# Draft

# Amended General Conformity Determination Authorizing Changes to the Falcon Launch Program Action Activities within the Los Angeles-South Coast Air Basin Ozone Extreme Nonattainment Area, California

## May 2025

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AQMP | Air Quality Management Plan |
| CAA | Clean Air Act |
| CARB | California Air Resources Board |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| DAF | Department of the Air Force |
| EA | Environmental Assessment |
| GCR | General Conformity Rule |
| NAAQS | National Ambient Air Quality Standards |
| nm | nautical mile(s) |
| $NO_2$ | nitrogen dioxide |
| $NO_x$ | nitrogen oxides |
| $O_3$ | ozone |
| Pb | lead |
| PM2.5 | particulate matter less than 2.5 microns (fine particulate matter) |
| PM10 | particulate matter less than 10 microns |
| ROI | Region of Influence |
| RORO | Roll-On-Roll-Off |
| SBCAPCD | Santa Barbara Air Pollution Control District |
| SCAB | South Coast Air Basin |
| SCAQMD | South Coast Air Quality Management District |
| SCCAB | South-Central Coast Air Basin |
| SIP | State Implementation Plan |
| SLC | Space Launch Complex |
| SLD 30 | Space Launch Delta 30 |
| $SO_2$ | sulfur dioxide |
| SOx | sulfur oxides |
| SpaceX | Space Exploration Technologies Corporation |
| tpy | tons per year |
| U.S. | United States |
| U.S.C. | United States Code |
| USEPA or EPA | U.S. Environmental Protection Agency |
| USSF | United States Space Force |
| VCAPCD | Ventura County Air Pollution Control District |
| VSFB | Vandenberg Space Force Base |
| VOC | volatile organic compounds |

# 1 INTRODUCTION

According to Section 176(c) of the Clean Air Act (CAA) and subsequent amendments (CAA, Title 42 of the United States Code [U.S.C.] § 7506(c)), any Federal agency (in this case the Department of Air Force or DAF) must demonstrate that the action will "conform" to the applicable State Implementation Plan (SIP) as required under Section 110 (a) of the CAA (42 U.S.C. § 7410(a)) before the action is otherwise approved. In this context, conform means that the proposed action must be consistent with a SIP's purpose of eliminating or reducing the area's severity and number of violations of National Ambient Air Quality Standards (NAAQSs) and does not interfere with attainment of those standards.

Each Federal agency (including the DAF) must determine that a proposed action by the agency that is subject to the regulations implementing the conformity requirements (General Conformity Rule or GCR) will, in fact, conform to the applicable SIP before the action is taken.

This GCR Determination documents the evaluation of the Federal action in accordance with Section 176 (c) requirements of the CAA.

## 1.1 Proposed Action

The DAF Space Launch Delta 30 (SLD 30) proposes to implement the Proposed Action as outlined and evaluated in the *Environmental Impact Statement for Authorizing Changes to the Falcon Launch Program at Vandenberg Space Force Base* (DAF 2025a). The Proposed Action is to increase the annual Falcon launch cadence at Vandenberg Space Force Base (VSFB) through launch and landing operations at Space Launch Complex 4 (SLC-4) and SLC-6, including modification of SLC-6 for Falcon 9 and Falcon Heavy launch vehicles, to support future United States (U.S.) Government and commercial launch service needs. The Proposed Action would also authorize an increase in Falcon 9 launches from SLC-4; however, no modification of SLC-4 is proposed. The overall launch cadence for Falcon 9 and Falcon Heavy at both SLCs, combined, would be 100 launches per year. While SLC-4 and SLC-6 are located within Santa Barbara County, the overall Region of Influence (ROI) of the Proposed Action includes Santa Barbara, Ventura, and Los Angeles Counties, which also encompasses the coastal waters within three nautical miles (nm) of the shore of each county (see Figure 1-1).

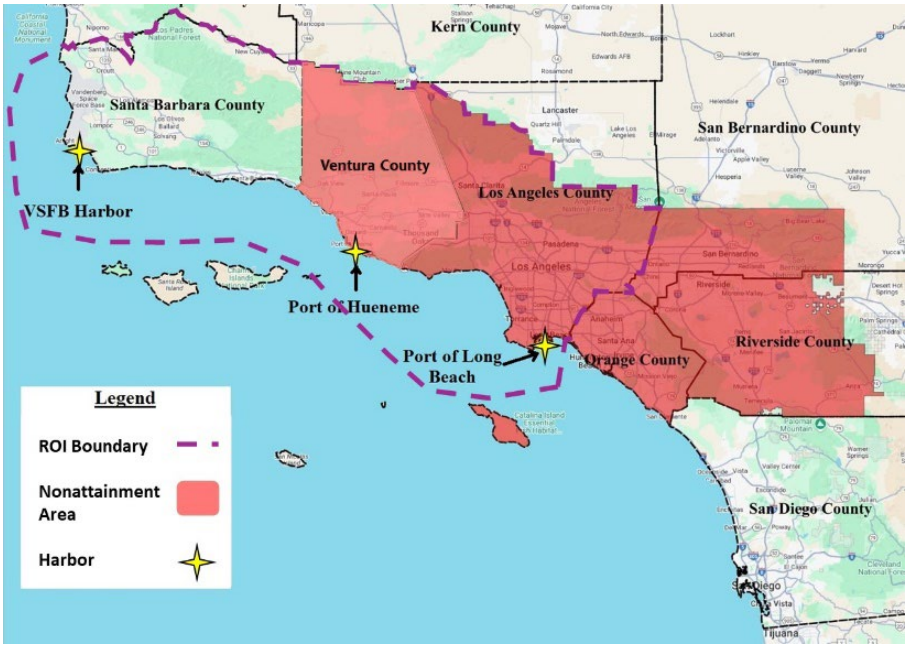
The Falcon spacecraft would launch from SLC-4 and SLC-6 with a projected launch cadence from 50 launches (as described in the *Environmental Assessment, Falcon 9 Cadence Increase at Vandenberg Space Force Base*, DAF 2024) up to 100 launches per year and would continue to land first stage boosters at VSFB or downrange on a droneship. The Proposed Action includes increased harbor operations for the transport of first stage boosters and fairings from the Port of Long Beach to the VSFB harbor via a "roll-on-roll-off" (RORO) barge.

