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**Appendix A**  
**TMD Extended Test Range Final EIS**  
**Executive Summary and Record of Decision**

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# **APPENDIX A**

## **TMD EXTENDED TEST RANGE FINAL EIS EXECUTIVE SUMMARY AND RECORD OF DECISION**

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### **ES.1.0 INTRODUCTION**

The Environmental Impact Statement (EIS) for the Theater Missile Defense (TMD) Extended Test Range consists of the Draft EIS released for public review in January 1994, the Supplement to the Draft EIS released in July 1994, and the Final EIS released in November 1994. These documents were prepared in accordance with Council on Environmental Quality (CEQ) and Department of Defense (DOD) regulations implementing the National Environmental Policy Act (NEPA). The U.S. Army Space and Strategic Defense Command is the lead agency for the EIS. Cooperating agencies included the Ballistic Missile Defense Organization, U.S. Air Force, U.S. Navy, and Federal Aviation Administration (FAA).

The Draft EIS analyzes the potential environmental consequences of conducting missile program demonstration and operational test flights and target intercept tests involving both proposed off-range missile flight path extensions and existing test ranges at four candidate test areas: White Sands Missile Range (WSMR), New Mexico; Eglin Air Force Base (AFB), Florida; Western Range, California; and the U.S. Army Kwajalein Atoll (USAKA) in the mid-Pacific.

In order to reduce environmental impacts identified in the Draft EIS resulting from off-range booster drops, the U.S. Army proposed new potential booster drop zones at the WSMR Candidate Test Area based on revised target vehicle flight trajectory analysis, consultation with appropriate government agencies, meetings with the public and environmental groups, contacts with local land owners, and additional technical analysis. The Supplement to the Draft EIS documents the analysis of these additional potential booster drop zones located along the missile flight paths from the Green River Launch Complex (GRLC), Utah, and Fort Wingate Depot Activity (FWDA), New Mexico, to WSMR.

The Final EIS makes additions and revisions to the Draft EIS and Supplement to the Draft EIS and provides responses to all comments documented in public hearing transcripts and written comments received. The two volumes of the Final EIS, the two volumes of the Draft EIS, and the Supplement to the Draft EIS constitute the complete EIS. A Record of Decision will be issued no sooner than 30 days after publication of the Final EIS.

### **ES.2.0 RELATED NEPA DOCUMENTATION**

The TMD Programmatic Life-Cycle EIS was completed in January 1994. This programmatic EIS is an umbrella or "first-tier" document which provides a description of

the potential environmental impacts over the entire life-cycle of the proposed TMD program and alternatives. As such, it addressed in the broad terms that were possible at that time the potential environmental impacts of the proposed research, development, and testing; production; basing (not deployment); and eventual decommissioning activities supporting all of TMD. The Record of Decision for the TMD Programmatic Life-Cycle EIS was signed in August 1994. It necessarily focused on the technologies involved and is neither system- nor site-specific. It also committed to preparation of lower-tier documents to assess site- and program-specific environmental impacts as the TMD program matured and possible locations were identified for the individual actions. Some of those documents have been prepared; others will be.

In order to provide environmental support to the wide range of Army TMD activities, the Army's TMD program has been divided into three basic program efforts:

1. Specific TMD weapons development
2. Extended test range development
3. TMD program development support activities

The current and future environmental documents being prepared in connection with these three efforts are related to each other. However, each effort is being analyzed as a separate element because it requires a separate decision. In order to adequately incorporate environmental considerations into program decisions for TMD, this tiered-document approach is necessary. The environmental documentation for each program effort is described as follows.

#### 1. Specific TMD Weapons Development

In the case of specific TMD weapons, the TMD program encompasses the potential for developing and testing several types of ground-based defensive radar and missile interceptor systems. The Army is preparing individual environmental assessments (EAs) for each of these systems as they reach decision points. Consequently, an EA has already been prepared for the Phased Array Tracking to Intercept of Target (PATRIOT), Extended Range Interceptor (ERINT [also known as the PAC-3 missile]), Army Tactical Missile System (ATACMS), Theater High Altitude Area Defense (THAAD), and Ground-Based Radar (GBR). An EA is currently in progress to assess HERA target missile launches from the Firing in Extension area north of WSMR with intercepts by defensive missiles on WSMR with particular emphasis on cumulative impacts. An EA for the Corps Surface-to-Air Missile (Corps SAM) has not yet been started because the weapon system is still in the conceptual stage.

#### 2. Extended Test Range Development

The Army needs to identify one or more occasional-use, off-range extensions of existing test ranges where development of ground-based TMD systems can be conducted over longer distances than currently available. Unlike weapons which can be developed individually, the Army must find the right combination of extended test range sites that allow all TMD program testing needs to be met. Consequently, the TMD Extended Test

Range EIS addresses all of the potential extended test range alternatives in a single document. This approach will allow decisions to be made that will address all TMD test range needs rather than making the decision on a weapon-by-weapon or site-by-site basis without the benefit

of an analysis of cumulative and related impacts. This current EIS represents a second-tier document which is site-specific but takes a broad, programmatic approach in covering types of programs over multiple years. It describes the potential environmental impacts resulting from test site modifications and launch preparation requirements and from multiple missile demonstration and operational flights along extended-range flight paths with intercepts of targets occurring over existing ranges or open sea areas. These tests are in support of developmental and operational requirements for various planned ground-based TMD missile and sensor systems being developed by the DOD.

### 3. TMD Program Development Support Activities

In addition to weapon and test range development, there are other TMD program experiments and tests that must be conducted in order to develop the tools and criteria by which the Army can evaluate whether a proposed TMD weapon is effective or not. Program activities include the development of target missiles for flight testing the TMD weapons and tests to determine what constitutes sufficient damage ("lethality") to a theater missile or its warhead to remove it as a threat. To date, these program development support activities have generated the need for several environmental documents, including the TMD Bulk Chemical Experiment EA (April 1991), the TMD Lethality Program EA (August 1993), and the TMD HERA Target Systems EA (January 1994).

**Installation Environmental Documents** – Various military installations are also in the process of preparing environmental documents that examine their continuing use and potential changes or additions to their present missions. These include WSMR (an EIS), Eglin AFB (an EIS), the USAKA (a Supplemental EIS), and Wake Island (an EA). The potential addition of a TMD program activity at a particular installation would be one of the items that an installation-wide EA or EIS would typically address. These subsequent installation-wide environmental documents may use the research and analysis found in TMD program environmental documents when assessing those aspects of the TMD program that are proposed for possible siting at their installation. This is an accepted procedure under the CEQ regulations implementing the NEPA and is referred to as "incorporated by reference."

As the TMD program continues to develop and mature into subsequent stages of production, basing, and decommissioning, the U.S. Government will undoubtedly identify other environmental analyses that need to be conducted to support the decision-making process. The timing of these analyses will be determined by the progression of the programs through the various stages that require decisions.



### **ES.3.0 PURPOSE AND NEED**

In the Missile Defense Act of 1991 Congress called for the provision of a highly effective TMD program to defend forward deployed and expeditionary elements of the armed forces of the United States and U.S. friends and allies. Additional Congressional guidance in the fall of 1992 directed that all "theater and tactical missile defense activities of the Department of Defense . . . be carried out under the Theater Missile Defense Initiative" which will be established as the responsibility of an office within the DOD (Strategic Defense Initiative Organization, 1993). The Ballistic Missile Defense Organization (BMDO) (previously known as the Strategic Defense Initiative Organization [SDIO]) has been designated as the management office, with various elements of the TMD program being delegated to the Army, Air Force, Navy and Marine Corps. Each service will participate in the defense acquisition process in developing and acquiring its respective TMD program elements.

The purpose of conducting TMD extended-range tests is to provide realistic test situations for TMD missile systems within a simulated theater of operations, which includes defense against threat-representative target missiles. This requires conducting target and other missile system flights over medium-range distances (i.e., up to approximately 1,207 kilometers [750 miles]). These missile flight tests are needed to fully validate system design and operational effectiveness of ground-based TMD missile and sensor systems. Currently, there are no operational overland ranges and few over-water ranges operated by the United States that provide realistic distances for defense testing within such a simulated theater of operations.

### **ES.4.0 PROPOSED ACTION AND ALTERNATIVES**

Under the proposed action it is anticipated that approximately 100 missile flight tests would be conducted between 1995 and approximately 2000 from more than one off-range location and potentially at more than one test range. A maximum of four tests per month was used for purposes of environmental analysis; however, for overland testing at WSMR only 6 to 10 tests per year would be anticipated.

For the purpose of this document, a "flight test" or "test event" is defined as either a target missile flight, a defensive missile flight, or a defensive missile intercept of a target missile. Some test events proposed for later in the program may require multiple target and/or defensive missile flights to validate specific defensive missile performance. If multiple flights require additional analyses, because of additional or different hazard areas, booster drop zones, access to public lands, etc., those analyses will be performed at a later date. Tests involving intercepts of targets would be conducted at a variety of altitudes, with missile intercepts occurring over existing ranges or open sea areas. Surface-to-surface missile tests are also proposed.

The NEPA requires the consideration of reasonable alternatives to a proposed action. This EIS considered the use of four alternative test range areas and a no-action alternative. Eleven candidate test range areas, both within and outside the United States, were

originally evaluated for TMD extended-range tests. Following the applications of various selection criteria (e.g., scheduling, range safety, and range instrumentation) it was determined that four test ranges could potentially satisfy some or all of the extended-range (medium distance) test requirements.

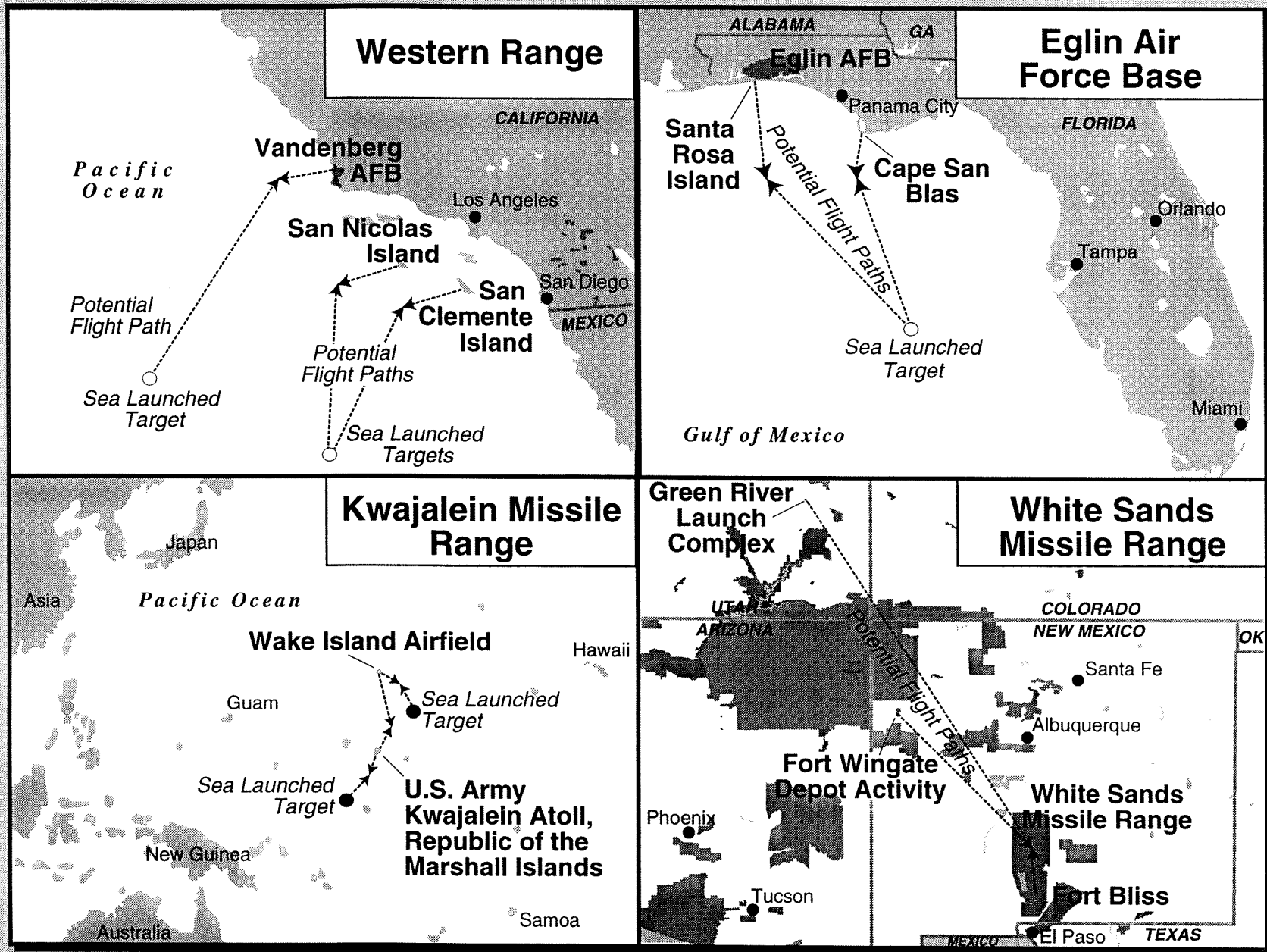
The candidate test area alternatives analyzed in the EIS are shown in figure ES-1 and are discussed as follows:

- **WSMR, New Mexico** – This alternative includes missile launches and sensor testing at WSMR and Fort Bliss, Texas, with off-range missile launches from FWDA, New Mexico, and the GRLC, Utah.
- **Eglin AFB, Florida** – This alternative includes missile launches and sensor testing at Eglin AFB on Santa Rosa Island and at Cape San Blas with off-range missile launches from a sea-based platform in the Gulf of Mexico.
- **Western Range, California** – This alternative includes missile launches and sensor testing at Vandenberg AFB, San Nicolas Island of the Naval Air Warfare Center-Weapons Division, and San Clemente Island of the Naval Air Station North Island with off-range missile launches from a sea-based platform in the Pacific Ocean.
- **Kwajalein Missile Range, USAKA, Republic of the Marshall Islands** – This alternative includes missile launches and sensor testing at Kwajalein Missile Range and Wake Island with off-range missile launches from a sea-based platform in the Pacific Ocean.

To fully validate the effectiveness of intercepts and surface-to-surface missile systems, it is desirable to use an overland test range for some tests to allow for the recovery and analysis of missile debris following an actual intercept or ground impact. The overland test range must be large enough to safely and effectively conduct these types of tests and have appropriate equipment (e.g., radars, telemetry equipment, and optical instruments) in place.

No single test range area is expected to satisfy all test objectives, consequently some combination of test range areas would likely be required. As individual TMD system programs mature to the point of defining specific flight/intercept test requirements, the most appropriate test range area(s) capable of meeting test requirements can then be identified.

If the no-action alternative is selected, ongoing activities and operations would continue to be performed within existing ranges. The development of ground-based TMD missile and sensor systems would continue, with missile flight tests and target intercepts being conducted utilizing existing test ranges.



**Figure ES-1 - Alternative Test Ranges**

Such restrictions of test areas by increasing reliance on shorter-range missile flights conducted at WSMR would place artificial limits on system test capabilities. This would make it impossible to fully validate system design and operational effectiveness in a variety of realistic theater environments.

## **ES.5.0 DECISION TO BE MADE**

The decision to be made is to determine which candidate test range(s) and range extensions may be used to conduct ground-based TMD extended-range missile and sensor tests.

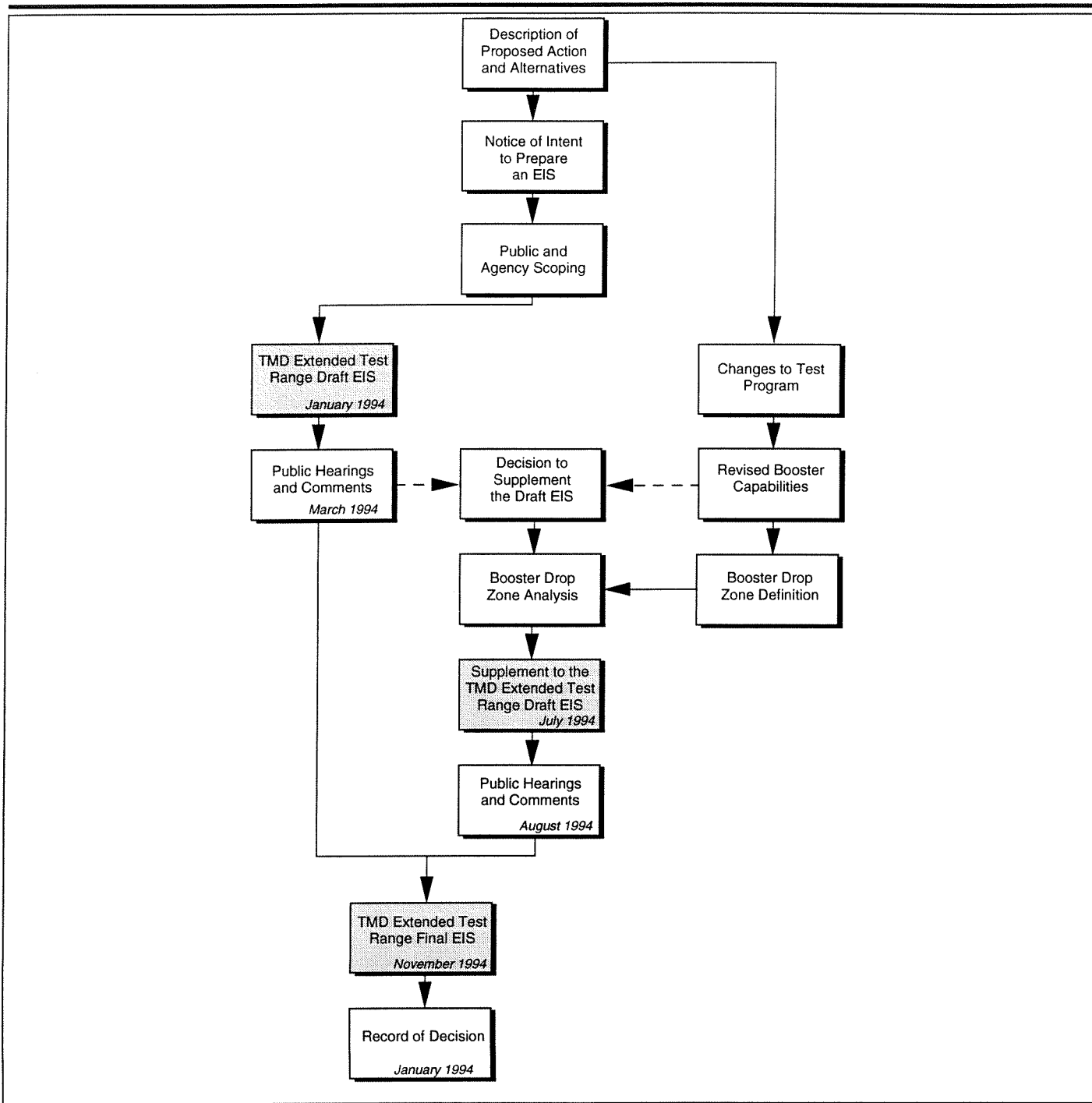
## **ES.6.0 SCOPE OF THIS EIS**

This EIS discusses the potential environmental impacts associated with implementing the proposed action at each of the four alternative test range areas and with the no-action alternative. To provide the context for understanding the potential environmental impacts, the affected environment for each environmental resource and its principal attributes was described. The following environmental resources are covered in this document: air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and waste, health and safety, land use, noise, socioeconomics, infrastructure and transportation, and water resources.


## **ES.7.0 OUTLINE OF THE EIS PROCESS**

The key milestones in the preparation of the TMD Extended Test Range EIS are graphically depicted in figure ES-2. This Final EIS is the culmination of a process begun with preparation of a description of the proposed action and alternatives and publication of a Notice of Intent to prepare an EIS in the *Federal Register*, local community newspapers, and other media on April 7, 1993. In accordance with CEQ regulations for implementing the procedural provision of the NEPA, public scoping meetings were held in April and May 1993, in Green River, Salt Lake City, and Moab, Utah; Gallup and Albuquerque, New Mexico; Fort Walton Beach and Port St. Joe, Florida; and Oxnard and Lompoc, California. Additional meetings were held in Window Rock, Arizona, during June and July 1993 and in Crownpoint, New Mexico, in October 1993.

The environmental issues and concerns identified during the scoping process were addressed in the Draft EIS, released in January 1994. Public hearings on the Draft EIS were held in March 1994 in Moab and Salt Lake City, Utah; Crownpoint, Gallup, Ramah, and Shiprock, New Mexico; Fort Walton Beach and Port St. Joe, Florida; and in Lompoc and Oxnard, California, to obtain the public's comments. Due to the selection of a new booster and a desire to reduce environmental impact resulting from booster drops that were identified in the Draft EIS, new additional booster drop zones were identified in Utah and New Mexico. A Supplement to the Draft EIS, addressing the environmental



## EXPLANATION

 Documents that comprise the Extended Test Range Documentation

## TMD Extended Test Range Environmental Documentation

Figure ES-2

consequences of including the new booster drop zones, was prepared and released in July 1994. Public hearings on the Supplement were held in August 1994 in Monticello and Salt Lake City, Utah, and in Grants and Magdalena, New Mexico. This Final EIS incorporates the public and agency comments and concerns identified in both the Draft EIS and Supplement to the Draft EIS public hearings.

## **ES.8.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

Table ES-1 provides a summary of the environmental consequences associated with the implementation of the proposed action at each candidate test area by individual environmental resource. The information presented in the table is based on the environmental impact analysis presented in Section 4.0 of the Draft EIS and Supplement to the Draft EIS.

The following sections summarize the principal impacts of implementing the proposed action by alternative candidate test area. Section ES.8.1 discusses the impacts deemed to be significant, using the significance criteria outlined in 40 CFR 1508.27. Section ES.8.2 summarizes the consequences identified as either a not significant impact or having no impact predicted.

Section 3.0 of the Final EIS provides detailed responses to all of the comments received during the public comment period on the Draft EIS and Supplement to the Draft EIS. The breadth and depth of comments on the Draft EIS and its Supplement mirror the breadth and depth of issues identified during the scoping period.

Appendix A of the Final EIS addresses key issues associated with potential cumulative impacts resulting from proposed TMD testing activities on extended ranges.

### **ES.8.1 SIGNIFICANT IMPACTS**

#### **White Sands Missile Range Candidate Test Area**

Significant impacts were identified with respect to launch hazard areas and booster drop zones.

##### ***Infrastructure***

Impact: Interstate Highway 70 in Utah would be temporarily closed during any proposed launches from the GRLC utilizing either Booster Drop Zone A or B.

Mitigation: This impact could be partially mitigated by scheduling launches in the early morning hours when traffic is light both on Interstate 70 and through the town of Green River. Use of the preferred Booster Drop Zone C1 or C2 would not require closure of Interstate 70.

Environmental Resource  Candidate Test Areas	Table ES-1. Comparison of the Environmental Consequences of the Alternatives											
	Air Quality	Air- space	Biological Resources	Cultural Resources	Geology/ Soils	Hazardous Mat/Waste	Health & Safety	Land Use	Noise	Socio- economics	Infrastructure/ Transportation	Water Resources
<b>WSMR/Fort Bliss</b>	○	○	○	○	○	○	○	○	○	○	○	○
<b>GRLC Launch Site/LHA</b>												
Launch Site <sup>1</sup> /LHA for BDZ A	○	○	○	○	○	○	○	○	○	○	●	○
Launch Site/LHA for BDZ B	○	○	○	○	○	○	○	○	○	○	●	○
Launch Site/LHA for BDZ C1	○	○	○	○	○	○	○	○	○	○	○	○
Launch Site/LHA for BDZ C2	○	○	○	○	○	○	○	○	○	○	○	○
<b>FWDA Launch Site/LHA</b>												
Launch Site <sup>2</sup> /LHA for BDZ A	○	○	○	○	○	○	○	○	○	○	○	○
Launch Site/LHA for BDZ B	○	○	○	○	○	○	○	○	○	○	○	○
Launch Site/LHA for BDZ C	○	○	○	○	○	○	○	○	○	○	○	○
<b>GRLC Flight Corridor</b>												
BDZ A	○	○	○	○	○	○	○	●	○	○	○	○
BDZ B	○	○	○	○	○	○	○	○	○	○	○	○
BDZ C1	○	○	○	○	○	○	○	○	○	○	○	○
BDZ C2	○	○	○	○	○	○	○	○	○	○	○	○
<b>FWDA Flight Corridor</b>												
BDZ A	○	○	○	○	○	○	○	○	○	○	○	○
BDZ B	○	○	○	○	○	○	○	●	○	○	○	○
BDZ C	○	○	○	○	○	○	○	○	○	○	○	○



No Impact



Not Significant Impact



Significant Impact

Note: 1 - GRLC Launch Site remains unchanged while the location and size of Launch Hazard Areas (LHAs) change depending on the location of the respective Booster Drop Zones (BDZs).

2 - FWDA Launch Site remains unchanged while the location and size of Launch Hazard Areas (LHAs) change depending on the location of the respective Booster Drop Zones (BDZs).

Environmental Resource		Table ES-1. Comparison of the Environmental Consequences of the Alternatives (Continued)											
Candidate Test Areas	Air Quality	Air-space	Biological Resources	Cultural Resources	Geology/ Soils	Hazardous Mat/Waste	Health & Safety	Land Use	Noise	Socio-economics	Infrastructure/ Transportation	Water Resources	
Eglin AFB													
Santa Rosa Island	○		○		○	○	○	○	○	○	○	○	
Cape San Blas	○	○	○	○	○	○	○	○	○	○	○	○	
Sea Launch	○	○	○				○					○	
Flight Corridor		○	○			○	○					○	
Western Range													
San Nicolas Island	○	○	○	○	○	○	○	○	○	○		○	
Vandenberg AFB	○	○	○	○	○	○	○	○	○	○	○	○	
San Clemente Island	○	○	○	○	○	○	○	○	○		○	○	
Sea Launch	○	○	○				○					○	
Flight Corridor		○	○			○	○					○	
Kwajalein Missile Range													
USAKA	○	○		○	○	○	○	○	○	○	○	○	
Wake Island	○	○	○	○	○	○	○		○	○		○	
Sea Launch	○	○	○				○					○	
Flight Corridor						○	○					○	
<div><div></div> No Impact</div>													
<div>○ Not Significant Impact</div>													
<div>● Significant Impact</div>													



## ***Land Use***

**Impact:** The use of GRLC's Booster Drop Zone A would result in a significant land use impact by restricting public access to the Island in the Sky District of Canyonlands National Park and Dead Horse State Park in Utah.

**Mitigation:** The impacts on recreational uses can be partially mitigated by providing sufficient notice to travelers on all roads into the affected areas, particularly on Highway 313 to the Island in the Sky district of Canyonlands National Park and to Dead Horse State Park and the Needles/Anticline Overlook Road including all off-road trails, well in advance of the planned road closures and impact-area evacuations.

In addition to clearly posting such closures on the entrances to highways, access roads, and off-road trails, other notification is advisable. The following should be notified: all hotels, motels, and campgrounds in the area; visitor centers; National Park Headquarters; Ranger Stations; BLM and U.S. Forest Service offices; and tour operators and outfitters. In this way, travelers and recreational users could anticipate and plan for the closure and area evacuations. This would go a long way to ameliorate the unavoidable impacts on recreational use of the affected areas.

**Impact:** The use of GRLC's booster drop zones C1 and C2 could have potentially significant impacts on the Bridger Jack Mesa and Fish Creek Canyon Wilderness Study Areas if the booster impact areas were allowed to overlap the wilderness study area lands.

**Mitigation:** The booster impact area can be located outside the Wilderness Study Areas, thus mitigating the potentially significant impact.

**Impact:** The use of FWDA Booster Drop Zone B which includes portions of the El Malpais National Monument and the El Malpais National Conservation Area, which includes Wilderness Areas and Wilderness Study Areas, would be considered a significant impact on land use. These lands have been set aside in order to protect the resources within the area.

**Mitigation:** For FWDA Booster Drop Zone B, there were no mitigation measures identified for the use of El Malpais National Monument for a booster drop zone because it would conflict with both the intent of the laws that established the areas as well as the El Malpais National Monument General Management Plan (National Park Service, 1990) and the El Malpais National Conservation Area General Management Plan (Bureau of Land Management, 1991). The use of wilderness study areas for booster drop zones is also restricted by the Bureau of Land Management's (BLM's) nonimpairment standard which protects lands under wilderness review in order to not impair their suitability for preservation as wilderness.

## **ES.8.2 NOT SIGNIFICANT IMPACT AND NO IMPACT PREDICTED**

### **ES.8.2.1 Impacts Common to All Candidate Test Areas**

#### **Air Quality**

Emissions from flight preparation and flight support activities fall below the minimal levels of the applicable Federal and state regulations. Gasoline and diesel-powered generators would only run intermittently. Application of Environmental Protection Agency (EPA) screening models and more detailed dispersion models revealed that emissions from target and defensive missile launches and on-pad failures are quickly dispersed, and emissions along the flight corridor occur largely at altitudes that allow dilution of the pollutants before they reach the ground.

#### **Airspace**

Airspace use impacts within existing or new restricted areas is a scheduling matter, not an environmental issue. The scheduling and rerouting of aircraft outside the existing and new restricted areas to avoid the flight tests would be directed and coordinated by the FAA.

#### **Biological Resources**

For the most part no ground-disturbing activities would be involved. Launch activities would take place in previously disturbed areas. Where new ground disturbance is proposed, preconstruction surveys would be undertaken, and if the presence of sensitive species is confirmed, appropriate mitigation measures would be implemented. The probability of early flight termination impacting plant or animal species through fire is low, and activity and noise associated with launch activities would have cleared the area of most wildlife before launch anyway. Missile launch noise quickly attenuates, and no noise-sensitive species are known to exist near the proposed launch sites. In terms of flight termination or intercept debris, critical species of wildlife are widely scattered, and the probability of them being hit by a single piece of debris is on the order of less than 1 in a million. Debris-recovery operations are likely to have larger impacts, but a qualified wildlife biologist would monitor debris-recovery activities to reduce impacts.

#### **Cultural Resources**

For the most part no new ground-disturbing activities would be involved. Where new ground disturbance is proposed, preconstruction surveys would be undertaken, and if the presence of cultural resources is confirmed, appropriate mitigation measures would be implemented. Noise-induced vibration impacts to historic structures is highly unlikely, due to the low overpressures predicted from sonic booms. In terms of flight termination or intercept debris, archaeological deposits are scattered, and the probability of them being hit by a single piece of debris is extremely remote. Debris-recovery activities have a greater potential to damage archaeological deposits, but ground disturbance would be minimized through the use of helicopters and monitoring by a qualified archaeologist in

areas requiring use of wheeled vehicles. Illegal collection of artifacts by program personnel is possible but, with the proper briefing, considered unlikely.

### **Geology and Soils**

Accidental spills of toxic materials during launch preparation are highly unlikely with the implementation of standard spill prevention, containment, and control measures. Deposition of missile exhaust products, particularly  $\text{Al}_2\text{O}_3$  and  $\text{HCl}$ , is a possibility, but deposits would be dispersed by the time they reached the ground and would be further neutralized by the buffering capability of the relatively alkaline soils in arid regions or diluted by rainfall in coastal areas. The amount of soil disturbance from direct physical impacts of early termination or intercept debris would be minimal. Debris-recovery efforts would have minor impacts on soil.

### **Hazardous Materials and Waste**

Some hazardous materials, such as cleaning solvents, hydraulic fluids, lubricants, radioactive materials (such as Nickel-63 in on-board electrical devices), solid fuel, and small quantities of pre-packaged liquid propellants, would be used. However, all would be handled in accordance with strict regulatory guidelines that would either totally avoid or minimize program personnel exposure. Fuel and propellants would be consumed during missile launch and flight. Proper handling, packaging, and disposal of any hazardous waste ensure that both program personnel and the public are not exposed to undue hazards.

### **Health and Safety**

Standard handling and disposal procedures ensure that both program personnel and the public would not be affected by any hazardous materials used or waste generated. The risks from the transportation of rocket boosters and other system components are minimal. The probability of an accident, regardless of transportation mode, is extremely low, and only a small fraction of accidents would actually affect missile system transportation because of the use of specialized shipping containers. The careful designation of launch hazard areas and booster drop zones, from which all nonessential personnel and the public would be excluded, and the containment of all intercept debris either within Government property (which is off-limits to the public) or verified clear open-water areas ensure the safety of program personnel and the public. Potential electromagnetic radiation (EMR) exposure from the various sensors and tracking radars is not an issue due to the establishment of EMR hazard safety zones and the exclusion of personnel from them.

### **Land Use**

Flight test programs conducted on existing military installations do not present a conflict with either current land use or land use plans, policies, and controls.

## **Noise**

Program personnel and the public's exposure to launch noise and sonic boom overpressures is minimized by the exclusion of nonessential personnel and the public from launch hazard areas and the absence of noise-sensitive receptors.

## **Socioeconomics**

Potential adverse socioeconomic impacts are precluded by the relatively low program-related personnel requirements and the fact that personnel would be both temporary and transient.

## **Infrastructure and Transportation**

Use of existing facilities and infrastructure and the relatively low program personnel requirements preclude both Government facility and local community infrastructure impacts. Similarly, the relatively small number of temporary, transient personnel mitigates transportation impacts.

## **Water Resources**

Accidental spills of toxic materials during launch preparation are highly unlikely with the implementation of standard spill prevention, containment, and control measures. Deposition of missile exhaust products, particularly  $\text{Al}_2\text{O}_3$  and  $\text{HCl}$ , is a possibility, but deposits would be dispersed by the time they reached surface water bodies or groundwater and would be further neutralized by the buffering capability of the water bodies or open ocean areas. The amount of surface water disturbance from direct physical impacts of early termination or intercept debris would be minimal. Debris-recovery efforts would have minor impacts on surface water bodies and no impact on groundwater.

### **ES.8.2.2 Impacts Unique to Specific Candidate Test Areas**

#### **Airspace**

For both the Eglin AFB and Western Range candidate test areas, impacts within the warning areas off the coasts of Florida and California, respectively, would be avoided by the issuance of Notices to All Mariners and ensuring that the launch, booster drop, and intercept debris impact areas are clear of all air traffic before proceeding with the test flights. For the USAKA Candidate Test Area, which lies in international airspace, well-removed from regular trans-Pacific airways and jet routes, similar pre-test flight procedures would be implemented.

#### **Biological Resources**

For the Western Range Candidate Test Area, San Nicolas Island launch option, the presence of California sea lions, northern elephant seals, and sea otters near the proposed

launch sites is of concern. Noise impacts, however, are expected to be minimal because the proposed launches are intermittent and of short duration.

### **Geology and Soils**

Deposition of missile exhaust products, particularly  $\text{Al}_2\text{O}_3$  and  $\text{HCl}$ , is a concern for the Eglin AFB Candidate Test Area. However, deposits would be diluted by the time they reached the ground and would be further diluted by rainfall and neutralized by quick migration to the Gulf of Mexico.

### **Health and Safety**

For the WSMR Candidate Test Area, detailed analysis of the risk to the population under the flight corridors in the event of an in-flight termination indicates that the overall hazard associated with a single flight operation is less than  $1 \times 10^{-6}$  (less than 1 casualty in 1 million flight terminations).

### **Land Use**

For the WSMR Candidate Test Area, program activities would take place on land that has been set aside and devoted to military uses for some time. The current use of private land, co-use public land, or other public land is covered by an existing lease, evacuation, or co-use agreement with the appropriate land owners or stewards. Use of the proposed new booster drop zones would not proceed until similar agreements had been negotiated to the satisfaction of all parties. Denial of access to and evacuation of public recreational areas not identified as significant in Section ES.8.1 would occur only for areas which experience relatively low levels of utilization and/or are not particularly recognized for their recreational value.

Potential conflicts with other proposed uses of FWDA, currently closed and in caretaker status, would be resolved through the Army's Base Realignment and Closure process. As part of this process, the BMDO has identified a potential use for sufficient property to conduct launch activities, establish safety zones, and ensure access. Lands not needed for missile testing activities would be returned to the public domain since the lands comprising FWDA were originally public domain lands. Lands retained for missile testing activities could potentially accommodate compatible additional uses, subject to acceptable security arrangements. Lands returned to the Department of the Interior would be subject to that agency's procedures and priorities in identifying potential uses.

### **Socioeconomics**

For the WSMR Candidate Test Area, intangible economic or social effects that would not have the potential for indirect environmental consequences were not addressed per 40 CFR 1508.14.

## **Infrastructure/Transportation**

For the WSMR and Eglin AFB candidate test areas, road closures not identified as significant in Section ES.8.1 either carry small volumes of traffic or are governed by an existing agreement with the appropriate state Department of Transportation.

### **ES.8.3 ADDITIONAL STUDIES**

Several additional studies were carried out in support of the TMD Extended Test Range Final EIS summarized as follows:

- A separate appendix (Appendix A) was prepared to address key issues associated with potential cumulative impacts resulting from proposed TMD testing activities on extended test ranges.
- The health and safety discussion in Appendix B now includes additional information regarding the flight safety approach for overland testing.
- Consultation with potentially affected American Indian tribes was carried out to identify areas of American Indian significance related to traditional resources such as archaeological sites, water sources, plant habitat or gathering areas, or any other natural area important to a culture for religious or heritage reasons. Results of these consultations were incorporated into the appropriate Cultural Resources sections.
- Additional agency consultation was carried out to ensure compliance with appropriate regulations and to establish a framework for ensuring implementation of the mitigation measures described in this Final EIS and adopted in the Record of Decision. Responses to agency comments are included as Section 5.0 of this Final EIS.

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RECORD OF DECISION  
BALLISTIC MISSILE DEFENSE ORGANIZATION  
ACTIONS AFFECTING EXTENDED TEST RANGES

INTRODUCTION

This document records my decision for the Ballistic Missile Defense Organization (BMDO) to conduct tests at two of four alternative test ranges. The potential for environmental impacts at these ranges was analyzed and documented in the Theater Missile Defense Extended Test Range Final Environmental Impact Statement (FEIS), and the public was notified of its availability on January 13, 1995. The following ranges were considered for extended range testing: White Sands Missile Range (WSMR), New Mexico, Eglin Air Force Base (AFB) Florida, Western Range, California, and Kwajalein Missile Range (KMR), U.S. Army Kwajalein Atoll (USAKA), Republic of the Marshall Islands.

In September 1993, we issued our Record of Decision (ROD) for the TMD Final Programmatic Environmental Impact Statement which analyzed potential environmental impacts over the life-cycle of the TMD Program. That document addressed potential environmental consequences of the proposed research, development, testing and production, basing, and eventual decommissioning activities. It serves as the foundation for the TMD Extended Test Range FEIS. I have also carefully considered the requirements of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (February 11, 1994), that this action not have a disproportionate impact on minority or low-income populations.

**Need:**

The proposed extended range testing arises from compelling national security needs recognized by both the Congress and the Administration. Effective Theater Missile Defense (TMD) is necessary to protect forward deployed and expeditionary elements of the Armed Forces of the United States and U.S. friends and allies overseas. Extended range testing is critical to the development of an effective theater missile defense.



## Purpose:

Extended range tests for TMD must realistically test missile defense systems under circumstances similar to a theater of operations. This includes construction of target launch facilities; development and testing of sensors, Battle Management Command, Control, and Communications components, and defensive missiles; and intercepts of missiles over land and water areas. System operational needs require conducting target and other missile system flight tests and intercepts at altitudes and over distances, greater than can be accommodated by current ranges. These tests validate system design and operational effectiveness of ground-based interceptors to protect our forces and allies overseas from theater ballistic missiles.

## DECISION

My decision is to proceed with the extended range testing at the WSMR and the KMR. At WSMR, I select the option to launch target missiles from Fort Wingate Depot Activity (FWDA) using Booster Drop Zone C, with intercepts over WSMR. It is part of my decision to take action to reserve a portion of FWDA for the proposed TMD activities. On February 28, 1994, the BMDO notified the Secretary of the Army of its potential need for sufficient property at FWDA to conduct missile launch activities, including provision for security, safety, and access. The BMDO will confirm its need for property at FWDA and take other necessary actions to ensure such property is not disposed of under the provisions of the Base Realignment and Closure Act. I have decided not to select sea-based target missile launches at this time. I select only the land-based target launch option from Wake Island for the KMR alternative. Missile intercepts will take place over existing impact areas or open sea areas at KMR.

## PROPOSED ACTION AND ALTERNATIVES

### Background:

The proposed action analyzed in the TMD Extended Test Range FEIS was to conduct extended range tests of target missiles,

defensive missiles, and sensor systems at one or more of four alternative test range areas. The tests would involve target and defensive missile launches from existing test ranges and from off-range locations with intercepts over existing ranges or open ocean areas. Preparations and testing would begin in 1995 and continue into the next century. The FEIS compared the impacts of alternative test range areas and a no-action alternative.

As individual TMD system programs mature to the point of defining specific flight/intercept test requirements, the most appropriate test range area(s) capable of meeting test requirements will be identified. The proposed action includes safety measures and standard range operating procedures to ensure the safety of the public and the environment. Some of these safety measures include (1) activating new or existing restricted airspace, (2) the establishment and evacuation of launch hazard areas and booster drop zones, including temporary closure of associated roads, and (3) public notification of launch activities, including Notices to Airmen and Notices to Mariners.

#### **No-Action Alternative**

Ongoing activities and operations would continue to be performed at all locations. The development of ground based TMD missile and sensor systems would continue, with missile flight tests and target intercepts being conducted utilizing existing test ranges. Testing for TMD would likely increase at WSMR and possibly at the KMR. Ground-based TMD testing of missile and sensor systems at Eglin AFB and the Western Range would not occur. The missile testing restrictions associated with existing ranges, particularly with shorter range missile flights conducted at WSMR, place artificial limits on system test capabilities. This would make it impossible to fully validate system design and operational effectiveness in a variety of realistic theater environments. Although this alternative is the environmentally preferable alternative, it was not selected because it fails to meet BMDO's missile requirements. A comparison of the impacts at the four ranges revealed the least impacts to resources at the KMR. Impacts to resources at Western Range, Eglin AFB, are roughly equivalent. The greatest potential impacts were identified for the WSMR

alternative and are primarily related to land use, cultural, and transportation issues associated with the initial booster drop zones analyzed in the Draft EIS.

#### **White Sands Missile Range Candidate Test Area Alternative**

This alternative included defensive missile launches from WSMR, New Mexico, and Fort Bliss, Texas, and off-range target missile launches from FWDA, New Mexico, and the Green River Launch Complex (GRLC), Utah, with intercepts over WSMR. Testing of TMD radars, positioned on WSMR, would occur during these flight tests. This option also included Army tactical missile launches from FWDA with impacts on WSMR. I anticipate approximately 6 to 8 launches per year from FWDA.

Two potential Booster Drop Zones (A and B) were analyzed in the Draft EIS for both the FWDA and GRLC target launch options. Substantial concerns were raised over the use of these drop zones. Although a number of mitigations could have been implemented to minimize the land use and other impacts, they could have become significant. In addition, I am sensitive to general concerns about missile overflight of substantial areas of Native American lands in Utah and New Mexico. Accordingly, other booster drop zones were identified and analyzed for both the FWDA and GRLC options in a supplement to the Draft EIS. In both cases, these drop zones were further away from the launch position and further along the flight path and required smaller launch hazard areas at the launch site due to a less vertical trajectory at launch. This enabled the respective launch hazard areas to be reduced in size, responsive to the concerns about proximity to schools, residences, and other potential users of surrounding areas at FWDA. It also avoided the requirement to close Interstate 70 and portions of the Green River during launches for the GRLC option.

In the case of the GRLC target launch options, both Booster Drop Zones A and B would have created significant land use problems associated with restricting access to Canyonlands National Park and Dead Horse State Park. Use of either of these drop zones would also have necessitated temporary closure of Interstate 70 and portions of the Green River adjacent to the launch area, due to the requirement for a large launch hazard area. The new Booster Drop Zones C1 and

C2 for GRLC included Bureau of Land Management (BLM) state of Utah, and private land, as well as the Bridger Jack Mesa and Fish Creek Canyon Wilderness Study Areas. Concerns included restrictions on public access for recreation, and hunting. Booster impacts within the wilderness study area could be avoided, and missile launches could be timed so as to minimize impacts to recreation and avoid nesting and breeding seasons of sensitive species. However, the authority to use BLM lands for military purposes, including the proposed missile tests involving booster drops, would require a lengthy process that would not be responsive to current testing needs. Consequently GRLC options are not under current consideration.

In the case of the FWDA option, use of either Booster Drop Zone A or B would require a launch hazard area extending up to 4 1/2 miles from the launch site. This caused substantial safety concerns for the local community about a nearby school and residences and other areas at FWDA. In addition, Booster Drop Zone B included portions of the El Malpais National Monument and the El Malpais National Conservation Area, which encompassed wilderness and wilderness study areas. Use of this drop zone would be considered significant because it restricts access to recreational areas and conflicts with the statutory purposes for these special use areas. Booster drop zones A and B will not be used.

The new Booster Drop Zone C for FWDA includes U.S. Forest Service and private land. Both the public land manager and private owner have expressed their willingness to allow use of these lands for booster drops. Use of this booster drop zone greatly reduces the launch hazard area at FWDA and significantly improves safety for nearby schools and residences, in keeping with the purpose of E.O. 12898 to avoid disproportionate impacts on minorities, such as the Indian communities in the Fort Wingate area. No significant environmental impacts have been identified associated with this drop zone.

#### Kwajalein Missile Range, USAKA, Republic of the Marshall Islands Alternative

This alternative included missile launches and sensor testing at KMR and Wake Island. USAKA would be primarily

used for launching defensive missiles, however, there is a possibility that target missiles may be launched from USAKA. Wake Island would primarily be used for target missile launches, however, it also could be used for defensive missile launches. Technical difficulties with launches and costs removed sea-based target missile launches from consideration. Existing facilities at KMR and at Wake Island and planned construction at Wake Island (analyzed in the Wake Island Environmental Assessment, 1994) would be adequate for TMD interceptor and target launching activities; therefore minimal environmental impacts are anticipated. Issues of concern included potential impacts on sensitive plant and animal species at the KMR and Wake Island, particularly in undisturbed areas, the potential for damage, destruction, or vandalism of cultural resources, and safety issues. Mitigations included avoidance of areas of native vegetation and sea turtle nesting areas, consultation with appropriate U.S. and Marshallese officials to establish procedures to protect cultural resources such as data recovery, and avoidance. Mitigations also establish hazard areas and place operating restrictions on radars to avoid significant impacts. No significant environmental impacts are predicted with the use of KMR or Wake Island.

#### **Eglin Air Force Base Candidate Test Area Alternative**

This alternative would include missile launches and sensor testing at Eglin AFB on Santa Rosa Island and at Cape San Blas, Florida, with missile launches from a sea-based platform in the Gulf of Mexico. No significant impacts are predicted with the use of Eglin AFB. Health and safety and airspace impacts would be avoided by the issuance of Notices to Airmen and Notices to Mariners, and ensuring that the launch, booster drop, and intercept debris impact areas are clear of air and water traffic before proceeding with the test flights. This alternative is not selected at this time because test objectives could be met at other ranges, sea-launch capabilities will not be available, and additional test instrumentation is needed.

#### **Western Range Test Area Alternative**

This alternative would include missile launches and sensor testing at Vandenberg AFB, San Nicolas Island of the Naval

Air Warfare Center Weapons Division, and San Clemente Island of the Naval Air Station North Island, California, with off-range missile launches from a sea-based platform in the Pacific Ocean. No significant impacts are predicted with the use of Western Range. Health and safety and airspace impacts would be avoided by the issuance of Notices to Airmen and Notices to Mariners, and ensuring that the launch, booster drop, and intercept debris impact areas are clear of all air traffic before proceeding with the test flights. This alternative is not selected at this time because test objectives could be met at other ranges, sea-launch capabilities will not be available, and additional test instrumentation is needed.

#### **Alternatives Considered But Not Carried Forward**

Initially eleven candidate test range areas were considered for TMD testing. Criteria used to evaluate candidate test ranges included weather, scheduling, range instrumentation, range safety, and debris recovery. All but the four ranges analyzed in the FEIS were eliminated by the criteria established at the beginning of the selection process.

#### **MITIGATION, MONITORING, AND ENFORCEMENT**

All practicable means to avoid and minimize environmental harm will be taken. I direct BMDO Deputies and Program Executive Officers to monitor extended range testing activities and ensure the following mitigation measures described in the TMD Extended Test Range FEIS are implemented. Specifically, at the WSMR, and the associated FWDA, mitigations will include implementing the Evacuation Plan, Booster Recovery Plan, and Emergency Response Plan. Launches will be avoided during weather conditions that would have adverse effects on air quality or on test safety. To the extent possible, launches will be scheduled to avoid major events such as major military maneuvers (i.e. Roving Sand Operations), holidays, hunting seasons, cattle roundups, or local festivities that could be effected by the testing activities. Maximum advance notice of launch activities will be provided to local communities, travelers, etc., as described in the FEIS. Prior to conducting launches and starting construction, consultation with appropriate Federal and state agencies, as discussed in the EIS will occur concerning specific debris impact areas,

debris recovery activities, and prelaunch and preconstruction surveys in order to protect cultural resources and threatened and endangered species. American Indian concerns regarding access to and disturbance of sacred lands will be addressed during consultation with each affected American Indian group on a regular basis and prior to each missile launch. Consultation with local community groups will establish the procedures, and coordinate times for use of FWDA lands under BMDO control during periods of launch inactivity.

At the USAKA, the existing USAKA mitigation plan will be followed. Other mitigations include: International Notices to Airmen and Notices to Mariners, timely coordination with the International Civil Aviation Organization through the Federal Aviation Administration, adherence to established procedures for keep-out zones, hazard areas, and limitations on use of radars, and a scheduling plan will be implemented to minimize airspace and health and safety impacts. Preconstruction surveys and/or other mitigation measures will be accomplished in coordination with the appropriate Federal agencies and the Republic of the Marshall Islands Environmental Protection Authority to protect cultural resources and threatened and endangered species. I will implement appropriate safeguards as subsequent decisions are made regarding system components and basing locations, and as their accompanying environmental documents elaborate specific requirements for monitoring and enforcement.

21 Mar 95

Date



MALCOLM R. O'NEILL  
Lieutenant General, USA  
Director  
Ballistic Missile Defense  
Organization

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## **Appendix B**

### **Laws and Regulations Considered**

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# APPENDIX B

## LAWS AND REGULATIONS CONSIDERED

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### AIR QUALITY REGULATIONS

**Clean Air Act (42 United States Code [USC] 7401, et seq.)** is the principal applicable Federal law for air quality. It is the source of state implementation plan regulations and regulations regarding the achievement and maintenance of the National Ambient Air Quality Standards (NAAQS). Further, Title III, from the 1990 Amendments to the Clean Air Act, incorporates and will eventually replace the old National Emission Standards for Hazardous Air Pollutants program.

The Clean Air Act (CAA), as amended in 1990, specifies that “no department, agency, or instrumentality of the Federal Government shall engage in, support in any way, or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan.” An implementation plan is considered applicable after it has been approved or promulgated under section 110 of this title. This is the General Conformity Rule. Conformity is defined in Section 176(c) of the CAA as conformity to the State Implementation Plan’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards.

To ensure that activities of Federal agencies do not inhibit reaching the goals of a State Implementation Plan (SIP) (or Federal Implementation Plan (FIP) in areas with no approved SIP) in nonattainment and maintenance areas, the U.S. Environmental Protection Agency (USEPA) promulgated the General Conformity rule. The rule requires all Federal agencies to review new actions and decide whether the actions would worsen an existing NAAQS violation, cause a new NAAQS violation, delay the SIP attainment schedule of the NAAQS, or otherwise contradict SIP requirements. The review must take place prior to the action. The term “action” has a very broad meaning and includes projects or actions which a Federal agency engages in, supports in any way, or provides financial assistance for, licenses or permits, or approves. To the extent that a particular Federal agency allows an action to occur, it must review the action for conformity.

In order for an action in a nonattainment or maintenance area to proceed, the review must result in a determination of one of the following:

- (1) The action is addressed by the Transportation Conformity Rule.
- (2) The action is specifically exempted by the rule.
- (3) The total direct and indirect emissions caused by the action will be less than the *de minimis* levels established by the rules.
- (4) A conformity determination has been made that the action conforms to the applicable SIP or FIP.

**Florida Final Regulation 200 series, Chapter 62 Air Pollution**, was originally transferred from Title 17, effective 8/10/94. The Florida Department of Environmental Protection (FDEP), Division of Air Resource Management, uses the 200 series of Chapter 62 to address air pollution elimination, prevention, and control. Specific titles include:

Chapter 62-204: This chapter establishes maximum allowable levels of pollutants in the ambient air (ambient air quality standards) for the State of Florida. These are the maximum levels deemed necessary to protect human health and public welfare. This chapter also establishes the maximum allowable increases of ambient air concentrations for subject pollutants in order to prevent significant deterioration of air quality in those areas where ambient air quality is better than that prescribed by the standards. Finally, this chapter addresses approved air quality monitoring and modeling methods.

Chapter 62-210: This chapter establishes general requirements for stationary sources of air pollution emissions. It further provides the criteria for determining the need to obtain air construction and/or operation permits, public notice requirements, reporting requirements, and requirements relating to estimation of emission rates. While it also contained information regarding air model usage, this section has been repealed and Chapter 62-210 does not currently address this subject.

Chapter 62-212: This chapter establishes preconstruction review requirements for proposed new emissions units and facilities and proposed modifications to existing units and facilities. This chapter includes general preconstruction review requirements, specific prevention of significant deterioration review requirements, and non-attainment area preconstruction review requirements. It also provides provisions for authorizing the creation of or change to air emissions bubble permits.

Chapter 62-213: This chapter establishes a comprehensive operation permit system for permitting major sources of air pollution (Title V sources).

Chapter 62-214: This chapter establishes permitting requirements in addition to those presented in Chapter 62-213 for Title V sources that are subject to the Federal Acid Rain Program. The intent of this chapter is to maintain compliance and consistency with the Federal requirements of 40 Code of Federal Regulations (CFR) 72.

Chapter 62-242: This chapter establishes the necessary rules, standards, and criteria for the Department of Highway Safety and Motor Vehicles to administer the Florida Motor Vehicle Inspection Program.

Chapter 62-296: This chapter establishes limiting emission standards and compliance requirements for specific classes of stationary sources of air pollution. The chapter also establishes reasonably available control technology requirements. It is further stipulated that standards for any "new" facility or emissions unit shall be the Federal standards of performance for new stationary sources, unless a different and more stringent standard is established in this Chapter.

Chapter 62-297: This chapter establishes test procedures to be used in determining compliance of air pollution emissions units with standards specified in or established pursuant to stationary source rules.

## **AIRSPACE REGULATIONS**

**The Federal Aviation Act (49 USC 1347, et seq.)** gives the Federal Aviation Administration (FAA) sole responsibility for the safe and efficient management of all airspace within the continental United States, a responsibility that must be executed in a manner that meets the needs of all airspace users, both civil and military.

**FAA Order 1001.1A, as stated in FAA Order 7400.2D, *Procedures for Handling Airspace Matters***, implements the FAA's policy on airspace as follows: "The navigable airspace is a limited national resource, the use of which Congress has charged the FAA to administer in the public interest as necessary to insure the safety of aircraft and the efficient utilization of such airspace. Full consideration shall be given to the requirements of national defense and of commercial and general aviation and to the public right of freedom of transit through airspace. Accordingly, while a sincere effort shall be made to negotiate equitable solutions to conflicts over its use for non-aviation purposes, preservation of the navigable airspace for aviation must receive primary emphasis."

**FAA Order 7400.2D and FAA Handbook 7610.4H, *Special Military Operations***, regulate military operations in the National Airspace System. The latter was jointly developed by the Department of Defense (DOD) and FAA to establish policy, criteria, and specific procedures for air traffic control planning, coordination, and services during defense activities and special military operations.

DOD policy on the management of special use airspace is essentially an extension of FAA policy, with additional provisions for planning, coordinating, managing, and controlling those areas set aside for military use. Airspace policy issues or inter-service problems that must be addressed at the DOD level are handled by the DOD Policy Board on Federal Aviation, a committee composed of senior representatives from each Service. However, airspace actions within the DOD are decentralized, with each Service having its own central office to set policy and oversee airspace matters.

FAA Order 7400.2D stipulates that special use airspace actions are subject to environmental assessments and procedures if the altitude of the proposed action is below 914.4 meters (3,000 feet) above ground level or if supersonic flight is anticipated at any altitude (FAA Order 7400.2D CHG 4, 7005, 1991). Prior to submission for approval, military proponents of special use airspace must coordinate proposals with locally affected air traffic control facilities and military units, local FAA representatives or liaison offices where assigned, and the Air Route Traffic Control Center having jurisdiction over the affected airspace prior to submission of the proposal for approval. In addition, with the exception of controlled firing areas and an optional requirement for temporary military operations areas (MOAs) and temporary restricted areas, special use airspace must be reflected in aeronautical publications and depicted in aeronautical charts. New and revised areas normally become effective on the FAA 56-day cycle publication dates.

The handling of special use airspace matters (such as the establishment of, modification to, or changes in special use airspace) falls into two categories:

- Non rule-making actions include alert areas, controlled firing areas, and MOAs where the FAA has the authority to make the final decision but does not express that decision by issuing a rule, regulation, or order. Also included in the non-rule category are offshore warning areas, where the FAA has an interest, but the final approval is shared by other agencies.
- Rule-making actions include restricted areas and prohibited areas. These relate to the assignment, review, modification, or revocation of airspace by a rule, regulation, or order.

Rule-making actions are published in the Federal Register, and review requirements are according to FAA minimum prescribed timelines.

**Air Force Instruction (AFI) 13-201, *Air Force Airspace Management* (1994)**, prescribes Air Force airspace management and applies to all active duty, reserve, and Air National Guard units having operational and/or administrative responsibilities for using airspace and navigational aids. This policy applies to each major command functioning as the Air Force component of a unified command and to specified commands as outlined in unified or specified command directives. AFI 13-201 covers aeronautical matters governing the efficient planning, acquisition, use, and reporting of airspace actions to support Air Force flight operations.

AFI 13-201 states that all airspace actions are subject to environmental analysis in order to comply with the National Environmental Policy Act (NEPA) (Public Law 91-190) as implemented in AFI 32-7061). The procedures to implement NEPA and the Council on Environmental Quality regulations regarding the establishment, designation, and modification of special use airspace are contained in a Memorandum of Understanding between the FAA and the DOD contained in FAA Handbook 7400.2D.

**AFI 32-7061, *Environmental Impact Analysis Process* (EIAP), 1995**, contains policies, responsibilities, and procedures for the Air Force EIAP within the United States, its territories, and abroad, applying to all Air Force activities and the Air National Guard. It lists the airspace-related actions that qualify for categorical exclusions from environmental review. All other airspace-related actions that have the potential to significantly affect the environment are subject to a higher level of environmental review under its provisions.

**Navy Regulations—*Navy OPNAV Instruction 3770.2H, Airspace Procedures Manual* (1994)**, prescribes the Navy's airspace management procedures and delineates responsibilities for airspace planning and administration.

**International Civil Aviation Organization (ICAO), Document 444, *Rules of the Air and Air Traffic Services*, 1985 and 1994**, outlines the procedures followed over international waters. ICAO Document 444 is the equivalent air traffic control manual to the FAA Handbook 7110.65, Air Traffic Control.

**Executive Order 10854** extends the responsibility of the FAA to the overlying airspace of those areas of land or water outside the jurisdictional limit of the United States. Under this order, airspace actions must be consistent with the requirements of national defense, must not be in conflict with any international treaties or agreements made by the United States, nor be inconsistent with the successful conduct of the foreign relations of the United States. Accordingly, actions concerning airspace beyond the jurisdictional limit (22.2 kilometers [12 nautical miles]) require coordination with the DOD and Department of State, both of whom have preemptive authority over the FAA.

**FAA Order 7400.2, *Procedures for Handling Airspace Matters, Part 7***, contains the policy, procedures, and criteria for the assignment, review, modification, and revocation of special use airspace overlying water (in effect, Warning Areas). A Warning Area is airspace, of defined dimensions over international waters, that contains activity which may be hazardous to non-participating aircraft. Because international agreements do not provide for prohibition of flight in international airspace, no restriction of flight is imposed. The term Warning Area is synonymous with the ICAO term Danger Area.

**Executive Order No. 12114, *Environmental Effects Abroad of Major Federal Actions, 1979***, provides for three types of environmental reviews: Environmental Impact Statements (EISs); international bilateral or multilateral environmental studies; and concise reviews of the environmental issues involved, including Environmental Assessments (EAs), summary environmental analyses, or other appropriate documents. Major Federal actions significantly affecting the environment of the global commons outside the jurisdiction of any nation (such as the oceans or Antarctica) require the preparation of an EIS.

**AFI 13-20, *Air Force Airspace Management, 1994***, identifies Air Force airspace management policy for international overwater areas. DOD Directive 4540.1 stipulates that DOD aircraft, when operating in international airspace, will comply with ICAO procedures.

**AFI 32-7061, *The Environmental Impact Analysis Process, 1995***, stipulates that the Air Force consider the environmental effects of actions that affect the global commons, where global commons is commonly defined as geographic areas that are outside the jurisdiction of any nation, including the oceans outside territorial limits. There are no airspace-related or other actions specific to the global commons that are categorically excluded from further environmental review.

**Navy Regulations—Navy OPNAV Instruction 3770.2H, *Airspace Procedures Manual (1994)***, prescribes the Navy's airspace management procedures and delineates responsibilities for airspace planning and administration. Chapter 6 of OPNAVINST 3770.2H addresses flight operations and firings over the High Seas.

## **BIOLOGICAL RESOURCES REGULATIONS**

**Clean Water Act, Section 404 (33 USC 1344)**, regulates the dredging and filling of jurisdictional wetlands. Permits from the U.S. Army Corps of Engineers (USACE) are required for conducting dredging and filling operations. See also Utilities Regulations.

**Endangered Species Act (ESA) of 1973, Section 7 as amended (16 USC 1531)**, details the requirements for Federal projects. The ESA declares that it is the policy of Congress that all Federal departments and agencies shall seek to conserve endangered and threatened species. The act also directs Federal agencies to use their authorities in furtherance of the purposes of the act. Under the ESA, the Secretary of the Interior creates lists of endangered and threatened species. The term endangered species means any species which is in danger of extinction throughout all or a significant portion of its range. The act defines a threatened species as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Plants and animals that are candidates for listing are not formally protected under the ESA, but are recommended for consideration in all impact statements.

A key provision of the ESA for Federal activities is Section 7 consultation. Under Section 7 of the act, every Federal agency must consult with the Secretary of the Interior, the U.S. Fish and Wildlife Service (USFWS), and/or the National Marine Fisheries Service (NMFS) to ensure that any agency action (authorization, funding, or execution) is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the habitat of such species. See also Noise Regulations.

**Marine Mammal Protection Act (MMPA) (16 USC 1361, et seq.)** gives the USFWS and NMFS co-authority and outlines prohibitions for the taking of marine mammals. The act also provides for penalties for the use of fishing methods in contravention of any regulations or limitations enacted by governmental agencies to achieve the purposes of the MMPA. The Marine Mammal Commission, which was established under the act, reviews laws and international conventions, studies world-wide populations, and makes recommendations of Federal officials concerning marine mammals.

**The Bald and Golden Eagle Protection Act** establishes penalties for the unauthorized taking, possession, selling, purchase, or transportation of bald or golden eagles, their nests, or their eggs (16 USC 668, et seq.). Any Federal activity that might disturb eagles requires consultation with the USFWS for appropriate mitigation.

**The Fish and Wildlife Coordination Act** encourages all Federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of nongame fish and wildlife and their habitats (16 USC 2901, et seq.). Further, the act encourages each state to develop a conservation plan.

The act also requires a Federal department or agency that proposes or authorizes the modification, control, or impoundment of the waters of any stream or body of water (greater than 4.1 hectares [10 acres]), including wetlands, to first consult with the USFWS. Any such project must make adequate provision for the conservation, maintenance, and management of wildlife resources. The act requires a Federal agency to give full consideration to the recommendations of the USFWS and to any recommendations of a state agency on the wildlife aspects of a project.

**Wilderness Act of 1964 (Public Law [PL] 88-577)** established a National Wilderness Preservation System to be composed of Federally owned real estate designated by Congress as wilderness areas in order to protect these areas.

**Marine Protection, Research, and Sanctuaries Act** regulates the ocean dumping of waste, provides for research on ocean dumping, and provides designation and regulation of marine sanctuaries.

**National Wildlife Refuge System Administration Act of 1966** consolidates the authorities for categories of areas previously established that are administered by the Secretary of the Interior for the conservation of fish and wildlife, including species that are threatened with extinction. All lands, waters, and interests therein administered as wildlife refuges, etc., are designated as the National Wildlife Refuge System.

**Florida Coastal Management Act** is administered by the Department of Community Affairs (DCA) and requires review of all plans and activities in the coastal zone.

