were feasible to allocate the usage of onshore vehicles and support facilities to a particular plan, the amount of emissions allocated from such support vehicles and facilities would likely be very low. Therefore, accounting for the air emissions of all onshore vehicles and support facilities would not be a reasonable alternative to the proposed action.

2) The BOEM could eliminate the exemption formulas that allow some operators to not model. This was not considered because this alternative would provide no measurable additional protection to the environment over the proposed action. An exemption threshold exceedance does not itself trigger a requirement to reduce air pollutants. The exemption formula's purpose is to act as a screening tool to avoid the unnecessary expenditure by operators, and for BOEM, of evaluating plans having no significant impact on the air quality of a State. The resource burdens would affect both the operators who would be required to model, and the BOEM, which would have to review and assess a significant increase in the number of modeling results. The exemption formula is an effective way to reduce the resource burdens on BOEM and operators while not compromising the protection to the air quality of States from OCS activities. Eliminating the exemption formulas would therefore not be a reasonable alternative to the proposal.

3) The BOEM could require operators obtain a permit for their air emissions, a similar approach to USEPA's offshore air quality program. A permit program would impose significant resource burdens on both the operators and the BOEM without assisting the BOEM to fulfill its obligations to ensure compliance with the NAAQS. A permit program would require a significant increase in the number of BOEM staff required to conduct the necessary reviews prior to the issuance of any permits. Moreover, the environmental effects of a permit program would not differ from the rule's environmental effects, since the permit application and the plan would collect the same information and evaluate it according to the same standards. This alternative would have similar impacts on the environment as the proposed action. While an air quality permit program would achieve the proposed action's purpose, it is not a reasonable alternative since the same results could be achieved through the simpler and more cost-efficient process set forth in the proposed action, and therefore it is not necessary to analyze this alternative.

3.0 AFFECTED ENVIRONMENT

The affected environment consists of the areas of the OCS over which BOEM has statutory authority to regulate air quality impacts and the adjoining states. The rule will not impact resources other than air quality. Any potential impacts to air quality would be related to the concentrations of pollutants for which there are NAAQS. Under the CAA, the USEPA has established NAAQS for the following six criteria pollutants to provide protection from adverse effects on human public health and public welfare:

- carbon monoxide (CO)
- nitrogen dioxide (NO_2)
- coarse particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$)
- sulfur dioxide (SO_2)

- ozone (O_3)
- lead (Pb)

The CAA established two types of air quality standards under the NAAQS. Primary standards are intended to protect human public health, including the health of sensitive populations such as people with asthma, children, and older populations. Secondary standards are intended to protect public welfare, including protection against decreased visibility, and negative impacts to animals, crops, vegetation, and buildings. The Primary and Secondary NAAQS are identical for four of the six criteria pollutants (NO_2, PM, O_3, and Pb). The SO_2 Secondary NAAQS is less strict than its Primary standard, and there is no Secondary NAAQS for CO. The criteria pollutants released by OCS sources include CO, NO_2, PM, and SO_2. O_3 is not emitted; however, nitrogen oxides, volatile organic compounds, and CO are emitted and are precursor pollutants for O_3, which is formed through photochemical reactions in the atmosphere. Similarly, NO_x, VOCs, NH_3, and SO_2, are precursors for $PM_{2.5}$, which is both formed through photochemical reactions in the atmosphere and directly emitted and disbursed though the environment.

When an area does not meet the air quality standard for one or more criteria pollutants, USEPA designates the location as a nonattainment area. The CAA sets forth the regulatory process to be applied to an area in order to comply with the standards within a specified timeframe. This timeframe varies by the type of pollutant and severity. See Figure 1 for a map of areas that are currently nonattainment.

The entire atmosphere above the OCS, both in areas under USEPA and BOEM juristiction, is unclassified. USEPA defines unclassified as “any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant” (USEPA, 2015).