For air quality, this Proposed Action is effectively an expansion of the previous action as described in the *GCR Determination Falcon 9 Cadence Increase Action Activities within the Los Angeles-South Coast Air Basin Ozone Extreme Nonattainment Area, California* (DAF 2025b).

## 1.2 Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the Federal and State ambient air quality standards. The CAA established NAAQSs for six "criteria" pollutants: ozone ($O_3$), carbon monoxide (CO), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), particulate matter (PM) less than 10 and 2.5 micrometers (PM10 and PM2.5), and lead (Pb). These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

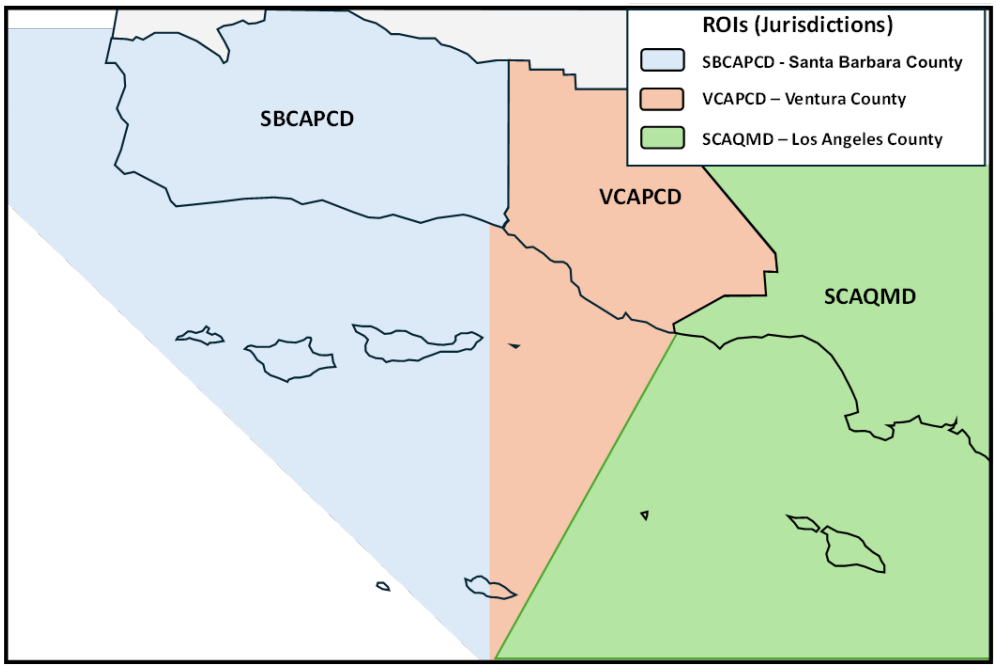
**Figure 1-1, Overall Region of Influence**




The Proposed Action includes activities in the South Central Coast Air Basin (SCCAB) and the South Coast Air Basin (SCAB). Therefore, for air quality assessments the overall ROI includes Santa Barbara, Ventura, and Los Angeles Counties which also encompasses the coastal waters within three nautical miles of the shore of each county (see Figure 1-1). VSFB is located within the SCCAB, which includes San Luis Obispo, Santa Barbara, and Ventura counties. The Santa Barbara County Air Pollution Control District (SBCAPCD) has jurisdiction over Santa Barbara County, and the Ventura County Air Pollution Control District (VCAPCD) has jurisdiction over Ventura County. The Proposed Action would also include vessel travel to and from the Port of Long Beach in Los Angeles County. Los Angeles County is located within the SCAB and the South Coast Air Quality Management District (SCAQMD). Therefore, there are three distinct localized ROIs for air quality (see Figure 1-2): SBCAPCD which includes all activities occurring within Santa

Barbara County, VCAPCD which includes all activities occurring within Ventura County, and SCAQMD which includes all activities occurring within Los Angeles County.

**Figure 1-2, Air Quality ROIs**




Source: SBCAPCD Authority to Construct Permit 16293

## 1.3 Air Quality Designations

The United States Environmental Protection Agency (USEPA) designates an area as in attainment when it complies with the NAAQS. Areas that exceed these ambient air quality standards are designated as nonattainment areas. Areas that have improved air quality from nonattainment to attainment are designated as attainment/maintenance areas. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified and are treated as attainment areas for regulatory purposes. Varying levels of nonattainment have been established for $O_3$, CO, and PM10 to indicate the severity of the air quality problem (i.e., the classifications run from moderate to serious for CO and PM10 and from marginal to extreme for $O_3$).

SBCAPCD (Santa Barbara County) is in attainment for all NAAQSs. Most of VCAPCD (Ventura County) is in serious nonattainment for eight-hour $O_3$ NAAQS, including the area where the action will take place. SCAQMD (Los Angeles County), where portions of the action will take place, is in extreme nonattainment for the eight-hour $O_3$ NAAQS, maintenance for CO, nonattainment for Pb, nonattainment for PM2.5, and maintenance for PM10 (Table 1-1). Within attainment areas, SpaceX is required to ensure air quality does not significantly deteriorate due to air emissions associated with the Proposed Action. The Proposed Action is required to demonstrate

conformity with the approved SIP if the net emissions equal or exceed the GCR de minimis emission levels in any nonattainment and maintenance areas.

**Table 1-1, NAAQS Designations**

| Criteria Pollutant | SBCAPCD (Santa Barbara Co.) | VCAPCD (Ventura Co.) | SCAQMD (Los Angeles Co.) |
|---|---|---|---|
| $O_3$ | Attainment | Serious Nonattainment | Extreme Nonattainment |
| CO | Attainment | Attainment | Maintenance |
| SOx | Attainment | Attainment | Attainment |
| NOx | Attainment | Attainment | Attainment |
| PM10 | Attainment | Attainment | Serious Maintenance |
| PM2.5 | Attainment | Attainment | Serious Nonattainment |
| Pb | Attainment | Attainment | Nonattainment |

Data Source: *Environmental Assessment for the Falcon 9 Cadence Increase at Vandenberg Space Force Base* (DAF 2024)

## 1.3.1 Federal Requirements

### 1.3.1.1 State Implementation Plan

The CAA requires that each State develop a SIP. A SIP provides for the implementation, maintenance, and enforcement of the NAAQS; defines emission limitations; and identifies control measures to attain and maintain the NAAQS.