**Florida Environmental Land and Water Act (Chapter 380 F.S., Areas of Critical State Concern)** is administered by the DCA and contains provisions for the designation of areas of Critical State Concern and the review of large scale development through the Development of Regional Impact process. FDEP is responsible for regulations concerning state-owned submerged lands up to 16 kilometers (10 miles) from shore in the Gulf of Mexico, including marine resources, wetlands, beaches, and shores. Activities affecting wetlands and other submerged lands require an Environmental Resources Permit from the FDEP.

**Florida Wetlands Protection Act** provides protection for mangroves located in waters where dredge and fill activities are permitted and may require specific attention in the Environmental Resources Permit process. See also Land Use Regulations.

**Florida Aquatic Preserves Act** establishes a standardized set of management criteria for all designated aquatic preserves in the state. These state-owned submerged lands have exceptional biological, aesthetic, and scientific value and are considered "Outstanding Florida Water." See also Land Use Regulations.

## **CULTURAL RESOURCES REGULATIONS**

**National Historic Preservation Act of 1996, amended through 1992 (PL 89-665; 80 STAT 915; 16 USC 470; 36 CFR 800)**, established a program for the preservation of historic properties throughout the nation. The act authorizes the Secretary of the Interior to "expand and maintain a national register of districts, sites, building, structures, and objects significant in American history, architecture, archaeology, and culture, hereinafter referred to as the National Register..." This act also establishes an independent Agency of the U.S. Government, the Advisory Council on Historic Preservation, to "advise the President and the Congress on matters relating to historic preservation and to implement and monitor the Historic Preservation Act."

**Executive Order 11593 (Protection and Enhancement of the Cultural Environment, May 13, 1971, 3 CFR 154)** expands upon the responsibilities of Federal agencies with respect

to the purposes of the National Historic Preservation Act and specifies a relationship between this act and the NEPA. It orders that the “Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation.” It requires that “the heads of Federal agencies shall locate, inventory, and nominate to the Secretary of the Interior all sites, building, districts, and objects under their jurisdiction that appear to qualify for listing on the National Register of Historic Places” and that those properties be “preserved, restored, and maintained for the inspiration and benefit of the people.”

**Archaeological and Historic Preservation Act of 1974 (PL 93-291; 88 STAT 174; 16 USC 469)** furthers the policy set forth in the Historic Sites Act of 1935 by specifically providing for the preservation of historic and archaeological data which might be irreparably lost or destroyed as the result of . . . “any alteration of the terrain caused as a result of any Federal construction project or Federally licensed activity or program.”

**American Indian Religious Freedom Act of 1978 (PL 95-341; 92 STAT 469; 42 USC 1996)** states that it is the policy of the United States to protect and preserve for Native Americans their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, including access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

**Archaeological Resources Protection Act of 1979 (PL 96-95; 93 STAT 722; 16 USC 470aa-47011)** provides guidelines for dealing with archaeological resources on public and American Indian land. It details the permit procedures necessary for excavation and outlines the criminal and civil penalties for the illegal removal of archaeological materials from Federal land.

**Native American Graves Protection and Repatriation Act (1990) (PL 101-601; 25 USC 3001 et seq.)** requires any person who wishes to excavate Native American remains and grave goods on Federal land to obtain a permit and to give the Indian tribe most closely associated with those goods the opportunity to reclaim them. The act also addresses the incidental discovery of such items on Federal land by persons engaged in other activities, such as mining or construction. When one or more of these items are found, the activity must cease and a reasonable effort made to protect the items. Written notification must be made to the Federal land manager in charge and to the appropriate tribe or organization, who are allowed 30 days in which to make a determination as to the appropriate disposition for these remains. The Native American Graves Protection and Repatriation Act also requires that Federal agencies and museums in possession of Native American human remains and grave goods inventory such items, attempt to identify them as to geographical and cultural affiliation, notify the appropriate Native American organization, and return the items, if the tribe so desires.

**National Natural Landmarks Program (PL 74-292; 36 CFR 62)** sets forth the processes and criteria used to identify, study, designate, recognize, and monitor National Natural Landmarks.



**Army Regulation 420-40, *Historic Preservation*** (May 1984, currently in revision), prescribes management responsibilities and standards for the treatment of historic properties on land controlled or used by the Army.

**AFI 32-7065, Cultural Resources Management** (June 1994), sets Air Force guidance for protecting and managing cultural resources in the United States and U.S. Territories and possessions. The regulation also provides guidance for consulting with American Indian groups and for preparing Cultural Resources Management Plans.

## **GEOLOGY AND SOILS REGULATIONS**

**Executive Order 11988, Floodplain Management**, is intended to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

## **HAZARDOUS MATERIALS AND HAZARDOUS WASTE REGULATIONS**

**Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (PL 96-510, 42 USC 9601, et seq.)** authorizes the USEPA to enforce remediation of past contamination. The law authorized Federal agencies to respond to the release or imminent release of hazardous substances into the environment through emergency response procedures coordinated with state governments.

**Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (PL 99-499, 42 USC 11001, et seq.)** as part of the **Superfund Amendments and Reauthorization Act of 1986 Title III (PL 99-499, 42 USC. 9611, et seq.)** establishes the emergency planning efforts at state and local levels and provides the public with potential chemical hazards information.

**Federal Insecticide, Fungicide, and Rodenticide Act of 1972 (PL 92-516, 7 USC 136, et seq.)** regulates the labeling requirement and disposal practices of pesticide usage.

**Florida Administrative Code Title 62**, among others, is administered by the FDEP. These titles provide regulatory standards in areas such as solid and industrial wastes, storage tank systems, hazardous substances release notification, and waste minimization. All other levels of government would be contacted to obtain all applicable regulatory information. See also Utilities Regulations.

**Florida Pollutant Spill Prevention and Control Act (Title 28, Natural Resources; Conservation, Reclamation, and Use, Chapter 376, Pollutant Discharge Prevention, Sections 376.011-376.319)** supports and complements applicable provisions of the Federal Water Pollution Control Act, as amended specifically those provisions relating to the national contingency plan for removal of pollutants occurring as a result of procedures involved in the transfer, storage, and transportation of such products pose threats of great danger and damage to the environment.

**Florida Solid and Hazardous Waste Management Act (Title 29, Public Health, Chapter 403, Environmental Control, Sections 403.702-403.7721)** Plans for and regulates the most

economically feasible, cost-effective and environmentally safe manner the storage, collection, transport, separation, processing, recycling, and disposal of solid waste as well as ensures that hazard waste is transported, disposed of, stored, and treated in a manner adequate to protect human health, safety, and welfare, and the environment. See also Utilities Regulations.

**Hazardous Materials Transportation Act of 1975 (PL 93-633, 49 USC 1801, et seq.)** gives the U.S. Department of Transportation (USDOT) authority to regulate shipments of hazardous substances by air, highway, or rail. These regulations, found at 49 CFR Parts 171–180, may govern any safety aspect of transporting hazardous materials, including packing, repacking, handling, labeling, marking, placarding, and routing (other than with respect to pipelines).

**Military Munitions Rule (62 FR 6621, 40 CFR 260, et seq.)** identifies when conventional and chemical military munitions become a hazardous waste under the Resource Conservation and Recovery Act (RCRA), and provides safe storage and transport of such waste. It amends existing regulations regarding emergency responses involving both military and non-military munitions and hazardous waste and explosives. The rule also exempts hazardous waste generators and transporters from needing RCRA manifests when traveling through or close to adjacent properties under the control of the same person. The State of Florida, a primacy state, is expected to adopt the rule in August 1998.

**Nuclear Regulatory Commission (NRC) (PL 93-438, 42 USC 5801, et seq.)** regulates radioactive materials, including depleted uranium; enforcement of this statute is conducted under 10 CFR 19, 20, 21, 30, and 40, NRC Standards for Protection Against Radiation. These health and safety standards were established as protection against ionizing radiation resulting from activities conducted under the licenses issued by the NRC. The handling, storage, establishing radiation protection programs, record keeping, transport, and disposal of radioactive materials are subject to NRC standards.

**Ocean Dumping Act (ODA) (PL 92-532, 33 USC 1401, et seq.)** is Title I of The Marine Protection, Research, and Sanctuaries Act of 1972. The ODA regulates what can be dumped into the ocean in order to protect the marine environment. It restricts allowed dumping to designated locations, and strictly prohibits dumping of materials such as radioactive and biological warfare substances. The U.S. Coast Guard conducts surveillance as a regulatory measure.

**Oil Pollution Act (OPA) of 1990 (PL 101-380, 33 USC 2701, et seq.)** requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. The OPA also established a trust fund for cleaning up oil spills when the responsible party is incapable or unwilling to do so. The OPA requires the development of Area Contingency Plans to prepare and plan for oils spill response on a regional scale.

**Pollution Prevention Act of 1990 (PL 101-508, 42 USC 13101, et seq.)** requires the USEPA to develop standards for measuring waste reduction, serve as an information clearinghouse, and provide matching grants to state agencies to promote pollution prevention. Facilities with more than 10 employees that manufacture, import, process, or

otherwise use any chemical listed in and meeting threshold requirements of EPCRA must file a toxic chemical source reduction and recycling report.

**Resource Conservation and Recovery Act (RCRA) of 1976, as amended 1984 (PL 94-580, PL 98-616 [1984], and 42 USC 6901, et seq.)** authorizes the USEPA to regulate the generation, storage, and disposal of hazardous wastes. The RCRA also manages underground storage tanks. See also Utilities Regulations.

**Toxic Substances Control Act (TSCA) of 1976 (PL 94-469, 15 USC 2601, et seq.)** establishes that the USEPA has the authority to require the testing of new and existing chemical substances entering the environment, and, subsequently, has the authority to regulate these substances. Many of the materials contained in the missiles and drones which Eglin Air Force Base (AFB) tests in the overwater areas contain substances that are considered toxic under the TSCA. The TSCA also regulates polychlorinated biphenyls.

## **LAND AND WATER USE REGULATIONS**

**Coastal Barriers Resource Act (CBRA) (16 USC 3501, et seq.)**—The CBRA of 1982, 16 USC 3501 et. seq., CBRA is intended to protect 186 undeveloped barrier island units from growth pressures by placing restrictions on Federal program funds, such as Federally-funded infrastructure and flood insurance, that serve future growth. Use of areas within these boundaries would require consultation with the Secretary of Transportation.

**Executive Order 12372, Intergovernmental Review of Federal Programs**, was issued in 1982 to foster intergovernmental cooperation in coordinating the review of the proposed Federal assistance and direct development. Cooperative agreements are in place between the Air Force and the State of Florida requiring the Air Force to submit information on plans, programs, and projects at Eglin AFB including Notices of Intent, Findings of No Significant Impact, and Draft and Final EISs.

**National Wildlife Refuge System Administration Act of 1966** authorizes the Secretary of the Interior to permit uses of a refuge “whenever he determines that such uses are compatible with the major purposes for which such areas were established.” Consequently the USFWS has prepared a *Refuge Manual* and a procedure for determining compatibility of uses on National Wildlife Refuges. The Manual defines a compatible use as a “use that will not materially interfere with or detract from the purposes for which the refuge was established.”

Under the procedure, compatibility determinations are based on a site-specific physical, geological, and biological analysis of anticipated impacts of a proposed action in terms of the resources that represent the purposes for which the refuge was established. A request for a determination of compatibility is filed with the refuge manager with regional and Washington office review where warranted. Impacts to be considered include direct, indirect, and cumulative impacts. Also, the compatibility takes into consideration whether impacts are short term or long term in nature. Preparing an EIS or EA as set forth in NEPA may satisfy this analysis.

**Chapter 380, Florida Statutes (the Environmental Land and Water Management Act)** was passed in 1972 and has been amended many times since then. Its primary roles are to

provide a state and regional review process for Developments of Regional Impact and to provide for special management plans and coordinated agency review of development in four regions of the state that are designated Areas of Critical State Concern. The function of the statute is to ensure that all permits are issued in accord with state statutes and rules administered by the Florida Department of Community Affairs (DCA). The DCA established a Monroe County field office in Marathon to facilitate this process.

**Beaches and Shore Preservation Act (Florida Statutes, Chapter 161)** requires a coastal construction permit for shoreline construction or reconstruction, defined as seaward of the mean high-water line of any tidal waters of the state. Activities requiring a coastal construction permit include: construction of “groins, jetties, moles, breakwaters, seawalls, revetments, artificial nourishment, inlet sediment bypassing, excavation or maintenance of dredging of inlet channels or other deposition or removal of beach material, or construction of other structures of a solid or highly impermeable design upon sovereignty lands of Florida.”

**Florida Coastal Planning and Management Act (Florida Statutes, Chapter 380.20-380.33)** regulates development in the coastal zone, defined as “that area of land and water from the territorial limits seaward to the most inland extent of marine influences.” The act stipulates that when an activity requires a permit or license subject to Federal consistency review, the state’s issuance or denial of a state permit shall constitute the state’s findings of consistency.

**Executive Order 83-150** directs intergovernmental cooperation at the state level. The State Clearinghouse serves as a repository of both Federal and state-prepared documents, studies, and impact reports. The State Clearinghouse also serves as the single point of contact for distributing information to interested parties regarding proposed activities in the State of Florida. The Clearinghouse function of Florida Executive Order 83-150 fulfills requirements under Federal Executive Order 12372.

**Chapter 163, Florida Statutes, Local Government Comprehensive Planning and Land Development Regulation Act**—The principle distinguishing features of the state planning act are:

- A set of minimum standards detailed in Rule 9-J.5 of the Florida Administrative Code, that set out the content of required elements of a local Comprehensive Plan and the planning process through which plans are prepared, reviewed, approved, adopted, implemented, and updated.
- A consistency requirement that sets up a system of plan review at the state and regional level and requires that local comprehensive plans and permits issued by local government be consistent with the State Comprehensive Plan and Regional Strategic Policy Plan and further the goals, objectives, and policies of the state and regional plans.
- A concurrency management system that governs provision of infrastructure (potable water, wastewater treatment, transportation, drainage, solid waste, and recreation), and requires that it be adequate to provide locally determined levels

of service and made available concurrently with the development of land that it serves.

Chapter 163 also requires that local government plans must discourage development of land and extension of infrastructure in the Coastal High Hazard Area (CHHA). The CHHA is defined by state regulation to be “areas which have historically experienced destruction or severe damage, or are scientifically predicted to experience destruction or severe damage from storm surge, waves, erosion or other manifestations of rapidly moving or storm driven water” (97-5.003(14)). Future development should be directed away from the CHHA to the maximum extent possible in order to discourage private investment in areas subject to storm surge impact. CHHAs exist along the shoreline of Santa Rosa Island, Cape San Blas, and throughout the Florida Keys.

**Coastal Zone Management Act (CZMA), 16 USC Sections 1451-1464**, CZMA as amended provide for the coordination of Federal and state actions to protect the resources of coastal area through a coordinated review of public and private activity in areas that the state designates as coastal areas. Florida has designated the entire state as a coastal zone.

In accordance with *Presidential Executive Order 12372*, CZMA, and NEPA, 42 USC Sections 4321, 4331-4335, 4341-4347, as amended, the authority to determine the consistency of the proposed action with the Federal CZMA has been delegated to the state of Florida through the Florida Coastal Management Program (FCMP) conducted in the State Clearinghouse review process. The FCMP networks 26 existing state laws administered by seventeen state agencies into a coordinated review process to assure that Federal activities affecting Florida’s coastal resources are planned and implemented in conformity with the CZMA. The lead agency is the Department of Community Affairs. The core statutes include:

- Chapter 380, Land and Water Management
- Chapter 161, Beach and Shore Preservation
- Chapter 186, State and Regional Planning
- Chapter 252, Emergency Management
- Chapter 259, Land Conservation Act of 1972
- Chapter 370, Marine Resources; Saltwater Fisheries
- Chapter 373, Water Resources Planning and Management

The issues covered under the aegis of Coastal Management are broad, and include issues such as preservation of wetlands, watersheds, beaches, and estuarine systems, water quality, protection of the habitat of endangered and threatened species, coastal setbacks and construction control line, erosion control, hurricane mitigation, protection of fisheries, and protection of cultural resources.

**Monroe County Land Development Regulations (LDRs)** govern land use and development. The LDRs allow for designation of Areas of Critical County Concern (ACCC) by the Board of the County Commissioners. Four ACCCs are identified in the Comprehensive Plan. These ACCC areas are not immediately adjacent to the proposed activity sites.

**Outer Continental Shelf Lands Act of 1953 (43 U.S.C. 1331).** Under the Outer Continental Shelf Lands Act, the Secretary of the Interior is responsible for the administration of mineral exploration and development of the Outer Continental Shelf. The Act empowers the Secretary to grant leases to the highest qualified responsible bidder(s) on the basis of sealed competitive bids and to formulate such regulations as necessary to carry out the provisions of the Act. The Act, as amended, provides guidelines for implementing an Outer Continental Shelf oil and gas exploration and development program.

**St. Joseph's Bay Aquatic Preserve Management Plan** addresses the St. Joseph Bay Aquatic Preserve. The St. Joseph Bay Aquatic Preserve includes the submerged lands in the St. Joseph Bay as well as submerged land on the west (Gulf of Mexico) side of the spit for a distance of 4.8 kilometers (3 miles) offshore. Uplands are excluded from the preserve. The aquatic preserve is managed by the FDEP, Division of Marine Resources in accordance with Florida Administrative Code (FAC), Chapter 18-20, and an adopted management plan. The management plan prescribes management activities intended to maintain and enhance its natural resources, especially the fragile seagrass beds and fisheries, and to provide for coordination of actions by Federal, state and local agencies.

## **NOISE REGULATIONS**

**Noise Control Act (PL 92-574, 42 USC 4901, et seq.)** directs all Federal agencies to the fullest extent within their authority to carry out programs within their control in a manner that promotes an environment free from noise that jeopardizes the health or welfare of any American. The act requires a Federal department or agency engaged in any activity resulting in the emission of noise to comply with Federal, state, interstate, and local requirements respecting control and abatement of environmental noise. Workplace noise is under the jurisdiction of the Occupational Safety and Health Administration (OSHA), and is thus addressed primarily in Safety and Health, rather than Noise.

**Florida Constitution, Article 2, Section 7**, states that "...Adequate provision shall be made by law for the abatement of ...excessive and unnecessary noise." Noise is also addressed generally, along with other environmental concerns, under the Florida Environmental Land and Water Management Act (Florida Statutes, Title 28). Under the act, the state is authorized to consider and be guided by the extent to which development would create or alleviate environmental problems, including noise. Local ordinances frequently address a nuisance being caused by noise (such as disturbing the peace), but are rarely applicable to noise caused by military activities.

**Department of Defense Noise–Land Use Compatibility Guidelines** states that sensitive land use, such as residential areas, are incompatible with annual A-weighted Day-Night Equivalent Sound Level ( $L_{dn}$ ) greater than 65 A-weighted decibels (dBA) (62 C-weighted decibels [dBC]).

**Endangered Species Act (ESA) of 1973, Section 7 as amended (16 USC 1531)**—see Biological Resources Regulations.

**Marine Mammal Protection Act (16 USC 1361, et seq.)**—see Biological Resources Regulations.

## **SAFETY REGULATIONS**

**29 CFR Parts 1910 and 1926**—Regulatory requirements related to the Occupational Safety and Health Act of 1970 have been codified in 29 CFR Part 1910, General Industry Standards, and 29 CFR 1926, Construction Industry Standards. The regulations contained in these sections specify equipment, performance, and administrative requirements necessary for compliance with Federal occupational safety and health standards, and apply to all occupational (workplace) situations in the United States. Requirements specified in these regulations are monitored and enforced by the OSHA, which is a part of the U.S. Department of Labor.

With respect to on-going work activities at the proposed action locations, the primary driver is the requirements found in 29 CFR Part 1910. These regulations address such items as electrical and mechanical safety and work procedures, sanitation requirements, life safety requirements (fire and evacuation safety, emergency preparedness, etc.), design requirements for certain types of facility equipment (such as ladders and stairs, lifting devices), mandated training programs (employee Hazard Communication training, use of powered industrial equipment, etc.), and record-keeping and program documentation requirements. For any construction or construction-related activities, additional requirements specified in 29 CFR 1926 also apply.

**EM 385-1-1, USACE Safety and Health Requirements Manual**—All work activities undertaken or managed by the USACE, which can include many types of Federal construction projects, must comply with the requirements of EM 385-1-1. In many respects the requirements in this manual reflect those in 29 CFR 1910 and 1926, but also include USACE-specific reporting and documentation requirements.

**Range Commanders Council (RCC) Standard 321-97, Common Risk Criteria for National Test Ranges.** RCC 321-97 sets requirements for minimally-acceptable risk criteria to occupational and non-occupational personnel, test facilities, and non-military assets during range operations. Methodologies for determining risk are also set forth.

**Range Commanders Council Standard 319-92, Flight Termination System Commonality Standards.** RCC 319-92 specifies performance requirements for flight termination systems used on various flying weapons systems.

**49 CFR**—Requirements pertaining to the safe shipping and transport handling of hazardous materials (which can include hazardous chemical materials, radioactive materials, and explosives) are found in the USDOT Hazardous Materials Regulations and Motor Carrier Safety Regulations codified in 49 CFR Parts 107, 171-180 and 390-397). These regulations specify all requirements that must be observed for shipment of hazardous materials over highways (truck shipment) or by air. Requirements include specific packaging requirements, material compatibility issues, requirements for permissible vehicle/shipment types, vehicle marking requirements, driver training and certification requirements, and notification requirements (as applicable).

**Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 USC 1251, et seq.)** has special enforcement provisions for oil and hazardous substances. For

example, the Spill Prevention Control and Countermeasure Plan covers the release of hazardous substances, as identified by USEPA, which could reasonably be expected to discharge into the waters of the United States.

**Pollutant Discharge Prevention and Removal (Florida Statute Title 29, Sections 376.011-376.319)** is intended to support and complement provisions of the Federal Water Pollution Control Act, as amended, specifically those provisions relating to the National Contingency Plan for the removal of pollutants.

**Solid and Hazardous Waste Management Act (Florida Statute Title 29, Sections 403.702-403.7721)** plans for and regulates the storage, collection, transport, separation, processing, recycling, and disposal of solid waste in order to protect public health, enhance the environment, and recover resources which have the potential for further usefulness. See also Utilities Regulations.

## **TRANSPORTATION REGULATIONS**

**Highways for the National Defense Act (23 USC 210)**—addresses the special use of public highways for military purposes; sets policies, procedures, and funding protocols for specific military use of public highways, and establishes a national Strategic Highway Corridor Network. This network is coordinated with civil highway authorities to ensure the Nation’s highway system meets defense needs.

**Intermodal Surface Transportation Efficiency Act (ISTEA)**—the ISTEA of 1991 directs the use of Federal transportation funds and planning activities among Federal, state, and local governments. Distinguishing characteristics of the program include:

- Creation of the National Highway System, a set of interstate and intrastate routes designated by states with a separate account of funds for maintenance and improvement.
- Increased flexibility in the use of highway funds for related, non-highway improvements, including transit, bicycle and pedestrian improvements, and other transportation enhancements that are intended to enhance the environment within which transportation activities are implemented. Examples of transportation enhancements include historic preservation, wetland banking, air quality improvements, and highway beautification.
- Increased participation of citizens in the planning process, including prioritizing transportation improvements.
- Specific connection with conformity with the Clean Air Act, requiring that local and state transportation plans be consistent with state air quality plans, with sanctions for non-conforming air sheds.
- Increased role of Metropolitan Planning Organizations in programming use of Federal funds in urban areas.



- Increased emphasis on land use, intermodal connectivity, and transportation efficiency.

In the state of Florida, **Chapter 163, F.S., Local Government Comprehensive Planning and Land Development Regulation Act** and Rule 9-J.5 of the FAC requires that land development be permitted only when adequate public facilities, including roads, are provided concurrent with growth such that the average locally adopted levels of service are maintained. Most local communities follow the guidelines for level of service for highways based on traffic volumes listed in the Florida Department of Transportation (FDOT) Generalized Annual Average Daily Volumes, adjusted for differing types of areas and functional classifications of highway facilities.

**Florida Statutes Sections 316.302 and 316.70** contain safety requirements that apply to the operation of commercial vehicles on the public highways of the state. In general, these laws have adopted the Federal Motor Carrier Safety Regulations found in Chapter 49 CFR, parts 390 through 397. In part, they establish legal dimensions and weight limits for trucks in Florida. The legal height limit is 4.1 meters (13.5 feet). The legal width is 259 centimeters (102 inches), or 243.8 centimeters (96 inches) on a travel lane less than 3.7 meters (12 feet) in width. The maximum gross weight (vehicle plus load) is up to 36,288 kilograms (80,000 pounds). For oversize and/or overweight loads, a blanket permit may be obtained in certain circumstances. In the Florida Keys, no blanket permits are allowed for overweight vehicles.

**Hazardous Materials Transportation Regulations** are found in **49 CFR, parts 100 through 180**, as they apply to highway transportation. See also Hazardous Materials Regulations.

**Comprehensive Plans** are adopted by local governments in the ROI of Eglin AFB and provide for the implementation of state policy with regards to maintaining a satisfactory level of service on local streets and thoroughfares through a combination of transportation improvements and concurrency management. Development approvals are contingent upon the availability of adequate highway capacity or adequate provision to improve highways in accord with the demands of development as it occurs. Transportation planning and funding decisions in the Fort Walton Beach urbanized area are made cooperatively by state, local, and regional planning agencies acting through the Fort Walton Beach Metropolitan Planning Organization, which prepares long-range forecasts of future highway travel volumes and prepares a program of highway improvement needs and financially feasible funding priorities.

In Gulf County, there is no Metropolitan Planning Organization, and the FDOT does long-range transportation planning and programs highway improvements on the state and Federally funded road system in consultation with local elected officials.

**33 CFR (Navigation and Navigable Waters), Part 89**, centers upon Inland Navigation Rules, concerning such issues as drawbridge operation regulations, inland waterways navigation regulations, captain of the port zones, and danger zone and restricted area regulations; **46 CFR (Shipping)** covers building and classing steel vessels that utilize the waterway; **15 CFR** focuses on commerce; and **49 CFR**, on transportation aspects.

## **Intracoastal Waterway**

**Florida Department of Environmental Protection**—The Office of Waterway Management in the Division of Law Enforcement is responsible for the drafting of rules establishing boating restricted areas upon the Florida Intracoastal Waterway (IWW) and for permitting the placement of regulatory markers in support of those zones. Under Chapter 20, Florida Statutes, such action must then be coordinated with the Florida Department of the State and the Joint Administrative Procedures Committee of the state legislature, as well as the Coast Guard and USACE. (Parsons, 1996)

**USACE** regulates activities that involve navigable waters. The Gulf IWW is subdivided into five USACE districts responsible for Waterway maintenance and operation of navigation structures: the Galveston District, from the Mexican border to Louisiana; the New Orleans District, encompassing Louisiana; the Mobile District, from western Mississippi to just east of Tallahassee, Florida; and the Jacksonville District, covering the Waterway from Tallahassee to the Fort Myers' vicinity. The USACE ensures safe navigation by maintaining a constant minimum depth of 4 meters (12 feet) for most of the waterway's length; some areas, however, may vary from 2.1 to 2.7 meters (7 to 9 feet) in minimum depth.

**Inland Navigation Districts (IND)**—In 1947, the Florida Legislature created the West Coast IND as a unit of local government responsible for meeting the requirement imposed upon local interests (for example, rights of way) for the IWW.

## **Gulf Shipping Lanes**

**Key West Transportation Department** regulates public transit and the operations of the Monroe County cruise ports (Mallory Dock and Pier B in Key West).

**International Maritime Organization (IMO)** established a 4.02-kilometer (2.5-mile) "Area To Be Avoided" along the coastline, based upon international treaty agreements set up by the U.S. Senate to address safety and environmental concerns.

**Local Bar Pilots Association** is appointed by the Governor to ensure ship transport safety in and out of port.

**Ports and Waterways Safety Act, as amended**, seeks to enhance navigation and vessel safety; protect the marine environment; and protect life, property, and structures in, on, or immediately adjacent to the navigable waters of the United States. This act implements many IMO standards concerning maritime safety.

**USACE** regulates activities that involve navigable waters. In U.S. Coastal areas, the USACE has three primary missions: search and rescue, law enforcement, and the operation and maintenance of navigational aids (such as channel markers, navigational lights, and lighthouses).

**U.S. Coast Guard** regulates any activity involving bridges in the Florida Keys area.

## UTILITY REGULATIONS

### Water Supply

**Clean Water Act of 1972 (PL 92-500, 33 USC, 1251, et seq.)** authorizes the USEPA to regulate wastewater discharge to surface waters; the USEPA has delegated their authority to FDEP. Implementation regulations include the National Pollutant Discharge Elimination System (NPDES) permitting process (40 CFR 122), pretreatment programs (40 CFR 403), and categorical effluent limitations (40 CFR 405, et seq.). See also Biological Resources Regulations.

Federal statutes that affect stormwater management in the state are the Rivers and Harbors Appropriation Act of 1899; Section 10, the Clean Water Act of 1977; Section 404, and the Water Quality Act of 1987. Under the Clean Water Act, the states must certify that discharges will not violate state water quality standards. Section 301 of the Clean Water Act prohibits the discharge of any pollutant from a point source to waters of the United States without a permit. Also contained within the Clean Water Act is the National Pollutant Discharge Elimination System; Section 402. See also Biological Resources Regulations.

**National Pollution Discharge Elimination System, 33 USC Sect 1251-1376**, The Clean Water Act of 1972, as amended, prohibits the discharge of any pollutant to surface waters of the United States from a point source unless the discharge is authorized by USEPA with a NPDES permit. Congress enlarged the purview of the NPDES program in 1987 by requiring USEPA to issue or deny permits for industrial and certain municipal stormwater discharges. A final rule was promulgated in 1990 that requires permits for discharges of stormwater associated with industrial activity as well as municipal storm sewer systems serving a population over 100,000 persons.

**Environmental Resource Permit program** administered by the State of Florida authorizes use of state-owned submerged land/Federal dredge and fill. The program is administered by FDEP or the Water Management Districts depending on the type of activity being permitted. Application for this permit triggers distribution of the permit to many state agencies from whom comments are requested and distribution to the USACE for consideration of whether a 404 Dredge and Fill permit is needed.

**Safe Drinking Water Act of 1979 (PL 93-523, 42 USC 300f, et seq.)** sets primary drinking water standards for owners and operators of public water systems and seeks to prevent underground injection that can contaminate drinking water sources.

**Consumptive Water Use Permit**—This permitting system stems from the Clean Water Act and is administered by the South Florida Water Management District (SFWMD), Regulations Division, Water Use Section. Florida water use regulations cover consumptive water use in the areas of commercial and municipal use, private domestic and facility water wells, “dewatering” for construction purposes, installation of utilities, and stormwater conveyances, and any other operation that requires dewatering.

**FAC Title 62-302, Florida Drinking Water Standards** establish primary and secondary maximum contaminant levels for organics, inorganics, turbidity, microbiological substances, and radionuclides.

**Florida Water Resources Act (Florida Statutes, Title 28, Section 373)** requires a comprehensive approach to water management based on regional hydrological boundaries and provides for the creation of five regional water management districts, including the Northwest Florida Water Management District (NFWMD) that has jurisdiction over Eglin AFB and the SFWMD that has jurisdiction over the Florida Keys. Water districts are authorized to conserve, protect, manage, and control the waters of the state within regional boundaries. The FDEP classifies public water supply systems as those having at least 15 service connections or regularly serving 25 individuals daily at least 60 days of the year.

**Florida Keys Aqueduct Authority (FKAA) (48-8001[1])**—under the SFWMD, the FKAA has the sole responsibility for obtaining, supplying, and distributing an adequate water supply for the Florida Keys, as well as regulating all potable water supplies within its boundaries.

**Florida Water Conservation Act (Florida Statutes 553.14)**—regulates water conservation in the state. This act requires implementation of a water conservation program designed to enhance the efficient use of water and reduce demand.

#### **Wastewater Treatment**

**Florida Air and Water Pollution Control Act (Florida Statutes, Title 28 Section 403)** governs industrial and domestic wastewater discharges in the state. The NFWMD has been delegated as the enforcement authority by the FDEP. Title 62 of the FAC contains the implementing state regulations regarding wastewater discharges.

**Florida Department of Health and Rehabilitative Services** is in charge of regulating septic tanks and individual aerobic treatment units (under 37,900 liters [10,000 gallons] per day) as well as regulating wastewater discharge to drainage fields and infection wells (FAC Title 10D-6). Septic tanks and aerobic treatment units on military facilities are not regulated by the state.

#### **Solid Waste Management**

**Florida Solid and Hazardous Waste Management Act (Florida Statutes 29 Chapter 403)** - requires that counties establish and operate solid waste disposal facilities and that each county implement a recycling program to achieve a 30 percent reduction from 1990 levels in the disposal of solid waste by 1994. See also Hazardous Materials Regulations.

**Florida Resource Recovery and Management Regulations (FAC 62-7)** establish local resource recovery and management programs and regulate the collection, transport, storage, separation, processing, recycling, and disposal of solid wastes including sludge.

**Florida Solid Waste Disposal Facility Regulations (FAC 62-701)** establish regulations for the construction, operation, and closure of solid waste facilities.

**Solid Waste Disposal Act of 1965 (32 USC 3251, et seq.)** establishes guidelines for solid waste collection, transport, separation, recovery, and disposal systems.

**Resource Conservation and Recovery Act (42 USC 6901, et seq.)** amended this act by shifting the emphasis from disposal to recycling and reuse of recoverable materials. Florida also has solid waste management regulations pertaining to solid waste facilities, state resource recovery and management programs, certification, utilization, and disposal criteria. The FDEP develops and adopts rules that govern proper management of solid waste in the state. Most of the responsibility for solid waste management under the law rests with local governments. Generally, counties operate solid waste disposal facilities to serve the cities and towns within their jurisdictions. See also Hazardous Materials Regulations.

**Florida Solid Waste Management Act** requires special management and handling for a number of solid wastes. (See also Hazardous Materials Regulations)

**Air Force Policy Directive (AFPD) 32-70, Environmental Quality** requires compliance with applicable Federal, state, and local environmental laws and standards. For solid waste, AFPD 32-70 is implemented by AFI 32-7042, Solid and Hazardous Waste Compliance, and AFI 32-7080, Pollution Prevention Program. AFI 32-7042 requires that each installation have a solid waste management program that includes a solid waste management plan addressing handling, storage, collection, disposal, and reporting of solid waste. AFI 32-7080 contains the solid waste requirement for preventing pollution through source reduction, resource recovery, and recycling.

### **Stormwater Management**

**The Florida Environmental Land and Water Management Act of 1972**—See Biological Resources Regulations.

**The Florida Water Resources Act of 1972** regulates the construction, alteration, maintenance, operation, and abandonment of dams, appurtenant works, impoundments, reservoirs, and works affecting waters in the state. The act also created the various water management districts and grants them the authority to acquire land.

**Water Management Districts** are given jurisdiction over virtually all types of artificial and natural structures or construction that affects waters in the state. Jurisdiction of the Water Management Districts goes beyond that of the Department of Environmental Regulation (DER) to include isolated wetlands. Water management districts that have been delegated stormwater management responsibility by DER are required to adopt rules to establish permitting criteria for certain small isolated wetlands that are not within the dredge and fill jurisdiction of DER.

**Florida Air and Water Pollution Control Act (Section 403.182)**—under Chapters 373 and Chapters 403 the DER has adopted a separate set of rules relating to stormwater pollution pursuant to its authority.

**Chapter 17-25 FAC** known as the stormwater rule, is intended to prevent pollution of waters of the state by stormwater discharged from new, expanded or modified development.

**Chapter 17-40 FAC** is intended to establish a more comprehensive state wide stormwater management strategy.

**Florida Statutes and Rules IV.373; 40E-40 FAC** authorize the SFWMD to regulate stormwater systems.

**Florida Administrative Code 14-86** authorizes the FDOT to independently permit stormwater discharges and connections to FDOT rights-of-way.

**The Department of Environmental Regulation Stormwater Management Rule (Chapter 17-25, FAC) and the Federal Emergency Management Administration Floodplain Ordinance** regulate Stormwater generated from new development.

### **Electricity**

The Florida Public Service Commission regulates the Gulf Power Company and CHELCO.

### **Water Resources Regulations**

**Section 404 of the Clean Water Act**, the USACE has jurisdiction over the disposition of fill or dredge material in the navigable waters of the United States and is given permit authority over regulated activities that affect navigable waters. Navigable waters includes virtually any waterbody of the United States, plus adjacent wetlands, including wetlands separated from other waters of the U.S. by dikes, barriers, or beach dunes, and the like. In *United States v. Holland*, the discharge of dredged or fill material in mangrove wetlands above mean high water was specifically prohibited without a permit from USACE. See also Biological Resources Regulations.

**Section 404(b)(1) of the Clean Water Act (33 USC 1344(b)(1))** directs the Administrator of the USEPA, working with the Secretary of the Army, to develop guidelines for the specification of sites for the discharge of dredged or fill materials. The guidelines (40 CFR 230.1(c)) prohibit wetlands discharges unless it can be demonstrated that the effects of the discharge will not be adverse or that there are no “practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences”. A practicable alternative is one that is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes”.

**Florida Constitution Section 16 Limiting Marine Net Fishing** (Constitution of the State of Florida, adopted 1994)—This section of the Florida Constitution enacted limitations on marine net fishing in state waters. It banned gill nets and other entangling nets and limited the size and number of mesh nets in near-shore and inshore Florida waters (within 4.8-kilometer [3-mile] limit). This measure significantly changed near-shore commercial fishing activities.

**Florida Keys National Marine Sanctuary Management Plan of 1996**—This management plan sets up a process for current and future changes in fishing activities including prohibitions, gear restrictions and permits within the Sanctuary.

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## **Appendix C**

### **Environmental Justice**

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# APPENDIX C ENVIRONMENTAL JUSTICE

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## Affected Environment

**Santa Rosa Island.** On 11 February 1994, the President issued Executive Order (EO) 12898, Environmental Justice, and an accompanying Transmittal Memorandum that referred to existing Federal statutes and regulations that were to be used in conjunction with the EO.

The objective of the Executive Order was to ensure that Federal agencies analyzed “the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC Section 4321 et seq.”

The following analysis of environmental justice is designed to comply with the intent of EO 12898, Environmental Justice, Army, and Department of Defense (DOD) guidance.

**Methodology.** The majority of the environmental effects of the no-action alternative and the proposed action would occur in Okaloosa and Santa Rosa counties. These counties, therefore, form the region of influence (ROI) for this environmental justice analysis.

The 1990 Census of Population and Housing, carried out by the U.S Department of Commerce, Bureau of Census, identified small subdivisions as a means to group statistical data within each county. These subdivisions are known as census tracts.

Data from the 1990 Census of Population and Housing was used to identify the size of low-income and minority populations in each of the census tracts in Okaloosa and Santa Rosa counties.

Low-income status is synonymous with poverty status and applies to families whose annual income fell below the poverty level (\$12,764 for a family of four in 1989, as reported in the 1990 Census of Population and Housing).

Minority status is identified in the 1990 Census as Black; American Indian, Eskimo, or Aleut; Asian or Pacific Islander; Hispanic; or other. Non-minority status is applied to the population identified as White.

A census tract is considered disproportionate under either of two conditions: (1) the percentage of persons in the tract having a low-income and/or minority status exceeds the percentage in the county as a whole, or (2) the percentage of persons in the tract having a low income and/or minority status exceeds 50 percent.

Table C-1 shows the profile of every census tract in Okaloosa and Santa Rosa counties. In Okaloosa County 14,183 people (10.3 percent) had low-income status in 1989 and 21,553 people were members of an ethnic minority (15 percent). In Santa Rosa



County, 11,375 people (14.2 percent) had low-income status and 6,089 people were members of an ethnic minority (7.5 percent).

Of the 45 census tracts that comprise both counties, 28 had disproportionate percentages of low-income or minority populations (or both). These 28 census tracts, therefore, may be subject to environmental justice impacts.

**Table C-1: Income and Minority Status—Okaloosa and Santa Rosa Counties**

	<b>Percent Minority Status</b>	<b>Disproportionately High Minority Population?</b>	<b>Percent Low Income Status</b>	<b>Disproportionately High Low-income Population?</b>
United States	24.24		13.12	
Florida	26.76		12.70	
<b>Okaloosa County</b>	15.00		10.30	
<b>Tract Number</b>				
<b>201</b>	4.64	No	14.40	<b>Yes</b>
<b>202</b>	16.84	<b>Yes</b>	19.59	<b>Yes</b>
203	4.22	No	7.81	No
<b>204</b>	11.79	No	12.91	<b>Yes</b>
<b>205</b>	9.77	No	19.71	<b>Yes</b>
<b>206</b>	45.14	<b>Yes</b>	23.42	<b>Yes</b>
<b>207</b>	11.49	No	16.83	<b>Yes</b>
<b>208</b>	35.66	<b>Yes</b>	10.43	<b>Yes</b>
209	12.46	No	3.68	No
210	7.81	No	2.36	No
211	8.21	No	7.05	No
<b>212</b>	12.06	No	11.05	<b>Yes</b>
213	14.38	No	4.99	No
<b>214</b>	29.49	<b>Yes</b>	6.06	No
215	14.50	No	8.65	No
216	4.70	No	2.35	No
217	7.64	No	5.29	No
218	14.30	No	8.41	No
<b>219</b>	25.76	<b>Yes</b>	14.70	<b>Yes</b>
<b>220</b>	19.07	<b>Yes</b>	16.82	<b>Yes</b>
221	11.57	No	9.16	No
<b>222</b>	5.98	No	10.79	<b>Yes</b>

**Table C-1: Income and Minority Status—Okaloosa and Santa Rosa Counties (Continued)**

	<b>Percent Minority Status</b>	<b>Disproportionately High Minority Population?</b>	<b>Percent Low Income Status</b>	<b>Disproportionately High Low-income Population?</b>
223	7.33	No	6.52	No
224	11.63	No	8.93	No
<b>225</b>	16.61	<b>Yes</b>	6.78	No
<b>226</b>	38.42	<b>Yes</b>	26.91	<b>Yes</b>
227	11.82	No	9.58	No
<b>228</b>	29.56	<b>Yes</b>	10.14	No
<b>229</b>	17.72	<b>Yes</b>	5.77	No
<b>230</b>	25.40	<b>Yes</b>	10.90	<b>Yes</b>
<b>231</b>	14.41	No	11.40	<b>Yes</b>
<b>232</b>	4.04	No	13.40	<b>Yes</b>
233	2.57	No	7.08	No
<b>Santa Rosa County</b>	7.50		14.20	
<b>Tract Number</b>				
<b>101</b>	4.27	No	21.13	<b>Yes</b>
<b>102</b>	1.01	No	15.72	<b>Yes</b>
103	2.76	No	6.54	No
<b>104</b>	14.59	<b>Yes</b>	16.39	<b>Yes</b>
<b>105</b>	11.66	<b>Yes</b>	11.34	No
<b>106</b>	19.77	<b>Yes</b>	25.99	<b>Yes</b>
<b>10701</b>	4.93	No	15.71	<b>Yes</b>
<b>10702</b>	14.89	<b>Yes</b>	21.51	<b>Yes</b>
<b>10801</b>	11.92	<b>Yes</b>	21.90	<b>Yes</b>
<b>10802</b>	2.63	No	18.97	<b>Yes</b>
10803	5.42	No	8.92	No
109	0.87	No	4.55	No

**Cape San Blas.** The environmental justice ROI for Cape San Blas is Gulf County. The 1990 census shows that Gulf County had a population of 11,057. About 1,895 persons (17.1 percent) were of low-income status, while 2,311 persons were members of an ethnic minority (20.1 percent). Table C-2 shows that Gulf County is divided into three census tracts, two of which had a disproportionate percentage of low-income and/or minority populations in 1989. Therefore, these tracts may be subject to environmental justice impacts.

**Table C-2: Income and Minority Status—Gulf County**

	Percent Minority	Disproportionately High Minority Population?	Percent Low Income	Disproportionately High Low-income Population?
United States	24.2		13.1	
Florida	26.8		12.7	
<b>Gulf County</b>	20.1		17.1	
<b>Tract Number</b>				
<b>9601</b>	13.7	No	19.1	<b>Yes</b>
<b>9602</b>	40.0	<b>Yes</b>	22.4	<b>Yes</b>
9603	8.0	No	10.3	No

**Cudjoe Key.** The environmental justice ROI for Cudjoe Key is Monroe County. The 1990 census shows that Monroe County had a population of 78,024. About 8,200 persons (10.8 percent) were of low-income status in 1989, while 14,338 persons were members of an ethnic minority (18.4 percent). Table C-3 shows that Monroe County comprises 27 census tracts, of which 14 had a disproportionate percentage of low-income and/or minority populations. These 14 tracts, therefore, may be subject to environmental justice impacts.

**Table C-3: Income and Minority Status—Monroe County**

	Percent Minority	Disproportionately High Minority population?	Percent Low Income	Disproportionately High Low-income Population?
United States	24.2		13.1	
Florida	26.8		12.7	
<b>Monroe County</b>	18.4		10.8	
<b>Tract Number</b>				
<b>9701</b>	35.9	<b>Yes</b>	35.5	<b>Yes</b>
9702.98	6.7	No	6.7	No
9703	9.4	No	8.8	No
<b>9704</b>	15.4	No	16.0	<b>Yes</b>
9705	9.0	No	5.2	No
9706	17.3	No	10.0	No
9707	14.2	No	9.2	No
9708	7.9	No	7.0	No
9709	11.5	No	8.9	No

**Table C-3: Income and Minority Status—Monroe County (Continued)**

	Percent Minority	Disproportionately High Minority population?	Percent Low Income	Disproportionately High Low-income Population?
9710	6.9	No	5.8	No
9711	10.2	No	9.6	No
<b>9712</b>	20.7	<b>Yes</b>	15.1	<b>Yes</b>
<b>9713</b>	26.1	<b>Yes</b>	20.2	<b>Yes</b>
9714	5.6	No	10.7	No
9715	4.6	No	6.5	No
<b>9716</b>	8.7	No	12.0	<b>Yes</b>
<b>9717</b>	19.5	<b>Yes</b>	9.9	No
<b>9718</b>	40.9	<b>Yes</b>	15.6	<b>Yes</b>
<b>9719</b>	25.0	<b>Yes</b>	8.1	No
<b>9720</b>	23.0	<b>Yes</b>	9.2	No
<b>9721</b>	22.5	<b>Yes</b>	6.1	No
9721.99	12.5	No	0.0	No
<b>9722</b>	34.7	<b>Yes</b>	11.0	<b>Yes</b>
<b>9723</b>	19.7	<b>Yes</b>	8.4	No
<b>9724</b>	53.4	<b>Yes</b>	20.0	<b>Yes</b>
9725	12.6	No	6.0	No
9725.99	0.0	No	0.0	No
<b>9726</b>	24.5	<b>Yes</b>	19.9	<b>Yes</b>

**Saddlebunch Keys.** Saddlebunch Keys has the same ROI as Cudjoe Key. Table C-3 therefore applies equally to this land-launch alternative.

### Environmental Consequences

As described in the Affected Environment, disproportionately high low-income and minority populations have been identified in the respective county-based ROIs for Santa Rosa Island and Cape San Blas, in the Florida Panhandle, and Cudjoe and Saddlebunch Keys, in the Florida Keys. Table C-4 summarizes the findings of the analysis.

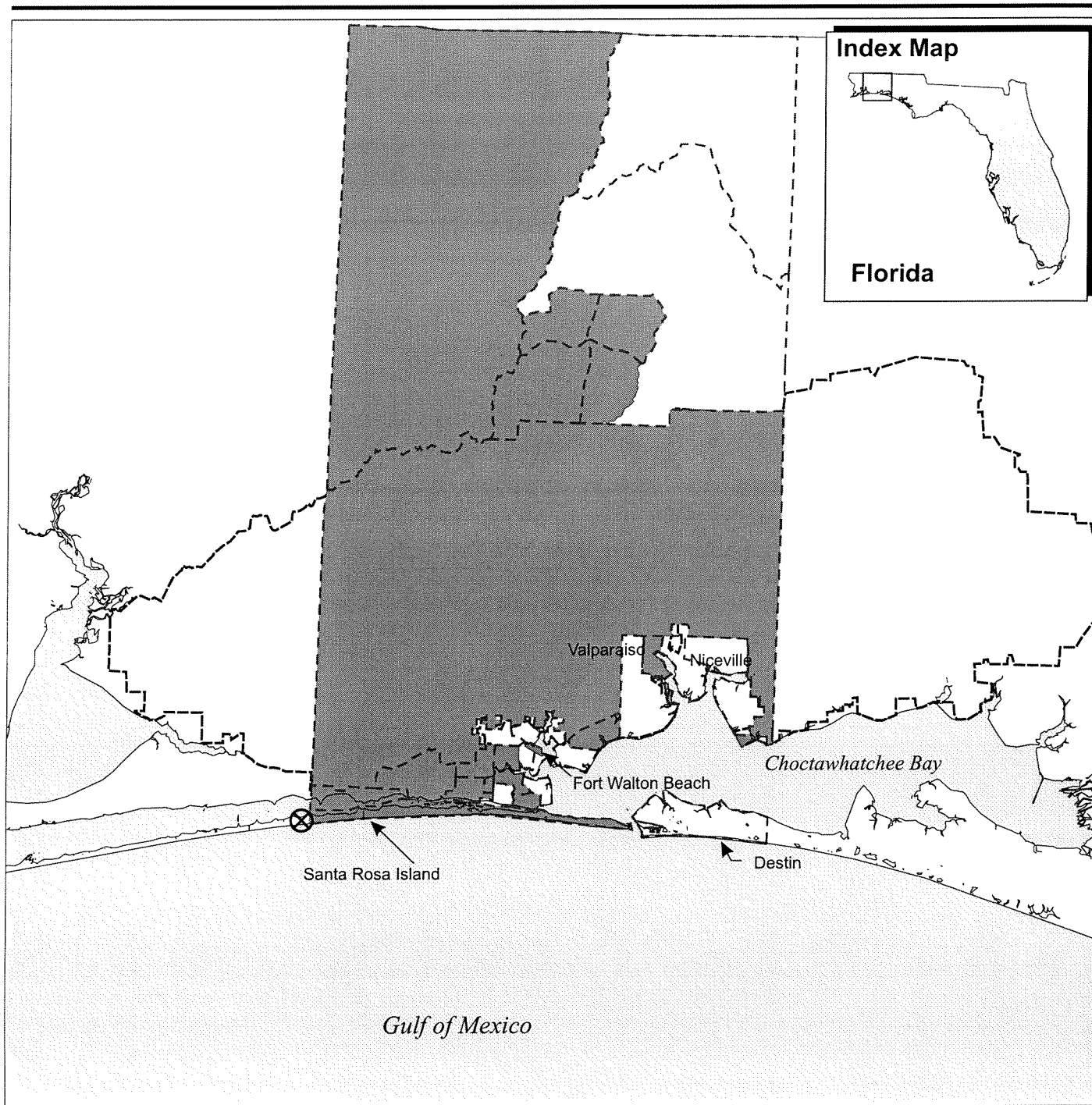
**Table C-4: Income and Minority Analysis Summary**

Alternative Land-launch Locations	Environmental Justice Region of Influence	Number of Census Tracts in the ROI	Number of Census Tracts with Disproportionately High Low-income or Minority Populations Compared to ROI	Number of Census Tracts with Disproportionately High Low-income or Minority Populations, Compared to the State of Florida	Number of Census Tracts with Disproportionately High Low-income or Minority Populations, Compared to the United States
Santa Rosa Island	Okaloosa and Santa Rosa counties	45	28	22	20
Cape San Blas	Gulf County	3	2	2	2
Cudjoe and Saddlebunch keys	Monroe County	27	14	8	9

**Santa Rosa Island.** Figures C-1 and C-2 show the location of the census tracts within Okaloosa and Santa Rosa counties, respectively, that meet the poverty and minority environmental justice criteria. The poorest census tracts in Santa Rosa County, as well as those with the largest minority populations, are located away from the coast. The nearest census tract that meets the minority or low-income population criteria in Santa Rosa County is 4.7 kilometers (3 miles) from the alternative land-launch location on Santa Rosa Island.

Two census tracts in Okaloosa County are adjacent to the launch site and display low-income or minority population criteria. Tract 0231 had a low-income population of 11.4 percent in 1990. The overall county percentage was 10.3 percent, while the equivalent percentages for the State of Florida and the United States were 12.7 percent and 13.1 percent respectively. Tract 0232 had a low-income population of 13.4 percent.

Environmental justice concerns may arise, therefore, with respect to the Santa Rosa Island launch alternative. First, it is important to emphasize that the launch hazard area for the proposed action is uninhabited. Furthermore, the impact analysis within each resource area shows that environmental justice issues are not expected to arise as a result of the alternative land-based action. Air quality attainment status would not change. Biological resources are only relevant to social justice where subsistence food sources would be threatened, and this would not be the case. Cultural activities would not be affected by the action. The potential for soil contamination is considered minor within the geology and soils resource. Hazardous waste and materials would be controlled in accordance with Federal and State regulations. There are no low-income populations within safety and health region of the launch site. Noise levels outside the LHA would fall within acceptable standards. Some economic benefit could occur in the local economy as a result of site preparation and operations. Displacement of residents from the waters within the LHA would lead to alternative waters being sought. Alternatives are in plentiful supply. Launch activities would not be expected to affect water resources.

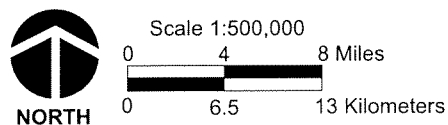


#### EXPLANATION

- Census Tract Boundary
- Eglin AFB Boundary
- Disproportionately High Minority Population or High Low-Income Population
- X Launch Site

#### Environmental Justice: Census Tracts Affected

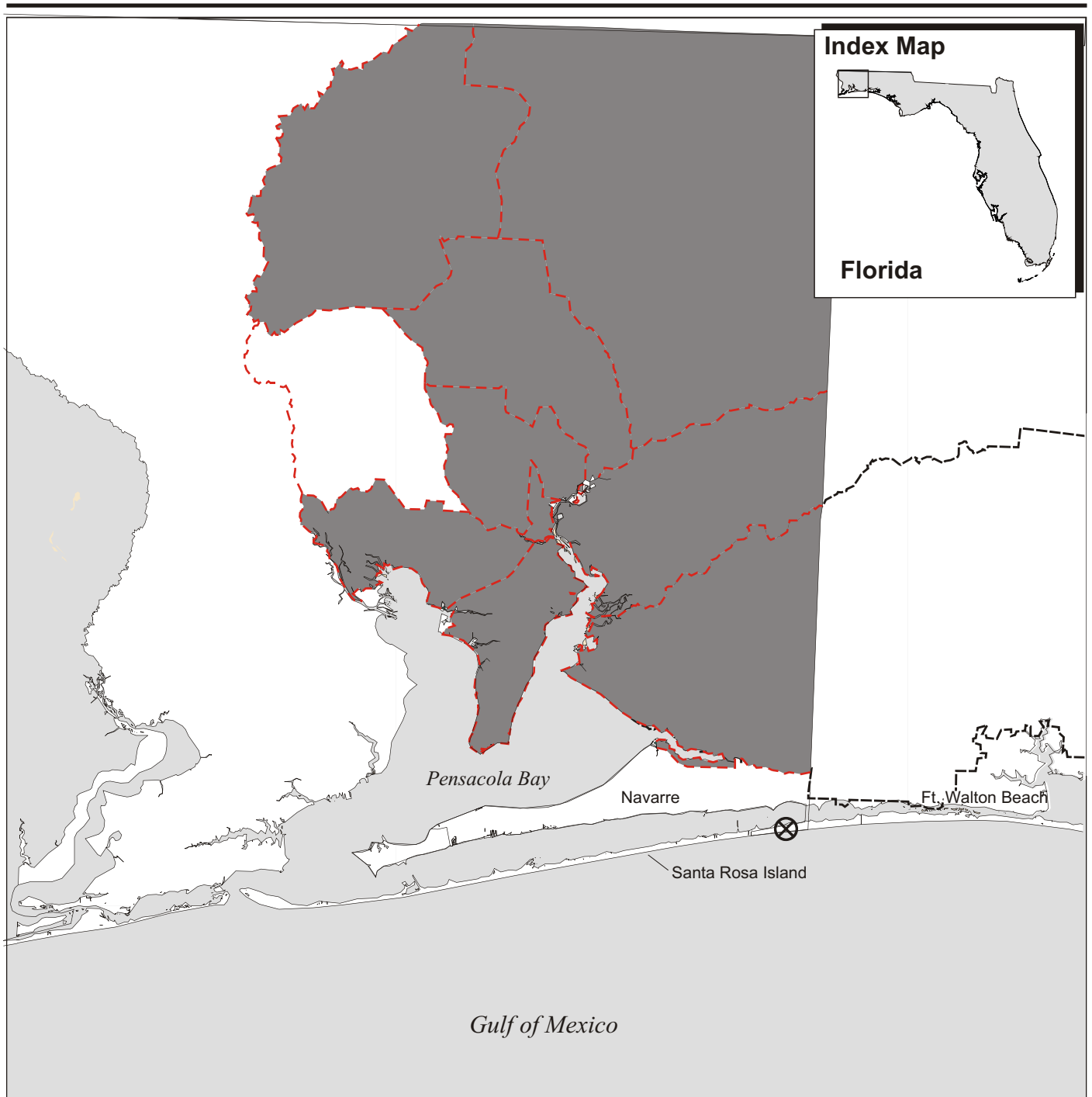
Okaloosa County, Florida



sri-500k-cen001

Final TMD ETR SEIS—Eglin Gulf Test Range

**Figure C-1**



## EXPLANATION

- - - Census Tract Boundary
- Eglin AFB Boundary
- Disproportionately High Minority Population or High Low-Income Population
- X Launch Site



Scale 1:500,000

0 4 8 Miles

0 6.5 13 Kilometers

## Environmental Justice: Census Tracts Affected

Santa Rosa County, Florida

**Figure C-2**

**Cape San Blas.** Figure C-3 shows the location of the two census tracts within Gulf County that have disproportionate minority or low-income populations. Neither tract is adjacent to the launch site, the nearest tract being some 17 kilometers (10.5 miles) from the launch area. Environmental justice issues, therefore, do not arise with respect to the Cape San Blas land-launch alternative.

**Florida Keys.** Figure C-4 shows the census tracts within Monroe County that have disproportionate minority or low income populations. Census tract 9716 includes the launch site at Saddlebunch Keys. None of the other tracts displaying disproportionate low-income or minority population characteristics are close to or adjacent to the proposed alternative land launch sites. Cudjoe Key does not fall within a census tract with a disproportionately low-income or minority population.

In 1990, census tract 9716 had a low-income population of 12 percent, or 220 people. This compared to a low-income population of 10.8 percent for Monroe County as a whole, 12.7 percent for the State of Florida and 13.1 percent for the United States.

Environmental justice concerns could arise, therefore, with respect to the Saddlebunch Keys land-launch alternative. In response to these potential concerns, it is important to emphasize that the launch hazard area for the alternative action is uninhabited. The launch site is sufficiently isolated by surrounding Federal lands not to be a natural destination for the homeless and indigent. This particular concern was raised during the scoping process.

The impact analysis within each resource area shows that environmental justice issues are not expected to arise as a result of the Saddlebunch Keys land-launch alternative. Air quality attainment status within census tract 9716 would not change. Biological resources are only relevant to social justice where subsistence food sources would be threatened. This would not be the case. Cultural activities and resources would not be affected by the action. The potential for soil contamination is considered minor, within the geology and soils resource. Hazardous waste and materials would be controlled in accordance with Federal and state regulations. There are no low-income populations within safety and health region of the launch site. Noise levels outside of the LHA would fall within acceptable standards. Some economic benefit could occur in the local economy as a result of site preparation and operations and could assist low-income residents of the area through the provision of new jobs. Temporary displacement of residents from the waters within the LHA would lead to alternative waters being sought. Alternative areas of the are in plentiful supply and, in any event, the displacement time is short. Launch activities would not be expected to affect local water resources.





# EXPLANATION

--- Census Tract Boundary

Disproportionately High Minority Population  
or High Low-Income Population

⊗ Launch Site

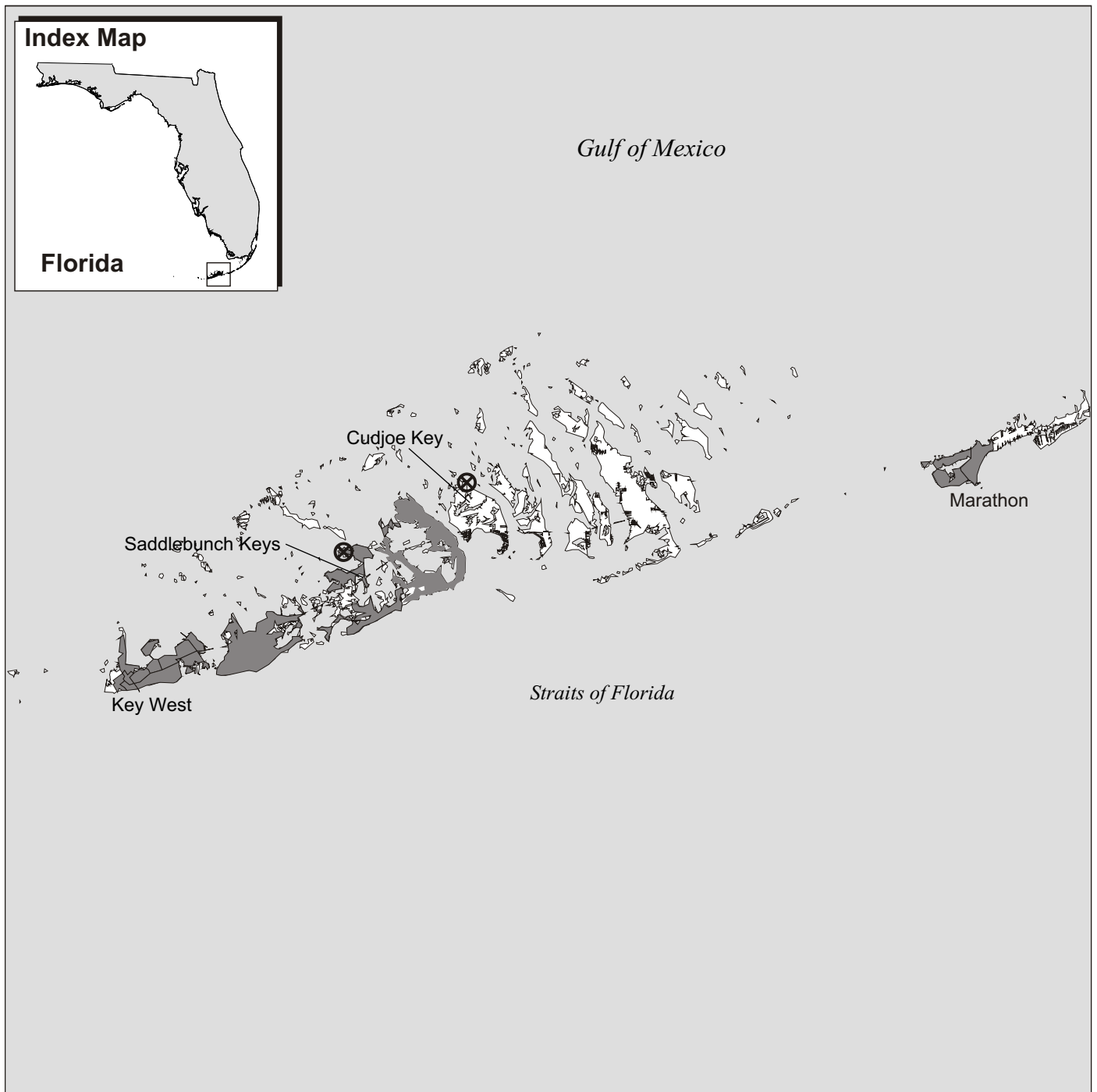


Scale 1:500,000  
0 4 8 Miles  
0 6.5 13 Kilometers

## Environmental Justice: Census Tracts Affected

Gulf County, Florida

**Figure C-3**



#### EXPLANATION

 Disproportionately High Minority Population or High Low-Income Population

 Launch Site

## Environmental Justice: Census Tracts Affected



Scale 1:500,000  
0 4 8 Miles  
0 6.5 13 Kilometers

Monroe County, Florida

**Figure C-4**

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**Appendix D**  
**Description of the Proposed Action and**  
**Alternatives for the Target Air Drop System**

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# **APPENDIX D**

## **DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES FOR THE TARGET AIR DROP SYSTEM**

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The Air Drop Target System program is designed to provide a realistic target for Theater Missile Defense (TMD) interceptors. Its purpose is to provide threat-representative target missiles to support development and test requirements needed to validate system design and operational effectiveness of TMD missile and sensor systems. The targets must simulate the expected threat and be realistic in size and performance. The Air Drop Target System would provide an air launch target delivery system using standard C-130 cargo aircraft, rather than a fixed land-based site.

