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STAFF REPORT: REGULAR CALENDAR

Application No.: CD-0010-22

Applicant: Department of the Air Force, U.S. Space Force

Location: Vandenberg Space Force Base, Santa Barbara County

Project Description: Construct a new commercial space launch facility at the former site of Space Launch Complex 5 on Vandenberg Space Force Base and carry out up to 48 rocket launches and 48 static fire engine tests per year.

Staff Recommendation: Concurrence

SUMMARY OF STAFF RECOMMENDATION

The Department of the Air Force (DAF) has submitted a consistency determination for the construction and operation of a new commercial space launch facility for Phantom Space Corporation (Phantom) at the former site of Space Launch Complex 5 (SLC-5) on Vandenberg Space Force Base (VSFB), located in northern Santa Barbara County. The proposed project involves construction of two 1,500 square foot concrete launch pads and associated infrastructure as well as implementation of a space launch

program with a maximum frequency of 48 rocket launches and 48 static fire engine tests annually.

The proposed project has the potential to result in a variety of effects to California coastal resources. Most significantly, the proposed project would result in the release of debris into the ocean and the disturbance to and loss of environmentally sensitive habitat areas (ESHA) at and around the project site associated with vegetation management for fire risks, elevated sound levels during launches, and the use of night lighting.

With respect to marine debris, the proposed project includes two sources: weather balloons and the “first stage” section of the rockets. A weather balloon would be released prior to each launch to measure upper atmosphere conditions and would then fall to the ocean below in state or federal waters. Due to the height it would fall from and large ocean area it may land in, it would not be feasible to recover each weather balloon and associated 1.5 pound instrument array. DAF has therefore committed to ensure that Phantom provide a monetary donation to UC Davis’ California Lost Fishing Gear Recovery Project to offset this source of marine debris through the recovery of lost and abandoned fishing nets and other gear. Each rocket launch would also involve the release of the rocket’s first stage in the upper atmosphere. This section of the rocket would weigh between 2,600 and 7,200 pounds, is made primarily of aluminum, and would land and sink in the international waters off the coast of Baja California, Mexico. This material is also expected to be unrecoverable. Although it would be released into the ocean far from shore outside of the coastal zone and is unlikely to be buoyant enough to move into the coastal zone or affect coastal resources, Commission staff has encouraged DAF to take steps to recover the first stage or offset its release into the ocean by collecting and removing other types of marine debris. DAF has not committed to taking any such steps, however, and has stated that the release of this material into the ocean would not have an adverse effect on coastal resources.

With respect to ESHA impacts, the proposed project would result in the loss of 4.09 acres of ESHA on VSFB and “spillover” effects to ESHA located within the coastal zone but outside the boundary of the VSFB. DAF conveyed its position that the ESHA policy of the Coastal Act does not apply to the proposed project site on Vandenberg because it would be located on a federal military installation and, under the Coastal Zone Management Act (CZMA), lands “whose uses are subject solely to the discretion of the federal government” are excluded from the coastal zone. Nevertheless, DAF has also determined that, even if the ESHA policy was applicable, the proposed project would still be consistent to the maximum extent practicable with it. “Consistent to the maximum extent practicable” is defined in the CZMA to mean “full consistency is prohibited by existing law applicable to the federal agency.”

On March 28, 2023, DAF provided Commission staff with a document describing the statutory provisions and legal authority limiting their discretion in siting and designing the proposed project to be fully consistent with the ESHA policy. In short, DAF’s position

is that VSFB is required to be used for construction and operation of commercial space launch complexes and due to the extensive rare and sensitive habitat and species present on VSFB, development and operation of these complexes cannot occur there without some level of adverse impact to natural resources.

Construction of the launch facilities would require clearance of sensitive vegetation within a proposed fire break. However, DAF has sited, configured, and designed the proposed project to avoid and minimize impacts to ESHA to the maximum extent practicable, including through implementing a program to offset the unavoidable loss of sensitive vegetation within the proposed fire management zone at a six to one ratio.

The proposed project also has the potential to adversely affect sensitive wildlife¹ habitat adjacent to the site, primarily through elevated sound levels from launches. However, DAF has conducted extensive monitoring across VSFB to understand wildlife responses to launch activity and has found that no adverse impacts have occurred and that significant wildlife populations continue to be present despite periodic launch events and elevated sound levels. However, the proposed project would increase the frequency of launches on VSFB and raises questions about how representative past monitoring results will be to future conditions. To demonstrate that adverse impacts to sensitive wildlife and habitats continue to be absent and that the increased launch frequency remains compatible with the continued use of adjacent ESHA, DAF will implement an enhanced monitoring program focused on the sensitive species and habitats most likely to be found in the project area, California reg-legged frog, western snowy plover (snowy plover), marine mammal haul-out areas, and two species of bat designated by the California Department of Fish and Wildlife as state species of special concern. The proposed monitoring programs were developed in coordination with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and bat biologists with national and international expertise.

With implementation of these commitments and the additional coastal resource protection measures described in the report below and included in [Exhibit 1](#), the staff recommends that the Commission **concur** with DAF consistency determination (No. CD-0010-22) and find the proposed project consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program. The motion to concur is on **page 5**.

¹ Wildlife species include: California red-legged frogs, western snowy plover, pallid bat, and western red bat.

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I. FEDERAL AGENCY'S CONSISTENCY DETERMINATION

Space Launch Delta 30 of the Department of the Air Force, United States Space Force (DAF), has determined that the project is consistent to the maximum extent practicable with the California Coastal Management Program (CCMP).

II. MOTION AND RESOLUTION

Motion:

I move that the Commission concur with Consistency Determination CD-0010-22 on the grounds that the project described therein would be consistent to the maximum extent practicable with the enforceable policies of the CCMP.

Staff Recommendation:

Staff recommends a YES vote on the forgoing motion. Passage of this motion will result in a concurrence with the determination of consistency, and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution:

The Commission hereby concurs with Consistency Determination CD-0010-22 on the grounds that the project is consistent to the maximum extent practicable with the enforceable policies of the CCMP.

III. APPLICABLE LEGAL AUTHORITIES

A. STANDARD OF REVIEW

The federal Coastal Zone Management Act (CZMA), 16 U.S.C. §§ 1451-1464, requires that federal agency activities affecting coastal resources be "carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs." *Id.* at § 1456(c)(1)(A). The implementing regulations for the CZMA (federal consistency regulations), at 15 C.F.R. Section 930.32(a)(1), define the phrase "consistent to the maximum extent practicable" to mean:

... fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the federal agency.

This standard allows a federal activity that is not fully consistent with California's Coastal Management Program (CCMP) to proceed, if full compliance with the CCMP would be "prohibited by existing law." The federal consistency regulations at 15 C.F.R. Section 930.32(a)(2) further state:

If a Federal agency asserts that full consistency with the management program is prohibited, it shall clearly describe, in writing, to the State agency the statutory provisions, legislative history, or other legal authority which limits the Federal agency's discretion to be fully consistent with the enforceable policies of the management program.

In a document provided to Commission staff via email on March 28, 2023, DAF describes the statutory provisions and legal authority it believes limits its discretion in siting and designing the proposed project to be fully consistent with the enforceable policies of the CCMP. This document is included as [Exhibit 2](#) to these findings. In it, DAF asserts that federal law calls for it to facilitate and expedite commercial space launch activities and that numerous regulations, statutes, and standards have been adopted for US Air Force and Space Force installations that support space launch programs to govern the placement and configuration of launch sites. DAF standards exist in the context of the following federal laws and regulations:

United States Code Title 51 Chapter 509 Section 50901 states in part that:

(6) providing launch services and reentry services by the private sector is consistent with the national security and foreign policy interests of the United States and would be facilitated by stable, minimal, and appropriate regulatory guidelines that are fairly and expeditiously applied;

(7) the United States should encourage private sector launches, reentries, and associated services and, only to the extent necessary, regulate those launches, reentries, and services to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States; ...

United States Code Title 51 Chapter 509 Section 50913 states in part that:

(a)(1)The Secretary of Transportation shall facilitate and encourage the acquisition by the private sector and State governments of—

(A) launch or reentry property of the United States Government that is excess or otherwise is not needed for public use; and

(B) launch services and reentry services, including utilities, of the Government otherwise not needed for public use.

Department of Defense Directive 3230.3 states, in part, that:

It is DoD policy to:

4.1 Encourage the U.S. private sector development of commercial launch operations.

4.1 Endorse fully and facilitate the commercialization of U.S. Expendable Launch Vehicles (ELVs), consistent with U.S. economic, foreign policy, and national security interests.

DAF initially selected Vandenberg as a site for space launches because of its isolated location, ability for year-round operations, and because it could support launches that would not involve flights over large civilian populations. DAF has also stated that Vandenberg is well-positioned for launching rockets into polar orbit, and only a subset of the other launch sites in the United States would be suitable for such launches. DAF further indicates that there are several major planning constraints for launch site development on Vandenberg that limit the number of locations that could be used. Such constraints include existing spacecraft and missile launch sites and flight hazard zones, explosive safety quantity-distance arcs, utility corridors and natural and cultural resources.

The central premise provided by DAF in [Exhibit 2](#) and subsequent discussions with Commission staff regarding the inability of the project to be fully consistent with the CCMP is that Vandenberg Space Force Base (VSFB) is required to be used for the construction and operation of commercial space launch complexes; that due to numerous planning constraints and the extensive rare and sensitive habitats and species present throughout VSFB, such development and operational activity cannot be carried out without some level of adverse impact to those natural resources; and that the proposed project has been sited, configured and designed to avoid and minimize such impacts to the maximum extent practicable, including through implementation of a program to offset the loss of sensitive vegetation within the proposed fire management zone at a ratio of six to one through removal of invasive plant species from similar habitat elsewhere on VSFB. This program is described in further detail in the Environmentally Sensitive Habitat Area (ESHA) Section of these findings and would fully offset any unavoidable impacts of the project on rare vegetation communities within the proposed project disturbance footprint.

That section of these findings also details DAF's position that Section 30240 of the Coastal Act does not apply to the proposed project because it would be located on federal property. Nevertheless, DAF has determined that, even if the ESHA policy was applicable, the proposed project would still be consistent to the maximum extent practicable with it. This is because federal statutes and policy compel DAF to support the development of commercial space launch facilities on VSFB, and the proposed project would be sited, configured and implemented in a way that would avoid and minimize adverse effects to coastal resources, particularly ESHA, to the maximum extent practicable, and offset those impacts that are unavoidable.

Based on the provisions discussed above, the Commission agrees that DAF is subject to federal statutory provisions and other legal authority that limits its discretion in making its project fully consistent with the environmentally sensitive habitat policies of Section 30240. However, as discussed in the ESHA section of these findings, the Commission

finds that the project is consistent to the maximum extent practicable with that policy. As also discussed in the findings below, the Commission has concluded that the proposed project is fully consistent with the other applicable CCMP policies and is thus consistent to the maximum extent practicable.

However, the Commission has the ability under the federal consistency regulations to re-open this consistency determination should there be impacts to coastal resources substantially different from those expected at the time of concurrence. Should this scenario occur, the Commission's finding that the project is "consistent to the maximum extent practicable" could be re-examined in light of new circumstances.

B. FEDERAL LANDS EXCLUDED FROM THE COASTAL ZONE

Under the federal CZMA, the Commission is authorized to review federal agency activities and actions that occur within or outside of California's coastal zone and that affect any land or water use or natural resource of the coastal zone. However, the CZMA defines "coastal zone" to exclude most land under the ownership and control of the federal government. Thus, in cases such as this where a proposed project that is being reviewed under the CCC's federal consistency authority is to be located on federal land (i.e., on VSFB), the Commission's review is limited to evaluating whether the activities will result in effects that extend outside of the federal property and will "spill over" into the coastal zone. For example, public safety zones implemented during rocket launches such as those proposed in the current project would extend outside of VSFB and result in the closure of public beaches and campgrounds, including those at Jalama Beach County Park. This would affect public beach access and recreation within the coastal zone. In addition, the loss and disturbance of sensitive habitats and wildlife species, such as snowy plover and California red-legged frogs, on VSFB can imperil the survival and health of those same habitats and species outside of VSFB. As such, the Commission has the authority to review federal agency activities on federal property like VSFB, but that review must be carried out somewhat differently than the Commission's typical review of development activities within the coastal zone.