### 1.3.1.2 General Conformity Rule (GCR)

The GCR, CAA Section 176(c), applies to any proposed action or portion of a proposed action occurring within an area designated as nonattainment or maintenance for any NAAQS. A "nonattainment area" is a geographical area designated by USEPA as exceeding the NAAQS for one or more criteria pollutants. Maintenance areas are former nonattainment areas. The intent of GCR is to ensure that Federal actions do not adversely affect the timely attainment and sustainment of a NAAQS. An action cannot proceed without first complying with the GCR requirements.

Each nonattainment or maintenance area that an action (or portions of the action) will occur within is considered a separate ROI, and each must have its own GCR evaluation (40 Code of

Federal Regulations [CFR] Section 93.150(e)). None of the Air Districts where any portion of the Proposed Action will occur within has adopted the 2010 revisions to 40 CFR Part 93. Consequently, the applicable conformity rules are found at SCAQMD Rule 1901; SBAPCD Rule 702; and VCAPCD Rule 220.

### 1.3.2 State Requirements

Federal clean air laws require areas with unhealthy levels of ozone, inhalable particulate matter, CO, $NO_2$, and $SO_2$ to develop plans, known as SIPs. SIPs are comprehensive plans that describe how an area will attain NAAQSs. The 1990 amendments to the Federal CAA set deadlines for attainment based on the severity of an area's air pollution problem.

State law makes the California Air Resources Board (CARB) the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to the USEPA for approval and publication in the Federal Register. The 40 CFR52.220 lists all the items which are included in the California SIP.

As indicated above, the CAA requires each State to develop, adopt, and implement a SIP to achieve, maintain, and enforce Federal air quality standards throughout the State. SIPs are developed on a pollutant-by-pollutant basis whenever one or more air quality standards are violated.

The CARB designates both Air Quality Management Districts and Air Pollution Control Districts within California for the purpose of implementing and enforcing ambient air quality standards on a regional or air shed basis. These district agencies must prepare regional plans (Air Quality Management Plans or AQMPs) to support the broader SIP, as well as to meet the goals of the California Clean Air Act.

The Proposed Action is located within the SCAB which is within the geographic jurisdiction of the SCAQMD. On March 3, 2017, the SCAQMD adopted the 2016 AQMP for the South Coast Air Basin and Coachella Valley (2016 AQMP). The 2016 AQMP is the current "applicable implementation plan or applicable SIP" as defined in 40 CFR 51.852.

The 2016 AQMP, which is the latest plan approved by USEPA, established set-aside budgets to accommodate emissions subject to GCR requirements. The set-aside accounts include 730 tons per year (tpy) of NOx each year starting in 2017 through 2030 and 182.5 tpy of NOx each year in 2031 and thereafter. Additionally, the CAA requires attainment of the standard to be achieved as "expeditiously as practicable," but no later than the attainment years listed in the applicable SIP; Table ES-1 of the 2016 AQMP lists the latest attainment year as 2031 for the 8-hour Ozone NAAQS. (SCAQMD 2016)

# 2 GENERAL CONFORMITY COMPLIANCE

There are two progressive levels of GCR assessments and documentation under a General Conformity Evaluation: an Applicability Analysis and a Determination. A GCR Applicability Analysis is first an exemption review and then, if the proposed action is not exempt, a quantitative emission net-change analysis is used to determine if the Federal action must be supported by a GCR Determination. A GCR Determination is an extensive evaluation (made after a GCR Applicability Analysis indicates a Determination is needed) to ensure a proposed action "conforms" to the applicable SIP and meets all GCR requirements. Additionally, a GCR Reevaluation is required if any modification to the action would result in emissions above one or more GCR de minimis values (40 CFR 93.157).

## 2.1 GCR Reevaluation

A GCR Reevaluation is required if any modification to the action would result in emissions above one or more GCR de minimis values (40 CFR 93.157). A Revised GCR Applicability Analysis is performed to evaluate if any GCR de minimis values would be exceeded.

For air quality, DAF considers this Proposed Action (as described in DAF 2025a) as effectively a continuation and an expansion of the previous actions associated with Falcon 9 launch cadence increases at VSFB. Based on the previous Environmental Assessments (EAs) and Supplemental EAs, the increases in launch cadence emissions were below the GCR de minimis values until the increase was up to 50 launches per year (as described in the 2024 EA and the associated 2025 GCR Determination). Given the launch cadence prior to 2024 had insignificant impacts on air quality and were below the GCR de minimis values, reevaluation prior to the 2024 increased cadence is unwarranted.

A GCR Determination was already established for activities associated with up to 50 launches per year in the 2024 EA and the 2025 GCR Determination through allowances provided by SCAQMD of 31.26 tpy of NOx for 2025 through 2030 and accommodated within the 2016 AQMP budget (SCAQMD 2024). The requirement for the 31.26 tpy of NOx was based on assumptions reflecting the uncertainty and best available information at the time. However, with additional data collected for tugboat routing and operational times, it has since been demonstrated the assumptions used were unrealistic and excessively conservative. Given this Proposed Action is effectively a continuation and an expansion of the previous actions associated with Falcon 9 launch cadence increases at VSFB, the following GCR Reevaluation was performed for 2025 and beyond.

## 2.2 Revised GCR Applicability Analysis

The USEPA's General Conformity Rule (40 CFR Part 93 Subpart B and 40 CFR Part 51 Subpart W, as adopted by reference in SCAQMD Rule 1901, September 1994) establishes a GCR Applicability Analysis for ascertaining which Federal actions are subject to the General Conformity requirements for nonattainment and maintenance areas.

