

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
CONSTRUCTION AND OPERATION OF BERYLLIUM PROPELLANT FACILITY
ROCKET PROPULSION LABORATORY, EDWARDS AIR FORCE BASE

INTRODUCTION

1. The United States Air Force proposes to develop a facility to test beryllium-fueled solid rocket motors. The Beryllium Propellant Facility (BPF) will be located at the Rocket Propulsion Laboratory (RPL), Edwards Air Force Base (EAFB) in California. The facility will be operated by RPL, and the data generated will support the Department of Defense Strategic Defense Initiative Program. The project site is located entirely in Kern County, in the eastern portion of EAFB. The facility, access, and utilities will disturb about three to four acres. Construction of the BPF is estimated to require 12-13 months.
2. The BPF will provide altitude simulation experimentation to gather performance data in near-vacuum conditions. Currently, no large full-scale test facility exists for beryllium rocket motors. The BPF will test motors containing up to 150 lbs. Of solid propellant with a maximum beryllium content of 20% by weight. A total of 65 test firings are planned during an initial three-year testing program, with a possible four-year follow-on program involving 100 additional test firings.
3. Due to the environmental concerns associated with beryllium, numerous project design features are included within the project to prevent the release of beryllium. Discussions with environmental and regulatory agencies have resulted in incorporation of additional mitigation measures into the appropriated areas of the design, construction, and operation of this facility.

IMPACTS

1. Primary impacts associated with the project include:
 - potential effects of accidental releases of beryllium on human, wildlife and the environment.
 - potential effects of project construction activities on candidate threatened and endangered species.
 - potential air quality effects from emissions resulting from normal project operations.
 - potential for increased soil erosion.

Of these, impacts from accidental releases of beryllium, and candidate species issues, are the great concerns.

2. Beryllium and its combustion products are toxic materials if inhaled, swallowed or deposited on the skin. The primary environmental issue from the BPF would be the impacts of accidental releases of beryllium, as a result of rocket motor explosions or fires occurring during storage or transport.

Risk assessments were produced as part of the environmental analysis. The considered worst-case accident scenarios that would: release the largest amount of beryllium in the most hazardous from the pathway; ambient air quality Impacts during worst-case accidents; dosage that would result at population centers; and the magnitude of population receptors potentially subject to exposure during worst-case accidents. Assessment of the health risk considered: the probability of the accident's occurring; probability of the wind's blowing toward population receptors; and the potential for acute or chronic beryllium disease of cancer production. Quantitative probability analyses were conducted for; (a) the worst case accident in the Motor Test Cell, involving one rocket motoring containing 150 lbs of fuel, with 20% beryllium content; and (b) the worst case accident in the storage facility, involving ten motors, each containing 70 lbs of fuel, with 20% beryllium content.

Results of the risk assessments indicate that release of beryllium particulate emissions from worst-case accidents do not pose a significant health hazard to the public or to workers at RPL. Potential exposure levels at the nearest off-

Base population center (the town of Boron), public access point (highway 395), and main RPL facility are not expected to cause either acute or chronic beryllium disease. At Boron, the risk of cancer occurrence is about 1×10^{-11} (one in 100 billion) for any individual or about 1×10^{-8} (one in 100 million) for one cancer to occur in the town. The risk to the individual can be compared to the risk of 1×10^{-10} (one in 10 billion of being killed by a meteorite).

Environmental risk calculations from worst-case accidents indicate that outside the detonation/fire area, there would not be animal deaths or acute effects due to a beryllium release and that only small risks are incurred for sub-chronic exposures. A very small decrease in plant yield could occur, over a limited area within the Base. However, only plants of the desert community would be involved; there is no agriculture within 10 km of the site.

3. Evidence of the desert tortoise, a candidate species for Federal Endangered Species listing, has been found at the site. In addition, two candidate plant species and the candidate Mojave ground squirrel are also potentially present on the project site. Although candidate species do not receive formal protection under the Endangered Species Act, the following mitigation measures will be carried out, on the basis of initial project planning and consultation with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG):
 - Prior to construction, biological surveys will be performed, to identify tortoise and ground squirrel burrows, the desert cymopterus (a plant), and the Mojave spine-flower.
 - A biological specialist will be on-site, or on-call, during the heavy earth-moving phases of construction.
 - During utility corridor excavation, burrow sites and individual candidate plant species will be avoided as much as possible.
 - Desert tortoise and Mojave ground squirrel burrows that would be destroyed by project-related activities will be excavated, any tortoises found in those graded areas will be removed and relocated, and any Mojave ground squirrels found in those graded areas will be removed and relocated, and any Mojave ground squirrels found will be allowed to leave the area. The burrows will then be filled in.
 - Tortoises encountered will be released in unaltered areas within one mile from the point of capture, weather permitting, or placed in an artificial hibernaculum (for later release) if winter weather persists into April.
 - The facility site area will be fenced during construction to prevent ingress by the tortoise.
 - Trenches will have temporary cover until they can be backfilled.
 - A 10-inch ground clearance will be provided for above pipeline, to permit tortoise passage after construction is completed.
 - Construction workers will be educated and trained on protection of sensitive species.
 - Following construction disturbed surface soils will be revegetated with native plants.
4. Air quality effects from construction or normal operations are potential impacts. However, engineering design and air emission control equipment planned as part of the BPF would limit stack emission to quantities well below well below National and Kern County standards: beryllium emissions of 2g/hr and 10g/day. Therefore, no adverse impacts on humans or on environment will occur. Fugitive dust and diesel emissions would be temporary impacts of construction. Wetting of soil during earth-moving activities will reduce fugitive emissions by 50 %.
5. Soil disturbance during construction could increase erosion, and because of previous testing of beryllium rocket motors in the area, might cause hazardous level of beryllium to be resuspended in the air, if there are high level of beryllium below the surface. (measurements in the site indicate beryllium level in surface soil that are a factor of 1,000 below those that could expose construction workers to the threshold limit value (TLV) of 2 ug/m³ if the surface soil is resuspended during heavy earth moving. Therefore, there is no potential threat from resuspension of

