



Final Environmental Assessment for the C-17 Globemaster III Beddown, Hickam Air Force Base, Hawaii



September 2003

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EXECUTIVE SUMMARY

The United States Air Force (USAF) proposes to beddown and operate a squadron of C-17 Globemaster III aircraft at Hickam Air Force Base (AFB), Oahu, Hawaii (HI). The Lightning Drop Zone (DZ), Schofield Barracks, Oahu is being considered for airdrop training. This environmental assessment (EA) was prepared to evaluate the potential environmental impacts of the proposed beddown of the C-17 aircraft and associated operations at Hickam AFB and related sites. This EA is part of the environmental impact analysis process (EIAP) for the proposed action as set forth in 40 CFR, which implements the National Environmental Policy Act (NEPA), Council on Environmental Quality Act (CEQA) regulations, numerous Executive Orders, and Department of Defense (DoD) Instruction 4715.9, Environmental Planning and Analysis.

PURPOSE OF AND NEED FOR ACTION

The United States, in its current role of supporting global security and humanitarian aid, needs to provide supplies, equipment, food, clothing, and military assistance worldwide. The USAF needs to support this mission throughout the world and within the Pacific Asian Theater of Operations, and has determined that the C-17, an aircraft with superior airlift capabilities, would best support this need.

The DoD recently released an evaluation of its overall transportation capabilities and needs in the *Mobility Requirements Study 2005* (MRS 2005) report, and the Air Force Air Mobility Command (AMC) has published an *Air Mobility Strategic Plan 2002*. Part of the proposed Air Force mobility plan briefed to Congress in 2002 includes assigning C-17 squadrons within the Pacific Air Forces (PACAF) so that humanitarian missions and responses to regional conflicts can be handled within and around the Pacific. Hawaii has become the focus for assigning C-17s because of its existing support infrastructure and mid-Pacific location that is also forward of the 48 contiguous states (CONUS).

ALTERNATIVES INCLUDING THE PROPOSED ACTION

Concurrent with the Defense Acquisition Board's decision to buy the C-17, the Air Force and AMC defined the operational and physical elements needed to support aircraft operations. Proposed basing of the C-17 in Hawaii is a reallocation of strategic assets to support the United States Pacific Command (PACOM) and the USAF contingency mission. In accordance with AFI 32-7061, "The Air Force may expressly eliminate alternatives from detailed analysis, based on reasonable selection standard. Proponents may develop written selection standards to firmly establish what is a 'reasonable' alternative for a particular project, but they may not so narrowly define these standards that they unnecessarily limit consideration to the proposed action initially favored by proponents." The primary requirements identified the focus of the alternative identification process. These criteria were evaluated taking into account the existing active airfields within PACAF:

- Geographic Location
- Existing Base Infrastructure
- Military Airspace and Training Areas Required
- Community Considerations
- Environmental Considerations

Presently, and in the past, no large bodied aircraft have been stationed outside the boundaries of the United States. Stationing C-17s within PACAF will provide PACOM commanders more flexibility in meeting their mission requirements. To provide support to PACAF the C-17 home base must be centrally located within the Command. The C-17 beddown location should be able to host the aircraft and its support infrastructure without extensive installation reconfigurations or land acquisition. Basing the C-17 squadron near a major metropolitan area provides the necessary community support, such as housing and services, and provides a

diverse population of potential employees to support the C-17 mission. The local economy would benefit by the presence of this unit.

Proposed Action

The Proposed Action consists of the beddown of eight C-17 aircraft in Hawaii, the continued use of an existing DZ and use of military airspace for training, and construction of associated support facilities. The Active Duty Air Force and the Hawaii Air Guard will combine resources in a lead - associate type organization with the Active Duty being the lead agency and the HIANG serving as an associate unit. The manning for the organization will be proportionally split between the two units throughout the operational and management functions. Although comprised of two organizations the resultant squadron will function as a singular unit. The aircraft will become part of the 15th Airlift Wing (15 AW) supported by the Hawaii Air National Guard (HIANG) together as an associate unit.

Proposed Alternatives

All proposed Alternatives would require construction activities on Hickam AFB, use of the proposed DZ, and a SAAF runway location. Training operations would involve the use of Hickam AFB in combination with one or more training areas.