Applicability analysis is the process of determining if a Federal action must be supported by a GCR Determination. A GCR Applicability Analysis is the first of two progressive levels of a GCR evaluation. It starts with an exemption review and (if no exceptions apply) is followed by a quantitative emission net-change analysis. If the proposed action is exempt from or is already presumed to conform under the GCR, no further action is required. If there is no exemption, a formal quantitative GCR Applicability Analysis is required. The GCR Applicability Analysis is a quantitative annual net change in emissions assessment, where the projected net emissions are compared against regulatory thresholds (GCR de minimis value) which, if exceeded, triggers a GCR Determination.

GCR de minimis emission levels are criteria pollutant (or its precursors) emission rates (levels) that are too low to cause or contribute to exceeding one or more NAAQS. NAAQSs are the maximum amount of a criteria pollutant (or its precursors), averaged over a specified regional area and period of time (year), that can be present in outdoor air without harming public health and the environment. Therefore, any action resulting in annual net change emissions (direct and indirect) below the de minimis levels is considered clearly insignificant to public health and the environment locally, regionally, and cumulatively.

As part of the air quality analysis in the *Environmental Impact Statement for Authorizing Changes to the Falcon Launch Program at Vandenberg Space Force Base, California* (DAF 2025a), a GCR Applicability Analysis was reperformed for each nonattainment and maintenance area where the Proposed Action will occur within. The previous air quality assessment (2024 EA and 2025 GCR Determination) was based on overly conservative assumptions on tugboat routing and operational times that have since been demonstrated to be unrealistic. Therefore, for this expanded assessment, the assumptions have been revised to be more in line with operation limits expected in future permitting (while still being very conservative). As a result, this air quality assessment used the revised assumptions for estimating projected emissions.

Based on the revised GCR Applicability Analyses results, only one nonattainment area, *Los Angeles-South Coast Air Basin 8-Hour Ozone Extreme Nonattainment Area* (2008 and 2015 NAAQSs), exceeded the GCR de minimis levels (see Table 2-1 and Table 2-2). Therefore, only the *Los Angeles-South Coast Air Basin 8-Hour Ozone Extreme Nonattainment Area* requires a GCR Determination.

**Table 2-1, Revised GCR Applicability Analysis Results**

| Designated Area | | Annual Net Change In Emissions (tpy) | De Minimis Value (tpy) | Analysis Results |
|---|---|---|---|---|
| SBCAPCD (Santa Barbara Co.) | None | N/A | N/A | In Attainment |
| VCAPCD (Ventura Co.) | Ventura County Serious 8-Hour Ozone (2008 & 2015 NAAQSs) | VOC = 3.51<br>NOx = 41.96 | 50<br>50 | De Minimis |
| SCAQMD (Los Angeles Co.) | Los Angeles-South Coast Air Basin 8-Hour Ozone Extreme Nonattainment Area (2008 & 2015 NAAQSs) | VOC = 2.54<br>NOx = 28.58 | 10<br>10 | Exceeds De Minimis for NOx ($O_3$ precursor) |
| | Los Angeles-South Coast Air Basin PM-2.5 Serious Nonattainment Area (2006 & 2012 NAAQSs) | PM-10 = 0.72 | 100 | De Minimis |
| | Los Angeles-South Coast Air Basin PM-10 Serious Maintenance Area (1987 NAAQS) | PM-10 = 0.72 | 70 | De Minimis |
| | Los Angeles-South Coast Air Basin Pb Nonattainment Area (2008 NAAQS) | Pb = 0.00 | 25 | De Minimis |
| | Los Angeles-South Coast Air Basin CO Maintenance Area (1971 NAAQS) | CO = 40.26 | 100 | De Minimis |

Notes:

GCR de minimis values from 40 CFR 51.853 and 40 CFR 93.153(b)(1).

Table includes ozone precursors (i.e., VOC and NOx).

Data Source: *Draft Environmental Impact Statement for Authorizing Changes to the Falcon Launch Program at Vandenberg Space Force Base, California* (May 2025)

As shown in Table 2-1, Revised GCR Applicability Analysis Results, and Table 2-2, Net Change in Emissions Analysis for Activities within the Los Angeles-South Coast Air Basin, the net change in annual emissions of the Proposed Action will not exceed the GCR de minimis levels for VOC, CO, PM10, or PM2.5 in the Los Angeles-South Coast Air Basin (within the SCAQMD). However, due to increased harbor operations, NOx emissions would exceed the GCR de minimis threshold value. As such, a revised look at the 2025 GCR Determination is necessary to determine if the

Proposed Action would have an adverse effect on air quality within the *Los Angeles-South Coast Air Basin 8-Hour Ozone Extreme Nonattainment Area*.

**Table 2-2, Net Change in Emission Analysis for Activities within the Los Angeles-South Coast Air Basin**

| Source | Annual Emissions (tons per year) | | | | | | |
|---|---|---|---|---|---|---|---|
| | VOC | $NO_x$ | CO | $SO_x$ | PM10 | PM2.5 | Pb |
| Proposed Action (≤ 100 operations) | 2.54 | 28.58 | 40.26 | 0.78 | 0.72 | 0.72 | 0.00 |
| *De Minimis Value or DAF Insignificance Indicator** | 10 | 10 | 100 | 250* | 100 | 70 | 25 |
| **Threshold Exceeded** | **No** | **Yes** | **No** | **No** | **No** | **No** | **No** |

Notes:

Table includes ozone precursors (i.e., VOC and NOx).

* Indicates the value is a DAF Insignificance Indicator (not a GCR de minimis value)

GCR de minimis values from 40 CFR 51.853 and 40 CFR 93.153(b)(1)

*Draft Environmental Impact Statement for Authorizing Changes to the Falcon Launch Program at Vandenberg Space Force Base, California* (May 2025)

## 2.3 Revised GCR Determination

The USEPA's General Conformity Rule (40 CFR Part 93, Subpart B, and 40 CFR Part 51, Subpart W, as adopted by reference in SCAQMD Rule 1901, September 1994) also establishes a GCR Determination evaluation (made after a GCR Applicability Analysis is completed) for ascertaining if a Federal Action conforms to the applicable SIP and meets the requirements of the GCR.