### **DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

The Proposed Action is to provide the capability to produce, deploy, and maintain the Air Drop Target System. The Air Drop Target System program would provide a realistic target for current and evolving interceptor programs. The Air Drop program would provide a highly flexible short-range target system allowing multi-shot engagements with high azimuth variability.

The Air Drop Target System would provide an air launch target delivery system using standard C-130 cargo aircraft, rather than a fixed land-based site. The target vehicle would be built on a standard cargo pallet and specialized sled. The target/pallet assembly would be loaded on a C-130 aircraft and flown to a predetermined drop point. The target/pallet assembly would be extracted from the aircraft via parachute and dropped at 15,000 feet above mean sea level (MSL). The target would separate from the pallet and descend on parachutes to about 5,000 feet above MSL for launches over water. For launches over land, the launch altitude would have to be recalculated for each individual range, depending on the range's elevation. The parachutes would then be released from the target as it ignites. After firing, the target would follow its flight path to intercept or to land within a designated impact area.

All Air Drop activities would occur within special use airspace and over existing ranges, extended ranges, and/or over temporarily designated open ocean areas. As many as 330 SR-19-AJ-1 (modified) rocket motors could be available to support the Air Drop Target System program. The target system would require limited production because the target missile is comprised of existing rocket boosters and components from other decommissioned rocket programs.

Under the No-Action Alternative, there would be no Air Drop Target System, and testing would continue using existing ground-launched targets. The ranges would be limited to currently authorized test programs.

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## **Appendix E**

### **Agency Consultation**

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DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

22 April 1998

Mr. James H. Lee  
U.S. Department of the Interior  
Richard B. Russell Federal Building  
75 Spring Street SW  
Atlanta GA 30303

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Lee

Thank you for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

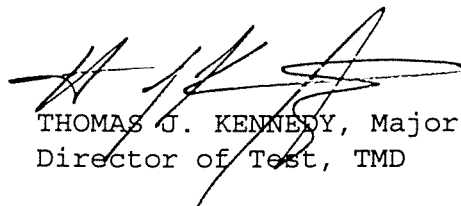
The TMD SEIS has been prepared in accordance with Council on Environmental Quality (CEQ) guidelines, and includes sufficient analysis to inform the decision maker and the public of potential environmental impacts of the proposed action and to assist in the decision making process. The Final SEIS identifies mitigation measures that could be implemented to reduce potential impacts due to the proposed action. These proposed mitigation measures address your concerns about both the biological resources and oil and gas operations in the Eastern Gulf. They may be more fully developed and refined as we go through the respective permitting and consultation processes.

The proposed action of the SEIS is to enhance the capability of the Eglin Gulf Test Range for TMD testing or training activities. A no-action alternative is also evaluated in the SEIS. The preferred alternative for the proposed action includes target and interceptor launch and support activities at Eglin AFB sites; Air Drop or air-launch of target missiles; and possible Navy ship interceptor launches. Other alternatives within the proposed action include target launch and support activities at locations in the Florida Keys, target missile launches from a sea vessel, and interceptor launches from offshore platforms near Santa Rosa Island and Cape San Blas. In accordance with CEQ guidelines, the SEIS analyzes all reasonable alternatives including



sites in the Keys. No final decision has yet been made about which alternative(s) may be selected.

Sincerely

A handwritten signature in black ink, appearing to read 'T. J. Kennedy', with a large, sweeping flourish extending to the right.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



# United States Department of the Interior

## OFFICE OF THE SECRETARY OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE

Richard B. Russell Federal Building  
75 Spring Street, S.W.  
Atlanta, Georgia 30303

April 14, 1998

ER-98/146

Ms. Linda Ninh  
46 OG/OGM-TMD  
205 West "D" Ave., Suite 241  
Eglin AFB, FL 32578-6866

RE: DSEIS for the Theater Missile Defense Extended Test Range  
Eglin AFB, FL

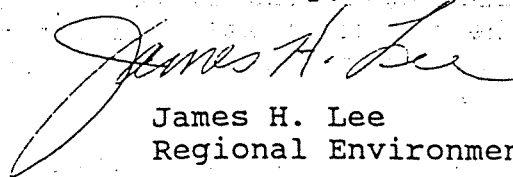
Dear Ms. Ninh:

The Department of the Interior has reviewed the referenced document, as requested. The enclosed comments are a compilation of comments received from the bureaus within this Department.

If there are questions related to fish and wildlife resources, please contact Bruce Bell, Fish and Wildlife Service, at 404/679-7089. If there are questions related to oil and gas leasing operations, please contact Archie Melancon at 703/787-1547. If you have other questions concerning these comments, you may reach me at 404/331-4524.

Thank you for the opportunity to review the draft supplement EIS.

Sincerely,



James H. Lee  
Regional Environmental Officer

Enclosure

THEATER MISSILE DEFENSE EXTENDED TEST (TMD) RANGE  
EGLIN GULF TEST RANGE (EGTR)  
EGLIN AFB, FLORIDA

ER-98/146

GENERAL COMMENTS

The Fish and Wildlife Service (FWS) believes the current document does not adequately address concerns regarding potential effects to Federal trust resources and land management responsibilities. The effect of ground vibrations from missile or interceptor launches on wildlife, specifically federally listed sea turtle embryos and hatchlings, still needs to be evaluated. Data from the space shuttle and Titan/Delta rocket launches at Kennedy Space Center and their potential effects on sea turtles nesting on nearby Canaveral National Seashore could be used for comparison.

The effects of launch activities (e.g., human disturbances, noise impacts) on the following species nesting within the five-mile radius of the Launch Hazard Areas (LHA) for Eglin AFB (Santa Rosa Island and Cape San Blas) needs to be evaluated: loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), and bald eagle (*Haliaeetus leucocephalus*).

The effects of pre-launch and launch activities on populations of the following species existing within the LHA for both Cudjoe Key and Saddlebunch Key needs to be evaluated: silver rice rat (*Oryzomys argentatus*); Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*); transient Key deer (*Odocoileus virginianus clavium*); bald eagle; and eastern indigo snake (*Drymarchon corais couperi*). These activities could interfere with the FWS's recovery efforts for listed species in the Keys, such as repatriating the Key deer to Cudjoe Key.

The effects of prelaunch and launch activities on shorebird and wading bird rookeries within the LHA for both the Florida panhandle and the Florida Keys needs to be evaluated. Avifauna, especially in the Florida Keys, are already subjected to significant stress from noise and disturbance. Currently, nesting populations of wading birds are continuously disturbed by the ever increasing presence of humans, such as tour boats around their rookeries. Furthermore, as nesting birds take flight in response to prelaunch and launch activities, they leave their nests exposed to predators, such as the magnificent frigatebird (*Fregata magnificens*), and to the elements. Flushing birds unnecessarily expend valuable energy that may otherwise be used for hunting, foraging, and/or maintenance. Thus, the launching of target missiles from land-based facilities in the Florida Keys is another level of stress

these birds must endure. The cumulative effect of these existing stresses along with the added stress from the proposed action may result in changing the reproductive behavior of nesting birds (e.g., decreased fecundity) and force them to seek other potential nest areas, which are becoming increasingly limited in availability and suitability. Details of the specific mitigative measures designed to ameliorate these effects are lacking in the document.

The proposed action is inconsistent with the Congressional designation of "wilderness areas" for 2,278 and 1,900 acres in the Great White Heron NWR and National Key Deer Refuge, respectively. Specifically, wilderness areas are "an area of Federal land retaining its primeval character and influence, without permanent habitation, which is protected and managed so as to preserve its natural conditions such that it (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; and (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation . . . ." (Wilderness Act of 1964). Furthermore, "wilderness areas. . . shall be administered in such a manner as will leave them unimpaired for future use and enjoyment as wilderness" (50 CFR 35.2).

The effects of the proposed action (e.g., visual pollution of wilderness areas, the impact on wilderness solitude, the recreational and economic impact to the highly desired "wilderness experience") on wildlife and human users in federally-designated areas (e.g., Great White Heron NWR, Florida Keys National Marine Sanctuary, wilderness areas) needs to be evaluated.

The document should identify ongoing natural resource monitoring and management programs at Cape San Blas and Santa Rosa Island. Eglin AFB has a history of strong environmental management and much of their existing programs may need to be continued or expanded to address endangered species issues regarding the project.

Furthermore, a more complete description of potential mitigative actions to reduce impacts on federally listed species should be included in the document. These actions could include changes in TMD activity protocol and schedules during species reproductive or migration seasons (sea turtles and shorebirds), incorporation of existing FWS management guidelines (bald eagle), and studies to determine or evaluate effects of the proposed action (e.g., noise, vibration, and human presence) and implementation of remedial actions as necessary.

The document contains little discussion of oil and gas operations in the Eastern Gulf, and the conclusion that "TMD activities would

have little effect on the oil and gas exploration use in the Gulf of Mexico" (Section 3.2.7, page 3-296) is not supported. The DSEIS does not adequately evaluate the impacts of the proposal to oil and gas operations in the Eastern Gulf. To improve the analysis, we encourage a more extensive coordination with Minerals Management Service (MMS). The document also does not address alternatives which would allow oil and gas activities to proceed with minimal interference from the proposal such as modified impact areas, timing of missile testing activities and oil and gas activities, or some combination of these two and perhaps other procedures. Additional consultation between the MMS and the Air Force would be useful to develop alternatives and/or mitigating measures which will allow both oil and gas operations and missile testing without unduly interfering with either use of the area and to improve the analysis in the SEIS regarding reasonably foreseeable oil and gas activities and the cumulative effects of OCS oil and gas activities and DOD activities.

The Air Force proposes to conduct 24 test events per year over a 10 year period (except in 1999 when it conducts 55 tests) from all test ranges. The number of test events per year if carried out without close cooperation with MMS, poses a significant conflict with exploration for oil and gas resources. Drilling for these resources may take up to 150 days in the Eastern Gulf of Mexico. During that time period drilling rigs/ships are rarely easily evacuated or moved from the site. The preferred alternative in Section 2.2.1.1. would impact 98 leases within the Eastern Gulf of Mexico and with the proposed TMD testing schedule, without the consideration of additional alternatives or mitigation, it could prevent or hinder oil and gas exploration on those leases.

The analysis is based on the current status of activity in the EGOM and not on potential OCS build-out which will likely occur during the life of the missile testing program. When assessing the impact to OCS oil and gas activities, the SEIS states that, "No surface structures associated with oil and gas extraction are currently located in the EGOM planning area." However over the life of the testing program, OCS platforms could be sited in the Air Force's "Interceptor Debris and Evacuation" areas. Omitting this information and associated impact analysis is an oversight that could affect the conclusion of "little effect to oil and gas use."

Oil and gas operations are only mentioned in two tables and in Section 3.2.7 (Gulf of Mexico: Land and Water Use). There is no discussion of the economic implications of conflicts between this proposal and oil and gas activities (indeed the only "socioeconomic" discussion involves commercial fishing); there is no mention of airspace use conflicts with oil and gas related

helicopter flights; safety to oil and gas operations and structures is not addressed; nor is there any discussion of transportation in general involving oil and gas activities. In addition, the SEIS omitted other analysis such as: economic impacts associated with enhanced structural design, construction delays, production delays, personnel evacuation; impact to routine operations such as hampered support vessel transit (air and water) during testing, impeded platform construction, and halted production; impacts to human safety and platform integrity from debris striking a platform; impacts to the existing and future leases (e.g., Could this testing program inhibit existing lessees from exercising lease rights? Will new mitigation be required of leases issued from Sale 181?).

The current 5-year OCS leasing program schedules only one OCS lease sale in the Eastern Gulf. This sale is currently scheduled for late 2001. The decision process for that sale, lasting about 3 years, will begin with a Call for Information and Nominations/Notice of Intent to Prepare an EIS and will include extensive consultations with the States, Federal Agencies, and other interested parties. This proposed sale may result in the issuance of additional leases in the Eastern Gulf, followed by as yet unknown levels of exploration and development activity. A decision on whether or not there may be additional lease sales scheduled in the Eastern Gulf in the future will be made in the context of the development of the next 5-year program which would cover the years 2002-2007. There are a number of currently active leases in the Eastern Gulf. Considerable exploration has already been accomplished, and development plans are being formulated. The DSEIS needs to address these reasonably foreseeable activities and how the proposal will impact them.

The DSEIS does not address pre-lease geological or geophysical activities in the EGOM area. Permits are issued to companies to collect data and information. Stipulations attached to a G&G permit require the operator to coordinate their use in an area with the various military groups that require notification. The effects of evacuation on seismic activities should be addressed.

#### SPECIFIC COMMENTS

Page 3-38: The correct spelling for the Gulf sturgeon is *Acipenser oxyrinchus desotoi*. The Santa Rosa beach mouse should also be included in the list of mammals occurring on Santa Rosa Island.

Page 3-39, Table 3.1.3-1: *polionatus* should be *polionotus*.

Page 3-61, ¶ 5: It should be mentioned that Site D-3A is also within the nest protection zone as identified in the FWS's habitat management guidelines for bald eagles. The guidelines recommend limitations on activities that could affect bald eagles depending on the time of year, type of activity, and distance from the nest.

Page 3-238: The SEIS inaccurately describes the jurisdiction of air regulation. In Section 3.2.1.2 Region of Influence, Air Pollution Emissions Sources, the first paragraph states, "Platform emissions are controlled by Outer Continental Shelf regulations." Although the OCSLA regulates OCS facilities in the Western and Central Gulf of Mexico, it does not cover those located offshore Florida. The sentence should be replaced with: "Jurisdiction over OCS-related emissions is shared: the U.S. Environmental Protection Agency regulates OCS emissions offshore Florida and the U.S. Department of the Interior regulates OCS emissions offshore the remaining Gulf Coast States."

Page 3-267, ¶ 3: Eastern Gulf of Mexico live-bottom habitats in addition to coral and bank reef habitats should be described. The Minerals Management Service has funded numerous studies to identify and describe these habitats.

Page 3-298: Some of the SEIS's descriptions of OCS activities in the EGOM Planning Area are either unneeded, out-of-date, or incomplete. The discussion about Pensacola Block 889 is unnecessary because Mobil Oil does not intend to proceed with exploratory drilling and this discussion could be deleted.

Page 3-298, ¶ 3: The information regarding Chevron's Destin Dome 56 Unit Development and Production Plan completeness review is out of date. The plan proposes a manned Central Production Facility complex with 14 satellite platforms spread over 10 blocks with numerous flowlines to connect the platforms as well as a 30" export pipeline. It was deemed complete by the MMS on August 12, 1997. The Notice of Intent to Prepare an EIS was published in the Federal Register on August 22, 1997. The EIS process will take about 2 years. The MMS has provided the Air Force and it's EIS contractor with extensive information concerning the DD 56 Unit; however, the information was not considered. It is noteworthy that in Table ES-2 the alternative to test over Matagorda Island, Texas, was eliminated because of the lack of "appropriate safety areas, trajectories overfly existing oil rigs." Yet, the 18 proposed structures in the DD 56 Unit are not considered.

Additionally, the OEDC Exploration and Production discussion is incomplete because it does not mention the future surface structures associated with that project. If these changes are made

to the overview, the SEIS will have a "scenario" to more accurately evaluate the full impact of its testing program on OCS activities.

Other OCS activity information presented in the EIS is not used in the evaluation. For example, the SEIS lists the right-of-way applications associated with constructing three pipelines in the EGOM but does not assess impacts to the future pipe laying/construction activities from any of the potential impact sources of the testing program (e.g., evacuation of surface vessels). Further, the information on the plans for Destin Dome 1 and 2 and Pensacola 881 is out of date. These were approved September 5, 1997. The discussion should include details regarding the proposed facilities. MMS has also recently been informed that further development activities may be proposed in the near future in this area.

Pages 3-373, ¶ 5: Information on nesting, foraging, wading, and colonial birds is incomplete.

Page 3-382, ¶ 3: Again, information on nesting, foraging, wading, and colonial birds is incomplete.

Page 3-391, Figure 3.3.3-10: The figure is inaccurate and the rookery data is incomplete. For example, many of the rookeries are depicted in open water.

Page 3-400, Figure 3.3.3-15: As before, the figure is inaccurate, the rookery data is incomplete, and rookeries are depicted in open water.

Page 3-433, ¶ 1: Wildlife Management Areas of the Florida Keys National Marine Sanctuary were adopted zones originally designated in the 1992 Management Agreement for Submerged Lands (MA-44-088) between the FWS and the State of Florida for the specific management of critical habitat.

Page 3-439, Figure 3.3.7-7: Federal lands should be distinguished between military property and conservation/preservation lands.

Page 3-445, Figure 3.3.7-10: Again, Federal lands should be distinguished between military property and conservation/preservation lands.

Page 3-530: There is no mention of oil and gas activities in Section 3.4 (Relationship Between Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity), even though subsections include such topics as "Airspace Use", "Geology and



Soils", "Land and Water Use", "Safety", "Socioeconomics", and "Transportation".

Tables 3.3.13-1& 13-2: The Forest Service's Visual Resource Management System may be an inappropriate tool to rate the scenic attractiveness of the Florida Keys' "backcountry" and mangrove habitats.

Appendix A: The MMS Gulf of Mexico Region should be added as an agency to be notified for upcoming launch activities. The MMS is not listed in Appendix A, page 1-11.

Appendix B: The OCS Lands Act (43 U.S.C. 1331-1356, as amended) should be mentioned in Appendix B (Laws and Regulations Considered); it was not.

Appendix D: Appendix D (Draft Air Drop Environmental Assessment) should consider oil and gas operations.

Appendix I: The Draft Evacuation Plan does not mention oil and gas operations specifically; it should, since moving personnel out of the area and securing platforms and equipment (if such is possible considering the operations in question here) is not a trivial matter and will require considerable advance notice and will entail considerable costs.

Appendix L: Information regarding the distinction between **loggerhead** nesting sub-populations and recovery potential should be included in the narrative. This is based on genetics studies conducted by Brian Bowen and his associates at the University of Florida. This information provides support on the importance of conserving the Florida panhandle sea turtle population.

After reviewing the document, FWS is still concerned with the potential adverse effects of the proposed action on fish and wildlife resources. As a cooperating agency in the NEPA process, FWS attempted to identify gaps in the information provided within the document as well as to note any inaccuracies. Specifically, the document does not provide the mitigative measures necessary to offset adverse effects to trust resources and land management responsibilities as a result of target launch activities proposed in the Florida panhandle and, in particular, the Florida Keys. Furthermore, FWS does not believe that the adverse effects (e.g., noise impacts to nesting avifauna) of launching target missiles from the Keys can be ameliorated. As such, the Draft SEIS is incomplete in its current form. FWS will continue to coordinate with your agency prior to completing the Final SEIS on fish and wildlife issues that need to be addressed as part of the

environmental review process. The FWS recommends that the Florida Keys be eliminated from consideration as an alternative launch site for target missiles in the Eglin Gulf Test Range.

While development and testing of missile defense systems and other DOD activities in the Eastern Gulf are very important, the OCS oil and gas program in the Gulf of Mexico, including the Eastern Gulf, is also of importance to the nation. While MMS believes the impacts of this proposal to activities associated with OCS oil and gas activities are not "negligible" as stated in the DSEIS, we believe that, with additional analysis of potential impacts and reasonable mitigating measures, that potential impacts can be avoided or minimized. Decisions by DOD and DOI regarding the near- and long-term effects of their respective programs in the Eastern Gulf should be made based on complete and sound information and in the context of the importance of these programs to the National interest.



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 April 1998

Mr. Estus D. Whitfield  
Office of the Governor  
The Capitol  
Tallahassee FL 32399-0001

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Whitfield

Thank you for your letter concerning the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

The TMD SEIS has been prepared in accordance with Council on Environmental Quality (CEQ) guidelines, and includes sufficient analysis to inform the decision maker and the public of potential environmental impacts of the proposed action and to assist in the decision making process. Once a Record of Decision is reached, close consultation and coordination with federal and state resource agencies would continue to assess the potential impacts. The Final SEIS identifies additional mitigation measures that could be implemented to further reduce potential impacts to the Florida and Gulf of Mexico. These proposed mitigation measures would be more fully developed and refined as we go through the respective permitting and consultation processes.

These mitigation measures include the state's concerns on water quality and historic resources. Additional information on the affects of the launch emissions on shallow water quality is included in the Final SEIS. The mitigation measures proposed for the Cape San Blas Lighthouse and keepers' quarters should address the safety of these structures once the final disposition of these structures is determined.

Sincerely

A handwritten signature in black ink, appearing to read "THOMAS J. KENNEDY", is written over a horizontal line.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD

COUNTY: State

Message:

DATE: 02/12/98  
 COMMENTS DUE-2 WKS: 02/26/98  
 CLEARANCE DUE DATE: 03/30/98  
 SAI#: FL9612240949CR

## STATE AGENCIES

Community Affairs  
 Environmental Protection  
 Game and Fresh Water Fish Comm  
 OTED  
 State  
 Transportation

## WATER MANAGEMENT DISTRICTS

Northwest Florida WMD

*Cindy  
 This finishes  
 our paper work  
 on the job -  
 Mary*

## OPB POLICY UNITS

X Environmental Policy/C &amp; ED

**RECEIVED**  
 FEB 17 1998

OFFICE OF PLANNING  
 & BUDGETING  
 ENVIRONMENTAL POLICY UNIT

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- ☒ Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

## Project Description:

Department of Defense - Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs - Florida.

To: Florida State Clearinghouse  
 Department of Community Affairs  
 2555 Shumard Oak Boulevard  
 Tallahassee, FL 32399-2100  
 (850) 922-5438 (SC 292-5438)  
 (904) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- ☐ No Comment  
☒ Comments Attached  
☐ Not Applicable

- ☐ No Comment/Consistent  
☐ Consistent/Comments Attached  
☐ Inconsistent/Comments Attached  
☐ Not Applicable

From:

Division/Bureau:

Reviewer:

Date:

*EO. OPB Env. Policy*  
*[Signature]*  
 3/31/98



LAWTON CHILES  
GOVERNOR

STATE OF FLORIDA

# Office of the Governor

THE CAPITOL  
TALLAHASSEE, FLORIDA 32399-0001

March 31, 1998

**RECEIVED**  
APR 02 1998

State of Florida Clearinghouse

Ms. Linda Ninh  
46 OG/OGM-TMD  
205 West D Avenue, Suite 241  
Eglin AFB, Florida 32578-6866

Dear Ms. Ninh:

The Governor's Environmental Policy, Community and Economic Development Unit appreciates the opportunity to review and comment on the Department of Defense - Ballistic Missile Defense Organization's (BMDO) Theater Missile Defense Extended Test Range Draft Supplemental Environmental Impact Statement for the Eglin Gulf Test Range (DSEIS).

The Air Force Development Test Center (AFDTC) located at Eglin Air Force Base (AFB) is managing the DSEIS with the environmental documentation prepared by the U.S. Army Space and Missile Defense Command (USASMDC) in Huntsville, Alabama. The Eglin AFB staff and the USASMDC have provided opportunities for public review and input on the proposed Eglin Gulf Test Range proposal, including state, federal and local briefings, public scoping meetings, and other presentations at locations in the Florida Keys, as well as northwest Florida.

The Florida Keys has been designated by the Florida Legislature as an "area of critical state concern" and is one of the most environmentally sensitive areas in the state. The state has worked, in concert with local governments and federal agencies, to foster environmental programs to protect this "one of a kind" area in Florida.

In a letter dated November 24, 1997, Lieutenant General Lester Lyles notified the state that the Keys alternative was no longer being considered for missile testing. We support the decision by the BMDO to seek alternative locations to test the mid-range missiles/interceptor capabilities. Further, we understand that if the national security is threatened, the BMDO may reconsider missile testing in the Keys. We request to be kept apprised on this matter and, if another alternative should come under consideration in the future, the state would need to review the environmental documentation regarding the Theater Missile Defense Extended Test Range Site.

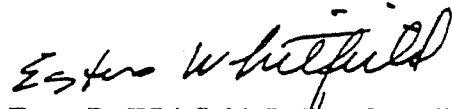
We encourage the BMDO to consider comments from the state's reviewing agencies concerning permitting requirements, water quality issues regarding Santa Rosa Sound and St. Joe Bay, and wetland impacts. The Department of State's Division of State Historical Preservation Office

Ms. Linda Ninh  
March 31, 1998  
Page Two

(SHPO) has discussed the future of the two U. S. Coast Guard buildings and the light house located on Cape San Blas with the Gulf County Historical Preservation Office, the U. S. Coast Guard and Eglin Air Force Base personnel. Of particular concern to the SHPO is the preservation of the light house lens. We ask that you keep SHPO informed of any future negotiations on these issues.

We appreciate the opportunity to assist the Department of Defense - BMDO in the coordination and review of the draft SEIS on the Theater Missile Defense Extended Test Range.

Sincerely,



Estus D. Whitfield, Policy Coordinator  
Environmental Policy/Community and  
Economic Development Unit

EDW/mmt



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 April 1998

Mr. G. Steven Pfeiffer  
Department of Community Affairs  
2555 Shumard Oak Blvd  
Tallahassee FL 32399-2100

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Pfeiffer

Thank you for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

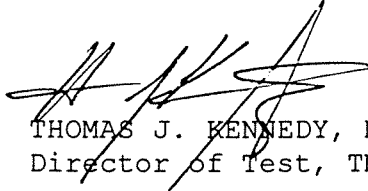
The proposed action of the SEIS is to enhance the capability of the Eglin Gulf Test Range for TMD testing or training activities. A no-action alternative is also evaluated in the SEIS. The preferred alternative for the proposed action includes target and interceptor launch and support activities at Eglin AFB sites; Air Drop or air-launch of target missiles; and possible Navy ship interceptor launches. Other alternatives within the proposed action include target launch and support activities at locations in the Florida Keys, target missile launches from a sea vessel, and interceptor launches from offshore platforms near Santa Rosa Island and Cape San Blas. In accordance with CEQ guidelines, the SEIS analyzes all reasonable alternatives including sites in the Keys. No final decision has yet been made about which alternative(s) may be selected.

The TMD SEIS has been prepared in accordance with Council on Environmental Quality (CEQ) guidelines, and includes sufficient analysis to inform the decision maker and the public of potential environmental impacts of the proposed action and to assist in the decision making process. Once a Record of Decision is reached, close consultation and coordination with federal and state resource agencies would continue to assess the potential impacts. The Final SEIS identifies additional mitigation measures that could be implemented to further reduce potential impacts to the Florida and Gulf of Mexico. These proposed mitigation measures would be more fully developed and refined as we go through the respective permitting and consultation processes.

These mitigation measures include the state's concerns on water quality and historic resources. Additional information on the affects

of the launch emissions on shallow water quality is included in the Final SEIS. The mitigation measures proposed for the Cape San Blas Lighthouse and keepers' quarters should address the safety of these structures once the final disposition of these structures is determined.

Sincerely

A handwritten signature in black ink, appearing to read 'T. J. Kennedy', with a large, stylized flourish at the end.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



DIVISIONS OF FLORIDA DEPARTMENT OF STATE  
Office of the Secretary  
Office of International Relations  
Division of Administrative Services  
Division of Corporations  
Division of Cultural Affairs  
Division of Elections  
Division of Historical Resources  
Division of Library and Information Services  
Division of Licensing



FLORIDA DEPARTMENT OF STATE  
Sandra B. Mortham  
Secretary of State  
DIVISION OF HISTORICAL RESOURCES

MEMBER OF THE FLORIDA COUNCIL  
Historic Florida Keys Preservation Board  
Historic Palm Beach County Preservation Board  
Historic Pensacola Preservation Board  
Historic St. Augustine Preservation Board  
Historic Tallahassee Preservation Board  
Historic Tampa/Hillsborough County  
Preservation Board  
Ringling Museum of Art

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State of Florida Clearinghouse

April 1, 1998

Captain Brian W. Moss  
Director, Test & Engineering Resources  
Department of the Air Force  
Ballistic Missile Defense Organization  
7100 Defense Pentagon  
Washington, DC 20301-7100

In Reply Refer To:  
Laura A. Kammerer  
Historic Preservationist Supervisor  
Project File No. 981373

RE: Theater Missile Defense Extended Test Range Draft Supplemental Environmental  
Impact Statement for Eglin Gulf Test Range  
Florida

Dear Captain Moss:

In accordance with the procedures of the National Historic Preservation Act, the National Environmental Policy Act and Florida's Coastal Management Program, this office has reviewed the referenced Draft Supplemental Environmental Impact Statement (SEIS). Pursuant to our responsibilities we will address those sections of the SEIS addressing possible impacts to historic properties listed, or eligible for listing, in the National Register of Historic Places. Please see note the following concerns and comments:

It is the opinion of this office that the potential impacts to the historic lighthouse and keeper's quarters located at Cape San Blas, Gulf County will be more than "minimal". The potential noise induced vibration impacts may be very significant. We believe the launch noise or sonic boom will adversely affect the lighthouse lens. If the impacts to the properties are so significant that they would have to be relocated for protection, this would constitute an adverse effect and a significant impact.

Launches from Cudjoe Key and Santa Rosa Island may have significant impacts on historic resources.

We noted that paleontological resources were included throughout the SEIS document under the cultural resources sections. These are not cultural resources - they pre-date any human life in Florida.

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (904) 488-1480  
FAX: (904) 488-3353 • WWW Address <http://www.dos.state.fl.us>

☐ ARCHAEOLOGICAL RESEARCH  
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☒ HISTORIC PRESERVATION  
(904) 487-2333 • FAX: 922-0496

☐ HISTORICAL MUSEUMS  
(904) 488-1484 • FAX: 921-2503

Ms. Linda Ninh  
April 13, 1998  
Page Two

Air Force is advised that the concerns identified by the DOS and the NFWFMD must be addressed prior to the implementation of the preferred alternative.

The DOS indicates that missile launches and other project activities at Cape San Blas could result in adverse impacts to the historic lighthouse and keeper's quarters and may affect historic resources at Santa Rosa Island and Cudjoe Key. The DOS also notes that the statements in the DSEIS which suggest otherwise are inaccurate. Therefore, the Air Force is advised to coordinate with the DOS prior to completion of the final Environmental Impact Statement (FEIS) to ensure that the proposed action is revised to avoid and/or minimize impacts to historic and archaeological resources. Please refer to the enclosed DOS comments.

The NFWFMD indicates that the proposed project may result in adverse impacts to wetlands and the water quality of St. Joe Bay and Santa Rosa Sound, which are both designated as Class II waters (shellfish harvesting and propagation) and Surface Water Improvement and Management priority water bodies. St. Joe Bay is also an Aquatic Preserve and an Outstanding Florida Water; therefore, degradation of water quality is prohibited by Rule 62-302.700, Florida Administrative Code (F.A.C.). The NFWFMD recommends additional evaluation of potential impacts and the incorporation of additional measures designed to minimize wetland impacts and to improve stormwater and wastewater treatment. Please refer to the enclosed NFWFMD comments.

The Environmental Policy/Community and Economic Development Unit, Executive Office of the Governor (EOG); Florida Game and Fresh Water Fish Commission (FGFWFC); Department of Environmental Protection (DEP); South Florida Water Management District (SFWMD); and South Florida Regional Planning Council (SFRPC) indicate that the Florida Keys is an environmentally sensitive area of regional significance. The Florida Keys and surrounding waters are subject to protection through special federal and state designations and management plans including the Florida Keys National Marine Sanctuary; Florida Keys Area of Critical State Concern, pursuant to section 380.05, F.S.; Outstanding Florida Water; and Aquatic Preserve. Several endangered and threatened species, as well as significant wetland and marine habitat, also occur in the area. Impacts to the area's resources must be thoroughly evaluated in a revised DSEIS if the Air Force revises its plans to include land launches from the Florida Keys. If a revised DSEIS is prepared, the DSEIS should identify specific measures designed to avoid and minimize potential impacts to wetlands and which ensure that state water quality standards are not violated.

If target launch sites in the Florida Keys are selected, a state Environment Resource Permit issued by the DEP or SFWMD will be required. As noted by the SFWMD, primary, secondary and/or commutative impacts to wetlands, surface water and ground water of the Florida Keys described in the DSEIS are inconsistent with the requirements of section 373.414, F.S.; the discussion of impacts to wetlands, surface water and ground water must be revised to comply with section 373.414, F.S. Specifically, section 373.414, F.S., requires that impacts to wetlands and critical habitat be avoided or

MAET  
10/10/98  
Ms. Linda Ninh

April 13, 1998

Page Three

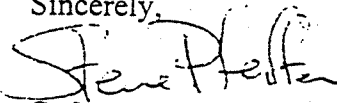
minimized and when impacts cannot be avoided, mitigation must be provided. The DSEIS does not address these requirements. If the project is revised to include the Florida Keys, the Air Force is advised to coordinate closely with the SFWMD to ensure compliance with the Chapter 373, F.S. requirements. Please refer to the enclosed comments for further detail of these issues.

The Department, pursuant to its role as the state land planning and emergency management agency, indicates that Appendix J - Draft Emergency Response Plan contains incomplete or inaccurate information regarding notification procedures and time frames for informing local authorities and other government agencies of impending launches, accidents, evacuation and response activities. Some of the sections of the Plan relating to communication and notification do not include the Department's Division of Emergency Management (DEM). The Air Force is required to notify the DEM of planned launches, mishaps and HAZMAT incidents and to coordinate all activities and information concerning scheduled launches and emergency incidents with the DEM. Please refer to the Department's enclosed comments.

Thank you for the opportunity to review this project. If you have any questions regarding the letter, please contact Cherie Trainor, Clearinghouse Coordinator, at (850) 922-5438 or the address above.

In accordance with 15 CFR 930.42(c), a copy of this letter has been sent to the U.S. Department of Commerce, NOAA, Office of Ocean and Coastal Resource Management. Please be advised that pursuant to 15 CFR 930, subpart G, mediation by the Secretary of the U.S. Department of Commerce may be sought by the Air Force, if the Air Force decides to initiate land based launches from the Florida Keys in the absence of federal consistency concurrence from the State of Florida.

Sincerely,



G. Steven Pfeiffer  
Assistant Secretary

GSP/rk

Enclosures

cc: Jeff Benoit, Office of Ocean and Coastal Resource Management  
Estus D. Whitfield, EOG  
George Percy, DOS  
Duncan Jay Cairns, NFWFMD  
Bradley J. Hartman, FGFWFC  
Lynn Griffin, DEP  
Samuel E. Poole, III, SFWMD  
John Hulsey, SFRPC



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 48TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 April 1998

Mr. George W Percy  
Division of Historical Resources  
500 South Bronough Street  
Tallahassee FL 32399-0250

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Percy

Thank you for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

The TMD SEIS has been prepared in accordance with Council on Environmental Quality (CEQ) guidelines, and includes sufficient analysis to inform the decision maker and the public of potential environmental impacts of the proposed action and to assist in the decision making process. Once a Record of Decision is reached, close consultation and coordination with federal and state resource agencies, including your office, would continue to assess the potential impacts. The Final SEIS identifies additional mitigation measures that could be implemented to further reduce potential impacts to the Florida and Gulf of Mexico. These proposed mitigation measures would be more fully developed and refined as we go through the respective permitting and consultation processes. The mitigation measures proposed for the Cape San Blas Lighthouse and keepers' quarters should address the safety of these structures once the final disposition of these structures is determined.

Sincerely

A handwritten signature in black ink, appearing to read "T. J. Kennedy", is written over the typed name and title.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



STATE OF FLORIDA

# DEPARTMENT OF COMMUNITY AFFAIRS

*"Helping Floridians create safe, vibrant, sustainable communities"*

LAWTON CHILES  
Governor

JAMES F. MURLEY  
Secretary

April 13, 1998

Ms. Linda Ninh  
Department of Defense  
46 OG/OGM-TMD  
205 West D Avenue, Suite 241  
Eglin Air Force Base, Florida 32578-6866

RE: U.S. Air Force - Department of Defense - Theater Missile Defense (TMD) Extended Test Range - Draft Supplemental Environmental Impact Statement - Eglin Gulf Test Range and Notice of Availability for Proposed TMD Test Programs - Florida  
SAI: FL9612240949CR

Dear Ms. Ninh:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced Draft Supplemental Environmental Impact Statement (DSEIS).

The Department of Community Affairs (Department), designated as the State's lead coastal agency pursuant to section 306 of the federal Coastal Zone Management Act, 16 U.S.C. section 1456(c), and section 380.22, Florida Statutes (F.S.), hereby notifies the Air Force that implementation of the preferred alternative identified in the DSEIS is consistent with the Florida Coastal Management Program (FCMP). However, based on the information contained in the DSEIS, implementation of any alternative which includes land launches from the Florida Keys would be inconsistent with the FCMP.

The State of Florida understands and appreciates the fact that the Air Force does not currently intend to initiate land launches from the Florida Keys; therefore, further action is not currently required to address the problems associated with the use of the Florida Keys sites. If the Air Force decides to reconsider the use of any sites in the Florida Keys, the concerns identified by our reviewing agencies, as enclosed and summarized below, must be addressed in a revised DSEIS. If necessary, the revised DSEIS should be provided to the Florida State Clearinghouse for interagency review.

The Department of State (DOS) and the Northwest Florida Water Management District (NFWFMD) have expressed concerns regarding the implementation of the preferred alternative. The

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100  
Phone: 850.488.8466/Suncom 278.8466 FAX: 850.921.0781/Suncom 291.0781  
Internet address: <http://www.state.fl.us/comaff/dca.html>

FLORIDA KEYS  
Area of Critical State Concern Field Office  
2796 Overseas Highway, Suite 212  
Marathon, Florida 33050-2227

GREEN SWAMP  
Area of Critical State Concern Field Office  
155 East Summerlin  
Bartow, Florida 33830-4641

SOUTH FLORIDA RECOVERY OFFICE  
P.O. Box 4022  
8600 N.W. 36th Street  
Miami, Florida 33159-4022

Captain Brian W. Moss

April 1, 1998

Page 2

Do not understand the following statement on Page 3-82, paragraph 1. "Relocation closer to the launch pad would bring the structures into closer proximity to the coastline, therefore increased exposure to noise is not anticipated as a result of relocation."

Page 3-82, paragraph 2. It would be more accurate to say "Rehabilitation of ~~one of~~ both of the keeper's quarters....

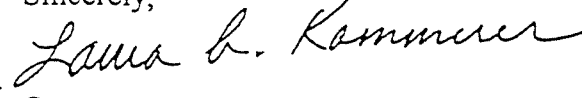
After-the-fact damage assessment and mitigation is not a viable alternative for historic resources. See Page 3-534, paragraph 3.5.2 as well - "Once a site is disturbed, it may be stabilized and protected from further deterioration, but it cannot be repaired to its original condition". Why not?

Throughout the document in the cultural resources sections statements are made such as no historical resources (shipwrecks or archaeological sites) are "present" or "there are no sites." Even though an area has been subjected to a cultural resource assessment survey, undiscovered sites or properties may exist. Therefore it would be more appropriate to use a phrase such as 'no resources have been identified, or no resources have been encountered' in the underwater site or the land site. Unexpected discoveries of cultural resources are always a possibility and provisions for such occurrences have to be addressed.

Page 3-531, paragraph 3.4.4. "The information resulting from the inadvertent loss of some potentially eligible sites should be useful in future efforts to manage the remaining resources." This statement makes this office uncomfortable and wish to be able to coordinate further discussions regarding the Cape San Blas site avoidance and mitigation measures with the Air Force prior to the completion of the final EIS.

We apologize for being brief, but are trying to provide comments prior to meeting tomorrow in Washington. We will be more than glad to provide more explanations or meet with SEIS preparers. If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

*for* 

George W. Percy, Director  
Division of Historical Resources  
and

State Historic Preservation Officer

GWP/Klk

xc: Cherie L. Trainor, State Clearinghouse

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT  
Project Review Form

RECEIVED  
MAR 04 1998

TO: State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100

State of Florida Clearinghouse

DATE: March 3, 1998

SUBJECT: Project Review: Intergovernmental Coordination  
Title: Dept. of Defense-Theater Missile Defense (TMD) Extended Test Range  
Draft Supplemental Environmental Impact Statement (DEIS) for  
Eglin Gulf Test Range and Notice of Availability for the Proposed  
TMD Test Programs-Florida  
SAI #: FL9612240949CR

The District has reviewed the subject application and attachments in accordance with its responsibilities and authority under the provisions of Chapter 373, Florida Statutes. As a result review, the District has the following responses:

ACTION

- ☐ No Comment.
- ☐ Supports the project.
- ☐ Objects to the project; explanation attached.
- ☐ Has no objection to the project; explanation optional.
- ☐ Cannot evaluate the project; explanation attached.
- ☐ Project requires a permit from the District under \_\_\_\_\_

DEGREE OF REVIEW

- ☒ Documentation was reviewed.
- ☐ Field investigation was performed.
- ☐ Discussed and/or contacted appropriate office about project.
- ☐ Additional documentation/research is required.
- ☒ Comments attached.

SIGNED

*Maria Albertson*

Duncan Jay Cairns  
Chief, Bur. Env. & Res. Plng.

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

MEMORANDUM

TO: Duncan Cairns, Chief, Bureau of Environmental Management and Planning

FROM: Paul Thorpe, Assistant Water Resource Planner

DATE: March 3, 1998

SUBJECT: Draft SEIS for Theater Missile Defense Test Range, SAI# FL9612240949CR

FILE: H:\p\_thorpe\comment\NEPA\TMD 980303

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Based on the Draft Supplemental EIS submitted, District staff have concerns about the proposed action with regard to wastewater treatment, nonpoint source pollution, and wetland impacts. Additionally, page 3-232 incorrectly states that the waters of St. Joe Bay subject to impact are Class III. These are Class II waters according to Section 62-302.600 (3) (b), Florida Administrative Code (F.A.C.).

Both Santa Rosa Sound and St. Joe Bay are receiving increasing cumulative impacts which may degrade their habitat quality and threaten their viability as recreational and shellfish waters. It would appear that surface water quality may be impacted by increased effluent from septic systems and increased nonpoint source pollution via stormwater runoff during both construction of new facilities and implementation of the proposed action. The proposed actions should involve full consideration of the status of the affected waters. The affected portions of both Santa Rosa Sound and St. Joe Bay are Class II (shellfish propagation and harvesting) waters, and St. Joe Bay is also an Aquatic Preserve and Outstanding Florida Water (OFW). As an OFW, any degradation of water quality, including due to indirect impacts, is prohibited in accordance with Section 62-302.700, F.A.C. Additionally, both Santa Rosa Sound and St. Joe Bay are Surface Water Improvement and Management (SWIM) priority waterbodies, which represents a public commitment to their protection.

Consideration should also be given to whether it would be feasible to avoid or further minimize wetland impacts, such as those planned for Cape San Blas. Additionally, new impervious surfaces should be minimized, the suitability of soils for septic tank use should be evaluated, and all stormwater runoff should be captured and treated on site.





## FLORIDA GAME AND FRESH WATER FISH COMMISSION



QUINTON L. HEDGEPEETH, DDS   MRS. GILBERT W. HUMPHREY   THOMAS B. KIBLER   JAMES L. "JAMIE" ADAMS JR.   JULIE K. MORRIS  
Miami   Micanook   Lakeland   Bushnell   Sarasota

ALLAN L. EGBERT, Ph.D., Executive Director  
VICTOR J. HELLER, Assistant Executive Director

Ms. Keri Akers  
Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oaks Boulevard  
Tallahassee, Florida 32399-2100

February 24, 1998  
**RECEIVED**  
FEB 26 1998

State of Florida Clearinghouse

OFFICE OF ENVIRONMENTAL SERVICES  
BRADLEY J. HARTMAN, Director  
FARRIS BRYANT BUILDING  
620 South Meridian Street  
Tallahassee, FL 32399-1600  
(850) 488-6661  
SUNCOM 278-6661  
FAX (850) 922-5679  
TDD (850) 488-9542

Re: Department of Defense, BMDO Theater  
Missile Defense Testing, Draft SEIS,  
Monroe County

Dear Ms. Akers:

The Office of Environmental Services of the Florida Game and Fresh Water Fish Commission has reviewed the Draft Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement-Eglin Test Range (SEIS) dated 6 February 1998. We offer the following comments in addition to our previous comments (see enclosed letter dated 22 January 1998) on this proposed project.

The Department of Defense Ballistic Missile Defense Organization (BMDO) has proposed to test theater missile defense (TMD) in the Eglin Test Range located off of the west coast of Florida in the Gulf of Mexico. Initially, the BMDO Proposed Action included a land-based missile launch site to be located in the Florida Keys, at either Cudjoe Key or Saddlebunch Key. The Cudjoe Key site is an existing U.S. Air Force facility, and construction would not have significantly impacted native habitats. Construction at the Saddlebunch site, a U.S. Navy facility, would have resulted in the destruction of 1.79 acres of mangrove and salt marsh wetlands. Our previous letter outlines the specific concerns associated with construction of a missile launch facility at these locations.


On 24 November 1997, the director of the BMDO amended the Proposed Action in the SEIS to state that launching targets from the southern Gulf of Mexico would be from aircraft. The land-based Florida Keys missile launch sites were moved to the category of Alternatives Considered. Although the Florida Keys launch sites are analyzed in the SEIS for procedural reasons, their selection as launch sites is unlikely to be approved.

We support the BMDO's decision to remove the Florida Keys launch sites from the proposed action. We were initially concerned that the proposed TMD activities may adversely impact wildlife in the Florida Keys, notably the Lower Keys marsh rabbit, silver rice rat, and the

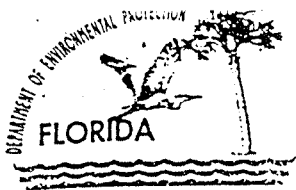
Ms. Keri Akers  
February 24, 1998  
Page 2

diverse wading bird populations adjacent to the proposed launch locations. Removal of the Florida Keys launch sites from the Proposed Action effectively removes this concern, and makes the overall proposal much more acceptable. Should the Proposed Action change to include the Florida Keys as a missile launch site, please notify us so that we may initiate additional coordination.

Sincerely,

  
Bradley J. Hartman, Director  
Office of Environmental Services

BJH/pf  
ENV 8-4-1  
Enclosure



# Department of Environmental Protection

Lawton Chiles  
Governor

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

Virginia B. Wetherell  
Secretary

March 31, 1998

**RECEIVED**  
APR 02 1998

*State of Florida Clearinghouse*

Ms. Cherie Trainor  
Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

Re: Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DSEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs, Florida

SAI: FL9612240949CR

Dear Ms. Trainor:

The Department of Environmental Protection reviewed the Department of Defense Ballistic Missile Defense Organization (BMDO) proposal to expand the theater missile Defense Eglin test range within the Gulf of Mexico. The proposal initially considered alternative target launch sites to be located in the Florida Keys, either at Saddlebunch or Cudjoe Key. Construction at Saddlebunch Key, a U.S. Navy facility, would impact 1.79 acres of mangrove and salt marsh wetlands while construction at Cudjoe Key, an existing Air Force installation, would have less impact on habitat in the area. However, both sites presented significant concerns for environmental impact to land and water resources of the Keys and surrounding waters.

The Department of Defense (DOD) now is proposing a preferred alternative for missile testing which does not launch from either of the sites located in the Keys, or the waters of the Florida Keys National Marine Sanctuary (FKNMS). The department concurs that testing outside of the Keys area of impact is a more acceptable approach to conducting these tests; however, should launch sites in the Keys or surrounding waters be revisited as an alternative at a later date and a launch site within the Keys or the FKNMS become desirable, a supplemental revision of the Draft Supplemental Environmental Impact Statement (DSEIS) document should be developed and circulated for review by the State.

The following comments refer to the adequacy of the DSEIS and the evaluation of alternatives, specifically those launch sites located within the Keys or the FKNMS.

## Introduction

The State of Florida signed the Florida Keys National Marine Sanctuary (FKNMS) Management plan in January 1997. Therefore, proposed conflicts with the management plan are of primary concern to the State. The following is a list of issues which reflect conflicts between the Keys launch sites and existing sanctuary regulations. Regulations and statutes are referenced after the identification of each issue when applicable.

### Issue #1: Discrepancy with the "Water Resource Regulations" Section

The following was stated within volume 2 of the referenced Supplemental Environmental Impact Statement, under appendix B, the "Water Resource Regulations" Section:

*"Florida Keys National Marine Sanctuary Management Plan of 1996 - This management plan sets up a process for current and future changes in fishing activities including prohibitions, gear restrictions and permits within the Sanctuary."*

This statement does not correctly define the management plan program goals or regulations. National marine sanctuaries are built around distinctive natural and historical resources whose protection and beneficial use require comprehensive planning and management. Sanctuary regulations address not only fishing activities, but also regulate activities that affect sanctuary resources or qualities.

### Issue #2: Volume 1, 2.0 "Description of Alternatives including the Proposed Action"

According to the Supplemental Environmental Impact Statement, "Cudjoe Key and Saddlebunch Key are the alternative candidates for target launch locations."

Should the Florida Keys sites be used as alternative sites, several construction activities have been identified as being necessary to prepare the areas as launch sites. These construction activities would include dredging and filling in areas the DSEIS has identified as "jurisdictional wetlands regulated under the Clean Water Act." In addition, the DSEIS notes that Federal and state threatened species have been reported on Cudjoe, Boca Chica and Sugarloaf Keys. Furthermore, the majority of Cudjoe Key has been designated as critical habitat under the ESA (50 CFR 17.95).

By definition, the FKNMS is mandated to protect the Keys resources from any adverse effects. Authorization for this mandate is found in 15 CFR, Section 922.162 which states:

"(a) The following definitions apply to the Florida Keys National Marine Sanctuary regulations. To the extent that a definition appears in Section 922.3 and this section, the definition in this section governs."

"Acts means the Florida Keys National Marine Sanctuary and Protection Act, as amended, (FKNMSPA) (Pub. L. 101605), and the National Marine Sanctuaries Act (NMSA), also known as Title 111 of the Marine Protection, Research, and Sanctuaries Act, as amended, (MPRSA) (16 U.S.C. 1431 et seq.). Adverse effect means any factor, force, or action that independently or cumulatively damages, diminishes, degrades, impairs, destroys, or otherwise harms any Sanctuary resource, as defined in section 302(8) of the NMSA (16 U.S.C. 1432(8)) and in this section, or any of the qualities, values, or purposes for which the Sanctuary is designated. "

In addition to Federal regulations, Chapter 161.5, F.A.C., states:

"The Legislature further recognizes that these coastal areas are among Florida's most valuable resources and have extremely high recreational and aesthetic value which should be preserved and enhanced. " It is "the intent of the Legislature that the most sensitive portions of the coastal area shall be managed through the imposition of strict construction standards in order to minimize damage to the natural environment, private property, and life. "

Should either of the Florida Keys sites become a preferred alternative, it will be necessary for the SEIS to address in greater detail potential impacts to the sanctuary and consistency of the project with Federal and State statutes.

**Issue #3: Toxic emissions from solid fuel rockets that may enter the marine environment and injure marine resources; Damage to mangroves and vegetation due to launch activities; Negative effects to the natural resources due to launching and launch accidents.**

Under section 2.4 "Comparison of Alternatives" it was stated:

*At Cudjoe Key, site preparation and targetflight test activity would result in minimal environmental impacts for biological resources, land and water use, noise, socioeconomics, transportation, and water resources; potential impacts on other resources would be negligible.*

That statement does not completely agree with the previous draft of the Supplemental EIS, Section 4, which outlined the following projections:

- 1 ) the greatest concentrations of exhaust products would be released near the ground and less exhaust being released in any specific area as the missile increases its speed;
- 2) the effect of 12 launches per year may permanently remove or degrade vegetation close to the launch pad;
- 3) Cumulative Impacts, over the 10-year period the launch activities could result in an overall loss of plant species diversity and total vegetation cover. This loss could be due to the deposition of hydrogen chloride;
- 4) If an accident occurs on the launch pad, the explosion and resultant fire could harm Federally or State listed species of nesting or wintering wading birds and shorebirds or their habitat; and,
- 5 ) Impacts from launch-related activities could result in changes in water chemistry due to deposition of launch emissions, chemical stimulants and missile debris.

These two drafts contain different opinions on possible resource damage. The SEIS should define "minimal damage" and explain how the impacts listed in the earlier draft were determined to be minimal. Also, the SEIS should recognize that the following activities are prohibited by Section 922.163, 15 CFR:

*"3) Alteration of, or construction on, the seabed. Drilling into, dredging, or otherwise altering the seabed of the Sanctuary, or engaging in prop-dredging; or constructing, placing or abandoning any structure, material, or other matter on the seabed of the Sanctuary....*

*(4) Discharge or deposit of materials or other matter. (i) Discharging or depositing, from within the boundary of the Sanctuary, any material or other matter, except: (A) Fish, fish parts, chumming materials, or bait used or produced incidental to and while conducting a traditional fishing activity in the Sanctuary; (B) Biodegradable effluent incidental to vessel use and generated by a marine sanitation device approved in accordance with section 312 of the Federal Water Pollution Control Act. as amended, (FWPCA), 33 U.S.C. 1322 et seq.;....*

*(11) Possession or use of explosives or electrical charges. Possessing, or using explosives, except powerheads, or releasing electrical charges within the Sanctuary."*

The following statutory citations relate to the issues identified above and also mandate either prohibitions or constraints related to proposed activities which cause pollution; cause, authorize, create, suffer or allow an imminent hazard to occur or continue; cause, place or deposit solid waste in or on land or water in a manner not approved by the DEP: Sections 403.161; 403.727; and, 403.708, F.S., respectively.

**Issue #4: Disturbance to Marine waterfowl through interference with nesting, feeding and breeding behaviors in the sensitive backcountry environment.**

There are threatened and endangered species of birds; such as bald eagles, white-crowned pigeons, and peregrine falcons, within the areas evaluated and within a Wildlife Management Area. Any impacts to the habitats or disturbances to the marine waterfowl should be done with consideration of the rules under the National Wildlife Refuge System (16 U.S.C.).

Within the DSEIS, section 3.3.3.4.1, it was stated that:

*"The heat and noise of launch events may cause mortality to those animals in the immediate vicinity (15 meters/50 feet) of the launch pad that were not previously frightened away by increased human activity. Deposition of hydrogen chloride and aluminum oxide emissions... could cause some spotting and browning of plants.... The long-term result would be some loss of biodiversity in the immediate vicinity of the launch pad."*

However, these acts are either prohibited or require permits through 16 U.S.C, Section (c) Prohibited and permitted activities, which states:

*"It shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess..., any migratory bird, any part, nest, or eggs of any such bird "*

*"No person shall knowingly disturb, injure, cut, burn, remove, destroy, or possess any real or personal property of the United States, including natural growth, in any area of the System; "*

Also, under Section 63.302, Florida Statutes, it is unlawful to discharge domestic, industrial, agricultural, or other man-induced non-thermal components which are present in concentrations which are carcinogenic, mutagenic, or teratogenic to human beings, wildlife or welfare.

**Issue #5: Negative impacts to marine resources from secondary vessel activity associated with the rocket facility were outlined as follows:**

- 1) increased activity at the site may result in disturbance to the wildlife;
- 2) use of aircraft and patrol vessels could increase the chance of striking protected species;
- 3) increased vessel activity to support the upland facility could be of concern due to the shallow surrounding waters. Improper vessel activity within these areas could result in prop dredging, scarring and vessel groundings.

Under 15 CFR, Section 922.163, Sanctuary-wide activities which could act to constrain the above activities include the following:

*(5) Operation of vessels. (i) Operating a vessel in such a manner as to strike or otherwise injure coral, seagrass, or any other immobile organism attached to the seabed, including, but not limited to, operating a vessel in such a manner as to cause prop-scarring.*

*(iv) Operating a vessel in such a manner as to injure or take wading, roosting, or nesting birds or marine mammals. (v) Operating a vessel in a manner which endangers life, limb, marine resources, or property.*

Although existing military activities within the sanctuary are allowed and may be exempted from FKNMS provisions pending consultation with the Director of the FKNMS, new military activities would need to be modified so that they are not likely to destroy, or significantly injure Sanctuary resources. If an activity conducted by the DOD is determined to have or cause resource damage, the DOD would need to take



appropriate actions to cease, respond or mitigate the harm and restore or repair the damage.

**Issue #6: Permit Requirements:**

Any expanded activities within the Florida Keys will require an Environmental Resource Permit (ERP) from either this agency or the South Florida Water Management District. This ERP requirement was not mentioned in Appendix N, which outlines the required permits. Section 373.414, Florida Statutes also requires the minimization and avoidance of wetland impacts which would be involved in the Saddlebunch Key alternative. Impact to those wetlands would need to be avoided and minimized prior to acceptance of a plan for mitigation. The DSEIS did not clearly outline this requirement.

Based on the information provided, it appears construction of support facilities in the Northwest region of the state will primarily be on uplands. In the event construction will impact wetlands, Wetland Resource Permits will be required. For more assistance regarding wetland permitting processes and standards, please contact Ms. Connie Kristoff at the Northwest District Office, (850)595-8300. The proposed construction will also require stormwater discharge permits. For more information, please contact Mr. Cliff Street also at the above mentioned number.

The DSEIS indicated that water acidity will occur as a result of missile launches from the Keys sites. However, it should be pointed out that the waters surrounding the Keys are classified as Outstanding Florida Waters and also within an Aquatic Preserve, protected from degradation by Chapter 62-302, F.A.C. Any changes in water chemistry would need to be accompanied by reasonable assurances that the project would not degrade water quality standards. Further, it was stated that aluminum oxide and hydrogen chloride may be spilled during the proposed target launch activities. Control of these substances would be required in conjunction with a stormwater management plan which provides assurances that water quality degradation would not occur.

**Conclusion**

The DSEIS did not adequately address the above issues. Since the preferred alternative is an offshore launch site outside of the FKNMS further analysis of impacts to the Keys or the FKNMS may not be warranted at this time. However, if the Air Force determines at a later date that its testing program should include a launch site in the Keys, the EIS should be supplemented with a complete evaluation of the above issues.

In addition, the DSEIS did not include a federal consistency determination as required by the Coastal Zone Management Act. The final EIS should include an appropriate

FL9612240949CR

March 31, 1998

page8

determination in accordance with the requirements of 15 CFR 930, Subpart C, and address consistency of project impacts with the DEP's statutory authorities in the Florida Coastal Management Program, specifically Chapters 373, 403, 161, 370, 253, and 258, Florida Statutes.

We appreciate the opportunity of commenting on this proposal. If you have any questions regarding this letter please call either Mr. Robert Hall or me at (850)487-2231.

Sincerely,



Lynn Griffin

Office of Intergovernmental  
Programs

cc: G.P. Schmahl  
Anna Marie Hartman  
Ron Blackburn



# South Florida Water Management District

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 860-1600 • FAX (561) 860-1601 • TDD (561) 860-1602 • RELAY TEX 1-800-432-2045

GOV 04-12 RF: 98303

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March 27, 1998

State of Florida Clearinghouse

Ms. Cherie Trainor  
Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100

**Subject: Theater Missile Defense Extended Test Range (SAI #9612240949CR)  
Draft Supplemental Environmental Impact Statement**

Dear Ms. Trainor:

In response to your request, South Florida Water Management District (SFWMD) staff has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for the above-referenced proposal for consistency with the Florida Coastal Zone Management Program (FCMP).

Projects reviewed by the SFWMD pursuant to the FCMP are reviewed for consistency with the provisions of Chapter 373, F.S. (Florida Water Resources Act of 1972, as amended), as well as the programs and regulations developed thereunder. Chapter 373, F.S. provides the authority to regulate the withdrawal, diversion, storage, and consumptive uses of water, the construction and operation of stormwater management systems, and work in, on, or over surface waters or wetlands. Chapter 373, F.S. also provides authority to acquire and manage land, to conduct research and investigations into all aspects of water resource management, and to disseminate information relating to the water resources of the state to public and private users. While overall responsibility for administration of most of this act rests with the Florida Department of Environmental Protection (FDEP), most of the implementation is delegated to the five water management districts.

Among the alternatives addressed in the DSEIS are target launch and support activities in the Florida Keys (Cudjoe Key or Saddlebunch Key). These are the only activities proposed within the jurisdictional boundaries of the SFWMD.

Based on an analysis of the mandatory enforceable provisions and recommended policies of the core FCMP statutes and implementing rules administered by the SFWMD, the proposed target launch sites in the Florida Keys are inconsistent with the achievement of the SFWMD's projects, programs, and objectives.

*Governing Board:*

Frank Williamson, Jr., Chairman  
Eugene K. Pettis, Vice Chairman  
Mitchell W. Berger  
E-36

Vera M. Carter  
William E. Graham  
William Hammond

Richard A. Machek  
Michael D. Minton  
Miriam Singer

Samuel E. Poole III, Executive Director  
Michael Slayton, Deputy Executive Director

The above determination is based on the following:

- (1) The proposed target launch facilities in the Florida Keys will require an Environmental Resource Permit (ERP). The requirement for an ERP is not listed in Appendix N (Potential Permits) of the DSEIS. Please be advised that, although SFWMD staff has had some discussions with FDEP staff regarding permitting responsibility for this project, a final decision has not been made as to whether the FDEP or SFWMD will be responsible for the review of this project.
- (2) According to the DSEIS, use of the Saddlebunch Key site will result in disturbance to unaltered uplands (1.79 acres) and wetlands (2.2 acres) while use of the Cudjoe Key site will not disturb any previously unaltered upland or wetland areas. Section 373.14, F.S. requires the avoidance and minimization of wetland impacts. Once the applicant has demonstrated that impacts to wetlands have been avoided or minimized to the extent practicable, any remaining wetland losses must be mitigated. The DSEIS does not address avoidance and minimization of wetland impacts for the Saddlebunch Key site as required under Chapter 373.414, F.S. Although the DSEIS states that "specific mitigation measures will be developed in consultation with the appropriate agencies," no details regarding the proposed mitigation activities are provided.
- (3) Although the DSEIS addresses direct impacts to both sites, the potential for secondary or cumulative impacts at either location are not addressed, as required under Chapter 373.414, F.S.
- (4) The wetland boundaries and acreages existing on the proposed target launch sites have not been field verified by SFWMD environmental staff. Consequently, the applicant-estimated wetland boundaries and acreages may vary significantly from the actual acreages based on the Statewide Wetland Delineation Rule (Chapter 62-340, F.A.C.). If the applicant-estimated wetland acreage is significantly lower than actual on-site acreages, additional on or off-site mitigation may be necessary to meet the SFWMD's minimum mitigation requirements. The DSEIS does not provide any details regarding proposed on or off-site wetland mitigation activities.
- (5) The DSEIS indicates that an increase in water acidity will result from missile launching at these sites. Please be advised that the surrounding water bodies are classified as an Outstanding Florida Water (OFW) and an Aquatic Preserve. Consequently, any increase in acidity of surrounding water bodies would not be in compliance with State Water Quality Standards, as set forth in Chapter 62-302, F.A.C.

- (6) Most of the target launch and support activities proposed in the Keys are within the boundaries of the Florida Keys National Marine Sanctuary. SFWMD staff has concerns regarding implementation of the proposed activities within the boundaries of a wildlife refuge. This area is designated as critical habitat for the silver rice rat and also supports numerous other listed species. The proposed activities are projected to impact foraging habitat for numerous species and have the potential to displace nesting areas. Prior to project implementation, the applicant must demonstrate minimization of any potential adverse impacts, as required under Chapter 373.414, F.S. After the applicant has demonstrated minimization of any potential adverse impacts, a mitigation plan must be submitted which offsets potential impacts related to the proposed project. The DSEIS (Page 3-403) indicates that a mitigation plan will be developed in coordination with several agencies. However, the SFWMD is not included. The SFWMD should be included in any coordinated effort to develop a plan to offset any potential adverse impacts (not just listed species) incurred as a result of project implementation.
- (7) The DSEIS indicates that aluminum oxide and hydrogen chloride may be spilled on the ground during the proposed target launch activities. Staff has concerns related to the potential for this material to enter the groundwater and contaminate wetlands or other surface waters due to the high transmissivity of the soils in the Keys. Please be advised that containment of this material may be recommended if target launch activities are implemented in the Keys. Prior to any missile launching, additional information regarding the toxicity of this material and a demonstration of material containment will be required.
- (8) The breakdown products of the exhaust gases could potentially form harmful acids. These acids could adversely impact the surrounding area by altering surrounding vegetation, the vegetative community structure, and acidifying surrounding waters. Please be advised that the extent of the potential impacts will require quantification and measures to mitigate for these impacts prior to project implementation.
- (9) The DSEIS indicates that runoff will be allowed to sheetflow from impervious areas to adjacent waters (i.e., no stormwater management facilities are proposed for these sites). Please be advised that a stormwater management plan will be required prior to construction activities at either of these sites as part of the ERP application review process.

The above comments only address concerns related to activities proposed within the jurisdictional boundaries of the SFWMD. Staff considers activities proposed outside of

Ms. Cherie Trainor  
March 27, 1998  
Page 4

SFWMD boundaries as a potential secondary impact. These activities will require thorough evaluation during the ERP application review process.


