
COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION FOR GUAM

Submitted to:

Government of Guam
Bureau of Statistics and Plans
P.O. Box 2950
Hagatna, Guam 96932

Submitted by:

Virgin Orbit, LLC
4022 E Conant Street
Long Beach, CA 90808

OCTOBER 2020

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COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

Virgin Orbit, LLC (VO), under direction of the Federal Aviation Administration (FAA), has prepared a Draft Environmental Assessment (EA) pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States [U.S.] Code [USC] 4321, et seq.); Council on Environmental Quality NEPA-implementing regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508); and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. This Consistency Determination is part of VO's environmental compliance for carrier aircraft operations at Andersen Air Force Base (AFB), Guam.

VO has prepared this Consistency Determination to provide the Guam Coastal Management Program (GCMP) with VO's Consistency Determination under the Coastal Zone Management Act (CZMA) section 307(c)(1) and 15 CFR § 930, Subpart D, for aircraft activities that may have reasonably foreseeable effects on any coastal use or resource of Guam. The information in this consistency determination is provided pursuant to 15 CFR §§ 930.57 and 930.58. Proposed VO activities are described in Chapter 2 (Description of Proposed Action and Alternatives) of the Draft EA for Issuing a Launch Operator License to Virgin Orbit, LLC for LauncherOne Operations from Andersen Air Force Base, Guam. Potential environmental impacts on coastal resources are described in Chapters 3 (Affected Environment and Environmental Consequences) and 4 (Cumulative Impacts) of the Draft EA, and foreseeable coastal effects are summarized below.

The GCMP defines the "coastal zone" of Guam to include all non-federal property within the Territory, including offshore islands and the submerged lands and waters extending seaward to a distance of 3 nautical miles (nm). The United States federal government retained the rights to certain lands and mineral rights to include "all submerged lands adjacent to property owned by the United States above the line of mean high tide" in 48 USC § 1705(b)(ii). The National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resources oversees implementation of the CZMA and the GCMP provides day-to-day implementation of coastal management of waters or submerged lands outside of U.S. federal jurisdiction.

Proposed VO activities do not have the potential to affect uses and natural resources of Guam's coastal zone, as described in the attached completed GCMP Assessment Form and in the Draft EA. Per 15 CFR § 930.53, VO assessed reasonably foreseeable direct and indirect effects on Guam's defined coastal zone and Guam's resources, and reviewed relevant management programs (enforceable policies) of the GCMP in accordance with the CZMA. Proposed actions that could affect coastal uses or resources are subject to CZMA federal consistency requirements. This consistency determination has been prepared in accordance with Guam's Bureau of Statistics and Plans *Procedures Guide for Achieving Federal Consistency with the Guam Coastal Management Program*.

Based on the information, data, and analysis contained in the attached completed GCMP Assessment Form and in the enclosed Draft EA, VO finds that the proposed activities are consistent to the maximum extent practicable with the enforceable policies of the GCMP.

Pursuant to 15 CFR § 930.62, at the earliest practicable time, GCMP shall notify the Federal agency and the applicant whether the GCMP concurs with or objects to a consistency certification or object to this Consistency Determination, or to request an extension under 15 CFR § 930.62(b).

DATE OF APPLICATION: October 14, 2020
NAME OF APPLICANT: Virgin Orbit, LLC
ADDRESS: 4022 E Conant Street, Long Beach, CA 90808
TELEPHONE NUMBER: 661-754-4371 Fax: _____ Cell: 661-754-4371
E-MAIL ADDRESS: Collin.Corey@virginorbit.com

TITLE OF PROJECT:
LauncherOne Operations from Andersen Air Force Base, Guam

FOR BUREAU OF STATISTICS AND PLANS ONLY:

DATE APPLICATION RECEIVED: _____
 OCRM NOTIFIED: _____ LIC. AGENCY NOTIFIED: _____
 APPLICANT NOTIFIED: _____ PUBLIC NOTICE GIVEN: _____