In accordance with 40 CFR 51.850(b) "a Federal agency must make a Determination that a Federal action conforms to the applicable implementation plan." Additionally, as defined in 40 CFR 51.852, an "applicable implementation plan or applicable SIP means the portion (or portions) of the SIP or most recent revision thereof, which has been approved under section 110 of the Act, or promulgated under section 110(c) of the Act (Federal implementation plan), or promulgated or approved pursuant to regulations promulgated under section 301(d) of the Act and which implements the relevant requirements of the Act."

For any criteria pollutant, conformity to the applicable SIP can be demonstrated by showing through existing documentation that the total direct and indirect emissions caused by the action are specifically identified and accounted for in the applicable SIP. Where the actions are specifically identified and accounted for in the SIP, the GCR demonstration can be easy and straightforward – the Federal agency would only have to document the information in the SIP. In the cases where the emissions caused by the action are not specifically identified in the SIP, but are included in an emission budget category, the Federal agency can demonstrate conformity by having the applicable State or local air quality agency provide a written statement documenting that the emissions caused by the action along with all other emissions in the area will not exceed the budget for those emissions in the SIP.

Specifically for ozone, as is the case for this Proposed Action, where USEPA has approved a revision to the applicable SIP, 40 CFR 51.858(a)(5)(i)(A) and 40 CFR 93.158(a)(5)(i)(A) enable a GCR Determination with documentation by the State when the result in a level of emissions which, together with all other emissions in the nonattainment (or maintenance) area, would not exceed the emissions budgets specified in the applicable SIP.

#### 2.3.1.1 GCR Determination Need

Within the SCAQMD's ozone nonattainment area, the Proposed Action exceeds the GCR Applicability Analysis de minimis threshold for NOx beginning in the year of 2025 at 10.84 tons per year (tpy) and increasing in 2027 to a steady-state of 28.58 tpy for the lifetime of the project. Given the GCR Applicability Analysis indicated the annual net change in NOx emissions will exceed the 10 tpy de minimis value, a GCR Determination reevaluation is required for NOx emissions within the *Los Angeles-South Coast Air Basin Extreme Ozone Nonattainment Area*. The GCR Determination must be completed in accordance with CAA Sec. 176(c) [42 U.S.C. Sec. 7506(c)], as implemented in the SCAQMD Rule 1901.

#### 2.3.1.2 SCAQMD Determination Documentation

As stated earlier, for ozone, 40 CFR 51.858(a)(5)(i)(A), and 40 CFR 93.158(a)(5)(i)(A), enable a GCR Determination with documentation by the State when the result in a level of emissions which, together with all other emissions in the nonattainment (or maintenance) area, would not exceed the emissions budgets specified in the applicable SIP.

The 2016 AQMP, which is the latest plan approved by USEPA, established set-aside budgets to accommodate emissions subject to GCR requirements. The set-aside accounts include 730 tpy of NOx each year starting in 2017 through 2030 and 182.5 tpy of NOx each year in 2031 and thereafter. The SCAQMD reviewed the emissions anticipated from the 2024 EA (≤50 launches per year) based on the overly-conservative emissions calculations used at that time and information provided by SLD 30. Upon review of the provided overly-conservative emissions information, on September 26, 2024, the SCAQMD provided a letter to SLD 30 (see Appendix A) documenting their GCR Determination for the 2024 EA's Proposed Action. SCAQMD "determined that the NOx emissions (31.26 tpy) exceeding the de minimis thresholds can be accommodated within the general conformity budgets established in the 2016 AQMP", as shown in Table 2-3. SCAQMD concluded that the 2024 EA's Proposed Action "will conform to the latest EPA approved AQMP as the project's emissions are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the NAAQS or impede the projected attainment of the NAAQS in the years 2025 through 2030." Therefore, SCAQMD determined and documented the 2024 EA's Proposed Action conforms with the applicable SIP, as defined in 40 CFR 51.852, in the years 2025 through 2030.

**Table 2-3, 2024 Proposed Action NOx Emissions Accommodated within the 2016 AQMP Emissions Budgets (tpy)**

| 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|---|---|---|---|---|---|
| 31.26 | 31.26 | 31.26 | 31.26 | 31.26 | 31.26 | Attainment Year* |

* 2016 AQMP Table ES-1

### 2.3.1.3 Reevaluation of GCR Determination

As stated previously, the previous air quality assessment (2024 EA and 2025 GCR Determination) was based on overly conservative assumptions on tugboat routing and operational times that have since been demonstrated to be unrealistic. Therefore, for this reevaluation the assumptions have been revised to be more in line with operation limits expected in future permitting, while still being very conservative. As a result, this air quality assessment used the revised assumptions for estimating projected emissions for this reevaluation of the GCR Determination, as shown in Table 2-4.

**Table 2-4, Net Change in Emissions within the Los Angeles-South Coast Air Basin with the 2016 AQMP Documented Determination (Starting in 2025)**

| Source | Annual Emissions (tons per year) | | | | | | |
|---|---|---|---|---|---|---|---|
| | VOC | $NO_x$ | CO | $SO_x$ | PM10 | PM2.5 | Pb |
| Proposed Action (100 operations) | 2.54 | 28.58 | 40.26 | 0.78 | 0.72 | 0.72 | 0.00 |
| *2016 AQMP General Conformity Budget Emissions from SCAQMD* | 0.00 | ***-31.26*** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Net Change Delta (Proposed Action – Baseline) | 2.54 | **-2.68** | 40.26 | 0.78 | 0.72 | 0.72 | 0.00 |
| *De Minimis Value or DAF Insignificance Indicator** | 10 | 10 | 100 | 250* | 100 | 70 | 25 |
| **Threshold Exceeded** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

Notes:

Table includes ozone precursors (i.e., VOC and NOx).

"*" indicates the value is a DAF Insignificance Indicator (not a GCR de minimis value).

