

Keegan O'Day
Space Exploration Technologies
1 Rocket Road
Hawthorne, CA 90250

FID: 10436
Permit: A 16293
SSID: 11146

Re: Draft Authority to Construct 16293

Dear Keegan O'Day :

Enclosed is a draft Authority to Construct (ATC) No. 16293 for modifications to the tugboat and barge operational scenarios. Please carefully review the enclosed documents to ensure that they accurately describe your facility and that the conditions are acceptable to you. Note that your permitted emission limits may, in the future, be used to determine emission fees.

If you have any comments on this draft permit, submit them in writing to the Air Pollution Control District (District) within 21 days from the date of this letter. We will consider your comments before we issue your final permit. If we receive no comments within this period, we will issue a final permit with the enclosed conditions. If you have no comments and wish to receive the final permit earlier, please call the number below.

This is a draft permit. Please be advised that construction of your facility without a final Authority to Construct is a violation of District rules and the California Health and Safety Code.

Please include the facility identification (FID) and permit numbers as shown at the top of this letter on all correspondence regarding this permit. If you have any questions, please contact me at (805) 979-8317.

Sincerely,



Agnieszka Letts , Air Quality Engineer
Engineering Division

enc: Draft ATC 16293
Draft Permit Evaluation

cc: Space Exploration Technologies 10436 Project File
Engr Chron File
21-Day Suspense File
Agnieszka Letts (Cover letter only)
Adam Poll
David Harris
William Sarraf

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air pollution control district
SANTA BARBARA COUNTY

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EQUIPMENT OWNER:

Space Exploration Technologies

EQUIPMENT OPERATOR:

Space Exploration Technologies

EQUIPMENT LOCATION:

Location for Stationary Source 11146

STATIONARY SOURCE/FACILITY:

Space Exploration Technologies

SSID: 11146
FID: 10436

AUTHORIZED MODIFICATION:

This permit authorizes updated operational scenarios for the primary and support tugboats. A total of 36 boat trips per year are authorized by this permit.

EQUIPMENT DESCRIPTION:

The equipment subject to this permit is listed in the table at the end of this permit.

PROJECT/PROCESS DESCRIPTION:

Space Exploration Technologies (SpaceX) uses two tugboats and barge to transport rocket boosters from the Port of Long Beach to Vandenberg Space Force Base (VSFB) harbor. The primary tugboat and barge depart from the Port of Long beach while a support tugboat departs from Port of Hueneme. These operations will allow SpaceX to expand its launch capability at Space Launch Complex 4 (SLC-4) on VSFB.. The transport and support operations occur over a three to eight calendar day period depending which route is taken and how many days offloading the rocket booster takes. Emissions from this project are generated from each tugboat's propulsion engines and auxiliary engines.

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CONDITIONS:

1. **Emission Limitations.** The mass emissions from the equipment permitted herein shall not exceed the values listed in Table 1. Compliance shall be based on the operational, monitoring, recordkeeping and reporting conditions of this permit.
2. **Operational Restrictions.** The following operational restrictions apply to the permitted equipment:
 - a. *Fuel Use Limits.* The daily and annual fuel use for the primary tugboat¹ and support tugboat² engines shall not exceed the values listed in Table 3.
 - b. *Hours of Operation.* The daily and annual hours of operation for the primary tugboat³ engines and support tugboat engines shall not exceed the values listed in Table 3. These operation limits include all attempts undertaken, including all attempts that result in an unsuccessful delivery.
 - c. *Annual Trip Limit.* Primary and support tugboat operations shall not exceed an annual limit of 36 trips⁴ per year. Of those 36 trips, primary tugboat Operational Scenario 2 usage shall not exceed more than 9 trips per year.
 - d. *Primary Tug Boat Operating Scenarios:* The permittee shall only operate primary tug boats that meet Operational Scenario 1 or Operational Scenario 2 during each trip. Operational Scenario 1 is defined as use of a primary tug boat which does not exceed the emission and operational assumptions of the Elizabeth C tug boat as defined in Table 1 and Table 3. Operational Scenario 2 is defined as use of a primary tug boat which does not exceed the emission and operational assumptions of the Kelly C tug boat as defined in Table 1 and Table 3.

¹ The primary tugboat is defined as the tugboat used to transport the barge from the Port of Long Beach to VSFB harbor and back. Two operating scenarios are defined for the fuel use limits of the primary tugboat propulsion and auxiliary engines based on the engine tier, horsepower, and load factor ratings.

² The support tugboat is defined as the tugboat used to assist in barge maneuvering in the VSFB harbor which departs from the Port of Hueneme.

³ Two operating scenarios are defined for the hours of operation for the primary tugboat propulsion and auxiliary engines based on the engine tier, horsepower, and load factor ratings.

⁴ A trip is defined as the tugboats departing their home ports (Port of Long Beach or Port of Hueneme), traveling to VSFB harbor and either offloading the rocket booster or aborting the offload, and returning to their home ports. Trips typically take between 3 and 8 days depending on offloading conditions, number of offloading attempts, and the routes taken to and from VSFB harbor.

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- e. *Operational Restrictions.* The following operating restrictions shall apply while operating in District Waters:
 - i. When docked in VSFB harbor, the support tugboat shall only conduct hoteling⁵ operations when not actively conducting transit⁶ or offloading⁷ operations.
 - ii. When docked in VSFB harbor, the primary tugboat shall only conduct unpowered hoteling operations when not actively conducting transit or offloading operations.
 - iii. When operating under Operational Scenario 2 in designated low-load areas⁸, the primary tugboat, barge and support tugboat shall follow the operational restrictions outlined in the *Marine Vessel Monitoring and Reporting Plan*.
 - f. *Fuel Restriction.* As required by the Air Toxic Control Measure (ATCM) for Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline (CCR Title 17, Chapter 1, Subchapter 7.5, §93118.5), the permittee shall only fuel a diesel engine on a harbor craft with R100 fuel or R99 fuel blend, except to demonstrate compliance with engine and fuel standards as specified in subsection (q) of the ATCM.
 - g. *Visible Emissions.* The tugboat engines shall comply with the visible emissions standards of District Rule 302.
3. **Monitoring.** The permitted equipment is subject to the following monitoring requirements:
- a. *Engine Fuel Use.* The volume of fuel (in units of gallons) combusted in the tugboat engines shall be measured individually through the use of in-line dedicated District-approved calibrated non-resettable totalizing fuel meters. The fuel meters shall be accurate to within five percent (5%) of the full-scale reading. The fuel meters shall be calibrated in accordance with the manufacturer's specifications and the calibration records shall be made available to the District upon request.

⁵ Hoteling operations includes both powered and unpowered hoteling. Powered hoteling is defined as the tugboat tied off or moored at VSFB harbor while operating the permitted auxiliary engine power. Unpowered hoteling is defined as the tugboat tied off or moored at VSFB harbor with no permitted engine operations. Unless further defined as either powered or unpowered, the use of the term "hoteling" in this permit assumed both powered and unpowered hoteling operations is authorized.

⁶ Transit operations are defined as all tugboat engine operations (i.e., transit, maneuvering, vessel stabilization, etc.) associated with traveling to and from VSFB harbor, not including any hoteling or offloading operations which occur in VSFB harbor.

⁷ Offloading operations are defined as tugboat engine operations (i.e., transit, maneuvering, mooring, vessel stabilization, etc.) associated with docking while offloading the rocket booster.

⁸ Low-load areas are defined as locations at or near VSFB as identified in the approved *Marine Vessel Monitoring and Reporting Plan* where additional operational restrictions are required to ensure compliance with the modeling parameters in the AQIA while operating under primary tugboat Operational Scenario 2.

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- b. *Engine Hours of Operation.* Each tugboat engine shall be equipped with a dedicated District-approved non-resettable hour meter. The hour meters shall be installed in a manner that allows personnel reasonable access to the hour meters without impediment. The hour meters shall be operational at all times when the engines are in use. The permittee shall monitor the number of daily hours each tugboat engine operates and the cumulative annual operating hours for each tugboat engine.
 - c. *Global Positioning System.* The permittee shall continuously track the location of the tugboats using an onboard GPS while conducting operations associated with this project, including operations outside of District Waters as required by the *Marine Vessel Monitoring and Reporting Plan*. This GPS system shall be capable of storing each trip's information for recordkeeping and reporting purposes.
 - d. *Fuel Properties.* The permittee shall maintain documentation certifying the sulfur content and the higher heating value (HHV) of the fuel combusted in the tugboat engines. This documentation shall be provided with the vendor's billing vouchers. Sulfur and HHV analyses shall be performed using District-approved ASTM methods. If the HHV of the fuel is not available, a default value of 137,000 Btu/gal shall be used for compliance determination and reporting.
4. **Recordkeeping.** The following records shall be maintained by the permittee and shall be made available to the District upon request:
- a. *Engine Fuel Use.* The daily and annual volume of fuel (in units of gallons) combusted individually in each of the primary tugboat's propulsion and auxiliary engines (Device ID: 398638, 398639, 395401, 395407, and 397971, 397972, 398640, 398641) as well as the support tugboat's propulsion and auxiliary engines (Device ID: 395573, 395574 and 395575) while operating in District Waters. This log shall note the starting and ending fuel meter readings for each engine when entering and exiting District Waters and if the engine was used for transit or offloading operations.
 - b. *Engine Hours of Operation.* The daily and annual hours of operation for each of the primary tugboat's propulsion and auxiliary engines (Device ID: 398638, 398639, 395401, 395407, and 397971, 397972, 398640, 398641) as well as the support tugboat's propulsion and auxiliary engines (Device ID: 395573, 395574 and 395575) while operating in District Waters. This log shall note start time and end time of the hour meter for each engine when entering and exiting District Waters and if the engine was used for transit or offloading operations.
 - c. *Global Positioning System.* The GPS location and time data, recorded in intervals of no greater than 15-minutes, for each tugboat's operation to and from VSFB harbor, including all operations outside of District Waters. This log shall include a map charting the primary tugboat's and support tugboat's position for the operation, the date and time

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the primary tugboat and support tugboat crossed jurisdictional boundaries (i.e., federal waters, South Coast AQMD waters, Ventura County APCD waters, and District waters) and electronic copies of the GPS system data as required by the *Marine Vessel Monitoring and Reporting Plan*.

- d. *Primary Tug Boat Operational Scenario*. For each trip, record whether the primary tug boat was operated under Operational Scenario 1 or Operational Scenario 2 as defined in Condition 2.d.
 - e. *Fuel Properties*. Billing vouchers or other data certifying the sulfur content and the higher heating value (HHV) of the fuel combusted in the tugboat engines. The documentation shall clearly denote the ASTM methods used for analysis and be clear that the fuel purchased matches the fuel noted in the billing voucher.
 - f. *District-Approved Plan*. All records required by the District-approved *Marine Vessel Monitoring and Reporting Plan*.
5. **Reporting**. A written trip report shall be submitted to the District within 45 days of the completion of each trip. Additionally, by March 1st of each year a written report documenting compliance with the terms and conditions of this permit for the previous calendar year shall be provided by the permittee to the District (Attn: *Annual Report Coordinator*). The reports shall contain information necessary to verify compliance with the emission limits and other requirements of this permit. The reports shall be in a format approved by the District. All logs and other basic source data not included in the reports shall be made available to the District upon request.

The following information shall be included in both the annual report and trip reports:

- a. *Engine Fuel Use*. The daily and annual volume of fuel (in units of gallons) combusted individually in each of the primary tugboat's propulsion and auxiliary engines (Device ID: 398638, 398639, 395401, 395407, and 397971, 397972, 398640, 398641) as well as the support tugboat's propulsion and auxiliary engines (Device ID: 395573, 395574 and 395575) while operating in District Waters, the starting and ending fuel meter readings for each engine when entering and exiting District Waters and if the reported fuel use was associated with transit or offloading operations. The annual volume of fuel shall be reported for each primary tugboat operational scenario separately and totalized for both scenarios.
- b. *Engine Hours of Operation*. The daily and annual hours of operation for each of the primary tugboat's propulsion and auxiliary engines (Device ID: 398638, 398639, 395401, 395407, and 397971, 397972, 398640, 398641) as well as the support tugboat's propulsion and auxiliary engines (Device ID: 395573, 395574 and 395575) while operating in District Waters, start time and end time of the hour meter for each engine when entering and exiting District Waters and if the reported hours of operation was

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associated with transit or offloading operations. The annual hours of operation shall be reported for each primary tugboat operational scenario separately and totaled for both scenarios.

- c. *Primary Tug Boat Operational Scenario.* For each trip, report whether the primary tug boat was operated under Operational Scenario 1 or Operational Scenario 2 as defined in Condition 2.d.
- d. *Fuel Properties.* Billing vouchers or other data certifying the sulfur content and the higher heating value (HHV) of the fuel combusted in the tugboat engines. The documentation shall clearly denote the ASTM methods used for analysis and be clear that the fuel purchased matches the fuel noted in the billing voucher.
- e. *District-Approved Plan.* All reports required by the District-approved *Marine Vessel Monitoring and Reporting Plan*.

The following information shall be included in the trip reports:

- f. *Global Positioning System.* The GPS location and time data, recorded in intervals of no greater than 15-minutes, for each tugboat's operation to and from VSFB harbor, including all operations outside of District Waters. This log shall include a map charting the primary tugboat's and support tugboat's position for the operation, the date and time the primary tugboat and support tugboat crossed jurisdictional boundaries (i.e., federal waters, South Coast AQMD waters, Ventura County APCD waters, and District waters) and electronic copies of the GPS system data as required by the *Marine Vessel Monitoring and Reporting Plan*.
6. **New/Replacement Tugboats.** The permittee may utilize any new/replacement tugboat without the need for a permit revision if all of the following conditions are met:
- a. The combined brake horsepower (bhp) ratings of the new/replacement tugboat propulsion engines are equal to or less than the combined bhp ratings of the corresponding tugboat propulsion engines found in Table 3. Note that engine bhp ratings shall be based on the engine's maximum rated RPM, and;
 - b. The combined brake horsepower (bhp) ratings of the new/replacement tugboat auxiliary engines are equal to or less than the combined bhp ratings of the corresponding tugboat auxiliary engines found in Table 3. Note that engine bhp ratings shall be based on the engine's maximum rated RPM, and;
 - c. The daily potential to emit (PTE) of the new/replacement tugboat propulsion and auxiliary engines is equal to or less than the corresponding values found in Table 1, and;

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- d. The NO_x, ROC, CO, SO_x, PM, PM₁₀ and PM_{2.5} emission factors are equal to or less than the permitted emission factors for the corresponding propulsion and auxiliary engines found in Table 2.