OTHER AGENCY REVIEW
REQUESTED: _____

DETERMINATION:
☐ CONSISTENT ☐ NON-CONSISTENT ☐ FURTHER INFORMATION REQUESTED
 OCRM NOTIFIED: _____ LIC. AGENCY NOTIFIED: _____
 APPLICANT NOTIFIED: _____
 ACTION LOG: _____

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

DATE REVIEW COMPLETED:_____

DEVELOPMENT POLICIES (DP)

DP 1. SHORE AREA DEVELOPMENT

Intent: To ensure environmental and aesthetic compatibility of shore area land uses.

Policy: Only those uses shall be located within the Seashore Reserve that enhance, are compatible with, or do not generally detract from the surrounding coastal area's aesthetic and environmental quality and beach accessibility; or can demonstrate dependence on such a location and the lack of feasible alternative sites.

Discussion: **Not applicable.** The Proposed Action does not include any shore area development on Guam or shore area/land-based training activities.

DP 2. URBAN DEVELOPMENT

Intent: To cluster high-impact uses to ensure coherent community design, function, infrastructure support, and environmental compatibility.

Policy: Commercial, multi-family, industrial, and resort-hotel zone uses and uses requiring high levels of support facilities shall be concentrated within appropriate zone as outlined on the Guam Zoning Code.

Discussion: **Not applicable.** The Proposed Action does not involve the development of commercial, multi-family, industrial, or resort-hotel zone uses or uses requiring high levels of support facilities.

DP 3. RURAL DEVELOPMENT

Intent: To provide a development pattern compatible with environmental and infrastructure support suitability and which can permit traditional lifestyle patterns to continue to the extent practicable.

Policy: Rural districts shall be designated in which only low-density residential and agricultural uses will be acceptable. Minimum lot size for these uses should be one-half acre until adequate infrastructure including functional sewerage is provided.

Discussion: **Not applicable.** The Proposed Action does not involve residential development and agricultural uses.

DP 4. MAJOR FACILITY SITING

Intent: To include the national interest in analyzing the siting proposals for major utilities, fuel, and transport facilities.

Policy: In evaluating the consistency of proposed major facilities with the goals, policies, and standards of the comprehensive development and coastal management plans, Guam shall recognize the national interest in the siting of such facilities, including those associated with electric power production and transmission, petroleum refining and transmission, port and air installations, solid waste disposal, sewage treatment, and major reservoir sites.

Discussion: **Not applicable.** The Proposed Action does not involve construction or siting of major utilities, fuel, or transport facilities.

DP 5. HAZARDOUS AREAS

Intent: Development in hazardous areas will be governed by the degree of hazard and the land use regulations.

Policy: Identified hazardous lands, including flood plains, erosion-prone areas, air installations, crash and sound zones, and major fault lines, shall be developed only to the extent that such development

does not pose unreasonable risks to the health, safety, or welfare of the people of Guam and complies with the land use regulations.

Discussion: **Not applicable.** The Proposed Action does not involve development in hazardous areas.

DP 6. HOUSING

Intent: To promote efficient community design placed where the resources can support it.

Policy: The government shall encourage efficient design of residential areas, restrict such development in areas highly susceptible to natural and manmade hazards, and recognize the limitations of the island's resources to support historical patterns of residential development.

Discussion: **Not applicable.** The Proposed Action does not involve residential development.

DP 7. TRANSPORTATION

Intent: To provide transportation systems while protecting potentially impacted resources.

Policy: Guam shall develop an efficient and safe transportation system, while limiting adverse environmental impacts on primary aquifers, beaches, estuaries, coral reefs and other coastal resources.

Discussion: **Not applicable.** The Proposed Action does not include the development of transportation systems.

DP 8. EROSION AND SILTATION

Intent: To control development where erosion and siltation damage is likely to occur.

