UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

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MEMORANDUM FOR: The Record

FROM: Donna S. Wieting, Director
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SUBJECT: Adoption of the U.S. Air Force's Environmental Assessment on *Boost-Back and Landing of the Falcon 9 First Stage at SLC-4 West Vandenberg Air Force Base, California and Offshore Landing Contingency Option*

I. Background

I.A. NMFS' Proposed Action

The National Marine Fisheries Service (NMFS), a division of the National Oceanic and Atmospheric Administration (NOAA), is proposing to issue an Incidental Harassment Authorization (IHA) to Space Exploration Technologies Corporation (SpaceX) pursuant to Section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. §§ 1371 *et seq.*), and the regulations governing the taking and importing of marine mammals (50 Code of Federal Regulations [CFR] Part 216, Subpart I). The IHA would be valid from June 30, 2016, through June 29, 2017, and would authorize take, by Level B harassment, of marine mammals incidental to Falcon 9 First Stage rocket recovery activities at Vandenberg Air Force Base in California (VAFB) and at a contingency landing location on a barge approximately 31 miles (50 km) offshore of VAFB. Falcon 9 First Stage rocket recovery activities include in-air boost back maneuvers and landings.

NMFS' proposed action is a direct outcome of SpaceX's IHA request (received on January 29, 2015), which involves acoustic sources (e.g., sonic booms) that have the potential to cause marine mammals in the vicinity of VAFB and the nearby northern Channel Islands to be behaviorally disturbed and, therefore, warrants an authorization from NMFS. NMFS' IHA issuance criteria require that the unintentional taking of marine mammals authorized by an IHA will have a negligible impact on the species or stock(s) and, where relevant, will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. In addition, the IHA must set forth the permissible methods of taking, other means of effecting the

least practicable impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such taking.

I.B. U.S. Air Force's Proposed Action

The Environmental Assessment (EA), prepared by the U.S. Air Force (USAF), evaluates the potential environmental impacts associated with the recovery of the First Stage of the Falcon 9 rocket at Space Launch Complex 4 West (SLC-4W) at VAFB or on a special purpose barge no less than 31 miles (50 km) off VAFB's shore. The EA also addresses related infrastructure improvements at SLC-4W and the implementation of an autonomous flight termination system. The recovery of the Falcon 9 First Stage includes an in-air boost-back maneuver and vertical landing, and is conducted by Space Exploration Technologies Corporation (SpaceX), which operates the Falcon Launch Vehicle Program at VAFB. Up to six Falcon 9 First Stage recovery actions are proposed per year. The Proposed Action is needed so that SpaceX can implement missions for the USAF and the National Aeronautics and Space Administration (NASA), under the Space Act Agreement.

I.C. Comparison of USAF's Proposed Action to NMFS' Proposed Action

NMFS' proposed action (issuance of an IHA) would authorize take of marine mammals incidental to a subset of the activities analyzed in the USAF's EA that are anticipated to result in the take of marine mammals, (i.e., Falcon 9 First Stage recovery activities conducted by SpaceX). Thus, these components of the USAF's proposed action are the subject of NMFS' proposed action. To the extent that authorizing incidental takes of marine mammals may result in effects on other components of the human and natural environment, NMFS' environmental review evaluates those effects as appropriate or applicable. In this case, other components of activities analyzed in the USAF's EA not expected to result in incidental take of marine mammals, (i.e., infrastructure improvements at VAFB and the implementation of an autonomous flight termination system), are not the subject of NMFS' proposed action. The USAF's EA contains a thorough analysis of the environmental consequences of their proposed action on the human environment, including specific sections addressing the effects of sound on marine mammals and describing potential mitigation measures specific to marine mammals. In addition, since the scope of NMFS' environmental review pertaining to IHAs is limited to regulating takes of marine mammals, the mitigation and monitoring measures within NMFS' authority to impose via permits is specific to mitigating the impacts on the resources that are the subject of the IHA.
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II. Alternatives and Impact Assessment