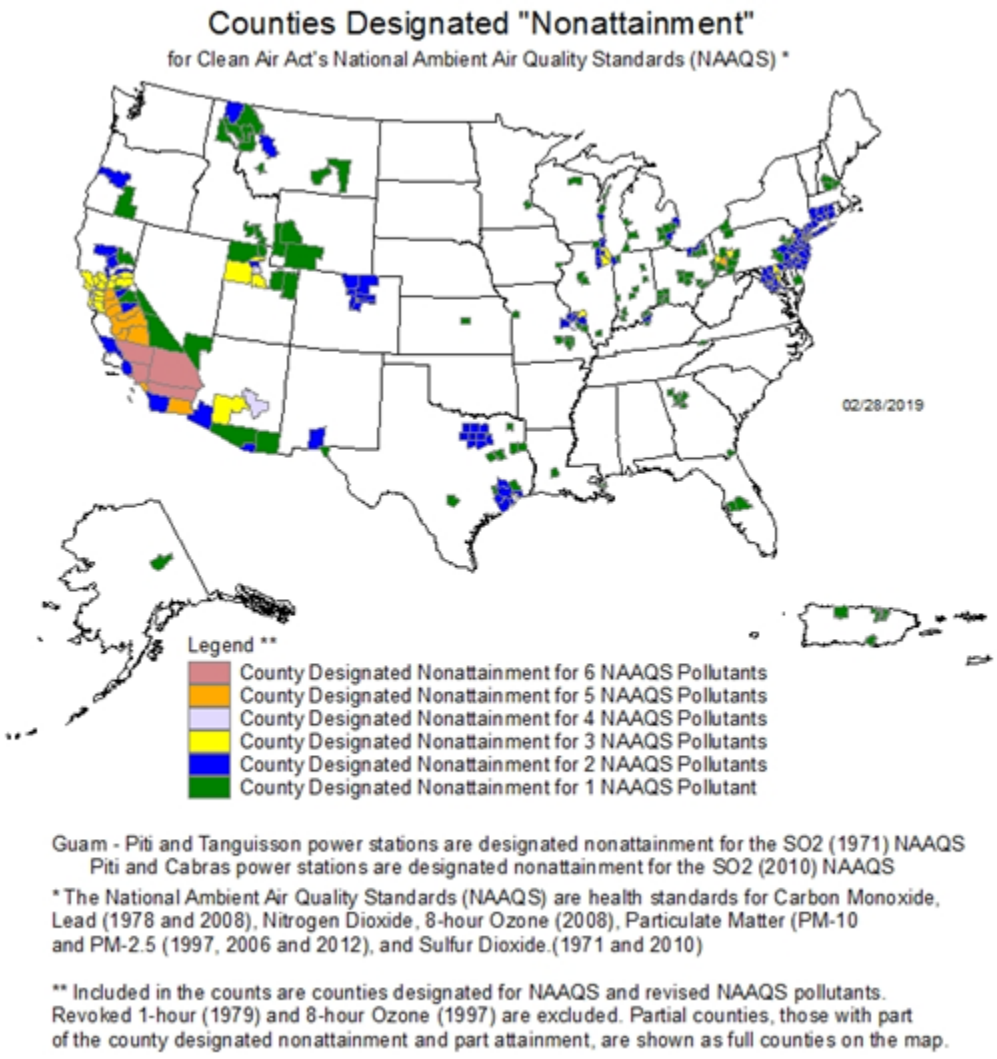

Figure 1 – The location of USEPA's current nonattainment areas (USEPA, 2019)

Artic Air Quality: For a detailed description of the affected environment in the Arctic, refer to Liberty Development Project Draft Environmental Impact Statement (BOEMb 2017), incorporated by reference here.The closest nonattainment area to the Arctic OCS is a portion of Fairbanks North Star Borough, which is located approxmately 500 mi (805 km) south of the Arctic OCS. This area was designated by USEPA as nonattainment for $PM_{2.5}$ in December 2010 and is the only nonattainment area in Alaska (see Figure 1). There is a mountain range, the Brooks Range, which stretches from east to west across northern Alaska acting as a barrier between OCS operations and Fairbanks North Star Borough. The distance from the nonattainment area, the barrier caused by the Brooks Range, and the relatively few existing emission sources on the North Slope prevents contribution of $PM_{2.5}$ to Fairbanks North Star Borough from the Arctic OCS.

Gulf of Mexico Air Quality: For a detailed description of the affected environment in the Gulf of Mexico refer to 4.1.1 of Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2022 Final

Multisale Environmental Impact Statement (BOEM 2017a), incorporated by reference here. The Gulf of Mexico OCS and nearby onshore areas are more industrialized than the Arctic OCS and northern Alaska. The USEPA identifies several nonattainment areas in the southeastern U.S. These nonattainment areas include all or part of the Dallas-Fort Worth, Houston, and the Tampa-St. Petersburg metropolitan areas, as well as Evangaline Parish, Lousisana, and Bexar, Freestone, Anderson, Mount Springs, Rusk, Titus, and Panola Counties, Texas (see Figure 1). Some nonattainment areas are as close as 10 mi (16 km) to the OCS, although the oil and gas operations typically generating high levels of emissions are generally farther offshore.