Data Source: *Environmental Assessment for the Falcon 9 Cadence Increase at Vandenberg Space Force Base* (DAF 2024)

Based on the allowances provided by SCAQMD of 31.26 tpy of NOx for 2025 through 2030 and accommodated within the 2016 AQMP budget and the 2016 AQMP's attainment year of 2031,

the net change in NOx emissions within the *Los Angeles-South Coast Air Basin 8-Hour Ozone Extreme Nonattainment Area* is deemed to be -2.86 tpy. The proposed NOx emissions are still fully accounted for within the 2016 AQMP (see Table 2-4). Therefore, the Proposed Action is still in compliance with 42 U.S.C. § 7506(c) and the applicable implementing rules and regulations in the Los Angeles nonattainment area.

## 2.4 Reporting

To support a decision concerning the Proposed Action, the DAF is issuing this draft Amended GCR Determination for public review and comment. The DAF will also make public its final Amended GCR Determination for the Proposed Action.

Draft Amended GCR Determination: The DAF is providing copies of this Amended GCR Determination to the appropriate regional offices of USEPA, CARB, SCAQMD, and tribes, providing an opportunity for a 30-day review. The DAF is also placing a notice in the Los Angeles Times, a daily newspaper of general circulation in the area affected by the action, announcing the availability of this draft GCR Determination and requesting written public comments for a 30-day period. For any member of the public requesting a copy of this draft GCR Determination, the DAF will provide such party a copy.

Final Amended GCR Determination: The DAF will provide copies of its final Amended GCR Determination to the appropriate regional offices of USEPA, CARB, SCAQMD, and tribes, within 30 days of its promulgation. The DAF will also place a notice in the Los Angeles Times, a daily newspaper of general circulation in the area affected by the action, announcing the availability of its final GCR Determination within 30 days of such determination. As part of the GCR evaluation, the DAF will document its responses to all comments received on the draft GCR Determination in the final GCR Determination.

# 3 FINDINGS AND CONCLUSION

Based on the net annual NOx emissions being accommodated in the set-aside emission budgets in the 2016 AQMP with the 31.26 tpy of NOx SCAQMD allowance, in accordance with 40 CFR 51.850(b) the Proposed Action will conform with the applicable SIP and will not have a significant adverse impact on air quality. The Proposed Action conforms to the applicable SIP for NOx (as an ozone precursor) because the net emissions associated with the action, taken together with all other NOx emissions in the SCAB, would not exceed the emissions budgets in the approved SIP for the years subject to the GCR evaluation.

Therefore, DAF herewith concludes that the Proposed Action complies with the requirements of the GCR regulations and conforms to applicable SIP based on the NOx emissions accommodated into the set-aside emission budgets in the 2016 AQMP.

# 4 REFERENCES


DAF 2024, "*Final Environmental Assessment: Environmental Assessment Falcon 9 Cadence Increase at Vandenberg Space Force Base, California,"* U.S. Department of the Air Force, SLD-30, Installation Management Flight, October 2024.

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# APPENDIX A,

# SCAQMD LETTER TO SLD-30 ON DETERMINATION

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

September 26, 2024

Colonel Mark A. Shoemaker, USSF
Commander
Space Launch Delta 30
747 Nebraska Ave, Ste A302
Vandenberg SFB, CA 93437-6261

RE: General Conformity Determination for the increased SpaceX launch operations at Vandenberg Space Force Base during 2025–2030

To. Mr. Shoemaker,

This letter is in response to your letter dated September 24, 2024 requesting South Coast Air Quality Management District (South Coast AQMD) to accommodate the anticipated emissions within the South Coast Air Basin (Basin) from the SpaceX increased launch operations at Vandenberg Space Force Base (VSFB) in the Air Quality Management Plan (AQMP)/State Implementation Plan (SIP) emissions budget for general conformity purposes.

The general conformity determination process is intended to demonstrate that a proposed Federal action will not: (1) cause or contribute to new violations of a national ambient air quality standard (NAAQS); (2) interfere with provisions in the applicable SIP for maintenance of any NAAQS; (3) increase the frequency or severity of existing violations of any standard; or (4) delay the timely attainment of any standard. As such, for general conformity determination, the proposed federal action needs to conform to the latest approved SIP/AQMP.

The Basin is designated as an extreme non-attainment area for ozone, serious non-attainment area for PM2.5 and maintenance area for Carbon Monoxide. To accommodate projects subject to general conformity requirements and to streamline the review process, general conformity budgets for NOx and VOC emissions were established in an AQMP. The 2016 AQMP[1], which is the latest SIP approved by U.S. EPA, established set aside accounts to accommodate emissions subject to general conformity requirements. The set-aside accounts include 2 tons per day (tpd) or 730 tons per year (tpy) of NOx and 0.5 tpd or 182.5 tpy of VOC each year starting in 2017 through 2030, and 0.5 tpd (182.5 tpy) of NOx and 0.2 tpd (73 tpy) of VOC in 2031. Emissions from this set-aside account are granted on a first-come-first-serve basis, and as of September 2024, a limited amount of NOx and VOC emissions remain available. It's important to note that the

[1] https://www.aqmd.gov/home/air-quality/air-quality-management-plans/final-2016-aqmp

general conformity set-aside accounts are subject to change in future AQMPs. The 2022 AQMP[2], for instance, introduces control measure EGM-02, which seeks to eliminate the general conformity set-aside account after 2031. Instead, EGM-02 proposes to require that new federal project emissions be accommodated with appropriate mitigation or offset of the increased emissions. The 2022 AQMP was submitted to U.S. EPA via California Air Resource Board (CARB) in February 2023 and is currently under review.

The proposed U.S. Space Force (USSF) project (Proposed Action) involves increasing the annual SpaceX Falcon launch cadence at VSFB through launches at Space Launch Complex (SLC)-4. The project proposes to transport first stages from the Port of Long Beach to the VSFB Harbor via a "roll-on-roll-off" barge. A support tug would be launched from the Port of Long Beach or Port Hueneme and travel up the coast to assist the barge and primary tug in maneuvering into and out of the VSFB Harbor. The Proposed Action would include up to 50 events per year utilizing roll-on-roll-off operations.