To verify that a new/replacement tugboat meets the requirements specified above, the permittee shall submit the following information to the District for review and approval prior to bringing a new/replacement tugboat into service:

- e. Tugboat information including vessel name, number of new/replacement engines, each engine's type (i.e., propulsion or auxiliary) and tugboat use (i.e., primary tugboat or support tugboat). For new/replacement primary tugboats, the request shall specify whether the new vessel is being evaluated to meet Operational Scenario 1 or 2 as defined in Condition 2.d.
- f. Documentation or manufacturer specifications that include each new/replacement engine's make, model, year of manufacturer, EPA Tier, marine diesel engine category, emission control equipment, maximum bhp rating with the associated RPM, kW rating, cylinder quantity and cylinder displacement.
- g. Documentation detailing the new/replacement tugboat's onboard Global Positioning System (GPS) as well as each new/replacement engine's fuel meter and hour meter.
- h. Documentation showing that the new/replacement propulsion engines are equal to or less than the corresponding bhp ratings found in Table 3.
- i. Documentation showing that the new/replacement auxiliary engines are equal to or less than the corresponding bhp ratings found in Table 3.
- j. Documentation showing that the daily potential to emit (PTE) of the new/replacement propulsion and auxiliary engines is equal to or less than the corresponding values found in Table 1.
- k. Documentation showing that the NO_x, ROC, CO, SO_x, PM, PM₁₀ and PM_{2.5} emission factors of the new/replacement propulsion and auxiliary engines are equal to or less than the permitted emission factors for the corresponding propulsion and auxiliary engines found in Table 2.
- l. Any other documentation or information the District deems necessary to ensure the new/replacement tugboat will operate consistent with the analyses that form the basis of this permit.
- m. An updated *Marine Vessel Monitoring and Reporting Plan* detailing the new/replacement vessel and associated engines. The permittee shall obtain District approval for the revised plan prior to bringing any new/replacement tugboat into service

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7. **Source Testing.** The following source testing provisions shall apply:
- a. The permittee shall conduct source testing of air emissions and process parameters listed in Table 4 of this permit for the Elizabeth C Propulsion Engines 1 and 2 (Device IDs: 398638, 398639) on an annual schedule using May 30th as the anniversary date. If an alternative primary tugboat is authorized to operate under Operational Scenario 1 in addition to or in lieu of the Elizabeth C, then source testing shall occur on the main propulsion engines of primary tugboat vessel with the majority of the trips since the start of the calendar year. More frequent source testing may be required if the equipment does not comply with permitted limitations or if other compliance problems, as determined by the District, occur.
 - b. The permittee shall submit a written source test plan to the District (e-mail to sourcetest@sbcapcd.org) for approval at least thirty (30) days prior to initiation of each source test. The source test plan shall be prepared consistent with the District's *Source Test Procedures Manual* (revised May 1990 and any subsequent revisions). The permittee shall obtain written District approval of the source test plan prior to commencement of source testing. The District shall be notified (e-mail to sourcetest@sbcapcd.org) at least ten (10) calendar days prior to the start of source testing activity to arrange for a mutually agreeable source test date when District personnel may observe the test.
 - c. Source test results shall be submitted to the District (e-mail to sourcetest@sbcapcd.org) within forty-five (45) calendar days following the date of source test completion and shall be consistent with the requirements approved within the source test plan. Source test results shall document the permittee's compliance status with BACT requirements, mass emission rates, and applicable permit conditions, rules and NSPS (if applicable). All District costs associated with the review and approval of all plans and reports and the witnessing of tests shall be paid by the permittee as provided for by District Rule 210.
 - d. A source test for an item of equipment shall be performed on the scheduled day of testing (the test day mutually agreed to) unless circumstances beyond the control of the operator prevent completion of the test on the scheduled day. Such circumstances include mechanical malfunction of the equipment to be tested, malfunction of the source test equipment, delays in source test contractor arrival and/or set-up, or unsafe conditions on site. Except in cases of an emergency, the operator shall seek and obtain District approval before deferring or discontinuing a scheduled test, or performing maintenance on the equipment item on the scheduled test day. If the test can not be completed on the scheduled day, then the test shall be rescheduled for another time with prior authorization by the District. Once the sample probe has been inserted into the exhaust stream of the equipment unit to be tested (or extraction of the sample has begun), the test shall proceed in accordance with the approved source test plan. In no case shall a test run be aborted except in the case of an emergency or unless approval is first obtained from the District. Failing to perform the source test of an equipment item on the scheduled test day without

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a valid reason and without the District's authorization shall constitute a violation of this permit. If a test is postponed due to an emergency, written documentation of the emergency event shall be submitted to the District (e-mail to sourcetest@sbcapcd.org) by the close of the business day following the scheduled test day.

The timelines in (a), (b), and (c) above may be extended for good cause provided a written request is submitted to the District at least three (3) days in advance of the deadline, and approval for the extension is granted by the District.

8. **District Inspection.** The permittee shall provide the District advance written notice of at least seven days, but not greater than 30 days, of the tugboats and barge arrival date for each trip to allow for a District inspection of the equipment subject to this permit.
9. **Offsets.** The permittee shall offset all NO_x emissions pursuant to Tables 5(a) and 5(b). Emission Reduction credits (ERCs) sufficient to offset the permitted annual NO_x emissions shall be in place for the life of the project.
10. **Operational Increment Fee.** The permittee shall pay increment fees in the schedule below:

Increment Fee Schedule

Due Date	Amount Due
December 1, 2024	\$13,716.27
December 1, 2025	\$12,344.64
December 1, 2026	\$10,973.02
December 1, 2027	\$9,601.39
December 1, 2028	\$8,229.76
December 1, 2029	\$6,858.14
December 1, 2030	\$5,486.51
December 1, 2031	\$4,114.88
December 1, 2032	\$2,743.25
December 1, 2033	\$1,371.63

11. **Marine Vessel Monitoring and Reporting Plan.** The permittee shall submit and implement the District approved updated *Marine Vessel Monitoring and Reporting Plan*. The plan shall be revised to detail the following:
 - a. Identify the designated low-load areas via a map, where operational restrictions are implemented to comply with the modeling assumptions made in the AQIA.
 - b. Identify the operational restrictions implemented within the low-load areas identified in condition 11.a. This should include engine load or fuel use limits, hours of operation restrictions, or any other parameters that will be used to comply with the assumptions made in the AQIA.

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- c. Identify the recordkeeping and reporting requirements used to comply with restrictions identified conditions 11.a and 11.b.
12. **Consistency with Analysis.** Operation under this permit shall be conducted consistent with all data, specifications and assumptions included with the application and supplements thereof (as documented in the District's project file) and the District's analyses under which this permit is issued as documented in the Permit Analyses prepared for and issued with the permit.
13. **Equipment Maintenance.** The equipment listed in this permit shall be properly maintained and kept in good condition at all times. The equipment manufacturer's maintenance manual, maintenance procedures and/or maintenance checklists (if any) shall be kept on site.
14. **Compliance.** Nothing contained within this permit shall be construed as allowing the violation of any local, state or federal rules, regulations, air quality standards or increments.
15. **Severability.** In the event that any condition herein is determined to be invalid, all other conditions shall remain in force.
16. **Conflict Between Permits.** The requirements or limits that are more protective of air quality shall apply if any conflict arises between the requirements and limits of this permit and any other permitting actions associated with the equipment permitted herein.
17. **Access to Records and Facilities.** As to any condition that requires for its effective enforcement the inspection of records or facilities by the District or its agents, the permittee shall make such records available or provide access to such facilities upon notice from the District. Access shall mean access consistent with California Health and Safety Code Section 41510 and Clean Air Act Section 114A.
18. **Equipment Identification.** Identifying tag(s) or name plate(s) shall be displayed on the equipment to show manufacturer, model number, and serial number. The tag(s) or plate(s) shall be affixed to the equipment in a permanent and conspicuous position.
19. **Emission Factor Revisions.** The District may update the emission factors for any calculation based on USEPA AP-42 or District emission factors at the next permit modification or permit reevaluation to account for USEPA and/or District revisions to the underlying emission factors.
20. **Reimbursement of Costs.** All reasonable expenses, as defined in District Rule 210, incurred by the District, District contractors, and legal counsel for the activities listed below that follow the issuance of this permit, including but not limited to permit condition implementation, compliance verification and emergency response, directly and necessarily related to enforcement of the permit shall be reimbursed by the permittee as required by Rule 210. Reimbursable activities include work involving: permitting, compliance, CEMS, modeling/AQIA, ambient air monitoring and air toxics.

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21. **Nuisance.** Except as otherwise provided in Section 41705 of the California H&SC, no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
22. **Grounds for Revocation.** Failure to abide by and faithfully comply with this permit or any Rule, Order, or Regulation may constitute grounds for revocation pursuant to California Health & Safety Code Section 42307 *et seq.*
23. **Transfer of Owner/Operator.** This permit is only valid for the owner and operator listed on this permit unless a *Transfer of Owner/Operator* application has been applied for and received by the District. Any transfer of ownership or change in operator shall be done in a manner as specified in District Rule 203. District Form –01T and the appropriate filing fee shall be submitted to the District within 30 days of the transfer.
24. **Documents Incorporated by Reference.** The documents listed below, including any District-approved updates thereof, are incorporated herein by reference and shall have the full force and effect of a permit condition for this permit. These documents shall be implemented for the life of the Project and shall be made available to District inspection staff upon request.
 - a. *Marine Vessel Monitoring and Reporting Plan* (to be updated)
25. **Source Compliance Demonstration Period.** Equipment permitted herein is allowed to operate temporarily during a 120-day SCDP. The issuance of this permit defines the start of SCDP. During the SCDP, the permittee shall comply with all operational, monitoring, recordkeeping and reporting requirements as specified in this permit.

During the SCDP, the permittee shall:

- a. Begin recordkeeping as specified in the *Recordkeeping* condition of this permit.
- b. Within 14 of days of the start of the SCDP, the permittee shall provide the District written notification of the SCDP start date using the attached yellow SCDP notification card or by e-mail to enfr@sbcapcd.org.
- c. Prior to the first operations of the Kelly C under Primary Tug Operational Scenario 2 under this permit or within 90 days from the start of SCDP, whichever occurs earlier, the permittee shall submit and obtain District approval of an updated *Marine Vessel Monitoring and Reporting Plan* to include the operational restrictions modeled in the AQIA and associated monitoring, recordkeeping, and reporting requirements as required in Condition 11 of this permit.

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- d. Arrange for District inspection not more than 30 calendar days (or other mutually agreed to time period) after the SCDP begins. An inspection can be arranged via e-mail to enfr@sbcapcd.org or by calling the District Compliance Division at (805) 979-8050. A minimum of three calendar days advance notice shall be given to the District. The Compliance Division may waive this inspection requirement if an initial inspection is deemed unnecessary to verify that the modifications authorized by this permit are in compliance with District rules and permit conditions.
- e. Submit a Permit to Operate (PTO) application and the appropriate filing fee not more than 90 calendar days after the SCDP begins pursuant to District Rule 201.E.2. Upon the District's determination that the permit application is "complete", the permittee may continue temporary operations under the SCDP until such time the PTO is issued final or one year from the date of PTO application completeness, whichever occurs earlier. Failure to submit the PTO application within the specified time period shall constitute a violation of this permit.

SCDP extensions may be granted by the District for good cause. Such extensions may be subject to conditions. When good cause cannot be demonstrated, no administrative extension is available and the permittee shall cease operations. Alternatively, the permittee may submit an application to revise the ATC permit and upon the District finding the application complete the SCDP can be extended. A written request to extend the SCDP shall be made by the permittee at least seven days prior to the SCDP expiration date.

AIR POLLUTION CONTROL OFFICER

DATE

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Attachments:

- Table 1 – Permitted Emission Limits
- Table 2 – Tugboat Engine Emission Factors
- Table 3 – Tugboat Engine Operational Restrictions
- Table 4 – Source Test Requirements
- Table 5(a) – Offset Liabilities for the Space Exploration Technologies Stationary Source
- Table 5(b) – Emission Reduction Credits for the Space Exploration Technologies Stationary Source
- Permit Equipment List(s)
- Permit Evaluation for Authority to Construct 16293

Notes:

- This permit is valid for one year from the date stamped above if unused.
- This permit supersedes ATC 16223.

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TABLE 1. PERMITTED EMISSION LIMITS

Equipment	NO_x	ROC	CO	SO_x	PM	PM₁₀	PM_{2.5}
Primary Tug Operational Scenario 1							
<i>Elizabeth C - Propulsion Engines</i>							
lb/day	184.65	19.49	512.93	6.98	4.10	4.10	4.10
TPY	9.88	1.04	27.44	0.37	0.22	0.22	0.22
<i>Elizabeth C - Auxiliary Engines Engines</i>							
lb/day	6.10	0.46	6.07	0.08	0.15	0.15	0.15
TPY	0.33	0.02	0.32	0.00	0.01	0.01	0.01
Primary Tug Operational Scenario 2							
<i>Kelly C - Propulsion Engines</i>							
lb/day	410.97	30.93	394.56	5.37	8.68	8.68	8.68
TPY	5.50	0.41	5.28	0.07	0.12	0.12	0.12
<i>Kelly C - Auxiliary Engines</i>							
lb/day	6.10	0.46	6.07	0.08	0.15	0.15	0.15
TPY	0.08	0.01	0.08	0.00	0.00	0.00	0.00
Support Tug							
<i>Support Tug - Propulsion Engines</i>							
lb/day	205.49	15.47	197.28	2.68	4.34	4.34	4.34
TPY	10.99	0.83	10.55	0.14	0.23	0.23	0.23
<i>Support Tug - Auxiliary Engines</i>							
lb/day	6.10	0.46	6.07	0.08	0.15	0.15	0.15
TPY	0.33	0.02	0.32	0.00	0.01	0.01	0.01
Totals							
lb/day	628.65	47.32	722.34	9.82	13.31	13.31	13.31
TPY	24.55	2.07	38.65	0.53	0.53	0.53	0.53

1. Worst case daily emissions assume the use of either the M/V Elizabeth C or the M/V Kelly C and the Support Tug.
2. Worst case annual emissions assume the use of Primary Tug Operational Scenario 1 100% of the time or the use of Primary Tug Operational Scenario 1 75% of the time and Primary Tug Operational Scenario 2 25% of the time.
3. Operational Scenario 2's annual emissions are calculated based on a worst case scenario of 642 hours of operation per year.