Please note that staff plans to present this inconsistency finding to our Governing Board at their next regularly-scheduled meeting (April 16, 1998) for their concurrence with this finding. Staff will advise you regarding the Governing Board's action on this item.

The SFWMD's inconsistency finding is based exclusively upon the information contained in the DSEIS. It is without prejudice towards full consideration of a modified proposal which addresses the potential for adverse impacts outlined in this letter.

SFWMD staff are available to meet with the applicant to further discuss the issues and concerns raised in this letter. If the applicant plans to proceed with either of the alternative target launch sites in the Keys, the applicant should coordinate any such efforts with our staff (and/or the appropriate staff from FDEP) prior to finalization of the SEIS or submittal of any permit applications.

If any of the above requires additional clarification or if we can be of further assistance, please do not hesitate to contact Jim Golden, Senior Planner in the Regulation Department, at (561) 687-6862.

Sincerely,

  
for Samuel E. Podle III  
Executive Director  
South Florida Water Management District

SEP/jjg

c: Jim Golden

South  
Florida  
Regional  
Planning  
Council



**RECEIVED**  
MAR 16 1998

VIA FACSIMILE AND MAIL

State of Florida Clearinghouse

March 12, 1998

Ms. Cherie Trainor  
Florida State Clearinghouse  
Florida Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

RE: SFRPC #98-0307, SAI #FL9612240949CR - Request for comments on the Theater Missile Defense Extended Test Range Draft Supplemental Environmental Impact Statement for the Eglin Gulf Test Range, U.S. Department of Defense, Boca Chica, Cudjoe, Fleming and Saddlebunch Keys, Monroe County.

Dear Ms. Trainor:

We have reviewed the above-referenced permit application and have the following comments:

- Council staff is greatly concerned about the impacts this project could have on the water quality, wildlife habitat and the overall ecological integrity of the region. The project should be consistent with the goals and policies of the Monroe County and City of Key West comprehensive plans and their corresponding land development regulations and the goals and policies of the Florida Keys National Marine Sanctuary Management Plan.
- Staff recognizes the location of the alternative test launch sites' launch hazard areas in the Florida Keys National Marine Sanctuary, the Key Deer National Wildlife Refuge and the Great White Heron National Wildlife Refuge, natural resources of regional significance as designated in the *Strategic-Regional Policy Plan of South Florida* (SRPP). Staff recommends that, if the use of these alternative sites is pursued, 1) impacts to the natural systems be minimized to the greatest extent feasible and 2) the Department of Defense determine the extent of sensitive marine life and vegetative communities in the vicinity of the project and protect and or mitigate disturbed habitat. This will assist in reducing the cumulative impacts to native plants and animals, wetlands and deep water habitat and fisheries that the goals and policies of the SRPP seek to protect.
- The goals and policies of the SRPP, in particular those indicated below, should be observed when making decisions regarding this project.

3440 Hollywood Boulevard, Suite 140, Hollywood, Florida 33021  
Broward (954) 985-4416, Area Codes 305, 407 and 561 (800) 985-4416  
SunCom 473-4416, FAX (954) 985-4417, SunCom FAX 473-4417  
e-mail sfadmin@sfrpc.com

### Strategic Regional Goal

- 3.1 Eliminate the inappropriate uses of land by improving the land use designations and utilize land acquisition where necessary so that the quality and connectedness of Natural Resources of Regional Significance and suitable high quality natural areas is improved.

### Regional Policies

- 3.1.1 Natural Resources of Regional Significance and other suitable natural resources shall be preserved and protected. Mitigation for unavoidable impacts will be provided either on-site or in identified regional habitat mitigation areas with the goal of providing the highest level of resource value and function for the regional system. Endangered faunal species habitat and populations documented on-site shall be preserved on-site. Threatened faunal species and populations and species of special concern documented on-site, as well as critically imperiled, imperiled and rare plants shall be preserved on-site unless it is demonstrated that off-site mitigation will not adversely impact the viability or number of individuals of the species.
- 3.1.2 Direct inappropriate uses of land that are not consistent with the protection and maintenance of natural resource values away from Natural Resources of Regional Significance and suitable natural resource areas.
- 3.1.9 Degradation or destruction of Natural Resources of Regional Significance, including listed species and their habitats will occur as a result of a proposed project only if:
- a) the activity is necessary to prevent or eliminate a public hazard, and
  - b) the activity is in the public interest and no other alternative exists, and
  - c) the activity does not destroy significant natural habitat, or identified natural resource values, and
  - d) the activity does not destroy habitat for threatened or endangered species, and
  - e) the activity does not negatively impact listed species that have been documented to use or rely upon the site.
- 3.1.10 Proposed projects shall include buffer zones between development and existing Natural Resources of Regional Significance and other suitable natural resources. The buffer zones shall provide natural habitat values and functions that compliment Natural Resources of Regional Significance values so that the natural system values of the site are not negatively impacted by adjacent uses. The buffer zones shall be a minimum of 25 feet in width. Alternative widths may be proposed if it is demonstrated that the alternative furthers the viability of the Natural Resource of Regional Significance, effectively separating the development impacts from the natural resource or contributing to reduced fragmentation of identified Natural Resources of Regional Significance.
- 3.1.11 Implement monitoring and maintenance of Natural Resources of Regional Significance and other suitable natural resources so that an Overall Positive Gain in quality and quantity of the Natural Resources of Regional Significance is achieved. The monitoring of the Natural Resources of Regional Significance shall be included on all projects that have not been demonstrated to not adversely impact the resource or associated listed species.



- 3.1.19 Uses of the land shall be consistent with the sustained ecological functioning of the Natural Resources of Regional Significance and suitable adjacent natural buffer areas and will be based upon the radius required to provide protection to the natural system and associated inhabitants. The radius will vary in size depending upon the resource or species that is to be protected.

#### Strategic Regional Goal

- 3.2 Develop a more efficient and sustainable allocation of the water resources of the region.

#### Regional Policies

- 3.2.6 When reviewing proposed projects and through the implementation of the SRPP, discourage water management and proposed development projects that alter the natural wet and dry cycles of Natural Resources of Regional Significance or suitable adjacent buffer areas or cause functional disruption of wetlands or aquifer recharge areas.
- 3.2.9 Require all inappropriate inputs into Natural Resources of Regional Significance to be eliminated through such means as; redirection of offending outfalls, suitable treatment improvements or retrofitting options.
- 3.2.10 The discharge of freshwater to Natural Resources of Regional Significance and suitable adjacent natural buffer areas shall be designed to imitate the natural discharges in quality and quantity as well as in spatial and temporal distribution.
- 3.2.11 Existing stormwater outfalls that do not meet or improve upon existing water quality or quantity criteria or standard, or cause negative impacts to Natural Resources of Regional Significance or suitable adjacent natural buffer areas shall be modified to meet or exceed the existing water quality or quantity criteria or standard. The modification shall be the responsibility of the outfall operator, permittee or applicant.

#### Strategic Regional Goal

- 3.3 Achieve improved air quality throughout the region through a reduction of transportation related impacts and the increased use of natural plantings.

#### Regional Policies

- 3.3.6 Proposed development shall be reviewed with respect to the potential for related impacts to the regional air quality, and negative impacts eliminated or effectively mitigated.

#### Strategic Regional Goal

- 3.4 Improve the protection of upland habitat areas and maximize the interrelationships between the wetland and upland components of the natural system.

#### Regional Policies

- 3.4.4 Require the use of ecological studies and site and species specific surveys in projects that may impact natural habitat areas to ensure that rare and state and federally listed plants and wildlife are identified with respect to temporal and spatial distribution.

- 3.4.5 Identify and protect the habitats of rare and state and federally listed species. For those rare and threatened species that have been scientifically demonstrated by past or site specific studies to be relocated successfully, without resulting in harm to the relocated or receiving populations, and where *in-situ* preservation is neither possible nor desirable from an ecological perspective, identify suitable receptor sites, guaranteed to be preserved and managed in perpetuity for the protection of the relocated species that will be utilized for the relocation of such rare or listed plants and animals made necessary by unavoidable project impacts. Consistent use of the site by endangered species, or documented endangered species habitat on-site shall be preserved on-site.
- 3.4.6 Require the protection of listed species identified in ecological studies of proposed project areas by such means as, the isolation of suitable habitat or relocation of the individuals to suitable Natural Resources of Regional Significance or other suitable natural areas with sufficient carrying capacity consistent with the requirements of Policies 3.4.1, 3.4.2, 3.4.3, 3.4.4, and 3.4.5.
- 3.4.7 Natural system corridors shall include upland as well as wetland habitat areas to facilitate the re-establishment of regional system ecological values and functions.
- 3.4.8 Remove invasive exotics from all Natural Resources of Regional Significance and associated buffer areas. Require the continued regular and periodic maintenance of areas that have had invasive exotics removed.
- 3.4.9 Required maintenance shall insure that re-establishment of the invasive exotic does not occur.
- 3.4.10 Local governments shall be encouraged to require invasive exotic removal as a condition of development approvals.
- 3.4.11 Local governments shall be encouraged to remove invasive exotics from government property.

#### Strategic Regional Goal

- 3.8 Enhance and preserve natural system values of South Florida's shorelines, estuaries, benthic communities, fisheries, and associated habitats, including but not limited to, Florida Bay, Biscayne Bay and the coral reef tract.

#### Regional Policies

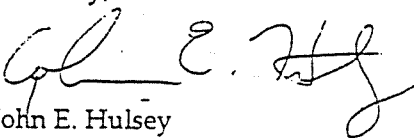
- 3.8.1 Enhance and preserve natural shoreline characteristics through requirements resulting from the review of proposed projects and in the implementation of ICE, including but not limited to, mangroves, beaches and dunes through prohibition of structural shoreline stabilization methods except to protect existing navigation channels, maintain reasonable riparian access, or allow an activity in the public interest as determined by applicable state and federal permitting criteria.
- 3.8.2 Enhance and preserve benthic communities, including but not limited to seagrass and shellfish beds, and coral habitats, by allowing only that dredge and fill activity, artificial shading of habitat areas, or destruction from boats that is the least amount practicable, and by encouraging permanent mooring facilities. Dredge and fill activities may occur on

submerged lands in the Florida Keys only as permitted by the Monroe County Land Development Regulations. It must be demonstrated pursuant to the review of the proposed project features that the activities included in the proposed project do not cause permanent, adverse natural system impacts.

- 3.8.3 As a result of proposed project reviews, include conditions that result in a project that enhances and preserves marine and estuarine water quality by:
- a) improving the timing and quality of freshwater inflows;
  - b) reducing turbidity, nutrient loading and bacterial loading from wastewater facilities, vessels;
  - c) reducing the number of improperly maintained stormwater systems; and
  - d) requiring port facilities and marinas to implement hazardous materials spill plans.
- 3.8.4 Enhance and preserve commercial and sports fisheries through monitoring, research, best management practices for fish harvesting and protection of nursery habitat and include the resulting information in educational programs throughout the region. Identified nursery habitat shall be protected through the inclusion of suitable habitat protective features including, but not limited to:
- a) avoidance of project impacts within habitat area;
  - b) replacement of habitat area impacted by proposed project; or
  - c) improvement of remaining habitat area within remainder of proposed project area.
- 3.8.5 Enhance and preserve habitat for endangered and threatened marine species by the preservation of identified endangered species habitat and populations. For threatened species or species of critical concern, on-site preservation will be required unless it is demonstrated that off-site mitigation will not adversely impact the viability or number of individuals of the species.

Thank you for the opportunity to comment. We would appreciate being kept informed on the progress of this project. Please do not hesitate to call if you have any questions or comments.

Sincerely,



John E. Hulsey  
Senior Planner

JEH:icg

cc: Timothy McGarry, Monroe County Planning  
Ted Strader, City of Key West Planning



STATE OF FLORIDA  
DEPARTMENT OF COMMUNITY AFFAIRS

EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

LAWTON CHILES  
Governor

JAMES F. MURLEY  
Secretary

M E M O R A N D U M

TO: Keri Akers, State Clearinghouse

FROM: G. Steven Pfeiffer, Assistant Secretary

SUBJECT: Department of the Air Force - Scoping Letter for Proposed Supplemental Environmental Impact Statement - Extended Eglin Gulf Test Range for Theater Missile Defense Systems - Gulf, Monroe and Santa Rosa Counties and Gulf of Mexico, Florida  
SAI: FL9612240949

DATE: February 20, 1997

The Department of Community Affairs (Department), pursuant to its role as the State's land planning and emergency management agency, has reviewed the above-referenced project. The Department has identified issues which are recommended for inclusion in the referenced study. The Department has also considered the attached comments provide by the West Florida Regional Planning Council (WFRPC) in the preparation of our comments.

Salt marsh and mangrove wetlands and several listed species occur within and adjacent to the project areas in the Florida Keys. Therefore, the Air Force is advised to consider protection measures for the natural resources, protected species and environmentally sensitive lands located within the Florida Keys. While the military lands are not regulated by the Monroe County Comprehensive Plan, the Plan's Goals, Objectives, and Policies specify several coordination and protection measures which should be considered in the evaluation and minimization of the project's impacts to these resources. The Air Force may wish to contact Mr. Ty Symroski, of the Department's Florida Keys Field Office at (305) 289-2402 for assistance regarding the Monroe County concerns.

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100

FLORIDA KEYS AREA OF CRITICAL STATE CONCERN  
FIELD OFFICE  
2796 Overseas Highway, Suite 212  
Marathon, Florida 33050-2227

SOUTH FLORIDA RECOVERY OFFICE  
P.O. Box 4022  
8600 N.W. 36th Street  
Miami, Florida 33159-4022

GREEN SWAMP AREA OF CRITICAL STATE CONCERN  
FIELD OFFICE  
155 East Summerlin  
Bartow, Florida 33830-4641

The Supplemental Environmental Impact Statement (SEIS) should also include an evaluation of the following:

1. The extent and timing of the closure of land, air and water space during launch days;
2. Impacts of closures and launch accidents to transportation routes, including critical links in evacuation routes for the Florida Keys, Santa Rosa Island and Cape San Blas; power and water transmission lines; and the Gulf Intercoastal Waterway;
3. Measures that will be used to alert operators of small private boats who may not have adequate radio or other communications equipment on board;
4. Advance notification procedures and time frames for informing residents and visitors of pending launch and noise activities;
5. Impacts of proposed activities to endangered species, including impacts in Santa Rosa and Gulf Counties to the least tern and Santa Rosa Beach Mouse;
6. Anticipated needs for dredging to accommodate barges or other water craft involved in the delivery of missiles, personnel, or equipment;
7. Plans for reporting the transport and storage of hazardous materials and the types of substances involved; and
8. The potential public safety impacts associated with the proposed project.

In addition, the Air Force is required to coordinate all activities and information concerning scheduled launches with the Department's Division of Emergency Management (DEM). The DEM recommends the establishment of a Memorandum of Understanding (MOU) between the State and the Air Force similar to the enclosed MOU concerning the State's coordination with the U.S. Navy for the launching of Tomahawk Cruise Missiles. The Air Force should contact Eric Tolbert, DEM, at 904/431-9837 or at the address above, regarding development of the MOU.

Thank you for the opportunity to comment on this project. If you have any questions, please contact Rosalyn Kilcollins, Florida Coastal Management Program, at (904) 922-5438 or the address above.

GSP/rfk

Attachment

cc: Ty Symroski, Florida Keys Field Office

## MEMORANDUM OF UNDERSTANDING

BETWEEN THE

STATE OF FLORIDA

AND THE

PROGRAM EXECUTIVE OFFICER CRUISE MISSILES PROJECT AND  
UNMANNED AERIAL VEHICLES JOINT PROJECT

## I. PURPOSE

To define the procedures necessary for the support of and response to all launches and incidents associated with the United States Navy's Tomahawk Cruise Missile Test Program over the State of Florida.

## II. SCOPE

The provisions of this Memorandum of Understanding (MOU) apply to the launching of Tomahawk Cruise Missiles that will pass over the State of Florida using Instruments Routes (IR) 015, 032 and 033. Procedures for notification, communications, accidents response and media coordination between the Naval Air Warfare Center Weapons Division (NAWCWPNS) Point Mugu, CA, acting as agent of the Program Executive Officer Cruise Missiles Project and Unmanned Aerial Vehicles Joint Project (PEO(CU)), and the State of Florida are set forth herein.

## III. DEFINITIONS

- A. U.S. Navy Command Post - Location of the NAWCWPNS test team including the Test Director, Navy Test Conductor, and real-time analysis. Can be located in either a land based facility or on an airborne platform.
- B. Control Control Facility (CCF) - Land based facility located at Eglin Air Force Base equipped with all assets required to support the U. S. Navy Command Post.
- C. Division of Emergency Management (DEM) - State of Florida agency responsible for coordinating with NAWCWPNS on all emergency management aspects of a missile launch.
- D. Instrument Route (IR) - Pre-identified flight corridor extending across the State of Florida.

- E. Notice to Airmen (NOTAM) - Communications to flight service facilities identifying specific items of interest to pilots.
- F. Notice to Mariners (NOMAR) - Communications to marine interests.
- G. Rumor Control - Toll-free telephone lines located in the DEM designed to provide information to public inquiries.
- H. Special Event - Any event occurring or scheduled to occur along Instrument Route that would be jeopardized as a result of the launching of a Tomahawk Cruise Missile.
- I. State Emergency Operations Center (SEOC) - Facility located in the DEM to respond to any emergency occurring in the State of Florida needing state assistance.

#### IV. RESPONSIBILITIES

- A. NAWCPNS has the overall responsibility for all flights of Tomahawk Cruise Missiles over Florida. Safety and accident briefings will be conducted by the NAWCPNS for emergency service personnel in all counties included within the selected instrument routes.
- B. The Department of Community Affairs, Division of Emergency Management is responsible for coordinating all activities and information concerning the launch with appropriate state and local governments as necessary.

#### V. SPECIAL CONDITIONS

The NAWCPNS will conduct one Tomahawk test demonstration flight over the proposed instrument routes. The Governor will review the launch procedures, communications, and performance of the Tomahawk test vehicle during the demonstration launch for conformity with state standards for the protection of the public health, welfare and safety, and shall notify the NAWCPNS of his determination. Upon receipt of a written letter of approval from the Governor, the NAWCPNS may proceed with further test flight activity.

The following special conditions will apply to the demonstration flight, and each Tomahawk Cruise Missile launch over Florida thereafter.

- A. No more than six Tomahawk test flights per year will be conducted over the proposed routes.
- B. Tomahawk test flights may be conducted only during daylight hours. During standard time, flights may occur between 0900 and 1500 Monday through Thursday, 0900 and 1200 on Friday. During daylight savings time, flights may

occur between 0900 and 1700 Monday through Thursday, 0900 and 1200 on Friday. No flights may be conducted December 15 through January 3 (inclusive), nor Thanksgiving Day and the following Friday, Saturday, and Sunday.

- C. In-flight visibility of not less than five statute miles must be maintained while over Florida.
- D. Airfields will be avoided by 1,500 feet elevation or three nautical miles laterally.
- E. Missile altitude while in the IR-033 flight corridor between points "B" and "C" will be between 3,000 and 5,000 feet MSL.
- F. No Tomahawk missile flight tests will occur during FAA-sanctioned and programmed special events, including parachute events, at any of the airfields within the IR corridors.
- G. No Tomahawk flight tests will be conducted when the Governor or his authorized representative declares there is an emergency situation over any of the counties in the IR corridors.

## VI. PRELAUNCH NOTIFICATION

- A. DEM will notify NAWCWPNS of any known or scheduled special events in flight corridors at least six months prior to their occurrence.
- B. NAWCWPNS will provide forty-eight hours notice prior to the opening of the launch window to the Director, Division of Emergency Management (904-413-9911) that IR-015, IR-032 and/or IR-033 have been activated.
- C. Upon receipt of forty-eight hour notice, DEM will brief the appropriate county warning points that IR-015, IR-032 and/or IR-033 have been activated.
- D. NAWCWPNS will issue a Notice to Airmen (NOTAM) and Notice to Mariners (NOMAR) twenty-four hours prior to missile launch.
- E. NAWCWPNS will notify DEM of imminent launch of missile two hours prior to launch. NAWCWPNS will establish communications with DEM using High Frequency/Single Side Band Radio (HF/SSB) on 7.932 MHz.
- F. NAWCWPNS will notify DEM of imminent launch of missile thirty minutes prior to launch.
- G. After receiving the thirty minute notification, DEM will notify the appropriate county emergency management offices in the flight corridor of the imminent



launch of a missile.

H. DEM will notify each designated county warning point and law enforcement agency in the IR corridors of the activation of the State Rumor Control number (1-800-342-3557).

I. NAWCWPNS will notify DEM of the actual launch of the missile.

## VII. POINTS OF CONTACT

The points of contact for all activities associated with the Tomahawk Cruise Missile Test Program are as follows:

Division of Emergency Management	904-413-9911
DEM Facsimile	904-488-5366
Rumor Control (state)	1-800-342-3557
NAWCWPNS	805-989-9055
PEO(CU)-CT	703-604-1072
Central Control Facility	904-882-3806, 3810, 3815

## VIII. COMMUNICATIONS

- A. The initial notification call activating IR-015, 032 and/or 033 by NAWCWPNS to the Director, Division of Emergency Management will be made by telephone using 904-413-9911.
- B. The U.S. Navy Command Post will establish communications with the DEM using HF/SSB on 7.932 MHz. This will only be used for emergency communications.
- C. The NAWCPNS will conduct a practice communications exercise prior to launch to test the notification procedure for impending launch, activation of launch and completion of launch.

## IX. MEDIA

- A. The Public Affairs Officer for PEO(CU) will establish media liaisons with the Governor's Office of Communications (Press Secretary).
- B. DEM will be provided a copy of all press releases issued by the Navy by facsimile.

## X. ACCIDENT RESPONSE

- A. NAWCWPNS will notify DEM immediately via telephone or HF/SSB radio of any incident during the flight of the missile.

- B. DEM will notify the appropriate county warning point to apprise them of the situation.
- C. DEM will notify the appropriate state agencies involved.
- D. DEM will coordinate any state resources required by the NAWCWPNS on-scene commander.
- E. NAWCWPNS on-scene commander will coordinate with local/state response forces.

#### XI. TERMINATION OF FLIGHT

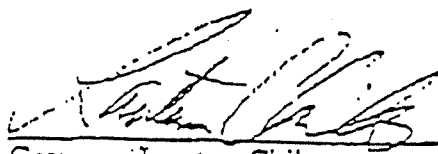
- A. NAWCWPNS will notify DEM when flight has been terminated and missile is secure.
- B. DEM will notify local governments that flight has been completed.

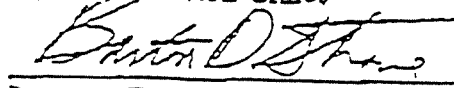
#### XII. LIABILITY

The U. S. Navy shall assume liability for injury or damage caused by any mishap of a missile during test flights.

#### XIII. CONDITIONS AND AMENDMENTS

- A. The agreement shall commence on August 1, 1995 and will be in effect for the duration of the Tomahawk Cruise Missile Test Program in Florida.
- B. This MOU may be modified or amended only with written agreement of both parties and amendments will be attached to this agreement.
- C. Failure of the NAWCPNS to conduct Tomahawk Cruise Missile test flights in accordance with the special conditions agreed to under Part V of this agreement may provide grounds for immediate termination of this agreement by the State of Florida.

  
Governor Lawton Chiles

  
Program Executive Officer Cruise Missiles Project and  
Unmanned Aerial Vehicles Joint Project

8/1/95  
Date

8/7/95  
Date

0475-02-189

**FLORIDA STATE CLEARINGHOUSE  
RPC INTERGOVERNMENTAL COORDINATION  
AND RESPONSE SHEET**

SAI #: FL9612240949CR

DATE: 02/12/98

COMMENTS DUE TO CLEARINGHOUSE: 03/14/98

AREA OF PROPOSED ACTIVITY: COUNTY: State

☐ FEDERAL ASSISTANCE ☒ DIRECT FEDERAL ACTIVITY ☐ FEDERAL LICENSE OR PERMIT ☐ OCS

**PROJECT DESCRIPTION**

Department of Defense - Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs - Florida.

**ROUTING:**

**RPC**

South FL RPC  
X West Florida RPC  
Apalachee RPC

**RECEIVED**  
MAR 04 1998

State of Florida Clearinghouse

PLEASE CHECK ALL THE LOCAL GOVERNMENTS BELOW FROM WHICH COMMENTS HAVE BEEN RECEIVED; ALL COMMENTS RECEIVED SHOULD BE INCLUDED IN THE RPC'S CLEARINGHOUSE RESPONSE PACKAGE. IF NO COMMENTS WERE RECEIVED, PLEASE CHECK "NO COMMENT" BOX AND RETURN TO CLEARINGHOUSE.

COMMENTS DUE TO RPC: 03/05/98

NO COMMENTS: ✓

(IF THE RPC DOES NOT RECEIVE COMMENTS BY THE DEADLINE DATE, THE RPC SHOULD CONTACT THE LOCAL GOVERNMENT TO DETERMINE THE STATUS OF THE PROJECT REVIEW PRIOR TO FORWARDING THE RESPONSE PACKAGE TO THE CLEARINGHOUSE.)

NOTES:

ALL CONCERNS OR COMMENTS REGARDING THE ATTACHED PROJECT (INCLUDING ANY RPC COMMENTS) SHOULD BE SENT IN WRITING BY THE DUE DATE TO THE CLEARINGHOUSE. PLEASE ATTACH THIS RESPONSE FORM AND REFER TO THE SAI # IN ALL CORRESPONDENCE.

IF YOU HAVE ANY QUESTIONS REGARDING THE ATTACHED PROJECT, PLEASE CONTACT THE STATE CLEARINGHOUSE AT (904) 922-5438 OR SUNCOM 272-5438.

FLORIDA STATE CLEARINGHOUSE  
RPC INTERGOVERNMENTAL COORDINATION  
AND RESPONSE SHEET

94-40

SAI #: FL9612240949CR

DATE: 02/12/98

COMMENTS DUE TO CLEARINGHOUSE: 03/14/98

AREA OF PROPOSED ACTIVITY: COUNTY: State

☐ FEDERAL ASSISTANCE ☒ DIRECT FEDERAL ACTIVITY ☐ FEDERAL LICENSE OR PERMIT ☐ OCS

PROJECT DESCRIPTION

Department of Defense - Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs - Florida.

ROUTING:

RPC

South FL RPC  
West Florida RPC  
X Apalachee RPC

RECEIVED  
MAR 17 1998

State of Florida Clearinghouse

RECEIVED  
FEB 27 1998  
3434  
APALACHEE REGIONAL  
PLANNING COUNCIL

PLEASE CHECK ALL THE LOCAL GOVERNMENTS BELOW FROM WHICH COMMENTS HAVE BEEN RECEIVED; ALL COMMENTS RECEIVED SHOULD BE INCLUDED IN THE RPC'S CLEARINGHOUSE RESPONSE PACKAGE. IF NO COMMENTS WERE RECEIVED, PLEASE CHECK "NO COMMENT" BOX AND RETURN TO CLEARINGHOUSE.

COMMENTS DUE TO RPC: 03/05/98

\_\_\_ Bay County  
\_\_\_ Santa Rosa County

NO COMMENTS: X

(IF THE RPC DOES NOT RECEIVE COMMENTS BY THE DEADLINE DATE, THE RPC SHOULD CONTACT THE LOCAL GOVERNMENT TO DETERMINE THE STATUS OF THE PROJECT REVIEW PRIOR TO FORWARDING THE RESPONSE PACKAGE TO THE CLEARINGHOUSE.)

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IF YOU HAVE ANY QUESTIONS REGARDING THE ATTACHED PROJECT, PLEASE CONTACT THE STATE CLEARINGHOUSE AT (904) 922-5438 OR SUNCOM 272-5438.

MD

**FLORIDA STATE CLEARINGHOUSE  
LOCAL GOVERNMENT COORDINATION  
ROUTING SHEET**

SAI #: FL9612240949CR

DATE: 02/12/98

COMMENTS DUE TO RPC: 03/05/98

AREA OF PROPOSED ACTIVITY: COUNTY: State

☐ FEDERAL ASSISTANCE ☒ DIRECT FEDERAL ACTIVITY ☐ FEDERAL LICENSE OR PERMIT ☐ OCS

**PROJECT DESCRIPTION**

Department of Defense - Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs - Florida.

**ROUTING:**

RPC

\_\_\_\_ South FL RPC  
\_\_\_\_ West Florida RPC  
\_\_\_\_ Apalachee RPC

Local Governments

\_\_\_\_ Bay County  
\_\_\_\_ Santa Rosa County  
X Gulf County

RECEIVED  
MAR 17 1998

State of Florida Clearinghouse

RECEIVED  
MAR 10 1998  
3741  
APALACHEE REGIONAL  
PLANNING COUNCIL

IF YOU HAVE NO COMMENTS, PLEASE CHECK HERE AND RETURN FORM TO RPC :



ALL CONCERNS OR COMMENTS REGARDING THE ATTACHED PROJECT SHOULD BE SENT IN WRITING BY THE DUE DATE TO THE REGIONAL PLANNING COUNCIL SHOWN BELOW. PLEASE REFER TO THE SAI # IN ALL CORRESPONDENCE:

Mr. Mike Donovan  
Apalachee Regional Planning Council  
314 East Central Avenue  
Room 119  
Blountstown, FL 32424

FLD  
2-9-98  
P

**IMPORTANT: PLEASE DO NOT SEND COMMENTS DIRECTLY TO THE CLEARINGHOUSE!**

IF YOU HAVE QUESTIONS REGARDING THE ATTACHED PROJECT OR THE INTERGOVERNMENTAL COORDINATION PROCESS, PLEASE CONTACT THE STATE CLEARINGHOUSE. IF YOU HAVE QUESTIONS REGARDING THE FEDERAL CONSISTENCY REVIEW PROCESS, PLEASE CONTACT THE FLORIDA COASTAL MANAGEMENT PROGRAM. THE TELEPHONE NUMBER FOR BOTH PROGRAMS IS (904) 922-5438 OR SUNCOM 272-5438.

FLORIDA STATE CLEARINGHOUSE  
RPC INTERGOVERNMENTAL COORDINATION  
AND RESPONSE SHEET

SAI #: FL9612240949

DATE: 12/24/96

COMMENTS DUE TO CLEARINGHOUSE: 01/23/97

AREA OF PROPOSED ACTIVITY: COUNTY: Escambia County CITY: Pensacola

☐ FEDERAL ASSISTANCE ☐ DIRECT FEDERAL ACTIVITY ☐ FEDERAL LICENSE OR PERMIT ☐ OCS

PROJECT DESCRIPTION

Scoping Letter - Supplemental Environmental Impact Statement - Theater Missile Defense System - Extended Test Range - Eglin Air Force Base - Escambia County, Florida

ROUTING:

RPC

X West Florida RPC

RECEIVED  
FEB 10 1997

State of Florida Clearinghouse

PLEASE CHECK ALL THE LOCAL GOVERNMENTS BELOW FROM WHICH COMMENTS HAVE BEEN RECEIVED; ALL COMMENTS RECEIVED SHOULD BE INCLUDED IN THE RPC'S CLEARINGHOUSE RESPONSE PACKAGE. IF NO COMMENTS WERE RECEIVED, PLEASE CHECK "NO COMMENT" BOX AND RETURN TO CLEARINGHOUSE.

COMMENTS DUE TO RPC: 01/14/97

Escambia County

RPC comment attached.

NO COMMENTS: X

(IF THE RPC DOES NOT RECEIVE COMMENTS BY THE DEADLINE DATE, THE RPC SHOULD CONTACT THE LOCAL GOVERNMENT TO DETERMINE THE STATUS OF THE PROJECT REVIEW PRIOR TO FORWARDING THE RESPONSE PACKAGE TO THE CLEARINGHOUSE.)

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IF YOU HAVE ANY QUESTIONS REGARDING THE ATTACHED PROJECT, PLEASE CONTACT THE STATE CLEARINGHOUSE AT (904) 922-5438 OR SUNCOM 272-5438.

COUNTY: State

Message:

DATE: 02/23/98  
COMMENTS DUE-2 WKS: 02/26/98  
CLEARANCE DUE DATE: 03/30/98  
SAI#: FL9612240949C

STATE AGENCIES

Community Affairs  
Environmental Protection  
Game and Fresh Water Fish Comm  
Marine Fisheries Commission  
OTTED  
State  
Transportation

WATER MANAGEMENT DISTRICTS

X Northwest Florida WMD  
South Florida WMD

OPB POLICY UNITS

Environmental Policy/C & ED

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

— Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.

X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.

— Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.

— Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of Defense - Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs - Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(904) 414-0479 (FAX)

EO. 12372/NEPA

☐ No Comment  
☒ Comments Attached  
☐ Not Applicable

Federal Consistency

☐ No Comment/Consistent  
☒ Consistent/Comments Attached  
☐ Inconsistent/Comments Attached  
☐ Not Applicable

From: NWFWMD

Division/Bureau:

Reviewer:

Date E-56

RMD, Div. Env. & Res. Plng.  
Duncan J. Cairns  
3 MARCH 1998

COUNTY: State

Message:

DATE: 02/23/98  
COMMENTS DUE-2 WKS: 02/26/98  
CLEARANCE DUE DATE: 03/30/98  
SAI#: FL9612240949CR

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
Game and Fresh Water Fish Comm  
X Marine Fisheries Commission  
OTTED  
State  
Transportation

Northwest Florida WMD  
South Florida WMD

Environmental Policy/C & ED

RECEIVED  
MAR 04 1998

State of Florida Clearinghouse

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

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Project Description:

Department of Defense - Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (DEIS) for Eglin Gulf Test Range and Notice of Availability for the Proposed TMD Test Programs - Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(904) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- ☐ No Comment  
☐ Comments Attached  
☐ Not Applicable

- ☒ No Comment/Consistent  
☐ Consistent/Comments Attached  
☐ Inconsistent/Comments Attached  
☐ Not Applicable

From:

Division/Bureau

Reviewer:

Date:

E-57



# WEST FLORIDA REGIONAL PLANNING COUNCIL

POST OFFICE BOX 486 • 3435 NORTH 12<sup>TH</sup> AVENUE  
PENSACOLA, FLORIDA 32593-0486

PHONE (904) 444-8910 • S/C 693-8910 • (800) 226-8914  
FAX: (904) 444-8967  
<http://www.wfrpc.dst.fl.us/wfrpc/>

Daniel F. Krumel  
Executive Director

Garnett M. Breeding, Jr.  
Chairman

Charles D. Covey, III  
Vice-Chairman

## MEMORANDUM

TO: Terry A. Joseph, Director - Environmental Planning Division

FROM: Larry P. McDonald - Senior Planner *LPm*

DATE: January 9, 1997

RE: MJ357-01-0397 Supplemental EIS - Theater Missile Defense System Extended Test Range - Eglin Air Force Base

The following comments are hereby submitted for the above named project:

1. The following concerns should be addressed by an EIS for a launch site as proposed in this application:
  - A. Endangered Species. Especially Animals. Namely the Least Tern and Santa Rosa Beach Mouse - How will the project impact these animals?
  - B. Emissions of Rockets Entering Area Waters - What impacts will emissions have on area waters?
  - C. Intracoastal Waterway Traffic Interruptions - How often and for how long (average and maximum times) will barge and pleasure craft be prohibited from using the Gulf Intracoastal Waterway during the test launches? What costs does that add to commercial shipping? Is stopping traffic on the Intracoastal a dangerous task? What risks are associated with stopping such traffic?
  - D. Noise Levels and the Public - Many retirees live on the mainland and Navarre Beach areas. There is also a facility located nearby which serves the needs of persons recovering from addictions. Will the public be notified of pending launch and noise activities? If so, how will they be notified (through

".....serving Escambia, Santa Rosa, Okaloosa, Walton, Bay, Holmes & Washington Counties and their municipalities."

county government, mailouts, newspaper, television, door hangers, etc.)?

- E. Traffic Distraction on US 98 - Will noise levels and the sight of a missile launch distract drivers on US 98, possibly leading to auto/truck accidents? What studies have been conducted to research this possibility?
- F. Emergency Planning and Community Right-To-Know Act of 1986 Compliance - Any substances brought to the launch site or other locations which exceed the thresholds for reporting under EPCRA will need to be reported within the time guidelines established by EPCRA and the State of Florida. Although the type of rocket fuels to be used was not named in the documentation, some rocket fuels are extremely hazardous and local emergency management offices and fire departments, along with the District I Local Emergency Planning Committee and State Emergency Response Committee should be fully aware of the characteristics of the substances so proper emergency response can be made in the event of an accidental release.
- G. Channels/Barges - Will the project at any foreseeable time in the future require dredging in Santa Rosa Sound or the Gulf of Mexico to accommodate barges or other water craft involved in the delivery of missiles, personnel, etc.?

“....serving Escambia, Santa Rosa, Okaloosa, Walton, Bay, Holmes & Washington Counties and their municipalities.”



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 April 1998

Mr. Billy D. Causey  
U.S. Department of Commerce  
National Oceanographic and Atmospheric Administration  
Florida Keys National Marine Sanctuary  
PO Box 500368  
Marathon FL 33050

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Causey

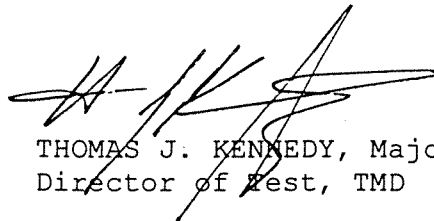
Thank you for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

The TMD SEIS has been prepared in accordance with Council on Environmental Quality (CEQ) guidelines, and includes sufficient analysis to inform the decision maker and the public of potential environmental impacts of the proposed action and to assist in the decision making process. If either of the sites in the Florida Keys (Cudjoe Key or Saddlebunch Keys) is selected for target missile launch, close consultation and coordination with federal and state resource agencies would continue to assess the potential impacts. The Final SEIS identifies additional mitigation measures that could be implemented to further reduce potential impacts to the marine resources of the Florida Keys. These proposed mitigation measures may be more fully developed and refined as we go through the respective permitting and consultation processes.

The proposed action of the SEIS is to enhance the capability of the Eglin Gulf Test Range for TMD testing or training activities. A no-action alternative is also evaluated in the SEIS. The preferred alternative for the proposed action includes target and interceptor launch and support activities at Eglin AFB sites; Air Drop or air-launch of target missiles; and possible Navy ship interceptor launches. Other alternatives within the proposed action, include target launch and support activities at locations in the Florida Keys, target missile launches from a sea vessel, and interceptor launches from offshore platforms near Santa Rosa Island and Cape San Blas. In accordance with CEQ guidelines, the SEIS analyzes all reasonable

alternatives including sites in the Keys. No final decision has yet been made about which alternative(s) may be selected.

Sincerely

A handwritten signature in black ink, appearing to read 'H. K. S.', with a large, sweeping flourish extending to the right.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Florida Keys National Marine Sanctuary  
P.O. Box 500368  
Marathon, FL 33050  
Phone: (305) 743-2437  
Fax: (305) 743-2357

March 26, 1998

Ms. Linda Ninh  
46 OG/OGM  
205 West D Avenue  
STE 241  
Eglin Air Force Base, FL 32542-6866

Dear Ms. Ninh:

I have reviewed the Theater Missile Defense Extended Test Range Draft Supplemental Environmental Impact Statement (DSEIS) for the Eglin Gulf Test Range. Environmental concerns relating to the Florida Keys were addressed within this EIS; however, resolutions to mitigate these concerns were not fully addressed. I submitted comments on this proposed action on November 19, 1997 and would like to restate those comments now during the comment period for the DSEIS.

Pursuant to letters from Lester Lyles to Congressman Peter Deutsch dated November 24, 1997 and Thomas Johnson to Virginia Wetherall dated December 23, 1997, we understand that the Keys are no longer in the proposed action and it is unlikely that the Keys will be approved in the final decision unless operational and testing requirements change. June Cradick of my staff recently spoke to Lt. Col. Lehner of your office concerning this matter. Lt. Col. Lehner stated the Keys are no longer an active option. The purpose of this letter is to reaffirm our commitment to protecting the marine resources of the Florida Keys and again request the missile testing initiative be located elsewhere. As this proposal is in draft form, I will further identify areas of concerns that should be addressed in the preparation of the final EIS for this project.

The following is a list of issues that come in direct conflict with existing Florida Keys National Marine Sanctuary (FKNMS) regulations. The relevant section of our regulations is cited for each issue.

**Issue #1: Disruption of wilderness character in the Florida Keys**

The Supplemental EIS states:

"Virtually all of the unoccupied vegetated area surrounding the proposed sites on Cudjoe, Saddlebunch, Sugarloaf, and Boca Chica Keys are jurisdictional wetlands regulated under the Clean Water Act. Furthermore, mangroves are protected by state law."

It was also noted that Federal and State threatened species have been reported on Cudjoe, Boca Chica and Sugarloaf Keys. Further, Cudjoe Key surrounding the aerostat facility has been designated as critical habitat under Endangered Species Act (ESA) 50 CFR 17.95.

Within the Definitions section of the FKNMS regulations at 15 CFR §922.162:

“(a) The following definitions apply to the Florida Keys National Marine Sanctuary regulations. To the extent that a definition appears in §922.3 and this section, the definition in this section governs.”

“Act” means the Florida Keys National Marine Sanctuary and Protection Act, as amended, (FKNMSPA) (Pub. L. 101-605), and the National Marine Sanctuaries Act (NMSA), also known as Title III of the Marine Protection, Research and Sanctuaries Act, as amended, (MPRSA) (16 U.S.C. 1431 et seq.).

Adverse effect means any factor, force, or action that independently or cumulatively damages, diminishes, degrades, impairs, destroys, or otherwise harms any Sanctuary resource, as defined in section 302 (8) of the NMSA (16 U.S.C. 1432 (8)) and in this section, or any of the qualities, values, or purposes for which the Sanctuary is designated.”

By definition, the FKNMS is mandated to protect the Keys resources from any adverse effect by regulating activities affecting them. This was in order to protect, preserve and manage and thereby ensure the health, integrity and continued availability of the conservation, ecological, recreational, research, education, historical and aesthetic resources and qualities of these areas.

**Issue #2: Toxic emissions from solid fuel rockets that may enter the marine environment and injure marine resources; Damage to mangroves and vegetation due to launch activities; Negative effects to the natural resources due to launching and launch accidents.**

Section 4 of the Supplemental EIS states:

- 1) that the greatest concentrations of exhaust products would be released near the ground and with less exhaust being released in any specific area as the missile increases its speed;
- 2) the effect of 12 launches per year may permanently remove or degrade vegetation close to the launch pad;
- 3) cumulative impacts, over the 10-year period the launch activities could result in an overall loss of plant species diversity and total vegetation cover, and this loss could be due to the deposition of hydrogen chloride;

- 4) if an accident occurs on the launch pad, the explosion and resultant fire could harm Federally or state listed species of nesting or wintering wading birds and shorebirds or their habitat;
- 5) impacts from launch-related activities could result in changes in water chemistry due to deposition of launch emissions, chemicals and missile debris.

Section of 15 CFR §922.163 - Prohibited activities-Sanctuary-wide states:

(3) Alteration of, or construction on, the seabed. Drilling into, dredging, or otherwise altering the seabed of the Sanctuary, or engaging in prop-dredging; or constructing, placing or abandoning any structure, material, or other matter on the seabed of the Sanctuary ....

(4) Discharge or deposit of materials or other matter. (i) Discharging or depositing, from within the boundary of the Sanctuary, any material or other matter, except: (A) Fish, fish parts, chumming materials, or bait used or produced incidental to and while conducting a traditional fishing activity in the Sanctuary; (B) Biodegradable effluent incidental to vessel use and generated by a marine sanitation device approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended (FWPCA), 33 U.S.C. 1322 et seq.;

(11) Possession or use of explosives or electrical charges. Possessing, or using explosives, except powerheads, or releasing electrical charges within the Sanctuary.

**Issue #3: Disturbance of marine waterfowl through interference with nesting, feeding and breeding behaviors in the sensitive backcountry environment.**

There are threatened and endangered species of birds; such as bald eagles, white-crowned pigeons, and peregrine falcons, within the areas of evaluation and within a Wildlife Management Area. Any impacts to the habitats or disturbances to the marine waterfowl should be done with consideration of the rules under the National Wildlife Refuge System (16 U.S.C)

Within the Supplemental EIS, section 4.2.3.1.3, it was stated there would be a slight chance of direct mortality of protected bird species. Within 16 U.S.C. under (c) Prohibited and permitted activities, it states:

"it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess..., any migratory birds, any part, nest, or eggs of any such bird..."

"No person shall knowingly disturb, injure, cut, burn, remove, destroy, or possess any real or personal property of the United States, including natural growth, in any area of the System;"

**Issue #4: Negative impacts on marine resources from secondary vessel activity associated with the rocket facility.**

- 1) increased activity at the site may result in the disturbance of the wildlife;
- 2) use of aircraft and patrol vessels could increase the chance of striking protected species;
- 3) increased vessel activity to support the upland facility could be of concern due to the shallow surrounding waters. Improper vessel activity within these areas could result in prop dredging, scarring and vessel groundings.

**Section of 15 CFR §922.163 Prohibited activities - Sanctuary-wide states:**

(5) Operation of vessels. (i) Operating a vessel in such a manner as to strike or otherwise injure coral, seagrass, or any other immobile organism attached to the seabed, including, but not limited to, operating a vessel in such a manner as to cause prop-scarring.

(iv) Operating a vessel in such a manner as to injure or take wading, roosting, or nesting birds or marine mammals. (v) Operating a vessel in a manner which endangers life, limb marine resources, or property.

Although military activities within the Sanctuary are allowed and may be exempted from FKNMS provisions pending consultation with the Superintendent of the FKNMS, new military activities should be modified so that they are not likely to destroy, or significantly injure Sanctuary resources. If an activity conducted by the Department of Defense is determined to have caused resource damage, they are responsible for taking appropriate actions to cease, respond or mitigate the harm and restore or repair the damage.

If you would like to discuss these comments, or have any questions, please feel free to contact me at (305) 743.2437.

Sincerely,

*Billy D. Causey*

Billy D. Causey  
Sanctuary Superintendent





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 Apr 98

Mr. Andreas Mager, Jr.  
Habitat Correction Division  
Southeast Regional Office  
9721 Executive Center Dr N.  
St Petersburg FL 33702

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Mager

Thank you, for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS.

The Final SEIS identifies mitigation measures that could be implemented to reduce potential impacts due to the proposed action. These proposed mitigation measures may be more fully developed and refined as we go through the respective permitting and consultation processes.

Sincerely

A handwritten signature in black ink, appearing to read "T. J. Kennedy", is written over the typed name and title.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Drive N.  
St. Petersburg, Florida 33702

April 3, 1998

Ms. Linda Ninh  
46 OG/OGM-TMD  
205 West D Avenue, Suite 241  
Eglin Air Force Base, Florida 32578-6866

Dear Ms. Ninh:

The National Marine Fisheries Service (NMFS) has reviewed the Theater Missile Defense Extended Test Range Draft Supplemental Environmental Impact Statement (DSEIS) dated February 6, 1998. The DSEIS describes the potential impacts and mitigation measures that would occur from the development of a missile testing range covering a range of up to 1,100 miles. The test range could have land-based launch sites for target and intercept missiles at various sites in Florida including Santa Rosa Island, Cape San Blas, and various locations in the Florida Keys.

In general, the DSEIS appears to adequately address the range of potential impacts to fishery habitats for each of the proposed launch locations. The preferred alternatives identified as Eglin Air Force Base including Santa Rosa Island and Cape San Blas with the air drop or air launch of target missiles and the possible use of Navy AEGIS ship-launch of interceptor missiles. If the preferred alternative is selected, the NMFS anticipates that impacts to fishery habitats will be minimal. If, however, other alternatives in the Florida Keys are selected, the NMFS will work cooperatively with the Air Force to identify appropriate mitigation measures that offset the adverse impacts to the fishery habitats discussed in the DSEIS.

We appreciate the opportunity to review and provide comments on the latest DSEIS and look forward to the final. If there are questions regarding these comments, please contact Mr. John Miff at 305/595-8352.

Sincerely,

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 April 98

Mr. Heinz J. Mueller  
U.S. Environmental Protection Agency  
Region 4 Atlanta Federal Building  
100 Alabama Street SE  
Atlanta GA 30303-3104

46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

Dear Mr. Mueller

Thank you, for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We are including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

The TMD SEIS has been prepared in accordance with Council on Environmental Quality (CEQ) guidelines, and includes sufficient analysis to inform the decision maker and the public of potential environmental impacts of the proposed action and to assist in the decision making process. As necessitated by the rating of EC-2 the Final SEIS identifies mitigation measures that could be implemented to reduce potential impacts due to the proposed actions. These proposed mitigation measures may be more fully developed and refined as we go through the respective permitting and consultation processes.

Sincerely

A handwritten signature in black ink, appearing to read "H. J. Kennedy", is written over a printed name and title.

THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
100 ALABAMA STREET, S.W.  
ATLANTA, GEORGIA 30303-3104

APR 3 1998

Captain Brian W. Moss  
U.S. Department of Defense  
Ballistic Missile Defense Organization  
7100 Defense Pentagon  
Washington, DC 20301-7100

**Subject: Draft Supplemental Environmental Impact Statement (DSEIS) for the Theater Missile Defense (TMD) Extended Test Range at Eglin Air Force Base (EAFB) Gulf Test Range (EGTR), FL**

Dear Captain Moss:

Pursuant to Section 309 of the Clean Air Act and Section 102 (2)(C) of the National Environmental Policy Act (NEPA), EPA, Region 4 has reviewed the subject document, an evaluation of the potential consequences associated with development and operational flight testing of TMD systems. Specifically, the DSEIS examines missile launch and support locations, facility construction, launch preparation activities, missile flight tests, radar and optical tracking operations, and intercept tests in the Gulf of Mexico. The preferred alternative involves the target/interceptor launch from facilities at EAFB together with target launches from an air configuration array or possibly a Navy ship.

TMD missile testing is being expanded to determine the capabilities of U.S. Department of Defense (DOD) weapon systems to intercept enemy missiles with medium-range ballistic characteristics, i.e., trajectories of 550 to 1,100 kilometers. Currently there are no plans by DOD to use EGTR for this type testing; however, in the event circumstances change and use of this facility becomes warranted, its NEPA documentation would be completed.

EGTR is a logical site for a mid-range test area. In 1995, it conducted approximately 10,000 missions similar to those envisioned within this testing protocol. Three principal types of TMD training/testing activities were examined in the DSEIS: (1) target launches from land at EAFB and/or from aircraft above the Gulf of Mexico, (2) interceptor launches from EAFB and/or ships, (3) interception of the target missile (launched from Florida Keys) by the interceptor over the Gulf of Mexico and EGTR. All constituent elements of the testing have important ramifications which are assessed in the text.

Most tests would include a launch of a target missile, tracking by range and interceptor missile sensors, launch of an interceptor missile, intercept, and debris (missile components, penetration aids, etc.) impact into the Gulf of Mexico. The "intercept box's" remote location together with its restricted access during testing limit the more obvious societal concerns. Associated safety considerations and procedures to address them have been elaborately devised and are noted for rigorous enforcement. For example, notwithstanding their great distance from the shore, debris impact and booster drop areas are repeatedly modeled for most likely "splash-down" locations. Moreover, the area will be cleared prior to and during testing via standard notification procedures. Similar determinations are made in/around the launch site to maximize the safety of mission personnel and adjacent residents during the test periods.

If/when DOD begins testing, maximum use would be made of existing infrastructure and facilities at ground-based launch sites. Modification and/or any new construction needs would be relatively small; in many cases the launch vehicles are motorized, portable structures which are merely moved after launch events. Road, rail, and air transportation will be necessary to bring components to launch sites, but volumes are considered incidental in comparison to existing traffic on roadway systems servicing the area. Given the value of the launch equipment, stringent safety monitoring is in place during transport. The same restrictions are in force for transporting the missile propellants and other associated hazardous materials necessary to operate the various missile systems.

To add an additional measure of safety to the proposed testing, offshore launch platforms could be used to enlarge the safety clear zone during actual testing. These structures would involve incrementally more construction impacts than the shore-based mobile vans which are merely parked on existing hardstands. However, long-term adverse effects of the structure, per se, are probably negligible and would compare to an equivalently-sized fishing pier. In fact, it was assumed that these platforms may function as habitat (vertical structure) after construction activities subside. Further, their use would obviate the relatively minor wetland impacts at the land based interceptor launch site, viz., A-15 and D-3A. More importantly, the need to recurrently restrict vehicle traffic during launches would be removed. On the other hand, the impact(s) of air emissions from missile engines on local water quality and associated biota remain undetermined, but should be examined in the final document. We suggest that a long-term monitoring plan be developed to ascertain the impacts of these emissions.

Air drop and ship target launch testing modes appear to have lesser overall impact(s) than their shore-based counterparts. More importantly, the societal implications associated with using the launch site at Saddlebunch/Cudjoe Key would be eliminated. However, there are other considerations which must be taken into account, viz., strategic arms treaty (START) stipulations. For example, while the technology to launch long-range target missiles from a towed ship platform is available, their use would have to be restricted to a 600-kilometer arc to avoid treaty violations. Use of platforms to launch targets is similarly restricted. Hence, all technically practical options are not necessarily available for other compelling reasons.

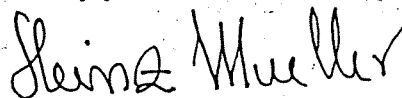
While testing activities in the mid-Gulf do not affect the public at large, there are nevertheless some impacts. Shipping and commercial airline interest must take these tests into consideration when planning schedules and routes. Since this could be a new mission, there is an additive effect to its implementation. It was noted that these tests would add approximately 100 hours to the current use of the existing restricted areas. The significance of this increase remains to be determine, but is unavoidable.

Target launches from Santa Rosa/Cape San Blas would result in direct adverse impacts to wetland habitat and possible disturbance of sensitive species by increased human activity. Additional construction would convert less than 10 acres of natural areas to various testing facilities. Launch emissions containing elevated concentrations of hydrogen chloride may cause some leaf necrosis beyond the construction site. Heat generated by the rocket motor during lift-off may also cause some adverse effects to adjacent vegetation, but the EIS did not consider these significant impacts. Overall, the effects of TMD testing can be mitigated by design changes, or if that proves infeasible, by compensation. However, in our opinion, there are a few instances, e.g., noise effects on wildlife and permanent removal of vegetation, where the impacts appear unavoidable/unmitigatable and would just have to be considered a cost of the TMD training.

On the basis of our review, a rating of "EC-2" has been assigned the preferred alternative. That is, we have some of environmental concerns about the future testing using the air/sea launch options; some additional information/exposition in the final document will be necessary. However, in the event that land-based target launches from the Florida Keys were to become an active alternative, our reservations would be pronounced. The objections we have in this regard are detailed in the attached Comments. If the latter scenario eventuates, we suggest that additional NEPA coordination both with the public and federal/State agencies will have to be accomplished.

If you wish to discuss this matter further, Dr. Gerald J. Miller (404-562-9626) of my staff will serve as initial point of contact.

Sincerely yours,



Heinz J. Mueller, Chief  
Office of Environmental Assessment

Enclosure

## SPECIFIC COMMENTS

We believe that there are practical alternatives to the use of the Florida Keys launching sites. It is our understanding that the U.S. Army Kwajalein Atoll long-range test facility in the Pacific can deal with targets with flight distances greater than 1,100 km (683 miles). With modification, this facility could accommodate testing missiles with the theater flight parameters with acceptable societal/environmental outcomes. On the other hand, the Saddlebunch and Cudjoe Key options could have some significant consequences to the Keys and especially the Florida Keys National Marine Sanctuary (FKNMS).

This preserve was created with the signing of HR5909 (Public Law 101-605, Florida Keys National Marine Sanctuary and Protection Act) on 16 November 1990. The Sanctuary encompasses 2,800 square nautical miles of nearshore waters extending from just south of Miami to the Dry Tortugas. The designation was made in recognition of its unique character and diversity of the marine environments. NOAA has prepared a Final Management Plan/Environmental Impact Statement for the FKNMS that was implemented on July 1, 1997. The Water Quality Protection Program for the Sanctuary that was prepared by EPA and the State of Florida at the direction of Congress is included in the Final Management Plan.

Missiles launched from sites in the Florida Keys would conflict with goals, objectives, mandates, and regulations of the FKNMS. This operational clash includes:

Further degradation of the wilderness character of the Florida Keys "back country", i.e., virtually all of the unoccupied vegetated areas surrounding the proposed sites in the Keys are jurisdictional wetlands and sea grass beds regulated by State and federal laws. In addition, federal and State threatened species have been reported from the lower Keys and the area surrounding the arostat facility on Cudjoe Key; the latter has been designated as Critical Habitat under the Endangered Species Act. The proposed launch sites are in or immediately adjacent to the Great White Heron National Wildlife Refuge which was designated by Congress as a "Wilderness." NOAA using the FKNMS process is mandated to protect resources of the Keys from adverse effects. This includes assuring the health, integrity, and continued availability of the ecological, recreational, research, education, historical, and aesthetic resources and qualities of these areas. In our opinion, construction and operation of missile launching facilities at the proposed locations in the Keys is not consistent with the wilderness character and other, more environmentally friendly uses of these environs.

Damage to sensitive plant and animal resources is likely. The impacts of approximately 12 launches per year for ten years could result in significant and long-lasting detrimental impacts to vegetation and marine life. In addition, water quality could be detrimentally affected. Chemical fallout from solid fuel target missiles includes aluminum oxide and hydrogen chloride compounds that could lead to plant mortality within the fallout zone. The potential physical impacts due to an

accidental explosion at the launch pad could have long-term effects on surrounding vegetation and animal communities. Noise from missile launches would have negative impacts on bird and animal life (roosting, nesting, feeding and breeding behaviors) and the tranquility of the wilderness. Increased numbers and activities of aircraft and vessels in the launch and target zones increase the chance of negatively impacting wildlife resources. All proposed launch sites in the Keys are adjacent to shallow waters; improper vessel activities in those areas could result in propeller dredging, seagrass/coral impacts, vessel groundings, and other damages to the ecological resources.

If you wish to discuss any of the above matters in greater detail, Dr. Bill Kruczynski, EPA Program Scientist, at the FKNMS can be contacted at (305) 743-0537.

Relative to air quality, it does not appear as if any of the subject testing/training activities will negatively impact the continued attainment of the National Ambient Air Quality Standards (NAAQS). However, a minor error was noted in Table 3.1.1-1-National and Florida Ambient Air Quality Standards. The new standard for ozone is an eight-hour standard during which time the average can not exceed 0.08 ppm. The one-hour standard, which is still in effect in existing ozone nonattainment areas elsewhere, is 0.12 ppm averaged over one hour. The table transposes the two standards; however, it was noted that the EGTR area is in attainment for other standards. If you wish to discuss any air issues further, Mr. Dale Aspy (404-562-9041) will serve as point of contact.





U.S. Department  
of Transportation

**Federal Aviation  
Administration**

Southern Region  
P.O. Box 20636  
Atlanta, Georgia 30320

FEB 12 1998

Ms. Linda Ninh  
46 OG/OGM  
205 West D Avenue, Suite 241  
Eglin AFB, FL 32542-6866

Dear Ms. Ninh:

We have reviewed the Draft Theatre Missile Defense Extended Test Range Supplemental Environmental Impact Statement - Eglin Gulf Test Range and have no comments at this time.

Sincerely,

A handwritten signature in cursive script that reads "Nancy B. Shelton".

Nancy B. Shelton  
Manager, Airspace Branch

U.S. Department  
of Transportation

United States  
Coast Guard



Commanding Officer  
U.S. Coast Guard  
Marine Safety Office

P.O. Box 01-6940  
Miami, FL 33101-6940  
Phone: (305) 535-8701

8800  
December 4, 1997

Ms. Linda Ninh  
46 OG/OGM  
205 West D Avenue, Suite 241  
Eglin AFB, FL 32542-6866

Subj: THEATER MISSILE DEFENSE; EGLIN TEST RANGE

Ref: Your letter of October 24, 1997 with draft SEIS

As requested in reference (a), written comments are hereby provided concerning the draft Supplemental Environmental Impact Statement for the Eglin Theater Missile Defense Extended Test Range. This is a follow up to earlier verbal comments provided to Ms. Susan Anders of your office.

As amply documented in your Supplemental Environmental Impact Statement, the Florida Keys are an extremely environmentally sensitive area. Of particular concern to this office would be the potential for introduction of propellant, missile components and debris into the launch hazard area, in the event of a mishap. The tremendous amount of boating traffic in the Florida Keys area is also cause for concern. If alternate launch sites are available, I would strongly urge you to reconsider use of the Florida Keys, due to the environmental sensitivity of the Keys and the adjacent Florida Bay and Gulf of Mexico. I am aware as a result of several recent articles in local newspapers that perhaps this option has been ruled out. From my perspective, alternate land-based launch sites or sea launches would be preferable options.

If, however, the Department of Defense determines that test launches from the Florida Keys are essential to national defense and are still being considered, this office stands ready to provide any required assistance including the establishment and enforcement of safety zones or security zones within the U.S. territorial sea.

My point of contact for this matter is Chief Warrant Officer Bruce Wyly (305) 535-8762.

Sincerely,

A handwritten signature in dark ink, appearing to read "D. F. Miller".

D. F. MILLER  
Captain, U. S. Coast Guard  
Captain of the Port  
Miami, FL



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 46TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE, FLORIDA

23 Apr 98

Ms. Anne Harvey  
St Joseph Peninsula State Park  
8899 Cape San Blas Rd  
Port St. Joe FL 32456

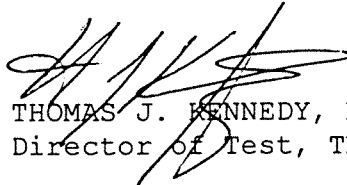
46 OG/OGM-TMD  
205 West D Ave Ste 241  
Eglin AFB FL 32542-6866

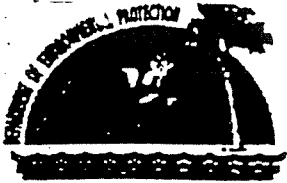
Dear Ms. Harvey

Thank you for your review and recommendations on the Theater Missile Defense (TMD) Extended Test Range Draft Supplemental Environmental Impact Statement (SEIS) for the Eglin Gulf Test Range. We including the comments received during the public and agency review process in the Final SEIS. Further, we will provide a response to each within Volume 2 of the document.

The Final SEIS identifies mitigation measures that could be implemented to reduce potential impacts due to the proposed action. These proposed mitigation measures may be more fully developed and refined as we go through the respective permitting and consultation processes.

Sincerely

  
THOMAS J. KENNEDY, Major, USAF  
Director of Test, TMD



# Department of Environmental Protection

Lawton Chiles  
Governor

Virginia B. Wetherell  
Secretary

St. Joseph Peninsula State Park  
8899 Cape San Blas Road  
Port St. Joe, FL 32456  
March 18, 1998

Ms. Linda Ninh  
46 OG/OGM-TMD  
205 West Avenue, Suit 241  
Eglin AFB, FL 32542-6866

Dear Ms. Ninh:

St. Joseph Peninsula State Park has reviewed the Draft Theater Missile Defense Extended Test Range (SEIS) document dated 6 February, 1996. Some of our concerns were not fully addressed. Areas of concern that should be addressed in the final EIS are listed below.

- 1 Page ES-7, SAFETY & Page 3-129, Mitigations Considered, no mention is made of providing the state park with PSA's for distribution or notification of our traveling guests. First-time visitors comprise 53% of our market and 46% find out about us through word of mouth, not through media sources (4%). Most guests (95%) come from outside Gulf County.
- 2 Page ES-9, CUMULATIVE IMPACTS, & Page 2-75 COMPARISON OF ALTERNATIVES The contribution of TMD testing to cumulative effects using interceptors may indeed be small, however the construction and use of target missile facilities represent significant changes and poses threats to sensitive species.  
  
The SEIS state that offshore platforms could be used to accomplish mission goals with minimal impacts and we support this conclusion. Please consider this option first.
- 3 Page 2-40, Debris Recovery, Debris from a sailboat that broke up in rough seas approximately five miles offshore the Cape San Blas launch site has taken months to remove from 4.5 of our 9.8 miles of beach. Pieces came ashore over several weeks. How are staff and volunteers to recognize missile debris from the SEIS and would any of the missile launch debris pose a hazard for someone picking up a piece without protective gear?

**Page 2, TMD SEIS Comments**

Currently we attempt to train volunteers and staff on the hazards of phosphorous flares and other military debris we have encountered in the past to assure their safety. We recently recovered a 4' metal sleeve with parachute material attached to the interior from the peninsula, its origin or purpose is unknown. Staff members have expressed concern regarding the time it takes to wash liquid propellant, UDMH a poison, off missile debris so that it can safely be handled as well as hazardous material content in the debris.