IV. FINDINGS AND DECLARATIONS

A. BACKGROUND AND PROJECT LOCATION

Vandenberg Space Force Base (VSFB or Vandenberg) is located in Santa Barbara County, west of the City of Lompoc and encompasses an area of 99,100 acres. Vandenberg was originally used by the U.S. Army and was transferred to the U.S. Air Force (DAF) in 1957.² DAF selected Vandenberg as a site for what would eventually become the Western Range³ because of the isolated location, ability for year-round operations, and because the base could support space and rocket launches with flight

² <https://www.vandenberg.spaceforce.mil/About-Us/History/>

³ The Western Range is the area over which rockets are fired for testing and tracking. The Western Range extends from the West Coast of the United States to 90 degrees east longitude in the Indian Ocean, where it meets the Eastern Range.

paths that did not extend over large civilian populations⁴. Throughout the 1950s, Vandenberg was used extensively for testing various missile systems and also for the launch of the first polar orbiting satellite, Discoverer 1, in 1959. Space exploration then became the primary focus for activities at Vandenberg⁵. The Commission has reviewed consistency and negative determinations from the US Air Force for various space programs at VSBF since the early 1980s, including the Space Shuttle Program (CD-21-82), multiple rocket launching programs (Atlas, Titan, etc.), and, more recently, launch activities carried out by the commercial Space Exploration Company, SpaceX (ND-103-03, ND-088-05, ND-055-10, ND-0035-14 and ND-0009-23). In 2021, the 2,000th launch from Vandenberg was completed.

The proposed project would be located on VSBF at the former Space Launch Complex-5 (SLC-5) site. Maps of the SLC-5 site location within VSBF, and the proposed project development areas are available in [Exhibit 3](#) and [Exhibit 4](#), respectively. Portions of the site were previously developed and used by the National Aeronautics and Space Administration (NASA) to launch Scout space vehicles. When the Scout program ended in 1994, all facilities at SLC-5 were deactivated and then demolished between 2009 and 2012. Buildings were removed and the concrete pad used for launches was covered by new fill soil. A map showing the extent of historical development at SLC-5, compared to the proposed development area is available in [Exhibit 5](#).

Over the past five years, (2017-2021), VSBF has supported an average of 4.4 rocket launches per year, with a maximum of 7 launches in both 2017 and 2018. In recent years, private space exploration companies have expressed increased interest in performing commercial space launches at Vandenberg. In addition to the proposed project, several other new launch programs are under development and expected to be proposed. Establishment and operation of additional launch complexes at VSBF has the potential to significantly increase the annual number of launches at Vandenberg. Thus far, the Commission is aware of a proposal from Blue Origin (CD-0010-21) to construct a new space launch complex and associated operations for up to 8 launches of medium-heavy-lift class space vehicles. Additionally, the existing SpaceX launch program at Vandenberg is increasing the annual number of launches of its heavy-lift space vehicles from 6 to 36 annually (ND-0009-23).

B. PROJECT DESCRIPTION

Within the VSBF, DAF proposes to approve construction of two 1,500 square foot concrete launch pads, associated infrastructure, and a 7,500 square foot horizontal integration facility at the former SLC-5 launch complex. This new launch complex would be constructed and operated by Phantom Space Corporation (Phantom) for its Daytona-E and Laguna-E launch programs. The project would also include installing utilities such

⁴ <https://www.vandenberghousing.com/history>

⁵ <https://militarybases.com/california/vandenberg/>

as electrical and communication lines, firebreaks, and improvements to fire access roads. Utilities would be installed along existing roadways and utility corridors.

Rocket and payload (e.g. satellite) assembly would be conducted at the existing Phantom factory in Tucson, Arizona. Once assembled, the rockets would be shipped via commercial truck transport to VSFB. Payloads would be shipped from several locations including Arizona, Florida, Colorado, and elsewhere in California. Final assembly of the rocket and payload would occur at the proposed space launch complex within the horizontal integration facility. The flight-ready rocket would then be transported to one of two proposed launch pads at the complex, and prepared for vertical tests or launch. Vertical tests would be performed a few days prior to each launch. Phantom proposes to perform up to 48 launches annually in addition to up to 48 vertical or static fire tests. Static fire tests involve ignition of the rocket engine in a controlled manner to determine proper functioning prior to a launch attempt.

The number of launch and static fire tests under the proposed project would gradually increase over the course of six years, as shown below in Table 1.

Table 1: Projected Phantom Launches and Tests by Calendar Year

Calendar Year	Number of Launches	Number of Static Fire Tests
2023	1	1
2024	2	2
2025	5	5
2026	12	12
2027	24	24
2028	48	48

The purpose of the proposed project is to provide low-cost access to satellite technology by mass manufacturing launch vehicles, satellites, and space propulsion systems. DAF states that:

The need for the Proposed Action is to fulfill the requirements of commercial and governmental entities in the small satellite orbital and suborbital market. The satellite industry is changing and leading to an interest in small, responsive, efficient, and commercially focused launch vehicles that are low-cost solutions for government and commercial clients. The Proposed Action would also fulfill the U.S. expectation to reduce space transportation costs and ensure continued exploration, development, and the use of space is more affordable.

Additional details about Phantom’s proposed launch pad and other facility construction, utility and road improvements, construction phasing, and launch schedules can be found in [Appendix A](#).

Although the proposed space launch complex would be constructed and operated by the privately held company, Phantom, DAF has communicated to Commission staff that such activities located on VSFB and involving space launches carried out on behalf of the federal government would be a federal activity performed on behalf of a federal agency in the exercise of its statutory responsibility and should therefore be considered a “federal agency activity” under Section 930.31(a) of the CZMA’s federal consistency regulations. As such, DAF determined that it was appropriate for DAF to submit a consistency determination for the Commission’s review rather than for Phantom to pursue a coastal development permit or consistency certification.

Alternatives Analysis

As part of its analysis of the proposed project, DAF considered a range of potential alternative sites on VSFB and other military installations by using a set of selection criteria. The site selection criteria for alternative sites were:

1. Direct orbital access to high-inclination, polar, and sun-synchronous orbits
2. Existing and approved commercial or federal spaceport and proven launch pad to meet an initial launch target date for Daytona-E in calendar year 2023.
3. Ability to:
 - a. Accommodate multiple launch pads to enable launches within three to four days of each other, and
 - b. Configure site to optimize Phantom’s projected launch systems.
4. Provided minimal disruption to Phantom operations, including:
 - a. Phantom staff having unimpeded access and use of the site.
 - b. Ability to pre-position ground support equipment between launch operations.

In addition to the proposed site, DAF assessed several alternative sites at VSFB and the Pacific Spaceport Complex (PSCA) at Kodiak Island in Alaska. The alternative sites considered were dismissed from detailed analysis because they did not meet the criteria described above. At VSFB, DAF considered sites including SLC-8, Boat Dock, Sudden Flats, and Boathouse Flats. At PSCA, DAF considered launch pad (LP)-1, LP-2, LP-3C, and LP-3E. The Boat Dock, Sudden Flats, and Boathouse Flats at VSFB and LP-3E at PSCA have not previously or currently had active launch operations, causing uncertainty in their potential to support efficient launch operations. The extra time needed to understand these sites’ potential to support launch operations would not enable launches to begin in 2023, so these sites were removed under criterion 2. In addition, and as described in the ESHA section of these findings, these other sites would have required more extensive work to make them useable and more extensive impacts to sensitive habitat than the proposed site. SLC-8 at VSFB and LP-1, LP-2 and LP-3 at PSCA are currently approved for launch operation, however they are shared

multi-user launch sites for commercial and government launch operations, which means that Phantom would not have exclusive control and unimpeded access. This would not support a regular launch frequency under Criteria 3 and 4 above, and so DAF removed these alternatives from further consideration.

C. OTHER AGENCY APPROVALS

United States Fish and Wildlife Service

DAF has completed a formal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) for federally listed species protected under the federal Endangered Species Act that may be affected by the proposed project. The biological opinion issued by the USFWS, dated April 24, 2023, found that the proposed project may affect but is not likely to affect marbled murrelet, southern sea otter, California condor, unarmored threespine stickleback and tidewater goby. The USFWS further found that the proposed project would not likely jeopardize the continued existence of California red-legged frogs or snowy plovers. The USFWS made these determinations due to the protection and mitigation measures that DAF has agreed to implement. These protection and mitigation measures are available in [Appendix A](#).

National Marine Fisheries Service

DAF has consulted with the National Marine Fisheries Service (NMFS) regarding rocket and missile launches and aircraft operations at Vandenberg under the Marine Mammal Protection Act, and received a Letter of Authorization (LOA) from NMFS in 2019. The LOA is provided in [Appendix A](#). The LOA is valid for five years and allows for up to 110 rocket launches annually, and DAF indicates that the proposed project falls within the scope of the activities covered by the LOA.

According to the consistency determination and the draft environmental assessment prepared for the proposed project, DAF conducted informal consultation with NMFS for potential impacts on species listed under the Endangered Species Act. On May 4, 2022, NMFS concurred with DAF that the proposed project “is not likely to adversely affect the NMFS ESA-listed species and/or designated critical habitat.”

Federal Aviation Administration

The Federal Aviation Administration (FAA) has a role in licensing commercial space launch operations and approving airspace closures for launch operations. Phantom submitted a launch license application to the FAA in April 2023, and the FAA will consider the application after DAF completes its NEPA process.

Tribal Outreach and Consultation

DAF performed tribal consultation in 2022 with the Santa Ynez Band of Chumash Indians (Santa Ynez Band) under Section 106 of the National Historic Preservation Act. No ground disturbance is expected at any archaeological sites, and DAF has indicated to the Commission that the Santa Ynez Band of Chumash did not request the presence of a cultural resources monitor or other protective measures.

Consistent with the Commission's Tribal Consultation policy, Commission staff received a list of Tribes with potential cultural connections to the project area from the Native American Heritage Commission and completed outreach to those Tribes in January of 2023. Consultation invitations were mailed to the Barbareno/Ventureno Band of Mission Indians, the Chumash Council of Bakersfield, the Coastal Band of the Chumash Nation, The Northern Chumash Tribal Council, the San Luis Obispo County Chumash Council, and the Santa Ynez Band of Chumash Indians. The Commission received a response from the Northern Chumash Tribal Council requesting consultation. The Commission held a consultation meeting with Northern Chumash Tribal Council representatives on May 25, 2023. Further discussion tribal consultation and cultural resources is available in the Cultural Resources findings below.

D. ENVIRONMENTALLY SENSITIVE HABITAT AREAS

Coastal Act Section 30240 states:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

Coastal Act Section 30107.5 defines environmentally sensitive area:

"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

Environmentally Sensitive Habitat Areas or ESHA are areas where plant communities or species are rare or especially valuable and easily disturbed or degraded by human activities. Vandenberg provides habitat for several rare plant and animal species due to its location in a transition zone around Point Conception. Section 30240(a) states that ESHA must be protected against any significant disruption of habitat values and development within it is only permissible if it is resource dependent. Section 30240(b) requires development adjacent to ESHA be sited and designed to prevent impacts that would significantly degrade ESHA habitat and be compatible with continued use of ESHA habitat. The proposed project has the potential to adversely affect ESHA in three ways: through the establishment and maintenance of a vegetation management area for fire suppression around the space launch complex, through the use of artificial night lighting at the complex that would extend into adjacent habitat areas, and due to the elevated levels of noise produced by the proposed launches and static fire tests at the launch complex.

However, DAF believes the ESHA policy is not applicable to the proposed project because it would be sited on federal property. Under the federal CZMA, the Commission is authorized to review federal agency activities and actions for consistency with the enforceable policies of California's Coastal Management Program (CCMP). Those enforceable policies are also found within Chapter 3 of the Coastal Act. The CZMA defines "coastal zone" to exclude "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government, its officers or agents." DAF has provided Commission staff with its position that Vandenberg Space Force Base (VSFB) qualifies as land which is by law subject solely to the discretion of the federal government and is therefore not part of the "coastal zone." DAF therefore believes that: 1) ESHA may only be found within the coastal zone; 2) VSFB is excluded from the coastal zone; and 3) the Commission therefore has no authority to identify or protect ESHA on VSFB.

The Commission disagrees with this assessment. The Commission has a long history of identifying and protecting ESHA on federal lands, including military installations and VSFB⁶. It is worth noting, however, that for federal agency activities (i.e., projects like the current one that are reviewed by the Commission as consistency determinations) on land which is by law subject solely to the discretion of the federal government, the Commission's consideration of ESHA is carried out somewhat differently than it is on other types of land or with other types of development. Specifically, the Commission's review focuses exclusively on "spillover effects" – those effects to species and habitats within the coastal zone that would occur because of the loss and disturbance associated with the proposed project. In other words, it evaluates a project's consistency with Coastal Act ESHA policies by analyzing how any impacts to ESHA on the federal property may spill over and affect species or habitat resources located in the coastal zone beyond the federal property boundary.