4.0 ENVIRONMENTAL CONSEQUENCES

The proposed action is a rulemaking which, if finalized, would apply to all current and future OCS oil and gas exploration, development, production and transportation (pipelines) activities in any OCS planning area under the jurisdiction of BOEM. As described, the proposed action and alternatives would address air quality regulation. The main impact to air quality by oil and gas operations in the Gulf of Mexico and anticipated in the Arctic offshore the North Slope Borough is from:

- platform construction and emplacement
- platform operations
- drilling activities
- flaring
- seismic-survey and support-vessel operations
- pipeline laying and burial operations
- evaporation of volatile petroleum hydrocarbons during transfers
- fugitive emissions
- chemicals used offshore, or pollutants from the burning of these chemicals

These activities result in the release of NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and potentially lead, which are criteria pollutants, as well as precursor pollutants such as volatile and semi-volatile organic compounds, hydrogen sulfide, methane, and ammonia, which are not. VOCs and ammonia are considered major precursor pollutants under this rule, since the former contributes to the formation of both O_3 and PM, while the latter contributes to the formation of $PM_{2.5}$.

After analyzing the rule, BOEM has determined air quality is the primary resource with the potential to be affected as the rule affects the standards for submitting and approving plans only with regard to air quality. This determination was made by BOEM after considering the following resources for impacts by the air quality rulemaking:

- Air Quality
- Water Quality
- Marine Mammals
- Marine and Coastal Birds
- Fish Resources and Essential Fish Habitat

- Sea Turtles
- Coastal Habitats
- Seafloor Habitats
- Areas of Special Concern
- Population, Employment, and Regional Income
- Sociocultural Systems and Environmental Justice
- Archeological Resources
- Land Use and Existing Infrastructure
- Tourism and Recreation
- Fisheries

The rule does not change the overall way facilities operate on the OCS, except in regards to air emissions. As a result, only air quality is expected to be impacted by the proposed action and its alternatives.

4.1 Alternative A: No Action Alternative

Selection of the "no action" alternative would mean there would be no revisions to 30 C.F.R. Part 550; therefore, 30 C.F.R. Part 550 changes would not be implemented and the rule's intended benefits would not be realized.

OCS oil and gas exploration and development activity may increase over the coming decades. Without the amendments, any changes to the USEPA standards which would be applicable under the rule to facilities regulated by and within BOEM's jurisdiction, would not be incorporated. Further, because the existing BOEM regulations were adopted 38 years ago, they were designed for the environment, circumstances, and OCS activities and equipment existing at the time. The SLs are not consistent with those used by USEPA to reflect today's science regarding health effects and therefore ensure activities will not be permitted to cause effects to State attainment of the current NAAQS.

These OCS activities result in the release of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$, volatile and semi-volatile organic compounds, which are criteria and precursor pollutants. Individual facility operations are not expected to have, in NEPA-terms, a major or significant effect onshore, as prevailing atmospheric conditions and emissions rates typically disperse pollutants before reaching the shoreline. Indeed, historically individual OCS operations contributed a minority of the emissions onshore (BOEM, 2015). However, as the USEPA has made adjustments to the AAQSB, the BOEM's regulations have not been updated accordingly. Without the revisions to the regulation, BOEM's current regulations could allow for future contribution of criteria pollutants to onshore nonattainment areas and degradation of State air quality.

These impacts of OCS activities that have been and would continue to be reviewed and approved under the current regulations are analyzed in the 2017-2022 OCS Oil and Gas Leasing Program Programmatic Environmental Impact Statement (BOEM 2016), which found "cumulative impacts on air quality on and near the GOM OCS oil and gas operations, as well as unrelated activities are expected to be moderate, because of the level of industrialization, both in the GOM,

and along the surround coasts."

Although that analysis includes sources other than OCS oil and gas emissions, BOEM is currently funding a modeling study (BOEM Study M14PC00007) to evaluate the contribution to the degradation of ambient air quality from OCS sources in the Gulf of Mexico. Information from the draft interim deliverable was published in the Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2022 Final Multisale Environmental Impact Statement in Appendixes F, G and H (BOEM 2017a), incorporated by reference here, and suggests OCS-sources are contributing to higher concentrations of ambient criteria pollutants, visibility reduction and acid deposition in the region. The modeling suggests impacts are largely over the OCS, but are also seen at the SSB, onshore, and in nearby Class I and Sensitive Class II Areas. This includes contributing minor amounts of emissions to the O_3 nonattainment areas in the Greater Houston Area. These results are still preliminary, but suggest wider impacts than had been previously modeled. Once the results are finalized they will be fully discussed and addressed in relevant leasing documents. This study is expected to be completed in 2019. Under the no action alternative these contributions to onshore air quality degradation would continue.