8 Page 2-32, ESQD, & Page 3-154, 'Liquid Fuel Spills, preparations are not adequately addressed in the appendices. Neither the location of emergency personnel nor their numbers are revealed. Will HAZMAT, fire suppression and emergency medical teams be able to respond to an emergency on the north/west side of D-3A's LHA. Will they be stationed on-site at Cape San Blas or at Eglin AFB proper awaiting notification if an explosion occurs. Is a response time of three hours or more expected to suffice? The upland flatwoods near the proposed target launches include areas considered to be among the most hazardous for prescribed burns in the southeastern U.S. If ignited it is unlikely a fire could be quickly contained. Please consider cool season prescribed fires for fuel load reduction in adjacent communities prior to any launch dates, especially for target missile launches.

9 Page 3-42, Sensitive Habitat

The potential impacts to the historic habitat of the St. Andrew beach mouse might jeopardize the ability of the D-3A site to participate in a reintroduction program as part of the recovery efforts.

10 Page 3-49, Sensitive Habitat, William J. Rish Park (a sublease property) of T.H. Stone Memorial St. Joseph Peninsula State Park is located 4 miles north of Cape San Blas. Sea turtles, beach mice and plovers have been documented at this parcel, also.

11 Page 3-112, LAND AND WATER USE & Page 3-127, Cape San Blas, the temporary closure of C-30E (not SR 30-E) could be mitigated inexpensively by the construction of hard surfaced or paved 50-60 foot turnarounds at either end of the LHA where traffic is stopped. The final EIS should address the need to provide such for individuals driving trucks and trailering boats or those in motor homes with or without tow vehicles. The two lane road is 18-20 feet in width and cannot be used by vehicles of such size or configuration to safely reverse their direction. Your current draft leaves those individuals no alternative but to spend 1-4 hours under perhaps adverse weather condition in a single line of halted traffic. Are portable toilets to be installed nearby?

**Page 3, TMD SEIS Comments**

Travelers might choose to spend their time at a nearby recreational area (Cape Palms or Salinas Park, two county parks near the LHA). This would have the added benefit of allowing adjacent businesses (Cape San Blas Camping Resort) to operate uninterrupted by parked vehicles. The imposed restriction would be ameliorated by giving travelers some choice in what they could do in the interim. Boaters could launch at an alternate boat ramp on C-30A instead of waiting to access ours.

- 4 Page 3-124, Recreation Activities, The Florida Department of Children and Family Services... operates... under a sublease from St. Joseph Peninsula State Park. There are ten cabins.

Cape Palms is located approximately 3 miles north of Site D-3A. The park is a Gulf county facility with picnic facilities and beach access.

- 5 Page 3-127, Flight Test Activities, would require the closure of C-30E. Following page - south of St. Joseph Peninsula State Park. The park (bottom of Page 3-128) is open 8:00 a.m. to sunset daily. Peak attendance between 8:00a.m. Closure of C-30E...

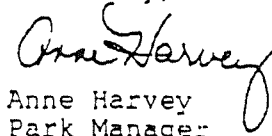
See above comments on road closure.

- 6 Page 3-178, Cape San Blas, area includes C-30E, and 30... and again on Page 3-184, 189, 191, 192 & 198 in several locations. Refer to comments re: turnarounds for large rigs and fisher folk. Developing offshore platforms would limit impacts to local transportation. With over 101,000 visitors in 1997 we continue to increase in both visitation and the size of the camping rigs. Just this past January we experienced a 45% increase in day use visitation and a 39% increase in overnight visitation compared to 1997. Are you sure that Gulf County's peak traffic volume occurs from mid-December to January (Page 3-191)?

- 7 Page 3-200, Solid Waste Management, dumpster that is picked up weekly by City Environmental Services, Inc.

We hope these comments will enable the individuals making the final determination on this program to consider the least impactful alternatives. Mitigation for several of the areas listed above should be included in the final version.

Sincerely,

  
Anne Harvey  
Park Manager

cc: John Bente

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## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

South Florida Ecosystem Office

P.O. Box 2676

Vero Beach, Florida 32961-2676

June 30, 1998

Linda Ninh  
46 OG/OGM  
205 West D Avenue, Suite 241  
Eglin AFB, FL 32542-6866

RE: Coordinating Final SEIS for Theater Missile Defense System in the Eglin Gulf Test Range

Dear Ms. Ninh:

Thank you for the copies of the Coordinating Final Supplemental Environmental Impact Statement (SEIS) dated May 22, 1998. This letter represents the combined responses from three U.S. Fish and Wildlife Service (FWS) field offices responsible for reviewing the Coordinating Final SEIS (document). Accordingly, the Panama City Field Office provided comments on TMD activities proposed for Eglin AFB; the South Florida Field Office in Vero Beach provided comments on TMD activities occurring in the lower Florida Keys; and the Florida Keys National Wildlife Refuges (NWR) on Big Pine Key provided comments since both potential launch sites in the lower Florida Keys (Cudjoe Key and the Saddlebunch Keys) occur adjacent to refuge boundaries. This letter provides general and specific comments addressing the TMD system's potential effects to threatened and endangered species, migratory birds, anadromous fish, and wetland habitats.

### GENERAL COMMENTS

The subject document has been significantly improved and addresses most of our previous comments. However, we continue to remain concerned with some critical issues associated with the proposed action.

1. If a national need develops and the Florida Keys are used as launch sites, the effects of launch activities on populations of the following species existing within the LHA needs to be evaluated: silver rice rat (*Oryzomys argentatus*); Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*); transient Key deer (*Odocoileus virginianus clavium*); bald eagle (*Haliaeetus leucocephalus*); and eastern indigo snake (*Drymarchon corais couperi*). These activities could interfere with the FWS' recovery efforts for listed species in the Keys, such as repatriating the Key deer to Cudjoe Key (FWS 1998 draft). Prior to this evaluation, surveys for threatened and endangered species occurring within the LHA need to be conducted.



2. The effects of launch activities on shorebird and wading bird rookeries within the LHA for the Florida Keys needs to be evaluated. Avifauna in the Florida Keys are already subjected to significant stress from noise and disturbance. We maintain that the launching of target missiles from land-based facilities in the Florida Keys is another level of stress these birds must endure. The cumulative effect of existing stresses along with the added stress from the proposed action may result in changing the reproductive behavior of nesting birds (e.g., decreased fecundity) and force them to seek other potential nest areas, which are becoming increasingly limited in availability and suitability.
3. The effects of the proposed action (e.g., visual pollution of wilderness areas, the impact on wilderness solitude, the recreational and economic impact to the highly desired "wilderness experience") on wildlife and human users in federally designated areas (e.g., Great White Heron NWR, Florida Keys National Marine Sanctuary, wilderness areas) still needs to be evaluated.

#### SPECIFIC COMMENTS

1. Page ES-9, mitigative measures for bald eagles: Although bald eagle nests are legally protected, a nest in and of itself, from a biological perspective, is relatively inconsequential to a given pair of bald eagles (a pair can construct a nest in less than a week). It is the nest site that originally attracted the pair that is of critical importance (FWS 1987). Thus, relocating a nest to another site would not ensure the relocation of the bald eagle pair to that site.

Note: Not only is the bald eagle protected under the Endangered Species Act, it is also protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Any action, such as a nest relocation, would constitute "take" under both of these acts.

The recommended primary zone where certain activities are prohibited or restricted is 750-1,500 feet from the nest tree, not 1,968 feet as stated in the document (FWS 1987). In addition, Grubb and King (1991) found that human activities that are distant, of short duration, out of sight, few in number, below, and quiet have the least impact to bald eagles. Distance to human activity appears to have the greatest effect on the overall disturbance to bald eagles.

2. Page 2-79, Table 2.4-2, relocate raptor roosts: If this action relates to the relocation of bald eagle nests, refer to previous comment.
3. Page 2-79, Table 2.4-2, low intensity, low wash lighting: If this measure relates to sea turtle lighting needs, it should state, "sea turtle compatible lighting." If this measure relates to other animals, the need for low intensity lighting should be discussed in the document for each species.

4. Page 3-45, Figure 3.1 3-3, nesting and breeding periods-Santa Rosa Island and Cape San Blas: The table should include "wintering periods" to identify the wintering period for piping plover at Cape San Blas.
5. Page 3-46, 1st ¶, Atlantic loggerhead turtle: A sentence should be added at the end of the paragraph that states, "However, the sea turtle nesting season for the loggerhead is considered to be from May 1 through October 31."
6. Page 3-46, Atlantic loggerhead turtle: Information regarding the distinction between loggerhead nesting subpopulations and recovery potential should be included in the narrative. This information provides support on the importance of conserving the Florida panhandle sea turtle population.  
  
Recent genetic analyses using restriction fragment analysis and direct sequencing of mitochondrial DNA (mtDNA) have been employed to resolve management units among loggerhead nesting cohorts of the southeastern United States (Bowen *et al.* 1993). Assays of nest samples from North Carolina to the Florida Panhandle have identified three genetically distinct nesting sub-populations: (1) northern nesting sub-population - Hatteras, North Carolina, to Cape Canaveral, Florida; (2) South Florida nesting sub-population - Cape Canaveral to Naples, Florida; and (3) Florida Panhandle nesting sub-population - Eglin Air Force Base and the beaches around Panama City, Florida. These data indicate that gene flow between the three regions is very low. If nesting females are extirpated from one of these regions, regional dispersal will not be sufficient to replenish the depleted nesting sub-population (Bowen *et al.* 1993, Encalada *et al.* 1998).
7. Page 3-47, 1st ¶, Kemp's ridley turtle: In 1997, stranded ridley turtles were documented in Bay (4), Franklin (7), and Gulf (5) counties (Florida Marine Research Institute, St. Petersburg - contact Allen Foley 813/896-8626).
8. Page 3-65, 4th ¶, launch activities: Night lighting could also deter female turtles from coming ashore to nest (Witherington and Martin 1996).
9. Page 3-141, protected areas, Coastal Barrier Resource Act: The Department of Defense will need to consult with the FWS regarding the military's exemption from the ban on federal expenditures in a CBRs Unit because of national security. The requirement to consult can be found in Federal Register, Volume 57, No. 215, Thursday, November 5, 1992, Rules and Regulations, pages 52730-52733.
10. Page 3-431, mitigations considered: These proposed activities should be eliminated since they actually represent assessments of the action and not measures to mitigate the action: (1) conduct endangered species population surveys within the LHA, (2) survey plants adjacent to the launch pad to assess launch effects, (3) monitor launch locations for ambient

and test activity noise levels during initial launch, (4) monitor flight termination or launch failure debris recovery activities to reduce impacts to birds and plants.

11. Pages 3-441 & 3-442, mitigations considered: These proposed activities should be eliminated since they actually represent assessments of the action and not measures to mitigate the action: (1) conduct endangered species population surveys within the LHA, (2) survey plants adjacent to the launch pad to assess launch effects, (3) monitor launch locations for ambient and test activity noise levels during initial launch, (4) monitor flight termination or launch failure debris recovery activities to reduce impacts to birds and plants.
12. Appendix B, page B-11, Coastal Barrier Resource Act: Refer to comment number 9.

### CONCLUSION

After reviewing the document, we are still concerned with the potential adverse effects of the proposed action on fish and wildlife resources. Specifically, the document does not provide adequate mitigative measures necessary to offset adverse effects to our trust resources and land management responsibilities as a result of target launch activities proposed in the Florida Keys. Furthermore, we do not believe that the adverse effects (e.g., noise impacts to nesting avifauna) of launching target missiles from the Keys can be ameliorated. As such, the Coordinating Final SEIS is incomplete in its current form. We will continue to coordinate with your agency prior to completing the Final SEIS on fish and wildlife issues that need to be addressed as part of the environmental review process. Once again, it is the FWS' recommendation that the Florida Keys be eliminated from consideration as an alternative launch site for target missiles in the Eglin Gulf Test Range.

Thank you for the opportunity to provide comments on the Coordinating Final SEIS. If you have any questions regarding the contents of this letter, please contact Lorna Patrick (Panama City Field Office at 850/769-0552), Susan White (Florida Keys NWR at 305/872-2239) or Kalani Cairns of our office at 561/562-3909.

Sincerely,



James J. Slack  
Project Leader  
South Florida Field Office

cc:

FWS, Atlanta, GA (Attn: Bruce Bell)

FWS, Panama City, FL (Attn: Lorna Patrick)

Florida Keys NWR, Big Pine Key, FL (Attn: Susan White)

NMFS, Miami, FL

GFC, Marathon, FL

DEP, Marathon, FL

DCA, Marathon, FL

## LITERATURE CITED

- Bowen, B., J.C. Avise, J.L. Richardson, A.B. Meylan, D. Margaritoulis, and S.R. Hopkins-Murphy. 1993. Population structure of loggerhead turtles (*Caretta caretta*) in the northwestern Atlantic Ocean and Mediterranean Sea. *Conservation Biology* 7(4):834-844.
- Encalada, S.E., K.A. Bjorndal, J.C. Zurita, B. Schroeder, E. Possardt, C.J. Sears, and B.W. Bowen. 1998. Population structure of loggerhead turtle (*Caretta caretta*) nesting colonies in the Atlantic and Mediterranean as inferred from mitochondrial DNA control region sequences. In Press. *Marine Biology*.
- Grubb, T.R., and R.M. King. 1991. Assessing human disturbance of breeding bald eagles with classification tree models. *Journal of Wildlife Management* 55(3):500-511.
- U.S. Fish and Wildlife Service [FWS]. 1987. Habitat management guidelines for the bald eagle in the southeast region. U.S. Fish and Wildlife Service, Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1998. Multi-species recovery plan for the threatened and endangered species of South Florida, Volume 1 of 2, The Species. Technical Agency Draft. Atlanta, Georgia.
- Witherington, B.E., and R.E. Martin. 1996. Understanding, assessing, and resolving light-pollution problems on sea turtle nesting beaches. Florida Marine Research Institute Technical Report TR-2, St. Petersburg, Florida.

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**Appendix F**  
**Individuals and Agencies Contacted**

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# APPENDIX F

## INDIVIDUALS AND AGENCIES CONTACTED

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### FEDERAL AGENCIES (DOD)

Defense Technical Information Center  
Chemical Propulsion Information Agency—The Johns Hopkins University  
James E. Cocchiaro, Senior Research Chemist  
M.L. Coleman, Research Analyst

### *U.S. Department of the Air Force*

Air Force Combat Climatology Center—Asheville, North Carolina  
Upper Air Data Section (COU)  
Stewart Gibeau, Meteorological Technician  
Surface Data Section (COS)  
Mr. Vann B. Gibbs, Jr., Meteorologist

Air Force Special Operations Command—Hurlburt Field, Florida  
16<sup>th</sup> Civil Engineering Squadron  
Carl Hoffman, Lead Community Planner

Arnold Air Force Base, Tennessee—Advanced Missile Signature Center  
Rick Gamble, Manager

Brooks Air Force Base, Texas—Center for Environmental Excellence  
Ron DiBenedetto, Community Planner

Eglin Air Force Base  
Air Force Development Test Center (AFDTC)  
Environmental Management Directorate (AFDTC/EM)  
Environmental Compliance Division (AFDTC/EMC)  
Environmental Engineering (AFDTC/EMCE)  
Jim Fitzpatrick, Chief  
Ed O’Gallagher, Quality Program Manager  
Dan Robeen, Environmental Engineer, Water Quality  
Program Manager  
Maria Rodriguez, Environmental Engineer, Air Quality Program Manager  
Pollution Prevention (AFDTC/EMCP)  
Russell Brown, Chief  
Waste Management Branch (AFDTC/EMCW)  
Stephen Kauffman, Environmental Protection Specialist  
Judy Ramsey, Chief  
Bruce Stippich, Environmental Protection Specialist  
EPCRA Program Manager, Spill Response Manager

## FEDERAL AGENCIES (DOD)

### *U.S. Department of the Air Force*

#### Eglin Air Force Base (continued)

##### Air Force Development Test Center (AFDTC) (continued)

##### Environmental Management Directorate (AFDTC/EM) (continued)

##### Environmental Stewardship Division (AFDTC/EMS)

Dan Nichols, Chief, Environmental Stewardship

Al Jordan, Environmental Planner

##### Historic Preservation (AFDTC/EMSH)

Newell O. Wright, Ph.D., Chief, Preservation Branch, Historic Preservation

#### Officer

##### Natural Resources Division (AFDTC/EMSN)

Debby Atencio, Endangered Species Biologist

Richard W. (Rick) McWhite, Chief

##### Environmental Restoration Branch (AFDTC/EMR)

Robin M. Bjorklund, P.G., Project Manager

John F. Krishack, P.E., ER Program Manager

##### History Office (AFDTC/HO)

Vicki Jones, Chief

##### Public Affairs (AFDTC/PA)

Janet Tucker, Environmental Public Involvement Specialist

Lois Walsh, Office Administration

##### Community Relations (AFDTC/PAC)

Shirley Pigott, Public Affairs Officer

##### Requirements Directorate (AFDTC/DR)

##### Strategic Plans Division (AFDTC/DRP)

Danny Pugh, Chief

##### Safety Division (AFDTC/SE)

##### Range Safety (AFDTC/SEU)

##### Operations Element (AFDTC/SEUO)

Henry Caldwell, General Engineer

Walter (Walt) Monteith, Chief

##### Base Safety (AFDTC/SEO)

##### Weapons Safety (AFDTC/SEOW)

SGT. Gary Flinn, Weapons Safety Manager

#### 46<sup>th</sup> Test Wing (46 TW)

##### 46<sup>th</sup> Operations Group (46 OG)

##### 46<sup>th</sup> Munitions Test Division (46 OG/OGM)

Maj Tom Kennedy, Director of Test, TMD

Nga Linda Ninh Busch, Test Engineer

Jefferson K. (Kelly) Oliver, Deputy Director of Test (TMD)

##### 46<sup>th</sup> Operations Support Squadron (46 OSS)

##### Current Operations Flight Office (46 OSS/OSC)

##### Airspace Management Branch (46 OSS/OSCM)

Donald R. (Don) Setterberg, Airspace Manager

##### Plans Office (46 TW/XP)

##### Range Environmental Planning Office

Jesse Borthwick, Senior Environmental Scientist

Ken Bristol, Natural Resource Planner



**FEDERAL AGENCIES (DOD) (continued)**

***U.S. Department of the Air Force (continued)***

Eglin Air Force Base (continued)

Technical Directorate (46 TW/TS)

Range Systems Flight (46 TW/TSRS)

TSPI/Data Communications Section (46 TW/TSRST)

James Brogdon, Electronics Engineer

Shawn M<sup>c</sup>Cooley, Electronics Engineer

96<sup>th</sup> Air Base Wing

96<sup>th</sup> Medical Group (96 MDG)

96<sup>th</sup> Air Space Medicine Squadron (96 AMDS)

CAPT. Cynthia Redelsperger, Officer in Charge (SGPBE)

96<sup>th</sup> Civil Engineering Group (96 CEG)

Eglin Fire Department (96 CEG/CEF)

Sr. Master Sergeant Chambers, Chief

Chief William Parsons, Chief of Technical Services

Tom Ryan, Assistant Chief of Training

Housing Division (96 CEG/CEH)

Cindy Masters, Assistant Director of Housing

Jan Whited, Housing Manager

Real Property Office (96 CEG/CERR)

Ann Brown, Chief, Real Estate Flight

Readiness Division (96 CEG/CEX)

Steve Denney, Staff Sergeant

96<sup>th</sup> Support Group (96 SPTG)

96<sup>th</sup> Services Squadron (96 SVS)

Base Lodging (96 SVS/SVML)

Airman Shanie Hoke, Administration (no longer there)

Bob Pritchard, Billeting Manager (no longer there)

Langley Air Force Base—Hampton, Virginia

Air Combat Command Headquarters (ACC)

Directorate of Logistics

Logistics Environmental Office (ACC CPS/CEV)

Bruce Stephens, Chief

Los Angeles Air Force Base, Space and Missile Systems Center (SMC)

Directorate of Systems Acquisition (SMC/AX)

Acquisition Health and Safety Division (SMC/AXZ)

Bioenvironmental Engineering Branch (SMC/AX2B)

LT. COL Denton Crotchett, Chief, Environmental Security

Operations Safety (SMC/AXZO)

Ron Walters, Chief

Patrick Air Force Base—Florida

45<sup>th</sup> Space Wing (45 SW)

Environmental Planning (45 CES/CEV)

Ginger Crawford, Environmental Planner

Environmental Flight (45 CES/CEVP)

Michael B. Camardese, Cultural and Natural Resources Program Manager, CHHM

## **FEDERAL AGENCIES (DOD) (continued)**

### ***U.S. Department of the Air Force (continued)***

Patrick Air Force Base—Florida (continued)

45<sup>th</sup> Space Wing (45 SW) (continued)

Systems Safety (45 SW/SE)

Engineering Support (45 SW/SESE)

Ken Hill, Safety Engineer

Large Programs (45 SW/SESL)

Major Daniel Berlinrut, Eastern Range

Tyndall Air Force Base

Sand Dollar Inn (Billeting)

Sgt. Harp, Operations NCO

Wright-Patterson Air Force Base, Air Force Research Laboratory

Noise Effects Branch

Robert A. Lee, Chief

Bioenvironmental Engineering Division

J. Micah Downing, Ph.D., Physicist

Toxicology Division (AL/OEBN)

Dave Mattie, Ph.D., Chief

Teri Sterner, Risk Assessor

### ***U.S. Department of the Army***

Dugway Proving Ground—Utah

Materiel Test Facility

Meteorology and Obscurants Division

Modeling and Assessment Branch

Jim Rafferty, Meteorologist

John White, Meteorologist

Program Executive Office

Air and Missile Defense (SFAE-AMD-TSD-DT)

Duane R. Nelson, P.E.

U.S. Army Center For Health Promotion and Preventative Medicine

Ambient Air Quality Management

Tedd Ruff, Supervisory Environmental Engineer

James Wood, Program Manager

U.S. Army Corps of Engineers

Jacksonville District

Regulatory Division

South Permit Branch

Osvaldo Collazo, Acting Chief

Marathon Regulatory Field Office

Vic Anderson, Biologist

Mobile District

Doug Nester

## **FEDERAL AGENCIES (DOD) (continued)**

### ***U.S. Department of the Army (continued)***

#### U.S. Army Corps of Engineers (continued)

##### Mobile District (continued)

##### Planning Division

Ken Claseman, Chief, Economic Analysis Section (PD-FE)

John Eringman, Project Study Manager (PD-FP)

Dr. Claudia Rogers, Social Scientist

##### New Orleans

##### Navigation Data Center/Waterborne Commerce Statistics Center

Charlotte Cook

Mark Haab

##### Panama City Regulatory Field Office

Teresa Zar, Environmental Protection Specialist

##### Planning Division Headquarters

##### Formulation and Evaluation Branch

Lillian Almodovar

Rob Conner

Robert Daniel

#### U.S. Army Research Laboratory—Adelphi, MD

##### Information, Science and Technology Directorate—Headquarters

##### Battlefield Environmental Division

##### Atmospheric Effects Branch (AMSRL-IS-EE)

John Noble, Research Scientist

##### Information, Science and Technology Directorate -

##### White Sands Missile Range

##### Battlefield Environmental Division (AMSRL-BE-S)

John Fox (no longer there)

#### U.S. Army Space and Missile Defense Command—Huntsville, Alabama (formerly U.S. Army Space and Strategic Defense Command)

##### Installations Division (SMDC-EN-I)

Dennis R. Gallien

##### Test Resources Office (SMDC-TE-O)

F. David (Dave) Crawford, Mechanical Engineer

Gregory E. (Greg) Walls, General Engineer

##### White Sands Missile Range

##### Materiel Test Directorate (MTD)

##### Missile Systems Test Division

##### National Programs Branch

Richard Martinez, Hera Program Engineer

### ***U.S. Department of the Navy***

#### Naval Air Station, Key West

##### Naval Air Station, Boca Chica

##### Air Traffic Control

Sr. Chief Billips

## **FEDERAL AGENCIES (DOD) (continued)**

### ***U.S. Department of the Navy (continued)***

#### Naval Air Station, Key West (continued)

##### Naval Air Station, Boca Chica (continued)

##### Air Traffic Control (continued)

LT. Commander Dino Tyre, Facility Officer

##### Naval Computer and Telecommunications Area Master Station

##### LANT Detachment, Key West (NCTAMS LANT DET)

Bill Carter, Technical Director of Communications

Shawn Kempshall, Electronics Technician

Receptionist

##### Operations Department

##### Air Traffic Control Office

Petty Officer Naggar, Training Chief

LT. Junior Grade Michael Schaeffner, Air Traffic Control Officer

##### Fleet Liaison

Earl Crawford, LP OSI

##### Ground Electronics Division

Tom McKendrick, ET2

Warrant Officer Edwards

##### Public Affairs (O1J)

Petty Officer Blevins (no longer there)

Jonathan Hup, Engineering Director

Wayne Meshler, Public Affairs Officer

Petty Officer Raggo, Public Affairs (no longer there)

##### Public Works Department (PWD)

##### Engineering Division

Ron Demes, Engineering Director

Charlie Roberts, Housing Director

##### Civil Engineer

Tom Charette, Environmental Coordinator

Tom Maples, Engineering Technician

##### Environmental Branch

Curtis Kimball, former Environmental Coordinator

Supervisor (now Paul Camire)

Patsy McNeill, Hazardous Waste Facility Manager

Scott Rogowski, Environmental Protection Specialist

Arnim Schuetz, Natural Resources Manager

##### Facilities Planning

Richard Davis, Engineer

##### Weapons Department

##### Ammunition/Logistics Office

Chief Braddy, Ammunition Explosives Leading Chief

Petty Officer

#### Naval Surface Warfare Center—Indian Head Division

##### Navy Ordnance Environmental Support Office (OESO)

John Dow, Engineer

## **FEDERAL AGENCIES (DOD) (continued)**

### ***U.S. Department of the Navy (continued)***

Office of the Chief of Naval Operations  
Office of Naval Intelligence  
Intelligence Directorate (ONI 2)  
Merchant Operations Department  
Phyllis J. Owen, Senior SEA WATCH/Merchant Analyst  
Nancy N. Walter, Supervisor

Theater Air Defense  
Program Executive Office (PMS-422), Standard Missile  
CAPT. Michael J. Mathis, Program Manager  
Production Branch (PMS-422-21)  
Mike Hoobchaak, Manager  
Program Executive Office Theater Air Defense  
Jim Irwin, Environmental Engineer

Southern Division, Naval Facilities Engineering Command—Charleston  
Environmental Department  
Air and Solid Waste Branch  
Mary (Stabelski) Oxendine, Environmental Engineer  
Planning Department  
Will Sloger, Environmental Engineer

## **FEDERAL AGENCIES (Non-DOD)**

National Research Council  
Library  
Susan Fourt, Research Librarian

U.S. Department of Agriculture  
Natural Resources Conservation Service  
Warren Henderson  
Natural Resources and Environment  
U.S. Soil Conservation Service  
Reports

U.S. Department of Commerce  
Bureau of the Census  
Foreign Trade Division  
Transportation Branch  
George Martinez  
Doug McDonald  
National Oceanic and Atmospheric Administration (NOAA)  
National Ocean Service (NOS)  
National Geodetic Survey  
Photogrammetry Division  
Greg Fromm, Nautical Charting  
Geodetic Services Division  
Joan E. Rikon, Information Specialist

## **FEDERAL AGENCIES (Non-DOD) (continued)**

### **U.S. Department of Commerce (continued)**

#### **National Oceanic and Atmospheric Administration (NOAA) (continued)**

##### **National Ocean Service (NOS) (continued)**

##### **Office of Ocean Resources Conservation and Assessment**

###### **Pollution Sources Characterization Branch**

Daniel Farrow, Branch Chief

###### **Strategic Environmental Assessments Division**

Daniel J. Basta, Chief, Strategic EA Division

John Klein III, P.E., Chief, Physical Environments Characterization Branch

Dr. Vernon (Bob) Leeworthy, Jr., Chief Economist

Maureen A. Warren, Chief, Human Activities

###### **Assessment Branch**

##### **Office of Ocean and Coastal Resource Management**

###### **Florida Keys National Marine Sanctuary (FKNMS) Headquarters (Marathon;**

Cooperative Effort with Florida DEP, Division of Marine Resources)

Bill Causey, Director

June Cradick, Assistant Superintendent

Joanne Delaney, Permits Assistant

Ben Haskell, Research Coordinator

###### **Florida Keys National Marine Sanctuary (FKNMS) Headquarters**

Joy Taggenhort, Education Assistant

###### **Lower Keys Region (Key West)**

Cecilé Daniels, Assistant Manager, Lower Keys Region

Lauri MacLaughlin, Resource Management Specialist

George P. Schmahl, Manager, Lower Keys Region

Alyson Simmons, Public Outreach

##### **National Marine Fisheries Service**

###### **Assistant Administrator for Fisheries**

###### **Office of Protected Resources**

###### **Marine Mammal Conservation Division**

Donna Wieting, Fishery Biologist (formerly Acting Director, Ecology and Conservation Division)

###### **Office of Sustainable Fisheries**

###### **Domestic Fisheries Division**

William P. Chappell, Fishery Management Specialist

###### **Southeast Regional Office—St. Petersburg**

###### **Southeast Fisheries Science Center**

###### **Panama City Laboratory**

###### **Fisheries Statistics Division**

Deborah C. (Debbie) Fable, Port Agent

##### **National Marine Fisheries Service**

###### **Southeast Regional Office—St. Petersburg**

###### **Southeast Fisheries Science Center**

###### **Miami Laboratory**

###### **Migratory Fishery Biology Division**

John W. Iliff, Fishery Biologist

Edward (Ed) J. Little, Jr., Port Agent-Key West

###### **Mississippi Lab, Pascagoula and Stennis Space Center**

Dr. Keith D. Mullin

## **FEDERAL AGENCIES (Non-DOD) (continued)**

### **U.S. Department of Commerce (continued)**

#### **National Oceanic and Atmospheric Administration (NOAA) (continued)**

##### **National Marine Fisheries Service**

##### **Southeast Regional Office—St. Petersburg**

##### **St. Petersburg Branch**

LT. Junior Grade David M. Bernhart, Fishery Biologist

Georgia Cranmoor, Fish Management Group

David N. Dale, Fishery Biologist, Habitat Conservation Division (SEO23)

Dr. Charles (Chuck) A. Oravetz, Chief, Protected Species Management Branch  
(SEO13)

Kathy Wang, Protected Species Group

##### **Office of Oceanic and Atmospheric Research**

##### **Richard S. Artz**

##### **Environmental Research Laboratories**

##### **Air Resources Laboratory**

Jeffery (Jeff) T. McQueen

Atmosphere Turbulence and Diffusion Division (Oak Ridge)

William (Will) Pendergrass III, Physical Scientist

##### **Pacific Marine Environmental Laboratory (Seattle)**

Dr. Timothy (Tim) S. Bates

### **U.S. Department of the Interior**

#### **Fish and Wildlife and Parks**

##### **National Park Service**

##### **Everglades National Park**

Drette Pendleton, Administrative Support Aid

South Florida Natural Resources Center

Skip Snow, Researcher

##### **Gulf Island National Seashore**

Ann Folker, Park Ranger

Riley Hoggard, Natural Resources Administrator

##### **U.S. Fish and Wildlife Service**

##### **South Florida Ecosystem Office (Vero Beach)**

Craig Johnson, Supervisor of Recovery

Kalani Cairns, Coastal Team Leader, Multi-species Ecosystem Recovery Planning

Becky Stanley, Key West

##### **Florida Keys Refuges**

Michael J. McMinn, Assistant Refuge Manager

##### **National Key Deer Refuge**

Great White Heron National Wildlife Refuge

Barry Stieglitz, Refuge Manager

Tom Wilmers, Wildlife Biologist

Susan White, Marine Biologist

##### **Crocodile Lake National Wildlife Refuge**

Steve Klett, Refuge Manager (formerly with South Florida Ecosystem  
Office, permitting)

##### **Merritt Island National Wildlife Refuge**

Kathy Whisley, Assistant Refuge Manager

## **FEDERAL AGENCIES (Non-DOD) (continued)**

### **U.S. Department of the Interior (continued)**

#### **Fish and Wildlife and Parks (continued)**

##### **National Park Service (continued)**

##### **U.S. Fish and Wildlife Service (continued)**

##### **Region 4—Southeast Office (Atlanta)**

Ed Loth, National Wildlife Refuge System Expert

Tom Wheaton, Enforcement Agent

##### **Endangered Species Division**

David P. Flemming, Chief

##### **Panama City Field Office**

Mike Brim, Contaminants Biologist

Frank Finchum, Clerk (transferred)

Lorna Patrick, Fish and Wildlife Biologist

##### **St. Vincent National Wildlife Refuge**

Don Kosin, Refuge Manager

##### **Minerals Management Service**

##### **Gulf of Mexico Outer Continental Shelf Region**

Bill Martin, Deputy Regional Director for Field Operations

##### **Leasing and Environment**

Richard Defenbaugh, Deputy Regional Supervisor

##### **Environmental Studies Section**

Bob Avent, Oceanographer

Norm Froomer, Geographer

John Green, Environmental Scientist

##### **Public Information**

Ed Richardson, Environmental Scientist

Jercia Martin-Rose

Sherry Yoesting, Publications

##### **U.S. Geological Survey**

##### **National Wetlands Research Center**

Bob, Service Representative

Bob Bonde

##### **Southern Research Station—Lafayette**

Judy Buys, Reference Librarian

##### **Spatial Analysis Branch**

Larry Handley, Geographer

### **U.S. Department of Transportation**

#### **Federal Aviation Administration (FAA)**

##### **Office of Air Traffic System Management**

##### **Airspace Analysis Laboratory (ATA 200)**

Bruce Ware, Manager

##### **Airspace Management Systems Program Office**

Jim Aarnio

##### **Jacksonville Air Route Traffic Control Center**

Greg Abdian, Military Liaison

##### **Southwest Region—Fort Worth**

Don Day, Environmental Specialist



## **FEDERAL AGENCIES (Non-DOD) (continued)**

### **U.S. Department of Transportation (continued)**

#### **U.S. Coast Guard**

##### **Headquarters**

LT. W. Michael Pittman, Water Coordinator

Office of Navigation Safety and Waterway Services

Short Range Aids to Navigation Division

Navigation Rules and Information Branch

Ed LaRue, Jr., Chief

##### **7th District**

###### **Group Key West**

Commander Scott Gordon, Deputy Group Commander

LT. Commander Brian Kelley, Operations Officer

##### **8th District—New Orleans**

LT. Louise Berney, U.S. Coast Guard Safety Office

Paul Putkey, Chief Petty Officer

Marine Safety Office—Mobile

Waterways Management Branch

LT. Junior Grade Anthony Davis, Chief

### **U.S. Environmental Protection Agency**

#### **Headquarters**

Energy Efficiency International Branch

Acid Rain Division

Brian Bloomer, Environmental Engineer

#### **Region 4—Southeast Office (Atlanta)**

Pete Callas

John Hamilton, Federal Facility EIS Coordinator

Wayne Mathis, Environmental Coordinator

#### **South Florida Office (Marathon)**

Bill Kryzinsky, Regional Wetlands Expert

#### **Water Management Division**

Wetlands Section

Pete Kalla, Life Scientist

### **U.S. Information Agency**

#### **Bureau of Broadcasting**

Office of Cuba Broadcasting, Radio Marti

Glen Robinson, Senior Technician

Ted Tate, Chief of Radio Technical Operations

## **STATE AGENCIES**

### **Alabama State Docks Department**

Captain Dave Carey, Harbor Master

#### **Administrative Services**

John Carey, General Administrator

### **Florida Department of Agriculture and Consumer Services**

Bureau of Seafood and Aquaculture

Marie Holmes, Public Information Specialist

## STATE AGENCIES (continued)

### Florida Department of Business and Professional Regulation

Division of Hotels and Restaurants  
Bill Risk, Management Analyst II

### Florida Department of Community Affairs

Division of Resource, Planning, and Management

Charles Pattison, Director  
Ty Symroski, Planning Manager  
Bureau of State Planning

James L. Quinn, Chief

Coastal Management Program

Camille Coley, Environmental Scientist, Outreach  
Public Information Administrator  
Steve Gavigan, Planner  
Rosalyn Killcollins, Federal Consistency  
Jasmin Ruffington, Planner, Florida Clearinghouse Review

### Florida Department of Environmental Protection

District Offices

Northwest District Office (Pensacola)

Air Resources Management  
Andrew (Andy) Allen, Air Permitting Supervisor  
Water Facilities (WFA)  
Glenn L. Butts, Environmental Specialist III

South District Office (Fort Myers)

Air Resources Management  
Wayne B. Lewis, Environmental Specialist II  
Water Facilities (WFA)  
Ronald D. Blackburn, Environmental Specialist III  
So. District Branch Office (Marathon)  
Dave P. Grabka, Environmental Specialist I  
Air Quality Management  
James (Jim) T. Edds, Environmental Specialist II  
Wastewater Facilities (WFA)  
Gustavo (Gus) Rios, Environmental Specialist III

Division of Air Resources Management

Bureau of Air Monitoring and Mobile Sources

Tammy F. Eagan, Meteorologist

Bureau of Air Regulation

Willard M. Hanks, Applications Review Engineer IV  
Cleveland (Cleve) G. Holladay, Engineer IV

Office of Policy Analysis and Program Management

Yi Zhu, Environmental Manager, Emissions Inventory

Division of Environmental Resource Permitting

Dianne M. Bair, FEMA Projects Coordinator

Janette Hobbs, Environmental Technician

Bureau of Submerged Lands and Environmental Resources

Martin (Marty) K. Seeling, Environmental Specialist III, WFA

## STATE AGENCIES (continued)

### Florida Department of Environmental Protection (continued)

#### Division of Environmental Resource Permitting (continued)

##### East Coast Inland Navigation District

Stephanie Kuhn, Accountant

David Roach, Executive Director

Brenda Sullivan, Secretary

##### West Coast Inland Navigation District

Chuck Listowski, Executive Director

Marcia Seaman, Secretary

#### Division of Law Enforcement

##### Bureau of the Florida Marine Patrol

###### District 3 (Marathon)

LT. Michael D. Minski, Law Enforcement Lieutenant

#### Division of Marine Resources

##### Bureau of Coastal and Aquatic Managed Areas

Anna Marie Hartman, Chief

##### Florida Marine Research Institute (St. Petersburg)

Christopher (Chris) R. Anderson, Marine Research Assistant

Greg Anderson, GIS Specialist

Dave Capaz, Research Technician

Christopher (Chris) A. Friel, Program Administrator, Info.

Science and Management

Lara J. Halenda, Operations Management Consultant I

John H. Hunt, Research Administrator II

Peter J. Rubec, Research Scientist

Bill Sargent, Associate Research Scientist

Bob Warford (no longer employed there)

Bradley (Brad) L. Weigle, Research Scientist, Manatees

Dr. Blair E. Witherington, Associate Research Scientist

##### Fisheries Dependent Monitoring Section

Steven (Steve) E. Brown, Environmental Specialist I, Statistics

Joe O'Hop, Research Administrator II

##### Marine Mammals Pathobiology Laboratory—Field Lab

Bruce B. Ackerman, Research Scientist

#### Division of Recreation and Parks

##### St. Joseph Peninsula State Park

Anne Harvey, Resident Park Manager II

#### Division of Water

John Cox, Environmental Specialist

#### Executive Services Coordinator

##### Administrative Services Division

##### Bureau of Human Resource Services

Pamela (Pam) A. McChesney, Staff Assistant

##### Division of Technical Services

##### Bureau of Geology

##### Florida Geological Survey

Edward (Ed) W. Garrett, Professional Geologist I

Publications

## STATE AGENCIES (continued)

### Florida Department of Environmental Protection (continued)

#### Office of the Secretary

##### Library

Brunilda (Bruny) M. Betancourt, Library Technical Assistant I

##### Marine Fisheries Commission

Dr. Russell S. Nelson, Executive Director

Robert (Bob) M. Palmer, Economic Analyst

William (Bill) H. Teehan, Fisheries Management Analyst

##### Office of Ecosystem Management

##### Office of Intergovernmental Programs

Richard Deadman, Environmental Specialist III

Robert W. Hall, Environmental Specialist III

##### Office of Greenways and Trails

Deirdre Hewitt, Information Specialist

### Florida Department of Health

#### Monroe County Health Department

##### Environmental Health

Jack Teague, Director

Bob Turner, Environmental Specialist III

Kris Williams, Environmental Specialist II

##### Office of Environmental Health

Gerald Briggs

#### Okaloosa County Health Department (Fort Walton)

Jean Bloomer, Environmental Supervisor I

#### Santa Rosa County Public Health Department

##### Environmental Division

Tom Kidder, Environmental Health Specialist

### Florida Department of the State

#### Historical Resources Division

##### Bureau of Archaeological Research

Kim Heinz, Archaeological Data Analyst

Roger Smith, State Underwater Archaeologist

##### Elections Division

##### Bureau of Administrative Code

Vicki McIntosh, Research Assistant

Kristy Maddox, Staff Assistant

##### Historic Preservation Bureau

##### Joint Legislative Management Committee

Steve Amiss, Archaeological Data Analyst

##### Review and Compliance

Laura Kammerer, Director

### Florida Department of Transportation

#### District 3 (Chipley)

##### Planning and Programs Division

Paul Day, Transportation Engineer, Planning Bureau

Mac Sanders, Construction

## STATE AGENCIES (continued)

### Florida Department of Transportation (continued)

#### District 6 (Miami)

Commercial Vehicle Law Enforcement Motor Carrier

Compliance Section

Officer Gary Grunfelder

Construction Office, Marathon

Cathy, Receptionist

Planning and Programs Division

Mike Ciscar, Project Manager, US-1

Albert A. Dominguez, Transportation, Statistics, and GIS Administrator, Management

Systems and Statistics Organization

Rolando Jimenez, Transportation Engineer

David Korras, Transportation Engineer

Phillip Steinmiller, Transportation Engineer

Public Information Division

Kimberly Coleman, Director

#### District 9 (Tallahassee)

Aviation Office

Bob Clay, Aviation Safety Manager

Motor Carrier Compliance Section

Captain Kenneth Carr, Law Enforcement Captain

Ports and Intermodal Facilities

Robert Herbert, Director

### Florida Game and Fresh Water Fish Commission

Everglades Regional Office

Beth Forsys, Key West

Phil Frank, Wildlife Ecologist, Key West

Tallahassee (Central) Office

John Stys, Office of Environmental Services (former)

Wildlife Division

Endangered Species Program

Tom Logan, Director

Don Wood, former Director

### Florida Ports Council

Communications

Nancy J. Leikauf, Director

### Florida Power Company

Mike McDonald, Area Manager

Roy Medlate, Engineer

### Florida State Harbor Pilot Association

Julie Meyers, Executive Director

### Florida Tourism Industry Marketing Corporation

## **STATE AGENCIES (continued)**

Mississippi State Port Authority (Gulfport)  
James Badger, Manager  
Trade, Development, and Logistics  
Anthony J. Taormina, Executive Director

State of Florida Legislature  
Joint Legislative Management Committee  
Economic and Demographic Research Division  
Information Systems  
Linc Clay, Chief

## **LOCAL AND REGIONAL AGENCIES**

Agency for Health Care Administration  
Gulf County  
Ken Arnold, Area Office Supervisor  
Pensacola  
Paul Pineau, Health Service Administrator

Appalachee Regional Planning Council, District 2 (Blountstown)  
Neil Fleckenstein, Emergency Programs Coordinator

Bay County Board of Commissioners  
Panama City Port Authority  
Tommy Berry, Assistant Director  
H.R. (Rudy) Etheredge, Port Director

Bay County Public Utilities  
Sharon and Rick, Administrator(s)

City of Fort Walton Beach  
Planning and Zoning  
Len Mitchell, Director

City of Key West  
City Electric System  
Dale Finegan, Engineer  
Dave Gurstenkorn, Engineer  
Community Services  
Randy Sterling, Director  
Office of the City Clerk  
Josephine Parker, City Clerk  
Planning Department  
Ted Strader, City Planner  
Transportation Department (formerly Port and Transit Authority)  
Raymond W. Archer, Director  
Valerie Barrera, Accounting Clerk II  
Chuck Hamlin, Assistant Director  
Norman Roberts, Transit Supervisor

## **LOCAL AND REGIONAL AGENCIES (continued)**

### **City of Port St. Joe**

Pauline Pendarvis, City Clerk

### **Escambia County**

Santa Rosa Island Authority  
Developmental Services  
Debbie Norton, Manager

### **Flight Department Jet Center**

Tracy Dart, Line Service

### **Florida Coastal Management**

Department of Community Affairs  
Kathleen Fox, Planner

### **Florida Keys Aqueduct Authority**

Lower Keys  
Jolynn Cates, Administration  
Ed Nicoll, Senior Engineering Technician

### **Florida Keys Association of Dive Operators**

Maryanne Rockett, Lower Keys Representative (Underseas, Inc.)  
Spencer Slate, President

### **Gulf County**

Board of County Commissioners  
Office of the Chief Administrator  
Debbe Wibberg, Administrative Assistant  
Emergency Management  
Marshall Nelson, Emergency Management Coordinator

### **Gulf County Public Library**

Jean Faliski, Library Branch Manager

### **Gulf of Mexico Fisheries Management Council**

Anthony (Tony) Lamberte, Economist

### **Key Largo Public Library**

Donna Bosold, Branch Manager

### **Key West Bar Pilots Association**

Captain Edwin E. Crusoe IV  
Captain Robert Johnson

### **Key West Bight**

Mark Summers, Manager

### **Key West Chamber of Commerce**

Holland Brown, Economic Analyst  
Virginia Penico, Executive Vice-President

## **LOCAL AND REGIONAL AGENCIES (continued)**

### **Key West Hotel/Motel Association**

Jack Smith, Executive Vice-President

### **Lighthouse Utility Company**

Rick Simmons, Operations Manager

### **Lower Keys Chamber of Commerce**

Barbara, Administrative Assistant

Carol A. Fisher, Chamber Manager

Nancy Herlehy

### **Marathon Airport**

Jim Shimkus, Airport Manager

### **Marathon Chamber of Commerce**

Ray Kitchner, Executive Director

### **Marine Industries Association of South Florida**

Frank Herhold, Executive Director

### **Monroe County**

Shirley Freeman, former Mayor

Wilhemina Harvey, County Commissioner

Ruth Ann Jantzen, Administrative Assistant to County Clerk

#### **Community Services**

##### **Airport Services**

Key West International Airport

Arthur (Art) R. Skelly, Director of Airports

##### **Cooperative Extension Services**

Douglas Gregory, County Director/Sea Grant Marine Agent

#### **Environmental Management**

Diana Stephenson, Biologist

##### **Environmental Resources**

Ross Alliston, Manager

##### **Solid Waste Management Division**

Carol Cobb, Administrative Coordinator

#### **Growth Management Division**

Dianne M. Bair, FEMA Projects Coordinator

Bob Herman, Executive Director

#### **Growth Management Division (continued)**

##### **Marine Resources Office**

George Garrett, Director

##### **Planning Department**

Harry Delashmutt, Biologist

Linda Fatora, Graphic Artist, Graphics Department

Tim McGarry, Director of Planning

Bill Miller (no longer there)

Kim Ogren, Comprehensive Planner

Julie, Receptionist



## **LOCAL AND REGIONAL AGENCIES (continued)**

### **Monroe County (continued)**

#### **Management Services**

##### **Management and Budget Office**

John Carter, Director

#### **Public Safety**

##### **Emergency Management Division**

Lisa Coats, Emergency Management Coordinator

Jerald L. O'Cathey, Emergency Management Coordinator

Michael Puto, Emergency Management Coordinator

#### **Public Works**

##### **Engineering Office**

David Koppel, P.E., Director and County Engineer

#### **Tourism Development Council**

Linda MacMinn, Director of Marketing

#### **Property Appraiser's Office**

Mike Bole, Deputy Appraiser, Plantation Office

Mr. Higgs, Property Appraiser

Cindy Miller, Tax Assessor, Property Appraiser, Computer Operations Department

Alan Smith, Tax Assessor

Paul Sprague, GIS Cartographic Supervisor

### **Monroe County Commercial Fishermen, Inc.**

John Sanchez, Executive Director

### **Monroe County Public Library**

#### **Main Branch**

John Brown, Head of Technical Services

#### **Marathon—George Dolezal Public Library**

Lynn Petty

### **Northwest Florida Emergency Planning Department**

Glen Butts, Biologist

### **Northwest Florida Water Management District**

Doug Barr, Executive Director

Doug Barton, GIS Division

Angela Chelette, Administrator

#### **Groundwater Section**

Tom Pratt, Bureau Chief

Tonya Williams, Student Intern

### **Okaloosa County**

#### **Emergency Services**

##### **Emergency Management**

George Collins, EM Manager/911

##### **Planning and Inspection Department**

Jim Dukes, Computer Technician

### **Pensacola Port Authority**

Tom Wharton, Marketing Manager

## **LOCAL AND REGIONAL AGENCIES (continued)**

### **Plantation Key Weigh Station**

Lieutenant Defeo, Weigh Station Officer

### **Port Authority of Port St. Joe**

Gary Thomas Pitts, Vice Chairman

### **Port Commission, New Orleans**

J. Ron Brinson, President and Chief Executive Officer

Jim Reese, Assistant to the President

### **Port of Galveston**

Ernest Conner, Port Director

### **Port of Houston Commission, Port of Houston Authority**

Walt Kleczkowski, Port Operations, Turning Basin Terminal and Jacintoport Terminal Manager

### **Port of Pascagoula—Jackson County Port Authority**

Melody Bradley, Port Director

### **Port of Pensacola**

Tyler Jones, Port Director

### **Port Panama City USA**

Wayne Creel, Dock Master

Joyce Soares, Billing Clerk

### **Port St. Joe Wastewater Treatment Plant**

Lynn Todd, Lab Supervisor

### **Santa Rosa County**

Board of County Commissioners

Engineering Department

Roger Blaylock, County Engineer

Public Services

Planning Department

Bob Arn, Planning Director

Emergency Management Department

Tom Roche, Director

### **South Florida Regional Planning Council, District 11 (Hollywood)**

Planning and Analysis

Doris A. Mitchell, Planner

Richard Ogburn, Principal Planner

### **South Florida Water Management District (West Palm Beach)**

Ron Peekstok, Staff Environmental Analyst

Surface Water Division

Regulations Department

Edwardo Lopez, Staff Civil Engineer

Florida Keys Service Center (Big Pine Key)

Cheri Turner, Public Communications Associate

## **LOCAL AND REGIONAL AGENCIES (continued)**

Tampa Bay Regional Planning Council, District 8 (St. Petersburg)  
Julia Green, Executive Director

Tampa Bay International Terminals  
Elsworth Brown, Director of Operations

Tampa Port Authority  
Charles (Chuck) Towsley, Managing Director  
Operations Department  
Jim Watson, Operations Superintendent  
Traffic Department  
Deborah Davis, Marketing Services

Tourist Development Council—Recreational Fishing Umbrella  
Jim Sharpe, Sea Boots Outfitters

West Florida Regional Planning Council, District 1 (Pensacola)  
Dan Krummel, Executive Director  
Ms. Terry Joseph, Director of Environmental Planning  
Larry McDonald, Senior Planner  
Wiley Page, Senior Transportation Planner (no longer there)

Western Gulf Maritime Association  
Ted Thorjussen, President

## **PRIVATE AND NON-PROFIT ORGANIZATIONS AND INDIVIDUALS**

A & B Marina  
Dennis Chandler, Manager

Aerospace Corporation  
Norm Keegan, Project Engineer

Boeing North America  
Chuck Hart, Site Manager

Cayo Grande  
Sandy Shelling, Concierge

City Electric System  
Robert (Rob) Shaw, Geographic Information Systems Analyst

Coleman Research Corporation  
Harry Whitmer, Systems Safety

Darby Printing Company  
Natasha, Receptionist

Dolphin Marina (Looe Key Reef Center, Big Pine Key)  
Vince Taporowski, General Manager

## **PRIVATE AND NON-PROFIT ORGANIZATIONS AND INDIVIDUALS (continued)**

EARTH TECH, Long Beach

Jim Unmack, Project Engineer (see Westates EHS Services)

El Dorado Engineering

Rich Fransden, Program Designer

Falcon Fleet—South Florida Sea Ventures, Inc. (Captain Red and Whale Watcher ferries)

Sean Minogue, President

Federal Express

Dorita Miranda, Customer Service Representative

Florida International University

Southeast Environmental Research Program (SERP)

Joseph N. Boyer, PhD

Biological Services

Professor Ronald “Ron” Jones, Director

Florida Keys Community College

Library

Maria Soule, Librarian

Florida League of Anglers

David Gluckman, Legislative Council

Florida Natural Areas Inventory (FNAI)

Susan Hortenstine, Financial Administrator

Gary Knight, Director/Program Coordinator

Barbara Lenczewski, PhD, Environmental Reviewer

Jim Muller (private consultant, no longer with FNAI)

Cathleen (Katie) NeSmith, Zoological Research Scientist

Florida State University

Institute of Science and Public Affairs

Peter Crafft, Director of Cartography

Florida Trend Magazine

Connie Lopez, Researcher

Governors Council on Indian Affairs

Joe Quetone, Executive Director

GRC International, Inc.

National Program Operations

Decision Technologies Division

Mark A. Mercadante, Senior Environmental Scientist

Greyhound Bus Lines

Orlando Rodriguez, Travel Agent

## **PRIVATE AND NON-PROFIT ORGANIZATIONS AND INDIVIDUALS (continued)**

### **Griner, Inc.**

Randy Irion, Airport Noise Analyst  
Debra Murphy, Senior Airport Noise Specialist

### **J. & S. Sponge Importers/Exporters**

Pete Skaroulis

### **Key West Association of Realtors**

Ed Kolesar, Multiple Listing Service Chairman

### **Key West-Conch Harbor Marina**

Claude Owens, Dock Master

### **Key West Excursions—Florida Cruise and Ferry Service**

(Friendship 4 & 5 ferries)

Carol, Booking Agent

Dick Massari

Bob McCune, General Manager

Arthur Savage, President, A.R. Savage and Company

Kristie Vallee, Booking Agent

### **Kit Curtan (Private contractor for USFWS National Biological Survey)**

### **Latitude 24 Real Estate, Inc.**

Chuck Vowels III, Broker, Multiple Listing Service Chairman

### **Lawbook Distributors**

Receptionist

### **Lockheed-Martin**

Rob Morrow, Site Manager

Training and Technical Services

Larry McClain, Environmental Manager/On-site Engineer

### **Loral**

U.S. Air Force Aerostat Site

Harry H. Hayes, Site Manager

### **Manoa Public Library**

Lynn Masumoto, Librarian

### **Matrix Audio/Visual, Inc.**

Phil Parcase, Vice President

Phil Phifer (no longer there)

### **Mersea Ship, Inc.**

Giovanni Sotgiu, Project Director

### **Miss Barnegat Light**

Ann Van Nocker, Secretary

## **PRIVATE AND NON-PROFIT ORGANIZATIONS AND INDIVIDUALS (continued)**

Okaloosa-Walton Community College

Niceville Campus

Library

Margaret Philips, Acquisitions

University of West Florida—Fort Walton Beach Campus (cooperative with OWCC)

University Library

Dr. Lois C. Gilmer

Pennsylvania State University

Graduate Program in Acoustics

Victor W. Sparrow, Ph.D., Associate Professor of Acoustics

Presnell's Fish Camp

Mr. Eckley, Proprietor and Guide

OST Environmental (Environmental Science & Engineering, Inc.)

Raphael DePaz, Project Engineer

Raytheon/Naval Systems

Drew Dowling, Marketing Manager

SAIC—Fort Walton Beach Office

Environmental Science and Compliance Division

Jamie McKee, Marine Biologist

Ned Studholm

Sandia National Laboratory

Bruce Swanson, Project Engineer

SciComm, Inc.

David A. Carlisle

Southern Bell

Stuart-Newman Associates, Miami

Andy Newman, President

Suburban Propane

Peggy Leger, Customer Representative

Sugarloaf Key Volunteer Fire Department

The Archaeological and Historical Conservancy

Bob Carr, Dade County Archaeologist

The Nature Conservancy of the Florida Keys

Mark Robertson, Director

Tallahassee Field Office

## **PRIVATE AND NON-PROFIT ORGANIZATIONS AND INDIVIDUALS (continued)**

The New SeaEscape Cruises, LTD  
Receptionist

TRW–Redi Property Data, Inc.  
Jim Haggerty, Sales Representative

University of Alabama in Huntsville  
Earth Systems Science Lab (ESSL)  
Neur Galani, Adjunct Faculty  
Dr. Dick McNider, Director  
Bettinna E. Student, Intern

University of Florida  
Alan Bolton, Courtesy Co-assistant Professor  
College of Agriculture  
Department of Wildlife Ecology and Conservation  
Margaret “Meg” M. Lamont, Biological Scientist  
Food and Resource Economics Department  
Charles M. Adams, Professor, Marine Economy  
College of Engineering  
Department of Environmental Engineering Sciences  
Phelps Lab—Center for Wetlands  
Sue Ellen Smith  
College of Liberal Arts and Sciences  
Department of Zoology  
Archie Carr Center for Sea Turtle Research  
Florida Sea Grant College Program  
Douglas R. Gregory, Jr., CED and Ext. Agt. 3 (county ops)  
Warrington College of Business Administration  
Bureau of Economic and Business Research  
Operations  
Information and Publication Services  
Carol McLarty, B.S., Researcher

University of Hawaii at Manoa Library  
Gifts and Exchange Department  
Jean Kusano

University of Miami  
Biology Department  
Dr. Kathleen Sullivan, Marine Ecologist

University of South Florida  
Center for Economic & Management Research  
Thomas J. Murray, Research Associate/Research Economist

Veronda Environmental Consulting  
Rick Veronda, Transportation and Air/Noise Quality Consulting

**PRIVATE AND NON-PROFIT ORGANIZATIONS AND INDIVIDUALS (continued)**

Vitro Services (now Tracor)

Don Lolly, On-site Manager

Randy M<sup>c</sup>Clain, Environmental Coordinator

Bobby Witfield, Mission Director

Westates EHS Services, Inc.

James L. (Jim) Unmack, Senior Engineer

Wyle Laboratories—Arlington

Ken Plotkin, Ph.D., Senior Scientist

Yankee Fleet (Yankee Freedom ferry)

Nancy Gallen, Reservationist



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**Appendix G**  
**Launch Hazard Area Development Process**

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# APPENDIX G

## LAUNCH HAZARD AREA DEVELOPMENT PROCESS

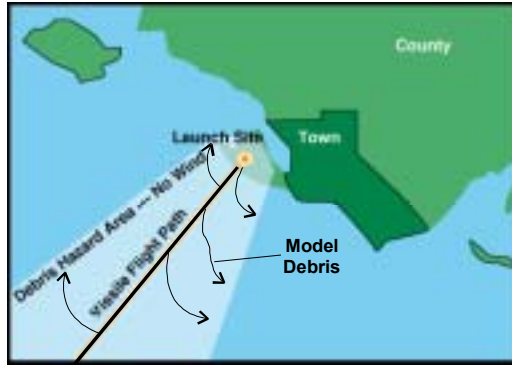
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The following steps describe how the range safety engineers develop an LHA. The normal or intended missile flight path is plotted from the proposed launch site. This flight path is three-dimensional (altitude, down range and cross range). This flight path is entered into a computer model which contains all of the important data for that particular missile, including the various pieces of debris that would be created if the missile were to be destroyed (figure G-1).



**Figure G-1: The Launch Hazard Area Development Process—Flight Path**

Using the computer model, the missile is turned perpendicular to and behind its intended flight path to fly for 5 seconds. After 5 seconds, a missile destruct action is simulated and the model imitates the resulting pieces of missile debris. Using the initial momentum and aerodynamic characteristics of each piece of debris, the direction and distance traveled by these pieces is determined. The most distant piece of debris from the nominal flight path defines a point on the Debris Hazard Line. This process is continued every five seconds throughout the entire missile flight. When all the turns have been completed, the most distant pieces are connected together defining the boundary of the Debris Hazard Area. However, no wind effects have been included, and wind can affect the final impact point of the debris. The result is a Debris Hazard Area—No Wind (figure G-2).



**Figure G-2: Combining Debris Model and Direction Change**

Wind data compiled over the past 20 years is used to determine the wind effects on the missile debris. A 50 percent wind profile is applied to the debris. A 50 percent wind profile is defined by the wind speed that is not exceeded 50 percent of the time from every direction. So, a 50 percent wind blowing from the north could be 25 knots, while a 50 percent wind blowing from the west could be 15 knots. Wind data is compiled for every month of the year up to an altitude of 30 kilometers (19 miles). Using the month with the highest 50 percent winds and using the wind effects at the point from which each piece of debris begins its fall, a new wind-aided most distant piece of debris point is defined for all cases. Heavier, denser pieces of debris are less affected by wind than lighter, less dense pieces. Again, the wind-aided most distant pieces are connected together, giving the boundary of the Debris Hazard Area—With Wind (figure G-3).



**Figure G-3: Adding the Wind**

Should the resulting Debris Hazard Area—With Wind include public or private property that the Government does not want to put at risk, the wind limits for launch would be restricted so as not to hazard those areas. That means that the LHA boundary excludes the protected areas and is drawn closer to the launch site, by constraining the allowable winds. This means that in the direction of these properties there must be less than a 50 percent wind in order to conduct a launch (figure G-4).



**Figure G-4: Implementing the Launch Hazard Area Restrictions**

Combining the Debris Hazard Area—With Wind line and the public and private property boundaries defines the actual Launch Hazard Area that would be cleared of non-mission personnel on the day of the launch. Prior to the launch, an analysis using the computer model and the current actual winds is performed. If debris is projected to exceed the LHA, the launch is canceled or delayed until conditions are safe. No one can override this safety requirement (figure G-5).



**Figure G-5: Implementing the Launch Hazard Area Restrictions**

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## **Appendix H**

### **Chemical Descriptions**

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# APPENDIX H

## CHEMICAL DESCRIPTIONS

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### **Triethyl Phosphate**

Triethyl phosphate may be used as a chemical simulant for testing purposes. Triethyl phosphate is a colorless liquid industrial chemical with a mild odor. It is used as a plasticizer for resins, plastics, and gums; as a lacquer remover; and as a solvent in adhesives on food packages. Triethyl phosphate was selected as a simulant because it is commercially available in quantities necessary for testing, is more environmentally benign than other compounds, and its physical characteristics resemble those of real chemical agents. The U.S. Department of Transportation determined that neither the toxicity nor flammability of triethyl phosphate warrant regulating the transportation of it as hazardous material. The U.S. Environmental Protection Agency does not regulate triethyl phosphate as a pesticide under the Federal Insecticide, Fungicide, and Rodenticide Act or as a hazardous waste under the Resource Conservation and Recovery Act, nor has the Occupational Safety and Health Administration set occupational exposure limits for it. However, triethyl phosphate is listed and regulated in the Toxic Substances Control Act. The maximum amount of triethyl phosphate needed for a launch would be one 208-liter (55-gallon) drum. (U.S. Army Space and Strategic Defense Command, 1994) This amount is equivalent to 222 kilograms (489.5 pounds). Depleted uranium will not be used in place of warheads.

### **Unsymmetrical Dimethylhydrazine (UDMH)**

Unsymmetrical dimethylhydrazine (UDMH) is a colorless liquid with an ammonia-like fish odor that is hypergolic with many oxidants (such as inhibited red fuming nitric acid [IRFNA]) and is therefore used as a high-energy propellant for liquid-fueled missiles such as the Lance. UDMH is a flammable liquid and is considered a poison by the U.S. Department of Transportation. If UDMH becomes a waste, it must be managed according to Federal or state hazardous waste regulations. It is listed on the U.S. Environmental Protection Agency's Extremely Hazardous Substances List. Emergency Planning and Community Right-to-Know reporting is required for a release of over 4.54 kilograms (10 pounds) and a threshold planning quantity of 454 kilograms (1,000 pounds). The reportable quantity of UDMH under Section 311 of the Clean Water Act is 454 kilograms (1,000 pounds).

### **Inhibited Red Fuming Nitric Acid (IRFNA)**

IRFNA is a yellow to red-brown, clear, strongly fuming, very corrosive liquid that releases toxic nitric acid vapor. Hypergolic fuels quickly ignite on contact with IRFNA. If IRFNA becomes a waste, it must be managed according to Federal or state hazardous waste regulations. Emergency Planning and Community Right-to-Know reporting is required for a release over 454 kilograms (1,000 pounds) and a threshold planning quantity of 454 kilograms (1,000 pounds). The reportable quantity of IRFNA under Section 311 of the Clean Water Act is 454 kilograms (1,000 pounds).

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**Appendix I**  
**Example Evacuation Plan**

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EXAMPLE

**EGLIN GULF TEST RANGE  
THEATER MISSILE DEFENSE MISSIONS**

**EXAMPLE EVACUATION PLAN**

This evacuation plan is an example of the type of site-specific plan that would be prepared should a specific alternative be selected.

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### 1.0 INTRODUCTION

#### 1.1 PURPOSE

The purpose of this Evacuation Plan is to define the requirements and procedures to be implemented during pre-launch clearances associated with extended test range mission activities originating at remote locations. Requirements of this plan shall be observed for all TMD-related launches.