For rare coastal habitats and species sensitive to disturbance, any loss or damage – even if located outside the coastal zone – can have adverse impacts because it can reduce the overall population size, range, health and/or genetic diversity of those species and increase their risk of further degradation or extinction. In implementing this approach, the Commission must therefore find that: (1) the plant or animal life or their habitats are rare or especially valuable because of their special nature or role in an ecosystem; (2) that they could be easily disturbed or degraded by human activities and developments; (3) that they are also species and habitats that are found within and

⁶ As recent examples, the Commission identified ESHA on VSFB in 2019 (Consistency Certification No. CC-0003-19), on Naval Base Coronado in 2014 (Consistency Determination No. CD-0003-14), and on Marine Corps Base Camp Pendleton in 2007 (Consistency Certification No. CC-018-07). Further, the Commission considered potential impacts to ESHA on VSFB and other federal land including the Channel Islands National Park as part of its review of most of the missile and rocket launch facilities constructed, modified, and operated on VSFB over the past 40+ years. These include CD-21-82 in 1982 for the Space Shuttle Program at SLC-6; CD-28-90 in 1990 for conversion and use of SLC-6 for the Titan IV/Centaur program; CD-51-90 in 1990 for construction and operation of SLC-7; CD-049-98 in 1998 for the Expendable Launch Vehicle program at SLC-6; and CD-059-03 in 2003 for the Ground-based Midcourse Defense Program.

present in the coastal zone; and (4) that impacts to the species and habitats outside the coastal zone will affect the species and habitats in the coastal zone due to species movement, population viability, or other factors. As discussed below, the proposed project has the potential to result in the loss and disturbance of such species and habitats.

Despite its disagreement with the Commission about application of the ESHA policy, DAF nevertheless has concluded in its consistency determination that the proposed project is consistent to the maximum extent practicable with Section 30240. As described further below, DAF has also sited and configured the proposed project to avoid and minimize adverse impacts to rare or especially valuable species and habitats to the maximum extent practicable and has also proposed offsets for those impacts that cannot be avoided.

Types of Environmentally Sensitive Habitat Areas

The proposed project would be sited entirely within the former footprint of a space launch complex, SLC-5, that was in use for several decades and then decommissioned and restored from 2009 to 2012. However, as shown in [Exhibit 6](#) and [Exhibit 7](#), the vegetation/fire management area that would surround the new proposed facility includes an area of a rare vegetation community, Lemonade Berry Scrub, and the launch complex itself is located adjacent to riparian habitat at Honda Creek that supports sensitive wildlife. In addition, areas known to support nesting by snowy plovers are in close proximity to the proposed launch complex and within the zone that would experience elevated sound levels during launch activities and static fire engine testing.

Lemonade Berry Scrub at the Project Site

Lemonade Berry (*Rhus integrifolia*) is an aromatic evergreen shrub found within the coastal zone and very close to the coast from Santa Barbara County down through Baja California. Lemonade Berry Scrub is a vegetation alliance dominated by lemonade berry and comprised of coastal scrub species, such as California sagebrush (*Artemisia californica*), Coyote bush (*Baccharis pilularis*), Mediterranean broom (*Genista linifolia*), Laurel sumac (*Malosma laurina*), or orange bush monkey flower (*Diplacus aurantiacus*). Lemonade Berry Scrub has been identified with a Global (G) and State (S) rarity ranking of 3 in the Manual of California Vegetation (Manual). Global and State level 3 communities and species are identified in the Manual as vulnerable which denotes, “a moderate risk of extinction due to a restricted range, relatively few populations (often <80), recent and widespread declines, or other factors.” These rarity rankings are developed considering the range, extent, area of occupancy, number of occurrences and the number of high-quality occurrences of a vegetation alliance.⁷ In the

⁷ CDFW defines natural communities, animals, and plants with a global or state ranking of 1, 2, or 3 as rare and the CCC typically finds these to be ESHA. CCC also typically considers plant and animal species listed by the federal and state endangered species acts (ESA and CESA, respectively) and/or identified under other special status categories (e.g., California Species of Special Concern) and/or identified by the California Native Plant Society (CNPS) as ‘1B’ and ‘2’ plant species as constituting ESHA.

specific case of Lemonade Berry Scrub, a ranking of G3/S3 means that it is considered vulnerable both worldwide and statewide, with an estimated 21 to 100 occurrences.

In addition to its rarity, Lemonade Berry Scrub is a vertically diverse habitat type, which makes it suitable for roosting, nesting, denning, and foraging for native animals. Its canopy is around 10 feet in height, and it has both an understory layer of numerous native shrubs and an herbaceous layer on the ground of various native species of grasses and forbs. This vegetation alliance is also considered to be particularly vulnerable and sensitive to disturbance from vegetation removal and development because its seeds are not viable over long time periods and it has low recruitment (reproduction). Additionally, the composition of this vegetation alliance is changing due to increasing cover of invasive plants, such as fountain grasses. As such, the Commission's staff ecologist has determined that this habitat type in the project area meets the definition of ESHA under Coastal Act Section 30107.5. Lemonade Berry Scrub species are also part of Coastal Sage Scrub and Chaparral communities in the coastal zone, and occurrences of Lemonade Berry are found south of Vandenberg along the Gaviota Coast in Santa Barbara County.⁸ Lemonade Berry Scrub relies on animals for seed dispersal; the stand of Lemonade Berry Scrub on Vandenberg provides a significant source of seeds for dispersal into the coastal zone and creates a higher potential for this vulnerable habitat type to establish itself and persist in the coastal zone. Due to the rarity of this habitat type, a reduction of the seed supply on Vandenberg would negatively affect populations outside of Vandenberg as well and potentially risk its overall viability.

Honda Creek Riparian Habitat

The Commission's staff ecologist has determined that the riparian habitat in Honda Creek also meets the definition of ESHA because it provides breeding habitat, forage and refuge for California red-legged frogs. A habitat assessment and population status report on California red-legged frogs, provided as part of the consistency determination, found that Honda Creek supports a high number of adult frogs compared to many other areas of frog habitat on Vandenberg, such as San Antonio Terrace or ABRES-A Lake. Honda Creek also serves as a refugia and provides consistent breeding habitat for frogs during extended drought conditions.

The rarity of California red-legged frogs is widely recognized and has resulted in its designation as a threatened species under the federal Endangered Species Act and as a state species of special concern. California red-legged frogs are sensitive to disturbance and their habitat could be easily disturbed or degraded from development including direct habitat loss due to stream alteration, loss of aquatic habitat, and indirect effects of expanding urbanization affecting their dispersal and migration into new habitats, as identified by the USFWS biological opinion. California red-legged frogs are found outside of Vandenberg in the coastal zone; the USFWS identified them as being prevalent along the coast north of Ventura county (USFWS 2022). The populations on

⁸ [https://calscape.org/Rhus-integrifolia-\(Lemonade-Berry\)?srchcr=sc6466a34ca91d7](https://calscape.org/Rhus-integrifolia-(Lemonade-Berry)?srchcr=sc6466a34ca91d7)

Vandenberg add to the genetic diversity and population of frogs outside of the base, particularly because California red-legged frogs are known to make long distance overland migrations, up to around 1.75 miles, to reach breeding sites (USFWS 2023). The loss of the frog population from Vandenberg would reduce genetic diversity, which could affect the overall population of California red-legged frog in the coastal zone outside of the base. For rare species, maintaining genetic diversity is particularly critical in the face of climate change due to the variety of environmental stressors it can bring and the need for adaptation and new traits that will enable survival.

Additionally, pallid bat and western red bat are known to be present within the riparian habitat of Honda Creek. These bat species have been designated by the California Department of Fish and Wildlife (CDFW) as state species of special concern. Bats play a special role in the ecosystem due to their high metabolic needs and extensive feeding on insects. In general, CDFW designates certain animals as “species of special concern” when they:

- Occur in small, isolated populations or in fragmented habitat, and are threatened by further isolation and population reduction;
- Show marked population declines; or
- Depend on a habitat that has shown substantial historical or recent declines in size and/or quality or integrity, among other factors (CDFW 2023).

CDFW identified pallid bats as a species of special concern because they have experienced a marked population decline in recent years in California. Pallid bats are not tolerant of suburban or urban development, and habitat conversion has led to their decline (CDFW 1998). CDFW identified Western red bats as a species of special concern because they face increased predation from species associated with human development (jays and opossums), and their primary habitat in riparian corridors is under consistent threat of conversion to other land uses, specifically agriculture (CDFW 1998). CDFW’s findings show that the habitat of both bat species is easily disturbed or degraded by development, leading to population declines. Both pallid bats and western red bats are more common globally than within California. They each have a rarity ranking of G4/S3, meaning that their populations are apparently secure and at low risk for extinction globally, but within California they are vulnerable and at moderate risk for extinction due to a restricted range, relatively few populations or recent and widespread declines. Populations of these species and bat populations in general are at risk for significant declines in California, as white-nose syndrome has been found on the west coast in recent years. This illness is believed to be caused by a fungal infection that bats are particularly susceptible to and frequently results in high mortality rates and the catastrophic loss of entire bat colonies (CDFW 2023). The special role of these bat species in the ecosystem and their vulnerability to population declines supports designating their roosting habitat as ESHA.

Acoustic data collection carried out by DAF biologists within Honda Creek have identified the presence of multiple bat species, including pallid bat and western red bat.

Although formal surveys for roosting areas have not been conducted, the riparian habitat and geology of Honda Canyon provides characteristic roosting habitat and bats are expected to engage in roosting behavior there. As shown in [Exhibit 7](#), the California Natural Diversity Database includes records of Western red bat and pallid bat in Honda Canyon.

These bat species occur both on Vandenberg and outside of Vandenberg in the coastal zone of Northern Santa Barbara County. Adverse impacts to the populations on Vandenberg would have spillover effects to outside areas, including within the coastal zone, by reducing overall carrying capacity⁹ and genetic diversity of western red bats and pallid bats in Santa Barbara County.

Western Snowy Plover Nesting Habitat

Surveys carried out by Point Blue Conservation Science, an independent avian research organization, for DAF and provided to Commission staff as part of the consistency determination have documented snowy plover nesting habitat on the beach approximately 3.5 miles northwest of the proposed project site within Vandenberg (USFWS 2023). The rarity and vulnerability of snowy plovers is well established, with the species being listed as threatened under the federal Endangered Species Act since 1993. The recovery objective west coast-wide for snowy plover is 3,000 birds, and the current estimate falls over 20% below that at 2,371 birds. The USFWS notes that threats to snowy plover and their habitat include, “habitat loss and degradation attributed to human disturbance, urban development, introduced beachgrass, and expanding predator populations,” indicating that snowy plover nesting habitat is easily degraded by human activities and developments (USFWS 2023). The USFWS additionally identified that active efforts to improve habitat at breeding beaches have improved snowy plover population numbers (USFWS 2023). Therefore, snowy plover habitat qualifies as ESHA under the Coastal Act.

Snowy plover are present throughout the coastal zone in California, both north and south of Vandenberg. In the winter, snowy plovers migrate to non-nesting beaches to forage (USFWS 2023). The populations of snowy plover nesting and reproducing on Vandenberg therefore disperse to other beaches throughout the state in the winter, and may use beaches in the coastal zone for nesting the following year. Thus, nesting habitat on Vandenberg contributes to snowy plover population growth within the coastal zone. Impacts to snowy plover nesting habitat on Vandenberg would affect snowy plovers in the coastal zone due to species movement during the winter season and reduced population viability.

Preventing the degradation of this nesting habitat is important for the continued population growth and recovery of snowy plover. Vandenberg contributes to the largest sub-population of snowy plovers on the coast, which is found from San Luis Obispo County through Ventura County. The population target established by the USFWS for snowy plover in San Luis Obispo, Santa Barbara, and Ventura Counties is 1,200

⁹ Carrying capacity is the maximum number of animals that can be supported by a given area or habitat.

breeding adults. In 2022, the USFWS found that the population remains well below this target at 804 breeding adults (USFWS 2023). This comparatively large population is critical to maintain and grow for long-term success of the species across the west coast.

Potential Impacts to ESHA

Vegetation Management

The proposed project would involve rocket launches and result in the discharge of waves of high temperatures, combustion and open flame at and around the launch pad area that would be constructed. To minimize the number and size of areas exposed to fire during launches and reduce the extent of required vegetational management around the proposed space launch complex, the site would be configured to include a “flame bucket” that would direct flames into a limited portion of the site. Implementation of the proposed project would result in permanent removal of up to 4.09 acres of Lemonade Berry Scrub for fire management, as shown in [Exhibit 6](#) (map of vegetation alliances at the site and table of the total acreage of vegetation types to be removed). DAF states that vegetation removal is necessary to ensure that launch operations do not spark wildfires, and therefore the removal of the Lemonade Berry Scrub would involve taking the vegetation down to bare ground.

