

**FINDING OF NO SIGNIFICANT IMPACT (FONSI)  
ENVIRONMENTAL ASSESSMENT  
SPACE TEST EXPERIMENTS PLATFORM MISSION 1  
VANDENBERG AIR FORCE BASE, CALIFORNIA**

**AGENCY:** United States Air Force (USAF), Headquarters space and Missile Systems Center (HQ SMC), Environmental Management Division (CEV)

**COOPERATING AGENCY:** Department of Defense (DOD) Space Test Program (STP)

**BACKGROUND:** Pursuant to the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing the Act (40 CFR Parts 1500-1508), DOD Directive 6050.1, Air Force Regulation 19-2, which implements these regulations in the Environmental Impact Analysis Process (EIAP), and other applicable Federal and local regulations, the USAF has conducted an assessment of the potential environmental consequences of the proposed implementation of the Space Test Experiments Platform Mission 1 (STEP M1) Program and alternatives.

**PROPOSED ACTION:** The DOD STP proposes to launch the STEP M1 spacecraft from Vandenberg Air Force Base (VAFB), California. STP is procuring a space vehicle based on an adaptable spacecraft bus to support numerous STP experiments. The overall goal of the STEP program is to support DOD in obtaining vitally needed scientific data about space and the earth's environment by creating low-cost, lightweight, standardized satellites for science payloads. The payload for this first mission of STEP consists of four DOD experiments, each designed to research different facets of the atmosphere. Once analyzed, this data will promote technological advances in high frequency communications, atmospheric modeling for aircraft and spacecraft, and provide possible insight into the prediction of geophysical phenomena such as earthquakes.

The space launch vehicle planned to launch the STEP M1 is the Air Force Small Launch Vehicle (AFSLV), known commercially as the Pegasus XL. The standard Pegasus launch vehicle and associated activities for placing the satellites in orbit have been evaluated in the AFSLV Environmental Assessment (EA) (May 1991) and the Pegasus EA (October 1989). The launch vehicle processing and integration facilities (Building 1555 and Hot Pad Loading Area) at VAFB were previously evaluated in the Orbital Sciences Corporation (OSC) Commercial Launch Services Program EA (March 1993). These facilities will be used to support the proposed action. A FONSI was approved for each of these actions. The EA for the proposed action updates and supplements the evaluation in these previous documents as necessary to complete the environmental analysis.

The STEP M1 launch will be the first flight of the AFSLV, and STEP M1 would be the only payload on this launch. The AFSLV would be carried aloft by an OSC-modified Lockheed L-1011 passenger aircraft, which would take off from the existing airfield on North VAFB. An F-16 chase aircraft, originating from Edwards Air Force Base, California, will be used for visual observations to improve flight safety.

It is a mission requirement to fly four DOD experiments in a 80° inclination polar orbit at specified altitudes to collect data on ionospheric propagation phenomena and obtain measurements of upper atmospheric composition and dynamic processes. The high inclination is needed to allow coordination between spacecraft receivers and various ground transmitters. The on-board propulsion system will provide orbit maintenance, since the low perigee (point in the satellite's orbit that is nearest the earth) will result in significant drag and continually lower the orbit energy. Existing USAF remote tracking stations around the world will be used to gather data from the satellite. STEP M1 has a planned operational life of 6 to 12 months. At the end of its operational life, all on-board fuel will be consumed, the orbit will decay, and the satellite will re-enter the atmosphere.

The proposed action involves the processing and launch of the STEP M1 spacecraft at VAFB. The STEP M1 program would include the use of three existing facilities on North VAFB:

- Building 1555 (Vehicle Integration Facility) for mission processing,
- the Pegasus Hot Pad Loading Area, and
- the airfield for takeoff and landing of the L-1011 aircraft.

**ALTERNATIVES TO THE PROPOSED ACTION:** As required by NEPA, HQ SMC considered other alternatives to the proposed action. There are no other available launch vehicles or combinations of systems in the U.S. inventory that can fulfill mission requirements of the STEP M1. Use of the limited payload opportunities on existing Titan, Atlas and Delta launch vehicles would place additional requirements on schedules, planning, and availability, and may result in the inability to carry out the STEP M1 mission as planned. Use of these launches would place small payloads in suboptimum orbits with larger payloads, adding unacceptable risk to satellite performance. Other vehicle or program concepts submitted as AFSLVs are not alternatives because they have not been developed and are not available.