4.2 Alternative B: The Proposed Rule (Proposed Action)

The proposed action consists largely of changes to administrative, procedural and informational requirements regarding air emissions associated with new or modified OCS facilities. Some of these changes address requirements for reporting, record keeping, testing and plan submission. Consequently, those portions of the proposed action would not cause environmental impacts. Other changes in the regulation would not result in significant environmental impacts because standard operational procedures and equipment would be used to implement the technological and reporting requirements, and would generally strengthen the protection provided by current regulations.

Five subsections need a more in-depth discussion.[1] Two of these subsections, **550.307** and **550.308**, when considered in isolation appear to allow for the emission of additional criteria and precursor pollutants; however, in the rule's broader context, these provisions would work to reduce emissions. These subsections are designed to allow facility operators to shift their emissions reduction efforts toward activities that will achieve a greater reduction in emissions. Three additional subsections, **550.303**, **550.304** and **550.310**, are also discussed below in greater detail as the environmental effects, though neutral or positive, are nuanced. The requirements in these sections would help avoid potential adverse environmental impacts by reducing the amount of criteria pollutants emitted as a result of BOEM-approved activities on the OCS. In addition, the proposed action would add new requirements for some operators to conduct modeling to determine the effect of their emissions on O_3 formation in a State and to control those emissions. By reducing emissions of criteria and precursor pollutants BOEM would, in certain cases, reduce the contribution of OCS facilities' emissions to ambient concentrations in nonattainment areas, thereby minimizing any future contribution to NAAQS exceedances caused by existing or new OCS facilities.

The amendments to 30 C.F.R. Part 550, listed below, are exclusively administrative and technical. No impacts to any State's air quality are anticipated as a result of these revisions since

[1] All the citations to sections and subsections are to the proposed rule. 81 Fed. Reg. 19717 (April 5, 2016).

they do not require or encourage changes to any facility's operations. Therefore, further environmental analysis of these provisions is not necessary.

Subpart A – General
550.101 Applicability
550.105 Definitions
550.198 Documents incorporated by reference
550.199 Paperwork Reduction Act statements – Information Collection

Subpart B—Plans and Information
550.200 Definitions

Subpart C—Pollution Prevention and Control
Title
550.300 What is the purpose of subpart C?
550.301 Under what circumstances does this subpart apply to operations in my plan?
550.302 Acronyms and Definitions concerning air quality.

The following changes to 30 C.F.R. Part 550 contain provisions which affect the way offshore air emissions data is collected from OCS operators. These regulations explain how offshore data would be collected, stored, and transferred to the BOEM. This includes the addition of certain specific criteria for when operators are required to monitor actual emissions within certain criteria, as well as the collection and retention of fuel logs and operational activity data (e.g., run times). This differs from the current practice, which involves tracking emissions reduction measures only on an exception basis. It also includes a requirement to review air emissions from all ROWs and RUEs, and decommissioning activities. These provisions cause no environmental impacts, since they do not relax current requirements applicable to any facility's operations; therefore, further environmental analysis of these provisions is not necessary. These provisions should lead to more accurate and focused information collection to inform OCS approvals; thereby, in combination with other provisions discussed later, resulting in beneficial environmental impacts. **550.205** also includes a provision which changes the way vessel emissions are collected, with operators attributing the entire route of each vessel. Currently vessel emissions are only examined for vessels within 25 miles of a facility.

Subpart A – General
550.102 What does this part do?
550.160 When will BOEM grant me a right-of-use and easement and what requirements must I meet?
550.187 What region-wide offshore air emissions data must I provide?

Subpart B —Plans and Information
550.205 What air emissions information must be submitted with my Plan (EPs, DPPs and DOCDs, or application for a RUE or pipeline ROW)?
550.211 What must the EP include?
550.212 What information must accompany the EP?

550.224 What information on support vessels, offshore vehicles, and aircraft you will use must accompany the plan?
550.225 What information on the onshore support facilities you will use must accompany the plan?
550.241 What must the DPP or DOCD include?
550.242 What information must accompany the DPP or DOCD?
550.257 What information must accompany the DPP or DOCD on support vessels, offshore vehicles, and aircraft you will use?
550.258 What information must accompany the DPP or DOCD on the onshore support facilities you will use?
550.280 How must I conduct activities under the approved EP, DPP, DOCD or RUE, pipeline ROW?
550.284 How will BOEM require revisions to the approved EP, DPP, DOCD, or application for a RUE?

Subpart C—Air Quality Analysis, Control and Compliance
550.311 What post-approval monitoring and reporting is required?
550.312 Under what circumstances will I be required to verify my actual emissions?