Policy: Development shall be limited in areas of 15 percent or greater slope by requiring strict compliance with erosion, sedimentation, and land use districting guidelines, as well as other related land use standards for such areas.

Discussion: **Not applicable.** The Proposed Action does not involve any development; therefore, erosion and siltation damage due to development would not occur.

RESOURCES POLICIES (RP)

RP 1. AIR QUALITY

Intent: To control activities to ensure good air quality.

Policy: All activities and uses shall comply with all local air pollution regulations and all appropriate federal air quality standards to ensure the maintenance of Guam's relatively high air quality.

Discussion: A comprehensive air quality impact analysis of the Proposed Action is presented in Section 3.3 (Air Quality) of the Draft EA and is summarized in the following paragraphs.

The proposed aircraft activities described in the Draft EA would occur mostly offshore of Guam, although some elements of the Proposed Action would occur within or over Andersen AFB and within or over the Guam coastal zone. Guam meets all national and local ambient air quality standards except for the area of the Cabras Power Plant, 20 miles southwest of Andersen AFB, which is in nonattainment for SO₂ primary NAAQS (U.S. Environmental Protection Agency [USEPA] 2020). The nonattainment area extends in a circle with a radius of 3.8 miles from the power-generating facilities. The study area is not within any nonattainment areas.

Most of the proposed aircraft activities would occur offshore, where attainment status is unclassified and Clean Air Act National Ambient Air Quality Standards (NAAQS) do not apply to nearer shore areas.

Pre-Flight and Post-Flight Activities

Emissions can occur from support equipment used during ground fueling operations, including trucks and equipment. Trucks would be driven to the carrier aircraft and the rocket would be fueled. Approximate travel time to the loading location is anticipated to be less than 10 minutes roundtrip. For each flight event, it is assumed that up to five trucks would be utilized. Given the small number of trucks used, and the short run-time of each truck, the total emissions from pre-flight and post-flight activities would be too small to lead to violations of the NAAQS. Five trucks operating for 1 hour each during 10 fueling operations would create approximately 0.00134 tons of carbon dioxide (CO₂) per year, and proportionately less emissions of other pollutants. Emissions associated with pre- and post-flight operations would be insignificant and would not be distinguishable from the impacts of the other flight and ground operations at Andersen AFB.

Carrier Aircraft Emissions

As described in Section 2.1, the Proposed Action would include a maximum of 10 flights per year in one year of the proposed 5-year operating period; the other 4 years would see <9 flights/year. The pollutants emitted by an aircraft during takeoff and landing operations are dependent on the emission rates and the duration of these operations. The emission rates are dependent upon the type of engine and its size or power rating. An aircraft operational cycle includes landing and takeoff operations and is termed the Landing and Take Off (LTO) cycle. An LTO cycle includes all normal operational modes performed by an aircraft between its descent from an altitude of about 3,000 ft on landing and subsequent takeoff to reach the 3,000 ft altitude. The term “operation” in this context is used by the FAA to describe either a landing or a takeoff cycle. Therefore, two operations make one LTO cycle. The aircraft LTO cycle is divided into five segments or operational “modes” and categorized by:

- landing approach (descent from about 3,000 ft to runway touch down),
- taxi/idle-in,
- taxi/idle-out,
- takeoff, and
- climb out (ascent from runway to about 3,000 ft)

The USEPA’s basic methodology for calculating aircraft emissions at any given airport in any given year can be summarized in six steps: (1) determine airport activity in terms of the number of LTOs; (2) determine the mixing height to be used to define an LTO cycle; (3) define the fleet make-up at the airport; (4) estimate time-in-mode (TIM); (5) select emission factors; and (6) calculate emissions based on the airport activity, TIM, and aircraft emission factors.

The emissions for the Proposed Action are based on the time of operation in each mode and the emission rates of the carrier aircraft engines. The time in the landing approach and climb-out modes are assumed to be 4.7 minutes and 3.0 minutes, respectively. The anticipated takeoff time is 0.5 minute and represents the time for initial climb from ground level to about 500 ft. The time in taxi/idle mode has been estimated as 15 minutes for both taxi/idle in and taxi/idle-out (FAA 2017).