South Coast AQMD staff has reviewed the emissions anticipated from the Proposed Action based on the information provided in your letter. We have determined that the NOx emissions exceeding the de minimis thresholds can be accommodated within the general conformity budgets established in the 2016 AQMP. Table 1 below shows the emissions from operation activities during 2025 to 2030 that are accommodated within the SIP set-aside budget established in the 2016 AQMP.

Table 1. The Proposed Action Emissions Accommodated in 2016 AQMP General Conformity Budgets (tons per year)*

| Pollutants | Emission Phase | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|
| NOx | Operation | 31.26 | 31.26 | 31.26 | 31.26 | 31.26 | 31.26 |

*USSF commits to track actual emission of the Proposed Action within the Basin annually and return the surplus credits, if any, to South Coast AQMD general conformity budget

The emissions submitted by USSF in their request were conservatively estimated to align with those in the Draft Environmental Assessment,[3] and represent the maximum potential emissions that could result from the Proposed Action. To ensure that the actual project emissions are accounted for in the South Coast AQMD's set-aside account accurately, USSF will prepare an annual report to track project activities within the Basin, quantify the associated emissions, and

[2] https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan
[3] Available at https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/

submit to the South Coast AQMD by March 30 each year. If the actual emissions from the Proposed Action are lower than the emissions identified in this letter, any surplus credits will be returned to the South Coast AQMD annually, as specified in Attachment 2 of the USSF's request letter.

Emissions from the Federal agency's future SpaceX launch activities within the Basin, scheduled for 2031 to 2055, are not included in this determination. A separate General Conformity Determination process will be required, which will be developed in collaboration with the South Coast AQMD at a future date.

In summary, based on our evaluation, the proposed USSF project to be conducted in 2025 through 2030 will conform to the latest EPA approved AQMP as the project's emissions are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the NAAQS or impede the projected attainment of the NAAQS in the years 2025 through 2030.

If you have any questions, please contact me at (909) 396-3244 or imacmillan@aqmd.gov or Dr. Sang-Mi Lee, Rules and Planning Manager at (909)-396-3169 or slee@aqmd.gov.

Sincerely,

Ian MacMillan
Assistant Deputy Executive Officer
Planning, Rule Development & Implementation
South Coast Air Quality Management District

**Attachments:**

1. Letter from U.S. Space Force dated September 24, 2024
2. Appendix A of Air Quality and Greenhouse Gas Emissions Technical Report: Falcon Program Expansion at Vandenberg Space Force Base, California. September 2024.
   Available at: https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/

**eCC**: Tom Kelly, US EPA Region IX
Barbara Baird, South Coast AQMD
Kathryn Roberts, South Coast AQMD
Sarah Rees, South Coast AQMD
Sang-Mi Lee, South Coast AQMD
Barbara Radlein, South Coast AQMD

Marc Carreras Sospedra, South Coast AQMD
Rui Zhang, South Coast AQMD

DEPARTMENT OF THE AIR FORCE
UNITED STATES SPACE FORCE
SPACE LAUNCH DELTA 30

September 24, 2024

Colonel Mark A. Shoemaker, USSF
Commander
Space Launch Delta 30
747 Nebraska Ave, Ste A302
Vandenberg SFB CA 93437-6261

Dr. Sarah Rees, Deputy Executive Officer
South Coast Air Quality Management District
Planning, Rule Development and Area Source Division
21865 Copley Drive
Diamond Bar CA 91765

Dear Dr. Rees

The general conformity findings outlined in this letter have been prepared by Dudek on behalf of Space Launch Delta 30 (SLD 30) to summarize the anticipated direct and indirect criteria pollutant emissions for the proposed Falcon Program Expansion Project (Proposed Action).

The Proposed Action is to increase the annual Falcon launch cadence at Vandenberg Space Force Base (VSFB) through launches at Space Launch Complex (SLC)-4. While most of the operations occur on VSFB, there are marine vessel operations that occur within the South Coast Air Basin (SCAB). The Proposed Action proposes to transport first stages from the Port of Long Beach to the VSFB Harbor via a "roll-on-roll-off" barge. The first stage would be pulled by a Tier 3 (or higher) tug from the Port of Long Beach into the VSFB Harbor. A support tug would be launched from the Port of Long Beach or Port Hueneme and travel up the coast to assist the barge and primary tug in maneuvering into and out of the VSFB Harbor. The Proposed Action would include up to 50 events per year utilizing roll-on-roll-off operations.

The Proposed Action is subject to the National Environmental Policy Act (NEPA) and requires a General Conformity Determination under the U.S. Clean Air Act. SLD 30 is currently preparing an Environmental Assessment for this Project. Annual net emissions anticipated to occur in the SCAB related to the Proposed Action were calculated and are presented in Tables 1 and 2 in Attachment 1. As shown in those tables, emissions of nitrogen oxides (NOx) within the SCAB are projected to be 31.26 tons per year, which exceeds the general conformity de minimis level of 10 tons per year, during years 2025 through 2030. NOx is a precursor pollutant to ozone, a pollutant for which the SCAB is designated as an "extreme" nonattainment area for multiple ozone national ambient air quality standards. All other air emissions are projected to be below de minimis levels for all years in which emissions were inventoried. There would be no construction emissions within the SCAB.

Attachment 1 also provides the anticipated average daily NOx emissions associated with the Proposed Action. While emissions were conservatively assumed to be constant through the operation of the proposed project's lifetime, it is reasonable to assume that emissions would go down over time due to increases in efficiency and marine vessel upgrades. Furthermore, the anticipated emissions from the Proposed Action, which align with those in the Draft Environmental Assessment, represent the maximum potential emissions that could result from the Proposed Action. To ensure that the South Coast Air Quality Management District (SCAQMD) emission budget accurately reflects the actual project emissions, SLD 30 will prepare an annual report to track project activities within the SCAB, quantify the associated emissions, and submit to the SCAQMD by March 30 each year. If the actual emissions from the Proposed Action are lower than the projected, any surplus credits will be returned to the SCAQMD annually. A detailed calculation methodology for the annual reporting is included in Attachment 2. SLD 30's Draft Environmental Assessment, Request for General Conformity Determination, and associated attachments are available online at: https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/.