DAF has stated that they cannot reduce the size of the vegetation management area due to wildfire safety concerns and basewide regulations on fire prevention and safety and that the configuration of the proposed project site is designed so that exhaust or rocket fumes will not flow into Honda Canyon. This configuration and the topography of the site necessitates the fuel break for the site being in the Lemonade Berry Scrub.

DAF has committed to implement environmental protection measures during the vegetation removal at the project site and facilities construction, including:

- Staging will occur from paved or existing roadways, and if this is not possible, from patches of non-native vegetation.
- Any seeds will be cleaned from construction equipment to prevent invasive species establishment.
- Standard erosion control measures will occur during grading, including the use of silt fences, and hydroseeding where temporary disturbances occur with a native hydroseed mix.
- A qualified biological monitor will inspect any equipment, trenches or holes left overnight and the work area, prior to the start of work for special-status species. The biological monitor will relocate any found special status species to comparable habitat outside of the work area.
- Construction activities would not occur until 24 hours after a precipitation event greater than 0.2 inch.

A full list of environmental protection measures is included in [Appendix A](#). Additionally, DAF has committed to enhancing at least 24.54 acres of Lemonade Berry Scrub habitat or similar habitat (e.g., coastal sage scrub habitat) on Vandenberg for the life of the Phantom project, through invasive species removal, to address the loss of 4.09 acres of Lemonade Berry Scrub caused by the proposed project. In 2022, DAF enhanced approximately 869 acres of similar habitat, and is committed to continuing to achieve no less than the required habitat enhancement until the acres of Lemonade Berry Scrub are no longer impacted. As stated in its letter to Commission staff dated May 24, 2023, and included in [Appendix A](#), DAF has also committed to provide a written update annually on the number of acres enhanced.

Notwithstanding DAF's proposed measures to minimize impacts and enhance other areas of Lemonade Berry Scrub on Vandenberg, removal of 4.09 acres of this sensitive habitat is inconsistent with Section 30240(a) because the proposed project would result in the complete removal of this habitat and is not a resource-dependent use. However, as noted earlier in this report and detailed further in the section below, the proposed project is not required to be fully consistent with the CCMP but rather consistent to the maximum extent practicable.

Consistent to the Maximum Extent Practicable

As discussed earlier in this report, Section 930.32 of the CZMA's federal consistency regulations allows federal agencies to fall short of full consistency with the enforceable policies of a coastal state's approved coastal management program if "full consistency is prohibited by existing law applicable to the Federal agency." Attached to an email provided to Commission staff on March 28, 2023, DAF provided the document included as [Exhibit 2](#), identifying the statutory provisions, legislative history, or other legal authority which it believes limits its discretion to be fully consistent with the enforceable policies of California's approved Coastal Management Program. The central premise of this document is that VSFB is required to be used for the development and operation of commercial space launch complexes and that the proposed project site is the best location for such a complex. However, even if full consistency is prohibited by other existing law, the proposed project must still be found "consistent to the maximum extent practicable." In the case of the proposed project, this means that the project should be sited and configured to avoid and minimize adverse impacts to ESHA to the maximum extent practicable and that any impacts remaining after such avoidance and minimization efforts should be fully offset.

As discussed in [Exhibit 2](#) and additional materials provided to Commission staff, DAF decided to pursue SLC-5 for the proposed project because it is the only available launch site at Vandenberg that has been previously developed. Any other location on VSFB would either be a greenfield site never before used for development, or a site where only a portion of the proposed project footprint would fit within an area that was previously paved (as shown in [Exhibit 5](#), the proposed project site would allow the entirety of the new launch complex to be located within the footprint of the previously developed and decommissioned SLC-5). The topography of the site also limits the

extent of the fuel management area; potential development of a greenfield site would require larger fuel breaks extending from the developed areas. Existing natural and cultural resource mapping efforts indicate that such locations are also within and closely adjacent to a variety of sensitive habitats and cultural resource sites, which means development activities would result in substantially greater loss and disturbance of sensitive species and ESHA. In addition, although the proposed site is served by existing utility lines and access roads, alternative sites would require constructing utilities and roads to provide access and amenities, often through undeveloped areas which would result in further adverse impacts to natural and cultural resources.

The specific configuration for the proposed Phantom project at the former SLC-5 site was developed by Phantom and DAF to address “ground safety inputs for explosive site planning to minimize impact in case of anomaly or mishap; VSFB range safety for overflight...and...in compliance with the VSFB Wildland Fire Management Plan.” The site has been configured to minimize impacts to natural and cultural resources, including those associated with Honda Creek. For example, the “flame bucket”¹⁰ configuration was rotated to ensure that the exhaust plume from the rockets was directed to the East, away from bat habitat and California red-legged frog habitat in Honda Creek to prevent and reduce potential impacts. The lighting plan, as described above, was also designed to minimize the impacts of artificial lighting to Honda Canyon and ensure that lighting levels beyond 1-foot candle would not extend beyond the proposed facility. The fire breaks and fuel management areas have been configured to account for the direction of the exhaust plume and the potential for fire ignition sources. The fuel management area would typically be larger, but is restricted at the site due to topography in the area, specifically the drop off into Honda Canyon. Additionally, Monterey cypress, which is very fire-sensitive, is adjacent to the north of the site. The configuration of the launch pads, flame buckets, and flame deflectors have been designed and sited to minimize the potential for fire ignition to the north of the site as well.

The fuel break area was developed to comply with the Vandenberg Wildland Fire Management Plan. The Wildland Fire Management Plan was prepared in accordance with the standards and procedures of DoDI 6055.06, the DoD Fire and Emergency Services Certification Program, and Air Force Manual (AFM) 32-7003 (previously AFI 32-7064). AFM 32-7003 states in part that:

3.80 Wildland Fire Management Plans. All Air Force installations with burnable acreage are required to have a current WFMP.

3.80.1. Purpose. The purpose of the installation WFMP is to reduce wildfire potential, protect and enhance valuable infrastructure and natural resources, and implement ecosystem resiliency goals and objectives on

¹⁰ A flame bucket is a cavity in the launch pad, which is filled with water to receive exhaust and hot gasses during the rocket launch. It is part of a system to direct the rocket flames and prevent them from spreading across the launch pad.

Air Force-managed properties. The WFMP will directly support the Air Force mission and be consistent with the installation INRMP¹¹.

Vandenberg's Wildland Fire Management Plan guides the size, location, and configuration of fuel management zones and firebreaks. The Wildland Fire Management Plan states in part that:

Section 3.9: Missile Launch Facilities and Rocket Launch Complex/Areas

Launch operations are one of the highest sources of ignitions for wildfires on VAFB (Type III Risk Assessment, 2018). Combined with wind activity, year-round low humidity, extremely volatile fuel beds throughout the 99K acres and the hazardous/combustive nature of launch operations, fire/fuel breaks are required for each launch facility and launch complex/area... This requirement is to not only protect our launch facilities from wildfires, but also to protect the rest of the installation from fires created by launch operations. Launch operations are inherently dangerous. Nominal launches not only cause spot fires, they also generate hazardous byproducts that prevent firefighters from immediately responding to the launch site until the localized atmosphere is safe. These delays can last up to 30 minutes. During this response delay, fire/fuel breaks are the only thing preventing spot fires from spreading into heavy fuel beds and developing into catastrophic wildfire events.

Section 3.11 Fire and Fuel Break System Maintenance Plan

Firebreaks provide strategic locations for indirect attack of wildfires on VAFB, which in turn greatly reduces the need for direct attack with heavy ground-disturbing equipment which can result in significant resource damage. Approximately 50 miles of existing firebreaks are currently in place at VAFB... Fire breaks are generally wide, about 16 to 32 feet or 2 to 4 blade widths of a dozer, and contain little to no vegetation. Fire breaks must be constructed and maintained, or rehabilitated, to prevent soil erosion. Fire breaks are maintained through mechanical treatment, such as discing or grading.

The siting of the fire break in the Lemonade Berry Scrub allows for the total firebreak size to be the minimum necessary to meet DAF's requirements. If the fire break was sited elsewhere, it would need to be larger, and would require the clearance of other habitats and expose those habitats to greater fire hazard. Additionally, the current configuration of the site ensures that rocket exhaust is not directed to Honda Canyon or to Monterey cypress to the north of the site, and this configuration requires that the fire break be in the Lemonade Berry Scrub. As described earlier in this section, DAF has committed to offsetting the clearance of Lemonade Berry Scrub by enhancing a

¹¹ Integrated Natural Resources Management Plan

minimum of 24.54 acres of Lemonade Berry Scrub through invasive species removal for the duration of the project.

With DAF's efforts to site and configure the proposed space launch complex to avoid and minimize adverse impacts to ESHA and to fully offset those that cannot be avoided, the proposed project would be implemented in a manner that is consistent to the maximum extent practicable with Section 30240.

Elevated Sound Levels

The proposed project also has the potential to cause adverse impacts to riparian habitat in Honda Creek and snowy plover nesting habitat in nearby shoreline areas through exposure to elevated sound levels during static fire tests and launches. Launch noise would be expected to last for around 1 minute and static fire noise would be expected to last for 30 seconds. Maps of nearby wildlife occurrences, including California red-legged frogs, pallid bat, western red bat, and snowy plover with the expected sound levels are available in [Exhibit 7](#). Phantom proposes to conduct up to 48 static fire tests and 48 launches annually, leading to a total of 96 proposed events with elevated sound levels. This would result in a total of approximately 72 minutes of elevated sound divided between 96 events spread throughout the year. During these events, the maximum decibel (dB) levels found in the riparian area of Honda Creek, where bats are present, would be expected to reach between a maximum 130 and 140 dB, based on modeling carried out by DAF. The areas of Honda Creek that contain California red-legged frogs would receive up to 130 dB. The nesting habitat on the beach for snowy plovers would receive lower sound levels between 100 and 110 dB. The extent to which these sound levels could significantly degrade wildlife habitat would be dependent on each species' sensitivity.

Bats

The bat species found in Honda Canyon are very sensitive to sound, as they use echolocation to navigate around obstacles and hunt in the dark. A 2016 report from Caltrans notes:

In bats, damage to high frequency hearing cells would likely result in impaired echolocation. Damage to the lower frequency hearing cells would likely result in impaired capacity for passive listening. Either effect could potentially be life threatening. Failure to accurately assess the locations of trees, branches, and other obstacles in their flight path could result in fatal collisions or debilitating injury. Failure to accurately detect and determine the precise location and movement patterns of prey (both aerial and ground) would likely result in significantly diminished capture success. Similarly, failure to detect the approach of a predator could be fatal. Because bats simply do not have the luxury of extended recovery time, even temporary shifts in hearing abilities have the potential to result in negative effects on affected individuals.

DAF's integrated resources management plan states that studies on the hearing sensitivity of bat species show that they have excellent hearing in the higher frequency ranges (above 20 kHz) but are insensitive to lower frequencies where launch noise has most of its energy (e.g., highest decibel measurements). This may reduce potential impacts to bats and to continued use of their habitat, but as noted in the Caltrans quote above, damage to lower frequency hearing cells in bats would still affect their survival.

Consultations between Commission staff and staff of the California Department of Fish and Wildlife (CDFW) during the course of this project's review have indicated that birds and bats experience permanent hearing loss at continuous sound exposure above 110 dB or with impulse noise above 125 dB. CDFW staff recommend that continuous sounds be kept below the temporary threshold shift or temporary hearing loss threshold of 93 dB and impulse noise should not exceed 110 dB at any point in operations measured at bat roosting locations. Bat habitat in Honda Canyon is expected to exceed these thresholds, as described above. However, due to the limited duration of these elevated sound levels, one minute during launches and 30 seconds during test firings, the effect they may have on bat habitat within the creek is uncertain.

Under Section 30240(b) development in areas adjacent to ESHA must be sited and designed to prevent impacts that would significantly degrade those areas and be compatible with the continuance of ESHA. However, there are not effective design options available to reduce the sound from static fire tests or launches. Commission staff asked DAF if a sound berm or wall would be a feasible way to minimize sound impacts. DAF informed Commission staff that the sound generation during launches is shaped like a dome over the rocket. As the rocket takes off, the dome expands. Unlike other sound sources, like highways, a sound wall or berm would not make an appreciable difference in decibel level for wildlife, including bats, in Honda Canyon during launches.