#### 1.2 POLICY STATEMENT

It is the policy of the U.S. Air Force and the Air Force Development Test Center (AFDTC) that in all areas where there is a reasonable potential for the impact of flight hardware (either as a result of a nominal missile flight operation or a launch/flight anomaly) clearance of all civilian and unauthorized military personnel shall occur. Such areas include:

- Mission-specific near-launch hazard area (LHA)
- Mission-specific impact areas within designated booster drop zone

Due to mission-specific requirements, additional areas where pre-launch clearances may be warranted may be designated by the Eglin AFB Range Safety Office (AFDTC/SEU), the Chief of Safety (AFDTC/SE), or the Commander, Eglin AFB (AFDTC/CC).

#### 1.3 REFERENCES

The requirements of this plan have been developed in accordance with the following:

Air Force Instruction (AFI) 32-2001, *The Fire Protection Operations and Fire Prevention Program* (covers reciprocal Fire Department Agreement)  
AFI 91-202, *The U.S. Air Force Mishap Prevention Program*  
AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*  
AFDTC Instruction 13-204, *Mission Scheduling and Control*  
AFDTC Instruction 32-3001, *Explosive Ordnance Disposal (EOD) Assistance to Local Government and Civil Authorities*  
AFDTC Instruction 91-201, *AFDTC Test Safety Review Process*  
AFDTC Instruction 91-203, *AFDTC Safety Program*  
AFDTC Instruction 99-101, *Planning, Commanding, and Controlling of Off-base Test Activities*  
AFDTC Instruction 99-102, *AFDTC Test and Evaluation Workload Acceptance, Coordination, and Documentation*  
AFMAN 11-208, *The U.S. Military Notice to Airmen (NOTAM) System* (formerly AFR 55-16)  
DOD Directive 5000.1, Part 6, Section 1, *Systems Safety, Health Hazards, and Environmental Impact*

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DOD Directive 6050.1, *Environmental Effects in the U.S. of Department of Defense Actions*

### 2.0 RESPONSIBILITIES

#### 2.1 COMMANDER, AFDTC (AFDTC/CC)

The Commander, AFDTC (or his authorized representative) shall ensure that subordinate and tenant units and range user organizations observe all requirements of this plan during pre-launch, launch, and post-launch activities.

Final authority and responsibility for all aspects of range safety at Eglin AFB rest with the AFDTC Commander. This function is administered by the Deputy for Safety (AFDTC/SE), who is supported in this task by organizations with specific areas of responsibility.

#### 2.2 CHIEF OF SAFETY OFFICE (AFDTC/SE)

The Chief of Safety is the principal adviser to the Command Post regarding health and safety matters. Duties include:

- Providing staff assistance to ensure that the health and safety of people and property is not jeopardized
- Providing guidance and assistance to project personnel on test safety planning matters
- Assisting during the test planning phase to ensure identification of necessary safety constraints/procedures, including evacuation
- Preparing safety appendices for each test/task directive
- Using results of analysis provided by Eglin AFB Range Safety Office to determine evacuation zones which fully encompass the areas designated in the analysis

#### 2.3 AFDTC RANGE SAFETY OFFICE (AFDTC/SEV)

The AFDTC Range Safety Office is responsible for determining the extent of the following:

- Mission-specific LHAs
- All designated mission-specific impact areas
- Additional areas where there exists a reasonable probability for ground impact of flight hardware due to planned or anomalous activities

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Designation of the above areas shall be accomplished by examination of flight system performance characteristics (e.g., worst-case turns), anticipated impacts, system debris patterns, meteorological effects, maximum energy footprints and other specific data elements.

The results of this analysis will be expressed as bounded areas which can be presented on maps. Analysis results, including all necessary flight system and mission performance information, will be provided to the Chief of Safety for implementation of appropriate evacuation procedures.

In addition, the AFDTC Range Safety Office is responsible for the planning and control of clearance activities. This includes:

- Ensuring that appropriate agreements with all affected landowners are in place and adequately address clearance requirements
- Coordinating with and assisting local civilian authorities concerning clearance and evacuation requirements/activities
- Providing notice to affected persons in accordance with current Eglin AFB notification policies (see Section 3.1)
- Establishing appropriate roadblocks prior to launch activities to prevent traffic access into cleared areas (see Section 3.2)
- Conducting and/or coordinating appropriate ground and air surveillance sweeps to insure that all areas are cleared immediately prior to launch time. These sweeps will be conducted in accordance with agreements between Eglin AFB and the appropriate state (Florida Marine Patrol) and Federal (U.S. Coast Guard) agencies to insure that cultural and biological resources are not adversely affected. These supporting agencies will notify the AFDTC Range Safety Office in the event that persons are observed in any evacuation area through the Central Control Facility (CCF) (see Section 3.3.2)

### **2.4 STAFF METEOROLOGIST (46 OSS/OSWT)**

The Staff Meteorologist will provide the AFDTC Range Safety Office, project officers, and other project support personnel with necessary weather information required to accomplish safety studies and mission planning.

### **2.5 46 OPERATIONS SUPPORT SQUADRON (46 OSS)**

The AFDTC Range Safety Office requests clearance notification, such as the Notice to Airmen (NOTAM) and Notice to Mariners (NOTMAR) through the Scheduling Facility (see section 3.1). These offices, in turn, contact the U.S. Coast Guard and either the Jacksonville or Miami offices of the Federal Aviation Administration (FAA). Specific duties include:

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- Range Scheduling and Control (46 OSS/OSCS) will schedule all missions using AFDTC test areas and resources, or needed premission preparation of certain aircraft, and missions radiating or using any part of the radio frequency spectrum
- The Scheduling Planning Element (46 OSS/OSCSP) is responsible for review and issuance of the required NOTAMs
- Frequency Control and Analysis (46 OSS/OSCSF) or the Range Operations Control Center (ROCC) will broadcast marine advisories to commercial vessels concerning TMD testing activities conducted over the Gulf of Mexico in order to ensure proper evacuation and maximum safety, and to enhance community relations

### 2.6 SECURITY POLICE (96 SPS)

- Provide guidance for notification procedures for evacuating on-base areas
- Evacuate military-owned land areas and, where applicable, non-Federal lands adjacent to launch sites or within LHAs
- Ensure designated evacuation areas remain clear of non-authorized personnel or civilians immediately prior to and during launches/tests and until clearance areas are released and/or reentry is allowed; may be assisted by civilian authorities per current agreements

### 2.7 ASSISTING CIVILIAN AGENCIES

Civilian law enforcement and civil authorities will assist in evacuation notifications and enforcement of evacuation requirements in accordance with existing Mutual Aid Agreements or Memoranda Of Understanding. In addition, local law authorities will be responsible for evacuation within their own jurisdiction and will clear and patrol non-Federal evacuation areas per said agreements.

Reciprocal aid agreements are currently in place between AFDTC and local Emergency Management authorities.

### 3.0 EVACUATION METHODS AND REQUIREMENTS

#### 3.1 NOTIFICATION

The AFDTC Office of Public Affairs (AFDTC/PA) sends out a news release prior to tests that may affect the public; news releases will discuss road closures as appropriate. Either the responsible Test Engineer or the AFDTC AFB Range Safety Office may notify AFDTC/PA of requests and pertinent information. Additional public notification procedures would be used as needed.

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Notifications shall be made to affected persons and authorized civilian agencies for each launch operation requiring area evacuation. Notifications should meet the following criteria:

- For all land, sea surface, and airspace areas, the date and location of scheduled flight tests [or training events] and notices of intent to clear such areas would be provided at least 1 week (2 weeks for airspace) in advance to local newspapers and broadcast in local news media
- For TMD-related launches, the boundaries of LHAs would be posted with appropriate notifications
- Notice of the planned operation, the extent of evacuated areas, and locations of planned roadblocks (see section 3.2) will be provided to local daily newspapers one week prior to the scheduled launch and on local radio and/or television stations
- In the case of weekly newspapers, notification would occur on whatever deadline in the two-week period prior to launch is considered necessary to ensure publication at least one week prior to the launch event
- Per AFDTC Range Safety Office request, a NOTAM to clear certain airspace areas would be published by the FAA. AFDTC's standard procedures are to issue NOTAMS at least two days prior to a test.
- Aircraft transiting the Gulf of Mexico on a low-altitude airway or high-altitude jet route that are potentially affected by flight test activities would be notified by the FAA of any necessary rerouting before departing their originating airport enabling the securing of additional fuel prior to takeoff.
- Conditions that are expected to exist for an extended period of time will be reported in a flight data center (FDC) or NOTAM D (distant) and published in the next biweekly Notice to Airmen publication. Once published, these NOTAMs are not volunteered during weather briefings. Typically, the FDC NOTAMs are transmitted nationwide to all automated flight service stations (AFSS) within 643.7 kilometers (400 miles) of their facility. FDC NOTAMs greater than 643.7 kilometers (400 miles) from the AFSS, or NOTAMs that have already been published, are given to pilots only on request. NOTAM ds are sent to all navigational facilities that are a part of the National Airspace System.
- Per AFDTC Range Safety Office request, a NOTMAR to clear certain sea surface areas would be published by the U.S. Coast Guard. AFDTC's standard procedures are to issue NOTMARS at least one week prior to launches/tests

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- Notice of intent to clear certain sea surface areas (such as the Intracoastal Waterway) for safety reasons would be provided to local newspapers and news media, and distributed to commercial fishing, small craft operators, and tourist boating trade associations
- Advanced notification and communication with commercial fishermen would be made to ensure planning and adjusting of fishing activities where required
- Test mission personnel will place individual calls to local authorities (such as port authorities, harbor masters, and small airport managers) as project specifics dictate
- Warnings are transmitted over specific Marine VHF, HF-AM, and Citizens Band Radio Channels and are broadcast at 2-hour, 1-hour-, and 30-minute intervals prior to the launch
- The Division of Emergency Management would receive notification of planned launches, mishaps, and HAZMAT incidents as well as coordination on any emergency incidents

### 3.1.1 Civilian Agencies

Agencies may be contacted as deemed appropriate by the AFDTC/CC, the On-Scene Commander, and/or the AFDTC Range Safety Office.

### 3.1.2 Private Citizens

All persons potentially affected by a launch operation clearance shall be provided notification as follows:

- Notice of the planned operation, the extent of cleared areas, and locations of planned roadblocks will be provided to local daily newspapers, radio and/or television stations 1 week prior to the scheduled launch. In the case of weekly newspapers, notification would occur on whatever deadline in the 2-week period prior to launch is considered necessary to provide publication at least 1 week prior to the launch event
- Notice of road closure(s) shall be posted along all roadways traveling into evacuation areas at least 1 week prior to the planned operation

## 3.2 ROADBLOCKS

Roadblocks shall be used as appropriate to limit unauthorized access into clearance areas. The AFDTC Range Safety Office will designate appropriate roadblock locations on

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roads leading into evacuation areas. These locations will be sited such that traffic can be stopped outside the clearance area at launch time.

Roadblocks will be established by Security Police and/or the On-base Range Operation and Maintenance (O&M) Contractor personnel, augmented as needed by members of local law enforcement. For off-base road-blocks, civil and local law authorities, such as the county sheriff's offices and federal marshals, will assist in personnel staffing needs.

At each roadblock, positive communication will be established through the CCF and maintained between AFDTC Range Safety Office and appropriate security personnel. This communication occurs via either telephones or military radio systems.

Roadblock locations shall be established at least 1 hour prior to launch time; however, they will not initially be "active" (i.e., will not halt traffic). Once established, roadblock personnel will provide a warning of the clearance requirements to all motorists and other persons entering into the designated clearance areas.

At least 1 hour prior to launch, roadblocks will become partially "active," restricting the passage of all non-vehicular traffic such as bicycles and pedestrians. Roadblocks will become fully "active" at least 30 minutes prior to the scheduled launch time. While fully "active," no unauthorized vehicular or foot traffic will be allowed to pass the roadblock location. Roadblocks shall remain active until instructed by the AFDTC Range Safety Office that it is safe to allow traffic to pass. The maximum amount of time a roadblock on a major highway will remain active should be 1 hour.

In the event that an unauthorized entry of a clearance area occurs at any "active" roadblock, an immediate notification will be made to AFDTC Range Safety Office and security personnel. A launch "hold" may be required for safety reasons until the security of the clearance area is re-established.

In the event of a launch mishap, all roadblocks will remain "active" until individually notified by AFDTC Range Safety Office.

### 3.3 AREA CLEARANCE AND SURVEILLANCE

#### Area Clearance

Clearing land, airspace, or water ranges of personnel during launch/test missions is a standard part of supervising weapons testing or training. Clearance areas are determined by the AFDTC Range Safety Office to encompass the maximum probable distribution of debris or impact points of other missile components). As mentioned previously, the extent, date, and duration of the clearances are communicated to the FAA, the U.S. Coast Guard, the Florida Marine Patrol, local police/emergency response jurisdictions, and other agencies as deemed appropriate.

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Except under extreme circumstances, evacuation from the clearance areas shall be the responsibility of each individual within the designated areas. As detailed in Section 3.1 above, all persons should be properly notified well in advance of any planned clearance.

Mission personnel clear the test area prior to the mission by closing range gates and blocking all passable trails. Clearance of all designated areas shall be formally commenced at least 4 hours prior to the launch and should be completed at least 1 hour prior to launch time. Specifics are:

- Military-owned Land - Military Police close military lands at least 1 hour prior to launch time. For non-Federal land adjacent to a launch site and within the LHA, an easement would be required for local civilian law enforcement personnel to have the authority to proceed with clearance
- Off-base Lands - Subject to the conditions of appropriate Memoranda of Agreement, local law enforcement officials would close the required area(s) 1 hour before planned launches
- Airspace - Subject to the conditions of appropriate Memoranda of Agreement, FAA officials would close the area(s) one half-hour before the planned launches
- Water areas - Subject to the conditions of appropriate Memoranda of Agreement, U.S. Coast Guard and FMP officials would close the sea surface area(s) 4 hours prior to planned launches. Specifically, areas within a 22.2-kilometer (12-nautical-mile) limit would be cleared with the cooperation of both the FMP/U.S. Coast Guard; beyond that, clearance would fall under the jurisdiction of the U.S. Coast Guard, alone

Other areas under the flight path, but not in a predicted impact or debris area, would be monitored prior to the test event to determine the location of population or traffic; if range safety office determined that the population or ship traffic was in a safe position, the test would proceed.

### Area Surveillance

In order to ensure the effectiveness of evacuation procedures, the AFDTC Range Safety Office will implement surveillance sweeps of all evacuation areas as part of the pre-launch activities. These sweeps will be conducted on a regular basis, and constant radio contact will be maintained between surveillance teams (see below) and the AFDTC Range Safety Office. Helicopters and other aircraft (typically, the E-3 Sentry Airborne Warning and Control System (AWACS)) would be used, augmented by radar, ground security patrols and beach observers/spotters as required. Security sweeps shall be sufficient to determine the following:

- That all non-mission essential persons have properly evacuated the designated areas at least 1 hour prior to the launch time

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- That all non-mission essential vehicles have left the evacuation areas at least 30 minutes prior to launch time

Specifics are:

- Military-owned Land - Security Police and, as required, civilian law enforcement personnel, would patrol clearance areas to ensure they are free of non-mission personnel, particularly designated LHAs, which will be cleared of all people. This could include civilian personnel in cases where LHA boundaries extend into uncontrolled or private property (easements would be obtained to allow clearance of such properties). Personnel observed in any designated clearance area shall be provided with verbal warning of the planned operation and the evacuation requirements and advised to evacuate immediately
- Off-base Lands - Subject to the conditions of appropriate Memoranda of Agreement, local law enforcement officials would close required area(s) one hour prior to planned launch and patrol them to ensure that they are clear of all persons
- Airspace - One half hour prior to missile test flights or training events, radar and aerial surveillance aircraft will patrol proposed airspace clearance areas to locate any remaining aircraft. Should any be found, surveillance aircraft would initiate radio contact with the plane and request their departure from the area. Should the aircraft decline, its tail number would be noted and communicated to the FAA
- Water areas - Subject to the conditions of appropriate Memoranda of Agreement, Coast Guard and FMP officials would patrol sea surface clearance area(s) to ensure they are free of ships or water craft. One hour prior to missile test flights or training events, surveillance aircraft will also monitor the areas. Should any ships be detected, the U.S. Coast Guard would be contacted and either they or the FMP would be requested to escort the ship(s) out of any and all clearance areas

Continual surveillance of the area would be performed to ensure that it remains cleared up to and during launch time, and until clearance areas are released (see section 3.5).

If it is determined that proper clearance has not occurred (based on the above criteria) or that accidental entry of cleared areas by unauthorized personnel has taken place, notification will be made *immediately* to AFDTC Range Safety Office and security response personnel. A launch "hold" may be required for safety reasons until the security of the evacuation area is re-established. Security personnel can provide assistance with evacuation under "hold" conditions. If it is determined that the clearance cannot be

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properly completed, cancellation of the launch by the AFDTC Range Safety Officer may be required.

### **3.4 EXCEPTIONS FOR EMERGENCY RESPONSE**

Ambulance/medical or fire response units shall be permitted to pass through "active" roadblocks in the performance of their duties. Such an occurrence shall be immediately reported to AFDTC Range Safety Office, and the Test Engineer, who will respond appropriately depending on time remaining before launch.

### **3.5 CLEARANCE AREA RELEASE**

After completion of a missile flight test or training event, the AFDTC Range Safety Office releases the clearance areas and/or allows reentry. However, the 30-minute minimum would not apply in the event of a launch mishap, such as an accident or missile flight termination.

Clearance releases will be accomplished as soon a determination has been made that the hazardous aspects (such as presence of hazardous debris or indication of falling debris after completion of intercept) of test/launches are completed. Notification will be made by radio or telephone to aviation, maritime, and (where applicable) civil authorities.

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**Appendix J**  
**Example Emergency Response Plan**

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**EGLIN GULF TEST RANGE  
THEATER MISSILE DEFENSE MISSIONS**

**EXAMPLE EMERGENCY RESPONSE PLAN**

This emergency response plan is an example of the type of site-specific plan that would be prepared should a specific alternative be selected.

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### 1.0 INTRODUCTION

#### 1.1 PURPOSE

The purpose of this Emergency Response Plan is to define the initial response requirements and procedures to be implemented in the event that flight system malfunction and/or flight termination occurs during flight activities associated with extended test range mission activities. This draft plan implements AFDTC Plan 32-1, *Disaster Preparedness Operations Plan*; AFDTC Plan 32-5, *Hazardous Waste Management Plan*; and AFDTC Plan 32-6, *Oil and Hazardous Substance Pollution Contingency Plan*. Requirements of this plan shall be observed for all TMD-related launches.

#### 1.2 POLICY STATEMENT

It is the policy of the U.S. Air Force and Air Force Development Test Center (AFDTC) to immediately respond in the event of an emergency during any missile flight operation. Initial response to any areas impacted by flight hardware shall be to secure and render safe the area for follow-on recovery and restoration activities. All areas affected by ground impact of flight hardware shall be cleared of all recoverable debris and environmentally restored.

In actions wherein the recovery of launch hardware is required, such procedures shall be accomplished in a manner consistent with AFDTC requirements as set forth in applicable environmental documentation and/or conditions specified by the appropriate land owner(s).

#### 1.3 REFERENCES

The requirements of this Plan have been developed in accordance with the following:

AFDTC Plan 32-1, *Disaster Preparedness Operations Plan*  
AFDTC Plan 32-5, *Hazardous Waste Management Plan*  
AFDTC Plan 32-6, *Oil and Hazardous Substance Pollution Contingency Plan*  
AFDTC Instruction 13-204, *Mission Scheduling and Control*  
AFDTC Instruction 32-2001, *The Fire Protection Operations and Fire Prevention Program*  
AFDTC Instruction 32-3001, *Explosive Ordnance Disposal (EOD) Assistance to Local Government and Civil Authorities*  
AFDTC Instruction 91-201, *AFDTC Test Safety Review Process*  
AFDTC Instruction 91-203, *AFDTC Safety Program*  
AFDTC Instruction 99-101, *Planning, Commanding, and Controlling of Off-base Test Activities*  
AFDTC Instruction 99-102, *AFDTC Test and Evaluation Workload Acceptance, Coordination, and Documentation*  
AFI 32-2001, *The Fire Protection Operations and Fire Prevention Program*  
AFI 32-3001, *Explosive Ordnance Disposal Program*  
AFI-32-4001,  
AFI 32-4002, *Facility Hazardous Material Emergency Planning and Response Compliance*

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AFI 32-7042, *Hazardous Waste Management and Regulation*  
AFI 91-20, *Mishap Prevention Program*  
AFI 91-202, *The U.S. Air Force Mishap Prevention Program*  
AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*  
AFMAN 11-208, *The U.S. Military Notice to Airmen (NOTAM) System* (formerly AFR 55-16)  
Air Force Manual (AFMAN) 32-4004, *Emergency Response Operations*  
Air Force Policy Directive (AFPD) 32-20, *Fire Protection*  
AFPD 32-30, *Explosive Ordnance Disposal*  
AFOSH STD 48-1, *Respiratory Protection Program*  
AFOSH STD 91-43, *Storage, Use, and Handling of flammable and Combustible Liquids*  
AFOSH STD 161-2, *Hazard Communication*

## 2.0 RESPONSIBILITIES

### 2.1 COMMANDER, AFDTC

The Commander, AFDTC, shall ensure that subordinate and tenant units and range user organizations observe all requirements of this plan during pre-launch, launch, and recovery activities.

In cases of launch mishaps, the Commander can activate a Crisis Action Team (CAT), if necessary. Where required, the Eglin Command Post (33 FW/CPO), will be the focal point on requests for Explosive Ordnance Disposal (EOD) assistance from or to civil authorities. The AFDTC Commander may establish a Memorandum of Agreement (MOA) with other government agencies to offset internal levels of fire protection staffing and equipment (See Section 2.15).

### 2.2 AIR FORCE DEVELOPMENT TEST CENTER (AFDTC)

The AFDTC is responsible for supporting the timely, effective conduct of a wide variety of test activities on the Eglin AFB land and water ranges. As a result, the final authority and responsibility for all aspects of range safety at Eglin AFB rest with the AFDTC Commander.

The AFDTC Commander has assigned the administration of this responsibility to the Chief of Safety (AFDTC/SE), who is supported in this task by organizations with specific areas of responsibilities.

### 2.3 SAFETY OFFICE (AFDTC/SE)

The Chief of Safety is the principal adviser to the Command Post regarding health and safety matters and provides staff assistance/management necessary to ensure that all operations conducted by AFDTC activities are carried out safely and with minimum risk to life and property.

AFDTC/SE will provide overall surveillance for implementation of the safety program, which includes mishap investigating and reporting, safety education and training,

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safety inspections, hazard reporting, disseminating mishap prevention information, range safety and system safety. As adviser to the On-Scene Commander (OSC), the Chief of Safety also ensures the health and safety of emergency response personnel is not jeopardized and that all emergency response functions are conducted in accordance with applicable safety regulations and Standard Operating Procedures (SOPs).

Specific duties include:

- Preparation of a safety annex (to ensure safety standards are met for tests conducted on Eglin ranges), hazard analysis summary, and operating hazard analysis (if required) for AFDTC program test/task directives
- Assistance to project personnel during the test planning phase to ensure identification of necessary safety constraints/procedures
- When necessary, conducting a Hazard Review Board (HRB) for each test/task directive
- Supervision of the Mishap Prevention Program (AFI 91-20) for the Commander, AFDTC

### 2.4 HAZARD REVIEW BOARD (HRB)

An HRB is conducted for each test/launch to identify potential hazards. The HRB reviews all AFDTC operations and determines the risk level; results indicate a test/test point risk level of either low, medium, or high. The HRB at AFDTC is the same as a Safety Review Board at other agencies.

The HRB will convene as late as practical in the planning cycle to ensure all test plans have been finalized. This normally will occur no later than 8 work days prior to the coordination and signature cycle of the final test directive.

The HRB makes recommendations regarding each safety appendix; completed prior to Eglin testing, the annex is a set of parameters developed by individual safety and health organizations that are specific to an individual test program.

### 2.5 ON-SCENE COMMANDER (OSC)

The OSC shall be designated by the AFDTC Commander or the 96<sup>th</sup> Air Base Wing Command Section (96 ABW/CC). The OSC directs missile mishap operations and is the principal adviser to the AFDTC Commander regarding such operations. As such, the OSC keeps in contact with the Command Post and (if formed) the Crisis Action Team (CAT) in order to provide pertinent information.

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The OSC will:

- Be responsible for the proper conduct of all emergency response operations, directing actions to mitigate damage, save lives, restore primary mission assets, and, as required, assist/coordinate with civil authorities
- Determine the makeup of the Disaster Control Group (DCG). The membership of this group would be comprised as directed by AFDTC Plan 32-1, Disaster Preparedness Plan.
- Assemble or deploy Initial Response Element (IRE) to the accident scene
- Direct the establishment of an On-Scene Control Point (OSCP), Entry Control Point (ECP), and initial monitoring point
- Request EOD assistance, if required
- Be responsible for initial response to all impact/accident sites and initial site containment. Specifically, ensure the accident site is cordoned to control access/prevent unauthorized entry. Cordon size is determined by the senior on-scene fire representative and established with the assistance of Security personnel (96 SPS)
- Determine the needs for follow-on elements (FOE) and dispatch them to the OSCP
- Obtain available facts about the accident. Determine a safe route to the accident scene. When it is safe to do so, depart to the ECP.
- Control all on-site response elements and operations
- Ensure removal and treatment of medical casualties, fight fires, evacuate area.
- If necessary, emergency rescue of personnel shall be performed
- Work with Environmental Management to ensure personal protective equipment is utilized by all forces on site, as required
- Ensure all requirements of EPCRA/SARA Title III, and other related plans in AFDTC Plan 32-6 are complied with; OSC is aided in this task by the Eglin Judge Advocate (AFDTC/JA), Readiness Division (96CEG/CEX), Bioenvironmental Engineering (96 AMDS/SGPB), and Emergency Management (96 ABW/XP)
- Identify secondary hazards (HAZMAT, radiation); Immediately establish a contamination control capability to prevent spread of contamination if needed
- Develop initial news release; approve initial new release to media within 1 hour after the accident is reported

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Until the appointed OSC arrives, the senior fire official present at the scene will be the acting OSC. The DCG will be supervised by the OSC.

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### 2.6 CRISIS ACTION TEAM

The Crisis Action Team (CAT) serves as a link between the OSC, DCG, and Unit Control Center. All emergency logistics support will be coordinated with the CAT.

### 2.7 INITIAL RESPONSE ELEMENT (IRE)

The Initial Response Element is comprised of members of the Fire Department (96 CEG/CEF), Security Police, and Medical Personnel (typically, a bioenvironmental engineer). The IRE is responsible for the following:

- Initiating security and evacuation procedures upon arrival at an accident/incident scene
- Evacuation of nonessential people from the disaster cordon, using personal contact or communications systems
- Establishing the disaster cordon area and ECP to control access into and out of the area

The IRE responds directly to the scene of the mishap, under control of the Chief, Fire Protection Division.

### 2.8 AFDTC RANGE SAFETY OFFICE (AFDTC/SEU)

The AFDTC Range Safety Office is responsible for real-time analysis of missile flight performance. In addition, this office is responsible for conducting test missions, and shall assist emergency response personnel as required by providing expert advice and knowledge of specific flight systems and hazards. The Range Safety program is specifically tailored to each test mission.

Range Safety establishes policies and procedures for Flight Termination System requirements, including a detailed analysis and demonstration of the termination system itself. In the event of a flight termination or missile malfunction, Range Safety is responsible for determining the projected impact area(s) for all debris and flight hardware.

This information shall be provided to emergency response personnel in order to expedite travel to and evaluation and control of these areas. In addition, Range Safety will provide notification to the Federal Aviation Administration on missile mishaps occurring outside Eglin AFB restricted airspace.

### 2.9 WEAPONS SAFETY ELEMENT (AFDTC/SEOW)

The Weapons Safety Element ensures all missile operations are conducted according to the Air Force Missile Safety Program. This office is also responsible for:

- Planning, administration, and conducting of the overall integrated AFDTC Explosives Mishap Prevention Program

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- Monitoring of the EOD program
- Conducting explosives safety inspections. SEOW will be present during selected range explosives operations

### 2.10 GROUND SAFETY ELEMENT (AFDTC/SEOG)

The Ground Safety Element is responsible for investigating ground mishaps; all units are encouraged to develop written mishap notification procedures to ensure SEOG is apprised of all accidents.

### 2.11 TEST ENGINEERS

The 46<sup>th</sup> Test Wing or other Responsible Test Organization (RTO) or Participating Test Organization (PTO) will provide a Test Engineer or Test Manager for each mission.

Test Engineers must schedule range time for range clearance operations, and will participate in the HRB at AFDTC for each of their programs. Where warranted, they must ensure every possible effort is made by qualified personnel to recover all live explosive residue.

### 2.12 DIRECTOR OF CIVIL ENGINEERING (96 CEG/CC)

The Director of Civil Engineering will:

- Develop program-specific EOD checklists
- Provide EOD support for test projects, range clearances, and emergency operations; be responsible for safety during all EOD operations and range clearances
- Set up internal explosives safety operating instructions for Fire Department personnel; ensure that fire fighters are trained in hazards associated with fires involving explosives
- Keep a status board in the 96 CEG/CEF communications center listing the current status of all explosives locations
- Provide range clearance assistance

The 96<sup>th</sup> Civil Engineer Group Commander (96 CEG/CE) is designated as the Base Fire Marshall and is responsible to the 96<sup>th</sup> Air Base Wing Commander (96 ABW/CC) for adequacy of the fire protection operations and fire prevention program. The Group Commander:

- Provides personnel, equipment, tools, manpower, and supplies to implement containment, decontamination, recovery, and disposition plans within base capability and in compliance with the AFDTC Disaster Preparedness Operations Plan (AFDTC Plan 32-1)

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- Advises OSC concerning major accident response, and recovery policies and procedures; advises on evacuation and cordon size
- Ensures utilities are shut off and secured at or near the accident/incident site as conditions indicate

### 2.13 AFDTC READINESS DIVISION (96CEG/CEX)

Personnel of the Eglin AFB Readiness Division, formerly Disaster Preparedness, will maintain the *Eglin AFB Emergency Response Plan*.

Readiness Division personnel will respond directly to accident scene, after rendezvous with the OSC, to assist in setting up the OSCP. Readiness will provide a Mobile Command Post for communication purposes and, where necessary, provide decontamination capability in conjunction with the HAZMAT team.

### 2.14 AFDTC EXPLOSIVE ORDNANCE DISPOSAL (96CEG/CED)

The Eglin AFB EOD team is tasked to protect personnel, resources, and the environment from the effects of hazardous ordnance, and is responsible for the following:

- Initial impact site entry in order to evaluate any explosive hazards present due to unexploded missile ordnance or fuels (This will be done before any other personnel enter the area.)
- Recovery and proper detonation/disposal of all explosives in accordance with established AFDTC and U.S. Air Force requirements
- Immediate action to prevent or limit damage or injury
- Identification of any hazards associated with the disposal, recovery, and analysis (x-ray, sawing) of unspent munitions
- Providing assistance, in the form of EOD actions or advice, to civil authorities as outlined in the Interservice Support Agreement between the 96<sup>th</sup> Civil Engineer Group and the 547<sup>th</sup> Army EOD Control Center, Fort Gillem, Georgia.

EO requirements cover any test involving any explosive ordnance conducted under static, dynamic, or flight conditions, also providing for EOD personnel to declare the impact locations to be safe prior to anyone entering the area.

In the event of an explosives mishap, the Test Engineer, On-Scene Commander, Crew Chief, Senior Military Member, or USAF employee present will immediately contact the Eglin AFB Command Post. Associate organizations will report explosive mishaps according to host/tenant or interservice support agreements, and as prescribed in their command directives. If the explosive device originates from either a 46<sup>th</sup> Test Wing customer or an associate organization's test or training mission, the 46<sup>th</sup> Operations Group (46 OG) will provide any required information or assistance.

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### 2.15 96<sup>TH</sup> MEDICAL GROUP (96 MDG)

The 96<sup>th</sup> Medical Group (96 MDG)/Eglin AFB Regional Hospital will provide emergency medical teams in coordination with the On-Scene Commander. For launch missions, stand-by teams are available when required.

On-site medical representatives coordinate with local medical facilities and direct the treatment and decontamination of medical casualties at those facilities. The Medical Group acts as liaison with base medical facility for on- and off-base medical needs, providing appropriate protective clothing/gear and ensuring its use. Monitoring of releases (as well as collection of samples for analysis) will be accomplished and, based on findings/monitoring and information from the Staff Meteorologist, MDG will provide guidance on evacuation distances, neutralization, contamination control, and clean-up, and health information. Follow-up procedures for medical examinations of personnel exposed to HAZMAT also fall under the purview of MDG.

The 96<sup>th</sup> Medical Group will provide daily admission and disposition sheets to the Ground Safety Element (AFDTC/SEOG).

### 2.16 BASE FIRE DEPARTMENT (96 CEG/CEF)

The Chief, Fire Protection Division, is responsible to the Eglin AFB Base Fire Marshall for managing the fire protection organization including management of fire prevention, fire suppression operations, training, pre-fire planning, and maintenance of fire equipment. Provision is made for the availability of fire suppression at all launch activities. The Eglin AFB Fire Department is responsible for the following:

- Responding to all fires (from upwind direction) at launch sites due to launch activities
- Responding to all impact areas, as determined by AFDTC Range Safety Office, in order to evaluate and combat any fires initiated during ground impact
- Briefing and providing the responding OSC with a continuing update via DCG or crash radio net; respond with a command vehicle to provide on-scene command/control until arrival of OSC and DCG
- Performance of emergency rescue activities (such as moving victims to safety, administering first aid) as necessary
- Analysis of situation to determine whether or not the HAZMAT team is required
- Evacuation of immediate area
- Assist in establishing the OSCP
- When called upon, making its fire prevention and handling capabilities available to assist national and civil authorities under Department of Defense (DOD) Instruction 6055.6. Eglin AFB fire safety units can be augmented as needed by

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local civilian fire protection and emergency services, in accordance with appropriate Mutual Aid Agreements (See Section 2.25)

The Fire Chief manages Mutual Aid Agreements per AFI 32-2001. An “Agreement for Mutual Aid in Fire Protection and Hazardous Materials Incident Response” secures (to each) the benefits of mutual aid in fire prevention and hazardous materials incident response, in the protection of life and property from fire, hazardous materials incident and in fire fighting.

### **2.17 HAZMAT RESPONSE TEAM**

Each installation publishes a HAZMAT emergency planning and response plan (HAZMAT plan ) and a HAZMAT emergency response appendix (HAZMAT appendix) to Annex A to OPLAN 32-1. These plans provide guidance to base personnel on procedures for the handling of known and unknown HAZMAT.

The HAZMAT IRE includes fire, medical, security personnel, and the HAZMAT Hazard group which includes one or more persons who receive training to perform specific tasks.

The Fire Department forms the core of the team, which evaluates response hazards and risks, fights fires, joins in rescue missions, and controls and contains HAZMAT releases. A HAZMAT Post-Emergency Response Team oversees release clean-up and, where dictated, ensures the incident site is returned to pre-emergency conditions.

### **2.18 SECURITY POLICE (96 SPS)**

Eglin AFB Military Police:

- Aid in establishing OSCP and ECP, assisting Fire Department and Readiness
- Aid the Fire Department in establishing initial cordon around accident sites and must be prepared to adjust cordon as necessary; secure the accident/cordoned site; ensure cordon is maintained by DCG and emergency teams
- Assist in evacuation of land areas during launch mishaps or dangerous material/toxic hazard accident. Provides guidance for coordinating off-base evacuation with local civil authorities during a HAZMAT release
- Patrol evacuated areas to ensure compliance with requirements
- Coordinate with civilian law enforcement agencies. Security personnel will coordinate with local law enforcement agencies in accordance with appropriate agreements to control access to the site. Provide reciprocal aid in security matters with civilian law authorities as dictated by appropriate Mutual Aid Agreements or MOAs

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### **2.19 BIOENVIRONMENTAL ENGINEERING (96 AMDS/SGPB)**

As required, Bioenvironmental Engineering will report to the On-Scene Commander, providing input regarding any hazardous materials involved and procedures in their safe handling; advising of health or environmental hazards, proper protective measures, and actions to be taken; assisting in emergency spill response activities, as appropriate; performing air monitoring, as appropriate; providing technical response for toxic modeling to establish upwind/downwind corridors; tracking any agent (chemical or radiological) run-off and coordinate cleanup efforts with the Fire Chief and Civil Engineer; and, where warranted, coordinating with medical personnel as to requirements for patient contamination control.

### **2.20 DIRECTOR, EMERGENCY MANAGEMENT (96 ABW/XP)**

As required, the Director, Emergency Management, is responsible for providing technical advice to the senior fire official present at the mishap scene, as well as the OSC and DCG. This office is also available to provide assistance to the OSC in controlling and direction response activities.

### **2.21 ENVIRONMENTAL OFFICE (AFDTC/EM)**

Environmental personnel will notify local, regional, state, and/or federal environmental agencies where required by AFDTC directives. Assists OSC in ensuring personal protective clothing is worn by response personnel when needed. Environmental informs readiness (and applicable Federal agencies) of all reportable releases, providing guidance for neutralization, contamination control and clean-up operations. In the event of a launch mishap, AFDTC/EM would provide a qualified biologist and archaeologist to participate on the debris recovery team to reduce potential impacts to biological and cultural resources.

### **2.22 OFFICE OF PUBLIC AFFAIRS (AFDTC/PA)**

The Chief, AFDTC Office of Public Affairs (or an authorized representative), is responsible for providing a sole point of contact with the news media. Where applicable, AFDTC/PA provides local media with advanced information regarding upcoming tests in the form of releases for publication in local newspapers and/or recorded messages for radio stations.

AFDTC/PA will coordinate and issue all public releases relative to Air Force EOD assistance, and will coordinate with the OSC on developing/publishing initial news release(s) during launch mishaps or other accidents.

### **2.23 AFDTC LEGAL OFFICE (AFDTC/JA)**

The AFDTC Legal Office and Staff Judge Advocate (AFDTC/JA) will provide legal advice to the OSC, as well as HAZMAT or any other investigation team. It will also:

- Coordinate aircraft and missile accident investigation board activities

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- Provide legal advice about major HAZMAT accidents involving military resources or resulting from military activities in areas under military or civil jurisdiction
- Provide a legal advisor to investigate claims
- When requested, provide assistance or advice to avoid violation of the Posse Comitatus Act of 1878 (18 U.S.C. 1385) forbidding by Congressional mandate and law the “use of direct physical force against any citizen of their respective state”

### **2.24 96<sup>TH</sup> COMMUNICATIONS GROUP (96 CG/CC)**

The 96<sup>th</sup> Communications Group (96CG/CC) will provide real-time mission support through the Consolidated Control Facility (CCF) as tasked in the test/task directive. Communications personnel are responsible for ensuring reliable and timely intercommunication between the OSC, the Eglin AFB Range Safety Office, emergency response personnel, Security, and local authorities. This will include (as necessary) providing equipment, procedures, and personnel.

### **2.25 TRANSPORTATION (96 TRNS)**

Transportation (96 TRNS) personnel provide fuel, vehicles, and other logistic support, as required, to the DCG members and other emergency response personnel.

### **2.26 46 OPERATIONS SUPPORT SQUADRON (46 OSS)**

Central Scheduling (46 OSS/OSCS) - will schedule all missions using AFDTC test areas and resources, or needed premission preparation of certain aircraft, and missions radiating or using any part of the radio frequency spectrum.

The Scheduling Planning Element (46 OSS/OSCSP) is the liaison between Range Scheduling and Control and all Eglin AFB test and training area users

The Staff Meteorologist (46 OSS/OSWT) - will provide Safety, project officers, and other project support personnel with necessary weather information required to accomplish mishap investigation, safety studies, and missions.

### **2.27 ASSISTING CIVILIAN AND DOD AGENCIES**

Civilian law enforcement and civil authorities will assist in impact area security and fire response activities in accordance with applicable Mutual Aid Agreements. Agencies of the DOD will also act in mutual assistance and support in accordance with current directives.

These agencies may include, but are not limited to, the Federal Emergency Management Agency (FEMA), U.S. Fish and Wildlife Service and Marine Sanctuary Keepers, American Red Cross, Florida Department of Emergency Management, Okaloosa County Emergency Management, Santa Rosa County Emergency Management, Walton

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County Emergency Management, Gulf County Emergency Management, Monroe County Emergency Management, the Florida Civil Preparedness Agency, state and county law authorities, and the Florida Air and Army National Guard.

### **2.28 EGLIN RECOVERY**

Explosive test items that have functioned, partially functioned, dudged or purposely impacted will not be recovered from test ranges unless previous arrangements have been made and documented in the test directive.

Eglin EOD personnel, together with recovery personnel, will comprise the initial entry team at all impact sites and will have overall responsibility for controlling recovery and restoration operations. Once cleared by EOD, the on-scene Operations and Maintenance contractor or Test Engineer may initiate recovery actions. Debris is typically not recovered from overwater areas unless the test directive or safety appendix otherwise directs.

## **3.0 EMERGENCY RESPONSE**

### **3.1 INITIAL NOTIFICATION**

In the event of a flight termination or malfunction, the AFDTC Range Safety Office will immediately determine the projected impact area(s) for all debris and flight hardware. The DCG and CAT will be notified, and the Eglin AFB Emergency Response Plan will be initiated. The Command Post will be apprised of the situation.

Non-essential personnel will be advised to evacuate the accident site, and (where applicable) local civil authorities will be notified.

In the event of an explosives mishap, the supervisor, test director, crew chief, senior military member, or USAF employee present will immediately contact the Eglin Command Post.

### **3.2 INITIAL ASSESSMENT**

Security units will provide an initial assessment of impact sites, providing information concerning site conditions to fire response, recovery, and EOD response (96 CEG/CED) personnel. As warranted, the DCG will be immediately dispatched to the predicted impact area(s) to assess the situation.

A Disaster Response Force (DRF), consisting of the DCG, the Commander's CAT, Command Post, Unit Control Center and specialized teams, responds in mishap/disaster situations to assume on-scene command and control functions.

Key elements of information to be obtained by the DRF will include:

- Exact impact location(s)
- Extent and condition of impact location(s)

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- Personnel injuries
- Indications of fires and/or hazardous materials releases
- Extent of property damage

Results will be reported back to the AFDTC Commander, and the OSC as expeditiously as possible. Based on this assessment, the AFDTC Commander will call up and dispatch to the impact site(s) the appropriate elements.

The Eglin AFB DRF will respond to all major accidents involving DOD resources wherein Eglin AFB is the nearest military installation; Eglin AFB may also respond to non-military incidents that are beyond local civilian capabilities to control.

### 3.3 INITIAL RESPONSE

The DCG provides initial response to peacetime major accidents and natural disasters. The makeup of the DCG will be designated by the OSC and will consist of those elements determined by the OSC to be required, based on the initial assessment; typically, this will comprise the OSC (or alternate) and an IRE.

The IRE responds directly to the site as soon as the location of the mishap is known.

The initial priorities for the DCG are the following:

- Establish command and communication
- Emergency rescue, lifesaving, and/or emergency medical treatment
- Establish site security (including cordoning, as necessary). Missile propellants will have a 60.96-meter (200-foot cordon) established. The ECP is always established upwind
- Contain, control, and extinguish fires
- Confine hazardous materials
- Evacuate mishap sites as required

Moreover, the DCG will provide for on-scene command and control of military resources and functional expertise; coordinate and direct operations and support requirements with the Command Post, unit control centers, and specialized teams; and coordinate with civil and governmental authorities.

All elements of the DCG will be under the control of the OSC. The OSC will retain on-scene control of all IREs until initial response operations are complete and recovery and site restoration activities commence. Any decision to recall the DCG will be the responsibility of the AFDTC Commander, the OSC, or a designated senior AFDTC official.

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The FOE consists of the remainder of the DCG, specialized teams (responding as requested by the OSC), and other support forces assembled to respond according to Eglin AFB procedures to provide enhanced command, control, and communication. Elements which may be included within the FOE support include, depending on the situation, the following: Readiness; the Director, Emergency Management; Public Affairs; the EOD unit; Safety; Bioenvironmental Engineer; Civil Engineer; Communications personnel, and others as referenced in AFDTTC Plan 32-1, *Disaster Preparedness Operations Plan*. Once established, the FOE responds to a primary or alternate assembly area, conveying to the mishap site as directed by the OSC.

For off-base response, civilian law enforcement personnel will perform response duties and are in charge until properly relieved.

### 4.0 CRITICAL RESPONSE FUNCTIONS

The highest priorities during any emergency response operation are the rescue of injured or trapped personnel and the control of any fires produced by a launch or impact event.

#### 4.1 EMERGENCY RESCUE

Rescue of injured and trapped personnel is of the highest priority. Responsibility for emergency rescue is shared among all initial response personnel but especially by the IRE (military or civilian).

Rescues should be attempted using appropriate safety equipment and required protective clothing (i.e., respirators/Self-Contained Breathing Apparatus, protective clothing, etc., as necessary). Since rescue may require entry into the impact area, care should be taken to avoid hazards associated with hazardous debris or fires. Under no circumstances shall rescue personnel unnecessarily endanger themselves during rescue activities. All response members will respond from an upwind direction and stop a minimum of 2000 feet upwind of the accident/incident until cleared by the senior on-scene fire representative.

#### 4.2 FIRE RESPONSE

The safety hazards and environmental damage which could be caused by uncontrolled conflagration makes fire suppression the next priority during the initial response. Where there is any indication of fires caused by launch operations or debris impacts, fire response units will immediately respond. These can be either ground units provided by the Eglin AFB and Naval Air Station, Key West base fire departments or their civilian counterparts in Okaloosa, Gulf, or Monroe counties and, as available through Mutual Aid Agreements. In either case, control or extinguishment of all fires will be accomplished prior to other site assessment activities.

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### 5.0 COMMUNICATIONS

This draft plan implements, as appropriate, AFDTC Plan 32-1, *Disaster Preparedness Operations Plan*; AFDTC Plan 32-5, *Hazardous Waste Management Plan*; and/or AFDTC Plan 32-6, *Oil and Hazardous Substance Pollution Contingency Plan*. Communication and notifications in accordance with these plans would be initiated.

Each on-scene response unit shall maintain the capability for communication with all other units on a common radio frequency. As mentioned previously, the 96<sup>th</sup> Communications Group will provide real-time mission support through the CCF as tasked in the test/task directive. The resulting radio network shall be used by the On-Scene Commander and Test Engineer to issue instructions to various emergency response units and as a means of coordinating activities between various response and work teams.

The U.S. Coast Guard, Florida Marine Patrol, and Federal Aviation Administration shall also maintain continuous contact with the OSC, as well as Eglin AFB safety elements and representatives for the AFDTC Commander. This contact will serve as a source of additional information which is available to the OSC in making decisions concerning on-site activities.

### 6.0 RECOVERY AND SITE RESTORATION ACTIVITIES

Emergency response operations are complete once all impact sites have been secured, rescue operations are completed, and any fires have been extinguished.

The recovery phase will begin with an initial reconnaissance of the area after initial suppression and containment actions are achieved. Initial Reconnaissance Teams, composed of specialist capable of assessing conditions at the accident scene and obtaining/relaying desired information to the OSC, will be formed to enter and assess affected areas. Where warranted, recovery and site restoration activities can then be initiated. This may include decontamination, removal of wreckage, and site restoration accomplished in accordance with Air Force Manual 32-4004, *Emergency Response Operations*.

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## **Appendix K**

### **Air Quality**

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# APPENDIX K AIR QUALITY

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## Air Quality Methodology, Analysis, and Selected Monitoring Data

Following the assessment strategy presented in *A Tiered Modeling Approach for Assessing the Risks Due to Sources of Hazardous Air Pollutants* (EPA-450/4-92-001) (U.S. Environmental Protection Agency, 1992), the air quality analysis as presented in the body of this environmental impact statement (EIS) used two distinct levels of computer modeling to determine the maximum potential impacts to air quality that could result from launch operations at each of the proposed sites. The first analysis was a general screening to determine if the amounts of pollutants emitted had the potential to cause exceedances of National or state ambient air quality standards or applicable health-based guidance levels. No further analysis was required for those scenarios which had no potential for exceedances. Those scenarios which the initial screening indicated had a potential to exceed the standards or guidance levels were subjected to additional refined modeling to better determine the potential concentrations of the applicable pollutant(s). This refined modeling indicated no potential to exceed the applicable standards or guidance levels, therefore no further action was required. If this modeling had indicated potentials to exceed the standards and guidance levels, mitigation measures would have been utilized to reduce or eliminate the potential for impacts to the public and/or environment, as appropriate.

Major exhaust from liquid-fuel rockets include carbon monoxide, carbon dioxide, water, and nitrogen; additionally, lead and nitric oxide may be produced in small amounts. Of these, only carbon monoxide, nitrogen dioxide, and lead pose potential health hazards. The Lance missile is the only missile specified in the proposed action that is liquid-fueled. The emissions of both lead and nitrogen dioxide are minor and the time weighted averages are quarterly and annually. The emissions are nearly spontaneous and calculation of even daily averages would be of questionable utility and mathematical accuracy. As such, no formal analysis of these two pollutants was conducted.

Major exhaust products from solid-fuel rockets include aluminum oxide, carbon monoxide, carbon dioxide, water, hydrogen chloride, and nitrogen. Of these, aluminum oxide, carbon monoxide, and hydrogen chloride have the potential to pose health hazards.

Table K-1 presents the levels of concern for each of the modeled pollutants.

**Table K-1: Exhaust Pollutant Levels of Concern**

Pollutant	Level of Concern (Time-Weighted)	
Aluminum Oxide	5 mg/m <sup>3</sup> (8-hour)	—
Carbon Monoxide	40 mg/m <sup>3</sup> (Hourly)	35 ppm
Hydrogen Chloride	1.5 mg/m <sup>3</sup> (Hourly)	1.0 ppm
Lead	1.5 µg/m <sup>3</sup> (Quarterly)	—
Nitrogen Dioxide	100µg/m <sup>3</sup> (Annually)	.053

Source: Clean Air Act, 42 USC 7401 et seq.; U.S. Department of Health and Human Services, 1994.

### Initial Screening Analysis

TSCREEN/PUFF was used for the initial screening of potential impacts to air quality. TSCREEN/PUFF is one of three programs which make up the EPA TSCREEN application suite. TSCREEN automates the screening techniques presented in *A Workbook of Screening Techniques for Assessing the Impacts of Toxic Air Pollutants, Revised* (U.S. Environmental Protection Agency, 1988). The TSCREEN/PUFF program is designed to model instantaneous releases of pollutants such as would occur during relief valve discharges. This is similar in nature to the high-pressure release of exhaust components from a rocket motor. TSCREEN/PUFF is programmed to select the atmospheric stability class that yields the maximum ground-level pollutant concentration. It also has preset wind speed and mixing height values (1.0 meter per second and 320 meters respectively). TSCREEN/PUFF requires mass of pollutant released and release height as input requirements. (U.S. Environmental Protection Agency, 1988)

The Hera missile was selected as the representative missile for analytical purposes. It has the highest level of emissions of all the proposed missiles for each of the three pollutants of concern (aluminum oxide, carbon monoxide and hydrogen chloride). The PATRIOT missile, the interceptor with the greatest emissions, emits approximately one-eighth the level of pollutants as the Hera. Therefore, even at the maximum proposed usage, interceptors would only impact air quality with approximately one-fourth the pollutants that the target launch option would. As such, the interceptor missile launch option was not specifically analyzed.

Several representative trajectories were used to determine the masses of pollutants used as input for the normal launch scenario. The representative trajectories were lofted and depressed trajectories for impacts at 500, 700, and 1000 kilometers. The maximum time for the missile to reach 1.7 kilometers (the maximum average mixing height in Florida) was less than 24 seconds. Specific masses were derived from the total calculated exhaust products generated over 24 seconds based on a 68 second burn time for the stage-1 motor.

Release masses for the mishap scenarios were derived from the total combustion products of the first-stage and combined first- and second-stages. The analysis assumed 100 percent combustion.

A release height of 200 meters (660 feet) was selected for the analysis. This is conservatively representative of the stabilization height of missiles similar to the Hera, which have been estimated to reach at least 300 meters (984 feet) (Strategic Defense Initiative Organization, 1991). The elevated release height will tend to underpredict concentrations near the launch site. However, this impact is negligible due to the LHA instituted at each launch. The preset mixing height of 320 meters (1,100 feet) will result in the entire mass of pollutant being included in the estimate. In addition, the preset wind speed of 1 meter per second (2 miles per hour) will result in maximum ground-concentration levels. Higher wind levels will tend to disperse the pollutant and result in lower concentration estimates.

Table K-2 presents the results of the initial screening for potential air quality impacts due to missile launches.

The initial screening indicated no potential for impacts to air quality from normal launch operations and potential air quality impacts during a mishap only due to release of hydrogen chloride. Therefore, no refined modeling was conducted for aluminum oxide or carbon monoxide and refined modeling for hydrogen chloride was conducted only for the mishap release scenarios.

### **Refined Impact Analysis**

Refined analysis of potential air quality impacts was conducted using the Open-Burn Open-Detonation Dispersion Model (OBODM). OBODM was specifically developed to estimate impacts to air quality due to open burning or detonation of explosives and fuels. While not specifically authorized by EPA or the state of Florida, it has been successfully used in estimating impacts at Dugway Proving Ground, Dugway, Utah and is now the suggested model for these type of scenarios in Utah. The scenarios in question are open burn or open detonation scenarios. This makes the OBODM a suitable model to determine potential impacts to air quality for the mishap scenarios which are, in essence, uncontrolled burn scenarios.

OBODM predicts the transport and dispersion of modeled pollutants using cloud rise and dispersion model algorithms from existing dispersion models such as the Rocket Exhaust Effluent Dispersion Model (REEDM), Real-Time Volume Source Dispersion Model (RTVSM), and Industrial Source Complex (ISC) Dispersion Model. OBODM can be used to calculate peak concentration, time-mean concentration, dosage, and particulate gravitational deposition. (U.S. Army Dugway Proving Ground, West Desert Test Center, 1996)

OBODM is not a screening model. It uses specific meteorological conditions and fuel data as inputs, and estimates concentrations at various specified points on a user-defined grid. Therefore, it was necessary to conduct multiple modeling runs to determine the conditions which would result in the maximum potential impact. The maximum results achieved through this method are presented in table K-3.

**Table K-2: TSCREEN PUFF Screening Results**

<b>Case 1: Normal Launch Conditions (24 Seconds of Combustion)</b>							
Pollutant (Exhaust Mass)	Health-Based Guidance Level	Maximum Exposure (at 1.94km)	Potential Maximum Hourly Time-weighted Average Concentration (mg/m <sup>3</sup> ) at specified Distance from Launch Point				
			0.5 km	1.0km	3.0km	5.0km	7.0km
Al <sub>2</sub> O <sub>3</sub> (634 kg)	5 mg/m <sup>3</sup>	0.920	0.00804	0.438	0.762	0.620	0.455
CO (475 kg)	40 mg/m <sup>3</sup>	0.689	0.00602	0.328	0.571	0.464	0.341
HCl (502 kg)	1.5 mg/m <sup>3</sup>	0.728	0.00637	0.347	0.603	0.491	0.360
<b>Case 2: Stage One Mishap (Complete Combustion of First Stage)</b>							
Pollutant (Exhaust Mass)	Health-based Guidance Level	Maximum Exposure (at 1.94km)	Potential Maximum Hourly Time-weighted Average Concentration (mg/m <sup>3</sup> ) at specified Distance from Launch Point				
			0.5 km	1.0km	3.0km	5.0km	7.0km
Al <sub>2</sub> O <sub>3</sub> (1763kg)	5 mg/m <sup>3</sup>	2.56	0.0224	1.22	2.12	1.72	1.26
CO (1324kg)	40 mg/m <sup>3</sup>	1.92	0.0168	0.916	1.59	1.30	0.950
HCl (1399kg)	1.5 mg/m <sup>3</sup>	2.03	0.0177	0.9675	1.68	1.368	1.00
<b>Case 3: Stage One and Stage Two Mishap (Complete Combustion of First and Second Stages)</b>							
Pollutant	Health-based Guidance Level	Maximum Exposure (at 1.94km)	Potential Maximum Hourly Time-weighted Average Concentration (mg/m <sup>3</sup> ) at specified Distance from Launch Point				
			0.50km	1.0km	3.0km	5.0km	7.0km
Al <sub>2</sub> O <sub>3</sub> (2296kg)	5 mg/m <sup>3</sup>	3.330	0.0291	1.59	2.76	2.24	1.65
CO (1774kg)	40mg/m <sup>3</sup>	2.53	0.0221	1.21	2.10	1.71	1.25
HCl (1730kg)	1.5 mg/m <sup>3</sup>	2.51	0.0219	1.20	2.08	1.69	1.24

Source: TSCREEN PUFF

**Table K-3: OBOD Modeling Results**

Launch Scenario (weight of HCl)	SPEGL	Maximum concentration
Stage-1 Mishap (1399 kg)	1.5 mg/m <sup>3</sup>	0.912 mg/m <sup>3</sup> at 2100m
Stage 1 + 2 Mishap (1730 kg)	1.5 mg/m <sup>3</sup>	1.047 mg/m <sup>3</sup> at 2000m

Source: Open-Burn Open-Destruction Dispersion Model

As shown above, refined modeling using the OBODM indicated no potential for exceedances of the SPEGL for either mishap scenario. Therefore, no further analysis of potential air quality impacts due to missile exhaust emissions was conducted.

### Gravitational Deposition Analysis

While not specifically an air quality issue, the potential deposition of hydrogen chloride was also modeled using the OBODM. Specific impacts due to the estimated potential levels are addressed in the appropriate sections of chapter 3.

As noted above, the OBODM has the capability to model particulate gravitational deposition. It is reasonable to assume that the maximum amount of deposition would result from the maximum amount of pollutant emitted. As such, the Hera was selected as the representative missile to be analyzed. The same three scenarios analyzed for air quality impacts were analyzed for deposition impacts: normal launch with no mishap; complete stage-one combustion mishap; and combined stage-one and stage-two combustion mishap.

Hydrogen chloride is emitted from the motor as a gaseous exhaust component. Water (from the exhaust, from open sources, or from the atmosphere) readily scavenges the hydrogen chloride from the exhaust cloud and forms hydrochloric acid. Monitoring of the space shuttle launches indicates that even in the presence of excess water, no more than approximately 20% of the gaseous hydrogen chloride is scavenged by the water. Therefore, because missile systems associated with the proposed action do not use excess water, it is assumed that no more than 20% of the total hydrogen chloride is scavenged and converted into acid. This establishes the maximum amount that could be deposited. Table K-4 indicates the amount of hydrogen chloride released for each scenario (based on exhaust data) and the potential maximum hydrogen chloride deposited using this assumption.

**Table K-4: Potential Hydrochloric Acid Deposition Totals**

Scenario	Total HCl gas emitted below 1500 meters	Potential HCl deposited as hydrochloric acid
Normal launch	502 kg	100.4
Stage-1 Mishap	1399 kg	279.8
Stage-1 and -2 Mishap	1730 kg	346.0

Source: Open-Burn Open-Detonation Dispersion Model

The maximum amount of deposition, measured in mass per unit area ( $\text{g}/\text{m}^2$  or  $\text{oz}/\text{ft}^2$ ), and the distance at which it will occur is dependent on the size of the acid droplets. If the droplets are large they will tend to fall out of the exhaust cloud and wind will have little effect on them. If the droplets are smaller, they will tend to be blown more by the wind and will take longer to reach the ground. If the droplets are small enough, they will act as vapor and not “rain out” of the exhaust cloud and will not add to the deposition. This means the size distribution of the raindrops directly impacts the potential level of acid deposition at any one location. If the distribution is weighted toward the larger drops, more acid will “rain out” of the cloud closer to the launch pad; if the distribution favors microdroplets, the deposition would be negligible.

No drop size distribution data has been identified for any of the representative missile systems. Data does exist for the shuttle launch exhaust data. This may or may not accurately portray the drop distribution of systems proposed for use. The shuttle drop size distribution was used due to the lack of system-specific drop-size distribution data.

The OBODM was again run multiple times so as to determine the highest concentration of hydrogen chloride that could be deposited at any one location. Table K-5 shows the resulting estimated maximum deposition and range and the maximum range at which deposition of less than  $1\text{g}/\text{m}^2$  is anticipated to occur.

**Table K-5: Representative HCl Deposition Results using Shuttle Particle Data**

Scenario	Maximum Predicted HCl Deposition	Distance to Deposition $< 1\text{g}/\text{m}^2$
Normal Launch	$1.642\text{g}/\text{m}^2$ at 61 m	117 m
Stage-1 Mishap	$3.947\text{g}/\text{m}^2$ at 182 m	486 m
Combined Stage-1 and -2 Mishap	$4.574\text{g}/\text{m}^2$ at 179 m	505 m

Source: Open Burn Open Destruction Dispersion Model

It is important to note that these projections use the space shuttle’s particle-size distribution. Actual deposition rates may differ, depending upon actual particle-size distribution.

Table K-6 provides selected air quality monitoring data from monitoring points within the ROI and for areas whose air quality may be representative of the air quality at the proposed activity locations.

Table K-7 presents potential emissions from representative portable generators which could be used to support the proposed action.