With no existing runways meeting the selection criteria for an SAAF runway, a new SAAF runway would need to be constructed; however, a location for the SAAF runway has yet to be determined. Due to the lack of availability of complete information, the proposed construction of a SAAF runway will undergo analysis for decision-making at a later time (40 CFR 1502.22 (b)). In this particular case, the basing for the C-17s is ripe for decision, but the decisions to support the proposed construction of an SAAF runway have not been resolved and are therefore, not ripe for decision at this time. As a result, analyses of specific to the proposed SAAF runway will be presented in a separate NEPA document that will include a cumulative impacts analysis of the entire Proposed Action (32 CFR 989.10).

As discussed above, the assessment of the SAAF runway will be assessed in a separate EA. For the purposes of this EA, the "No Action" alternative is the only other alternative carried forward.

SCOPE OF THE STUDY

The biophysical resources evaluated in this EA are: geology, soil, climate, land use, coastal zone management, floodplains, biological resources, water resources, air quality, airspace management, noise, safety, infrastructure, hazardous materials, hazardous waste, environmental restoration sites, socioeconomics, cultural resources, outdoor recreation, and visual resources/aesthetics. These resources are evaluated with respect to the Proposed Action and Alternatives.

SUMMARY OF ENVIRONMENTAL IMPACTS

Several resources that were analyzed in this EA are not expected to be impacted or impacts are expected to be negligible. Geological features, coastal zone management, floodplains, biological resources, airspace management, outdoor recreation facilities, and visual aesthetics would not be affected irreversibly and adherence to standard construction precautions and other guidelines would result in no long-term negative impacts. The impacts to other resource areas have been summarized below and reflect the highest level of environmental concern among the various resource subcategories assessed at all of the locations described within the Proposed Action and Alternatives.

Land Use

The area designated for construction of the C-17 Flight Simulator, Squadron Operations building, and Fire Station has been designated as "open space" in the most current Hickam AFB General Plan. Implementation of the Proposed Action would result in a change in land use of this area. The highest anticipated impact to land use would be moderate.

Air Quality

Under the Proposed Action the majority of fugitive dust generated would occur from demolition, site preparation, grading, and construction activities. The increase in emissions resulting from construction would have short-term adverse impacts that would be mitigated through BMPs such as soil stabilization, watering exposed soils, worker ride sharing, and seasonal scheduling of construction. Fugitive construction emissions would cease upon completion of the projects. Other temporary emissions would occur from the operation of construction equipment and construction workers commuting to and from the work site. Therefore, highest-level impacts resulting from the Proposed Action would be short-term and minor. Hickam AFB is currently designated as a major air emission source. Based on current design criteria, the total potential air emissions generated by facility operations can be accommodated within the established permitting framework. The requirements for permit modification will be addressed during the final design stage. Therefore, based on these estimates, the Proposed Action would not change the requirement for a Covered Source Permit.

Noise

Under the Proposed Action and the Alternatives, the majority of noise impacts would result during facility construction, C-17 flight and airfield operations, and aircraft maintenance. Construction is scheduled to occur over a four-year period. The impacts from the construction activities would be temporary in duration and would not create regional or permanent noise sources. Flight operations at Hickam AFB would increase noise levels negligibly when added to current Honolulu International Airport (HIA) noise levels that involve hundreds of commercial and general aviation aircraft operations daily. The highest level of noise impacts anticipated would be minor.

Safety

Generally, minor impacts to flight and ground safety are expected under the Proposed Action or Alternatives. Flight safety issues would be related to the introduction of and familiarization with a new aircraft during local training missions. Prior to aircrew and ground crew operations with actual C-17 aircraft, training and familiarization with equipment would be conducted as per Air Force regulations. Ground safety will experience short-term, minor impacts related to construction of new facilities. The Proposed Action includes the construction of new ordnance storage facilities to accommodate items used during C-17 operations. Storage and operational areas for explosives and ordnance will be located in designated explosive quantity distance safety zones. Explosive materials safety issues would be addressed under existing Air Force regulations and safety guidelines and impacts would be minor. The highest level of safety impacts anticipated would be minor.

Infrastructure

Overall, most immediately recognizable impacts to the infrastructure at Hickam AFB will occur during the construction phase. Short-term impacts include increased vehicular traffic and increased solid waste generation. C-17 facility operations would impact water delivery systems, sanitary sewer, and electrical power systems. However, as an integral part of the beddown operation, two phases of utility upgrading will be implemented. Upon implementation of these upgrades, long-term impacts to the infrastructure at Hickam AFB are minor. There will be no infrastructure impacts at Lightning DZ. The highest level of environmental concern regarding infrastructure is anticipated to be moderate but short-term.