Aircraft emissions for criteria pollutants were calculated by multiplying the TIM against respective emission factors and number of estimated flights. The increase in carrier aircraft

activities would result in a corresponding increase in criteria and precursor pollutant emissions. Although all would increase under the Proposed Action, air pollutant emissions under the Proposed Action would not result in violations of NAASQ because they would not have a measurable impact on air quality. Estimated emissions from the Proposed Action would account for less than 1% of the allowable emissions.

The USEPA has listed 188 hazardous air pollutants regulated under Title III (Hazardous Air Pollutants), Section 112(g) of the Clean Air Act. Hazardous air pollutants are emitted by processes associated with the Proposed Action, including fuel combustion. The amounts of hazardous air pollutants emitted are small compared to the emissions of criteria pollutants; emission factors for most hazardous air pollutants from combustion sources are roughly three or more orders of magnitude lower than emission factors for criteria pollutants. Hazardous air pollutant emissions estimates were not calculated because of the small amounts that would be emitted.

Under the Proposed Action, hazardous pollutant emissions would increase, and the increases would be roughly proportional to the increases observed for the criteria air pollutants emitted. Hazardous air pollutants emissions would be intermittent and distributed over the Andersen AFB study area. Their concentrations would be further reduced by atmospheric mixing and other dispersion processes. After initial mixing, it is possible that hazardous pollutants would be measurable, but they would be in very low concentrations and would not affect the air quality in the region. Therefore, no significant impacts to air quality would occur under the Proposed Action.

Based on the above analysis, VO finds that the proposed aircraft activities at Andersen AFB are fully consistent with the enforceable policy regarding air quality of the GCMP.

RP 2. WATER QUALITY

Intent: To control activities that may degrade Guam's drinking, recreational, and ecologically sensitive waters.

Policy: Safe drinking water shall be ensured and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuaries, reefs, and aquifer areas.

Discussion: Carrier Aircraft Operations at Andersen AFB – The Proposed Action does not involve construction activities that would potentially introduce non-point source pollution at Andersen AFB. The potential impact of operations is negligible as the LauncherOne propellants and pressurants are similar to those already in use at Andersen AFB with appropriate safety and pollution control measures in place. Any accidental spills associated with pre- and post-flight activities would be addressed by Andersen AFB emergency response procedures (refer to Draft EA Section 3.9). Therefore, implementation of the Proposed Action would not have significant impacts on water resources on Andersen AFB.

Based on the above analysis, VO finds that the proposed aircraft activities at Andersen AFB are fully consistent with the enforceable policy on drinking, recreational, and ecologically sensitive waters of the GCMP.

RP 3. FRAGILE AREAS

Intent: To protect significant cultural areas, and natural marine and terrestrial wildlife and plant habitats.

Policy: Development in the following types of fragile areas, including Guam's marine protected areas, shall be regulated to protect their unique character.

- Historical and archeological sites
- Wildlife habitats

- Pristine marine and terrestrial communities
- Limestone forests
- Mangrove stands and other wetlands
- Coral reefs

Discussion: The proposed aircraft activities do not include any development activities. The Draft EA provides detailed analyses of impacts on fragile areas (i.e., cultural and biological resources) listed above including federally owned lands.

Historical and Archeological Sites. Section 3.6 (Cultural Resources) discusses cultural resources on Andersen AFB. Routine aircraft operations at Andersen AFB have not been an issue for any previous National Historic Preservation Act (NHPA) Section 106 consultations. Future impacts to historic properties that are part of the built environment, which include the airfield proper (eligible for its WWII inception) and MSA-2 (eligible for its Cold War association), have been addressed with Historic American Engineering Records. While both the airfield and the MSA-2 structures are built to withstand the vibrations inherent in use of the airfield (e.g., B-52s have routinely used the runways and have done their power checks on the parking aprons, exercises are routinely conducted that result in ramped-up flight activities with a variety of aircraft, and the MSA-2 structures are built to contain the effects of explosions), any damage that might result from enhanced vibrations associated with the proposed B-747 carrier aircraft operations on the airfield would not affect eligibility of the airfield-related properties (36th Civil Engineer Squadron Environmental Flight [36 CES/CEV] 2020).