However, DAF has conducted bat monitoring on Vandenberg and has found significant bat populations on-base despite existing launch activities and periodic elevated sound levels. Although prior monitoring has not demonstrated impacts degrading bat habitat on site, Vandenberg has averaged 4.4 rocket launches annually over the past five years. The aspect of this project that is novel for pallid bat, western red bat, and other wildlife species is the proposed frequency of launch activities. As noted in the project description, Phantom proposes to slowly ramp up to conducting 48 launches a year, along with 48 static fire tests. To further demonstrate that elevated sound levels from launches will not be incompatible with the continued use of bat habitat, DAF has committed to conducting acoustic monitoring within the noise footprint of the launches, as shown in [Exhibit 7](#), to determine the extent to which bat species are present in Honda Canyon and to record and assess their call rates before and after rocket launches. DAF will provide the Executive Director with annual written reports on the data and results of their biological monitoring. While the information provided to the Commission by DAF does not indicate that adverse impacts to bats and bat habitat within Honda Creek would occur as a result of the proposed project, if the results of this

monitoring indicates that adverse impacts are indeed occurring, the Commission could consider re-opening its review of DAF's consistency determination.

In addition to providing annual reports, DAF has also committed to reporting back to the Commission five years into the project's operation, when Phantom is expecting to conduct 24 launches and 24 static fire tests annually. The 5-year report would provide information derived from monitoring efforts on how the Phantom project is or is not affecting the surrounding environment. Because extensive monitoring of launch activities and wildlife to date has not shown significant adverse impacts, the Commission expects that future monitoring would also not show significant impacts. The timing of the annual reports and 5-year report will enable the Commission to learn if unexpected impacts or new information is being found prior to Phantom starting its full launch schedule. If the monitoring and reporting shows significant new information about bat call rates from launch activities, the Commission may reopen this consistency determination in order to determine whether the impacts remain consistent with the CCMP and Section 30240 (15 CFR Section 930.46).

The continued coexistence of bat populations on Vandenberg with launch activities and periodic elevated sound demonstrate that elevated sound levels from launches do not significantly degrade bat habitat, are compatible with bats' continued use of their habitat, and are therefore consistent with Section 30240(b).

California red-legged frogs

All life stages of California red-legged frogs can detect noise and vibrations (DAF 2022) and are assumed to be able to perceive the engine noise produced by rockets. The proposed project thus has the potential to impact California red-legged frog habitat in Honda Creek. DAF states:

Engine noise would likely trigger a startle response in California red-legged frog, causing them to flee to water or attempt to hide in place. It is likely that any reaction would be dependent on the sensitivity of the individual, the behavior in which it is engaged when it experiences the noise, and the sound level (e.g., higher stimuli would be more likely to trigger a response). Regardless, the reaction is expected to be the same – the frog's behavior would be disrupted, and it may flee to cover in a similar reaction to that of a frog reacting to a predator. As a result, there could be a temporary disruption of California red-legged frog behaviors including foraging, calling, and mating (during the breeding season). However, frogs tend to return to normal behavior quickly after being disturbed.

DAF also provided estimates of the number of California red-legged frogs that are expected to be present within each noise level contour of the areas affected by launch noise.

Table 2: California Red-legged frog life stage estimates within each noise level contour from the Phantom project

Unweighted dB Lmax	Adult	Metamorph	Larvae	Egg Mass
100	19	2	90	13
110	12	1	50	13
120	2	0	0	3
130	0	0	0	0

There are no known studies on the impacts of launch sound on the hearing capabilities of California red-legged frogs, however Simmons et al. (2014) found hearing damage to American bullfrogs, which are in the same family as California red-legged frogs, when they were exposed to sounds greater than 150 dB. After hearing damage, the bullfrogs showed full functional recovery of their hearing within 3 to 4 days. California red-legged frogs likely have similar hearing structures and a similar resilience to sounds below 150 dB as well as an ability to recover from hearing damage. In its review of potential project impacts to California red-legged frogs, the USFWS states that, “the Service does not anticipate physiological effects to California red-legged frog’s inner ears at this time due to the short duration and lower noise levels of the project’s anticipated noise disturbance events.” However, the USFWS did find that operational noise may impact frog behavior, including calling frequency, and lead to increased risk of predation due to a “freeze” response to excessive sound. Despite anticipating some local negative effects, the USFWS found overall that:

Using the available information and considering minimization measures, including potential mitigation ensuring no net loss, we expect adverse effects to the recovery of California red-legged frogs on VSFB would be low. Therefore, we conclude that the proposed action would not appreciably reduce the likelihood of recovery of the California red-legged frog on VSFB, in the Northern Transverse Ranges and Tehachapi Mountains Recovery Unit, or rangewide.

...

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service’s biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog.

As discussed above, DAF has conducted long-term monitoring on Vandenberg to assess wildlife populations, including California red-legged frogs, and their response to

launch activities. DAF has consistently found that launch activities have not decreased California red-legged frog populations, and have only produced temporary observable changes in behavior. To further demonstrate that an increased frequency in elevated sound levels from launches will not be incompatible with the continued use of frog habitat, DAF has committed to monitoring and mitigation as part of its Biological Opinion with the USFWS.

In the Biological Opinion, DAF committed to placing passive bioacoustic recorders in Honda Creek and conducting California red-legged frog surveys. This monitoring program will be designed to track habitat occupancy, breeding behaviors (calling), and breeding success (egg mass and tadpole density). If habitat occupancy, calling frequency, or tadpole densities decline from baseline by 15% or more over two years, and the decline cannot be confidently attributed to other natural or human caused factors, DAF will mitigate for impacts to California red-legged frog breeding habitat. To offset any impacts found, DAF will create new California red-legged frog breeding habitat at the San Antonio Creek Oxbow Restoration Area, an established wetland site that is located outside of areas currently impacted by launch noise and site lighting on DAF. The full text of this commitment is available in the Biological Opinion excerpt in [Appendix A](#).

As discussed above, DAF has also committed to providing the Executive Director with written annual reports on the findings of its monitoring efforts and a comprehensive 5-year report on how the Phantom project is or is not impacting the surrounding environment. These reports will enable the Commission to respond to new information or unexpected impacts. Because the monitoring of launch events carried out on VSF to date has not shown significant adverse impacts to red-legged frogs or their habitat, the Commission expects that future monitoring would also not show significant impacts to California red-legged frog habitat.

With the information provided from DAF's monitoring programs, and the commitments provided by DAF for enhanced future monitoring and reporting prior to the full launch schedule, the proposed project is designed to prevent impacts that would significantly degrade California red-legged frog habitat, will be compatible with the continued use of Honda Creek by California red-legged frogs, and is consistent with 30240(b).

Western Snowy Plover

As mentioned above, snowy plover nesting habitat is farther away from the proposed project site and will receive lower sound levels. DAF has conducted monitoring of snowy plover nests during numerous launches at Vandenberg. In its consistency determination, DAF states:

Direct observations of wintering birds were made during a Titan IV and Falcon 9 launch from SLC-4E (SRS Technologies, Inc. 2006b; Robinette and Ball 2013). The Titan IV launches resulted in sound levels of 130 dBA Lmax. SNPL [snowy plover] did not exhibit any adverse reactions to these launches (SRS Technologies, Inc. 2006b; Robinette and Ball 2013) with

the exception of one observation. During the launch of a Titan II from SLC-4W in 1998, monitoring of SNPL found the nest located closest to the launch facility had one of three eggs broken after the launch (Applegate and Schultz 1998). The cause of the damaged egg was not determined.

More recently on 12 June 2019, SNPL response was documented during a SpaceX Falcon 9 launch and first stage recovery at SLC-4. The return flight of the first stage to VSBF produced a 3.36 psf sonic boom and landing engine noise of 138 dB Lmax and 130 dB SEL, as measured on South Surf Beach. SNPL response to the noise impacts was documented via pre- and post-launch monitoring and video recording during the launch event. Incubating SNPL captured on video were observed to startle and either jump or hunker down in response to the sonic boom. One SNPL egg showed signs of potential damage. This egg was part of a three-egg clutch in which the other two eggs successfully hatched. It is not uncommon for one or more eggs from a successful nest to not hatch. Failure of the egg to hatch could not be conclusively tied to the launch event (Robinette and Rice 2019).

The USFWS has also reviewed the potential for launch noise to impact snowy plover, and states, “Considering past monitoring results, we do not expect the proposed project’s individual launch and static fire events to result in short term observable effects, such as birds flushing from the nest. However, non-observable effects, such as increased heart rate or increased stress hormone levels could routinely occur. Consequently, the proposed project has the potential to contribute to long-term adverse effect that result from routine intermittent acute noise disturbance.”

However, with DAF’s proposal to monitor and mitigate for any impacts at the local level to achieve no net loss of the species, the USFWS ultimately concluded that:

After reviewing the current status of the western snowy plover, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service’s biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the western snowy plover.

As discussed above, DAF has conducted long-term monitoring on Vandenberg to assess wildlife populations, including snowy plover, and their response to launch activities. DAF monitoring to date has consistently found that launch activities have not decreased snowy plover populations, and has only produced temporary observable changes in behavior. To further demonstrate that an increased frequency in elevated sound levels from launches will not be incompatible with the continued use of snowy plover nesting habitat, DAF has committed to monitoring and mitigation as part of its Biological Opinion with the USFWS.

In the Biological Opinion, DAF committed to augmenting the existing snowy plover monitoring program on VSFB, which records habitat use, nesting efforts, nest fates, fledgling survival, and population size through each breeding season, with geospatial analysis of snowy plover nesting and the noise environment. Sound meters will be deployed immediately inland of South Surf Beach and a control site to characterize the noise environment during the breeding season within the noise footprint of Phantom launches. Geospatial analysis will be performed annually as Phantom's launch frequency increases to assess whether patterns of nesting activity, nest fates, or fledgling success are negatively impacted by noise from Phantom operations. If the geospatial analysis shows that a statistically significant decline in breeding effort or nest success over two consecutive years, and this decline cannot confidently be attributed to other natural or human caused factors, DAF will offset this impact by increasing predator removal efforts on VSFB to include the non-breeding season, particularly focusing on raven removal adjacent to VSFB beaches with a goal of achieving no net loss of the species. The full text of this commitment is available in the Biological Opinion in [Appendix A](#).

As discussed above, DAF has also committed to providing written annual reports to the Executive Director on the findings of its monitoring efforts and a comprehensive 5-year report on how the Phantom project is or is not impacting the surrounding environment. These reports will enable the Commission to respond to new information or unexpected impacts. Because the monitoring to date has not shown significant impacts to snowy plover populations on VSFB or their nesting habitat, the Commission expects that future monitoring would also not show significant impacts to snowy plover nesting habitat.

Therefore, with the information provided from DAF's monitoring programs, and the commitments provided by DAF for enhanced future monitoring and reporting prior to the full launch schedule, the proposed project is designed to prevent impacts that would significantly degrade snowy plover nesting habitat, will be compatible with the continued use of South Surf Beach for nesting, and is consistent with Section 30240(b).

Lighting

Artificial night lighting also has the potential to negatively impact California red-legged frogs. In studies on wood frogs, experimental exposure to artificial light at night was found to make them more vulnerable to other stressors such as parasites and pollution (DAF 2022). Another study focused on common toads found that artificial lighting reduced activity in male toads by half during the breeding season, and changed their energy metabolism, which has the potential to impact reproduction and overall fitness (DAF 2022). The effects of artificial lighting on frogs are inconsistent and vary by species and life stage; however enough research points to a potential for adverse impacts to California red-legged frog breeding that DAF found that the Phantom project was likely to adversely affect California red-legged frogs if appropriate protective measures were not implemented.

DAF has committed to minimizing the use of artificial lighting during the hours of darkness at the Phantom facility. DAF states, “The lights would be designed with the minimum lumens needed to meet operational and security requirements and would be shielded to minimize stray light from entering Honda Canyon.” Artificial lighting would only be used for necessary safety or performance of launch operations at night. Modeling of the preliminary lighting plan, as shown in [Exhibit 8](#), shows that lighting levels of 1-foot candle would not extend beyond the proposed facility.

As stated above, the USFWS reviewed the potential impacts of the Phantom project, including site lighting and excess sound to California red-legged frogs. The USFWS found that, with the commitments provided by DAF, the proposed Phantom project was not likely to jeopardize the recovery of California red-legged frogs.

With the available information from DAF’s monitoring programs, and the commitments provided by DAF for minimized site lighting, enhanced future monitoring and reporting prior to the full launch schedule, the proposed project is designed to prevent impacts that would significantly degrade California red-legged frog habitat, and will be compatible with the continued use of Honda Creek by California red-legged frogs, and is consistent with Section 30240(b).

Conclusion

As described above, DAF has sited, configured and designed the proposed project to avoid, minimize, and offset adverse effects on ESHA including Lemonade Berry Scrub, by re-developing a former space launch complex served by existing access roads and utility lines that was active until 1994 and decommissioned, minimizing the extent of the fuel break, committing to offsetting the loss of Lemonade Berry Scrub habitat by enhancing similar habitats within VSFB at a ratio of 6 to 1, directing launch exhaust away from Honda Creek, designing and shielding artificial lighting to limit potential spillover to riparian habitat at Honda Creek, and by committing to implementing a set of monitoring and management programs for special-status wildlife and their habitats. With these efforts and commitments, the Commission finds that the proposed project is consistent to the maximum extent practicable with Section 30240(a) of the Coastal Act, and consistent with Section 30240(b) of the Coastal Act.