Hazardous Materials and Waste

The Proposed Action will not have any major impacts on the use of hazardous materials and generation of hazardous waste. Short-term generation of small volumes of hazardous waste are expected due to construction activities. A potential exception to this however may be found in the area designated as the Hickam AFB, C-17 Support Facilities complex. In the event that subsurface hydrocarbon contamination is discovered during construction, the volume of hazardous waste generated during remedial activities may increase but the hazardous waste will be handled and disposed in accordance with applicable local, state, and federal regulations. The highest level of environmental concern with regard to hazardous materials, hazardous waste, and environmental restoration sites is anticipated to be moderate.

The type, classifications, and sources of hazardous waste associated with the Proposed Action would be similar in nature to that currently produced at Hickam AFB. The volume of hazardous materials used would increase based on additional aircraft being based at Hickam AFB as a consequence of implementing the Proposed Action. However hazardous material associated with C-130 operations would cease as this aircraft is replaced. The increased generation of hazardous waste would be the result of hazardous materials being introduced in support of C-17 maintenance. Adequate hazardous waste storage facilities exist or are planned as part of the Proposed Action to negate any adverse impacts of the Proposed Action. The highest level of environmental concern with regard to hazardous materials, and hazardous waste is anticipated to be minor.

Socio-economics

No disproportionate or adverse impacts to the specific demographic groups identified in the EA are expected as a result of the Proposed Action or alternatives. It is anticipated that beneficial and long-term effects on the economy of Hawaii would result from implementation of the Proposed Action and Alternatives described herein.

Cultural Resources

The C-17 beddown site at Hickam AFB is highly disturbed and predominantly fill material improved with pavement over large areas. Nevertheless, the project area is located in an area designated as a "moderate probability Archaeological Resources Area." The Air Force is currently assuring compliance with the National Historic Preservation Act (NHPA) by conducting a Section 106 consultation with appropriate state agencies and interested local organizations. If historic artifacts are found during ground disturbing activities, as stated above, Hickam AFB will follow all protocols as required by its responsibilities under Section 106. The Proposed Action may have minor impacts on cultural resources.

The EA and unsigned Finding Of No Significant Impact (FONSI) were made available to the public for a 30-day comment.

1 PURPOSE AND NEED FOR THE PROPOSED ACTION

This chapter states the purpose of and need for the proposed action; background information and a description of the C-17 Globemaster III aircraft; the location of the proposed action; a description of the NEPA process; a description of the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP); a description of other environmental compliance regulations that are related to this action, and; a description of the organization of this EA.

1.1 PURPOSE AND NEED

1.1.1 Introduction

The United States, in its current role of supporting global security and humanitarian aid, needs to provide supplies, equipment, food, clothing, and military assistance worldwide. The Air Force needs to support this mission throughout the world and within the Pacific-Asian Theater of Operations. The Air Force has determined that the C-17, an aircraft with superior airlift capabilities would best support this need. The C-17 aircraft would be able to provide three times the amount of cargo lift capacity as the existing C-130 aircraft and would be able to operate on the SAAF used by the Air Force within the Pacific-Asian Theater. The Air Force proposes to beddown (establish) a squadron of eight C-17 aircraft at Hickam AFB, HI in order to replace the four C-130s. Since 1995 the C-17 has used Hickam AFB and Honolulu International Airport (HIA) in a transient capacity. Establishment of the C-17 dedicated squadron would take place over approximately four years with construction beginning in 2004. It would involve the basing of the aircraft, along with the personnel needed to operate and maintain the aircraft and associated facilities for training.

As required by the NEPA, this EA also analyzes the alternative to the proposed action. A detailed description of the proposed action and the alternative selection process is outlined in Chapter 2.