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TABLE 2. TUGBOAT ENGINE EMISSION FACTORS

Tugboat		Engine Type	Device IDs	Emission Factors (g/kW-hr)						
				NOx	ROC	CO	SOx	PM	PM10	PM2.5
Primary Tugboats	Operational Scenario 1: Elizabeth C	Propulsion	398638, 398639	1.80	0.19	5.00	0.07	0.04	0.04	4.10
		Auxiliary	395401,395407	5.02	0.38	5.00	0.07	0.12	0.12	0.12
	Operational Scenario 2: Kelly C	Propulsion	397971, 397972	5.21	0.39	5.00	0.07	0.11	0.11	0.11
		Auxiliary	398640, 398641	5.02	0.38	5.00	0.07	0.12	0.12	0.12
Support Tugboat		Propulsion	395573, 395574	5.21	0.39	5.00	0.07	0.11	0.11	0.11
		Auxiliary	395575	5.02	0.38	5.00	0.07	0.12	0.12	0.12

TABLE 3. TUGBOAT ENGINE OPERATIONAL RESTRICTIONS

Tugboat		Device Name	Device ID	Engine Rating (bhp)	EPA Marine Tier	Fuel Use Limits (gals)		Time Based Operational Restrictions	
						Daily Fuel Use	Annual Fuel Use	Daily Hours	Annual Hours ¹
Primary Tugboat	Operational Scenario 1: Elizabeth C	Propulsion Engine 1	398638	1,300	4	1689.81	180809.69	24.00	2568.00
		Propulsion Engine 2	398639	1,300	4	1689.81	180809.69	24.00	2568.00
		Auxiliary Engines (combined limit)	395401, 395407	99	3	39.99	4278.59	24.00	2568.00
	Operational Scenario 2: Kelly C	Propulsion Engine 1	397971	1,000	3	1299.85	34771.09	24.00	642.00
		Propulsion Engine 2	397972	1,000	3	1299.85	34771.09	24.00	642.00
		Auxiliary Engines (combined limit)	398640, 398641	99	3	39.99	1069.65	24.00	642.00
Support Tugboat		Propulsion Engine 1	395573	500	3	649.93	69542.19	24.00	2568.00
		Propulsion Engine 2	395574	500	3	649.93	69542.19	24.00	2568.00
		Auxiliary Engine	395575	99	3	39.99	4278.59	24.00	2568.00

1. The primary tugboats may operate for 2568 combined total annual hours as shown in Operational Scenario 1, with up to 642 of those hours coming from Operational Scenario 2.

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TABLE 4. SOURCE TESTING REQUIREMENTS

Emission Points	Pollutants	Parameters^(b)	Test Methods^{(a),(c)}	Limits (per engine)
M/V Elizabeth C Main Propulsion Engines ^(b)	NO _x	ppmv, lb/hr, g/bhp-hr	EPA Method 7E, CARB 100	3.85 lb/hr
	CO	ppmv, lb/hr, g/bhp-hr	EPA Method 10	10.69 lb/hr
	ROC	ppmv, lb/hr, g/bhp-hr	EPA Method 18	0.41 lb/hr
	Sampling Point Det.		EPA Method 1	
	Stack Gas Flow Rate		EPA Method 2 or 19	
	O ₂	Dry, Mol. Wt	EPA Method 3	
	Moisture Content		EPA Method 4	
Fuel	Fuel Flow Rate		Flow Meter	
	Fuel Higher Heating Value	Btu/lb	ASTM D 240	
	Total Sulfur Content ^(d)	ppmw	ASTM D 2622-94	

Notes:

- (a) Alternative methods may be acceptable on a case-by-case basis.
- (b) All emissions tests shall consist of three 40-minute runs. The M/V Elizabeth C (or alternative tugboat primary tugboat) main propulsion engines are to be tested at cruise load. Additional testing may be required if loads are not achieved.
- (c) USEPA methods 1-4 to be used to determine O₂, dry MW, moisture content, CO₂, and stack flow rate. Alternatively, USEPA 19 may be used to determine stack flow rate.
- (d) SO_x emissions to be determined by mass balance calculation.
- (e) The main propulsion engines from the M/V Elizabeth C (or an alternative primary tugboat) operating under Operational Scenario 1 shall be tested annually in accordance with the Source Test Condition.
- (f) Procedures to obtain the required operating loads shall be clearly defined in the source test plan

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TABLE 5(A). OFFSET LIABILITIES FOR THE SPACE EXPLORATION TECHNOLOGIES STATIONARY SOURCE

Table 5(a) - Offset Liabilities for the Space Exploration Technologies Stationary Source
 Updated: **September 12, 2024**

Item	Permit	Facility	Issue Date	ERC Returned?	Project	Offset Liability --- tons/year ---					ERC Source	Notes
						NO _x	ROC	SO _x	PM	PM ₁₀		
1	ATC 16293	Space Exploration Technologies	TBD	no	Modify the tugboat operational scenarios (36 trips per year)	0.023	-	-	-	-	665	
TOTALS (tpy) =						0.023	0.000	0.000	0.000	0.000		

Notes

(a) ERCs used after August 26, 2016 may be returned to the Source Register. This line item reflects such a return. It is entered as a negative entry to balance this ledger. Original entry is not revised.

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TABLE 5(B). EMISSION REDUCTION CREDITS FOR THE SPACE EXPLORATION TECHNOLOGIES STATIONARY SOURCE

Table 5(b) - Emission Reduction Credits for the Space Exploration Technologies Stationary Source
 Updated: **September 16, 2024**

Item	Permit	Facility	Surrender Date	ERC Returned?	Emission Reduction Credits --- tons/year ---					Offset Ratio	ERC Source	NOTES
					NO _x	ROC	SO _x	PM	PM ₁₀			
1	ATC 16293	Space Exploration Technologies	09/16/24	no	0.031	-	-	-	-	1.3	665	
TOTALS (tpy) =					0.031	0.000	0.000	0.000	0.000			

Notes

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Equipment List for Authority to Construct 16293

PERMIT EQUIPMENT LIST - TABLE A

ATC 16293 / FID: 10436 Space Exploration Technologies / SSID: 11146

A PERMITTED EQUIPMENT

1 Primary Tugboat

1.1 Primary Tugboat Propulsion Engine 1 - Elizabeth C

<i>Device ID #</i>	398638	<i>Device Name</i>	Primary Tugboat Propulsion Engine 1 - Elizabeth C
<i>Rated Heat Input</i>	7420.000 Btu/bhp-hr	<i>Physical Size</i>	1300.00 Brake Horsepower
<i>Manufacturer Model</i>	Cummins QSK38-M2	<i>Operator ID Serial Number</i>	Port Main Engine TBD
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 4 certified, EPA engine family: RCEXN38.0AAC, 12 cylinders, 4 stroke, 37.7 L displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled.		

1.2 Primary Tugboat Propulsion Engine 2 - Elizabeth C

<i>Device ID #</i>	398639	<i>Device Name</i>	Primary Tugboat Propulsion Engine 2 - Elizabeth C
<i>Rated Heat Input</i>	7420.000 Btu/bhp-hr	<i>Physical Size</i>	1300.00 Brake Horsepower
<i>Manufacturer Model</i>	Cummins QSK38-M2	<i>Operator ID Serial Number</i>	Starboard Main Engine TBD
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 4 certified, EPA engine family: RCEXN38.0AAC, 12 cylinders, 4 stroke, 37.7 L displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled.		

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Equipment List for Authority to Construct 16293

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1.3 Primary Tugboat Auxiliary Engine 1 - Elizabeth C

<i>Device ID #</i>	395401	<i>Device Name</i>	Primary Tugboat Auxiliary Engine 1 - Elizabeth C
<i>Rated Heat Input</i>	0.735 MMBtu/Hour	<i>Physical Size</i>	99.00 Horsepower
<i>Manufacturer</i>	John Deere	<i>Operator ID</i>	Starboard Auxiliary Engine
<i>Model</i>	PowerTech 4045AFM85	<i>Serial Number</i>	PE4045N003988
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 3 certified, 4 cylinders, 4 stroke, 4.5 L displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled		

1.4 Primary Tugboat Auxiliary Engine 2 - Elizabeth C

<i>Device ID #</i>	395407	<i>Device Name</i>	Primary Tugboat Auxiliary Engine 2 - Elizabeth C
<i>Rated Heat Input</i>	0.735 MMBtu/Hour	<i>Physical Size</i>	99.00 Horsepower
<i>Manufacturer</i>	John Deere	<i>Operator ID</i>	Port Auxiliary Engine
<i>Model</i>	PowerTech 4045AFM85	<i>Serial Number</i>	PE4045N003989
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 3 certified, 4 cylinders, 4 stroke, 4.5 L displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled		

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1.5 Primary Tugboat Propulsion Engine 1 - Kelly C

<i>Device ID #</i>	397971	<i>Device Name</i>	Primary Tugboat Propulsion Engine 1 - Kelly C
<i>Rated Heat Input</i>	7420.000 Btu/bhp-hr	<i>Physical Size</i>	1000.00 Brake Horsepower
<i>Manufacturer Model</i>	Cummins QSK38-M1	<i>Operator ID Serial Number</i>	Port Main Engine 33227367
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 3 certified, EPA engine family: MCEXN19.0AAA, 12 cylinders, 4 stroke, 37.7 L displacement, 1,600 RPM, diesel fired, turbocharged and aftercooled. Electronically derated from 1,300 bhp.		

1.6 Primary Tugboat Propulsion Engine 2 - Kelly C

<i>Device ID #</i>	397972	<i>Device Name</i>	Primary Tugboat Propulsion Engine 2 - Kelly C
<i>Rated Heat Input</i>	7420.000 Btu/bhp-hr	<i>Physical Size</i>	1000.00 Brake Horsepower
<i>Manufacturer Model</i>	Cummins QSK38-M1	<i>Operator ID Serial Number</i>	Starboard Main Engine 33227441
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 3 certified, EPA engine family: MCEXN19.0AAA, 12 cylinders, 4 stroke, 37.7 L displacement, 1,600 RPM, diesel fired, turbocharged and aftercooled. Electronically derated from 1,300 bhp.		

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1.7 Primary Tugboat Auxiliary Engine 1 - Kelly C

<i>Device ID #</i>	398640	<i>Device Name</i>	Primary Tugboat Auxiliary Engine 1 - Kelly C
<i>Rated Heat Input</i>	0.735 MMBtu/Hour	<i>Physical Size</i>	99.00 Horsepower
<i>Manufacturer</i>	John Deere	<i>Operator ID</i>	FWD Auxiliary Engine
<i>Model</i>	PowerTech 4045AFM85	<i>Serial Number</i>	PE4045N030337
<i>Location Note</i>			
<i>Device</i>	EPA Commercial Marine Tier 3 certified, 4 cylinders, 4 stroke, 4.5 L		
<i>Description</i>	displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled		

1.8 Primary Tugboat Auxiliary Engine 2 - Kelly C

<i>Device ID #</i>	398641	<i>Device Name</i>	Primary Tugboat Auxiliary Engine 2 - Kelly C
<i>Rated Heat Input</i>	0.735 MMBtu/Hour	<i>Physical Size</i>	99.00 Horsepower
<i>Manufacturer</i>	John Deere	<i>Operator ID</i>	AFT Auxiliary Engine
<i>Model</i>	PowerTech 4045AFM85	<i>Serial Number</i>	PE4045N030044
<i>Location Note</i>			
<i>Device</i>	EPA Commercial Marine Tier 3 certified, 4 cylinders, 4 stroke, 4.5 L		
<i>Description</i>	displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled		

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Equipment List for Authority to Construct 16293

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2 Support Tugboat

2.1 Support Tugboat Propulsion Engine 1

<i>Device ID #</i>	395573	<i>Device Name</i>	Support Tugboat Propulsion Engine 1
<i>Rated Heat Input</i>	1.858 MMBtu/Hour	<i>Physical Size</i>	500.00 Brake Horsepower
<i>Manufacturer Model</i>	John Deere 6135	<i>Operator ID Serial Number</i>	RG6135L031149
<i>Location Note Device Description</i>	EPA Commercial Marine Tier 3 certified, EPA engine family: FJDXN13.5158, 6 cylinders, 4 stroke, 13.5 L displacement, 1,900 RPM, diesel fired, turbocharged and aftercooled		

2.2 Support Tugboat Propulsion Engine 2

<i>Device ID #</i>	395574	<i>Device Name</i>	Support Tugboat Propulsion Engine 2
<i>Rated Heat Input</i>	1.858 MMBtu/Hour	<i>Physical Size</i>	500.00 Brake Horsepower
<i>Manufacturer Model</i>	John Deere 6135	<i>Operator ID Serial Number</i>	RG6135L031150
<i>Location Note Device Description</i>	EPA Commercial Marine Tier 3 certified, EPA engine family: FJDXN13.5158, 6 cylinders, 4 stroke, 13.5 L displacement, 1,900 RPM, diesel fired, turbocharged and aftercooled		

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2.3 Support Tugboat Auxiliary Engine

<i>Device ID #</i>	395575	<i>Device Name</i>	Support Tugboat Auxiliary Engine
<i>Rated Heat Input</i>	0.735 MMBtu/Hour	<i>Physical Size</i>	99.00 Horsepower
<i>Manufacturer</i>	John Deere	<i>Operator ID</i>	
<i>Model</i>	PowerTech 4045AFM85A	<i>Serial Number</i>	PE4045L983330
<i>Location Note</i>			
<i>Device Description</i>	EPA Commercial Marine Tier 3 certified, 4 cylinders, 4 stroke, 4.5 L displacement, 1,800 RPM, diesel fired, turbocharged and aftercooled		

3 Barge

<i>Device ID #</i>	395402	<i>Device Name</i>	Barge
<i>Rated Heat Input</i>		<i>Physical Size</i>	
<i>Manufacturer</i>		<i>Operator ID</i>	
<i>Model</i>		<i>Serial Number</i>	
<i>Location Note</i>			
<i>Device Description</i>	Equipped with exempt generator, not equipped with any propulsion engines, used to transport rocket booster		

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B EXEMPT EQUIPMENT

1 Barge Generator

<i>Device ID #</i>	395403	<i>Device Name</i>	Barge Generator
<i>Rated Heat Input</i>		<i>Physical Size</i>	49.50 Brake Horsepower
<i>Manufacturer</i>	Various	<i>Operator ID</i>	
<i>Model</i>	Various	<i>Serial Number</i>	
<i>Part 70 Insig?</i>	No	<i>District Rule Exemption:</i> 202.F.1.e. Compression ignition engines w/ bhp 50 or less	
<i>Location Note</i>			
<i>Device Description</i>	California PERP engine. Tier IV		



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**PERMIT EVALUATION FOR
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1.0 BACKGROUND

- 1.1 General: The application for ATC 16293 was submitted by Space Exploration Technologies on June 10, 2024 and deemed complete by the District on September 24, 2024. This permit supersedes ATC 16223.

This permit revises the primary and support tugboats worst case operational scenarios including modifying the daily engine operating hour limits, engine loads and fuel use limits to allow for increased flexibility in routes taken and to resolve violations associated with exceedances under the previous operating restrictions. Specific daily operational restrictions and contingency days for offloading allowances were removed and replaced with overall daily and annual hours of operation restrictions. 36 boat trips are permitted per year. This permit does not allow for an increase in the number of boat trips per year.

This permit evaluates this project's operations in California Coastal Waters adjacent Santa Barbara County APCD. The conditions listed in this permit only pertain to operations taking place in District Waters.