E. MARINE RESOURCES AND WATER QUALITY

Coastal Act Section 30230 states:

Marine resources shall be maintained, enhanced, and, where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance.

Coastal Act Section 30231 states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health

shall be maintained and, where feasible, restored through...controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, [and] maintaining natural vegetation buffer areas that protect riparian habitats.

The proposed project has the potential to negatively affect water quality in Honda Creek and the Pacific Ocean due to construction, the use of deluge water, additional water supply needs, marine debris, and ocean release of the rockets' first stage. The proposed project also has the potential to adversely impact marine mammals in nearby ocean and shoreline areas due to launch noise. Both types of impacts are discussed further below.

Water Quality

Stormwater Runoff

Constructing the Phantom project at the former SLC-5 launch site would disturb soils, remove vegetation, increase impermeable surfaces and result in greater stormwater runoff from the site to coastal waters, including portions of Honda Creek that flow into the Pacific Ocean. Section 30231 of the Coastal Act requires that the quality of coastal waters and streams be maintained through controlling runoff. DAF has committed to controlling stormwater runoff and erosion during construction and operations through stormwater management measures, including:

- Installing hydroseed and erosion control measures on areas where temporary disturbances occur, and any areas that would be prone to erosion to protect sediment impacts to Honda Creek.
- Vegetation removal on the steep slopes on the east side of the site will be avoided to the extent practicable, unless necessary for fire safety.
- Securing the site from potential erosion resulting from rain and wind events including through preserving existing vegetation, to the extent feasible.
- Improvements to dirt roads would follow standard recommended practices to avoid and minimize erosion potential.

A full list of stormwater protection measures is available in [Appendix A](#). These measures will protect and maintain the quality of coastal waters and streams from stormwater runoff.

Deluge Water

Operation of the proposed space launch complex would include the use of deluge water during launches. The proposed launch pads at the new launch complex would have launch stools, where the rocket would be placed, and underneath the launch stool would be a flame bucket and flame deflector system. The flame bucket would be filled with an estimated 6,500 to 8,000 gallons of deluge water per launch. The deluge water would absorb vibration and heat from the rocket during the launch. Immediately downstream of the flame deflector, a concrete deluge containment basin would be provided that would collect deluge water runoff. The design of the deflector would direct

exhaust away from Honda Canyon as well. The deluge water has the potential to become contaminated with hydrocarbons during launches and could adversely impact the quality of coastal waters if it is discharged into Honda Creek and flows to the ocean.

DAF has stated that it will require Phantom to test the water in the deluge water retention basin for hydrocarbon contamination after each launch and also after storm events. This would include the use of a certified laboratory for the water quality testing. If the testing indicates that the water is of appropriate quality, it would be sent to the Industrial Wastewater Treatment Ponds on VSFB or discharged into the stormwater management area indicated in [Exhibit 4](#). Water discharged into this area would be expected to infiltrate directly into the ground. DAF has also stated that it will require Phantom to obtain a General Waiver for Specific Types of Discharges from the Regional Water Quality Control Board or other appropriate discharge permit prior to discharging any water out of the retention basin. The Commission believes that implementation of these measures is adequate to protect and maintain the quality of coastal waters and streams.

Water Supply

Operations of the proposed project would require a water line extension to be installed from the VSFB water supply line. Water uses at the Phantom site would include water for personnel and operational activities and deluge water for the launches, as discussed above. At the full proposed cadence of up to 48 launches per year, the annual amount of deluge water needed for Phantom operations would range between 100,800 to 480,000 gallons. In addition, up to 72,000 gallons would be required to support the personnel and operational activities at the proposed launch complex. The total maximum expected water supply need for the Phantom project is 552,000 gallons annually.

Section 30231 of the Coastal Act states that proposed projects should prevent depletion of groundwater supplies and prevent substantial interference with surface water flow. The water supply for VSFB includes four wells in the San Antonio Creek Basin. Any water line to the proposed launch complex would draw water from these wells. However, the maximum expected water usage of the Phantom project represents only 0.06% of the total annual water used on VSFB. In its consistency determination, DAF states that the proposed project's "water usage would...be negligible and not contribute in any measurable way to the collective effects of water extraction requirements for all VSFB operations." DAF has stated that the groundwater basin accessed by the wells has adequate supply to meet the projected needs of the project without becoming depleted. Therefore the Phantom project is not expected to contribute to depletion of groundwater supplies.

Ocean Release of Rocket First Stage

Components of Phantom's rockets, specifically the first stage, would be discharged into the ocean offshore of Baja California, Mexico, as part of normal operations. After a successful launch, the first and second stages of the Laguna-E and Daytona-E rockets

would separate during the main engine cut off flight phase. After separation, the first stage would fall back to earth and land in the ocean in international waters offshore of Baja California, Mexico. A map of the projected splashdown area for the first stage is provided in [Exhibit 9](#). The Daytona-E's first stage would weigh approximately 2,656 pounds, and the Laguna-E's first stage would weigh approximately 7,900 pounds. Both first stages would be primarily made up of aluminum. Upon re-entry to the atmosphere and impact with the ocean surface, the first stage would break apart into smaller pieces. At the proposed launch frequency of 48 per year, the total amount of first stage material proposed to be discarded into international waters offshore of Mexico would be a maximum of 379,200 pounds annually. These pieces of the first stage are expected to sink to the seafloor and remain in international waters. Since the first stage materials do not have buoyancy in water, they are not expected to move into California's coastal zone or have effects that would spill over into the coastal zone. Consistent with the Commission's efforts to address activities that contribute to marine debris and the discharge of waste into the ocean, however, staff have encouraged DAF to take steps to recover the first stage or offset its release into the ocean by collecting and removing other materials. DAF has not committed to taking any such steps, however, and has stated that they would exceed its legal requirements.

In addition to the physical materials of the first stage, it may also contain a limited amount of unused fuel when it reaches the ocean. In its consistency determination, DAF has stated that the first stage would contain no more than "a de minimis amount of fuel" and has defined this quantity as being less than 1% of the fuel needed for the launch. For the Daytona-E and Laguna-E space vehicles, this means up to 18 gallons and 40 gallons of fuel may remain in the first stage upon impact with the ocean, respectively. DAF also states in its consistency determination that the types of fuel that would be used for these space vehicles, RP-1 or Jet-A, have high volatility and evaporate quickly when exposed to the air, with over 90% of the mass of fuel remaining expected to evaporate within the first seven minutes and 99% of the mass remaining expected to evaporate within the first hour. Since this type of fuel is lighter than water, it would stay on top of the water's surface and spread into a very thin layer. This thin layer would create more surface area for evaporation and the total fuel amount is expected to completely evaporate by the end of two days.

In its consistency determination, DAF notes that cleanup of a spill of a small amount of very light fuel, like RP-1 or Jet-A fuel, is usually not possible given the rate of its evaporation. Due to the amount and characteristics of the fuel left in the first stage at impact, and the location in international waters offshore of Mexico where the first stage would land, the Commission finds that the de minimis amount of fuel is not expected to create effects with the potential to spill over into California's coastal zone.

Conclusion

In conclusion, with the stormwater protection measures in place, the testing of and appropriate discharge of deluge water, the minimal water supply needs of the proposed project, and the lack of coastal effects related to ocean release of the rockets' first

stages, the Commission finds the proposed project will protect the quality of coastal waters and therefore is fully consistent with the water quality and water supply protection policies of the CCMP.

Marine Resources

The proposed project also has the potential to adversely affect marine biological resources, including marine debris impacts and elevated sound level impacts to marine mammals. Marine mammals observed on or near the coastline of Vandenberg include: the Southern sea otter, Steller Sea Lion, Northern Elephant Seal, Pacific harbor seal, and California Sea Lion, and Guadalupe Fur Seal. There are also up to five sea turtle species, seven baleen whale species, and 22 toothed whales that may be found within the noise footprint of the proposed project offshore in the Pacific Ocean. Additionally marbled murrelet forage in the ocean offshore of Vandenberg. All of these species are considered species of special biological significance due to their roles in the ecosystem. As mentioned above and shown in [Exhibit 7](#), the expected engine noise during launches would affect the area between the Santa Ynez River and Sudden Ranch. Static fire engine tests would be conducted within several days prior to each launch. During static fire testing, when the vehicle is in a vertical position on the pad, the engine noise would be focused on the coast between SLC-4 and SLC-5 and would be contained entirely within VSFB, as shown in [Exhibit 7](#). [Exhibit 7](#) also provides maps displaying the modeled noise footprint with sea otter density and marine mammal haul out locations.

Marine Debris Impacts

Prior to launches, Phantom would release a 1.5 pound weather balloon to better understand upper atmosphere wind conditions. Attached to the weather balloon would be a small array of scientific instruments. Upon reaching an altitude of many thousands of feet above sea-level and providing the necessary data, a mechanism would be remotely triggered and the balloon would be torn open and destroyed. Although Phantom and DAF would attempt to recover these materials, the likelihood of such recovery is small due to the extreme height at which the balloon destruction would be triggered, the trajectory of its descent and the potential for it to sink or become lost in the ocean. If the balloon and associated materials would not be recovered, they would have the potential to land in the ocean and to become marine debris. Additionally, launches could contribute to marine debris if a mishap occurs, the rocket fails to launch successfully, and instead lands in ocean waters. These marine debris inputs could, depending on where they land, negatively affect areas of special biological significance, such as Channel Islands National Park, Channel Islands National Marine Sanctuary, and the state-designated marine protected areas offshore. To address these potential adverse impacts, DAF has committed to ensuring that Phantom provide contributions to the California Lost Fishing Gear Recovery Project to offset the release of unrecoverable debris in state and federal waters.

The California Lost Fishing Gear Recovery Project has removed lost or discarded commercial fishing gear from California waters since 2005. Their work now focuses on gear removal from the waters of Southern California, ensuring that gear recovery is occurring close to the areas of impact. Lost fishing gear is hazardous to divers and wildlife including seabirds, fish, turtles, sea otters and other marine animals. The entanglement hazards posed by lost fishing gear to wildlife are similar to the entanglement hazards from the weather balloon. Lost fishing gear, specifically traps, typically have a buoy attached with a line to a heavier trap; similarly, the weather balloon, which is relatively buoyant, is attached with lightweight lines to heavier scientific instruments. Thus, the weather balloon would be expected to pose similar entanglement risks to marine wildlife as lost fishing gear, and lost gear recovery will act as an effective offset for impacts.

On an annual basis, the amount of material potentially released into the ocean would be recorded and, for every one pound of such material, Phantom would make a compensatory donation of \$10.00 to the California Lost Fishing Gear Recovery Project, which the administrators of that program have confirmed would be sufficient to recover one pound of lost fishing gear. This commitment is consistent with compensation provided by other launch programs on Vandenberg for their marine debris impacts, including the recent negative and no effects determinations for the SpaceX and Stratolaunch programs (No. ND-0009-23). With this commitment, the proposed project is expected to maintain the biological productivity of coastal waters, including in areas of special biological significance.

Southern Sea Otter

Based on California Sea Otter Census Results in 2019, as collected by the US Geological Service and provided by DAF in [Exhibit 7](#), southern sea otters are present off the coast of Santa Barbara County at densities ranging from zero to three otters per square kilometer. Greater densities of otters are found further southeast, near Sudden Flats which has an extensive kelp bed habitat known to be preferred by otters.

Based on projected noise level modeling carried out by DAF and provided in its consistency determination, otters present directly offshore of the proposed launch site during launch and static fire testing events would experience maximum noise levels of between 115 and 120 dB. The area directly offshore of the proposed launch site does not provide the same quality of habitat for otters as areas further south and otters found there are often transiting through the area en route to the extensive kelp beds near Sudden Flats. Modeling carried out by DAF indicates that the otters in these kelp beds would experience noise levels of 100 to 110 dB during a launch event. To the human ear 120 dB would be as loud as a jet taking off and 110 dB would be as loud as a nightclub. However, marine mammal hearing differs from human hearing in the frequencies they hear best and their sensitivity to loud sounds. Southall et al (2019) produced thresholds to protect marine mammals from temporary threshold shifts (i.e. temporary hearing loss), and found that sounds must remain below 161 dB peak sound

pressure level (SPL)¹² to protect the hearing of sea otters in air. In water, sounds must remain below 226 dB peak SPL. The expected launch sounds from the proposed project would remain below both of these thresholds.