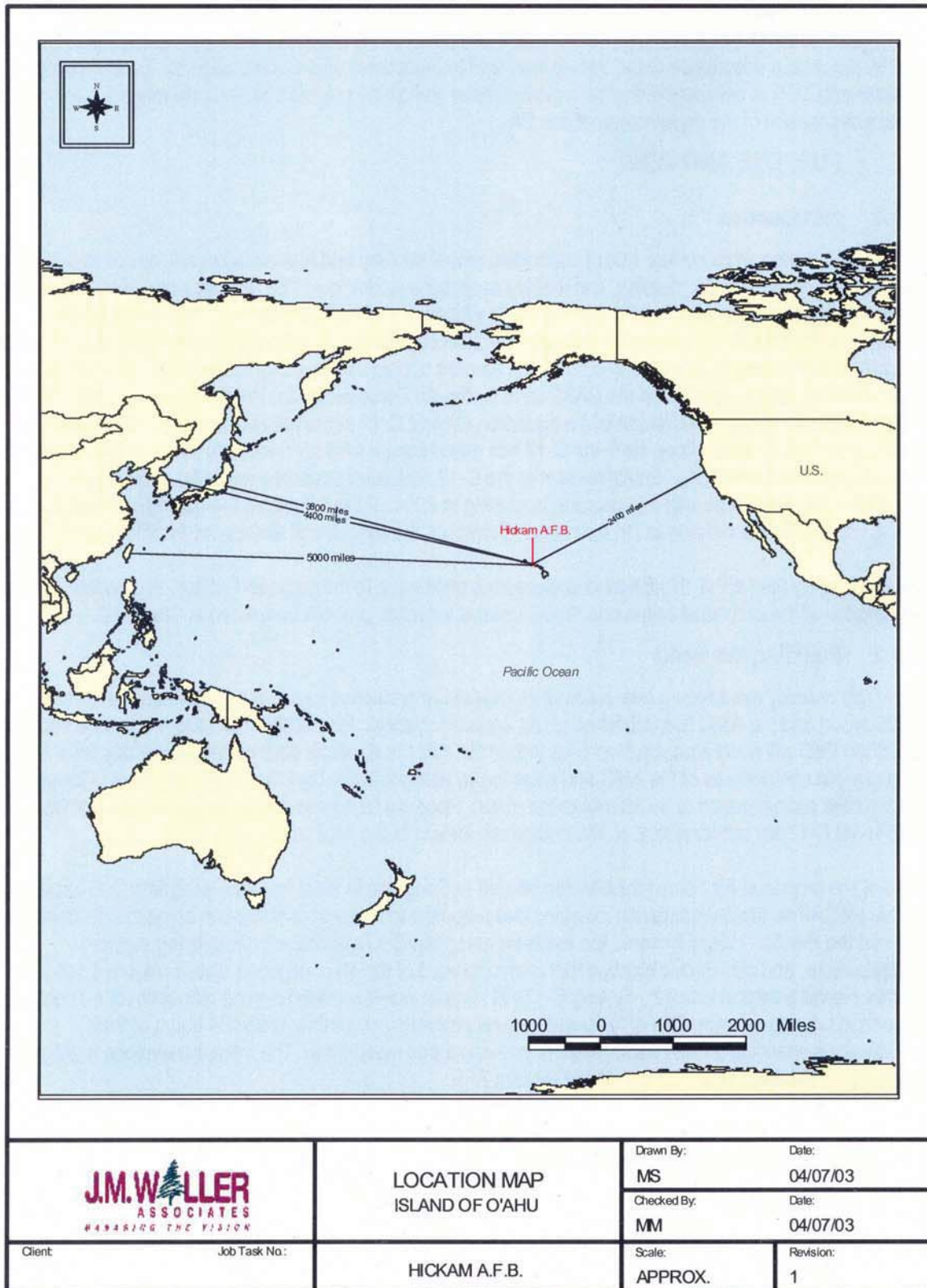
1.1.2 Fulfilling the Need

The DoD recently released an evaluation of its overall transportation capabilities and needs in the MRS 2005 report and the AMC has published an *Air Mobility Strategic Plan 2002*. The study estimated that by 2005 the DoD will need a minimum of 54.5 million ton miles in strategic airlift capability per day from active and reserve components of the AMC and commercial airliners in the Civil Reserve Airlift Fleet. Current capabilities are estimated to be 46 million ton miles. Recently Congress approved procurement of 60 additional C-17 aircraft for a total of 180 authorized for use in the Air Force.

Part of the proposed Air Force mobility plan briefed to Congress in 2002 includes assigning C-17 squadrons within PACAF so that humanitarian missions and response to regional conflicts can be handled within and around the Pacific. Hawaii became the focus for assigning C-17s because of its existing support infrastructure, and mid-Pacific location that is also forward of the 48 contiguous states. Figure 1.1.2-1 shows Hawaii's central location. Basing C-17s at Hickam would provide jumping-off points for airmobile responses during emergencies of terrorism, natural disasters, or wartime within 24 hours of their destinations providing a rapid deployment of personnel and equipment. The following reasons highlight the need for increasing the airlift capability at Hickam AFB:

- Regional conflicts have become the focus of our national security concerns, along with contingency operations and humanitarian relief efforts.