1.2 Permit History:

PERMIT	FINAL ISSUED	PERMIT DESCRIPTION
Exempt 15817	11/23/2021	Roll-on/Roll-Off (RORO) safety test utilizing two tugboats.
ATC 15704	01/11/2022	Operation of tug boats and a barge.
ATC Mod 15704 01	01/11/2022	Operation of tug boats and a barge.
PTO 15649	01/14/2022	Increase throughput of RP-1 and super-cooled RP-1.
ATC/PTO 15757	01/20/2022	Cummins Model QST30-G5 rated at 1,490 bhp
ATC Mod 15704 02	02/24/2022	Add a second tug boat
ATC 15756	03/25/2022	Hypergolic Fuel/Oxidizer Scrubbers
PTO 15704	07/21/2022	Add a second tug boat
ATC Mod 15704 03	07/21/2022	Modification to tugboat operations
PTO Mod 15649 01	11/16/2022	Increase launches, remove Falcon Heavy activity, no increase in emissions.
Reeval 14927 R1	05/25/2023	Installation of an abrasive blasting system.
ATC 15999	06/06/2023	Modification to PTO 13711. Increase in permitted launches at SLC-4 from 12 to 36 per year..

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PERMIT	FINAL ISSUED	PERMIT DESCRIPTION
ATC 16000	06/06/2023	Modification to PTO 15704. Modification to tugboat and barge operations in association with the increased Falcon 9 launch cadence.
PTO 15756	06/06/2023	Hypergolic Fuel/Oxidizer Scrubbers
ATC 16223	03/26/2024	Repower the Elizabeth C tugboat with Tier 4 engines.

1.3 Compliance History:

VIOLATION TYPE	NUMBER	ISSUE DATE	DESCRIPTION OF VIOLATION
Permit	12975	06/03/2022	Exceeding emissions limitations permitted by Condition 1 of ATC Mod 15704 02; Exceeding daily hours of operations for primary and support tugboats permitted by Condition 2.b of ATC Mod 15704 02; Failing to record and report GPS trip data as required by Condition 5.d and 5.f of ATC Mod 15704 04; and Failing to adhere to the Marine Vessel Monitoring and Reporting Plan, incorporated by reference by Condition 21 of ATC Mod 15704 02.
Emissions	13163	08/18/2022	Failure to utilize BACT as required by Condition 6 of Reeval 13711 R1; and exceeding mass emissions limitations required by Condition 1.a.i on two occasions
Emissions	13164	08/18/2022	Failure to utilize Best Available Control Technology as required by Condition 6 of Reeval 13711 R1.
Permit	13165	08/18/2022	Failure to perform portable analyzer monitoring in the first quarter of 2022 as required by Condition 3.b.iv of Reeval 13711 R2
Permit	13165	08/18/2022	Failing to perform quarterly portable analyzer monitoring in accordance with the Inspection and Maintenance Plan as required by Rule 333.F and Condition 3.b.iv of Reevaluation 13711 R2.

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VIOLATION TYPE	NUMBER	ISSUE DATE	DESCRIPTION OF VIOLATION
Permit	13213	11/16/2022	Exceeding emissions limitations permitted by Condition 1 of PTO 15704; Exceeding the daily fuel use and hours of operation limitations established by Conditions 5.a and 5.b of PTO 15704, respectively; Failing to conduct operations consistent with the permit analyses issued with the permit, as required by Condition 8 of PTO 15704; And exceeding CEQA assumptions for fuel use, vessel speed, and hours of operation outside of District waters, in violation of Condition 20, Documents Incorporated by Reference, of PTO 15704.
Permit	13477	09/13/2023	2023 Boat Trip 1 Exceedances
Permit	13478	09/13/2023	2023 Boat Trip 2 Exceedances
Permit	13479	09/13/2023	2023 Boat Trip 3 Exceedances
Permit	13480	09/13/2023	2023 Boat Trip 4 Exceedances
Permit	13481	09/13/2023	2023 Boat Trip 5 Exceedances
Permit	13482	09/13/2023	2023 Boat Trip 6 Exceedances
Permit	13483	09/13/2023	2023 Boat Trip 7 Exceedances
Permit	13486	09/13/2023	2023 Boat Trip 8 Exceedances
Permit	13487	09/13/2023	2023 Boat Trip 9 Exceedances
Permit	13490	09/13/2023	2023 Boat Trip 10 Exceedances
Permit	13494	09/13/2023	2022 Boat Trip 7 Exceedances
Permit	13495	09/13/2023	2022 Boat Trip 8 Exceedances
Permit	13496	09/13/2023	2022 Boat Trip 13 Exceedances
Permit	13497	09/13/2023	2022 Boat Trip 14 Exceedances
Permit	13529	01/25/2024	2023 Boat Trip 11 Exceedances
Permit	13575	01/25/2024	2023 Boat Trip 12 Exceedances
Permit	13576	01/25/2024	2023 Boat Trip 13 Exceedances
Permit	13577	01/25/2024	2023 Boat Trip 14 Exceedances
Emissions	13605	03/29/2024	Exceeding the daily limitation for emissions from solvent use per Table 1 of Reeval 13711-R2 in January, March, April and May 2023.
Permit	13606	04/03/2024	2023 Boat Trip 15 Exceedances
Permit	13607	04/03/2024	2023 Boat Trip 16 Exceedances
Permit	13608	04/03/2024	2023 Boat Trip 17 Exceedances
Permit	13609	04/03/2024	2023 Boat Trip 18 Exceedances
Permit	13610	04/03/2024	2023 Boat Trip 19 Exceedances
Permit	13611	04/03/2024	2023 Boat Trip 20 Exceedances
Permit	13612	04/03/2024	2023 Boat Trip 21 Exceedances
Permit	13613	04/03/2024	2024 Boat Trip 1 Exceedances

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VIOLATION TYPE	NUMBER	ISSUE DATE	DESCRIPTION OF VIOLATION
Permit	13749	05/31/2024	2024 Boat Trip 2 Exceedances
Permit	13750	05/31/2024	2024 Boat Trip 3 Exceedances
Permit	13751	05/31/2024	2024 Boat Trip 4 Exceedances
Permit	13752	05/31/2024	2024 Boat Trip 5 Exceedances
Permit	13789	08/23/2024	Submitting information which was known by the applicant not to accurately reflect the nature, extent, quantity or degree of air contaminants which would be discharged by the source for which the permit was applied.
Permit	13793	08/23/2024	Failing to submit the boat trip report within 45 days of trip completion and to report fuel use data for auxiliary tugboat engines as required by Condition 5 of ATC 16000; and 2024 Boat Trip 6 Exceedances
Emissions	13794	08/23/2024	Failing to submit the boat trip report within 45 days of trip completion as required by Condition 5 of ATC 16000; and 2024 Boat Trip 7 Exceedances
Permit	13795	08/23/2024	2024 Boat Trip 8 Exceedances
Permit	13796	08/23/2024	Failing to submit the boat trip report within 45 days of trip completion as required by Condition 5 of ATC 16223; and 2024 Boat Trip 9 Exceedances
Permit	13797	08/23/2024	Failing to submit the boat trip report within 45 days of trip completion as required by Condition 5 of ATC 16223; and 2024 Boat Trip 10 Exceedances

2.0 ENGINEERING ANALYSIS

2.1 Equipment/Processes: The primary tugboat and barge rocket booster transport operation originate from the Port of Long Beach while the support tugboat operation originates from Port Hueneme. The primary tugboat and barge may travel through federal waters as well as California Coastal Waters adjacent to South Coast AQMD, Ventura County APCD, Santa Barbara County APCD on its way to VSFB harbor, depending on the route that is taken. The support tugboat travels through California Coastal Waters adjacent to Ventura County APCD and Santa Barbara County APCD on its way to VSFB harbor. When the primary tugboat and barge arrive at VSFB harbor, the rocket booster is offloaded with the assistance of the support tugboat and transported to SLC-4.

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Following offloading operations, the tugboats and barge return to their ports of origin. Each boat trip occurs over roughly 3 to 8 calendar days, depending on the routes taken and number of days it takes to offload the rocket booster. Up to 36 round trips are permitted per year.

The definition of California Coastal Waters can be found in District Rule 102. District Waters are defined as the area created by extending one line directly west from the San Luis Obispo - Santa Barbara County border to its intersection with the California Coastal Waters boundary and another line directly south from the Ventura - Santa Barbara County border to its intersection with the California Coastal Waters boundary as shown in Attachment E of this permit.

- 2.2 Emission Controls: The Elizabeth C primary tugboat's two propulsion engines meet EPA Tier 4 certified standards and two auxiliary engines meet EPA Tier 3 certified standards for marine diesel Category 1 vessels.

The Kelly C primary tugboat's two propulsion engines and two auxiliary engines meet EPA Tier 3 certified standards for marine diesel Category 1 vessels.

The support tugboat's two propulsion engines and one auxiliary engine also meet EPA Tier 3 certified standards for marine diesel Category 1 vessels. Additionally, each tugboat's propulsion and auxiliary engines are turbocharged and aftercooled.

- 2.3 Emission Factors: The emission factors for the propulsion and auxiliary engines are documented in Attachment A. The engines' NO_x, ROC, CO, PM, PM₁₀ and PM_{2.5} emission factors are based on the exhaust emission standards for Category 1 marine diesel engines as stipulated under 40 CFR Part 1042.101.

Note that the District assumes that for Tier 3 engines, NO_x accounts for 93% of the combined NO_x and ROC emission factor found in the regulation while ROC accounts for the remaining 7%. Mass balance based on renewable diesel fuel properties was used to determine the SO_x emission factor for all engine tiers.

Not-to-Exceed (NTE) emission factors were not applied to the M/V Elizabeth C emission factors as compliance with the emissions limits will be confirmed via annual source testing.

- 2.4 Reasonable Worst Case Emission Scenario: The worst-case emissions scenario is summarized as follows:

- Primary Tug Boats:
 - The primary tugboat is equipped with two propulsion engines and two auxiliary engines.

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- Operational Scenario 1: M/V Elizabeth C
 - The primary tugboat's propulsion engines are EPA Tier 4 certified for marine diesel Category 1 vessels.
 - The primary tugboat propulsion engines each have a horsepower rating of no greater than 1,300 bhp.
 - The primary tugboat propulsion engines each operate with a maximum load factor rating of 1.00.
- Operational Scenario 2: M/V Kelly C
 - The primary tugboat's propulsion engines are EPA Tier 3 certified for marine diesel Category 1 vessels.
 - The primary tugboat propulsion engines each have a horsepower rating of no greater than 1,000 bhp.
 - The primary tugboat propulsion engines each operate with a maximum load factor rating of 0.66.
- The primary tugboats' auxiliary engines are EPA Tier 3 certified for marine diesel Category 1 vessels for all operating scenarios.
- The primary tugboat auxiliary engines each have a horsepower rating of no greater than 99 bhp.
- The primary tugboat fuel use limits are based off the operation of one auxiliary engine operating with a maximum load factor rating of 0.31.
- Support Tug Boats:
 - The support tugboat is equipped with two propulsion engines and one auxiliary engine.
 - The support tugboat propulsion engines each have a horsepower rating of no greater than 500 bhp.
 - The support tugboat auxiliary engine has a horsepower rating of no greater than 99 bhp.

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- The support tugboat's propulsion and auxiliary engines are EPA Tier 3 certified for marine diesel Category 1 vessels.
- Operations:
 - Primary Tugboat Operational Scenario 1: M/V Elizabeth C
 - Propulsion Engines (each): 24 hours/day, 1689.81 gallons/day
2568 hours/year, 180,809.69 gallons/year
 - Auxiliary Engines (combined): 24 hours/day, 39.99 gallons/day
2568 hours/year, 4278.59 gallons/year
 - Primary Tugboat Operational Scenario 2: M/V Kelly C
 - Propulsion Engines (each): 24 hours/day, 1299.85 gallons/day
642 hours/year, 34771.09 gallons/year
 - Auxiliary Engines (combined): 24 hours/day, 39.99 gallons/day
642 hours/year, 1069.65 gallons/year
 - Support Tugboat:
 - Propulsion Engines: 24.00 hours/day, 649.93 gallons/day
2568 hours/year, 69542.19 gallons/year
 - Auxiliary Engine: 24.00 hours/day, 39.99 gallons/day
2568 hours/year, 4278.59 gallons/year
- Primary Tugboat Operational Scenario 1 hours are inclusive of Primary Tugboat Operational Scenario 2 hours.
- When operating under Operational Scenario 2 in designated low-load areas, the primary and support tugboat engines' loads shall comply with the operational restrictions outlined in the updated *Marine Vessel Monitoring and Reporting Plan* as required by Condition 11.
- Project daily worst-case potential to emissions occur using the M/V Elizabeth C (Operational Scenario 1) for CO and SO_x and using the M/V Kelly C (Operational Scenario 2) for all other pollutants.
- No more than 36 trips will occur per year.

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- No more than 9 trips per year using primary tugboat Operational Scenario 2 will occur.
- Engines are fired on R100 fuel or R99 fuel blend.
- The barge is only equipped with permit exempt equipment.

2.5 Emission Calculations: Detailed emission calculation spreadsheets may be found in Attachment A. These emissions define the Potential to Emit for the permitted equipment.

2.6 Special Calculations: The following equation was used to calculate the engine fuel use limits:

$$\frac{\text{gal}}{\text{day}} = \text{Engine Horsepower (bhp)} * \text{Brake Specific Fuel Consumption (BSFC)} \left[\frac{\text{Btu}}{\text{bhp-hr}} \right] * \text{Daily Hours of Operation} \left(\frac{\text{hr}}{\text{day}} \right) \div \text{Diesel HHV} \left(\frac{\text{Btu}}{\text{gal}} \right) * \text{Load Factor}$$

Where:

- Brake Horsepower = 1,300 or 1,000 bhp for primary tugboat propulsion engines, 99 bhp for primary tugboat auxiliary engines, 500 bhp for support tugboat propulsion engines and 99 bhp for support tugboat auxiliary engines
- BSFC = 7,420 Btu/bhp-hr (as default)
- Daily Hours of Operation = See Table 3 for values
- Diesel HHV = 137,000 Btu/gal (as default)
- Load Factor = 1.00 for Tier 3 1,000 bhp primary tug propulsion engines, 1.00 for Tier 4 1,300 bhp primary tug propulsion engines, 1.00 for Tier 3 500 bhp support tug propulsion engines, and 0.31 for all auxiliary engines (except when operating in the designated low-load areas – see the updated *Marine Vessel Monitoring and Reporting Plan* for details)

2.7 BACT Analyses: Best Available Control Technology requirements were triggered for NOx for this project. The project, as defined in Rule 801, includes the tug boat/barge operations under this permit and previously permitted under ATC 16223, ATC 16000, increased launch cadence and solvent usage under ATC 15999 and installation of replacement fuel and oxidizer scrubbers under ATC 15756. Section §209(e)(2) of the Clean Air Act (as amended in 1990 under Title II §222) says that States and Districts are prohibited from adopting or enforcing any standard or requirement relating to the control of non-road engines. However, States were allowed to request a waiver from this Clean Air Act section to apply its own emission standards. The State of California was granted a waiver and adopted Title 17 CCR §93118.5 in November 2007. The engines subject to this permit meet the requirements of Title 17 CCR §93118.5 and are not subject to further emission requirements as part of triggering BACT.