Subpart J—Pipelines and Pipeline Rights-of-Way
550.1012 What are the air quality requirements for pipeline right-of-way holders?

The following changes to 30 C.F.R. Part 550 could help avoid potential adverse air quality impacts by expanding the number of facilities required to reduce their emissions. These changes do not allow for the emission of additional air pollutants, and therefore will have no negative impacts on air quality. They are likely to have a positive impact because the regulations could only decrease air emissions. This reduction would likely lead to lower levels of ambient air pollution onshore.

Subpart A – General
550.141 May I use or be required to use alternate procedures or equipment?

Subpart C—Air Quality Analysis, Control and Compliance
550.305 How do I determine whether my non-exempt emissions are significant and require ERM?
550.309 Under what circumstances will BOEM require additional ERM on my proposed facility or facilities?
550.313 Under what circumstances will BOEM impose additional requirements on facilities operating under already approved plans?
550.314 Under what circumstances will the Regional Supervisor review the emissions from my existing facility at the request of a State or Tribe?

The following change to 30 C.F.R. Part 550 provides a list of insignificant sources and activities that may be excluded from plan submittals. The purpose is to remove from consideration of emissions that are small or undetectable and do not meaningfully contribute to the overall facilities emissions. A methodology is provided to demonstrate additional sources and activities

that may qualify to be excluded from analysis. Many of these sources and activities listed were exempted under current practice since the current regulations have no provision which may have regulated them. Thereby, continuing to exclude them from analysis is expected to have no impact on air quality.

Subpart B –Plans and Information
550.205 (a) (5) Exceptions, Exemptions, and Exclusions

The following change to 30 C.F.R. Part 550 could help avoid potential adverse air quality impacts. This section describes how operators would reduce emissions, should such reductions be required. Although the current regulations contain provisions for offsets and controls, they do not describe specific requirements for methods of emission reduction. These changes would not establish standards for when controls would be required (as sections **550.307** through **550.309** do), but instead they determine how operators would be required to reduce their emissions. As a result, it is not clear how to quantify the effect from this change alone, but if used by OCS operators, it would result in lower emissions from their plans. The rule also contains expanded recording and reporting requirements, as well as stricter limitations on emissions of some pollutants which could, in combination with this provision, result in an increased number of facilities required to utilize emissions offsets and/or other emissions control technology. Since an increase in the use of offsets and emissions control technology could only reduce the net amount of emissions, the air quality impacts from this section would be either neutral if no plans require a reduction of emissions, or positive if control technology or offsets are required.

Subpart C—Air Quality Analysis, Control and Compliance
550.306 What requirements apply to my Emissions Reduction Measures (ERM)?

The following changes to 30 C.F.R. Part 550 could help avoid potential adverse environmental impacts because they describe how changes to USEPA regulations would affect the reporting of air emissions from facilities regulated by BOEM. These changes, in the immediate future, would have either a positive or a neutral impact. This regulation provides for incorporating future changes to USEPA's regulations into BOEM requirements. The impact of these changes will vary depending on how USEPA updates its regulations, and the relevance of those changes to OCS facilities. Although it is possible for USEPA to increase allowable emissions, thereby increasing the amount of emissions allowed at BOEM regulated facilities, this is a highly unlikely and unforeseeable event. The evidence used by USEPA to establish the current CAA regulations such as the NAAQS and associated significant impact levels are documented and subject to statutory criteria and a rigorous rulemaking process which will likely ensure they will continue to be environmentally protective. This provision will likely have positive air quality impacts should USEPA adjust the AAQSBs, particularly those related to NO_2, SO_2, or O_3.

Subpart C—Air Quality Analysis, Control and Compliance
550.310 (a), (b) How will revisions to the ambient air standards affect my plan?

The following five sections in *Subpart C—Air Quality Analysis, Control and Compliance* may have more nuanced impacts to air quality. These sections are discussed individually because they are not similar and their effects differ greatly.

The current regulation requires the use of BACT regardless of attainment status in nearby onshore areas. Like the current regulation, the changes in section **550.307 - What ERM are required for a short-term facility?** and section **550.308 - What ERM are required for a long-term facility?** would require the reduction of emissions when a facility's emissions are expected to exceed certain USEPA standards. However, while BACT is still required when USEPA standards are exceeded in a non-attainment or attainment areas, this rule would allow operators more options to reduce emissions when only attainment areas are affected, including offsets or operational controls and other ERMs. Under the rule, OCS facilities are still required to use BACT to prevent contributing to the degradation of the ambient air quality of any State. It is the intent of BOEM to allow facility operators to shift their resources towards operational controls and ERM, in areas where attainment has been achieved and emissions reductions can be achieved with methods such as offsets and credits. These alternative approaches to emissions control may have a positive impact because their reductions will typically occur closer to shore, or even onshore. More importantly, this provision requires emissions from OCS facilities not cause a significant adverse effect to the air quality of any State.