The Proposed Action, known as an undertaking per NHPA Section 106, would not result in any ground-disturbing activities and would not require any construction or modification of facilities at Andersen AFB. Proposed carrier aircraft operations would occur on existing apron, taxiway, and runway surfaces and there would be no changes to these areas under the Proposed Action. Carrier aircraft operations would be similar to military activities currently conducted on the same aprons, taxiways, and runways. Therefore, the Proposed Action would not result in significant impacts on historical, architectural, archeological, or cultural resources. The FAA has made a finding of No Historic Properties Affected in accordance with 36 CFR § 800.

Wildlife Habitats. **Not applicable.** Section 3.9 (Biological Resources) discusses wildlife and associated habitat on Andersen AFB. There would be no ground-disturbing activities associated with the Proposed Action and proposed aircraft operations would not impact wildlife habitat.

Pristine Marine and Terrestrial Communities. Section 3.9 (Biological Resources) of the Draft EA discusses marine and terrestrial communities. The Proposed Action does not involve land- or marine-based areas on Guam or activities that would affect terrestrial or marine communities on Guam.

Limestone Forests, Mangrove Stands, and Other Wetlands. **Not applicable.** The Proposed Action does not involve land-based areas on Guam or activities that would affect limestone forests, mangrove stands, and other wetlands on Guam.

Coral Reefs. **Not applicable.** The Proposed Action does not involve marine-based areas on Guam or activities that would affect coral reefs on Guam.

Aircraft activities occurring 3 nm beyond Guam would not result in effects to Guam coastal zone waters. Based on the analysis presented in the Draft EA, Section 3.6 (Cultural Resources) and Section 3.9 (Biological Resources) and information summarized above, VO has determined that the Proposed Action would be carried out in a manner that would protect

submerged cultural resources, and natural marine wildlife and plant habitats, from disruption and minimize adverse impacts on these fragile resources. Based on the above analysis, VO finds that the proposed aircraft activities at Andersen AFB are fully consistent with the enforceable policy on fragile areas of the GCMP.

RP 4. LIVING MARINE RESOURCES

Intent: To protect marine resources in Guam's waters.

Policy: All living resources within the waters of Guam, particularly fish, shall be protected from overharvesting and, in the case of corals, sea turtles, and marine mammals, from any taking whatsoever.

Discussion: Section 3.9 (Biological Resources) of the Draft EA provides analyses of impacts on biological resources, including marine resources. Based on the analysis presented in the Draft EA, Section 3.9 (Biological Resources), VO has determined that the Proposed Action would be carried out in a manner that would not impact marine resources. Aircraft activities occurring 3 nm beyond Guam would not result in effects to living marine resources in Guam coastal zone waters. Therefore, VO finds that the proposed aircraft activities at Andersen AFB are fully consistent to the maximum extent practicable with the enforceable policy to provide protection for living marine resources within the waters of Guam of the GCMP.

RP 5. VISUAL QUALITY

Intent: To protect the quality of Guam's natural scenic beauty.

Policy: Preservation and enhancement of, and respect for, the island's scenic resources shall be encouraged through increased enforcement of and compliance with sign, litter, zoning, subdivision, building, and related land-use laws. Visually objectionable uses shall be located to the maximum extent practicable so as not to degrade significant views from scenic overlooks, highways, and trails.