2.8 Enforceable Operational Limits: The permit has enforceable operating conditions that ensure the equipment is operated properly.

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- 2.9 **Monitoring Requirements:** Monitoring of the equipment’s operational limits are required to ensure that these are enforceable. This permit requires monitoring the volume of fuel combusted in the engines, engine hours of operation, GPS location data for each trip and fuel properties via billing vouchers.
- 2.10 **Recordkeeping and Reporting Requirements:** The permit requires that the data which is monitored be recorded and reported to the District. Trip reports are required to be submitted within 45 days of the completion of each boat trip. Trip reports require annual fuel usage and hours of operation data to be submitted for both the primary tugboats (reported for each operational scenario and totalized) and the support tugboat operations. The trip reports require GPS data from the trip to be submitted, however it is not required to be submitted with the annual reports unless requested by the District.

3.0 REEVALUATION REVIEW (not applicable)

4.0 REGULATORY REVIEW

4.1 **Partial List of Applicable Rules:**

- Rule 201. Permits Required
- Rule 202. Exemptions to Rule 201
- Rule 205. Standards for Granting Permits
- Rule 301. Circumvention
- Rule 302. Visible Emissions
- Rule 303. Nuisance
- Rule 311. Sulfur Content of Fuels
- Rule 801. New Source Review- Definitions and General Requirements
- Rule 802. New Source Review
- Rule 809. Federal Minor Source New Source Review
- Rule 810. Federal Prevention of Significant Deterioration
- Clean Air Act §209(e). Nonroad Engines
- Title 17 CCR §93118.5. ATCM for Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline

4.2 **Rules Requiring Review:**

- 4.2.1 *Rule 802 - New Source Review:* This rule applies to any applicant for a new or modified stationary source which emits or may emit any affected pollutant. The purpose of this rule is to provide for the review of new and modified stationary sources of air pollution and provide mechanisms by which Authorities to Construct for such sources may be granted without interfering with the attainment or maintenance of any ambient air quality standard, preventing reasonable further progress towards the attainment or maintenance of any ambient air quality standard and without interfering with the protection of areas designated attainment or unclassifiable.

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BACT – The BACT thresholds are exceeded for NO_x. See Section 2.7 for a discussion of the BACT requirements.

Air Quality Impact Analysis – The Air Quality Impact Analysis (AQIA) thresholds are exceeded for NO_x and CO. See Section 5.0 for a discussion of the AQIA modeling.

Offsets – The offset thresholds are exceeded for NO_x. See Section 6.0 for a discussion of the offset requirements.

Pre and Post-Construction Monitoring – The Space Exploration Technologies (SpaceX) stationary source potential-to-emit exceeds the thresholds in Table 5 of District Rule 802.G. The potential to-emit from the project exceeds the NO_x and CO threshold of 240 lb/day. Rule 802.G.1 allows an exemption for non-major stationary sources if there is sufficient data to determine the effects that the emissions from the stationary source modification may have on air quality. The District has determined that this project is exempt from pre-construction monitoring because data from the District’s nearby Lompoc monitoring station is sufficient to determine the effects of the emissions from SpaceX’s operations. Furthermore, data from the Lompoc monitoring station can be used to satisfy the post-construction monitoring requirements of Rule 802.G. For these reasons, SpaceX is not required to install ambient air monitoring equipment for pre or post-construction monitoring under ATC 16293.

- 4.2.2 *Rule 202 - Exemptions to Rule 201:* Rule 202.F.1.b exempts engines used to propel marine vessels. However, marine vessels associated with a stationary source are not exempt and, therefore, are subject to the provisions of Regulation VIII (New Source Review). The tugboat engines subject to this permit are being used to conduct transport operations as part of SpaceX’s launch operations at VAFB. As such, the tugboat engines are considered part of SpaceX’s stationary source and the Rule 202.F.1.b exemption does not apply.
- 4.2.3 *Rule 311 - Sulfur Content of Fuels:* Section B and Section C of this rule limit the sulfur content of liquid fuels (e.g., diesel) to no more than 0.5 percent by weight. However, the tugboat engines subject to this permit must comply with California’s ATCM for Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline (CCR Title 17, Chapter 1, Subchapter 7.5, §93118.5). The 2022 Amendments to the Commercial Harbor Craft (CHC) Regulation require the use of at least 99 percent Renewable Diesel (“R100” or “R99”) as defined in subsection 93118.5 (d). On January 1, 2023, the harbor craft became subject to those amendments. Therefore, the tugboat engines must be fired on R99 fuel blend or R100 with a sulfur content of no more than 0.0015% by weight which meets the federal registration requirements for fuels and fuel additives and the American Society for Testing Materials (ASTM) D975.

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- 4.2.4 *Title 17 CCR §93118.5 - ATCM for Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline:* This regulation defines harbor craft as, "...any private, commercial, government, or military marine vessel including, but not limited to, passenger ferries, excursion vessels, tugboats, ocean-going tugboats, towboats, push-boats, crew and supply vessels, work boats, pilot vessels, supply boats, fishing vessels, research vessels, U.S. Coast Guard vessels, hovercraft, emergency response harbor craft, and barge vessels that do not otherwise meet the definition of ocean-going vessels or recreational vessels".

Tugboats are specifically defined in the regulation as a harbor craft. Additionally, the tugboats and barge do not meet the definition of recreational vessel since they are not being operated "...primarily for pleasure or leased, rented, or chartered to another for the latter's pleasure". See below for a discussion regarding why the barge does not meet the CARB definition of an "ocean-going vessel" and, therefore, is defined as a harbor craft.

The tugboat engines comply with the fuel requirements of this regulation by using R100 fuel or R99 fuel blend, except to demonstrate compliance with engine and fuel standards as specified in subsection (q) of the ATCM. The tugboat engines are equipped with built-in hour meters and comply with the ATCM's hour meter installation requirement. The propulsion engines are either EPA Commercial Marine Tier 3 or 4 certified and auxiliary engines are EPA Commercial Marine Tier 3 certified and comply with the emission limit requirements of this regulation. The barge is not equipped with any engines subject to this regulation.

- 4.2.5 *Title 17 CCR §93118.5 - ATCM for Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-Going Vessels Within California Waters and 24 Nautical Miles of the California Baseline:* This regulation defines an ocean-going vessel as "...a commercial, government, or military vessel that meets any one of the following criteria: (A) a vessel with a "registry" (foreign trade) endorsement on its United States Coast Guard certificate of documentation, or a vessel that is registered under the flag of a country other than the United States, (B) a vessel greater than or equal to 400 feet in length overall (LOA) as defined in 50 CFR § 679.2, as adopted June 19, 1996, (C) a vessel greater than or equal to 10,000 gross tons (GT ITC) pursuant to the convention measurement (international system) as defined in 46 CFR 69.51-.61, as adopted September 12, 1989, or D) a vessel propelled by a marine compression ignition engine with a per cylinder displacement of greater than or equal to 30 liters".

The permitted barge is not registered under a non-United States flag, is less than 400 feet in length (actual length is 210 feet), weighs less than 10,000 gross tons (actual weight is 3,025 gross tons) and is not equipped with any propulsion engines. Therefore, the barge is not subject to this regulation. As discussed above, the tugboat is also not subject to this ATCM.

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5.0 AQIA

An Air Quality Impact Analysis (AQIA) was required because the potential-to-emit from the project exceeds the thresholds for NO_x and CO in Table 4 of District Rule 802. The AQIA results are summarized below. All pollutant concentrations are below the National AAQS for each averaging period. All pollutant concentrations are below the California AAQS for each averaging period except for 24-hour PM₁₀ and the annual PM₁₀. Santa Barbara County is currently in nonattainment status for PM₁₀, and the background concentration alone exceeds the California AAQS for the annual and 24-hour averaging periods. The District has determined that projects will not contribute significantly to an exceedance of an AAQS if the project’s contribution is less than ten percent of the AAQS. Therefore, the District typically approves projects with annual and 24-hour PM₁₀ impacts less than ten percent of the AAQS. As the 24-hour PM₁₀ California AAQS is 50 µg/m³, ten percent of this standard is 5.0 µg/m³. The modeled 24-hour PM₁₀ concentration for the SpaceX stationary source is 2.5 µg/m³, less than ten percent of the California AAQS. As the annual PM₁₀ California AAQS is 20 µg/m³, ten percent of this standard is 2.0 µg/m³. The modeled annual PM₁₀ concentration for the SpaceX stationary source is 0.3 µg/m³, less than ten percent of the California AAQS. The results of the increment analysis are presented in Table 3. The modeled concentration of all pollutants is below the maximum increment thresholds.

Table 1. National Ambient Air Quality Standard Analysis Results

Pollutant	Averaging ^{1,2} Period	Modeled Conc. (µg/m ³)	Ambient Background Conc. (µg/m ³)	Total Conc. (µg/m ³)	National AAQS (µg/m ³)	Percent of NAAQS
SO ₂	1-hour ³	6.3	7.0	13.3	196	6.8
	3-hour ⁴	5.1	2.6	7.7	1,300	0.6
	24-hour	1.8	2.6	4.4	365	1.2
	Annual	0.2	0.8	1.0	80	1.3
CO	1-hour	805.1	1264.0	2069.1	40,000	5.2
	8-hour	291.5	1149.0	1440.5	10,000	14.4
NO ₂	1-hour	139.6	8.8	148.4	188	79.0
	Annual	15.9	0.6	16.5	100	16.5
PM ₁₀	24-hour	2.5	143.0	145.5	150	97.0
PM _{2.5}	24-hour ⁵	1.1	23.3	24.4	35	69.7
	Annual	0.3	6.6	6.9	9	76.6

Notes:

1. All short-term results are the highest modeled value (1st Highest High) except where noted.
2. Annual results are the highest annual average.
3. This 1-hour SO₂ concentration is reported as the 4th Highest High (i.e., the 99th percentile, five-year average) for the NAAQS analysis.

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4. This 3-hour SO₂ concentration is reported as the 2nd Highest High (i.e., standard shall not be exceeded more than once per year) for the NAAQS analysis.
5. The 24-hour PM_{2.5} concentration is reported as the 8th Highest High (i.e., the 98th percentile, five-year average) for the NAAQS analysis.

Table 2. California Ambient Air Quality Standard Analysis Results

Pollutant	Averaging Period ^{1,2}	Modeled Conc. (µg/m ³)	Ambient Background Conc. (µg/m ³)	Total Conc. (µg/m ³)	California AAQS (µg/m ³)	Percent of CAAQS
SO ₂	1-hour ³	10.7	10.5	21.2	655	3.2
	24-hour	1.8	2.6	4.4	105	4.2
CO	1-hour	805.1	1264.0	2069.1	23,000	9.0
	8-hour	291.5	1149.0	1440.5	10,000	14.4
NO ₂	1-hour	141.2	22.6	163.8	339	48.3
	Annual	15.9	0.6	16.5	57	28.9
PM ₁₀	24-hour	2.5	143.0 ³	145.5	50	290.9
	Annual	0.3	27.6 ³	27.9	20	139.5
PM _{2.5}	Annual	0.3	6.6	6.9	12	57.4

Notes:

1. All short-term results are the highest modeled value (1st Highest High).
2. Annual results are the highest annual average.
3. Ambient background is greater than the CAAQS. Because the project contribution will not exceed 10% of the CAAQS, the contribution is considered less than significant.

Table 3. Increment Analysis Results

Pollutant	Averaging Period ^{1,2}	Modeled Conc. (µg/m ³)	Increment (µg/m ³)	Percent of Increment
SO ₂	3-hour ³	5.1	512	1.0
	24-hour	1.8	91	2.0
	Annual	0.2	20	1.1
CO	1-hour	805.1	10,000	8.1
	8-hour	291.5	2,500	11.7
NO ₂	1-hour	141.2	100 – 188	75.1
	Annual	15.9	25	63.4
PM ₁₀	24-hour	2.5	12 – 30	11.7
	Annual	0.3	17	1.7
PM _{2.5}	24-hour	1.9	9	20.7
	Annual	0.3	4	7.3

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Notes:

1. All short-term results are the highest modeled value (1st Highest High) except where noted.
2. Annual results are the highest annual average.
3. The result for the 3-hour averaging period for SO₂ is based on the 2nd Highest High.

Based on these results, the operations at Space Exploration Technologies’ operations will not contribute to an exceedance of any ambient air quality standard. More details may be found in Attachment G.

6.0 OFFSETS/ERCs

6.1 Offsets: The emission offset thresholds of Regulation VIII are exceeded for NO_x.

6.2 ERCs: SpaceX provided emission credits to offset the emissions associated with this permit. SpaceX authorizes the use of 0.031 TPY of NO_x from ERC Certificate 665 to offset the emissions associated with this permit. These ERCs offset the project’s NO_x PTE of 0.023 TPY at a 1.3 offset ratio. ERC Certificates 665 is only partially used to offset this project. See Tables 5(a) and 5(b) for details.

7.0 AIR TOXICS

Cancer risk and chronic and acute non-cancer Hazard Index (HI) risk values were calculated and compared to the significance thresholds adopted by the District’s Board of Directors. The calculated risk values and applicable thresholds are as follows:

	<u>SpaceX Max Risks</u>	<u>Significance Threshold</u>
Cancer risk:	0.7/million	≥10/million
Chronic non-cancer risk:	<0.1	>1
8-hour non-cancer risk:	<0.1	>1
Acute non-cancer risk:	0.7	>1

Based on these results, SpaceX’s proposed project under ATC No. 16293 does not present a significant risk to the surrounding community.

8.0 CEQA / LEAD AGENCY

The District has determined that the project is not subject to the California Environmental Quality Act (CEQA). Due to Vanderberg Space Force Base’s special status as a federal enclave, the District is preempted from applying CEQA. No further action is required.

9.0 SCHOOL NOTIFICATION

A school notice pursuant to the requirements of Health and Safety Code Section 42301.6 was not required.

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10.0 PUBLIC and AGENCY NOTIFICATION PROCESS/COMMENTS ON DRAFT PERMIT

10.1 This project is subject to a 30-day public notice per District Rule 802.I. The District has published a notice in the Lompoc Record, and notified the applicant, California Air Resources Board, Ventura County Air Pollution Control District, San Luis Obispo County Air Pollution Control District, and San Joaquin Valley Air Pollution Control District of the preliminary decision to grant this Authority to Construct. In accordance with District Rule 802.I, a public hearing may be called if any aggrieved party so requests in writing within the 30-day comment period. The public notice period begins on September 25, 2024 and ends on October 25, 2024.

10.2 Permittee draft comments, if any are received, will appear in the final permit.

11.0 FEE DETERMINATION

Fees for this permit are assessed under the cost reimbursement provisions of Rule 210. The Project Code is *205516 (Space Exploration Technologies)*.

12.0 RECOMMENDATION

It is recommended that this permit be granted with the conditions as specified in the permit.