The revisions in section **550.303 - How do I know if my plan's emissions are exempt under this subpart?** and **550.304 - What must I do if my projected emissions exceed an emissions exemption threshold (EET)?** in *Subpart C* would change BOEM's current policy of evaluating and modeling impacts at the shoreline, including air dispersion and other analyses which determine when reduction measures are required. This would require the modeling and evaluation of OCS emissions impacts at the SSB and points closer to shore and onshore, but would not actually alter the EETs. Under the Submerged Lands Act (43 U.S. Code § 1312), in most cases the SSB extends three nautical miles from the shoreline, however Gulf of Mexico seaward boundaries for Texas and Florida extends nine nautical miles offshore (NOAA, 2015). This change is intended to protect the air quality of all parts of a State including submerged lands, and which are subject to being designated as nonattainment. This will better enable States to bring coastal nonattainment areas into compliance with the NAAQS.

This change may not have an environmental impact or a positive impact depending on local conditions and depending on which atmospheric process is more dominant in mixing air aloft down to the surface, sea breezes or platform downwash. The atmosphere over maritime waters tends to be relatively stable, meaning there is very little vertical atmospheric mixing. Differences in how the ocean and the land heat and cool cause increased vertical and horizontal atmospheric mixing in the vicinity of the shoreline, commonly referred to as a sea breeze (NWS, 2010). If this mixing is the first vertical motion emissions interact with after being released, it would cause the highest concentration of emissions to occur at the shoreline. The shoreline location is presently being used to evaluate plans for impacts under the current regulation.

There is a second process that may affect where emission concentrations are highest, called downwash (Liu, 2002). In this process, air emissions from the top of solid buildings move down the leeward side of a building, within the building's wind shadow. In the offshore environment, the facility from which the emissions originate is the most likely building for downwash to occur. Downwash may not occur offshore in a similar manner to the way it occurs onshore, where the process is better known. This is a result of offshore facilities being elevated from the

water's surface, unlike onshore buildings where a building's footprint typically reflects its shape higher up. This and other differences in offshore facilities reduce the size of wind shadows, thereby reducing the amount of emission downwash (Peterson, 1986); however, should this process mix enough criteria and precursor pollutants to the surface, they may currently be impacting air quality at the SSB. The proposed action would have BOEM evaluate and prevent these impacts and thus have a positive air quality impact at the SSB by reducing the emissions reaching that boundary.

These sections also newly incorporate Pb into BOEM's plan review process. This is unlikely to have an impact on air quality, as the amount of Pb released as a result of OCS operations is small due in part to the widespread use of unleaded fuels in the United States. Since leaded fuels are still used in some aircraft however, impacts from Pb emissions could be reduced if a facility requires an unusual amount of aircraft.

Section **550.310 - How will revisions to the ambient air quality standards and benchmarks (AAQSB) affect my Plan?** would require approved plans to be resubmitted at least every ten years, allowing the Regional Supervisor to review any changes, if a relevant AAQSB is updated. The required resubmission of existing plans would be phased into this process over the first decade after promulgation of the new rule. Since the plan approval process is when facilities' potential emissions are evaluated to determine if a significant impact to a state's air quality would occur and whether emissions controls are necessary, resubmission of plans would require lessees and operators to comply with the new standards enacted by BOEM or USEPA and if necessary, re-determine whether the such emissions significantly impact a State's air quality.

The current regulations do not have a general requirement for operations under already-approved plans which meet air emissions standards that have come into effect since the plan was initially approved. Facility operators currently have the option to resubmit plans at any time and would continue to have that option under the rule. Consequently, this change would likely have a positive impact on the environment in the event BOEM or USEPA's air quality regulations are updated, since the new requirement would require plans older than ten years be updated based on new air quality regulations and standards.

This provision would have a positive impact to air quality because it subjects all plans to updated standards implemented by either USEPA or BOEM. The proposal to require plans to be resubmitted every ten years would not degrade air quality and would reduce emissions if the standards are raised.

4.3 Alternative C: Point of Impact Evaluation Unchanged

This section evaluates the environmental impact of promulgating the rule in its entirety with the exception of shifting the point of evaluation of impacts to a State's air quality to the SSB. Under this scenario, the shift in the point of impact would be the only provision that would not be adopted.