## K-6: Summary of Ambient Air Quality Measurements (1994-1997)

Pollutant: Nitrogen Dioxide					
Standard: Oxides of Nitrogen as Nitrogen Dioxide: 100µg/m <sup>3</sup> (0.05 ppm) Annual Arithmetic Mean.					
County: Bay					
Site: J02 Lynn Haven @ Smith S Remote					
Year	Sampling Period	Observations	1-hour max	Annual Arithmetic Mean	Exceedances
1994	Jan-Feb	1353	45µg/m <sup>3</sup>	7µg/m <sup>3</sup>	0
Site: J02 Lynn Haven @ Smith N Remote					
Year	Sampling Period	Observations	1-hour max	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	6886	53µg/m <sup>3</sup>	6µg/m <sup>3</sup>	0
County: Escambia					
Site: F01 Pensacola @ Ellyson Industrial Park					
Year	Sampling Period	Observations	1-hour max	Annual Arithmetic Mean	Exceedances
1996	Jul-Dec	3548	81µg/m <sup>3</sup>	15µg/m <sup>3</sup>	0
1997	Jan-Jun	4020	74µg/m <sup>3</sup>	16µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Monsanto remote Long 871445.5 Lat 30					
Year	Sampling Period	Observations	1-hour max	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	8081	184µg/m <sup>3</sup>	9µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Brunson remote Long 871307 Lat 303133					
Year	Sampling Period	Observations	1-hour max	Annual Arithmetic Mean	Exceedances
1994	Jan-Mar	2068	81µg/m <sup>3</sup>	16µg/m <sup>3</sup>	0

Pollutant: Ozone					
Standard: 235µg/m <sup>3</sup> (0.12ppm) hourly or 157µg/m <sup>3</sup> 8-hour time weighted average. Standard is attained when the number of calendar days with concentrations greater than or equal to the standard is not greater than one					
County: Escambia					
Site: F01 Pensacola @ Ellyson Industrial Park					
Year	Sampling Period	Observation Days	Observations	Hourly Max	Exceedances
1994	Jan-Dec	365	8642	0.123µg/m <sup>3</sup>	0
1995	Jan-Dec	365	8680	0.131µg/m <sup>3</sup>	1
1996	Jan-Dec	365	8675	0.125µg/m <sup>3</sup>	1
1997	Jan-Jun	181	4327	0.98µg/m <sup>3</sup>	0
Site: F01 Pensacola @ NAS Pensacola					
1994	Jan-Dec	365	8678	0.117µg/m <sup>3</sup>	0
1995	Jan-Dec	361	8512	0.121µg/m <sup>3</sup>	0
1996	Jan-Dec	365	8706	0.140µg/m <sup>3</sup>	1
1997	Jan-Jun	181	4313	0.100µg/m <sup>3</sup>	0



## K-6: Summary of Ambient Air Quality Measurements (1994-1997) (Continued)

<b>Pollutant: Particulate Matter</b>						
Standard: 50µg/m <sup>3</sup> annual arithmetic mean, and 150µg/m <sup>3</sup> averaged over a 24-hour period not to be exceeded more than once per year.						
<u>County: Monroe</u>						
Site: F02 Key West @ The Galleon Resort						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	58	11µg/m <sup>3</sup>	92µg/m <sup>3</sup>	28µg/m <sup>3</sup>	0
1995	Jan-Dec	59	11µg/m <sup>3</sup>	100µg/m <sup>3</sup>	25µg/m <sup>3</sup>	0
1996	Jan-Dec	59	5µg/m <sup>3</sup>	77µg/m <sup>3</sup>	25µg/m <sup>3</sup>	0
1997	Jan-Jun	29	12µg/m <sup>3</sup>	67µg/m <sup>3</sup>	29µg/m <sup>3</sup>	0
Site: F01 Marathon @ 2796 overseas Highway						
1994	Jan-Dec	60	7µg/m <sup>3</sup>	116µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
1995	Jan-Dec	57	8µg/m <sup>3</sup>	85µg/m <sup>3</sup>	20µg/m <sup>3</sup>	0
1996	Jan-Dec	48	8µg/m <sup>3</sup>	68µg/m <sup>3</sup>	22µg/m <sup>3</sup>	0
1997	Jan-Jun	27	10µg/m <sup>3</sup>	61µg/m <sup>3</sup>	25µg/m <sup>3</sup>	0
<b>Pollutant: PM-10</b>						
Standard: 50µg/m <sup>3</sup> annual arithmetic mean, and 150µg/m <sup>3</sup> averaged over a 24-hour period not to be exceeded more than once per year.						
<u>County: Bay</u>						
Site: F02 Panama city @ cherry Street and Henderson Ave S.T.P.						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	62	0µg/m <sup>3</sup>	56µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
1995	Jan-Dec	55	7µg/m <sup>3</sup>	82µg/m <sup>3</sup>	24µg/m <sup>3</sup>	0
1996	Jan-Dec	57	10µg/m <sup>3</sup>	58µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
1997	Jan-Jun	29	7µg/m <sup>3</sup>	51µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
<u>County: Escambia</u>						
Site: F02 Cantonment @ St. Regis Golf Course						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	60	11µg/m <sup>3</sup>	118µg/m <sup>3</sup>	25µg/m <sup>3</sup>	0
1995	Jan-Dec	55	8µg/m <sup>3</sup>	62µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
1996	Jan-Dec	63	10µg/m <sup>3</sup>	40µg/m <sup>3</sup>	21µg/m <sup>3</sup>	0
1997	Jan-Jun	25	11µg/m <sup>3</sup>	53µg/m <sup>3</sup>	22µg/m <sup>3</sup>	0
Site F01 Pensacola @ Ellyson Industrial Park						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	62	9µg/m <sup>3</sup>	47µg/m <sup>3</sup>	25µg/m <sup>3</sup>	0
1995	Jan-Dec	58	9µg/m <sup>3</sup>	45µg/m <sup>3</sup>	21µg/m <sup>3</sup>	0
1996	Jan-Dec	61	10µg/m <sup>3</sup>	54µg/m <sup>3</sup>	20µg/m <sup>3</sup>	0
1997	Jan-Jun	29	11µg/m <sup>3</sup>	56µg/m <sup>3</sup>	22µg/m <sup>3</sup>	0
Site: F09 Pensacola @ Ellyson Industrial Park						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	60	0µg/m <sup>3</sup>	49µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
1995	Jan-Dec	60	9µg/m <sup>3</sup>	46µg/m <sup>3</sup>	21µg/m <sup>3</sup>	0
1996	Jan-Dec	65	9µg/m <sup>3</sup>	55µg/m <sup>3</sup>	21µg/m <sup>3</sup>	0
1997	Jan-Jun	28	11µg/m <sup>3</sup>	55µg/m <sup>3</sup>	22µg/m <sup>3</sup>	0

## K-6: Summary of Ambient Air Quality Measurements (1994-1997) (Continued)

<b>Pollutant: PM-10 (Continued)</b>						
Site: F02 Pensacola @ McArthur Elementary School						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Mar	15	11µg/m <sup>3</sup>	34µg/m <sup>3</sup>	22µg/m <sup>3</sup>	0
Site: F01 Pensacola @ 300 S. Myrick St.						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Mar	15	14µg/m <sup>3</sup>	38µg/m <sup>3</sup>	24µg/m <sup>3</sup>	0
Site: F09 Pensacola @ 300 S. Myrick St.						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Mar	15	12µg/m <sup>3</sup>	36µg/m <sup>3</sup>	23µg/m <sup>3</sup>	0
<u>County: Gulf County</u>						
Site: F02 Port St. Joe @ Water Plant on Kenny's Mill Road						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Dec	60	6µg/m <sup>3</sup>	38µg/m <sup>3</sup>	19µg/m <sup>3</sup>	0
1995	Jan-Dec	54	8µg/m <sup>3</sup>	82µg/m <sup>3</sup>	22µg/m <sup>3</sup>	0
1996	Jan-Dec	59	4µg/m <sup>3</sup>	57µg/m <sup>3</sup>	20µg/m <sup>3</sup>	0
1997	Jan-Jun	27	9µg/m <sup>3</sup>	65µg/m <sup>3</sup>	21µg/m <sup>3</sup>	0
<u>County: Okaloosa</u>						
Site: F01 Fort Walton Beach @ first Street SE and church Avenue						
Year	Sampling Period	Observations	Minimum	Maximum	Annual Arithmetic Mean	Exceedances
1994	Jan-Mar	15	9µg/m <sup>3</sup>	38µg/m <sup>3</sup>	21µg/m <sup>3</sup>	0
<b>Pollutant: Sulfur Dioxide</b>						
Standard: Annual Arithmetic Average of 60µg/m <sup>3</sup> , 24-hour concentration of 260µg/m <sup>3</sup> and a maximum 3-hour concentration of 1300µg/m <sup>3</sup> The 24-hour and 3-hour concentrations are not to be exceeded more than once annually.						
<u>County: Bay</u>						
Site: J02 Lynn Haven @ Smith S Remote						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Feb	1353	212µg/m <sup>3</sup>	147µg/m <sup>3</sup>	8µg/m <sup>3</sup>	0
Site: J02 Lynn haven @ Smith West Remote						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Feb	1353	86µg/m <sup>3</sup>	23µg/m <sup>3</sup>	6µg/m <sup>3</sup>	0
Site: J02 Lynn Haven @ smith North Remote						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	6884	238µg/m <sup>3</sup>	44µg/m <sup>3</sup>	6µg/m <sup>3</sup>	0
Site: J02 Lynn Haven @ Smith East Remote						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	7672	597µg/m <sup>3</sup>	166µg/m <sup>3</sup>	10µg/m <sup>3</sup>	0

## K-6: Summary of Ambient Air Quality Measurements (1994-1997) (Continued)

Pollutant: Sulfur Dioxide (Continued)						
County: Escambia						
Site: J02 Pensacola @ Monsanto remote Long 871442						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	8081	618µg/m <sup>3</sup>	105µg/m <sup>3</sup>	10µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Chumackla Remote 871051.5						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Feb	1356	300µg/m <sup>3</sup>	58µg/m <sup>3</sup>	9µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Eastgate Remote Long 871220						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Feb	1356	474µg/m <sup>3</sup>	125µg/m <sup>3</sup>	20µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Brunson Remote Long 871307						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Mar	2068	431µg/m <sup>3</sup>	152µg/m <sup>3</sup>	33µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Greenbriar Remote						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	8171	338µg/m <sup>3</sup>	141µg/m <sup>3</sup>	27µg/m <sup>3</sup>	0
Site: J02 Pensacola @ Spanish Mill Creek						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Feb	1357	464µg/m <sup>3</sup>	85µg/m <sup>3</sup>	14µg/m <sup>3</sup>	0
Site: J02 Pensacola @ University of West Florida						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	7763	594µg/m <sup>3</sup>	182µg/m <sup>3</sup>	19µg/m <sup>3</sup>	0
Site: F01 Pensacola @ Ellyson Industrial Park						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	8709	557µg/m <sup>3</sup>	116µg/m <sup>3</sup>	11µg/m <sup>3</sup>	0
1995	Jan-Dec	8702	262µg/m <sup>3</sup>	67µg/m <sup>3</sup>	8µg/m <sup>3</sup>	0
1996	Jan-Dec	8516	240µg/m <sup>3</sup>	48µg/m <sup>3</sup>	7µg/m <sup>3</sup>	0
1997	Jan-Jun	4324	148µg/m <sup>3</sup>	65µg/m <sup>3</sup>	9µg/m <sup>3</sup>	0
Site: F02 Pensacola @ 11000 University Parkway						
Year	Sampling Period	Observations	3-hour Max	24-hour Max	Annual Arithmetic Average	Exceedances
1994	Jan-Dec	8698	577µg/m <sup>3</sup>	170µg/m <sup>3</sup>	16µg/m <sup>3</sup>	0
1995	Jan-Dec	8500	314µg/m <sup>3</sup>	79µg/m <sup>3</sup>	9µg/m <sup>3</sup>	0
1996	Jan-Dec	8583	430µg/m <sup>3</sup>	107µg/m <sup>3</sup>	12µg/m <sup>3</sup>	0
1997	Jan-Jun	4300	252µg/m <sup>3</sup>	86µg/m <sup>3</sup>	12µg/m <sup>3</sup>	0

### K-7: Representative Portable Generator Emissions

Pollutant	Hourly Emissions Per Kilowatt-Hour <sup>1</sup>	Emissions per 60kW Generator Hour	Emissions per 16 60kW Generators per Hour	Emissions per 60kW Generator Yearly Use <sup>2</sup>	Emissions per Launch <sup>3</sup>	Annual Emissions <sup>2,3</sup>	Total Program <sup>4</sup>
Carbon Monoxide	0.0015 kg (0.0033 lb.)	0.90 kg (2.0 lb.)	1.4 kg (3.1 lb.)	35 kg (77 lb.)	8.6 kg (19 lb.)	210 kg (460 lb.)	2100 kg (4600 lb.)
Oxides of Nitrogen	0.0064 kg (0.014 lb.)	0.38 kg (0.84 lb.)	6.1 kg (13 lb.)	150 kg (330 lb.)	37 kg (81 lb.)	880 kg (1900 lb.)	8800 kg (19000 lb.)
Particulate Matter	0.0002 kg (0.0004 lb.)	0.1 kg (0.2 lb.)	0.2 kg (0.4 lb.)	5 kg (10 lb.)	1 kg (2 lb.)	20 kg (40 lb.)	200 kg (400 lb.)
Sulfur Dioxide	0.00089 kg (0.0020 lb.)	0.53 kg (1.17 lb.)	0.85 kg (1.9 lb.)	21 kg (46 lb.)	5.1 kg (11 lb.)	120 kg (260 lb.)	1200 kg (2600 lb.)
Volatile Organic Compound	0.00020 kg (0.00043 lb.)	0.12 kg (0.26 lb.)	0.19 kg (0.42 lb.)	4.6 kg (10 lb.)	1.2 kg (2.6 lb.)	28 kg (62 lb.)	280 kg (620 lb.)

<sup>1</sup>Assumes 0.4% by weight sulfur content

<sup>2</sup>Assumes 24 launches per year

<sup>3</sup>Assumes 6 generators per launch

<sup>4</sup>Assumes 10 years at maximum activity

The following text is an excerpt from the *Supplemental Environmental Impact Statement Space Shuttle Advanced Solid Rocket Motor Program* (National Aeronautics and Space Administration, 1990). **All figure, table, and appendix numbers refer to that document.**

## **Potential Human Health Effects of HCl**

### **Short-term Health Effects**

**Toxicological Considerations.** HCl is highly water soluble and reacts with surface components of the upper respiratory tract. The hydrogen ion and chloride ion are natural constituents of near coastal atmospheres (Finlayson-Pitts and Pitts 1986) as well as all mammalian species. Two important chemical defenses against inhaled acidic compounds include endogenous (naturally occurring in the body) ammonia and airway surface liquid buffers (i.e., mucous) (EPA 1988b). Naturally occurring ammonia present on the surface of the nasal tract and mouth may react and neutralize (i.e., have a scrubbing effect on) low levels of acidic compounds such as HCl (Larson et al. 1982; EPA 1988b).

If HCl concentrations are quite high, such that they overwhelm the "scrubbing" capacity of the upper respiratory tract, then HCl may be deposited in the lower respiratory tract where it may cause acute irritation of the respiratory tract. This type of reaction only occurs at concentrations at least 100 times higher than those that would be observed at SSC. For example, Henderson and Haggard (1943) reported lower throat irritation in humans after a short exposure to 52 mg/m<sup>3</sup> HCl, while no adverse effects were observed from prolonged exposure to 15 mg/m<sup>3</sup>. Further, rats exposed to 15 mg/m<sup>3</sup> HCl for a lifetime did not experience any serious irritating effects to the nasal and pulmonary epithelium (Sellakumar et al. 1985). In addition, it appears that rodent species are an inadequate model for evaluating the toxicity of irritant gases in humans, in part because the rat is primarily a nose breather, unlike monkeys and humans which breathe through both the nose and the mouth. Based on anatomical comparisons, the baboon has the greatest upper airway similarity to children (Kaplan et al. 1988). Kaplan et al. (1988) reported no adverse short-term or long-term effects on pulmonary functions in anesthetized baboons exposed to HCl at exceptionally high concentrations (735 to 14,723 mg/m<sup>3</sup>) for 15 minutes. The predicted ASRM-related concentrations of HCl at 0.6 mile from the testing site (0.24 mg/m<sup>3</sup>, Table 5-1) are well below the "no-observed-adverse-effect-level" (NOAEL) observed in baboons (735 to 14,723 mg/m<sup>3</sup>) as well as the NOAEL for humans of 15 mg/m<sup>3</sup> (Henderson and Haggard 1943). Therefore, based on the low expected concentrations from ASRM testing and natural neutralizing capacity of the oral-nasal passages, no acute or chronic respiratory effects or systemic effects of HCl are expected. Since the maximum instantaneous air concentrations decrease with distance from the test stand, SSC workers between 2 and 4 miles from the test stand would receive lower doses than the levels predicted at 0.6 mile.

**Regulatory Guidelines and Standards.** No federal ambient air quality standards exist for HCl. Therefore, the predicted air concentrations were compared with relevant occupational standards issued by the Occupational Safety and Health Administration (OSHA 1989), and with air quality guidelines recommended by the state of Mississippi and the National Research Council (NRC) Committee on Toxicology (NRC 1987) (see Table

5-1). A recommended air concentration (RAC) established by the EPA (55 FR 17862) for a 3-minute average HCl concentration from hazardous waste incinerator emissions was also considered for comparison; however, it was not deemed an appropriate comparison because the 3-minute RAC was established for continuous 24-hour HCl emissions, while ASRM emissions exposure, even to persons directly downwind, will occur only for about ten minutes to two hours no more than 4 times per year with a few months between tests. A brief discussion comparing predicted HCl concentrations with appropriate existing regulatory standards or guidelines follows.

The maximum HCl concentration at 0.6 mile, the point of maximum instantaneous average air concentration, is  $0.24 \text{ mg/m}^3$ , well below the OSHA promulgated maximum allowed occupational exposure level of  $7.0 \text{ mg/m}^3$  (OSHA 1989). In addition, the state of Mississippi has derived a 24-hour average HCl air quality guideline for maximum HCl air concentration based on 1 percent of the American Conference for Governmental Industrial Hygienist (ACGIH) recommended occupational standard [threshold limit value (TLV)]. TLVs apply to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. As stated by ACGIH (1989), TLVs are based on the best available information from industrial experience, and from human and experimental studies. Although TLVs have received some criticism, they are routinely used by state and federal regulatory agencies to evaluate occupational exposures and are increasingly being used to develop ambient air quality standards (Calebrese and Kenyon 1989). Based on 1 percent of the ACGIH TLV of  $7.5 \text{ mg/m}^3$  (ACGIH 1989), the Mississippi guideline permits a maximum 24-hour average HCl air concentration of  $0.07 \text{ mg/m}^3$  (MBPC 1990). This 24-hour average HCl concentration guideline is approximately 9 times higher than the expected concentration at 4.2 miles ( $0.0088 \text{ mg/m}^3$ ), the point of maximum 24-hour average HCl concentration indicating that no adverse health effects from HCl emissions to workers or the general population are projected. As indicated in Table 5-1, the 24-hour average concentration of HCl is lower between 2 and 4 miles from the test stand than at 4.2 miles. Therefore, no SSC workers would experience adverse health effects from HCl emissions.

A more appropriate guideline to compare with ASRM HCl emissions is the short-term public emergency guidance levels (SPEGLs) developed by the National Research Council Committee on Toxicology specifically for short-term, intermittent community exposures occurring during Space Shuttle launches. To conservatively protect sensitive populations such as infants, children, the elderly, and people with respiratory diseases from the large quantities of HCl emitted during Space Shuttle launches, the Committee on Toxicology recommended a 1-hour SPEGL of  $1.5 \text{ mg/m}^3$  (NRC 1987). The Mississippi Bureau of Pollution Control further limits HCl daily exposure to a 24-hour average of  $0.007 \text{ mg/m}^3$  to protect the public. In other words, HCl concentrations averaged over a 1-hour and 24-hour time period should not exceed  $1.5 \text{ mg/m}^3$  and  $0.07 \text{ mg/m}^3$ , respectively. As shown in Table 5-1, the maximum predicted 1-hour and 24-hour HCl air concentrations at 4.2 miles from the test stand are approximately 10 times lower than either of these guidelines and therefore are considered protective of the health and safety of workers as well as off-site populations. Again, average concentrations at locations closer than 4.2 miles will be lower than the maximum at 4.2 miles.

## **Long-term Health Effects**

ASRM tests will be conducted infrequently (4 times per year) and are of short duration (2 minutes), resulting in predicted HCl concentrations that are well below guidelines for maximum 1-hour and 24-hour exposures established by the National Research Council, the state of Mississippi, and OSHA. Therefore, no long-term health effects from HCl emissions are anticipated. While evidence that cumulative health effects may occur from acute, intermittent exposures to certain toxic organic compounds such as PCBs or dioxins, these compounds are entirely different from ASRM type emissions. While hydrophobic compounds (i.e., compounds not soluble in water but which may be soluble in fats such as PCBs and dioxins) persist within the body fats for long periods of time, hydrophilic compounds (i.e., compounds soluble in water) such as HCl do not accumulate, are metabolically controlled, and are readily eliminated from the body. No evidence of cumulative health effects from intermittent exposures to low-levels of HCl was found. Since occasional exposures to levels of HCl from ASRM testing are sufficiently low to prevent adverse acute effects, no adverse chronic effects are expected.

## **Potential Health Effects of Acid Aerosols**

Acid aerosols are suspended solid or liquid particles with a pH less than 7, resulting from the movement of acids from the gaseous phase into liquid aerosols. The available information on concentration patterns and human exposures to atmospheric aerosols is sparse (EPA 1988b). Available data indicate that the atmospheric concentrations of acid aerosols depend upon variable conditions such as relative humidity, temperature, and the background composition of other pollutants. Insufficient data exist to quantify the extent of conversion of gaseous HCl to aqueous aerosols in the atmosphere. However, hydrogen chloride readily associates with water such that atmospheric HCl is likely to exist to some degree in the aerosol form (see Section 4.2.2).

## **Short-term Health Effects**

**Toxicological Considerations.** No studies were found regarding potential health effects associated with exposure to HCl-formed acid aerosols. Most of the research conducted in this area has focused on strong acid sulfates such as sulfuric acid and ammonium bisulfate. However, since anhydrous HCl gas is highly reactive with water and exerts its irritant effect by desiccation (dehydration) and corrosion, exposures to HCl gas are potentially more dangerous than exposures to HCl aerosols (NRC 1987; EPA 1969). It is also possible that aerosols are more efficiently deposited than are gases.

Two important chemical defenses against inhaled acids include airway surface liquid buffers (mucous) and endogenous ammonia (EPA 1988b). Endogenous ammonia and the buffering capacity of mucous material in the respiratory tract are capable of neutralizing low concentrations of acid aerosols and, hence, play an important role in determining the airway toxicity of acid aerosols (EPA 1988b). Respirable acid particles (i.e., smaller than 10 microns) are rapidly neutralized by resident ammonia and airway mucous in the body.

The total capacity of the mouth and respiratory tract to neutralize inhaled acids is substantial and variable depending on particle size, concentration of ammonia in the

airways, concentration of acid in the aerosol and residence time of aerosol in the airways (EPA 1988b).

Little information is available to precisely quantify the extent of HCl aerosol formation from ASRM testing. Assuming that all of the HCl gas resulting from ASRM testing forms acid aerosols, which is not expected, the maximum instantaneous HCl concentration resulting from ASRM testing ( $0.24 \text{ mg/m}^3$ ) may be compared, as a surrogate, to concentrations of sulfuric acid aerosol which have been reported to cause no adverse health effects in studies with human volunteers. For example, no adverse effects on pulmonary function (as measured by expiratory volume) have been reported in normal subjects exposed to sulfuric acid aerosols below  $0.5 \text{ mg/m}^3$  (EPA 1988b).

Small changes in spirometry (measurement of breathing capacity) have been observed in normal subjects after laboratory exposure to  $1.0 \text{ mg/m}^3$  sulfuric acid aerosols, although these changes have not been consistently observed. There is, however, one report of a small reduction in pulmonary function (i.e., forced expiratory volume in one second;  $\text{FEV}_1$ ) in nine adolescent asthmatics exposed in the laboratory while exercising in an environment with concentrations of sulfuric acid aerosols as low as  $0.068 \text{ mg/m}^3$  (Koenig et al. 1989). The reported reduction in  $\text{FEV}_1$  in those subjects was 6 percent. A reduction in  $\text{FEV}_1$  of 5 percent is considered significant for some asthmatics. The reported reduction in  $\text{FEV}_1$  is, in all probability, rapidly reversible after exposure ceases. At the concentration studied, no effects were observed in adult asthmatics. It is not absolutely clear that it is appropriate to compare HCl aerosols to sulfuric acid aerosols since sulfuric acid has over twice the effective acidity as HCl. Also, the small reduction in respiratory volumes was observed in a small group (sample size of 9) of sensitive individuals. The results of the Koenig et al. study (1989) must be considered preliminary and should not be extrapolated to the general population surrounding SSC.

Assuming a worst case where HCl and sulfuric acid are equally effective at producing respiratory effects (although it is believed that sulfuric acid is more toxic), the maximum possible concentration of HCl aerosol ( $0.24 \text{ mg/m}^3$ ) is below the no effect level for sulfuric acid ( $0.5 \text{ mg/m}^3$ ). On the basis of this information, adverse health effects in normal subjects from HCl emissions is not projected. Only one study using 9 subjects showed any effects at levels below the predicted maximum of  $0.24 \text{ mg/m}^3$ . Therefore, it is projected that ASRM testing will not result in significant or prolonged health impacts even to exercising adolescent asthmatics since HCl concentrations from ASRM testing are short lived. The maximum one-hour average concentrations are more applicable to exercising asthmatics and are 1.6 times lower than the maximum values at 0.6 mile from the test stand (Table 5-1).

**Regulatory Guidelines and Standards.** Currently, there are no federal ambient air quality standards or guidelines, nor any occupational standards, specifically for acid aerosols. However, EPA is considering listing acid aerosols as a separate criteria pollutant (EPA 1988b). Because of the absence of any guidance, exposure to HCl aerosols was evaluated in this assessment based solely on the sulfuric acid data.

### **Long-term Health Effects**



As stated above, it is not expected that any short term health effects will occur since ASRM testing is conducted infrequently, and for short durations. Furthermore, no long-term health effects are expected from potential acid aerosol formation. This conclusion is justified based on the analyses described in Section 4.2.2, which show that formation of HCl aerosols is limited in atmospheric conditions with a relative humidity less than 100 percent. Even assuming that all of the HCl dissolves in aqueous aerosols, the ambient HCl concentration would be so low (Table 5-1) that no long-term health effects are anticipated.

### **Potential Health Effects of Acid-coated Particles**

NASA investigations of ground-level aluminum oxide particulates from Space Shuttle emissions indicate that some aluminum oxide particles that collected on the ground had a slight acidic coating, and some chlorides were also found (NASA 1983). Upper-level airborne samples of aluminum oxide in the Shuttle plume indicate that some chlorides formed on the particles (Cofer et al. 1987). As explained in Section 4.2.2, the conversion of aluminum oxide to aluminum chloride does not appear to be thermodynamically favored at ambient temperatures. At the temperatures and the water content expected to be found in the atmosphere, it is more favorable for the chloride to be converted to the oxide (the nontoxic, stable form) rather than the oxide to the chloride. To address the specific concern that acid-coated particles may have an enhanced effect on respiratory function (i.e., greater combined effect than either acid aerosols or particulates alone), the following section briefly discusses the toxicology of acid coated particles as they apply to ASRM testing.

A review of the scientific literature demonstrated that information on the toxicological effects of HCl acid coated aluminum oxide particles was sparse. Wohlschlagel et al. (1975) conducted experiments with HCl, hydrogen fluoride, and aluminum oxide to examine the potential synergistic, additive, or antagonistic effects due to simultaneous exposures. They found no synergistic or additive effect on lethality due to simultaneous, 60-minute exposure to HCl and aluminum oxide. In recent studies, Amdur and Chen (1989) reported an enhanced effect (i.e., a cumulative effect greater than the sum of the effect of each individual pollutant) on bronchial reactivity in guinea pigs exposed to zinc oxide particles that were coated with sulfuric acid aerosols. These findings appear to suggest that sulfuric acid-coated particulates enhance the pulmonary effects of acid aerosols; however, these results are not directly applicable to aluminum oxide and HCl emissions at SSC for the following reasons:

- Zinc oxide alone affects pulmonary function at concentrations around 5 mg/m<sup>3</sup> (EPA 1987b), while aluminum oxide produces no observable effect on lung function even at high concentrations (EPA 1990). Furthermore, the size range of particles used in this study (median less than 0.05 mg) is much smaller than those emitted from ASRM testing.
- The repeated exposures in the Amdur and Chen study were more intense and of longer duration (3 hours per day for 5 consecutive days) than those planned for ASRM testing (less than 2 hours per day, 4 days per year), although cumulative effects were observed at sulfuric acid concentrations as low as 20 mg/m<sup>3</sup>.

- The results of the Amdur and Chen study have not been substantiated with other compounds (e.g., HCl). Interestingly, animals exposed 3 hours each day Monday through Friday and then rested on Saturday and Sunday, displayed normal pulmonary functions when tested on Monday (Amdur and Chen 1989). This suggests that some mechanism of repair occurs following the initial adverse effect. Further, the post-exposure lung function tests on Monday were also normal. It would therefore appear that despite evidence that sulfuric acid-coated zinc oxide particles produce an enhanced effect on pulmonary function, a brief period of nonexposure enabled full recovery.

In summary, given the low emission concentrations associated with ASRM testing, the benign nature of aluminum oxide (see Section 5.3.4), and the quick recovery time of animals exposed to sulfuric acid-coated zinc oxide, no enhanced acute or chronic adverse pulmonary effects from acid-coated aluminum oxide particles are expected.

## **Potential Health Effects of Aluminum Oxide Exposures**

### **Short-term Health Effects**

**Toxicological Considerations.** Aluminum oxide is the primary product of aluminum combustion. It is a relatively stable compound which is insoluble in water, dilute acids, and basic solutions. Aluminum compounds are normal components of the human diet, and people ingest aluminum in both food and water. The normal intake is between 10 to 100 mg/day. Most soft tissues in the body contain between 0.2 to 0.6 mg of aluminum per gram of tissue (Goyer 1986). Aluminum oxide is poorly absorbed from the intestines and lungs.

Aluminum oxide is considered an inert compound. After an exhaustive review of the toxicological literature, the EPA concluded that no evidence of acute (short-term) toxicity, reproductive effects or mutagenic effects of aluminum oxide have been reported in exposed workers or laboratory animals (EPA 1990; ACGIH 1989). The benign nature of aluminum oxide is illustrated by one study of the respiratory effects of fiber-epoxy dusts on rats (Lucht et al. 1989) which used aluminum oxide as an inert control dust. Control rats exposed to aluminum oxide in this study did not develop fibrotic lesions. In addition, Wohlschlagel et al. (1975) exposed rats to up to 478 mg/m<sup>3</sup> of aluminum dust for 60 minutes with no immediate post-exposure toxic effects and no observed toxic effects at the 14-day sacrifice.

**Regulatory Guidance and Standards.** Aluminum oxide is considered an inert, or unreactive, "nuisance" particulate with no significant toxic effects to lungs or other body organs (ACGIH 1989; EPA 1990). Since federal ambient air quality standards do not exist for aluminum oxide and it is considered as particulate matter, the projected air concentrations associated with ASRM testing were compared with the average 24-hour national ambient air quality standard for nonspecific particulate matter (e.g., dust, smoke, etc.) of 0.15 mg/m<sup>3</sup> (EPA 1989b). The expected 24-hour average ground-level (i.e., breathing zone) air concentration of aluminum oxide at 4.2 miles from the ASRM test stand (the point of maximum 24-hour average concentrations) is 0.015 mg/m<sup>3</sup>, which is 10 times lower than the national ambient air standard for particulate matter. The maximum background ambient 24-hour concentration of particulate matter in air at SSC is

0.046 mg/m<sup>3</sup>. The combined concentration of ambient particulate matter and the maximum 24-hour average aluminum oxide is 0.061 mg/m<sup>3</sup> (0.046 + 0.015 mg/m<sup>3</sup>), still well below the national air quality standard. Therefore, ASRM emissions will not increase the ambient concentration of particulate matter above the national ambient air quality standard to a level considered unhealthy. Furthermore, the occupational limit for an 8-hour exposure to aluminum oxide is 10 mg/m<sup>3</sup> (OSHA 1989). This occupational limit is 25 times higher than the predicted maximum instantaneous aluminum oxide concentration at 0.6 mile. Given the relatively inert properties of aluminum oxide and the low predicted maximum air concentration associated with ASRM testing, no short-term human health effects are projected for SSC workers or residents in off-site communities.

### **Long-term Health Effects**

There is no evidence of chronic (long-term) toxicity, carcinogenicity, reproductive effects, or mutagenic effects of aluminum oxide reported in workers or laboratory animals (EPA 1990; ACGIH 1989). Some studies have indicated minimal fibrogenic growth (development of fibers) in the lungs of long-term workers exposed to high concentrations of complex mixtures of aluminum dust, aluminum oxide and silica (Dinman 1988).

Reports of health effects due to heavy and prolonged (life-time) aluminum oxide dust exposure to industrial workers such as aluminum smelter workers (Gilks and Churg 1987) cannot be compared to the ASRM testing because the exposure duration and concentrations from ASRM testing are dramatically lower. In an animal inhalation study, aluminum oxide was efficiently cleared from the lung and demonstrated little or no fibrogenic potential (Sjogren et al. 1985).

Recognizing the toxicologically inert properties of aluminum oxide, EPA recently deleted nonfibrous aluminum oxide from its list of toxic chemicals (EPA 1990). EPA also determined that nonfibrous aluminum oxide did not meet the criteria for causing acute and chronic human health effects, carcinogenicity, or environmental toxicity (EPA 1990). EPA concluded that there was no evidence that nonfibrous aluminum oxide causes or "can be reasonably expected to cause" adverse health and/or environmental effects (EPA 1990).

Given the low aluminum oxide concentrations projected from ASRM emissions and the generally inert toxic properties of aluminum oxide, exposure from ASRM testing will not result in adverse long-term health effects.

Human health concerns have been raised about the possible connection between aluminum and neurological disorders such as Alzheimer's disease. It should be emphasized that ASRM emissions are comprised almost exclusively of chemically stable (i.e., not bioavailable) aluminum oxide with trace amounts of aluminum chloride. There has not been any link between aluminum oxide and Alzheimer's disease. However, because of the public's concern, a further comprehensive literature review was conducted on aluminum and Alzheimer's disease. This literature review is summarized below and presented in detail in Appendix F.

Although aluminum compounds are known to induce certain neurological effects in laboratory animals and is present in high concentrations in damaged neurons of Alzheimer's patients and persons with other neurological disorders, its link as a cause of

Alzheimer's disease or even its role in the progress of the disease has not been scientifically established. EPA, in a recent review of aluminum toxicity, had found no evidence that supports the theories that aluminum plays a pathological role (i.e., causes disease) in Alzheimer's disease, amyotrophic lateral sclerosis and Parkinson-dementia (EPA 1990). While there have been many popular articles written on the subject and many theories have been advanced, there is a lack of compelling or sufficient evidence which supports the hypothesis of any direct causal role of aluminum in Alzheimer's disease development. Several research groups currently continue to investigate the role of aluminum in Alzheimer's disease.

It is not clear whether the high levels of aluminum that are present in the neurofibrillary tangles (twisted helical neurons in the brain) of Alzheimer's patients is a cause or a secondary effect as a result of the disease (Crapper McLachlan 1985). As presented in Appendix F, there are certain observations that indicate some role of aluminum in Alzheimer's disease as well as observations that seem to refute an etiological (causative) role. For example, in Guam Parkinson-dementia subjects, the neurofibrillary tangles in the brains of persons with the disease can contain up to 300 times the aluminum concentration compared to the adjacent nontangled neurons of those of normal subjects (Perl et al. 1982; Perl et al. 1986). Whatever combination(s) of genetic and environmental factors that may be responsible for neurological disorders on Guam, it requires a long time (around 20 years) for immigrants to develop such disorders. Similarly, patients with Alzheimer's disease also have elevated aluminum levels in tangle-bearing neurons. Injection of aluminum compounds into the brain of laboratory animals produces neurofibrillary tangles, although structurally different from those seen in Alzheimer's disease. Furthermore, an epidemiological study reported a slight increased risk of Alzheimer's disease in regions with elevated aluminum levels in drinking water relative to areas with lower aluminum levels (Martyn et al. 1989). However, the results of this study are extremely controversial due to poor estimation of exposures, study design, and other factors.

Central to the question of the role of aluminum in neurological disorders is "How does the aluminum pass through the blood-brain barrier (a fatty layer surrounding the brain and central nervous system which prevents many chemicals from entering the brain), since it is not normally transported?" This implies a breakdown of the barrier to allow the aluminum to migrate to the neurons and then associate with the neurofibrills.

Most of these studies have produced rather interesting results but have not directly associated aluminum exposure as a cause of Alzheimer's disease. Therefore, at this time, a conclusive determination of whether aluminum plays a significant role in the development of neurological disorders is not possible. However, in trying to assess whether ASRM testing would have any adverse effects, it is important to recognize that the concern and controversy about Alzheimer's disease pertains to exposure to unknown species of aluminum. Samples taken from actual Space Shuttle emissions (NASA 1989a), and from ASRM dispersion modeling, indicate that emissions are comprised almost exclusively of nonfibrous aluminum oxide that are relatively environmentally immobile and inert. In addition, since the predicted concentrations of aluminum oxide that are quite low at 4.2 miles from the test stand ( $0.015 \text{ mg/m}^3$ , maximum 24-hour avg.) and aluminum oxide is not readily absorbed into the body, the contribution of ASRM emissions to any overall

aluminum intake appears to be exceedingly small. Average daily intake in food and water by persons not exposed to ASRM testing varies between 5 and 50 mg. Therefore, given the information available in the literature and given the exposure conditions at points of maximum air concentration, there does not appear to be any enhanced risk of neurological disorders, including Alzheimer's disease, associated with ASRM testing.

### **Summary and Conclusions**

As noted in the FEIS, and as further documented in these supplemental evaluations, potential exposures to HCl and aluminum oxide in ASRM emissions are not anticipated to result in adverse human health impacts. This conclusion is based on several key factors: (1) predicted HCl concentrations are below ambient air quality criteria; (2) no significant health impacts from acid aerosols are expected based on comparison with sulfuric acid aerosol toxicity; and (3) the predicted concentrations of aluminum oxide do not exceed the criteria for particulate matter.

Although aluminum may induce certain neurotoxic effects and is present in the neurofibrillary tangles of patients with Alzheimer's disease and Parkinson-dementia, a causal relationship between environmental exposures to aluminum and Alzheimer's disease has not been established. While aluminum oxide will be a component of ASRM exhaust, it will not exist in a bioavailable form and is not easily absorbed into the body. There has not been any link between aluminum oxide and Alzheimer's disease. Air dispersion modeling indicates aluminum oxide will be present only briefly and at low concentrations as a result of ASRM testing. Therefore, it is highly unlikely that ASRM emissions would significantly contribute to overall normal aluminum intake such that it could induce neurological disorders such as Alzheimer's disease.

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**Appendix L**  
**Descriptions of Sensitive Species**  
**Found in the Project Areas**

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# APPENDIX L

## DESCRIPTIONS OF SENSITIVE SPECIES FOUND IN THE PROJECT AREAS

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### PLANTS

**Cruise's Goldenaster**—Cruise's goldenaster (*Chrysopsis gossypina* ssp. *cruiseana*) is listed as an endangered species in the state of Florida (Wood, 1996). This species is a small, herbaceous, yellow daisy found within the Barrier Island ecological association. It grows on the crests and leeward sides of sand dunes on the north side of Santa Rosa Island and is associated with previously disturbed areas. Populations of Cruise's goldenaster were severely affected by Hurricane Opal in 1995. Between 1995 and 1996, Florida Natural Area Inventory personnel visited 26 of the 28 Cruise's goldenaster sites known to occur on Eglin's Santa Rosa Island property to determine post-Opal population status. Surveys documented 50 percent of the sites were gone, 31 percent were substantially diminished, and 19 percent remained the same. Although severely impacted by the storm, populations of this species survived throughout its range. (Florida Natural Areas Inventory, 1996)

**Florida Perforate Cladonia**—The Florida perforate cladonia (*Cladonia perforata*) is Federally and state listed as an endangered species (Wood, 1996). The Florida perforate cladonia is a small, pale gray-green ground lichen found on Santa Rosa Island. This lichen may reproduce only by vegetative fragmentation; no spore-producing organs have been observed. It prefers exposed patches of sand in coastal grassland and scrub (U.S. Department of the Air Force, 1995). Prior to the hurricane season of 1995, seven occurrences of this lichen had been documented on Santa Rosa Island. Post-hurricane surveys conducted by the Eglin Natural Resources staff indicated that several populations were severely damaged. Hurricane Opal impacted all three of the north Florida populations, including the largest on the eastern end of Santa Rosa Island. Recovery of these populations, and establishment of new populations resulting from movement related to the hurricane, will be monitored by Eglin Air Force Base (AFB). (Florida Division of Forestry, 1997; Florida Natural Areas Inventory, 1997)

**Geiger Tree**—The geiger tree (*Cordia sebestena*) is a state endangered species that primarily occurs in coastal rock barren communities along hammock edges (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West and at the Saddlebunch Key transmitter site, as well as several other keys in the area.

**Gulf Coast Lupine**—The Gulf coast lupine (*Lupinus westianus*), a species listed as threatened by the State of Florida, is a pea-flowered shrub known to exist on Santa Rosa Island and Cape San Blas within the Barrier Island ecological association. The species occurs in a disturbed dune area on the west side of Santa Rosa Island outside the proposed region of influence. On Cape San Blas, it occurs on sand dunes that face the Gulf and occasionally on disturbed areas where the other native vegetation has been

removed. It has been documented approximately 1.2 kilometers (0.75 mile) east of Site D-3A. (U.S. Department of the Air Force, 1995)

**Joewood**—The Joewood (*Jacquinea keyensis*) is a state threatened species that primarily occurs in transitional areas between mangrove swamps and salt marshes in coastal rock barren communities (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West, Saddlebunch Key transmitter site, and the Cudjoe Key site.

**Manchineel**—The manchineel (*Hippomane mancinella*) is a state threatened species that primarily occurs in hammock/coastal rock barren ecotone habitats, buttonwood-thorn scrub thickets (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West.

**Porter's Broom Spurge**—Porter's broom spurge (*Chamaesyce porteriana* var. *scoparia*) is a state endangered species that primarily occurs in the coastal rock barren community (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West and at the Saddlebunch Key transmitter site, as well as several other keys in the area.

**Telephus spurge**—The Telephus spurge (*Euphorbia telephioides*) is a Federal threatened and state endangered perennial herb with numerous short stems and smooth, fleshy leaves. It flowers from April through July and occurs among scrubby oaks on low ridges within 6 kilometers (4 miles) of the Gulf of Mexico. This spurge occurs in Bay, Gulf, and Franklin counties from Panama City Beach to east of Apalachicola. It is present and seems to be locally abundant immediately to the east of the St. Joseph Peninsula on similar coastal sand ridges. The St. Joseph Peninsula has apparently not been searched for this species. The primary threat to this species is adverse modification of habitat. (U.S. Fish and Wildlife Service, 1994)

**Twisted Air Plant**—The twisted air plant (*Tillandsia flexuosa*) is a state threatened species that primarily occurs in rockland hammock and buttonwood strands in coastal rock barren communities (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West.

**West Indian Mahogany**—The West Indian mahogany (*Swietenia mahagoni*) is a state threatened species that primarily occurs in rockland hammock communities (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West.

**Wild Cotton**—The wild cotton (*Gossypium hirsutum*) is a state endangered species that primarily occurs in coastal rock barren communities (Florida Natural Areas Inventory and The Nature Conservancy, 1994; Wood, 1996). It has been documented on Naval property on Key West.



## MAMMALS

### Terrestrial

**Key Deer**—The key deer (*Odocoileus virginianus clavium*) is a Federal and state endangered species that is endemic to the Lower Keys (Monroe County, 1993; Wood, 1996). It is the smallest race of North American deer (U.S. Department of the Interior, 1997). Adults measure 63.5 to 76.2 centimeters (25 to 30 inches) at the shoulder. Males weigh 24.9 to 34 kilograms (55 to 75 pounds) and females weigh 20.4 to 29.5 kilograms (45 to 65 pounds). Its primary food source is the red mangrove, but it also feeds on approximately 60 other plants. Breeding occurs all year, but peaks in September and October. Fawning peaks in April and May. (U.S. Department of the Interior, 1997)

In 1992, the population estimate was 250 to 300 animals (Monroe County, 1993). At present, approximately two-thirds of the population is centered on Big Pine Key and No Name Key with the range extending to Big Torch, Middle Torch, Cudjoe, Howe, Annette, Little Pine Island, Sugarloaf, and Knockemdown Keys (Monroe County, 1993). The use of the latter keys is limited to short-term foraging and movement. Historically, the key deer ranged from Key West to Duck Key (U.S. Department of the Interior, 1980).

It uses almost all habitats and feeds in slash pinelands, mangroves, and transitional habitats. Tropical hardwood hammocks are used for cover and fawning. Home range size ranges from 91.9 to 552.8 hectares (227 to 1,366 acres) (Silvy, 1975). Fresh drinking water and freshly burned slash pineland habitat appear to be most critical (U.S. Department of the Interior, 1980)

The primary reasons for the species' decline include the following: (1) loss of habitat and installation of fencing; (2) mortality from highways, domestic animals, poaching, and drowning in mosquito ditches; (3) hand feeding resulting in loss of fear of humans and vehicles; and (4) contamination of freshwater sources (U.S. Department of the Interior, 1985).

**Lower Keys Marsh Rabbit**—The Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*) is a Federal and state endangered species that is endemic to the lower Florida Keys (Wood, 1996). Current estimates are that only 200 to 400 rabbits remain in small, scattered populations on several keys west of the Seven-mile Bridge (Florida Game and Fresh Water Commission, 1996). A total of 82 patches of suitable habitat have been identified, of which some 50 were occupied by rabbits in 1995 (Florida Game and Fresh Water Commission, 1996). All of the occupied patches were on Boca Chica, Saddlebunch, Sugarloaf, and Big Pine keys.

During an inventory of Naval property, the Lower Keys marsh rabbit was found in natural graminoid marsh areas on Boca Chica, East Rockland, Geiger, and Saddlebunch keys (Florida Natural Areas Inventory and The Nature Conservancy, 1994). The number of occupied patches on Naval Air Station Boca Chica has increased since 1992, while the number of occupied sites outside the Naval Air Station has decreased (Florida Game and Fresh Water Commission, 1996). The marsh rabbit has not been documented on Cudjoe Key as of 1997, although suitable habitat that is monitored for rabbits exists to the east of the Aerostat facility (Florida Game and Fresh Water Commission, 1996; Frank, 1997).

Saddlebunch Key has the most extensive and continuous available habitat on Navy land in the Lower Keys. Several rabbits and their sign were noted associated with *Spartina-Fimbristylis-Cladium* marshes during a site visit at Saddlebunch Key in May 1997. Most of the observations were noted along the existing access road and near the proposed MAB site. Suitable foraging and cover habitat exists in the vicinity of the proposed launch pad and other project components on Saddlebunch Key. Marsh rabbit runs, dens, and nests are made in cordgrass and sedges (U.S. Department of the Interior, 1997).

The minimum marsh rabbit home range size is 0.3 hectare (0.74 acre) (Forys, 1995). A population viability analysis conducted by the Florida Game and Fresh Water Commission indicates that the marsh rabbit will become extinct within the next 50 years (Florida Game and Fresh Water Commission, 1996). Due to habitat fragmentation, the subpopulations in the various suitable habitat patches are socially isolated but interact through dispersal and exhibit metapopulation characteristics (Florida Game and Fresh Water Commission, 1996; U.S. Department of the Interior, 1989b). In addition to habitat loss, depredation by domestic cats and imported red fire ants is a significant cause of population decline (Forys, 1995; Florida Game and Fresh Water Commission, 1996).

**St. Andrew Beach Mouse**—The St. Andrew beach mouse (*Peromyscus polionotus peninsularis*) has been proposed for listing as endangered under the Endangered Species Act (ESA) and is a state endangered species in Florida. It relies on beach and dune habitat that provides sufficient vegetative cover. This small, light-colored rodent is restricted to coastal sand dune ecosystems where it burrows and excavates nests. Its diet consists of plant seeds and insects. Beach mice are not known to live in buildings or frequent garbage areas, but prefer sand-covered slopes with patches of sea oats, beach and other grasses, and herbs. The historic range of the St. Andrew beach mouse includes the St. Joseph Peninsula and mainland coastal dunes from Panama City east to Indian Pass in Gulf County. It was historically present at Cape San Blas, but now appears to be absent from the area due to habitat loss (U.S. Department of the Air Force, 1995; U.S. Fish and Wildlife Service, undated).

Habitat loss and other factors have eliminated this beach mouse from most of its historic range. Coastal development, military exercises, intense vehicle and pedestrian use, natural erosion, hurricanes, and tropical storms have damaged or destroyed sand dunes in the area. Predation by cats, competition from other rodents, and decreased genetic fitness as a result of population fragmentation have also contributed to the mouse's overall decline. (U.S. Fish and Wildlife Service, undated)

**Santa Rosa Beach Mouse**—The Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*) is under consideration for Federal listing as threatened or endangered. This small, light-colored mouse is restricted to coastal sand dune ecosystems where it burrows and excavates nests. Its diet consists of plant seeds and insects. It prefers sand-covered slopes with patches of sea oats, beach and other grasses, and herbs. This subspecies occurs only on Santa Rosa Island. (U.S. Fish and Wildlife Service, undated)

The once continuous range of the Santa Rosa beach mouse has been fragmented and reduced by habitat loss and other factors. The local population at Eglin AFB has declined, and other populations have almost been eliminated from Pensacola Beach and

Fort Walton Beach. Coastal development, intense vehicle and pedestrian use, natural erosion, hurricanes, and tropical storms have damaged or destroyed sand dunes in the area. Predation by cats, competition from other rodents, and decreased genetic fitness as a result of population fragmentation have also contributed to the mouse's overall decline. (U.S. Fish and Wildlife Service, undated)

**Silver Rice Rat**—The silver rice rat (*Oryzomys argentatus*) is a Federal and state endangered species (Wood, 1996). The silver rice rat is known to occur on 11 keys, including Cudjoe, Summerland, Big Torch, Middle Torch, Upper Sugarloaf, Saddlebunch, Little Pine, Raccoon, Water, Howe, and Johnston keys (Florida Game and Fresh Water Commission, 1996; Monroe County, 1993). Suitable habitat also exists on other keys, including Boca Chica. During a site visit on 6 and 7 May 1997, silver rice rats were observed at the Saddlebunch site. The entire wetland habitat that exists at the Saddlebunch Key site is suitable silver rice habitat. Critical habitat, encompassing the area surrounding the Cudjoe Key aerostat facility, has been designated for this species under provisions of the ESA. (Florida Game and Fresh Water Fish Commission, 1996).

Most of the known populations are dependent upon wetland habitat containing the gradient from intertidal red mangrove to the saltmarsh and buttonwood habitats in tussocks of *Sporobolus/Distichlis* (Monroe County, 1993). The mangroves are used as foraging habitat, while the higher elevations are used for nesting and foraging (Florida Game and Fresh Water Commission, 1996). The home range of one individual was estimated at 22.78 hectares (56.3 acres). Protection of the buttonwood wetlands and saltmarsh habitat on occupied keys has been proposed by Monroe County to protect this species. This species is negatively affected by the black rat, which nests in or near man-made structures and among debris (Frank, 1997). Black rats appear to nest inside small buildings associated with the Voice of America (VOA) antennas. Removal of such structures or making them inaccessible to black rats may represent a potential enhancement action.

### Aquatic

**Blue Whale**—The blue whale (*Balaenoptera musculus*) is a Federally endangered species of baleen whale. Sightings of this species have been extremely rare in the Gulf and are likely to be rare in the project vicinity (SSBN Security Program Office, 1995). The estimated density of this species in the Eglin Gulf Test Range (EGTR) is 0.00009 individuals/nm<sup>2</sup> (SSBN Security Program Office, 1995). Foraging typically takes place in water less than 100 meters (328 feet) deep.

**Fin Whale**—The Federally endangered fin whale (*Balaenoptera physalus*) is the second largest baleen whale ranging from 19.8 to 22.9 meters (65 to 75 feet) long and weighing approximately 63 metric tons. The main body and left side of the head is a dark blue-gray and the right side of the head and underside is yellowish white. The back is ridged towards the tail. The present worldwide population is estimated to be 120,000.

Fin whales have occasionally been found stranded on beaches throughout the Keys, indicating that they pass through the area (U.S. Department of the Interior, Minerals Management Service, 1990). Sightings of this species have been extremely rare in the Gulf and the estimated density in the EGTR is 0.00027 individuals/nm<sup>2</sup> (SSBN Security

Program Office, 1995). This species is most likely to occur off of the OCS. Fin whales compete with commercial fisheries, but this impacts the species only if prey species are severely overfished.

**Humpback Whale**—The humpback whale (*Megaptera novaeangliae*) is a Federally endangered species of baleen whale that potentially occurs in the Gulf of Mexico; sightings, however, have been extremely rare (Air Force Development Test Center, Environmental Management Directorate, 1997). The humpback whale has a knobby head and extraordinarily long flippers. The average length is 15 meters (48 feet) for females and 14 meters (44 feet) for males. Calving occurs mainly in winter. Human impacts include subsistence hunting, entanglement in fishing gear, collisions with ships, and habitat disturbance. Humpback whales breed and calve in the Caribbean. Although humpback whales were observed in the Gulf during 1992-1993 GulfCet surveys, a juvenile stranding was documented in Walton County in April 1998. Historical records include two sightings offshore from Tampa Bay and Fort Myers (U.S. Fish and Wildlife Service, Office of Biological Sciences, 1981). The estimated density in the EGTR is 0.00009 individuals/nm<sup>2</sup> (U.S. Department of the Air Force, Air Force Development Test Center, 1997). This species is most likely to occur along and off of the OCS, outside of potential drop zones and debris impact areas in the Gulf.

**Northern Right Whale**—The Federally endangered northern right whale (*Eubalaena glacialis*) is a medium sized baleen whale that is 13.5 to 16.5 meters (44.3 to 54.1 feet) long. It has no dorsal fin, a large head, narrow upper jaw, and strongly bowed lower jaw. Calving occurs in the winter along the southeast coast of the United States. Coastal Florida is one of five known areas used by the North Atlantic population. The only known calving ground is in the coastal waters of Georgia and Florida. Overwintering grounds are located on the east coast of Florida.

It is assumed that they may pass through the Keys during migration (U.S. Department of the Interior, Minerals Management Service, 1990). Sighting of this species has been extremely rare in the Gulf, with the estimated maximum density in the EGTR being 0.00009 individuals/nm<sup>2</sup> (SSBN Security Program Office, 1995). Historic records indicated only two accounts of right whales. None were observed during the 1992-1993 GulfCet surveys. Current estimates indicate no more than 500 individuals. Human impacts on right whales include vessel interaction, entanglement in fishing gear, habitat degradation, and hunting. Coastal pollution and collision with boats represent the primary threats to this species (Odell, 1992).

**Sei Whale**—The Federally endangered sei whale (*Balaenoptera borealis*) is the third largest of the great whales. It is a species of baleen whale that grows to 12 to 17 meters (36 to 51 feet) and weighs 20 to 30 tons. It has pleated grooves on its belly that streamline its shape and allow the throat area to expand during feeding. A single prominent longitudinal ridge on top of its rostrum distinguishes the sei whale from the Bryde's whale. It feeds mainly on copepods, but also on krill and other crustaceans.

Most sei whales live in the Southern Hemisphere. They are found in the Gulf of Mexico and may occur in the Lower Keys, although there have been no strandings or sightings in the region (U.S. Department of Commerce, National Oceanic and Atmospheric

Administration, 1995a; U.S. Department of the Interior, Minerals Management Service, 1990). Two groups of sei whales were observed in the northern Gulf of Mexico, west of the EGTR, during the GulfCet surveys. The estimated density in the EGTR is 0.00027 individuals/nm<sup>2</sup> (SSBN Security Program Office, 1995). The mean water depth for observations made during 1992 and 1993 GulfCet aerial surveys was 213 meters (698.8 feet).

**Sperm Whale**—The Federally and state endangered sperm whale (*Physeter macrocephalus*) is the largest of the toothed whales (odontocetes), reaching a length of 18.3 meters (60 feet) in males and 12.2 meters (40 feet) in females. It has an extremely large head that is approximately 25-35 percent of its total length. It has a single asymmetrical blowhole on the left side of its head near the tip. It has no dorsal fin, but has a series of humps along the dorsal surface.

Sperm whales tend to occupy waters that are deeper than 600 meters (1,968.5 feet) and are uncommon in waters less than 300 meters (984.2 feet) (National Marine Fisheries Service, 1997). Although they are reported to occur in water as shallow as 199 meters (652.9 feet) (Mullin, et al., 1994). Sperm whales feed mainly on squid. The sperm whale occurs in the Keys throughout the year and may use the area for calving (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a; U.S. Department of the Interior, Minerals Management Service, 1990; U.S. Fish and Wildlife Service, Office of Biological Sciences, 1981). During surveys conducted by the Minerals Management Service (MMS) and 1992-1993 GulfCet surveys, 22 groups of sperm whales were encountered most often in waters greater than 500 meters (1,640.4 feet) deep (U.S. Department of the Interior, Minerals Management Service, 1990). The sperm whale is the most abundant of the larger whales in the Gulf of Mexico, with densities in the EGTR estimated at 0.00456 individuals/nm<sup>2</sup>. No activities in U.S. waters are known to adversely affect this species (National Marine Fisheries Service, 1997). During the GulfCet aerial surveys, the mean group size was 2.1 individuals. Most breeding takes place in the spring; calves are born in the fall (National Marine Fisheries Service, 1997). No current activities in U.S. waters are known to adversely affect recovery of the species.

**West Indian (Florida) Manatee**—The Florida manatee (*Trichechus manatus*) is a Federal and state endangered species (Wood, 1996). Most of the manatees live along the Atlantic shore of Florida, with smaller numbers occurring in the Keys, and along the Gulf of Mexico. The manatee occurs in the Keys throughout the year, typically using habitats in the Key West area (Monroe County, 1993; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). Surveys conducted on a state-wide basis indicate that the maximum number of manatees present in the Lower Keys at any one time is approximately six and most of the time only one or two are present (Ackerman, 1997). Although the abundant seagrass beds associated with the Lower Keys provide good foraging habitat, the lack of fresh water appears to be limiting (Florida Natural Areas Inventory and The Nature Conservancy, 1994). Similarly, manatees only rarely pass along the Santa Rosa and Cape San Blas shores. None of the 25 warmwater refuges established within Florida are near the project sites.

The manatee is a herbivore that typically uses canals, creeks, and surrounding waters where it feeds heavily on seagrass beds (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). They can use a wide range of water types and quality ranging from fresh to saltwater, saline or acidic, clean or polluted (Ackerman, 1997; U.S. Department of the Interior, 1989c). The primary factors for its population decline are water quality degradation; seagrass bed destruction and damage; mortality from boat collisions, entanglement, and poaching; and disturbance from marine recreationists (U.S. Department of the Interior, 1989c). Cold stress, perinatal problems, and water control structures also contribute to manatee mortality (Florida Department of Environmental Protection, 1997). A high adult survival rate is critical for population maintenance (Marmontel, 1992).

## **BIRDS**

**Bald Eagle**—The southern bald eagle (*Haliaeetus leucocephalus*) is a Federal and state threatened species (Wood, 1996). In Florida, nesting and breeding activities occur year-round, although egg laying usually occurs during the winter. They typically nest in tall trees such as pines that are near water; in the keys they will also nest on mangroves (Monroe County, 1993).

In the Lower Keys there are at least four nesting pairs, two of which are in the vicinity of the proposed project sites. One nest is near the middle of Cudjoe Key and the second bald eagle nest in the vicinity of the Florida Keys sites is on Lower Harbor Keys, approximately 13 kilometers (8 miles) west of the proposed Saddlebunch launch site. They forage on waterfowl and fish along the shoreline.

The nearest bald eagle nest to the Santa Rosa Island site is located in Rocky Bayou, approximately 40 kilometers (25 miles) away. Another pair of eagles, possibly from East Bay Swamp, has been observed flying over Santa Rosa Island. Bald eagles regularly forage for waterfowl and fish throughout the Eglin AFB throughout the year, including on Santa Rosa Island. At Cape San Blas, a bald eagle nest occurs within approximately 914 meters (3,000 feet) of the proposed launch site. This pair began nesting at the site several years ago and produced young for the first time in 1997. The shorelines of Cape San Blas provide excellent foraging habitat for these bald eagles throughout the year.

The U.S. Fish and Wildlife Service (USFWS) lists three primary reasons for the decline of the southern bald eagle: (1) loss or modification of habitat; (2) predation/destruction from deliberate human persecution or environmental contaminants; and (3) disturbance during the nesting season (U.S. Department of the Interior, 1989a).

**Least Tern**—The least tern (*Sterna antillarum*) is a state-threatened species that nests throughout the Keys (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a; Wood, 1996). The nearest known nesting site in relation to the proposed project is located on Big Pine and Ohio keys (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). At Eglin AFB, the least tern nests in coastal strand and on flat rooftops (U.S. Department of the Air Force, 1995). At Cape San Blas, least terns occur during the summer, with as many as 100 birds using the beach habitat on the Cape.

**Piping Plover**—The piping plover (*Charadrius melodus*) is a Federal and state threatened bird species in Florida (Wood, 1996). It is a small, stocky shorebird that resembles a sandpiper (U.S. Department of the Interior, 1997). The east coast population breeds on sandy beaches from Newfoundland to South Carolina. These birds then migrate in early September to wintering habitat from North Carolina to Key West. In the Keys, the section from Seven-mile Bridge to Bahia Honda is most heavily used (U.S. Department of the Interior, 1988). Wetlands on Boca Grande, Ohio, and Woman keys provide most of the wintering habitat (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). Very few of the other keys in the project vicinity have high energy beaches that are suitable for plover foraging.

Piping plovers use coastal beach habitats of Cape San Blas for wintering habitat. As many as 59 piping plovers have been documented using habitats immediately along the shoreline at Cape San Blas (Florida Cooperative Fish and Wildlife Research Unit, 1994; U.S. Department of the Air Force, 1995). Although these plovers have the potential to occur on Santa Rosa Island, they have not been documented there to date.

Destruction of habitat, predation/destruction, and indirect disturbances are the primary factors for the species decline, although the latter two factors have not been identified for the wintering grounds in the Florida Keys (Monroe County, 1993).

**Roseate Tern**—The Caribbean breeding population (including birds nesting in Florida) of the roseate tern (*Sterna dougallii*) is a Federal and state threatened species that occurs from the middle Keys to the Dry Tortugas (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a; Wood, 1996). It has a light gray back and wings, long outer tail feathers, and a black bill that becomes pink at the base during the breeding season. Roseate terns begin arriving at breeding areas at the end of April with the earliest eggs being laid during the third or fourth week of May. Chicks usually fledge 25 to 28 days after hatching.

The closest known location of the roseate tern to the proposed project is the Spoil Islands in Key West Harbor. Roseate terns may occasionally forage in the waters surrounding the other keys. Habitat loss, disturbance by humans, and predation by raccoons and black rats are the primary threats to this species (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a).

**Southeastern American Kestrel**—The state threatened southeastern American kestrel (*Falco sparverius paulus*) has been documented at Cape San Blas during October and November (Florida Cooperative Fish and Wildlife Research Unit, 1994). This species is the smallest member of the falcon family in the United States and is restricted to South Carolina, Alabama, Georgia, and Florida. The southeastern American kestrel does not migrate but remains in the southeast year-round. It typically nests in cavities excavated by woodpeckers in dead trees, frequently longleaf pines. The main reason for decline of this species is loss of habitat. (University of Florida, 1997)

**Southeastern Snowy Plover**—The southeastern snowy plover (*Charadrius alexandrinus tenuirostris*) is listed as a threatened species in the state of Florida (Wood, 1996), and as many as 38 pairs of snowy plovers have been documented at Eglin AFB. Approximately one nest per kilometer (two nests per mile) occurs along Santa Rosa Island,

making these dunes the most abundant nesting location in Florida. The solitary nests are built between late March and early September. Several years ago, one snowy plover nest was found on the unused pad at Site A-15.

**White-crowned Pigeon**—The white-crowned pigeon (*Columba leucocephala*) is a bird listed as threatened by the State of Florida and as a species for which more information is needed by the USFWS. It has a completely gray body with a white head crown. The legs, feet, and eyelids are red. This bird inhabits mangrove keys and wooded islands of south Florida. This species occurs throughout the Lower Keys, including a limited foraging population at the Saddlebunch Key transmitter Site. It nests from May until September. Its diet consists of wild fruits, berries, seeds, and some insects. Foraging is done in hardwood forests of the Florida Keys. (University of Southern Mississippi, 1998)

The white-crowned pigeon is known in the east from the southern tip of Florida throughout the Keys. Declining hardwood habitat is the primary threat to the species. (University of Southern Mississippi, 1998)

## FISH

**Alabama Shad**—The Alabama shad (*Alosa alabamae*) is a candidate for Federal listing under the ESA and occurs in the Gulf of Mexico off the coasts of Alabama and Florida (62 FR 134:37560-37563). The Alabama shad spawns in fresh water in spring or early summer, ascending rivers and streams. Adults arrive in the fresh water of the Apalachicola River from January to April. Juveniles have been found in brackish water at Pensacola, Florida. This species has declined in abundance, and its habitat has become more restricted. There is scant information about the life history of this fish, especially early life stages.

**Groupers**—The speckled hind (*Epinephelus drummondhayi*), jewfish (*E. itijara*), and Warsaw grouper (*E. nigritus*) are candidates for Federal listing under the ESA and occur in the Gulf of Mexico, as well as the Atlantic Ocean (U.S. Department of Commerce, 1995).

The speckled hind, jewfish, and Warsaw grouper are serranids (groupers) that are widely dispersed in tropical and subtropical waters. Most groupers are found in coral reefs and rocky coasts, but some inhabit estuarine areas. Groupers are predatory and exclusively carnivores with cannibalistic tendencies. Discrete social units are formed in the wild, and permanent and defined territories are guarded. The jewfish is found in nearshore waters around docks, in deep holes, and on ledges. Young often occur in estuaries, especially around oyster bars. This fish is more abundant in southern Florida waters than northern waters. It spawns over the summer months, feeding on crustaceans and fish. (Agri-aqua, 1998)

**Sharks**—The dusky shark (*Carcharhinus obscurus*), night shark (*C. signatus*), and sand tiger shark (*Odontaspis taurus*) are candidates for Federal listing under the ESA and occur in the Gulf of Mexico, as well as the Atlantic Ocean (62 FR 134:37560-37563). Dusky sharks mature at 17 years of age and grow to approximately 2 meters (8 feet) in length. They are located in tropical seas worldwide except in the oceanic Pacific and are found in the western Atlantic from Massachusetts to Brazil. Sand tiger sharks grow to



lengths of 1 to 3 meters (4 to 9 feet) and are found in the western Atlantic from Maine to Brazil. The night shark is also a large coastal species currently covered in the National Marine Fisheries Service (NMFS) Shark Management Plan. (Burgess, 1998; Fish Guide, 1998)

**Gulf Sturgeon**—The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromas (ascends from sea to fresh water to spawn) with imbedded bony plates or scutes. It has an extended and blade-like snout with four fleshy barbels in front of the mouth. It is light to dark brown and pale underneath. It can grow longer than (9 feet) and weigh more than (300 pounds). The Gulf sturgeon lives up to 70 years and requires 9 to 12 years to reproduce. In 1991, the Gulf sturgeon became Federally listed as a threatened subspecies (U.S. Fish and Wildlife Service and Gulf States Marine Fisheries Commission, 1995). In 1984), the state of Florida prohibited the take of all sturgeon.