We respectfully request that the SCAQMD affirm that these emissions levels can be accommodated within the general conformity budget established in the Final 2016 Air Quality Management Plan (Appendix VI-D). We understand that this SIP set aside budget is reserved to handle General Conformity projects that exceed de minimis levels.

If you have any questions or would like to discuss the undertaking in more detail, please contact Ms. Bea Kephart, (805) 605-7924, beatrice.kephart@spaceforce.mil.

Sincerely

SHOEMAKER.MARK.A.1077726418 Digitally signed by SHOEMAKER.MARK.A.1077726418 Date: 2024.09.24 12:32:09 -07'00'

MARK A. SHOEMAKER, Colonel, USSF
Commander

2 Attachments:
1: Project Emissions
2: Annual Reporting Methodology

## Attachment 1: Project Emissions

### Table 1. Annual Project Operational Emissions – Proposed Action SCAQMD

| Emission Source | VOC | $NO_x$ | CO | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| | Tons Per Year | | | | | |
| Solvent Use | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Emergency Generators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fleet Vehicle Use | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor-Contractor Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Off-Road Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| RP-1, RSV Loading, and Payload Fueling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Roll-On-Roll-Off | 2.54 | 31.62 | 46.38 | 0.57 | 0.71 | 0.71 |
| Launch | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Payload Fairing Recovery | 0.14 | 0.67 | 0.28 | 0.11 | 0.05 | 0.05 |
| Landings | 0.00 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | **2.68** | **33.36** | **46.66** | **0.68** | **0.76** | **0.76** |
| **Baseline** | **0.34** | **2.10** | **1.35** | **0.05** | **0.07** | **0.07** |
| **Delta (Proposed Action – Baseline)** | **2.34** | **31.26** | **45.31** | **0.63** | **0.69** | **0.69** |
| *General Conformity De Minimis Thresholds* | *10* | *10* | *100* | - | *100* | *70* |
| **Threshold Exceeded?** | **No** | **Yes** | **No** | **No** | **No** | **No** |

**Notes**: VOC = volatile organic compound; $NO_x$ = oxides of nitrogen; CO = carbon monoxide; $SO_x$ = sulfur oxides; $PM_{10}$ = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = reported value less than 0.01.
See Appendix A for complete results.
Totals may not sum due to rounding.

## Table 2. Daily Project Operational Emissions – Proposed Action SCAQMD

| Emission Source | VOC | $NO_x$ | CO | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| | Tons Per Day | | | | | |
| Solvent Use | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Emergency Generators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fleet Vehicle Use | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor-Contractor Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Off-Road Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| RP-1, RSV Loading, and Payload Fueling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Roll-On-Roll-Off | 0.01 | 0.09 | 0.13 | 0.002 | 0.002 | 0.002 |
| Launch | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Payload Fairing Recovery | 0.0004 | 0.002 | 0.001 | 0.0003 | 0.0001 | 0.0001 |
| Landings | 0.0000 | 0.003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.01** | **0.09** | **0.13** | **0.002** | **0.002** | **0.002** |
| **Baseline** | **0.001** | **0.01** | **0.004** | **0.0001** | **0.0002** | **0.0002** |
| **Delta (Proposed Action – Baseline)** | **0.01** | **0.09** | **0.12** | **0.002** | **0.002** | **0.002** |

**Notes**: VOC = volatile organic compound; $NO_x$ = oxides of nitrogen; CO = carbon monoxide; $SO_x$ = sulfur oxides; $PM_{10}$ = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = reported value less than 0.01.
See Appendix A for complete results.
Totals may not sum due to rounding.

**Attachment 2: Annual Reporting Methodology**

By March 30 of each year, SLD 30 will submit an annual report summarizing actual emissions occurred from the Proposed Action in the jurisdiction of the SCAQMD from the previous calendar year.

Onboard GPS data from the marine vessels will be used to ensure that emissions within the SCAQMD jurisdiction are accurately captured and reported. The emissions from the marine vessels will be calculated based on annual fuel consumption and engine run hours using the following equations:

Equation 1: Load Factor

$$LF = \frac{G \; x \; HHV}{Engines \; x \; HP \; x \; Hrs \; x \; BSFC}$$

Where:
LF = load factor
G = total gallons for the year of R99
HHV = higher heating value (137,000 btu/gallon for R99)
Engines = number of engines
HP = engine rating brake horsepower of the engine
Hrs = total engine hours for the year
BSFC = brake specific fuel consumption (7,420 btu/bhp-hr)

Equation 2: Emissions

$$Em = \frac{EF \; x \; kW \; x \; LF \; x \; Hrs \; x \; Engines}{453.6 \; x \; 2{,}000}$$

Where:
Em = Annual emissions (tons per year)
EF = pollutant specific emission factor (g/kW-hr)
kW = kilowatt rating of engine
LF = load factor of engine (from equation 1)
Hrs = total engine hours for the year
Engines = number of engines
453.6 = conversion factor (453.6 g = pound)
2,000 = conversion factor (2,000 pounds = ton)

Due to the lack of available jurisdiction specific records for the offroad equipment and the fact that offroad equipment comprise a small portion of the overall proposed emissions, SLD-30 will track the actual operating days for offroad equipment. This can be done based on detailed marine vessel trip information. The hours per day will be assumed to be the same as within the 2024 EA[1]. The emissions will be calculated using equation 3 below.

[1] Available at: https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/

Equation 3: Offroad Equipment Emissions

$$Em = \frac{EF\ x\ HP\ x\ LF\ x\ Hrs\ x\ Days}{453.6\ x\ 2{,}000}$$

Where:
EM = annual emissions (tons per year)
EF = pollutant specific emission factor (g/hp-hr)
HP = horsepower of engine
LF = load factor (from 2024 EIS)
Hrs = hours per day (from 2024 EIS)
Days = days per year
453.6 = conversion factor (453.6 g = pound)
2,000 = conversion factor (2,000 pounds = ton)