<u>Agnieszka Letts</u>	<u>9/16/2024</u>	_____	_____
AQ Engineer/Technician	Date	Supervisor	Date

13.0 ATTACHMENT(S)

- A. Emission Calculations
- B. IDS Tables
- C. Route Map
- D. Transit Breakdown
- E. Santa Barbara County APCD Coastal Waters
- F. Stationary Source Potential to Emit
- G. AQIA and HRA Documentation

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ATTACHMENT A
Emission Calculations

OPERATIONAL SCENARIO 1					
M/V ELIZABETH C - PRIMARY TUG PROPULSION ENGINES EMISSION CALCULATIONS					
Attachment:	A-1				
Permit Number:	ATC 16293				
Facility:	Space Exploration Technologies				
Engine Information					
<u>Data</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>	<u>Each Engine Fuel Use Limits</u>	
Engine Rating.....	1300	bhp	Permit Application	--	
Maximum Daily Hours.....	24.00	hours	Permit Application	1689.81	(gals/day)
Maximum Annual Hours.....	2568	hours	Permit Application	180809.69	(gals/year)
EPA Tier.....	4	N/A	Permit Application	--	
Engine Load Factor.....	100	%	Permit Application	--	
Number of Engines.....	2	N/A	Permit Application	--	
Emission Factors					
<u>Pollutant</u>	<u>g/kW-hr</u>	<u>Reference</u>			
NO _x	1.8000	EPA Tier 4 Standards for Marine Diesel Category 1 ^a			
ROC	0.1900	EPA Tier 4 Standards for Marine Diesel Category 1 ^a			
CO	5.0000	EPA Tier 4 Standards for Marine Diesel Category 1 ^b			
SO _x	0.0680	Mass Balance based on R99 or R100 renewable Diesel ^c			
PM	0.0400	EPA Tier 4 Standards for Marine Diesel Category 1 ^a			
PM ₁₀	0.0400	EPA Tier 4 Standards for Marine Diesel Category 1 ^a			
PM _{2.5}	0.0400	EPA Tier 4 Standards for Marine Diesel Category 1 ^a			
Primary Tugboat Propulsion Engines Potential to Emit					
SBCAPCD Potential to Emit					
Pollutant	lb/day	TPY			
NO _x	184.65	9.88			
ROC	19.49	1.04			
CO	512.93	27.44			
SO _x	6.98	0.37			
PM	4.10	0.22			
PM ₁₀	4.10	0.22			
PM _{2.5}	4.10	0.22			
Processed By:	AXL	Date:	6/12/2024		

Notes:

- a. Emission factors based on power density of $\leq 35 \text{ kW/dm}^3$, $75 \text{ kW} \leq \text{Power (kW)} < 3,700 \text{ kW}$, and $2.5 \text{ dm}^3 \leq \text{Displacement Per Cylinder (dm}^3) < 7 \text{ dm}^3$
- b. CO emission factor based on engine rating $\geq 37 \text{ kW}$.
- c. Based on R99 or R100 Diesel properties of 0.0015% sulfur by weight, higher heating value of 137,000 Btu/gal, and assumed BSFC of 7,420 Btu/bhp-hr.

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ATTACHMENT A
Emission Calculations

OPERATIONAL SCENARIO 1				
M/V ELIZABETH C - PRIMARY TUG AUXILIARY ENGINE EMISSION CALCULATIONS				
Attachment:	A-2			
Permit Number:	ATC 16293			
Facility:	Space Exploration Technologies			
Engine Information				
<u>Data</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>	<u>Each Engine Fuel Use Limits</u>
Engine Rating.....	99	bhp	Permit Application	--
Maximum Daily Hours.....	24.00	hours	Permit Application	39.99 (gals/day)
Maximum Annual Hours.....	2568	hours	Permit Application	4278.59 (gals/year)
EPA Tier.....	3	N/A	Permit Application	--
Engine Load Factor.....	31	%	Permit Application	--
Number of Engines.....	1	N/A	Permit Application	--
Emission Factors				
<u>Pollutant</u>	<u>g/kW-hr</u>	<u>Reference</u>		
NO _x	5.0220	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,b}		
ROC	0.3780	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,c}		
CO	5.0000	EPA Tier 3 Standards for Marine Diesel Category 1 ^d		
SO _x	0.0680	Mass Balance based on CARB Diesel ^e		
PM	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
PM ₁₀	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
PM _{2.5}	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
Primary Tugboat Auxiliary Engines Potential to Emit				
SBCAPCD Potential to Emit				
Pollutant	lb/day	TPY		
NO _x	6.10	0.33		
ROC	0.46	0.02		
CO	6.07	0.32		
SO _x	0.08	0.00		
PM	0.15	0.01		
PM ₁₀	0.15	0.01		
PM _{2.5}	0.15	0.01		
Processed By:	AXL	Date:	6/12/2024	

Notes:

- a. Emission factors based on power density of $\leq 35 \text{ kW/dm}^3$, $75 \text{ kW} \leq \text{Power (kW)} < 3,700 \text{ kW}$, and $2.5 \text{ dm}^3 \leq \text{Displacement Per Cylinder (dm}^3) < 7 \text{ dm}^3$
- b. NO_x emission factor based on 93% of the 5.6 g/kW-hr NO_x + ROC emission factor
- c. ROC emission factor based on 7% of the 5.6 g/kW-hr NO_x + ROC emission factor
- d. CO emission factor based on engine rating $\geq 37 \text{ kW}$.
- e. Based on R99 or R100 Diesel properties of 0.0015% sulfur by weight, higher heating value of 137,000 Btu/gal, and assumed BSFC of 7,420 Btu/bhp-hr.

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ATTACHMENT A
Emission Calculations

OPERATIONAL SCENARIO 2				
M/V KELLY C - PRIMARY TUG PROPULSION ENGINES EMISSION CALCULATIONS				
Attachment:	A-3			
Permit Number:	ATC 16293			
Facility:	Space Exploration Technologies			
Engine Information				
<u>Data</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>	<u>Each Engine Fuel Use Limits</u>
Engine Rating.....	1000	bhp	Permit Application	--
Maximum Daily Hours.....	24.00	hours	Permit Application	1299.85 (gals/day)
Maximum Annual Hours.....	642	hours	Permit Application	34771.09 (gals/year)
EPA Tier.....	4	N/A	Permit Application	--
Engine Load Factor.....	100	%	Permit Application	--
Number of Engines.....	2	N/A	Permit Application	--
Emission Factors				
<u>Pollutant</u>	<u>g/kW-hr</u>	<u>Reference</u>		
NO _x	5.2080	EPA Tier 4 Standards for Marine Diesel Category 1 ^a		
ROC	0.3920	EPA Tier 4 Standards for Marine Diesel Category 1 ^a		
CO	5.0000	EPA Tier 4 Standards for Marine Diesel Category 1 ^b		
SO _x	0.0680	Mass Balance based on R99 or R100 renewable Diesel ^c		
PM	0.1100	EPA Tier 4 Standards for Marine Diesel Category 1 ^a		
PM ₁₀	0.1100	EPA Tier 4 Standards for Marine Diesel Category 1 ^a		
PM _{2.5}	0.1100	EPA Tier 4 Standards for Marine Diesel Category 1 ^a		
Primary Tugboat Propulsion Engines Potential to Emit				
SBCAPCD Potential to Emit				
Pollutant	lb/day	TPY		
NO _x	410.97	5.50		
ROC	30.93	0.41		
CO	394.56	5.28		
SO _x	5.37	0.07		
PM	8.68	0.12		
PM ₁₀	8.68	0.12		
PM _{2.5}	8.68	0.12		
Processed By:	AXL	Date:	6/12/2024	

Notes:

- a. Emission factors based on power density of $\leq 35 \text{ kW/dm}^3$, $75 \text{ kW} \leq \text{Power (kW)} < 3,700 \text{ kW}$, and $2.5 \text{ dm}^3 \leq \text{Displacement Per Cylinder (dm}^3) < 7 \text{ dm}^3$
- b. CO emission factor based on engine rating $\geq 37 \text{ kW}$.
- c. Based on R99 or R100 Diesel properties of 0.0015% sulfur by weight, higher heating value of 137,000 Btu/gal, and assumed BSFC of 7,420 Btu/bhp-hr.

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ATTACHMENT A
Emission Calculations

OPERATIONAL SCENARIO 2					
M/V KELLY C - PRIMARY TUG AUXILIARY ENGINE EMISSION CALCULATIONS					
<p>Attachment: A-4 Permit Number: ATC 16293 Facility: Space Exploration Technologies</p>					
Engine Information					
<u>Data</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>	<u>Each Engine Fuel Use Limits</u>	
Engine Rating.....	99	bhp	Permit Application	--	
Maximum Daily Hours.....	24.00	hours	Permit Application	39.99	(gals/day)
Maximum Annual Hours.....	642	hours	Permit Application	1069.65	(gals/year)
EPA Tier.....	3	N/A	Permit Application	--	
Engine Load Factor.....	31	%	Permit Application	--	
Number of Engines.....	1	N/A	Permit Application	--	
Emission Factors					
<u>Pollutant</u>	<u>g/kW-hr</u>	<u>Reference</u>			
NO _x	5.0220	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,b}			
ROC	0.3780	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,c}			
CO	5.0000	EPA Tier 3 Standards for Marine Diesel Category 1 ^d			
SO _x	0.0680	Mass Balance based on CARB Diesel ^e			
PM	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a			
PM ₁₀	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a			
PM _{2.5}	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a			
Primary Tugboat Auxiliary Engines Potential to Emit					
SBCAPCD Potential to Emit					
Pollutant	lb/day	TPY			
NO _x	6.10	0.08			
ROC	0.46	0.01			
CO	6.07	0.08			
SO _x	0.08	0.00			
PM	0.15	0.00			
PM ₁₀	0.15	0.00			
PM _{2.5}	0.15	0.00			
Processed By: AXL		Date:		6/12/2024	

Notes:

- a. Emission factors based on power density of $\leq 35 \text{ kW/dm}^3$, $75 \text{ kW} \leq \text{Power (kW)} < 3,700 \text{ kW}$, and $2.5 \text{ dm}^3 \leq \text{Displacement Per Cylinder (dm}^3) < 7 \text{ dm}^3$
- b. NO_x emission factor based on 93% of the 5.6 g/kW-hr NO_x + ROC emission factor
- c. ROC emission factor based on 7% of the 5.6 g/kW-hr NO_x + ROC emission factor
- d. CO emission factor based on engine rating $\geq 37 \text{ kW}$.
- e. Based on R99 or R100 Diesel properties of 0.0015% sulfur by weight, higher heating value of 137,000 Btu/gal, and assumed BSFC of 7,420 Btu/bhp-hr.

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ATTACHMENT A
Emission Calculations

SUPPORT TUG PROPULSION ENGINES EMISSION CALCULATIONS				
Attachment: A-5 Permit Number: ATC 16293 Facility: Space Exploration Technologies				
Engine Information				
<u>Data</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>	<u>Each Engine Fuel Use Limit (gals/day)</u>
Engine Rating.....	500	bhp	Permit Application	--
Maximum Daily Hours.....	24.00	hours	Permit Application	649.93 (gals/day)
Maximum Annual Hours.....	2568	hours	Permit Application	69542.19 (gals/year)
EPA Tier.....	3	N/A	Permit Application	--
Engine Load Factor.....	100	%	Permit Application	--
Number of Engines.....	2	N/A	Permit Application	--
Emission Factors				
<u>Pollutant</u>	<u>g/kW-hr</u>	<u>Reference</u>		
NO _x	5.2080	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,b}		
ROC	0.3920	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,c}		
CO	5.0000	EPA Tier 3 Standards for Marine Diesel Category 1 ^d		
SO _x	0.0680	Mass Balance based on CARB Diesel ^e		
PM	0.1100	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
PM ₁₀	0.1100	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
PM _{2.5}	0.1100	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
Support Tugboat Propulsion Engines Potential to Emit				
SBCAPCD Potential to Emit				
Pollutant	lb/day	TPY		
NO _x	205.49	10.99		
ROC	15.47	0.83		
CO	197.28	10.55		
SO _x	2.68	0.14		
PM	4.34	0.23		
PM ₁₀	4.34	0.23		
PM _{2.5}	4.34	0.23		
Processed By: AXL Date: 6/12/2024				

Notes:

- a. Emission factors based on power density of $\leq 35 \text{ kW/dm}^3$, $75 \text{ kW} \leq \text{Power (kW)} < 3,700 \text{ kW}$, and $2.5 \text{ dm}^3 \leq \text{Displacement Per Cylinder (dm}^3) < 7 \text{ dm}^3$
- b. NO_x emission factor based on 93% of the 5.6 g/kW-hr NO_x + ROC emission factor
- c. ROC emission factor based on 7% of the 5.6 g/kW-hr NO_x + ROC emission factor
- d. CO emission factor based on engine rating $\geq 37 \text{ kW}$.
- e. Based on R99 or R100 Diesel properties of 0.0015% sulfur by weight, higher heating value of 137,000 Btu/gal, and assumed BSFC of 7,420 Btu/bhp-hr.

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Authority to Construct 16293

ATTACHMENT A
Emission Calculations

SUPPORT TUG AUXILARY ENGINES EMISSION CALCULATIONS (Ver. 1.0)				
Attachment: A-6 Permit Number: ATC 16293 Facility: Space Exploration Technologies				
Engine Information				
<u>Data</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>	<u>Each Engine Fuel Use Limit (gals/day)</u>
Engine Rating.....	99	bhp	Permit Application	--
Maximum Daily Hours.....	24.00	hours	Permit Application	39.99 (gals/day)
Maximum Annual Hours.....	2568	hours	Permit Application	4278.59 (gals/year)
EPA Tier.....	3	N/A	Permit Application	--
Engine Load Factor.....	31	%	Permit Application	--
Number of Engines.....	1	N/A	Permit Application	--
Emission Factors				
<u>Pollutant</u>	<u>g/kW-hr</u>	<u>Reference</u>		
NO _x	5.0220	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,b}		
ROC	0.3780	EPA Tier 3 Standards for Marine Diesel Category 1 ^{a,c}		
CO	5.0000	EPA Tier 3 Standards for Marine Diesel Category 1 ^d		
SO _x	0.0680	Mass Balance based on CARB Diesel ^e		
PM	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
PM ₁₀	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
PM _{2.5}	0.1200	EPA Tier 3 Standards for Marine Diesel Category 1 ^a		
Support Tugboat Auxiliary Engines Potential to Emit				
SBCAPCD Potential to Emit				
Pollutant	lb/day	TPY		
NO _x	6.10	0.33		
ROC	0.46	0.02		
CO	6.07	0.32		
SO _x	0.08	0.00		
PM	0.15	0.01		
PM ₁₀	0.15	0.01		
PM _{2.5}	0.15	0.01		
Processed By: AXL		Date:		6/12/2024

Notes:

- a. Emission factors based on power density of $\leq 35 \text{ kW/dm}^3$, $75 \text{ kW} \leq \text{Power (kW)} < 3,700 \text{ kW}$, and $2.5 \text{ dm}^3 \leq \text{Displacement Per Cylinder (dm}^3) < 7 \text{ dm}^3$
- b. NO_x emission factor based on 93% of the 5.6 g/kW-hr NO_x + ROC emission factor
- c. ROC emission factor based on 7% of the 5.6 g/kW-hr NO_x + ROC emission factor
- d. CO emission factor based on engine rating $\geq 37 \text{ kW}$.
- e. Based on R99 or R100 Diesel properties of 0.0015% sulfur by weight, higher heating value of 137,000 Btu/gal, and assumed BSFC of 7,420 Btu/bhp-hr.