Should the sea breeze phenomenon discussed under the effects of section **550.303 and 550.304** in Alternative B be the dominant atmospheric factor mixing criteria pollutants to the surface, there will be no environmental impact as a result of adopting this Alternative since the impact of emissions in this scenario is already being addressed under the current regulation. However, if downwash is more significant in moving criteria pollutants to the surface, the highest concentrations of OCS emissions within a State are very likely to be at the SSB. If this is the case, it is possible there would be increased impacts on a State's air quality when compared to the proposed action. If platform downwash is not significant in mixing criteria pollutants to the surface, air quality will not be either positively or negatively affected. Given the likelihood downwash (Lui, 2002; Peterson, 1986) is the dominant cause of mixing criteria pollutants and precursor pollutants to the surface, it is possible this alternative would allow criteria pollutants and precursor pollutants to continue impacting the air quality over State submerged lands when compared to the proposed action. The contribution of OCS sources to criteria pollutant concentrations at the SSB are currently being studied by BOEM.

Recently a BOEM funded a modeling study (BOEM Study M14PC00007) evaluating the contribution, if any, to the degradation of ambient air quality from OCS sources in the Gulf of Mexico. A draft interim deliverable has been received by BOEM which suggests OCS-sources are contributing to ambient criteria pollutants, visibility reduction and acid deposition in the region. The modeling suggests impacts are largely over the OCS, but are also seen at the SSB. This study is expected to close in 2019, and could also be used to set new exemption thresholds, which are based on the SSB, instead of the shoreline.

Alternative C could have negative effects when compared to the proposed action, as described in section 4.1.

4.4 Alternative D: Resubmission of Air Emissions Plans Unchanged

This section evaluates the environmental impact of promulgating the rule in its entirety with the exception of the provision requiring periodic reevaluation of a plan's air quality information if AAQSBs have changed. This would be the only provision which would not be adopted.

This alternative would retain the current requirement for the mandatory reevaluation of plans when facilities are modified. By maintaining this provision of the current regulation, no new negative impacts are likely. However, higher levels of air emissions to the atmosphere could be expected compared to the proposed action. Under the current regulation after a facility's plan is approved, it is only reevaluated if there are changes in equipment or operation. Since there is not a general requirement for ongoing monitoring of emissions, frequently the only time BOEM will have for reevaluating an air emissions plan, is if changes in equipment or operations occur. This means an older facility, for which emissions have not increased, could emit air pollutants in amounts exceeding AAQSB that were promulgated after the plan was approved. It is possible for facilities to continue to emit criteria pollutants and precursor pollutants in excess of revised requirements by BOEM and USEPA if those revisions were made subsequent to the last

review of a facility's emissions. Under this alternative, when BOEM and USEPA requirements change, facilities would continue to operate under the standards at the time of their plan approval, unless the Regional Supervisor exercises his discretion to review the plan and require revision.

As a result, Alternative D could allow for higher levels of air emissions to the atmosphere than could be expected under the proposed action.

4.5 Alternative E: Disregard Vessel Emissions

This section evaluates the environmental impact of BOEM not attributing to facilities the air emissions from offshore vessels and other mobile sources that service those facilities. The rest of the proposed rule would be adopted in its entirety, with only the provisions addressing vessels and other mobile sources excluded. The vessel emissions would not be used for Subpart C purposes because OCSLA does not empower BOEM to regulate activities not authorized by OCSLA nor require attribution of vessel emissions in determining how to regulate facility emissions.

The current regulations require operators to report emissions from the vessels that they will use to support the facility when the vessels are operating within 25 miles of the facility. However, the current provisions in Subpart C for evaluation of emissions and controls only refer to facilities. Current practice in the Gulf of Mexico region attributes a support vessel's emission sources to the total emissions at an OCS facility when it is within 25 miles of a facility before calculating the emissions for use in the exemption formula and for emissions evaluation and reduction requirements. This practice treats vessel emissions as if they were permanently co-located with the facility. Alternative B would have significantly changed this practice.

Since the practice described above is not written into BOEM's regulations, the effect of not including attributed emissions from vessels and other mobile sources in the rule would be to exclude them from the air quality evaluation of facility plans, just as under the current regulations. Under Alternative E, BOEM would not adopt the proposed revisions to Subpart C on this topic nor codify existing practices, and accordingly it would cease the current practice of including emissions from vessel sources in exemption formulas and for emissions evaluation and reduction requirements.