II.A. Summary of the Alternatives Considered by the USAF

The USAF's EA considers a No-Action Alternative and two Action Alternatives:

No-Action Alternative: The No-Action Alternative is required by Council on Environmental Quality (CEQ) regulations as a baseline against which the impacts of the Proposed Action are compared. Under the No-Action Alternative, the concrete landing pad at SLC-4W would not be

constructed and the current launch processes would continue without using the boost-back capabilities of the Falcon 9 First Stage or autonomous flight termination system. Depending on the trajectory of the launch vehicle, the First Stage would drop into the Pacific Ocean approximately 300–500 mi. (480–800 km) west of the Baja California coast. The First Stage would subsequently sink and therefore would not be recovered. The potential impacts of the No Action Alternative have been previously analyzed in the *Final Environmental Assessment Falcon 9 and Falcon 9 Heavy Launch Vehicle Programs from Space Launch Complex 4 East Vandenberg Air Force Base, California.*

Action Alternative 1: Under Alternative 1 (the Proposed Action), infrastructure improvements at SLC-4W would occur, including construction of a landing facility for the Falcon 9 First Stage. Also under Alternative 1, the in-air boost-back maneuvers and landings of the Falcon 9 First Stage would occur. Landings would occur either on the landing pad constructed at SLC-4W or on a barge specifically designed for the landing located at least 31 miles (50 km) offshore of VAFB. Finally, under Alternative 1, implementation of an autonomous flight termination system for Falcon 9 launch and boost-back would occur. Alternative 1 was selected as the Proposed Action.

Action Alternative 2: Under Alternative 2 (the Alternative Action) the construction of a landing pad at SLC-4W would not occur. The Falcon 9 First Stage would therefore not land at VAFB and would only land on the barge specifically designed for the landing, which would be located 320 mi. (321.6 km) offshore of VAFB. The Falcon 9 First Stage would then be transported to Long Beach Harbor for offloading and transport back to VAFB.

II.B. Summary of Alternatives Considered by NMFS

No-Action Alternative: NMFS would not issue an IHA to SpaceX for the take of marine mammals incidental to activities described in the USAF's preferred alternative (for NMFS, this constitutes the NEPA-required No-Action Alternative). The effects of NMFS' No-Action Alternative are substantially the same as those of the USAF's No-Action alternative.

Action Alternative: NMFS would issue an IHA authorizing take of marine mammals incidental to activities described in the USAF's preferred alternative, with the mitigation, monitoring and reporting measures presented in NMFS' proposed IHA and the USAF's EA.

The USAF's EA includes consideration of a variety of mitigation, monitoring and reporting measures through incorporation of the IHA application. These measures include monitoring at the pinniped haulout site closest to the predicted sonic boom impact area and reporting of marine mammal reactions to sonic booms.

II.C. Environmental Consequences

The EA analyzed the impacts to biological resources as well as impacts to water quality, the physical and biological environment, cultural resources, and other aspects of the human environment. NMFS' proposed action concerns only the potential effects to the biological components of the environment. The anticipated impacts of the proposed action (Action

Alternative 1) on marine mammals are primarily from increased levels of airborne sound resulting from sonic booms associated with Falcon 9 First Stage boost-backs and landings. Noise levels from these activities may affect marine mammals; these effects are expected to be limited to behavioral disturbance. The analysis in the EA indicated these impacts would be short term and temporary.

Airborne sound associated with sonic booms could have an effect on wildlife as well as on humans in the VAFB vicinity. As such, the EA analyzed the impacts to wildlife as well as impacts to humans, marine vegetation, fish and benthic invertebrates and other environmental resources. The EA concludes the impacts associated with the proposed action are minor and temporary and result in no significant impacts, including impacts on species listed under the Endangered Species Act (ESA). No marine mammals are anticipated to be exposed to sound levels resulting in injury or mortality during the proposed action. Socioeconomics, environmental justice, the protection of children and the regional economy would not be significantly impacted as a result of the proposed action. There would be no disproportionately high and adverse environmental, human health and socioeconomic affects to minority and low income populations.