Sturgeon migrate from salt water into the large rivers of the Gulf of Mexico during the warm months of the year. In general, subadult and adult sturgeon migrate into rivers from the Gulf of Mexico from February through about early May and return to salt water during September or October. Young fish do not venture far into the Gulf of Mexico. Their primary prey include: crabs, amphipods, isopods, midge larvae, mud shrimp, lugworms, clams, crustaceans, and echinoderms. Because these fish are bottom feeders, ingestion of metals and other contaminants is a potentially significant issue.

The Gulf sturgeon's range extends from Florida Bay, along the western and northern coasts of Florida, to the Mississippi River. In the vicinity of the proposed project, the range includes the Yellow and Choctawhatchee rivers, Santa Rosa Sound, and Choctawhatchee Bay near Eglin AFB; they do not occur in the Florida Keys (U.S. Fish and Wildlife Service and Gulf States Marine Fisheries Commission, 1995). Adult sturgeon have also been captured 1.6 kilometers (1 mile) south of Cape San Blas in 15 meters (50 feet) of water. The status of the Gulf sturgeon in rivers other than the Suwannee and Apalachicola is unknown, but is thought to be reduced from historic levels. Barriers to spawning habitat, loss of habitat, poor water quality, and overfishing are the primary reasons for the species' decline.

**Key Silverside**—The key silverside (*Menidia menidia*), a state-threatened fish, is the smallest known species of *Menidia*. It is located in the Florida Keys from Key West to Long Key. The key silverside is the only species of *Menidia* regarded as endemic to the Florida Keys. It subsists on a diet of animal microorganisms such as copepods, mysids, isopods, amphipods, and insects. The key silverside is believed to spawn during middle to late winter. The key silverside is diurnal and occurs in fast-moving schools. It is believed that the rarity of this species results from its elusiveness and inaccessible habitat. Threat to this species is mainly from loss of its brackish water habitat by development. (University of Southern Mississippi, 1998)

## REPTILES AND AMPHIBIANS

### Terrestrial

**Eastern Indigo Snake**—The eastern indigo snake (*Drymarchon corias couperi*) is a large, shiny blue-black, non-poisonous snake that grows to a maximum length of 2.43 meters (8 feet) (U.S. Department of the Interior, 1997). Mating begins in November and continues into March. Averages of 8 to 9 eggs hatch approximately 3 months later. It often emerges from its den in the winter when air temperatures exceed (50°F). It is Federally and state listed as a threatened species and occurs in the Keys and Panhandle sections of the project area (Wood, 1996). In the Florida Keys, the eastern indigo snake occurs on various keys from Upper Key Largo to Sugarloaf Key (Monroe County, 1993). This species has also been documented on Boca Chica (Florida Natural Areas Inventory and The Nature Conservancy, 1994).

There have been less than 24 confirmed sightings of eastern indigo snakes at Eglin AFB in the last 20 years (U.S. Air Force Operational Test and Evaluation Center, 1994). In this area the indigo snake appears to be closely associated with high, dry, well-drained sandy soils in sandhill habitat used by gopher tortoise; gopher tortoises are not known to occur on Santa Rosa Island but do occur on the mainland to the north of the island. There is a remote chance that the eastern indigo snake occurs on the Cape San Blas Barrier Island (U.S. Department of the Air Force, 1995).

This carnivorous species of snake utilizes a variety of habitats including disturbed uplands, tropical hardwood hammock, slash pinelands, beaches/berms, freshwater wetlands, and mangroves (Kochman, 1978; Steiner, Bass, and Kushlan, 1983). Early habitat accounts indicated an association with xeric sand ridges and the species' dependence on gopher tortoise burrows for overwintering (U.S. Department of the Interior, 1982). Loss of habitat from development and interference with natural fire cycles and direct predation/destruction are the primary factors for this species' decline in the Florida Keys (Lazell, 1989; U.S. Department of the Interior, 1982).

**Lower Keys Ribbon Snake**—The Lower Keys ribbon snake (*Thamnophis sauritus sackenii*) is considered an endangered species by the state of Florida. This designation applies only to the lower Florida Keys (Wood, 1996). The ribbon snake occurs in fresh and saltwater wetlands.

### Aquatic

**American Crocodile and American Alligator**—The American crocodile (*Crocodylus acutus*) is Federally and state listed as an endangered species. In recent years, the American crocodile has been known to nest at two locations in the Florida Keys, one at Lake Surprise and one on Upper Key Largo (Monroe County, 1993). Crocodiles have been reported from the Lower Keys, including Big Pine, Cudjoe, No Name, Big Munson, Middle Torch keys and Key West (Lazell, 1989; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). However, there is no evidence for reproduction (U.S. Department of the Interior, U.S. Fish and Wildlife Service, 1984). Crocodiles primarily inhabit mangrove-lined creeks and swamps and may occasionally occur in the

mangrove wetlands near the proposed project. The USFWS's recovery plan for American crocodiles lists three primary reasons for the decline of this species: (1) destruction or modification of habitat through loss of mangrove habitat and degradation of nearshore water quality; (2) predation and/or destruction from native wildlife, human disturbance (egg collection and nest destruction), highway mortality, and commercial harvests; and (3) indirect human disturbance during courtship and nesting periods (U.S. Department of the Interior, U.S. Fish and Wildlife Service, 1984).

The American alligator (*Alligator mississippiensis*) is listed as a threatened species (due to their similar appearance with crocodiles) and as a state species of special concern (Wood, 1996). American alligators have been reported from Big Pine, Cudjoe, Little Pine, and Middle Torch keys (Monroe County, 1993). Alligators typically occur in freshwater wetland habitats, such as those found in the excavated mosquito-control ditches on Big Pine Key; alligators do use marine habitats as well (Jacobsen, 1983; Lazell, 1989). In the Florida panhandle, alligators are found in approximately 202 hectares (500 acres) of alligator habitat throughout Eglin AFB in fresh and brackish water in swamps and flatwoods. Most of these areas are in the bays and bayous along the mainland coastal rivers; alligators are not in the vicinity of the Santa Rosa or Cape San Blas sites (U.S. Department of the Air Force, 1995).

**Atlantic Green Turtle**—The green sea turtle (*Chelonia mydas*) is Federally classified as a threatened species, except for breeding populations in Florida, which are listed as endangered. The state of Florida also classifies the green turtle as an endangered species (Wood, 1996). The Atlantic green turtle is known to occur in the Florida Keys, Panhandle, and Gulf of Mexico portions of the project area. Between 200 to 1,100 females nest on U.S. beaches (National Marine Fisheries Service, 1996). The Florida Department of Environmental Protection (FDEP) estimates that between 130 and 717 female green turtles nest in Florida annually and that the population seems to be increasing, although annual estimates fluctuate greatly and some researchers question the reported population growth (Florida Department of Environmental Protection, Florida Marine Research Institute 1995; National Marine Fisheries Service, 1997). The historical nesting by green sea turtles in Florida is unclear (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995).

Green sea turtles nest on Santa Rosa Island and Cape San Blas. In the Florida Keys, green sea turtles nest in small numbers on several keys within the Great White Heron National Wildlife Refuge. The closest documented green sea turtle nesting to project sites in the Florida Keys is on Sawyer Key (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995). Very few of the other keys in the vicinity have high energy beaches that are suitable for turtle nesting.

Green sea turtles reach sexual maturity at 20 to 25 years of age (National Marine Fisheries Service, 1996). This species nests on southeastern Florida beaches from 28 April to 3 October, where they bury eggs approximately 20 centimeters (7.9 inches) below the surface in the sand above the high tide level on high energy beaches (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995; National Marine Fisheries Service, 1997; U.S. Fish and Wildlife Service, 1982). The only 3 years with reported nesting in northwestern Florida indicated a 25 May to 22 August nesting

season (Florida Department of Environmental Protection, Florida Marine Research Institute 1995). Each female turtle lays eggs three to four times each season. After approximately 40 to 60 days, hatchlings crawl out of the nest and to the ocean.

Juveniles subsist on a diet of shellfish, jellyfish, and other marine invertebrates. Because adult green turtles feed primarily on manatee grass and turtle grass, the nearshore waters of the Florida Keys and other coastal areas represent important foraging habitat (National Marine Fisheries Service, 1997; U.S. Fish and Wildlife Service, Office of Biological Sciences, 1982). However, the factors that lead to the observed annual nesting population variation, and locations and characteristics of the resident foraging grounds remain unknown (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995).

**Atlantic Loggerhead Turtle**—The loggerhead sea turtle (*Caretta caretta*) is Federally and state listed as a threatened species (Wood, 1996). The FDEP estimates that between 9,000 and 16,700 female loggerhead sea turtles nest an average of 4.1 times per nesting season in Florida (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995). The loggerhead is a large reddish-brown turtle that ranges in shell length from 0.85 to 1.0 meter (33 to 40 inches) and weighs between 68 and 182 kilograms (150 to 400 pounds). Loggerheads are the most commonly observed sea turtle in the southeastern U.S. (National Marine Fisheries Service, 1997)

In the Keys, the loggerhead sea turtle nests on at least 21 keys from Upper Matecumbe Key to the Dry Tortugas and is the most common marine turtle in the Florida Keys National Marine Sanctuary (Florida Department of Environmental Protection, 1996c; Monroe County, 1993). Very few of the other keys in the vicinity of the proposed project have high energy beaches that are suitable for turtle nesting.

Along the Florida Panhandle, loggerhead sea turtles nest on Santa Rosa Island near Site A-15 and along Cape San Blas, which has the highest sea turtle nesting density in northwest Florida. Along the eastern Gulf, most nesting occurs from Sarasota through Collier counties (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995).

In the southeast region of Florida containing the Keys, loggerhead sea turtles typically nest between 7 April and 2 October; in the northwest region, which contains Santa Rosa Island and Cape San Blas, nesting has been reported between 27 April and 24 September (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995). Loggerhead hatchlings are often associated with sargassum rafts (U.S. Department of the Interior, Minerals Management Service, 1990). Adults forage on a variety of crabs, jellyfish, and mollusks (National Marine Fisheries Service, 1997; National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991). Coastal development, commercial fishing, and pollution are the most significant threats to loggerheads.

**Hawksbill Turtle**—The hawksbill turtle (*Eretmochelys imbricata*) is Federally and state-listed as an endangered species. The hawksbill is a small to medium sized turtle ranging in shell length from 0.80 to 1.0 meter (30 to 36 inches) and weighs 45 to 90 kilograms (100 to 200 pounds). The hawksbill is the source of commercial tortoise shell and commercial exploitation is the major cause of its continued decline. The hawksbill is a

tropical reef-dwelling species that feeds primarily on sponges. Nesting by hawksbill turtles in Florida is rare; only 11 nests have been documented between 1979 and 1992, primarily in Dade County (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995). They may nest on the more remote cays and islands of the Florida Keys, where survey effort has not been regular. Since this species is a solitary nester, estimating population size is difficult. In the Florida Keys, this species is most often observed near coral reefs where they forage on sponges (National Marine Fisheries, 1997; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a).

All of the 141 hawksbill turtles observed during NMFS aerial surveys between 1987 and 1994 were in the vicinity of the Lower Keys (National Marine Fisheries, undated). There were no observations in the northern Gulf or along the proposed flight test area.

Posthatchling hawksbills occupy the pelagic environment and reenter coastal waters after they reach 20 to 25 centimeters (8 to 10 inches) carapace length (National Marine Fisheries Service, 1997). Breeding only occurs after at least 31 years following recruitment into the reef ecosystem.

**Kemp's Ridley Turtle**—The Kemp's Ridley turtle (*Lepidochelys kempii*) was Federally listed as an endangered species in 1970. An estimated 500 females nest worldwide (National Marine Fisheries Service, 1997). Only one Kemp's Ridley turtle nested in Florida between 1979 and 1992 (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995). This nest was in Pinellas County in 1989. The distribution of this species is restricted to the Gulf (Air Force Development Test Center, Environmental Management Directorate, 1997). They are occasionally observed in the Florida Keys and may pass through the Straits of Florida near Marathon (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). The Kemp's Ridley is the smallest and most endangered of the sea turtles. Shell length does not exceed 0.8 meter (30 inches) and weight ranges from 36 to 45 kilograms (36 to 45 pounds). (National Marine Fisheries Service, 1997)

Adults and subadults typically inhabit nearshore waters, mangrove creeks, and bays (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). Neonatal turtles feed on sargassum and associated infauna. Subadults and adults forage in shallow water for crab, especially portunid crab (National Marine Fisheries Service, 1997). Age at sexual maturity is thought to be 11 to 12 years, but could be as high as 35 years (National Marine Fisheries Service, 1997). Human activities are mainly responsible for the decline of this turtle species.

Of 31 Kemp's Ridley turtles observed during NMFS aerial surveys between 1987 and 1994, there were several observations well to the east of Cape San Blas, but none in the immediate area of the launch sites. No other observations were recorded along the proposed flight test area. (National Marine Fisheries Service, undated)

**Leatherback Turtle**—The leatherback turtle (*Dermochelys coriacea*) was Federally listed as an endangered species in 1970. In Florida, the leatherback turtle nests almost exclusively along the eastern shore, primarily in Martin and Palm Beach counties (Florida

Department of Environmental Protection, 1996c; Florida Department of Environmental Protection, Florida Marine Research Institute 1995). Estimating the population is difficult because females often change beaches used for nesting (National Marine Fisheries Service, 1997). The FDEP estimates that between 16 and 31 females nest annually from late February through early September in Florida, with each female potentially nesting 5 to 7 times each year (Florida Department of Environmental Protection, Florida Marine Research Institute, 1995). There are no records of leatherback nesting on Santa Rosa Island (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1995a). One nest was documented at St. Joseph State Park, near Cape San Blas, in 1993 (Florida Department of Environmental Protection, 1996c). This species is more pelagic than other species of turtles, is highly migratory, and feeds on jellyfish (National Marine Fisheries Service, 1997). The leatherback is the largest of the sea turtles with a shell length of 2 meters (6 feet) and weight of 637 kilograms (1,400 pounds). The leatherback is covered with a firm rubbery skin. (National Marine Fisheries Service, 1997)

Most of the 181 leatherback turtles observed during National Marine Fisheries Service aerial surveys of the Gulf conducted between 1987 and 1994 were concentrated offshore from Louisiana and Mississippi. However, at least 9 observations were offshore from Santa Rosa Island and several were near the shore to the east of Cape San Blas. Strandings have been reported to FDEP near Santa Rosa Island. No turtles were documented in the Lower Keys or along the southern 75 percent of the test flight path. Incidental takes during commercial fishing and pollution are the most significant threats to the leatherback.

**Striped Mud Turtle**—The striped mud turtle (*Kinosternon baurii*) has a dark colored carapace, up to 100 centimeters (39 inches), striped with three light lines. It is an aquatic turtle, listed as endangered by the State of Florida, found in peninsular Florida and extreme southeastern portions of Georgia and South Carolina. This species lives in and around small temporary ponds associated with hardwood hammocks, and is also associated with mangrove habitat and mosquito ditches. These turtles have a low tolerance to high salinity waters. (University of Southern Mississippi, 1998)

The specialized dependence on fresh water pond-marsh habitat is the reason that this species is of concern. This habitat has been destroyed mainly by intensive development in the lower Florida Keys. Filling of mosquito ditches also limits the amount of appropriate habitat in the Keys. (University of Southern Mississippi, 1998)

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## **Appendix M**

### **Noise**

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# APPENDIX M NOISE

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## Subsonic Noise

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time. Therefore, to compare levels over different time periods, several descriptors were developed that take into account this time-varying nature. Two common descriptors include the day-night average sound level ( $L_{dn}$ ) and maximum sound level ( $L_{max}$ ). These descriptors are used to assess and correlate the various effects of noise on man and animals, including land use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects.

The characteristics of sound include parameters such as amplitude, frequency, and duration. Sound can vary over an extremely large range of amplitudes. The decibel (dB), a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for the measurement of sound.

One decibel of sound level is defined from:

$$L_w = 10 \times \log(W/W_{ref})$$

where  $\log$  is the notation for the common logarithm,  $W$  (watts) is the measure of power,  $W_{ref}$  is the reference power, usually  $1 \times 10^{-12}$  W, and  $L_w$  is the sound power level. Sound pressure is the parameter that is normally measured in noise assessments. As sound pressure squared is proportional to sound power, it also can be denoted in terms of decibels. The resulting quantity is known as the Sound Pressure Level (SPL), and is defined as

$$SPL = 20 \times \log(p/p_{ref})$$

where  $p$  is the measured acoustic pressure and  $p_{ref}$  is the reference pressure. For measurement of sound in air the reference pressure is 20 micropascals ( $\mu Pa$ ), which corresponds to the standard limit of human hearing.

Because the logarithm of 1 is 0, the  $SPL = 0$  dB when the acoustic pressure is the same as threshold of hearing. Therefore, 0 dB corresponds to the threshold of hearing, or the SPL at which people with a healthy hearing mechanism can just begin to hear sound.

Sound levels must be qualified in terms of their ratioed parameter for the level to have meaning. This can be done by either stating the ratio reference after the decibel notation (for example, dB re 20  $\mu Pa$  implies a sound pressure ratio and dB re  $1 \times 10^{-12}$  W implies a sound power level), or by specifically naming the level designation (such as, SPL implies a pressure ratio and sound power level implies a power ratio).

An SPL quotation must also include the location with respect to the source to have meaning. This is because acoustic pressure varies with distance from the source.



In general, human sound perception is such that a change in SPL of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and an increase of 10 dB is perceived as a doubling of sound level.

An overall sound measurement results in a single decibel value that describes the sound environment, taking all frequencies into account. Most basic sound level meters measure sound in terms of overall sound pressure levels, using different weighting scales. Weighting scales are filters in sound level meters that vary frequency sensitivities according to set standards (Cowan, 1994). The most common weighting scales used are the A- and C-weighting. Figure M-1 shows how A-weighting and C-weighting in a sound meter are applied to sounds of various frequency.

The A-weighting scale de-emphasizes the low and high frequencies that fall outside the normal hearing range of humans. A-weighted sound levels are often used to account for the frequency response of the human ear. In contrast, the C-weighting scale gives nearly equal emphasis to sounds of all frequencies and approximates the actual sound level. The C-weighted sound levels are used when high intensity noise is evaluated to determine its effects on a human population. The low frequency content of impulsive noise contributes to effects, such as window rattle, that influence human perception of and reaction to the noise.

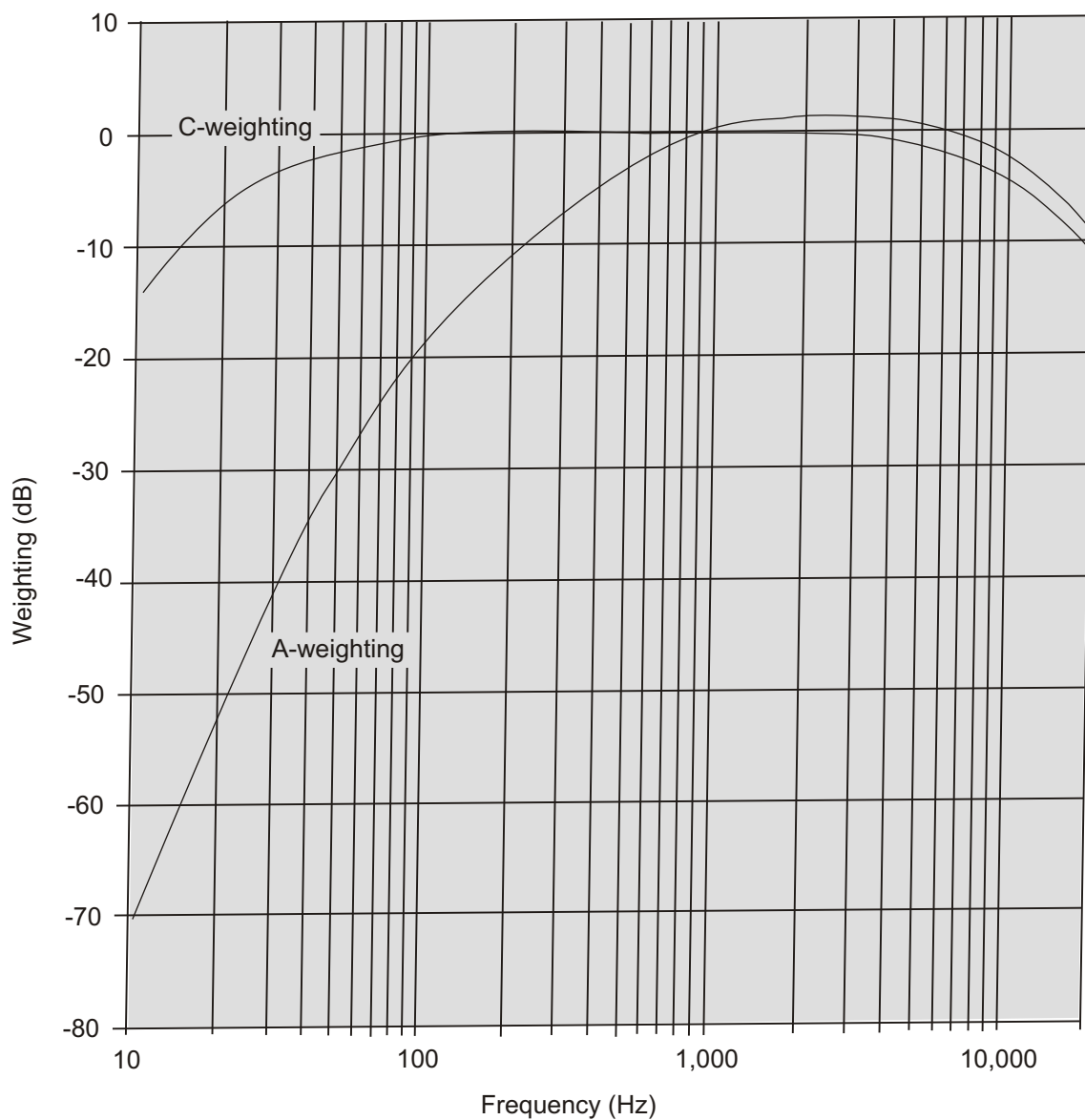
Figure M-2 shows how A-weighting and C-weighting scales apply to SPL values at various times during a Hera launch at 2 kilometers (1.2 miles). Figures M-3 and M-4 show the relationship between the SPLs and frequency.

The most common environmental noise descriptors used in environmental noise assessments are Continuous Equivalent Sound Level ( $L_{eq}$ ), the A-weighted Day-Night Equivalent Sound Level (which is abbreviated DNL and symbolized as  $L_{dn}$ ), the C-weighted Day-Night Equivalent Sound Level (CDNL and  $L_{cdn}$ ), the Sound Exposure Level (SEL), and Maximum Instantaneous SPLs ( $L_{max}$ ).

The  $L_{eq}$  is the continuous equivalent sound level, defined as the single SPL that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period. The  $L_{eq}$  must have a designated time period; for example, an  $L_{eq}$  for 30 minutes would be denoted as  $L_{eq(30 \text{ min})}$ .

The DNL is a variation of the  $L_{eq}$ . It is defined as a 24 hour continuous  $L_{eq}$  with 10 dBA added to all signal recorded within the hours of 10:00 p.m. and 7:00 a.m. This 10 dBA is a penalty that accounts for the extra sensitivity people have to noise during typical sleeping hours. The DNL is the primary measure of a noise environment that affects a community over an entire 24-hour day.

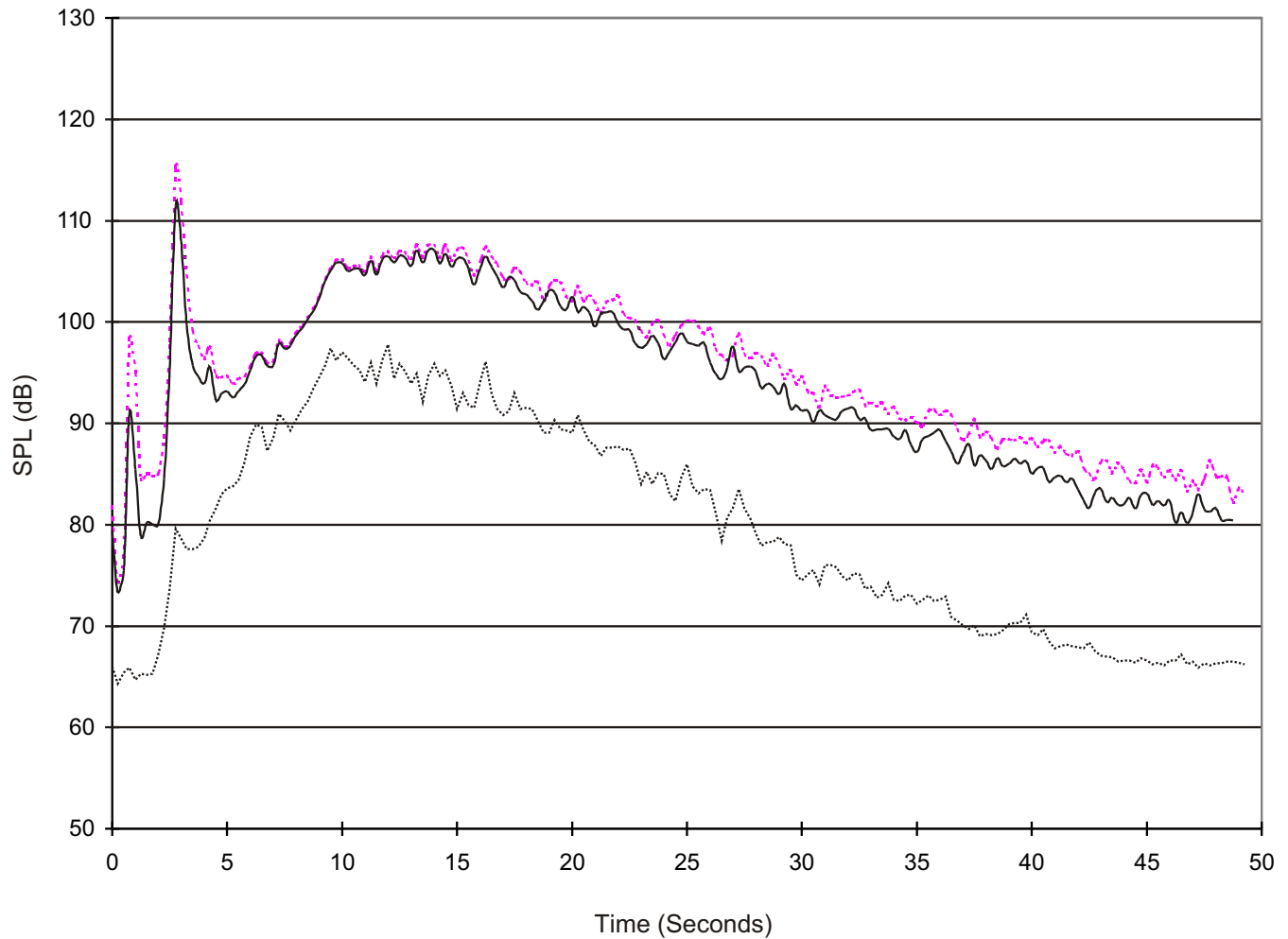
The CDNL is the C-weighted day-night equivalent sound level, used to assess impacts when noise sources have strong components with frequencies at and below 500 hertz (Hz). These low frequency components are significantly reduced by the A-weighting network, and although the sounds at these frequencies can not be heard, they can vibrate



Source: Federal Interagency Committee on Noise, 1992.

## Frequency Responses for Sound Level Weighting Characteristics

Figure M-1



**EXPLANATION**

- ..... A-Weighted
- Unweighted
- C-Weighted

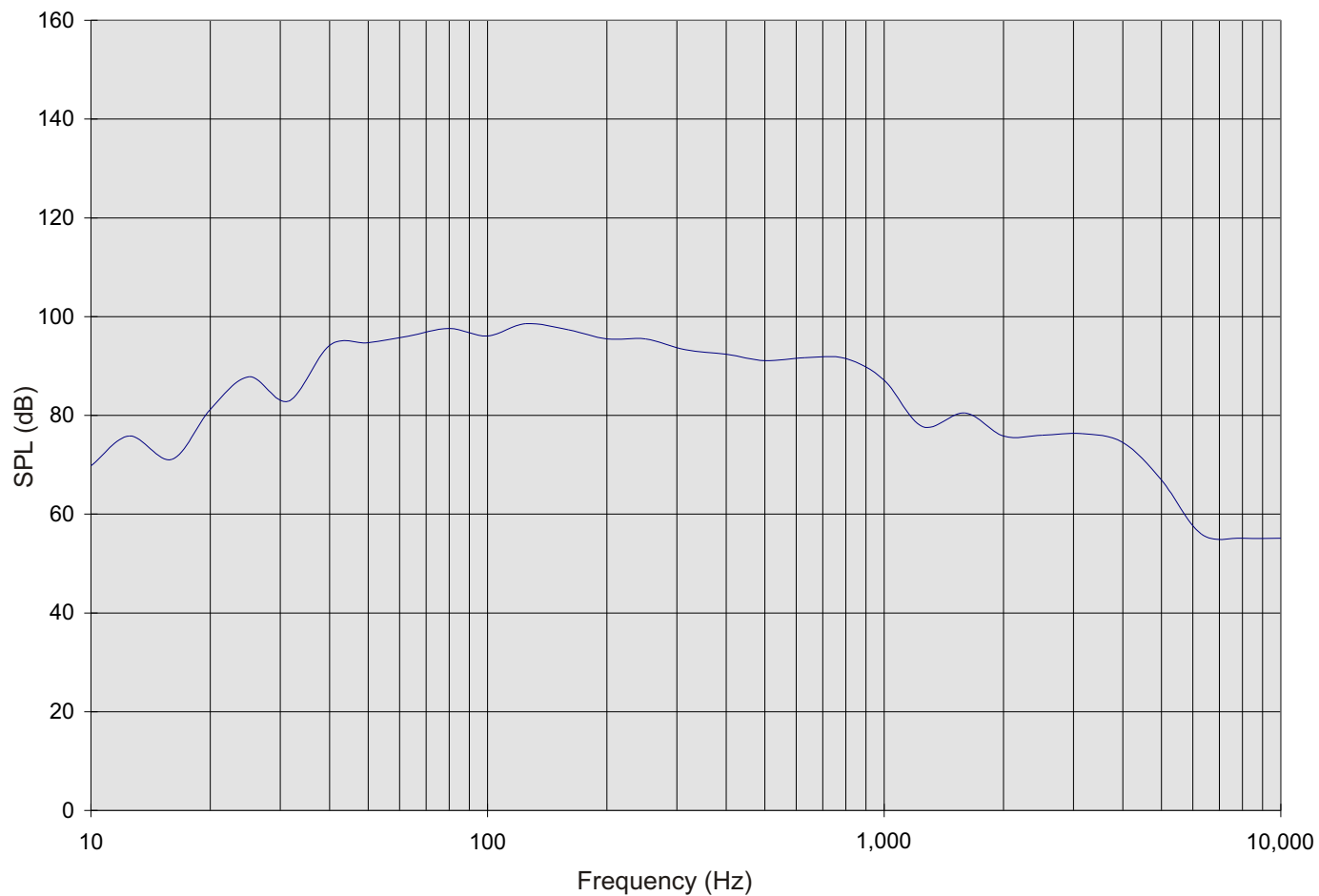
**Hera Launch,  
2.0 Kilometer Site**

**Figure M-2**



**SPLs in 1/3-Octave  
Band Levels for Hera  
Launch 2.0 Kilometer  
Site at 2.75 Seconds**

**Figure M-3**



**SPLs in 1/3-Octave  
Band Levels for Hera  
Launch 2.0 Kilometer  
Site at 12 Seconds**

**Figure M-4**

household objects and structures, causing annoyance from the rattling and buzzing. Aircraft flyovers and construction sources can generate sounds that would be appropriately analyzed by using the CDNL instead of the DNL.

The total energy of a single discrete event, such as an aircraft flyover or train passby, is represented by the SEL. The SEL is based on A-weighted sound levels that compresses the total energy for the event into a 1-sec time duration. Since most discrete events occur for longer than 1 sec, the SEL will be higher than values associated with any other rating method (including  $L_{max}$ ) for specific event. The  $L_{max}$  is simply the highest A-weighted sound level measured during the event.

It is often desired to have a single number to quantitatively represent the integrated significance of a noise environment to the exposed population. This number is referred to as the Sound Level Weighted Population (LWP) (National Academy of Sciences, 1977). The assumptions made in this method of analysis are:

- Intensity of human response is one of several consequences of average sound level, depending upon the response mode of interest (annoyance, speech interference, hearing loss).
- The impact of high noise levels on a small number of people is equivalent to the impact of lower noise levels on a larger number of people in an overall evaluation.
- On the bases on these two assumptions, one can ascribe differing numerical degrees of impact to different segments of the population of concern, depending on the average sound level.

These concepts have been embodied into a descriptive term called the fractional impact method. Summing the fractional impacts over the entire population provides the sound level weighted population (LWP):

$$LWP = \int P(L_{dn}) \times W(L_{dn}) d(L_{dn})$$

where  $P(L_{dn})$  is the population distribution function,  $W(L_{dn})$  is the day-night average sound level weighing function, and  $d(L_{dn})$  is the differential change in day-night average sound level (National Academy of Sciences, 1977).

Rather than computing the integral explicitly, the LWP was approximated by a summation.

$$\begin{aligned} LWP = & (\text{number of people in 25 Ldn blocks}) \times (\text{weighting function for the 25 Ldn interval}) \\ & + (\text{number of people in 30 Ldn blocks}) \times (\text{weighting function for the 30 Ldn interval}) \\ & + (\text{number of people in 35 Ldn blocks}) \times (\text{weighting function for the 35 Ldn interval}) \\ & + \dots \\ & + (\text{number of people in 70 Ldn blocks}) \times (\text{weighting function for the 70 Ldn interval}) \end{aligned}$$

The weighting functions for the various intervals are given in the following table.

**Table M-1: Weighting Function Intervals**

Yearly Day-Night Average Sound Level (dBA)	Interval Sound Level Weighting Function
25	0.001
30	0.002
35	0.004
40	0.009
45	0.021
50	0.045
55	0.093
60	0.180
65	0.324

Once the LWP was calculated, the Noise Impact Index (NII) was easily found. NII is a concept for comparing the relative impact of one noise environment with another and is defined as the sound level weighted population divided by the total population under consideration:

$$NII = \frac{LWP}{P_{Total}} = \frac{\int P(L_{dn}) \times W(L_{dn}) d(L_{dn})}{\int P(L_{dn}) d(L_{dn})}$$

where the functions are the same as described above.

**Noise Control Act (PL 92-574, 42 United States Code 4901, et seq.)** directs all Federal agencies to the fullest extent within their authority to carry out programs within their control in a manner that promotes an environment free from noise that jeopardizes the health or welfare of any American. The act requires a Federal department or agency engaged in any activity resulting in the emission of noise to comply with Federal, state, interstate, and local requirements respecting control and abatement of environmental noise. Workplace noise is under the jurisdiction of the Occupational Safety and Health Administration (OSHA), and is thus addressed primarily in section 3.1.9-Safety and Health, rather than noise.

**Florida Constitution, Article 2, Section 7**, states that "...Adequate provision shall be made by law for the abatement of ...excessive and unnecessary noise." Noise is also addressed generally, along with other environmental concerns, under the Florida Environmental Land and Water Management Act (Florida Statutes, Title 28). Under the act, the state is authorized to consider and be guided by the extent to which development would create or alleviate environmental problems, including noise. Local ordinances frequently address a nuisance being caused by noise (such as disturbing the peace), but are rarely applicable to noise caused by military activities.

## Sonic Booms

Sonic booms are an impulsive noise similar to thunder, caused by an object moving faster than the speed of sound (about 1207 kilometers per hour [750 miles per hour] at sea level). Sonic booms are measured in kilopascals (kPa) or pounds per square foot (psf) of overpressure. This is the amount of the increase over the normal atmosphere pressure which surround us (101.3 kPa [2,116 psf]) (National Aeronautics and Space Administration, 1994).

The sound heard on the ground as a “sonic boom” is the sudden offset and release of pressure after the buildup by the shock wave or “peak overpressure.” The change in pressure caused by sonic boom is only a few pounds per square foot—about the same pressure change we experience on an elevator as it descends two or three floors—in a much shorter time period (Armstrong Laboratory, 1996). It is the magnitude of this peak overpressure that describes a sonic boom.

As a missile moves through the air, the air in front is displaced to make room for the missile and then returns once the missile passes. In subsonic flight, a pressure wave (which travels at the speed of sound) precedes the missile and initiates the displacement of air around the missile. When a missile exceeds the speed of sound, referred to as Mach 1, the pressure wave, which cannot travel faster than the speed of sound, cannot precede the aircraft and the parting process is abrupt. As a result, a shock wave is formed in front of the missile when the air is displaced around it and, lastly, at the rear when a trailing shock wave occurs as the air recompresses to fill the void after passage of the missile.

The shock wave that occurs resulting from supersonic flight is commonly called a sonic boom. A sonic boom differs from most other sounds because it is impulsive (similar to a double gunshot), there is no warning of its impending occurrence, and the magnitude of the peak levels is usually higher. Sonic booms are measured in C-weighted decibels or by changes in air pressure. For a vehicle flying straight, the maximum sonic boom amplitudes will occur along the flight path and decrease gradually to either side. Because of the effects of the atmosphere, there is a distance to the side of the flight path, beyond which the sonic boom never reaches the ground. This distance is normally referred to as the lateral cut-off distance.

The procedure developed by the National Research Council of the National Academy of Sciences (1981;1977), used by the U.S. Environmental Protection Agency (1982), and adopted by the American National Standards Institute (1986) is used to assess the impact of exposure of people to high-energy impulsive noise, including sonic booms. The procedure related the long-term C-weighted day-night average sound level (CDNL) produced by booms to the number of people that would be highly annoyed by the booms. The procedure is based upon the results from several laboratory studies and social surveys. One social survey was conducted in Oklahoma City, where the residents were exposed to eight sonic booms each day for 6 months. During the course of this test, they were asked on three separate occasions to assess their reactions to the sonic booms. Another social survey was conducted near an army base where civilian residents were exposed daily to the noise from large artillery practice firings. Laboratory tests were



designed to explore people's ability to judge the relative annoyance of sonic booms and subsonic jet aircraft flyovers. The results of these annoyance studies are shown below.

**Table M-2: Definition of Land Use Zones for Noise**

Noise Zone	Compatibility with Noise-sensitive Land Use	Percent of Population Highly Annoyed	C-Weighted Day-night Average Sound Level
I	Acceptable	Less than 15%	Less than 62 dB
II	Normally Unacceptable	15% - 39%	62-70 dB
III	Unacceptable	More than 39%	More than 70 dB

The early (1965 to 1975) U.S. experience can be accounted for by the following large-scale tests that contain the bulk of field-recorded data on structural response to sonic booms. The most intensive test was conducted at White Sands Missile Range (WSMR), New Mexico, where 21 structures of various designs and construction were built, instrumented, and then exposed to more than 1,500 sonic booms with peak overpressures up to 1.0 kPa (20 psf) (Slutsky, 1975). Except for glass, no damage was detected following exposure to overpressures as great as 0.24 kPa (5 psf), nor was there evidence of any cumulative damage effects after exposure to a series of 860 successive flights at overpressures greater than 0.24 kPa (5 psf). The only evidence of damage at the conclusion of the tests, other than glass breakage, was the loosening of three bricks beneath a window ledge.

A 1973 Federal Aviation Administration (FAA) sponsored study using a database of unpublished static test results provided by Libbey-Owens-Ford Company was conducted using a statistical analysis to determine the probability of glass breakage for various overpressures. If all flight paths are considered equally likely (that is, the aircraft could approach the structure from any direction), then the probability of breakage for good glass at various nominal peak overpressures is shown below (Federal Aviation Administration, 1973).

**Table M-3: Probability of Breakage**

Overpressures kPa (psf)	Probability of Breakage*
0.05 (1)	0.000001
0.10 (2)	0.000023

\*1 pane in 1,000,000 panes

If the flight were to approach from head-on or perpendicular to the plane of the window, which is approximately the most severe condition, the probability would increase as shown table M-4.

**Table M-4: Increased Probability**

Overpressure kPa (psf)	Probability of Breakage
0.05 (1)	0.000023
0.10 (2)	0.000075
0.14 (3)	0.000300
0.19 (4)	0.001200
0.24 (5)	0.002300
0.29 (6)	0.004000

## Noise Effects

**Annoyance.** Noise-induced annoyance is considered an attitude with both acoustic and nonacoustic determinants (Fidell, Schultz, and Green, 1988). Noise-induced annoyance, most often defined as an adverse attitude toward noise, is often associated with sleep and speech interference and task interruption.

The standard method for determining annoyance in noise-exposed communities is through the use of an attitudinal survey. Surveys generally solicit a self-evaluation of annoyance through questions of the form "How bothered or annoyed have you been by the noise of (noise source) over the last (time period)?" Respondents are typically asked to respond by selecting one of a number of response alternatives, such as "Not at all Annoyed," "Slightly Annoyed," "Moderately Annoyed," "Very Annoyed," or "Extremely Annoyed."

Predictions of the prevalence of annoyance in a community can be made by extrapolation from an empirical dosage-effect relationship. Based on the results of a number of sound surveys, Schultz (1978) developed a relationship between percent highly annoyed and DNL.

Based on a regression analysis of the 161 data points developed by Schultz, the following equation was recommended as providing a simple relationship between noise exposure and annoyance:

$$\% \text{ HA} = 100 / [1 + \exp(10.43 - 0.132L_{dn})]$$

Based on analysis of a recent update, which includes a total of 400 data points (Finegold, Harris, and VonGierke, 1992), a revised equation was developed:

$$\% \text{ HA} = 100 / [1 + \exp(11.13 - 0.141L_{dn})]$$

The findings from the new study differed only slightly from the original however, it is recommended to use the new revised equation.

To determine the % HA for Hera launches, the revised equation was used.

**Sleep Disturbance.** The effects of noise on sleep have long been a concern in assuring suitable residential noise environments. Early studies noted background levels measured between 25 to 50 dB in people's bedrooms where sleep was apparently undisturbed by noise. The bulk of the research on noise effects upon which current understanding is based was conducted in the 1970's. The research was conducted in a laboratory environment where awakening was measured either by a verbal or button-push response, or by brain wave recordings to indicate changes in the stages of sleep. Various types of noise were introduced to the sleeping subjects throughout the night. These noises consisted primarily of transportation noises (aircraft, trucks, cars, and trains). The aircraft noises included both flyover and sonic booms.

DNL is a 24-hour average sound level, with noise events occurring between 10:00 p.m. and 7:00 a.m. incurring an artificial 10-dBA "penalty" to account for the additional sensitivity most people have to noise at night.

Lukas (1975) and Goldstein and Lukas (1980) both analyzed sleep-stage changes and waking effects of different levels of noise. Either waking or sleep-stage changes were useful as measurements of sleep disturbance. These two analyses showed great variability in the percentage of people awakened by exposure to noise. The variability is not merely random error, but reflects individual differences in adaptation or habituation. Such factors cannot be estimated from the purely acoustic measures in noise exposure.

To determine the percent of the exposed population expected to awakened (% awakening), the U.S. Air Force has developed an interim dose-response curve (Finegold, Harris, and VonGierke, 1992). This equation, used to predict the % awakened for a Hera launch is:

$$\% \text{ Awakening} = (7.079 \times 10^{-6}) \times \text{SEL}^{3.496}$$

These values for % awakened were used in conjunction with the total population for each launch site to predict the number of people awakening (table M-5). For these calculations it was assumed that a sound level reduction of 20 dBA from outside to inside existed (U.S. Environmental Protection Agency, 1974), and that the entire population would be asleep at the time of each launch. The sound level reduction for closed and opened window conditions is shown in table M-6.

**Table M-5: Sleep Disturbance for Hera Launches\***

Launch Site	Total Population	Maximum Number Awakening*	Maximum Percent Awakening*
A-15	12,256	3,276	27
D-3A	262	50	19
Cudjoe Key	3,724	1,113	30
Saddlebunch Key	4,212	1,235	29

\* Assumes entire population is asleep at time of launch

**Table M-6: Sound Level Reductions for Typical Residential Structures**

Climate	Windows Open	Windows Closed
Warm Climate	12 dB	24 dB
Cold Climate	17 dB	27 dB
Approximate National Average	15 dB	25 dB

Source: U.S. Environmental Protection Agency, 1974

A recent review (Pearsons, Barber, and Tabachnik, 1989) of the literature to sleep disturbance demonstrated that the relationship, based exclusively on laboratory studies, predicts greater sleep disturbance than that likely to occur in a home setting.

### Hera Detonations

The Noise Assessment Prediction Model (NAPS) was used to estimate the sound contours associated with a Hera detonation. This program provides an estimate of the peak noise intensity at ground level in all directions surrounding a blast source.

The NAPS model generates sound intensity contours surrounding a blast source based upon the meteorological conditions that influence the speed of sound. The meteorological profile contains the temperature, relative humidity, wind direction, wind speed, and atmospheric pressure interpolated for pre-assigned altitude levels ranging from 2 meters (6.6 feet) to 3,000 meters (1.9 miles).

Calm weather conditions were used for the Hera analysis, with the wind direction assumed to be zero and the wind speed at ground level to be 0.1 meters per second (0.2 miles per hour). The wind speed at altitudes above the ground was approximated using a power-law wind profile. This profile states that, the wind speed at a height,  $z$ , above the ground can be estimated from the wind measured at the height  $z_m$  by

$$U_z = U_m (z/z_m)^p$$

where  $u_m$  is the measured wind speed at the height,  $m$ , and the exponent,  $p$ , is related to the roughness and stability of the atmosphere. Potential  $p$  values ranging from 0.05 to 0.60 are given in table M-7.

**Table M-7: Exponent  $p$** 

Stability Class	TEM and TCM	Rural	Urban	RTDM
A	0.10	0.07	0.15	0.09
B	0.15	0.07	0.15	0.11
C	0.10	0.10	0.20	0.12
D	0.25	0.15	0.25	0.14
E	0.30	0.35	0.30	0.20
F	0.30	0.55	0.30	0.30

Source: Schulze, 1993

A value of .15 (rural area, stability class D) for p, with a wind speed of 1 meter per second (2.2 miles per hour) at a height of 2 meters (6.6 feet) was used to calculate the wind speed at various heights above the ground.

The temperatures, % relative humidity, surface altitude, and surface pressure were provided by meteorological data from Eglin Air Force Base for 1993. The NAPS model was run with meteorological data from April, July, November, and December 1993. The temperatures and % relative humidity varied for these months, however, there was no significant difference in the output. The meteorological data used is representatively shown in table M-8.

**Table M-8: Representative Meteorological Data**

<b>Altitude meters AGL</b>	<b>Temperature C</b>	<b>Relative Humidity %</b>	<b>Wind Speed m/s</b>	<b>Wind Direction N = 0</b>
0	18.700	70.000	0.100	0.0
2	18.639	69.949	0.101	0.0
10	18.664	69.743	0.106	0.0
50	18.522	68.715	0.132	0.0
70	18.450	68.201	0.145	0.0
100	18.343	67.430	0.164	0.0
150	18.158	66.160	0.191	0.0
200	17.943	64.945	0.199	0.0
300	17.529	62.531	0.211	0.0
400	17.172	60.174	0.219	0.0
500	16.458	57.931	0.226	0.0
600	16.358	55.745	0.233	0.0
700	16.000	53.602	0.240	0.0
800	15.572	51.602	0.247	0.0
900	15.186	49.601	0.250	0.0
1,000	14.812	47.664	0.251	0.0
1,200	13.932	44.304	0.259	0.0
1,400	12.984	41.080	0.267	0.0
1,600	12.072	38.025	0.275	0.0
1,800	11.164	34.953	0.280	0.0
2,000	10.196	31.920	0.281	0.0
2,200	9.156	31.120	0.289	0.0
2,400	8.184	29.6410	0.290	0.0
2,600	7.176	27.944	0.295	0.0
2,800	6.163	26.295	0.300	0.0

The results for the detonation of 1,663 kilograms (3,665.2 pounds) of rocket fuel for a Hera second stage rocket motor were 127 dB, 133 dB, 140 dB, and 170 dB at 5 kilometers (3 miles), 3 kilometers (2 miles), 1 kilometers (0.6 miles), and 0.5 kilometers (0.3 miles), respectively. The influence of temperature and relative humidity on noise propagation was not found to be significant. However, wind speed and direction would have an effect on the resulting noise contours. Since the weather conditions for a launch would not vary much from that of calm conditions, the noise contours should be approximately that given above for all launches.

### Traffic Noise Model

The estimated noise levels for traffic for U.S. 1 and U.S. 98 was determined using the methodology from the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA model). This model considers the roadway characteristics, topography, the distance from the roadway to the noise receptor, the types of vehicles (cars, medium trucks, heavy trucks) traveling the roadway, and the average speed and volume of each vehicle type. The output gives the noise levels produced by each individual vehicle type and the overall total traffic noise.

The FHWA model arrives at a predicted noise level through a series of adjustments to the reference sound level called the reference energy mean emission level. Adjustments are made to account for traffic flows, for varying distances from the roadway, for finite length roadways, and for shielding. All of these variables are related by the following equation:

$$\begin{aligned}
 L_{eq}(h)_i &= (L_o)_{Ei} && \text{reference energy mean emission level} \\
 &+ 10 \log (N_i \pi D_o / S_i T) && \text{traffic flow adjustment} \\
 &+ 10 \log (D_o / D)^{1+\alpha} && \text{distance adjustment} \\
 &+ 10 \log \{(\gamma_\alpha(\phi_1, \phi_2) / \pi)\} && \text{finite roadway adjustment} \\
 &+ \Delta_s && \text{shielding adjustment}
 \end{aligned}$$

where

$L_{eq}(h)_i$	is the hourly equivalent sound level of the ith class of vehicles.
$(L_o)_{Ei}$	is the reference energy mean emission level of the ith class of vehicles.
$N_i$	is the number of vehicles in the ith class passing a specified point during some specified time period (1 hour)
$D$	is the perpendicular distance (m) from the centerline of the traffic lane to the observer.
$D_o$	is the reference distance at which the emission levels are measured. In the FHWA model, $D_o$ is 15 m.

$S_i$	is the average speed of the $i$ th class of vehicles and is measured in km/h.
$T$	is the time period over which the equivalent sound level is computed (1 hour).
$\alpha$	is the site parameter whose values depend upon site conditions. Value of 0 for "hard site" (bare ground, water, or paved ground) and 0.5 for "soft site" (grass, shrubs, or agricultural fields).
$\gamma$	is a symbol representing a function used for segment adjustments, that is, an adjustment for finite length roadways.
$\Delta s$	is the attenuation, in dB, provided by some type of shielding such as barriers, rows of houses, densely wooded areas, etc.

For the estimated traffic noise levels for U.S. 1 and U.S. 98, the finite roadway adjustment and shielding adjustment were not used. So, the equation simplifies to:

$$L_{eq}(h)_i = (L_o)_{Ei} + 10 \log (N_i \pi D_o / S_i T) + 10 \log (D_o / D)^{1+\alpha}$$

The FHWA model places vehicles in three acoustical sources groups:

- Automobiles (A)—all vehicles having two axles and four wheels designed primarily for transportation of nine or fewer passengers. Generally, the gross vehicle weight is less than 4,500 kilograms (9,920 pounds).
- Medium trucks (MT)—all vehicles having two axles and six wheels designed for the transportation of cargo. Generally, the gross vehicle weight is greater than 4,500 kilograms (9,920 pounds) but less than 12,000 kilograms (26,455 pounds).
- Heavy trucks (HT)—all vehicles having three or more axles and designed for the transportation of cargo. Generally, the gross weight is greater than 12,000 kilograms (26,455 pounds).

These classifications are used to determine the reference mean emission levels:

$$(L_o)_{EA} = 38.1 \log(S) - 2.4$$

$$(L_o)_{EMT} = 33.9 \log(S) + 16.4$$

$$(L_o)_{EHT} = 24.6 \log(S) + 38.5$$

The 1995 average annual daily traffic (AADT) counts for U.S. 1 and U.S. 98 were provided by the Florida Department of Transportation. These counts were for locations along U.S. 1 and U.S. 98 that were within 9 kilometers (5.6 miles) of the proposed launch sites. The percentage of motorcycles, cars, pickups and vans, buses and light trucks, and heavy trucks included in the total vehicle volume were also provided.

The DOT classifications for vehicles were more detailed than those for the FHWA model. Consequently, the volume of motorcycles and cars were combined (as were pickups, vans, buses and light trucks) to form the classifications of automobiles and medium trucks, respectfully. The classification for heavy trucks was left the same.

The average speed ( $S_i$ ) was assumed to be 55 miles per hour (89 kilometers per hour) for each vehicle type and the ground between the roadway and the receptor ( $\alpha$ ) was assumed to be soft. The FHWA model—manual method was used to determine at what distance from the roadway the DNL values of 70 dBA and 65 dBA would occur.

Tables M-9 and M-10 show the traffic counts and estimated noise levels for U.S. 98 and U.S. 1. The traffic noise from U.S. 98 and U.S. 1 was not integrated into the background noise for the Eglin AFB sites and the Florida Keys sites, respectively. This is due to the drastic difference in the size of population census blocks located within the ROI for each potential launch site. To include the traffic noise in the background noise for the entire census block would have grossly over estimated the background noise. It is presented here only as a representation of major highway traffic noise levels. Figure M-5 shows the census blocks associated with the Santa Rosa Island site.

**Table M-9: Table of Traffic Counts and Estimated Noise Levels of U.S. 98**

Segment of U.S. 98	Average Annual Daily Traffic Count <sup>1,2</sup>	Distance from road at which DNL = 70 dBA occurs <sup>3</sup> in meters (feet)	Distance from road at which DNL = 65 dBA occurs <sup>3</sup> in meters (feet)
CR 191B to Bellameade Circle (Santa Rosa County)	19,650	39 (130)	85 (280)
Bellameade Circle to Okaloosa/Santa Rosa County Line (Santa Rosa County)	28,000	50 (160)	110 (350)
Okaloosa/Santa Rosa County line to Hurlburt Gate (Okaloosa County)	35,250	58 (190)	120 (410)

<sup>1</sup> Florida Department of Transportation, 1995

<sup>2</sup> All based on vehicle classification at traffic station #306 (Motorcycles = 0.3%, Cars = 81.7%, Pickups and Vans = 12.7%, Buses and Light Trucks = 2.5%, and Heavy Trucks = 2.8%)

<sup>3</sup> Based on methodology of U.S. Federal Highway Administration, 1978; distances approximate.



**Table M-10: Traffic Counts and Estimated Noise Levels of U.S. 1**

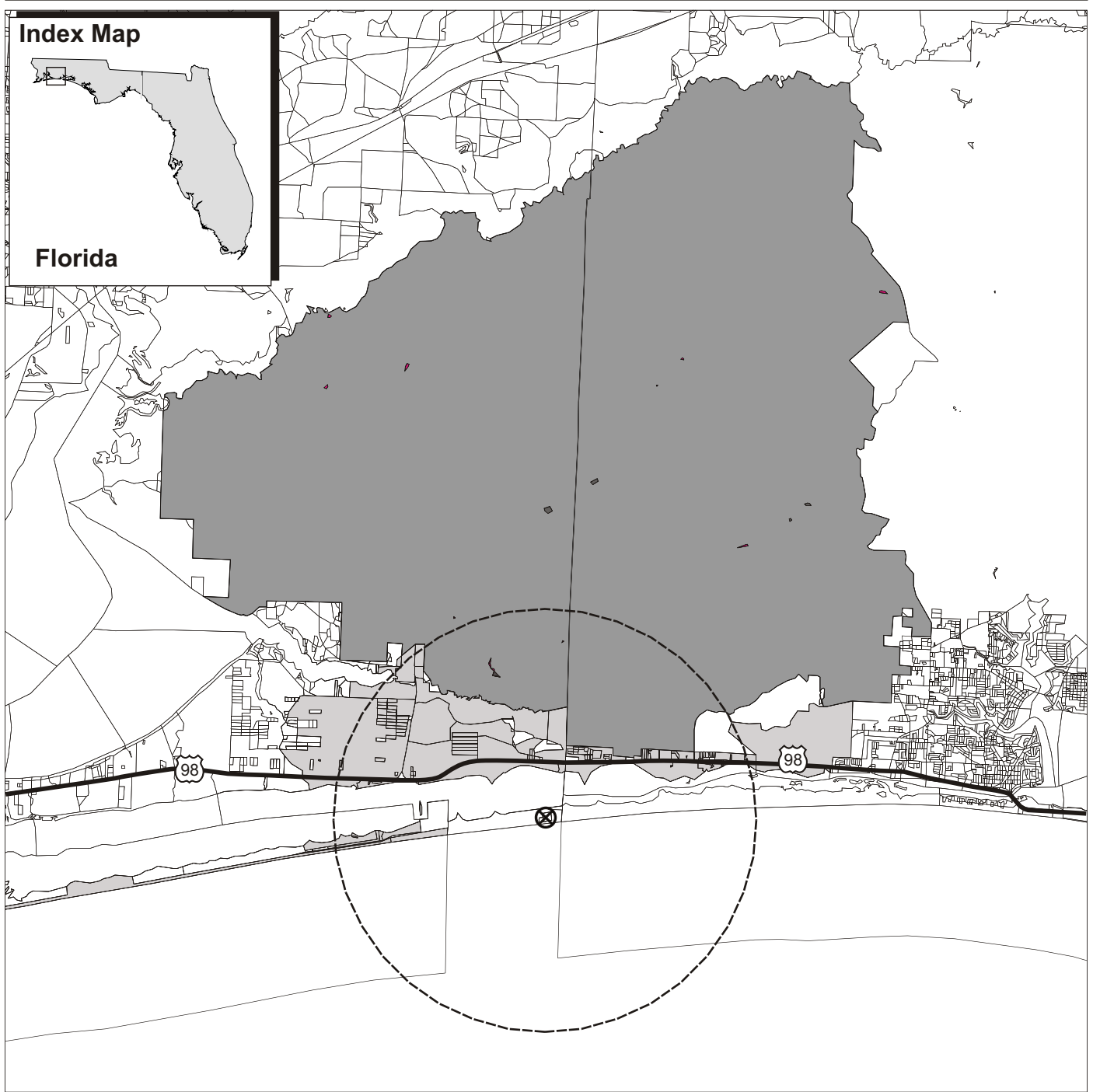
U.S. 1 Count Station	Average Annual Daily Traffic Count <sup>1</sup>	Distance from road at which L <sub>dn</sub> = 70 dBA occurs <sup>2</sup>		Distance from road at which L <sub>dn</sub> = 65 dBA occurs <sup>2</sup>	
		Meters	Feet	Meters	Feet
#106 (at MM 12) <sup>3</sup>	16,000	42	140	90	290
#107 (at MM 16.5) <sup>3</sup>	15,000	40	130	86	280
#108 (at MM 23.5) <sup>4</sup>	16,000	37	120	80	260

<sup>1</sup>Florida Department of Transportation, 1995







<sup>2</sup>Based on methodology of U.S. Federal Highway Administration, 1978; distances approximate.

<sup>3</sup>Vehicle classification for traffic at Count Stations #106 and #107 based on location #642 at MP 15.7 (Motorcycles = 0.8%, Cars = 72.9%, Pickups and Vans = 20.0%, Buses and Light Trucks = 1.9%, and Heavy Trucks = 4.4%)

<sup>4</sup>Vehicle classification for traffic at Count Station #108 based on location #227 at MP 25 (Motorcycles = 0.3%, Cars = 80.5%, Pickups and Vans = 14.4%, Buses and Light Trucks = 0.5%, and Heavy Trucks = 4.3%)



#### EXPLANATION

- |   |                        |   |                           |
|---|------------------------|---|---------------------------|
|  | Excluded from analysis |  | Noise Region of Influence |
|  | Included in analysis   |  | Census Block Boundary     |
|  | Site A-15              |   |                           |
|  | U.S. Highway           |   |                           |



Scale 1:250,000  
 0 2 4 Miles  
 0 3 6 Kilometers

### Santa Rosa Island Census Blocks Within the Region of Influence of A-15 Launch Site

Santa Rosa Island, Florida

**Figure M-5**

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## **Appendix N**

### **Potential Permits**

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# POTENTIAL PERMITS

	EGLIN AIR FORCE BASE	SANTA ROSA ISLAND	CAPE SAN BLAS	GULF OF MEXICO	FLORIDA KEYS	CUDJOE KEY	SADDLEBUNCH KEYS	BOCA CHICA KEY	FLEMING KEY	SUGARLOAF KEY	DREDGERS KEY	PLATFORM
AIR QUALITY												OCS
AIRSPACE USE						CFA RA	CFA RA					
BIOLOGICAL RESOURCES		SEC 7	ERP SEC 7 SEC 404	SEC 7 MMPA		SEC 7	ERP SEC 7 SEC 404					MMPA SEC 7
CULTURAL RESOURCES												
GEOLOGY AND SOILS			ERP SEC 404				ERP SEC 404					
HAZARDOUS MATERIALS AND HAZARDOUS WASTE												
LAND AND WATER USE										TEMPORARY USE PERMIT		SUB- MERGED LANDS PERMIT
NOISE												
SAFETY												
SOCIOECONOMICS												
TRANSPORTATION												
UTILITIES												
VISUAL AESTHETIC												
WATER RESOURCES			ERP SEC 404				ERP SEC 404					EPA Water Discharge

## EXPLANATION

CFA - Controlled Firing Area  
 ERP - Environmental Resource Permit  
 MMPA - Marine Mammal Protection Act  
 OCS - Outer Continental Shelf

RA - Restricted Airspace  
 SEC 404 - Section 404 of the Clean Water Act  
 SEC 7 - Section 7 of the Endangered Species Act

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## **Appendix O**

### **Distribution List**

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## FEDERAL GOVERNMENT AGENCIES

### AIR FORCE

Ms. Debby Atencio  
AFDTC/EMSN  
501 Deleon Street, Ste 101  
Eglin AFB, FL 32542

Mr. Jesse Borthwick  
46 TW/XPE  
501 Deleon Street, Ste 101  
Eglin AFB, FL 32542

Mr. Tom Brantley  
AFRL/MNMI  
101 W Eglin Boulevard Building 13,  
Ste 258  
Eglin AFB, FL 32542-6810

Ms. Linda Ninh Busch  
46 OG/OGM-TMD  
205 West D Avenue, Ste 241  
Eglin AFB, FL 32542-6866

Msgt. Walter Caulder  
96 AMDS/SGPBE  
504 W. Choctawhatchee Avenue  
Eglin AFB, FL 32542-5714

Dr. Jimmy C. Cornette  
Chief AFRL/MLQR  
139 Barnes Drive, Ste 2  
Tyndall AFB, FL 32403

Major Matt Durham  
AFDTC/PA  
101 West D Avenue, Suite 110  
Eglin AFB, FL 32542-5498

Mr. Bobby Ficquette  
AF/REO  
60 Forsith Street SW, Ste 8M80  
Atlanta, GA 30303-3416

Mr. Don Fitch  
AFDTC/JAV  
501 W Van Matre, Ste 1  
Eglin AFB, FL 32542

Lt. Col. Forbes  
SAF/AQRE  
1660 AF Pentagon, Room  
Washington, DC 20330-1690

Mr. David E. Hoard  
SAF/GCN  
1740 AF Pentagon, Room 4C921  
Washington, DC 20330-1740

Ms. Vicki Jones  
AFDTC/HO  
101 West D Avenue, Ste 130  
Eglin AFB, FL 32542-6800

Mr. Al Jordan  
AFDTC/EMSP  
501 Deleon Street, Ste 101  
Eglin AFB, FL 32542

Major Tom Kennedy  
46 OG/OGM-TMD  
205 West D Avenue, Ste 241  
Eglin AFB, FL 32542-6866

Mr. Jerry Koch  
HQ ACC/SUT  
11817 Canon Boulevard, Ste 306  
Newport News, VA 23606

Mr. Glenn Kuhlmeier  
AFDTC/SEOG  
100 North 2nd Street, Ste 366  
Eglin AFB, FL 32542-6838

Mr. Rick McWhite  
AFDTC/EMSN  
501 Deleon Street, Ste 101  
Eglin AFB, FL 32542

Mr. Walt Monteith  
46 AFDTC/SEUO  
1001 North 2nd Street, Ste 366  
Eglin AFB, FL 32542-6838

Mr. Dan Nichols  
AFDTC/EMS  
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Eglin AFB, FL 32542



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Washington, DC 20330-1660

Ms. Greta Parr  
SAF/PACE  
1690 AF Pentagon, Room 4A120  
Washington, DC 20330-1690

Mr. Brian Prescott  
46 OG/OGMT  
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Eglin AFB, FL 32542-6866

Ms. Judy Ramsey  
AFDTC/EMCW  
501 Deleon Street, Ste 101  
Eglin AFB, FL 32542

Ms. Jean Reynolds  
SAF/MIQ  
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Washington, DC 20330-1690

Ms. Maria Rodriguez  
AFDTC/EMCE  
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Eglin AFB, FL 32542

Mr. Mark Sanchez  
96 CEG/CECPM  
501 Deleon Street, Ste 100  
Eglin AFB, FL 32542-5101

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