

National Aeronautics and Space Administration  
**Headquarters**  
Washington, DC 20546-0001



Reply to Attn of: Space Technology Mission Directorate

**National Environmental Policy Act;  
Low Density Supersonic Decelerator Technology Demonstration Mission**

**AGENCY:** National Aeronautics and Space Administration (NASA), Space Technology Mission Directorate

**ACTION:** Finding of No Significant Impact

**SUMMARY:** Pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA policy and regulations (14 CFR Part 1216 Subpart 1216.3), NASA has made a finding of no significant impact (FONSI) with respect to the proposed Low Density Supersonic Decelerator (LDSD) Technology Demonstration Mission (TDM). Accordingly, an Environmental Impact Statement is not required. This mission would involve the launch, operation, and recovery of up to four Test Vehicles from a designated location on the Pacific Missile Range Facility (PMRF). Each test would involve a Test Vehicle with a small solid rocket motor, launched on a high altitude balloon from PMRF. The baseline plan calls for one test in the summer of 2014, and up to three tests in the summer of 2015.

**DATE:** 29 May 2013

**AVAILABILITY:** The Environmental Assessment (EA) and FONSI prepared for the LDSD TMD mission are available at:

<http://www.govsupport.us/nasaldsdea>, or  
<http://netpublic.grc.nasa.gov/eadocuments.cfm>, or  
[http://www.nasa.gov/mission\\_pages/tmd/ldsd/](http://www.nasa.gov/mission_pages/tmd/ldsd/).

**FOR FURTHER INFORMATION CONTACT:**

Mr. Steven W. Slaten  
NASA Management Office Environment and Facilities Manager  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
MS 180-801  
Pasadena, CA 91109  
(818) 393-6683

## **SUPPLEMENTAL INFORMATION:**

NASA has determined that the document entitled “National Aeronautics and Space Administration Low Density Supersonic Decelerator Technology Demonstration Mission Pacific Missile Range Facility Environmental Assessment” (hereinafter the “LDSD EA”) adequately and accurately analyzes the potential environmental effects of the proposed action. The LDSD EA and its underlying documents are hereby incorporated by reference in this FONSI.

**BACKGROUND:** The National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2451(d)(1)(5)) establishes a mandate to conduct activities in space that contribute substantially to “[t]he expansion of human knowledge of the Earth and of phenomena in the atmosphere and space,” and “[t]he preservation of the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere.” In response to this mandate, NASA, in coordination with the National Academy of Sciences, has developed a prioritized set of science objectives to be met through a long-range program of spacecraft missions.

As part of a prioritized set of science programs, NASA is currently undertaking a long-term Mars Exploration Program (MEP). The MEP is fundamentally a science-driven program that focuses on understanding and characterizing Mars as a dynamic system and ultimately addressing whether life is, or was, a part of that system through a strategy referred to as “follow the water.” The MEP would also ensure the development and demonstration of the technologies required to attain these goals.

The NASA Space Technology Mission Directorate (STMD) is responsible for direct management of NASA’s Space Technology programs. NASA’s Space Technology initiative develops and demonstrates advanced space systems concepts and technologies enabling new approaches to achieving NASA’s current and future missions. The STMD and the Space Technology initiative complement the technology development activities within NASA’s Mission Directorates, and deliver forward-reaching technology solutions for future NASA science and exploration missions and significant national needs.

The Jet Propulsion Laboratory (JPL) manages the LDSD TDM for NASA. The NASA Goddard Space Flight Center Wallops Flight Facility serves as the range operations and recovery agency for JPL on the Supersonic Flight Dynamics Test (SFDT) portion of the LDSD project. The United States Navy PMRF serves as the host range for the execution of the SFDT portion of the LDSD program. The NASA Columbia Scientific Balloon Facility is responsible for providing the balloon launch platform and launch services, and any required Federal Aviation Administration (FAA) transponders and strobes.

**DESCRIPTION OF THE PROPOSED ACTION:** The NASA JPL is proposing to conduct a series of SFDTs for NASA’s LDSD Project from PMRF in Kauai, Hawaii. These proposed tests would consist of launch, operation, and recovery of up to four missions from a designated location on PMRF. The purpose of the tests is to demonstrate and evaluate development of new supersonic inflatable aerodynamic decelerator (SIAD) and Supersonic Ring-Sail (SSRS) parachute technologies. These tests would allow the SIAD and SSRS parachute to fly in the Earth’s stratosphere at supersonic speed to simulate operation in the thin atmosphere of Mars. The Test Vehicle with its small solid rocket motor would be launched on a high altitude balloon from PMRF.