Recent and proposed projects at VAFB and other projects in the area were examined to determine possible cumulative impacts. All resource areas analyzed in the EA have been evaluated for cumulative impacts including past, present and reasonably foreseeable future actions. The analysis indicates that no significant cumulative impacts are anticipated because of the relative scale of projects and the nature and magnitude of specific impacts. The USAF's analysis indicates that the project would not result in significant impacts to the human environment; however, mitigation measures have been designed by NMFS and SpaceX to further reduce project impacts to marine mammals and other resources.

II.D. Public Involvement

NMFS' IHA: To allow other agencies and the public the opportunity to review and comment on the actions, NMFS published a notice of receipt of SpaceX's application and proposed IHA in the *Federal Register* on March 31, 2016 (81 FR 18574). The USAF's draft EA was also posted online with the publication of the proposed IHA. During the public comment period, NMFS received comments from the Marine Mammal Commission, which did not indicate that the environmental effects of NMFS' action were significantly controversial. The Commission recommended that NMFS issue the requested IHA, subject to inclusion of the proposed mitigation, monitoring, and reporting measures. NMFS concurs with the recommendation and will provide a response in the *Federal Register*. In addition, NMFS would make the IHA and USAF's Final EA available on the internet at *www.nmfs.noaa.gov/pr/permits/incidental*.

USAF's EA: The USAF made the Draft EA available for public review and comment. The USAF received one public comment on the Draft EA, which was deemed not significant. The USAF's Final EA and Finding of No Significant Impact will also be made available to the public.

III. Mitigation Measures and Monitoring and Reporting Requirements

NMFS' issuance of the IHA is conditioned upon the implementation of mitigation and monitoring designed to reduce impacts to marine mammals to the level of least practicable impact. The IHA, and USAF's, EA include details about the mitigation, monitoring and reporting requirements, summarized below.

III.A. Mitigation

Falcon 9 First Stage recovery actions will be scheduled to avoid, whenever possible, boost-backs and landings during the harbor seal pupping season of March through June, unless constrained by other factors including human safety or national security concerns.

III.B. Monitoring

Monitoring will include multiple surveys each day that record the species, number of animals, general behavior, presence of pups, age class, gender and reaction to noise associated with Falcon 9 First Stage recovery, sonic booms or other natural or human caused disturbances, in addition to recording environmental conditions such as tide, wind speed, air temperature, and swell.

III.C. Reporting

SpaceX is required to submit a report to NMFS within 60 days after each Falcon 9 First Stage recovery action.

IV. NMFS Review

The NMFS Office of Protected Resources (OPR) has reviewed the USAF's EA and concludes that the impacts evaluated by the USAF are substantially the same as the impacts of NMFS' proposed action to issue an IHA for the take of marine mammals. In particular, the EA contains an adequate evaluation of the direct, indirect and cumulative impacts on marine mammals and ESA-listed species. In addition, OPR has evaluated the USAF's EA and determined the EA includes all required components for adoption by NOAA, including:

- a brief discussion of the purpose and need for the proposed action;
- a listing of the alternatives to the proposed action;
- a description of the affected environment;
- a succinct description of the environmental impacts of the proposed action and alternatives, including cumulative impacts; and
- a listing of agencies and persons consulted and to whom copies of the Final EA are sent.

As a result of this review, the Office of Protected Resources has determined that the USAF's EA is complete and adequate to support NMFS' proposal to issue an IHA. It is therefore not necessary to prepare a separate EA or environmental impact statement to issue an IHA to SpaceX and adoption of the EA is appropriate.

V. Conclusion and Findings

The USAF's EA and NMFS' FONSI support the finding that no significant environmental impacts will result from NMFS' proposed action to issue an IHA for the incidental take of marine mammals related to SpaceX's Falcon 9 First Stage rocket recovery activities. Based on the environmental review and supporting analysis, the NMFS OPR has adopted the USAF's EA under the CEQ Regulations for Implementing the National Environmental Policy Act (40 CFR 1506.3).