the surface soil. Nevertheless, construction workers will be required to wear appropriate protective equipment during grading and earth-moving operations. Wetting soil during earth-moving activities will provide further protection.

Paving the access road and the apron around the facility and revegetation of disturbed area after construction will lessen the potential for increased wind erosion. The site and roadway will be graded to drain storm run-off properly and to minimize erosion.

6. Potential impacts from removal of vegetation and effects on cultural resources have been mitigated through project design and consultation with federal and California agencies. These include:

- Revegetation of disturbed areas with native plants.
- Removal of Joshua trees, and replanting in the surrounding desert.
- Completion of cultural resource surveys; no significant resources were found.
- Archaeologist on-site or on-call during construction, and avoidance and/or recovery of cultural resources if discovered during construction.

7. There will be no significant impact from hazardous waste generated in normal operations.

Hazardous solid wastes, consisting of pollution control bags and filters, contaminated clothing and gear, vacuum-cleaner bags, etc., will be drummed in the BPF, and stored in an approved portable container outside facility for period of up to 90 days, and then removed via licensed contractor to an offsite Class I disposal facility.

No hazardous liquid wastes will be generated during normal operations. Contaminated liquids from personnel shower and washdown operations will contain beryllium at levels below the threshold (0.75 ppm) defining a hazardous waste. Those liquids will go to an on-site sump, then to an on-site above-ground holding tank, and finally to the RPL wastewater treatment plant.

8. Other, less significant impacts include:

- Temporary and intermittent increases in noise levels.
- Slight increases in traffic during project construction.

9. Additional areas of impact evaluated but found to be nonsignificant issues were effects on land uses, water resources and water quality, and socioeconomic and visual concerns. These impacts are minimal because:

- No land use impacts are expected because adjacent and nearby land uses are those associated with ongoing EAFB flight-testing and RPL activities.
- There is little potential for surface water quality degradation because of the scarcity of rainfall and lack of perennial surface water bodies.
- No socioeconomic impacts would occur because the construction workforce (maximum of 40 workers at any one time) would likely commute to the site, and the operations work-force would consist of only four personnel already employed at EAFB.
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- The BPF would not significantly alter visual resources of the area; at the same and larger scale, other manmade features associated with the RPL are already ready located in the area.

ALTERNATIVES

1. Several alternative sites were considered for the BPF. However, because of the unique operational, geographical, and safety requirements for a beryllium rocket test facility, the proposed site at EAFB was determined to be the only appropriate and feasible site. Considerations for selecting the RPL site were:
 - Remoteness.
 - Availability of an existing operational site, with an already operating control building that could be used for the BPF in addition to controlling other operating test facilities at the RPL site.
 - Personnel requirements and qualifications; presence of an RPL RDT&E staff already familiar with and conducting solid rocket tests.
 - Requirements for engineering and scientific integration with an existing program.
2. The no-action alternative, if chosen, would have had the following effects:
 - There would be no facility in the U.S. at which beryllium-fueled rocket motors containing up to 150 lbs. of fuel could be feasibly and safely tested.
 - An important element of the DOD Strategic Defense Initiative Program would not be carried out.

LOCAL AGENCY REQUIREMENTS

1. Preliminary discussions with federal and California agencies have been completed. Mitigation measures, described above, for potential impacts on candidate species and on cultural and historic resources, were incorporated, based on agency recommendations.
2. An application for Authority to Construct was submitted to the Kern County Air Pollution Control District. Kern County granted the Air Force an Interim (180 days) research and development ATC exception under Kern County Rule 202.1 during which time the ATC Permit will be processed. Kern County, in meetings with the Air Force, has indicated that it has not found any problem to date with the ATC Permit Application or ATC Risk Assessment, and it will most likely approve the ATC Permit.
3. No Permits for liquid effluent discharges will be required. Permits for disposal of solid waste will be needed only after operations begin.

FINDINGS

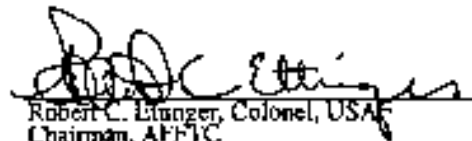
1. In view of the above, a finding of no significant impact is made. Positive impacts of the project should balance the negative impacts, provided that the mitigation measures are applied.
2. An environmental Assessment of the proposed action dated Feb 87 is on file at:

HQ Space Division
P.O. Box 92960
Worldway Postal Center
Los Angeles, California 9009
ATTENTION: Major Mark C. Mondl



Raphael O. Roig
Chairman, Space Division
Environmental Protection Committee
17 FEB 1987

Date



Robert C. Litinger, Colonel, USAF
Chairman, AFPC
Environmental Protection Committee
17 FEB 1987

Date