**NO-ACTION ALTERNATIVE:** Under the No-action Alternative, NASA would not conduct the Proposed Action. If in the future the agency decides to pursue the Proposed Action at a location other than PMRF, additional environmental analysis and documentation would be performed.

**ENVIRONMENTAL EFFECTS:** Fourteen areas of environmental consideration were initially evaluated for PMRF to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and waste, health and safety, land use, noise, socioeconomics, transportation, utilities, visual aesthetics, and water resources. Ultimately, 7 of the 14 areas of environmental consideration were addressed for the Proposed Action at PMRF, 4 of the 14 areas of environmental consideration were addressed for Niihau, and 6 of the 14 areas of environmental consideration were addressed for Open Ocean. The Global Environment was also analyzed for the effect of the Proposed Action on greenhouse gases and global warming, and the stratospheric ozone layer.

#### **Air Quality:**

**PMRF** — Negligible temporary increases in air emissions would occur from the launch of the SFDT. Due to the limited size and scope of the Proposed Action, air quality impacts as a result of pre-launch, flight test, and post-flight test activities would be minor and transitory. The SFDT launches would be short-term, discrete events, thus allowing time between launches for emissions products to be dispersed. No other construction projects, which would occur in the same locations and timeframe, have been identified. The total direct and indirect emissions from the execution of the Proposed Action, therefore, are not likely to result in adverse cumulative impacts to the regional air quality.

**Niihau** — Resource not applicable and not analyzed for this location.

**Open Ocean** — Resource not applicable and not analyzed for this location.

#### **Airspace:**

**PMRF** — The LDSD program would consist of up to four missions, beginning in the summer of 2014 and ending in the summer of 2015. The LDSD launches would be short-term, discrete events managed by the PMRF Range Control Facility. The Proposed Action would not occur at the same time as other regional programs. No other projects in the region of influence have been identified that would have the potential for adverse cumulative impacts to airspace. The use of the required scheduling and coordination process for Notice to Airmen (NOTAMs) will lessen the potential for adverse impact. No incremental, additive adverse cumulative impacts to airspace use have been identified.

**Niihau** — Up to four overflights of Niihau from approximately June to July 2014 and June to August 2015 would not result in adverse impacts to the island's airspace. Approximately one flight would be conducted in 2014 and up to three in 2015.

**Open Ocean** — Launches are short-term, discrete events that are actively managed by PMRF range safety. The Proposed Action is not scheduled to occur at the same time as other regional programs. The use of the required scheduling and coordination process for area airspace, and adherence to applicable DoD directives and FAA regulations concerning issuance of NOTAMs and selection of the Test Vehicle firing areas and trajectories, lessens the potential for substantial incremental, additive, adverse cumulative impacts.

### **Biological Resources:**

**PMRF** — Up to four LDSV vehicles would be launched from PMRF from approximately June to July 2014 and June to August 2015. The Proposed Action when combined with current and proposed launch activities would have little or no impact to biological resources. These combined activities would be performed at varying times and locations on PMRF and should have negligible cumulative impacts on biological resources. No substantial cumulative impacts to biological resources have been identified as a result of prior launches from PMRF. The Proposed Action would not affect the Papahānaumokuākea Marine National Monument.

**Niihau** — Up to four LDSV Test Vehicles would be launched from PMRF from approximately June to July 2014 and June to August 2015. These launches could potentially overfly Niihau, but are not anticipated to impact biological resources on the island. No substantial adverse cumulative impacts to biological resources are expected. The Proposed Action would not affect the Papahānaumokuākea Marine National Monument.

**Open Ocean** — The Proposed Action would not result in any direct impacts on the coral or degradation of water/sediment quality in the vicinity of the corals. PMRF strictly controls launches and does not permit an exercise to proceed until the range is determined clear after consideration of inputs from ships' sensors, visual surveillance of the range from aircraft and range safety boats, radar data, acoustic information from a comprehensive system of sensors, and surveillance from shore. Implementation of these controls minimizes the potential for cumulative impacts to marine species. No substantial adverse cumulative impacts are anticipated from the four planned LDSV launches. The Proposed Action would not affect the Papahānaumokuākea Marine National Monument.

### **Cultural Resources:**

**PMRF** — Under the Proposed Action, identified historic properties are situated some distance from PMRF's Red Label Area launch point and would not be affected by LDSV activities.

**Niihau** — Under the Proposed Action, there are no known historic properties that would be affected at Niihau.

**Open Ocean** — Under the Proposed Action, there are no known historic properties that would be affected within the Open Ocean Area.