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ATTACHMENT B
IDS Tables

PERMIT POTENTIAL TO EMIT

	NO _x	ROC	CO	SO _x	PM	PM ₁₀	PM _{2.5}
lb/day	628.65	47.32	722.34	9.82	13.31	13.31	13.31
lb/hr							
TPQ							
TPY	24.55	2.07	38.65	0.53	0.53	0.53	0.53

FACILITY POTENTIAL TO EMIT

	NO _x	ROC	CO	SO _x	PM	PM ₁₀	PM _{2.5}
lb/day	684.99	106.43	811.00	9.99	14.76	14.76	14.76
lb/hr							
TPQ							
TPY	25.02	8.10	39.35	0.53	0.53	0.53	0.53

STATIONARY SOURCE POTENTIAL TO EMIT

	NO _x	ROC	CO	SO _x	PM	PM ₁₀	PM _{2.5}
lb/day	684.99	106.43	811.00	9.99	14.76	14.76	14.76
lb/hr							
TPQ							
TPY	25.02	8.10	39.35	0.53	0.53	0.53	0.53

Notes:

- (1) Emissions in these tables are from IDS.
- (2) Because of rounding, values in these tables shown as 0.00 are less than 0.005, but greater than zero.

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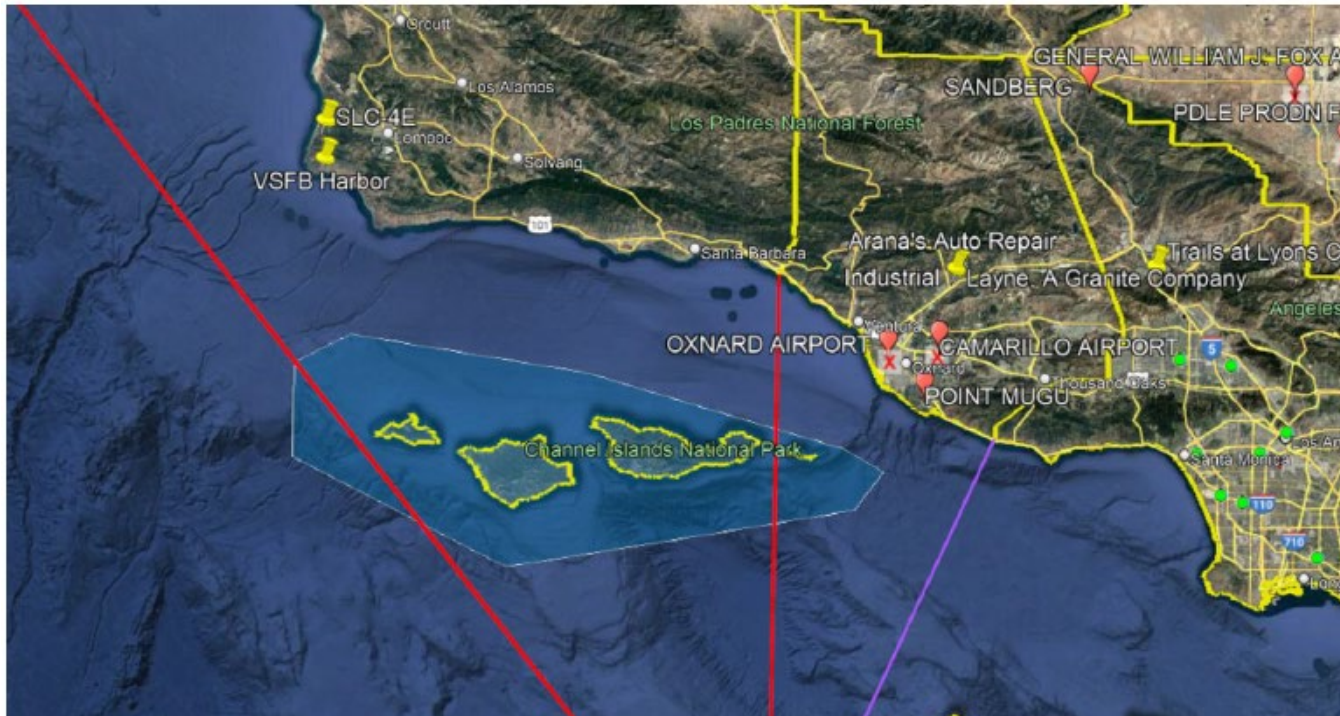
Authority to Construct 16293

ATTACHMENT C

Route Map

The proposed travel area for the primary and support tugboats and barge is shown in Figure 1 below. The primary and support tugboats and barge shall not travel through the Channel Islands National Marine Sanctuary as shown around the Channel Islands National Park. The red lines indicate the SBCAPCD jurisdictional waters and the purple line represents the Ventura County Air Pollution Control District (VCAPCD) outer boundary. Depending on environmental conditions, the primary and support tugboats and barge may travel up the Santa Barbara channel or around the Channel Islands National Park.

Figure 1 – Planned Route



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ATTACHMENT D
Transit Breakdown

Tugboat		Jurisdiction	Maximum Engine Hours of Operation (hours/engine)		Maximum Propulsion Engine Fuel Use (gals/engine)		Maximum Auxiliary Engine Fuel Use (combined gals/both engines)	
			hours/day	hours/year	gal/day	gal/year	gal/day	gal/year
Primary Tugboat	Operational Scenario 1: Elizabeth C	South Coast AQMD	10.70	770.4	753.37	54242.91	17.83	1283.58
		Ventura County APCD	24.00	1728	1689.81	121666.34	39.99	2879.05
		Santa Barbara APCD	24.00	2568	1689.81	180809.69	39.99	4278.59
		Federal	24.00	1728	1689.81	121666.34	39.99	2879.05
	Operational Scenario 2: Kelly C	South Coast AQMD	10.70	192.6	579.52	10431.33	17.83	320.89
		Ventura County APCD	24.00	432	1299.85	23397.37	39.99	719.76
		Santa Barbara APCD	24.00	642	1299.85	34771.09	39.99	1069.65
		Federal	24.00	432	1299.85	23397.37	39.99	719.76
Support Tugboat		South Coast AQMD	10.70	770.4	289.76	20862.66	17.83	1283.58
		Ventura County APCD	24.00	1728	649.93	46794.74	39.99	2879.05
		Santa Barbara APCD	24.00	2568	649.93	69542.19	39.99	4278.59

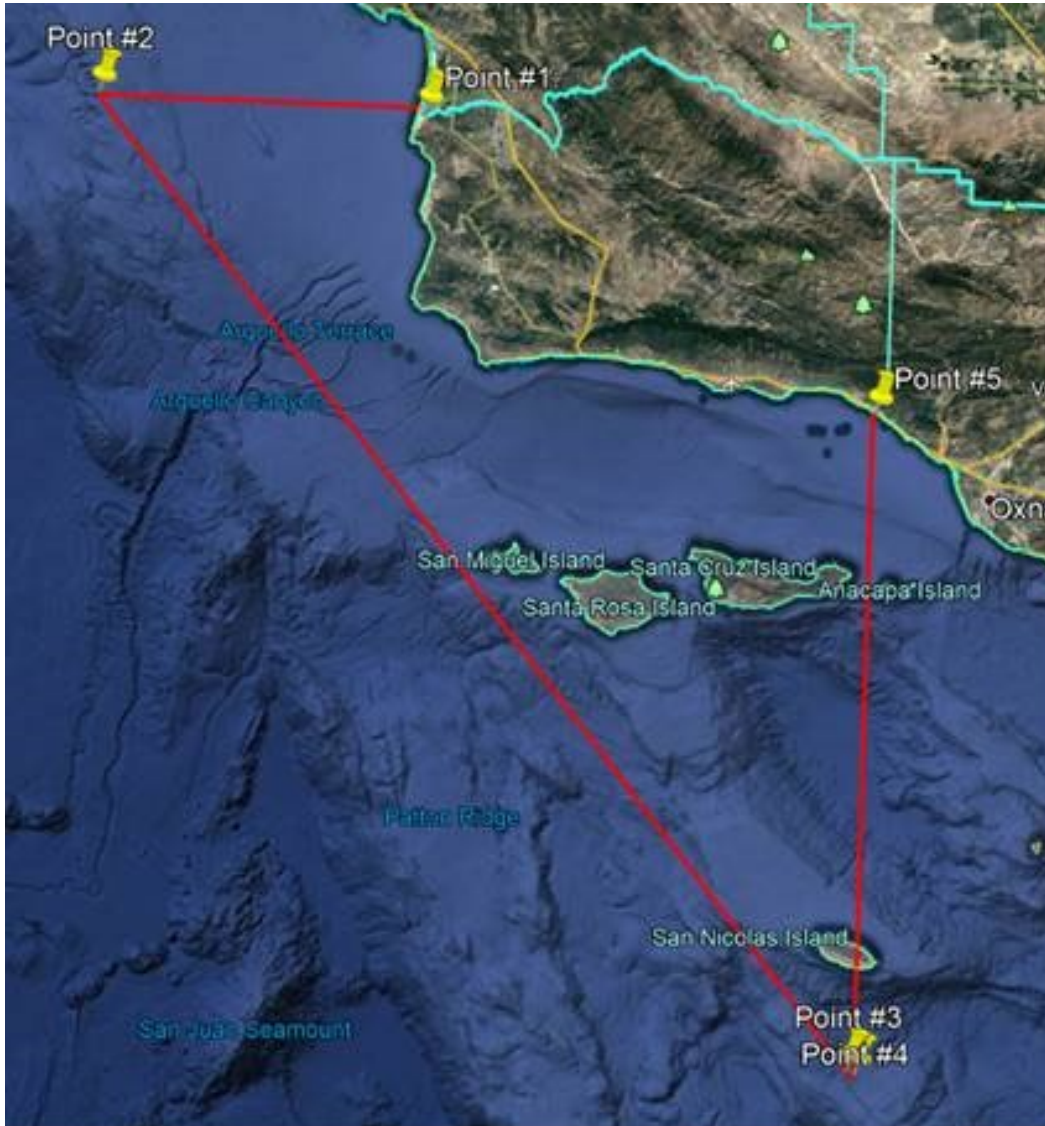
Note:

- Operational Scenario 1 total annual hours of operation are inclusive with Operational Scenario 2 hours of operation.
- Primary tugboat auxiliary engine fuel use is based on the operation of one auxiliary engine and is the combined limit for both engines.

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ATTACHMENT E
Santa Barbara County APCD Coastal Waters



Point	Degrees, Minutes, Seconds	Decimal Degrees
1	34° 58' 29" N, 120° 38' 53" W	34.974387°, -120.649032°
2	34° 58' 29" N, 121° 28' 25" W	34.974387°, -121.473656°
3	33° 00' 00" N, 119° 30' 00" W	33.0°, -119.5°
4	32° 59' 17" N, 119° 28' 33" W	32.988133°, -119.477981°
5	34° 22' 24" N, 119° 28' 33" W	34.372158°, -119.477981°

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ATTACHMENT F
Facility Permitted Emission Limits

Facility Permitted Emission Limits

Equipment	NO_x	ROC	CO	SO_x	PM	PM₁₀	PM_{2.5}
<i>Falcon 9 RP-1 (From ATC 15999)</i>							
lb/day		0.69					
TPY		0.01					
<i>RSV Loading (From ATC 15999)</i>							
lb/day		6.82					
TPY		0.03					
<i>Payload Fueling (From ATC 15756)</i>							
lb/day	14.84	0.15					
TPY	0.34	0.00					
<i>Emergency Standby Generator 1 (Device ID# 388333) (From ATC 15999)</i>							
lb/day	8.93	1.03	8.93	0.02	0.27	0.27	0.27
TPY	0.06	0.01	0.06	0.00	0.00	0.00	0.00
<i>Emergency Standby Generator 2 (Device ID# 388334) (From ATC 15999)</i>							
lb/day	8.93	1.03	8.93	0.02	0.27	0.27	0.27
TPY	0.06	0.01	0.06	0.00	0.00	0.00	0.00
<i>Emergency Standby Generator 3 (Device ID# 390260) (From ATC 15999)</i>							
lb/day	8.93	1.03	8.93	0.02	0.27	0.27	0.27
TPY	0.06	0.01	0.06	0.00	0.00	0.00	0.00
<i>Emergency Standby Generator 4 (Device ID# 114296) (From ATC 15999)</i>							
lb/day	4.53	0.32	4.21	0.01	0.24	0.24	0.24
TPY	0.03	0.00	0.03	0.00	0.00	0.00	0.00
<i>Emergency Standby Generator 5 (Device ID# 115149) (From ATC 15999)</i>							
lb/day	3.95	0.28	3.67	0.01	0.21	0.21	0.21
TPY	0.02	0.00	0.02	0.00	0.00	0.00	0.00
<i>Prime Engine (Device ID# 388332) (From ATC 15999)</i>							
lb/day	6.23	2.91	53.99	0.09	0.17	0.17	0.17
TPY	0.07	0.03	0.65	0.00	0.00	0.00	0.00
<i>Solvent Use (From ATC 15999)</i>							
lb/day		45.54					
TPY		5.93					
<i>Tug Boats Operations (From ATC 16293)</i>							
lb/day	628.65	47.32	722.34	9.82	13.31	13.31	13.31
TPY	24.55	2.07	38.65	0.53	0.53	0.53	0.53
Total Stationary Source Emissions							
lb/day	684.99	106.43	811.00	9.99	14.76	14.76	14.76
TPY	25.02	8.10	39.35	0.53	0.53	0.53	0.53

1. Rocket (Falcon 9) launches, static launches, and aborts shall not occur on the same day as RSV loading. Daily PTE reflects this worst case operational scenario.
2. E/S Engines 2 & 3 share a 25 hr M&T limit, annual PTE reflects the worst case operational scenario of only one engine operating the full 25 hours.
3. E/S Engines 4 & 5 share a 25 hr M&T limit, annual PTE reflects the worst case operational scenario of only E/S Engine 4 operating 25 hours per year.
4. Worst case daily emissions assume tug boat operations permitted under ATC 16293 occur on the same day as worst case daily operations under ATC 15999.

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Authority to Construct 16293

ATTACHMENT G
AQIA and HRA Documentation

MEMORANDUM

TO: Project File for SSID 11146 Space Exploration Technologies
FROM: Robin Cobbs and Charlotte Mountain
SUBJECT: HRA and AQIA Modeling for ATC No. 16293
DATE: September 19, 2024

Background

A health risk assessment (HRA) and an Air Quality Impact Analysis (AQIA) were submitted by Space Exploration Technologies (SpaceX) for primary and support tugboats, and associated equipment used to expand their launch capacity at Space Launch Complex 4 (SLC-4) at Vandenberg Space Force Base (VSFB) for the application of Authority to Construct (ATC) No. 16293. The memo summarizes the results of both the HRA and AQIA.