Discussion: **Not applicable.** All proposed aircraft activities would be in the areas currently used for aircraft activities, including military activities at Andersen AFB, and would have no impact on the aesthetic quality of the island of Guam's scenic views. There would be no reasonably foreseeable direct or indirect effects to the uses and resource of the Guam coastal zone from impacts on visual quality from proposed aircraft activities at Andersen AFB.

RP 6. RECREATION AREAS

Intent: To encourage environmentally compatible recreational development.

Policy: The Government of Guam shall encourage development of varied types of recreational facilities located and maintained to be compatible with the surrounding environment and land uses, adequately serve community centers and urban areas, and protect beaches and such passive recreational areas as wildlife, marine conservation and marine protected areas, scenic overlooks, parks, and historical sites.

Developments, activities, and uses shall comply with the Guam Recreational Water Use Management Plan.

Discussion: **Not applicable.** The Proposed Action does not involve recreational development.

RP 7. PUBLIC ACCESS

Intent: To ensure the right of public access.

Policy: The public's right of unrestricted access shall be ensured to all non-federally owned beach areas and all Guam recreation areas, parks, scenic overlooks, designated conservation areas, and their public lands. Agreements shall be encouraged with the owners of private and federal property for the provision of releasable access to and use of resources of public nature located on such land.

Discussion: **Not applicable.** The Proposed Action does not involve restrictions to public access to non-federally owned beach areas, Guam recreation areas, parks, scenic overlooks, designated conservation areas, and their public lands.

RP 8. AGRICULTURAL LANDS

Intent: To stop urban types of development on agricultural land.

Policy: Critical agricultural land shall be preserved and maintained for agricultural use.

Discussion: **Not applicable.** The Proposed Action does not involve development on agricultural land.

REFERENCES

36 CES/CEV. 2020. Status of Cultural Resources in Vicinity of Andersen AFB Runways. Personal communication via email from R. Olmo, Archaeologist and Cultural Resources Manager, 36 CES, Andersen AFB, Guam to R. Spaulding, Project Manager, ManTech International, Bainbridge Island, WA. May 17.

FAA. 2017. Final Environmental Assessment and Finding of No Significant Impact for Issuing a License to Virgin Orbit (LauncherOne), LLC for LauncherOne Launches at the Mojave Air and Space Port, Kern County, California. July.

USEPA. 2020. Status of Guam Designated Areas, Guam Areas by NAAQS. https://www3.epa.gov/airquality/urbanair/sipstatus/reports/gu_areabypoll.html. Last updated May 23; accessed May 24.

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FEDERAL CONSISTENCY SUPPLEMENTAL INFORMATION FORM

Date: October 14, 2020

Project/Activity Title or Description: LauncherOne Operations from Andersen AFB as described in the Draft EA for Issuing a Launch Operator License to Virgin Orbit, LLC for LauncherOne Operations from Andersen Air Force Base, Guam

Location: Andersen AFB

Other applicable area(s) affected, if appropriate:

Est. Start Date: March 2021 Est. Duration: 5 years

APPLICANT

Name & Title: Collin Corey, Manager, Systems Engineering/FAA Launch License

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AGENT

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E-mail Address: Rick.Spaulding@mantech.com

CATEGORY OF APPLICATION (check one only)

- () I Federal Agency Activity
- (X) II Permit or License
- () III Grants & Assistance

TYPE OF STATEMENT (check one only)

- ☒ Consistency
☐ General Consistency (Category I only)
☐ Negative Determination (Category I only)
☐ Non-Consistency (Category I only)

APPROVING FEDERAL AGENCY (Categories II & III only)

Agency: Federal Aviation Administration
Contact Person: Leslie Grey
Telephone No. during business hours: (907) 227-2113

FEDERAL AUTHORITY FOR ACTIVITY

Title of Law: 51 USC Chapter 509, Commercial Space Launch Activities
Section: 50905, License Applications and Requirements

OTHER GUAM APPROVALS REQUIRED

Date of: _____

Agency	Type of Approval	Date of Application	Status
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
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