### **Hazardous Material and Waste:**

**PMRF** — The pre-launch and launch activities represent routine types of activities at PMRF. Hazardous materials used and waste generated, as a result of the SFDT activities would not exceed the existing hazardous waste permit conditions on PMRF. Solid propellants used with the SFDT will be self-contained and not pose a risk of spill. The types of hazardous materials used and waste generated would be similar to those currently used and generated at PMRF and would follow existing PMRF Standard Operating Procedures. All hazardous waste would be disposed of in accordance with the PMRF Hazardous Waste Management Plan. Implementation of the Proposed Action would not introduce new types of hazardous materials and wastes. As a result, no substantial adverse impacts from the management of SFDT Project related hazardous materials and waste are anticipated.

**Niihau** — Resource not applicable and not analyzed for this location.

**Open Ocean** — The implementation of the Proposed Action would not introduce new types of hazardous materials and waste into the Open Ocean Area, and only small increases in quantities of previously introduced types of hazardous waste are expected. Therefore, no substantial adverse cumulative impacts from the management of hazardous waste and materials are expected in the Open Ocean Area.

### **Health and Safety:**

**PMRF** — As a major established test range, PMRF routinely provides safety support and infrastructure for multiple test and training programs. All missions or projects are closely reviewed and analyzed to ensure that there are no unacceptable risks to the public, Government and military personnel, and contractors. The Proposed Action activities would not occur at the same time as other regional programs. PMRF range operations management would regulate the site preparation, operational, and post-flight activities to ensure that established safety procedures and protocols are followed. As such, no adverse cumulative impacts to health and safety are anticipated from the Proposed Action.

**Niihau** — Up to four LDSV vehicles would be launched from PMRF during approximately June to July 2014 and June to August 2015. These launches could potentially overfly Niihau, but are not anticipated to impact the health and safety of the residents on the island. No substantial adverse cumulative impacts are expected.

**Open Ocean** — Launches are short-term, discrete events that are actively managed by PMRF range safety. The Proposed Action is not scheduled to occur at the same time as other launch programs. The use of the required scheduling and coordination process for area airspace, and adherence to applicable DoD directives and FAA regulations concerning issuance of NOTAMS and selection of the Test Vehicle firing areas and trajectories, lessens the potential for substantial incremental, additive, health and safety adverse cumulative impacts. The Recovery operations would not adversely affect the health and safety of those involved with retrieving the Test Vehicle and the balloon.

### **Socioeconomics:**

**PMRF** — The implementation of the Proposed Action would have a temporary positive impact on the local economy during each SFDT launch. There would be no adverse impact on the permanent population size, employment characteristics, schools, and type of housing available on island.

**Niihau** — Resource not applicable and not analyzed for this location.

**Open Ocean** — Resource not applicable and not analyzed for this location.

### **Water Resources:**

**PMRF** — The amount of exhaust products from the SFDT that could potentially be deposited due to the Proposed Action would be small, and no cumulative impacts are expected. Test vehicle hardware, debris, and propellants that could fall into the ocean are expected to have only a localized, short-term effect on water quality. Because of the minimal risk from fuel or other hazardous material spill or leakage to occur during the Proposed Action activities, no substantial adverse cumulative impacts to water resources are anticipated.

**Niihau** — Resource not applicable and not analyzed for this location.

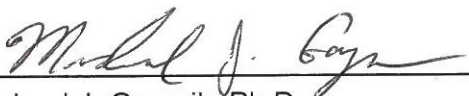
**Open Ocean** — No cumulative effects to water resources are anticipated as a result of the Proposed Action. The effect of any rocket motor emission products deposited in the open ocean would be very transient due to the buffering capacity of seawater and dilution by ocean current mixing and would not be expected to result in any adverse cumulative effects.

**For the Global Environment:**

On a global basis, the Proposed Action would release a minute quantity of carbon dioxide compared to anthropogenic releases worldwide and the CEQ's draft threshold guidance. The limited amounts of emissions would not contribute significantly to cumulative global warming; however, any emissions of greenhouse gas represent an incremental increase that could have incremental effects on the global atmosphere. Because the LDSD launches would release little or no ozone depleting substance, there would be no adverse cumulative impacts on the stratospheric ozone layer.

**CONCLUSION:**

On the basis of the LDSD EA and underlying reference documents, the NASA has determined that the environmental impacts associated with this Proposed Action will not individually or cumulatively have a significant effect on the quality of the human environment. Accordingly, the requirements of NEPA and the CEQ Regulations, 40 CFR Parts 1500-1508 are fulfilled and an environmental impact statement is not required.

  
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Michael J. Gazarik, Ph.D.  
Associate Administrator  
Space Technology Mission Directorate

May 10, 2013  
Date