The Additionally, DAF states in its consistency determination:

Extensive launch monitoring has been conducted for sea otters on both north and south VSFB, with pre- and post-launch counts and observations conducted at rafting sites immediately south of Purisima Point for numerous Delta II launches from SLC-2 and one Taurus launch from Launch Facility-576E and at the rafting sites near Sudden Flats for two Delta IV launches from SLC-6. No abnormal behavior, mortality, or injury of effects on the population has ever been documented for sea otter because of launch-related disturbance (SRS Technologies, Inc. 2006a, 2006b, 2006c, 2006d, 2006e, 2006f, 2006g; MSRS 2007a, 15 2007b, 2007c, 2008a, 2008b). More recently, for the SpaceX Falcon 9 SAOCOM launch and landing...sea otters were monitored during pre- and post-launch surveys on south VSFB (MSRS 2018b). The sonic boom received at the otter monitoring location was estimated at 0.71 psf and the maximum landing engine noise at this location was estimated at 99.5 dB Lmax. Count totals of both pups and adults were similar before and after the launch and there was no discernable impact on otters on south VSFB.

Research conducted by DAF at Vandenberg on northern and southern sea otters behavior has found that they acclimate to periodic elevated sound levels. Extensive launch monitoring of sea otters on Vandenberg has shown that launch noise is not a primary driver of sea otter behavior or use of the habitat along Sudden Flats and has not had any apparent long-term consequences for populations. This population of otters may be acclimated to launch and military activities at Vandenberg. With the research and evidence provided by DAF, the Commission finds that the proposed project would not adversely affect individual sea otters or their local population or habitat offshore of Sudden Flats.

Seal and Sea Lion Haul Outs

The nearest seal and sea lion (collectively referred to as pinnipeds) haul out to the proposed project site is North Rocky Point, as shown in [Exhibit 7](#). During the loudest launch, pinnipeds at this location would experience sound levels of up to 110 dB, and static fire tests would produce sound up to 100 dB. In coordination with the National Marine Fisheries Service, DAF has monitored pinnipeds at Vandenberg during launches over the past twenty years and determined that a portion of the hauled out animals present react to (e.g., enter the water or dive under the water) sonic booms or other loud sounds, but that these behavior changes are temporary and have not negatively affected the numbers of pinnipeds that make use of the shoreline at Vandenberg.

¹² All sound levels for the proposed project would be below both the impulse and continuous sound thresholds developed to protect the hearing of marine mammals.

Behavioral responses to launch noises vary between pinniped species. Harbor seals and California sea lions tend to be more sensitive to disturbance than Northern elephant seals. In its consistency determination, DAF reported, “Numbers of hauled out pinnipeds typically return to normal within 24 hours or less after a launch event.” Like sea otters, pinnipeds entering or diving under the water during launch noise will significantly reduce their exposure to elevated levels of sound, because little sound is transmitted between the air-water interface (DAF 2022). The underwater temporary threshold shift threshold (temporary hearing loss) are at 212 dB peak SPL and 226 dB peak SPL underwater for true seals like harbor seals and sea lions/fur seals, respectively. For in-air sounds, the temporary threshold shift threshold is 138 dB peak SPL and 161 dB peak SPL, harbor seals and sea lions/fur seals, respectively (Southall et al. 2019). Given that the above-water sound is expected to peak at 110 dB and a significant amount of sound energy would be lost transmitting the air/water interface, diving into the water is expected to provide relief to pinnipeds seeking to avoid launch noise.

In both its consistency determination and as part of its consultation with the National Marine Fisheries Service, DAF has committed to monitoring pinnipeds during all launches at Vandenberg, including those launches proposed by Phantom. Between January 1 and June 30, pinniped monitoring at south VSFB haul out locations would occur at least 72 hours prior to a launch event and would continue at least 48 hours after each event. As stated by DAF in its consistency determination, if this monitoring demonstrates that launch activity results in injury or mortality to marine mammals, DAF would immediately cease launch activities and report the incident to NMFS¹³. DAF further states in its consistency determination that launch activities would not resume until NMFS is able to review the associated data and circumstances and work with DAF to determine the additional measures necessary to minimize the likelihood of further impacts to marine mammals. In such a situation, DAF would also notify the Executive Director and share relevant information to help determine if the activity is being conducted or is having an effect on any coastal use or resource substantially different than originally described and, as a result, is no longer consistent to the maximum extent practicable with the enforceable policies of the CCMP.

With the information provided by DAF on the potential effects of launch noise on pinnipeds, the absence of data demonstrating adverse impacts during similar launches over the past roughly 20 years of monitoring marine mammal populations along the shoreline of VSFB, the monitoring that would continue to be carried out as part of the proposed project, and DAF’s commitment to working with NMFS and the Commission to address any unexpected impacts on marine mammals, the Commission finds that the proposed project would not adversely affect pinnipeds and their haul out locations within the area of the proposed launch complex.

¹³ The DAF currently has a letter of authorization from NMFS authorizing incidental take of marine mammals under the MMPA. The LOA only authorizes harassment, not injury or mortality.

Offshore Marine Mammals and Sea Turtles

As mentioned above, up to five sea turtle species, seven baleen whale species, and 22 toothed whales may be found within the noise footprint of the proposed project offshore in the Pacific Ocean. Like the pinnipeds, these species would be provided with a measure of protection by the air-water interface separating them from engine sounds during launches. The lowest sound level threshold is 140 dB peak SPL for porpoises and other very high-frequency hearing marine mammals. This is well above the expected in-air engine noise of up to 110 dB, which would be further reduced underwater.

In addition to the engine noise, the launches proposed by Phantom would create sonic booms of up to 1.5 pounds per square foot. It should be noted that the strongest potential sonic boom would come from a Daytona-E launch vehicle, not the Laguna-E launch vehicle, which creates the loudest engine noise impacts. Due to the proposed launch trajectories and timing of rocket acceleration, the sonic booms from the proposed project would occur both south and west of San Miguel Island and Santa Rosa Island, which are part of Channel Islands National Park. [Exhibit 10](#) provides maps of the predicted sonic boom footprint of the Daytona-E and Laguna-E space vehicles. To many species of wildlife, sonic booms would sound like thunder, and most of the sonic boom strength from both space vehicles is modeled by DAF to be one pound per square foot of peak overpressure. The distance between where the sonic boom would occur over the ocean, and marine mammal haul out locations on the Channel Islands National Park will reduce the sound exposure to marine mammals that are hauled out on the beach. Additionally, the loss of energy between the air-water interface would protect submerged marine mammals, sea turtles, and other wildlife from sonic boom-related sounds in the Channel Islands National Marine Sanctuary and marine protected areas.

As mentioned earlier, NMFS has reviewed rocket launches at Vandenberg, and through its LOA, it has required DAF to avoid launches which are predicted to produce a sonic boom over the Northern Channel Islands during the harbor seal pupping season from March through June, whenever possible. Additionally, NMFS required increased monitoring when sonic booms were expected to exceed 2.0 pounds per square foot over the Northern Channel Islands, but none of the proposed launches will exceed this threshold. With the information by DAF on the potential effects of sonic boom and launch noise on offshore marine mammals, and DAF's commitment to working with NMFS and the Commission to address any unexpected impacts on marine mammals, the Commission finds that the proposed project would not adversely affect offshore marine mammals, pinnipeds, and their haul out locations on the Northern Channel Islands.

Marbled Murrelet

The marbled murrelet is a small seabird that breeds along the Pacific coast in old growth forests in the Pacific Northwest and Northern California. There is no known suitable breeding habitat for this species on VSF. Marbled murrelet range from Alaska

to California, and the species is considered rare to very rare most of the year in Santa Barbara County. However, it is somewhat regularly observed offshore north of Vandenberg in the late summer and is also found in the spring (DAF 2022). Marbled murrelet have been sited from coastal observation points located approximately 2 miles north of the proposed project site and at Purisima Point. Marbled Murrelet foraging off the coast would have the potential to experience engine noise of up to 120 dB during the launch of the Laguna-E rocket. Very little information exists on marbled murrelet's responses to elevated sound, however studies examining their responses to boat noise found that the birds dive and surface a short distance away. Therefore, DAF expects marbled murrelet to dive in response to launch noise, but to return to flying soon after each launch or static fire event. Due to the distance from the launch area, and the expected behavioral response of marbled murrelet, the Commission believes that the launch activities would not adversely affect marbled murrelets or their use of the ocean waters offshore of VSFB.

Marine Protected Areas

Northern Santa Barbara County and the northern Channel Islands include areas of special biological significance under the Coastal Act, including Channel Islands National Park, Channel Islands National Marine Sanctuary, and the state-designated marine protected areas offshore. Vandenberg state marine reserve is directly offshore of the area surrounding the proposed project site, and Point Conception state marine reserve is to the south. The proposed project has the potential to impact these areas of special biological significance through elevated sound levels and releases of marine debris. Sound levels in the air above a portion Vandenberg state marine reserve would reach up to 120 dB during launches, and these launch sounds would be significantly lower under water (DAF 2022). All other marine protected areas would receive lower sound levels the Vandenberg state marine reserve, and these sound levels would be further reduced under water.

As discussed above, the proposed project would involve the release of marine debris from weather balloons, some of which could enter marine protected areas. To address this issue, DAF would ensure that compensation to remove marine debris is provided for all debris inputs into state and federal waters. Due to the reduction in sound levels below the air-water interface, and the commitment to compensate for marine debris impacts, the proposed project is not expected to degrade areas of special biological significance and therefore these areas do not require special protection from the project.

Conclusion

In conclusion, with the evidence presented by DAF, including the commitment to continue monitoring and address any unexpected impacts to marine mammals, the Commission agrees with DAF's conclusion that the proposed project will maintain the biological productivity and quality of coastal waters and will appropriately protect marine resources. Additionally, with the commitment to compensate for marine debris inputs into state and federal waters, and with the evidence presented regarding the lack of significant effects from potential elevated sound, the Commission finds that the

proposed project will protect areas and species of special biological significance, and is consistent with Coastal Act Sections 30230 and 30231.

F. OIL SPILLS

Coastal Act Section 30232 states:

Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

The proposed project has the potential to result in the accidental release of petroleum products in two ways: potential fuel spills from construction equipment and spills from rocket fuel storage. Due to the location of the proposed space launch complex adjacent to and uphill from Arroyo Hondo Creek, a coastal stream that drains to the ocean, a significant spill during construction or operation has the potential to extend outside of VSFB and into coastal waters of the Pacific Ocean. In order for a project to be found consistent with Section 30232 of the CCMP, two tests must be satisfied. The first test requires DAF to demonstrate that they have provided for protection against spills of petroleum products or hazardous substances, and the second test requires that DAF provide “effective containment and cleanup facilities and procedures” for any spills that may occur.

Potential Fuel Spills from Construction Equipment

During construction of the proposed facilities, accidental spills of petroleum products may occur through leaks in fuel tanks of construction equipment, leaks from fuel trucks for refueling construction equipment or accidents during refueling operations. The largest potential fuel tank on site during construction activities would be the fuel truck with a capacity of 5,500 gallons, and therefore the largest possible spill would be 5,500 gallons.

To address the first test of Section 30232, DAF has committed in its consistency determination to implement spill prevention actions and procedures during construction, including:

- Ensuring all equipment will be properly maintained and free of leaks during construction activities. All necessary repairs to equipment will be performed in pre-designated, controlled, paved areas to minimize risks from accidental spillage or release.
- Fueling equipment will only occur in pre-designated staging areas on existing roadways or non-native vegetation. The staging areas are not within environmentally sensitive habitat or water bodies.
- Vehicles and equipment will only be washed within staging areas. High pressure washing of undercarriages and wheel wells will be prohibited at the project site.

To address the second test, DAF has committed in its consistency determination to implement spill response procedures during construction, including:

- Requiring that spill containment materials be placed around the construction equipment and fuel truck before refueling. Stationary equipment would be outfitted with drip pans and hydrocarbon absorbent pads.
- Requiring that Phantom maintain spill response equipment and supplies at the site during construction and operation for immediate response and cleanup of any fuel spills. The amount of response supplies determined to be “adequate” is based on guidance provided by Vandenberg’s installation-wide Spill Prevention, Control, and Countermeasures (SPCC) Plan.
- Requiring Phantom to ensure employees and contractor staff are trained in proper prevention and cleanup procedures.
- Requiring Phantom to submit a SPCC Plan to the Santa Barbara County Certified Unified Programs Agency for approval. This plan would be required to be consistent with the criteria included in Vandenberg’s installation wide SPCC plan. Some of the elements required in Phantom’s SPCC plan include:
 - Procedures for designating responsible owners or operators who are accountable for the management and oversight of oil storage tanks and containers and oil-filled equipment.
 - General annual spill prevention and response training requirements for shop-level personnel and for personnel designated to act as responsible owners or operators.
 - Procedures for performing inspections and reporting results.
 - Guidelines and training for using and maintaining spill response equipment.
 - Procedures for storing, handling, and managing oil on the construction site.