Ending BOEM's current practice of attributing vessel source emissions to an OCS approved facility while not adopting a method of evaluating mobile sources would mean that facilities could emit more pollutants without exceeding the SLs, which trigger requirements for reducing emissions. It is possible that this could lead to operators planning their operations in such a way that their facilities would emit additional pollutants. However, it is speculative to predict that operators would react by conducting operations with increased emissions. Since all facilities reviewed under BOEM's current practice do not cause any impacts above the SLs even when vessel emissions are added to facility emissions, it is especially difficult to draw conclusions about what would happen when vessel emissions are no longer added. If emissions from facilities did increase as a result of this change in BOEM's practice, the increase could be only as

much as was emitted by the support vessels used within 25 miles of facilities. While BOEM does not have modeling data to indicate the impacts of this specific subset of vessel emissions, the modeling study discussed in the Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2022 Final Multisale Environmental Impact Statement (BOEM 2017a) suggests OCS-sources, including vessels supporting OCS activities, are contributing to higher concentrations of ambient criteria pollutants, visibility reduction, and acid deposition in the region.

4.6 Alternative F: Incorporating SL Values (Preferred Alternative)

This alternative would change 30 C.F.R. 550.303 and 304 to update the SLs with the USEPA's SLs presented in tables at 40 CFR 51.165(b)(2)(2018) while maintaining the current reference to the NAAQS. The updated SLs (the term for which was renamed from the proposed rule, which referred to SLs, due to the potential confusion over the use of the term "significant impact levels" (SIL) in USEPA's guidance documents) are provided in section 550.303(e). The alternative would also make additional changes in definitions and conforming text with no environmental impact consequences. The SLs currently written into BOEM regulations were those being used in 1980.

In the immediate future, the adoption of the USEPA's current SLs would have either a positive or a neutral impact. The change may result in reduced emissions from some OCS facilities. However, because current information indicates that facilities do not generally generate emissions that cause impacts exceeding USEPA's current SLs, and trigger mitigation requirements, these changes are unlikely to result in lower emissions. Thus adoption of the SLs are not likely to result in a significant change in environmental impacts and certainly not in any case result in an increase in emissions as compared to the current regulations. Nothing in the revisions incorporated in this alternative will require operators to engage in additional activities that could significantly affect any other environmental resource.

5.0 REFERENCES

BOEM (2015) Gulf of Mexico OCS Oil and Gas Lease Sales: 2015 and 2016: Western Planning area Lease Sales 246 and 248; Final Supplemental Environmental Impact Statement, US Department of the Interior, New Orleans, http://www.boem.gov/BOEM-2015-008/ pp. 100-103.

BOEM (2017a) Gulf of Mexico OCS Oil and Gas Lease Sales 2017-2022 Gulf of Mexico Lease Sales 249, 250, 251, 252, 253, 256, 257, 259, and 261 Final Multisale Environmental Impact Statement, US Department of the Interior, New Orleans, https://www.boem.gov/BOEM-EIS-2017-009-v1 and https://www.boem.gov/BOEM-EIS-2017-009-v2 and https://www.boem.gov/BOEM-EIS-2017-009-v3

BOEM (2017b) Liberty Development Project Draft Environmental Impact Statement, Volume 1. Executive Summary and Chapters 1 through 6, US Department of the Interior, Anchorage, https://www.boem.gov/2016-010-Volume-1-Liberty-EIS/

Liu, David H. F., Bela G. Liptak, (2002) *Environmental Engineers' Handbook Second Edition* CRC Press, Boca Raton, Florida, pp. 286-288.
NOAA (2015) *Maritime Zones and Boundaries* http://www.gc.noaa.gov/gcil_maritime.html Accessed April 2015
NWS (2010) *The Sea Breeze* http://www.srh.weather.gov/srh/jetstream/ocean/seabreezes.htm Accessed April 2015
Petersen, Ronald L., (1986) *Wind tunnel investigation of the effect of platform-type structures on dispersion of effluents from short stacks.* Journal of the Air Pollution Control Association 36.12: 1347-1352.
USEPA (2009) *National ambient air quality standards (NAAQS)* http://epa.gov/air/criteria.html Accessed April 2015
USEPA (2019) *Designations | Greenbook US EPA* http://www.epa.gov/airquality/greenbook/define.html Accessed January 2018
USEPA (2017) *National Area and County-Level Multi-Pollutant Information* http://www.epa.gov/airquality/greenbook/multipol.html Accessed July 2018

6.0 LIST OF PREPARERS

Eric Wolvovsky – Meteorologist, Division of Environmental Assessment
Bureau of Ocean Energy Management

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Bureau of Ocean Energy Management Mission

The Bureau of Ocean Energy Management (BOEM) manages the exploration and development of the nation's offshore resources. It seeks to appropriately balance economic development, energy independence, and environmental protection through oil and gas leases, renewable energy development and environmental reviews and studies.