The first HRA submittal for this project was received by the District on May 8, 2024. The District provided comments on the May 2024 HRA on May 23, 2024. A revised HRA was submitted on June 24, 2024, and the District provided comments on the revised HRA on July 15, 2024. The most recent HRA was submitted on September 6, 2024.

The first AQIA submittal for this project was received by the District on June 16, 2024. The District provided comments on the June 2024 AQIA on August 20, 2024. The most recent AQIA was submitted on September 5, 2024.

Dudek, on behalf of SpaceX, submitted two memos dated September 5, 2024 regarding the *Air Quality Impact Assessment for the SpaceX Falcon Program Expansion* (AQIA Report) and the *Revised Refined Health Risk Assessment for the SpaceX Falcon Program Expansion* (HRA Report), as well as associated attachments, all located in the Attachments section of this memo. The AQIA Report, HRA Report, and attachments included detailed emission calculations, source parameters, receptor information, building information, selected modeling options, meteorological data, terrain data, modeling files and results.

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Authority to Construct 16293

ATTACHMENT G
AQIA and HRA Documentation

Health Risk Assessment Results

Cancer risk and chronic and acute non-cancer Hazard Index (HI) risk values were calculated and compared to the significance thresholds adopted by the District’s Board of Directors. The calculated risk values and applicable thresholds are as follows:

	<u>SpaceX Max Risks</u>	<u>Significance Threshold</u>
Cancer risk:	0.7/million	≥ 10 /million
Chronic non-cancer risk:	<0.1	>1
8-hour non-cancer risk:	<0.1	>1
Acute non-cancer risk:	0.7	>1

Based on these results, SpaceX’s proposed project under ATC No. 16293 does not present a significant risk to the surrounding community.

Health Risk Assessment Review

The District reviewed the HRA Report and attachments, and found that the HRA was conducted in accordance with [Form-15i](#) and the District’s prior comment letters on this HRA. The risk results in the *Health Risk Assessment Results* section above are consistent with the results presented in the HRA Report. The District noted the following minor errors in the submitted HRA Report and Modeling Protocol Tables:

- Tables 3, 4 and 5 of the HRA Report identify multiple endpoints for the chronic, 8-hour chronic and acute non-cancer risk results. Although these endpoints are all impacted, the maximum hazard indices (HIs) presented in the tables for each type of non-cancer risk correspond to the impact for the respiratory endpoint only.
- Table 3 of the HRA Report lists the chronic HI at the MEIR as 0.01. This result is actually <0.01.
- The *HARP 2 Options* table of the Modeling Protocol Tables indicates that the beef and dairy pathways were applied in the initial HRA. These pathways were not applied in the initial HRA, consistent with guidance in the District’s [Form-15i](#). The pathways were not applied in the final HRA, as there were no pastures within the initial cancer risk isopleth of 1 per million nor the chronic HI isopleth of 0.1, in accordance with [Form-15i](#).

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Authority to Construct 16293

ATTACHMENT G
AQIA and HRA Documentation

National Ambient Air Quality Standard Analysis Results

The results of the National Ambient Air Quality Standard (AAQS) analysis are presented in Table 1. All pollutant concentrations are below the National AAQS for each averaging period.

Table 1. National Ambient Air Quality Standard Analysis Results

Pollutant	Averaging ^{1,2} Period	Modeled Conc. ($\mu\text{g}/\text{m}^3$)	Ambient Background Conc. ($\mu\text{g}/\text{m}^3$)	Total Conc. ($\mu\text{g}/\text{m}^3$)	National AAQS ($\mu\text{g}/\text{m}^3$)	Percent of NAAQS
SO ₂	1-hour ³	6.3	7.0	13.3	196	6.8
	3-hour ⁴	5.1	2.6	7.7	1,300	0.6
	24-hour	1.8	2.6	4.4	365	1.2
	Annual	0.2	0.8	1.0	80	1.3
CO	1-hour	805.1	1264.0	2069.1	40,000	5.2
	8-hour	291.5	1149.0	1440.5	10,000	14.4
NO ₂	1-hour	139.6	8.8	148.4	188	79.0
	Annual	15.9	0.6	16.5	100	16.5
PM ₁₀	24-hour	2.5	143.0	145.5	150	97.0
PM _{2.5}	24-hour ⁵	1.1	23.3	24.4	35	69.7
	Annual	0.3	6.6	6.9	9	76.6

Notes:

1. All short-term results are the highest modeled value (1st Highest High) except where noted.
2. Annual results are the highest annual average.
3. This 1-hour SO₂ concentration is reported as the 4th Highest High (i.e., the 99th percentile, five-year average) for the NAAQS analysis.
4. This 3-hour SO₂ concentration is reported as the 2nd Highest High (i.e., standard shall not be exceeded more than once per year) for the NAAQS analysis.
5. The 24-hour PM_{2.5} concentration is reported as the 8th Highest High (i.e., the 98th percentile, five-year average) for the NAAQS analysis.

California Ambient Air Quality Standard Analysis Results

The results of the California AAQS analysis are presented in Table 2. All pollutant concentrations are below the California AAQS for each averaging period except for 24-hour PM₁₀ and the annual PM₁₀. Santa Barbara County is currently in nonattainment status for PM₁₀, and the background concentration alone exceeds the California AAQS for the annual and 24-hour averaging periods. The District has determined that projects will not contribute significantly to an exceedance of an AAQS if the project's contribution is less than ten percent of the AAQS. Therefore, the District typically approves projects with annual and 24-hour PM₁₀ impacts less than ten percent of the AAQS. As the 24-hour PM₁₀ California

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ATTACHMENT G
AQIA and HRA Documentation

AAQS is 50 $\mu\text{g}/\text{m}^3$, ten percent of this standard is 5.0 $\mu\text{g}/\text{m}^3$. The modeled 24-hour PM_{10} concentration for the SpaceX stationary source is 2.5 $\mu\text{g}/\text{m}^3$, less than ten percent of the California AAQS. As the annual PM_{10} California AAQS is 20 $\mu\text{g}/\text{m}^3$, ten percent of this standard is 2.0 $\mu\text{g}/\text{m}^3$. The modeled annual PM_{10} concentration for the SpaceX stationary source is 0.3 $\mu\text{g}/\text{m}^3$, less than ten percent of the California AAQS.

Table 2. California Ambient Air Quality Standard Analysis Results

Pollutant	Averaging Period ^{1,2}	Modeled Conc. ($\mu\text{g}/\text{m}^3$)	Ambient Background Conc. ($\mu\text{g}/\text{m}^3$)	Total Conc. ($\mu\text{g}/\text{m}^3$)	California AAQS ($\mu\text{g}/\text{m}^3$)	Percent of CAAQS
SO_2	1-hour ³	10.7	10.5	21.2	655	3.2
	24-hour	1.8	2.6	4.4	105	4.2
CO	1-hour	805.1	1264.0	2069.1	23,000	9.0
	8-hour	291.5	1149.0	1440.5	10,000	14.4
NO_2	1-hour	141.2	22.6	163.8	339	48.3
	Annual	15.9	0.6	16.5	57	28.9
PM_{10}	24-hour	2.5	143.0 ³	145.5	50	290.9
	Annual	0.3	27.6 ³	27.9	20	139.5
$\text{PM}_{2.5}$	Annual	0.3	6.6	6.9	12	57.4

Notes:

1. All short-term results are the highest modeled value (1st Highest High).
2. Annual results are the highest annual average.
3. Ambient background is greater than the CAAQS. Because the project contribution will not exceed 10% of the CAAQS, the contribution is considered less than significant.

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ATTACHMENT G
AQIA and HRA Documentation

Increment Analysis Results

The results of the increment analysis are presented in Table 3. The modeled concentration of all pollutants is below the maximum increment thresholds.

Table 3. Increment Analysis Results

Pollutant	Averaging ^{1,2} Period	Modeled Conc. ($\mu\text{g}/\text{m}^3$)	Increment ($\mu\text{g}/\text{m}^3$)	Percent of Increment
SO ₂	3-hour ³	5.1	512	1.0
	24-hour	1.8	91	2.0
	Annual	0.2	20	1.1
CO	1-hour	805.1	10,000	8.1
	8-hour	291.5	2,500	11.7
NO ₂	1-hour	141.2	100 – 188	75.1
	Annual	15.9	25	63.4
PM ₁₀	24-hour	2.5	12 – 30	11.7
	Annual	0.3	17	1.7
PM _{2.5}	24-hour	1.9	9	20.7
	Annual	0.3	4	7.3

Notes:

1. All short-term results are the highest modeled value (1st Highest High) except where noted.
2. Annual results are the highest annual average.
3. The result for the 3-hour averaging period for SO₂ is based on the 2nd Highest High.

The modeled concentrations were compared to the Air Quality Increments specified in Table 1 of District Rule 805. While the modeled concentration of all pollutants is below the corresponding maximum increment threshold, the minimum increment for 1-hour NO₂ is exceeded. The results of the 1-hour NO₂ increment analysis are summarized below in Table 4. Table 5 displays the permittee's increment fee schedule.

Table 4. 1-hour NO₂ Increment Analysis Modeling Results

Modeled Impact ($\mu\text{g}/\text{m}^3$)	Rule 805 Air Quality Increment ($\mu\text{g}/\text{m}^3$)
141.19	100 - 188

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AQIA and HRA Documentation

Table 5. 1-hour NO₂ Increment Fee Schedule

Due Date	Amount Due
December 1, 2024	\$13,716.27
December 1, 2025	\$12,344.64
December 1, 2026	\$10,973.02
December 1, 2027	\$9,601.39
December 1, 2028	\$8,229.76
December 1, 2029	\$6,858.14
December 1, 2030	\$5,486.51
December 1, 2031	\$4,114.88
December 1, 2032	\$2,743.25
December 1, 2033	\$1,371.63

Ambient Air Quality Impact Analysis Review

The District reviewed the AQIA Report and attachments, and found that some of the results shown in the AQIA Report were higher (i.e., more conservative) than the results in the AERMOD output files. The results shown in this memo reflect the correct values taken from the AERMOD output files.

The AQIA Report included results for the “Tier 1 AQIA” and the “Tier 2 AQIA.” The Tier 1 AQIA was based on a conservative assumption that the Kelly C and the Bernardine C tugboats would operate at full load simultaneously at all locations along the route, including into the VSFB harbor. Since the results of the Tier 1 AQIA exceeded an NO₂ threshold, SpaceX refined the modeling and limited their project to be based on a more realistic scenario in the Tier 2 AQIA. SpaceX determined that their true worst-case scenario, the Tier 2 scenario, will be when the Kelly C operates its propulsion engines at 50% load between the VSFB harbor and Point Conception while Bernardine C hotels on its auxiliary engine (at 31% load) at the VSFB harbor. Page 11 of SpaceX’s AQIA Report notes that the Kelly C and the Bernardine C may both operate their propulsion engines up to 50% load while maneuvering the barge within the VSFB harbor. However, that emission scenario was not modeled and Dudek clarified via email (from Adam Poll to Robin Cobbs, September 6, 2024, Re: *Worst-case one hour scenario*) that during maneuvering, both the Kelly C and the Bernardine C will be operating their propulsion engines at no more than 20% load. For that reason, SpaceX will be permitted at the worst-case scenario of the Kelly C operating at 50% load between the VSFB harbor to Point Conception while Bernardine C is hoteling on its auxiliary engine at the VSFB harbor.

Summary

Per District guidelines, if a facility’s toxic emissions result in a cancer risk equal to or greater than 10 in a million, it is considered a significant risk facility. For non-cancer risk, if a facility’s toxic emissions result in a Hazard Index greater than 1.0, it is considered a significant risk facility. The HRA modeling results show that the equipment permitted under ATC No. 16293 will not present a significant risk to the surrounding community.

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AQIA and HRA Documentation

Based on the AQIA modeling results, operation under ATC No. 16293 will not exceed an ambient air quality standard for CO, SO₂, NO₂, or PM_{2.5}. The 24-hour and annual PM₁₀ California Ambient Air Quality Standards are exceeded based on the background concentrations alone. The modeled 24-hour and annual PM₁₀ concentrations for the entire stationary source are less than ten percent of the standards. Furthermore, the modeling shows that this project's impact is below the maximum allowable increment for all pollutants in a Class II area. As this project will consume part of the allowable increment for NO₂ in a Class II area, ATC No. 16293 will be issued with the required increment fees for mitigation.

References

- Santa Barbara County Air Pollution Control District. Adopted April, 17 1997 and revised August 25, 2016. *Rule 802: New Source Review*. <https://www.ourair.org/wp-content/uploads/Rule802.pdf>.
- Santa Barbara County Air Pollution Control District. Adopted April, 17 1997 and revised August 25, 2016. *Rule 805: Air Quality Impact Analysis, Modeling, Monitoring, and Air Quality Increment Consumption*. <https://www.ourair.org/wp-content/uploads/rule805.pdf>.
- Santa Barbara County Air Pollution Control District. June 2020. *Modeling Guidelines for Air Quality Impact Assessments*. <https://www.ourair.org/wp-content/uploads/aqia.pdf>.
- Santa Barbara County Air Pollution Control District. December 2023. *Modeling Guidelines for Health Risk Assessments (Form-15i)*. <http://www.ourair.org/wp-content/uploads/apcd-15i.pdf>.
- Dudek. Memorandum. September 5, 2024. *Air Quality Impact Assessment for the SpaceX Falcon Program Expansion*. (AQIA Report).
- Dudek. Memorandum. September 5, 2024. *Revised Refined Health Risk Assessment for the SpaceX Falcon Program Expansion*. (HRA Report).

Attachments

Dudek's AQIA Report received by the District on September 5, 2024 and the submitted modeling files may be found in the following location:

[\\sbcapcd.org\shares\Toxics\ActiveSourceFiles\SSID11146_Space_Exploration_Technologies\ATC 16172 and ATC 16173 Submittal\5Sept2024 AQIA Submittal](\\sbcapcd.org\shares\Toxics\ActiveSourceFiles\SSID11146_Space_Exploration_Technologies\ATC_16172_and_ATC_16173_Submittal\5Sept2024_AQIA_Submittal)

Dudek's HRA Report received by the District on September 6, 2024 and the submitted modeling files may be found in the following location:

[\\sbcapcd.org\shares\Toxics\ActiveSourceFiles\SSID11146_Space_Exploration_Technologies\ATC 16172 and ATC 16173 Submittal\6Sept2024 HRA Submittal](\\sbcapcd.org\shares\Toxics\ActiveSourceFiles\SSID11146_Space_Exploration_Technologies\ATC_16172_and_ATC_16173_Submittal\6Sept2024_HRA_Submittal)