In addition to these requirements, DAF has stated, in a letter to Commission staff dated May 22, 2023, that under 40 CFR 112, the SPCC would include elements that the Commission considers critical for these plans, including: an oil spill risk and worst-case scenario spill assessment that includes oil spill trajectories and identification of the coastal resources at risk from oil spill impacts, response capability analysis of the equipment, personnel, and strategies (both on-site and under contract) capable of responding to a worst-case spill, including alternative response technologies, oil spill preparedness training and drills, and evidence of financial responsibility demonstrating capability to pay for costs and damages from a worst-case spill.

Possible Spills from Rocket Fuel Storage

During project operations, Phantom would establish a fuel storage area for RP-1 or Jet-A, which are kerosene-based fuels for the Daytona-E and Laguna-E rockets. RP-1 or Jet-A would be stored in portable tanks. At each launch pad, up to two 5,500-gallon tanks would be used for fuel storage. These tanks would be connected to a fuel transfer manifold, which would include a 275 gallon-per-minute pump, isolation valves, and a 4-

inch line from the storage area to the launch pad for fueling rockets. A leak in any of these systems has the potential to spill petroleum products at the site. The largest possible spill, if all four tanks were to be damaged and spill at once, would be 22,000 gallons or 523 barrels of fuel. In the event of a catastrophic failure with no containment or control measures, this would be enough fuel to travel from the proposed project site to Honda Creek and then to the ocean and beaches of the coastal zone outside of VSFB.

As a standard procedure on VSFB, DAF requires monthly and annual inspections and reporting for all fuel storage containers larger than 55 gallons. This would be applicable to the Phantom project. A separate inspection frequency and protocol is also required for containers less than 55 gallons. DAF will also require integrity testing for all above-ground storage tanks on a monthly basis.

Notwithstanding the measures that DAF would implement to prevent a spill from occurring, onsite secondary containment is also proposed to be constructed as part of the launch complex facility. This containment would be designed to be capable of holding the entire capacity of the single largest container as well as sufficient volume to hold precipitation from a 24-hour, 25-year storm, if the secondary containment area is uncovered. In the case of Vandenberg, this is an additional 3.5-4 inches of precipitation. As mentioned above, DAF would also require Phantom to maintain adequate spill response supplies at the site during operations. Finally, Phantom is required under 40 CFR 112 to develop an SPCC plan, described above, which complies with both state and federal law, and includes elements that the Commission considers critical for oil spill prevention, control, and response. The detailed criteria the plan is required to meet is included in Vandenberg's installation wide SPCC Plan. The Commission believes these measures are adequate to respond to an accidental spill and preclude fuel from reaching Honda Creek and the coastal zone.

In conclusion, with the inspections, reporting, secondary containment, spill preparedness, cleanup procedures discussed in these findings and the preparation of a site specific SPCC Plan, the Commission finds that the proposed project is consistent with Coastal Act Section 30232.

G. CULTURAL RESOURCES

Coastal Act Section 30244 states:

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

As discussed in the consistency determination it prepared for the project, DAF has investigated whether the proposed project, including the new proposed development at the former site of SLC-5, would adversely impact archaeological resources as identified by the State Historic Preservation Officer (SHPO). DAF identified four archaeological sites within the general area of the proposed project. However, of the four sites, only

one is eligible for the National Register of Historic Places.¹⁴ The remaining three sites were ineligible because they were either destroyed and capped with concrete during the construction of SLC-5 for the NASA scout facility or are not within the proposed construction footprint for the Phantom Project. When the NASA Scout launch facilities at SLC-5 were being demolished, the site was restored by retaining the concrete pad and covering the SLC-5 site with an overburden of several feet of clean fill soil. Phantom proposes to build on top of this clean fill and is not expected to unearth any archaeological sites.

Of the archaeological sites considered, only one is eligible for the National Register of Historic Places. This site is also the only one located where it has the potential to be affected by the project; it is bisected by Honda Canyon Road. However, the portion of Honda Canyon Road within the delineated boundaries of this site would not require improvements, and the proposed activities within the site would be limited to removal of vegetation from the existing paved road segment. No ground disturbance is proposed.

Further, DAF proposes to protect this site during vegetation removal activities by installing exclusionary fencing along both sides of Honda Canyon Road where it crosses the archaeological site. The SHPO received notice about the site and the protection measures proposed by DAF and, on May 17, 2022, concurred with DAF's determination that the proposed project would not have an adverse effect on cultural resources.

DAF also consulted with the Santa Ynez Band of Chumash Indians as part of its Section 106 process. DAF has stated to Commission staff that the Santa Ynez Band of Chumash Indians agreed with DAF's evaluation regarding the lack of potential effects to cultural resources with implementation of the proposed protective measures and concluded that no tribal monitors would be necessary as an additional measure of protection. As part of its review process, Commission staff also reached out to the Santa Ynez Band of Chumash Indians and several other Tribes with potential cultural connection to the project area, as indicated by the list provided to Commission staff by the Native American Heritage Commission. The Santa Ynez Band of Chumash Indians did not request additional coordination or consultation with Commission staff beyond what had already been carried out by DAF.

Commission staff, however, did receive a request for additional information and consultation from the Northern Chumash Tribal Council (NCTC). Commission staff scheduled a consultation with the NCTC and met with their representatives on May 25, 2023. During consultation, the NCTC stated that if the fill at the project site is demonstrated to be free of cultural resources, and no native soils are disturbed during construction activities, tribal cultural monitors would not be necessary. Commission staff is working with DAF to confirm that the fill material at the project site was tested and

¹⁴ The SHPO reviews nominations to the national register of historic places, and a location or resource being eligible for the national register of historic places means that DAF would need to assess the impacts of their project on that resource under NEPA.

would not potentially include cultural resources. If this is not the case, Commission staff would prepare an addendum to this report providing further clarification. The NCTC also discussed the need for early consultation with DAF on all projects at Vandenberg. The Commission supports the need for DAF to provide adequate outreach and to NCTC and other tribes with cultural connections to this area. The Commission offers to facilitate those conversations and information sharing for future projects through implementation of the Commission's Tribal Consultation Policy.

In conclusion, with the protective measures proposed by DAF, the Commission agrees with DAF and the concurrence of the SHPO that the project would not adversely impact archaeological or paleontological resources. The Commission therefore finds that the project is consistent with Section 30244.

H. COASTAL ACCESS & RECREATION

Coastal Act Section 30210 states:

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Coastal Act Section 30211 states:

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Coastal Act Section 30214 states, in relevant part:

(a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case . . .

The closest beaches to the proposed project site with public access include Jalama Beach County Park (Jalama), Surf Beach, and Ocean Beach Park. Current space launch operations on Vandenberg may result in a total of up to 12 temporary closures of Jalama, Surf Beach, Ocean Beach Park, and Point Sal Road annually. These closures typically last between one and four hours. The need for the closures is summarized by DAF in its prior submission for ND-0009-23:

Since 1979, an evacuation and closure agreement has been in place between the DAF and Santa Barbara County. For the safety of park visitors, the County Parks Department and the County Sheriff currently close the parks upon request from the DAF. This agreement includes closing Jalama Beach County Park, Ocean Beach County Park, Surf

Beach, and Point Sal Road, in the event of launch activities that have been determined by SLD 30 Range Safety to have certain human health and safety risks. These closures are communicated at least 72 hours' prior to closure and can be closed for a maximum of 48 hours per the agreement.

In the past, the Commission has agreed that beach closures are a necessary part of space launching activities at Vandenberg, and in its concurrence with DAF's consistency determination for the Evolved Expendable Launch Vehicle Program (CD-049-98), the Commission found that with the addition of mitigation measures that included efforts to schedule launches outside of holiday weekends and high beach use seasons, up to 12 temporary beach closures per year would be consistent with the coastal access and recreation policies of the CCMP.

The proposed project operations would include temporary closures at Jalama Beach and its campground but would not include any closures at Surf Beach or Ocean Beach Park. Whether or not launch activities would require a closure of Jalama and its campground would depend on mission-specific characteristics, such as launch angle, trajectory, and risk modeling. Closures of Jalama would limit public access to the coast and would restrict low-cost public lodging and recreation at the park's campground. In its consistency determination, DAF states:

The DAF has agreed to not exceed 12 beach closures per year (including Jalama Beach County Park) for all launch activities from VSFB. ... Phantom's proposed launches ... will not exceed or increase the current allowable annual beach closures.

With DAF's current commitment to remain under its existing cap of 12 temporary closures per year of Jalama, the proposed project would not generate new or additional adverse impacts on coastal access and recreation not previously examined and found to be consistent by the Commission in consistency determination no. CD-049-98 and by the Executive Director in subsequent negative determinations (including ND-103-03, ND-088-05, ND-055-10, ND-0027-15, and ND-0009-23). The Commission therefore finds that the proposed project is consistent with Coastal Act Sections 30210, 30211, and 30214 and their requirement to maximize public access in a manner that accounts for the need to restrict access based on site-specific constraints.

I. AIR QUALITY

Coastal Act Section 30253 states:

New development shall do all of the following:

(c) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Board as to each particular development.

The proposed project has the potential to produce air pollution emissions through construction of the proposed project facilities and through launch activities. Coastal Act Section 30253 requires that the proposed project be consistent with the requirements imposed by the Santa Barbara County Air Pollution Control District. Construction activities for the Phantom project include both emissions from construction equipment and from the use of up to two generators during construction. As part of its draft Environmental Assessment, DAF calculated the expected air emissions of the proposed project and found that all annual air emissions fell below the screening threshold for the Santa Barbara County Air Pollution Control District. **Table 3** below shows the expected annual emissions for air pollutants per year.

Table 3: Estimated Annual Air Pollutant Emissions from the Phantom Space Project

Year	Estimated Emissions (Tons)						
	CO	NO _x	VOC*	SO _x	PM _{2.5}	PM ₁₀	Pb
2023	1.313	0.883	0.194	0.136	0.154	0.154	0.00
2024	2.711	1.979	0.462	0.362	0.394	0.394	0.00
2025	9.014	8.407	2.022	1.670	1.792	1.793	0.00
2026	7.943	0.017	0.002	0.000	0.001	0.001	0.00
2027	35.524	0.416	0.058	0.002	0.012	0.016	0.00
2028	71.047	0.831	0.116	0.003	0.024	0.031	0.00
Annual Screening Threshold	100	100	100	100	100	100	100
Below Threshold for all years?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* At the time of analysis, ROC emissions factors were not available for the activities analyzed in this table. VOC emissions factors were instead used as a surrogate and reported in this table.

Notes: Values report as 0.000 are less than 0.0005 units; Screening Thresholds are 100 tons per year for all emissions reported.

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; VOC = Volatile Organic Carbons; SO_x = Sulfur Oxides; PM_{2.5} = Particulate Matter less than 2.5 Microns in Diameter; PM₁₀ = Particulate Matter less than 10 Microns in Diameter; Pb = Lead

Although the project falls below the PM₁₀ screening threshold, the Santa Barbara County Air Pollution Control District requires that all discretionary construction activities adhere to standard dust control measures, because Santa Barbara County exceeds the state standard for PM₁₀. DAF proposes to implement dust control measures consistent with the County’s requirements. These measures include, but are not limited to:

- Water shall be applied at least twice daily to dirt roads, graded areas, and dirt stockpiles created during construction and demolition activities.
- On-site vehicle speed limits shall be limited.
- Stockpiles of soil or other fine loose material shall be stabilized by watering or another appropriate method.
- Earth moving shall comply with Santa Barbara County Air Pollution Control District’s Rule 345, control of fugitive dust from construction and demolition activities.

A full list of the conservation and environmental protection measures Vandenberg would adhere to, including dust control measures is provided in [Appendix A](#).

Similarly, the project is expected to release greenhouse gas emissions through construction and launch activities. The expected annual greenhouse gas emissions are provided in **Table 4** below:

Table 4: Estimated Annual Greenhouse Gas Emissions

Year	Metric Tons	Significance Threshold	Below Threshold?
2023	118.56	25,000	Yes
2024	238.49	25,000	Yes
2025	925.48	25,000	Yes
2026	92.01	25,000	Yes
2027	433.31	25,000	Yes
2028	862.72	25,000	Yes

Overall, the proposed project is not expected to exceed the annual CO_{2e} threshold or the annual threshold for criteria pollutants. With implementation of the dust control measures described in [Appendix A](#), DAF would be consistent with the requirements imposed by an air pollution control district and thus the project would be consistent with Section 30253(c).