A variety of launch sites were initially considered. Previous Pegasus missions have been flown from the National Aeronautics and Space Administration (NASA) Dryden Flight Test Facility at Edwards Air Force Base. Each of these missions have used, and will use, a NASA B-52 aircraft as the launch platform. There are two Pegasus missions remaining. Use of the Dryden Flight Test Facility is not possible for STEP M1 because NASA has decided to no longer support other commercial endeavors after the last Pegasus mission is flown. The Dryden facility will no longer support OSC activities after 1994. For these reasons, the only site considered is VAFB. This site has been approved for this program by the Air Force.

Use of a B-52 aircraft for the STEP M1 launch is not possible because the longer and heavier Pegasus XL was not designed or manufactured to be carried by the B-52. OSC has made the decision to depart from use of the NASA aircraft in favor of a completely commercial L-1011 carrier aircraft.

Although the AFSLV may be launched from Wallops Island or the Eastern Range at some later date, the specific mission of the STEP M1 requires an inclination for the orbit that is higher (80°) than would be possible from the Eastern Range (39° to 57°) or from Wallops Island off the coast of Virginia. Therefore, these sites are not being considered as alternatives to STEP M1 launch at this time.

HQ SMC also considered the no action alternative. If the STEP M1 program is not implemented as planned, DOD would not be able to fulfill the mission requirement. Under the no action alternative, it would not be possible to obtain the scientific and experimental data required for mission accomplishment. Specifically, there is no other alternative to this proposed method of collecting the atmospheric and ionospheric data. Each of the experiments would obtain unique data that can only be collected in space, in a low-earth orbit, and at the specific altitudes and atmospheric conditions required for each experiment. There are no other space experiments planned to gather this data in the areas needed to support DOD atmospheric and ionospheric models. It was therefore determined that the no action alternative would not meet mission requirements.

The Air Force has considered all of the above alternatives, and has selected the proposed action as the preferred alternative.

**SUMMARY OF FINDINGS:** The EA evaluated the environmental impacts at VAFB, with regard to the STEP M1 ground processing and launch at VAFB, in-orbit operation, and orbital decay and reentry. The following environmental areas were assessed for environmental effects in this EA: air quality, global climate change and stratospheric ozone depletion, waste management, noise, public services, utilities and transportation, socioeconomics, hydrology and water quality, natural resources, energy, visual resources, and safety and risk. Because the proposed action does not include the construction of any new ground facilities, the topics of biological resources, cultural resources, coastal resources, and soils and geology have not been evaluated.

Activities conducted in support of satellite processing and launch at VAFB including forklift unloading, alcohol wipedown, hydrazine transfer, assembly truck transfer, hydraulic lift for attachment, and takeoff and landings of the L-1011 and F-16 aircraft, will result in emissions to the atmosphere. Since these emissions are minor in quantity, and generated during a very short period of time at a location that is isolated from the general public, the impact to air quality is considered insignificant.

The emissions of greenhouse and ozone-depleting compounds from the STEP M1 launch will affect the atmospheric concentrations of these compounds. However, the significance of the launch impact is small.

Minimal amounts of hazardous and nonhazardous waste will be generated over a short period of time during satellite processing. All hazardous materials, including the hydrazine fuel, will be handled in accordance with applicable federal, state, and local regulations and safety plans.

STEP M1 processing and launch operations will not produce significant noise levels.

No new community facilities or services will be required for the proposed action. Transportation services and traffic will not be significantly affected, due to the limited number of personnel required for on-base processing and launch operations.

Socioeconomic resources, including populations, housing, and employment, will not be adversely affected by STEP M1 processing and launch at VAFB. The additional 20 personnel required for the proposed action will be only temporary.

Facility renovations have already been performed in support of processing activities at VAFB. No significant impacts on hydrology and water quality are anticipated. Water use required to support the temporary personnel during processing activities will be minimal.

Natural and visual resources at VAFB will not be affected by the proposed action.

Energy requirements of the STEP M1 project are minimal, and not considered significant.

Identified safety concerns have been considered in planning for STEP M1 processing at VAFB. Safety procedures have been developed, reviewed, and approved. Final risk levels are considered acceptable.

A review of the regulatory requirements indicated that no permits will be required for the proposed action.

No significant environmental impacts are expected as a result of ground processing and launch at VAFB, in-orbit operation, and orbital decay and reentry of the STEP M1. Potential impacts are either not anticipated, or may occur at less than significant levels. No mitigation measures are required for the proposed action.


**POINT OF CONTACT:** A copy of the STEP M1 FONSI and EA, 5 January, 1994, may be obtained from, or comments on these documents may be submitted to:

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