Figure 1.1.2-1 Location of the Hawaiian Islands



- Fewer troops are based overseas; instead, because of this, future actions will require additional forces to be sent directly from the United States to areas where there are few or no friendly bases.
- The DoD Bottom-Up Review concluded that new airlift is needed to meet probable future mobility requirements.
- In the mobility triad of airlift, sealift, and pre-positioning, the C-17 provides the capabilities needed for rapid force projection, as well as for timely and effective humanitarian relief.

The beddown of the C-17 aircraft within the islands of Hawaii would satisfy the need to provide the latest strategic airlifter at lower costs while enhancing readiness capabilities. The C-17 aircraft have been chosen to fulfill the Air Force mission as described because it is both a strategic and tactical aircraft.

1.1.3 Description of the C-17 Aircraft and Its Capabilities

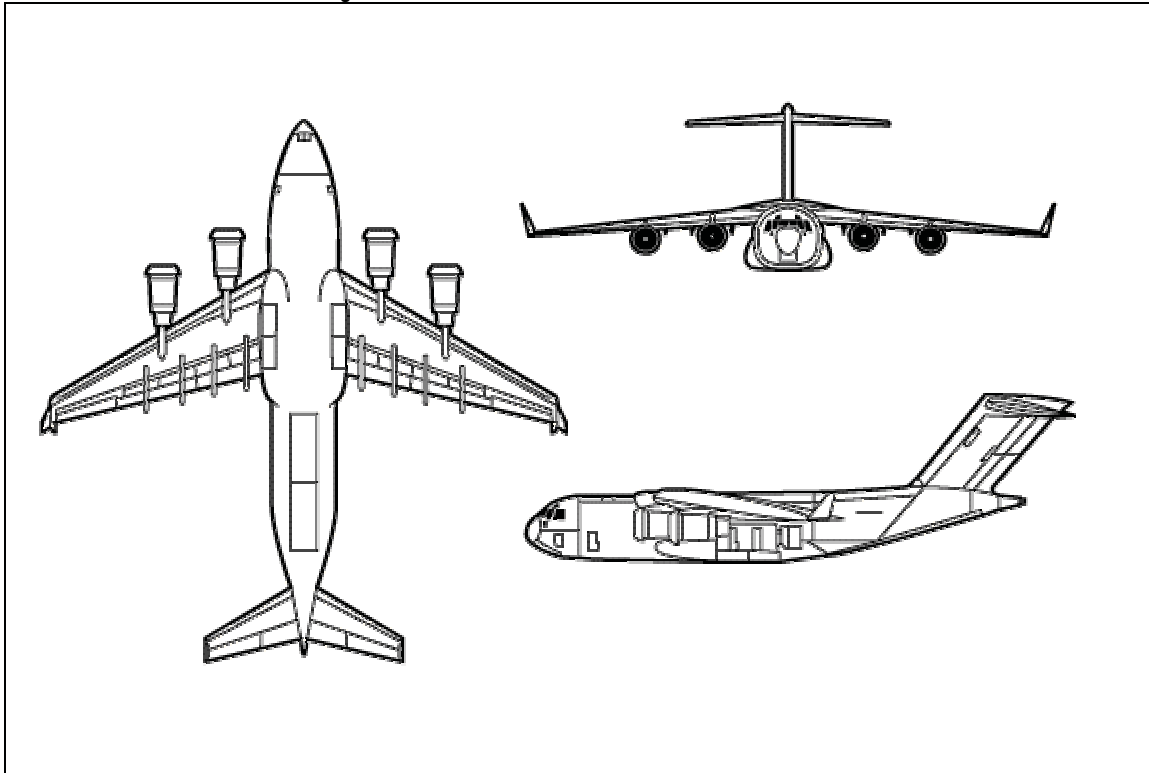
The C-17 aircraft was designed to combine the attributes of a strategic airlifter – long range, aerial refueling, and large payload (including outsize cargo) – with those of a tactical airlifter – agility in the air, survivability, ability to operate on austere airfields with short runways, and the ability to airdrop cargo and personnel. The C-17 aircraft is a long-range, air-refuelable, turbofan-powered, high-wing, heavy military cargo aircraft built around a large, unobstructed cargo compartment. It has a swept wing that uses super critical airfoil technology and winglets to achieve good long-range cruise performance, and give it the capability to operate into and out of short runways and austere airfields carrying large payloads. Figure 1.1.3-1 shows the general characteristics of the C-17.

Features or technologies that combine to achieve this shortfield landing performance are the large extremely blown flaps, full-span leading edge slats, spoilers, high sink-rate landing gear, antiskid braking, thrust reversers, head-up displays, and sophisticated fly-by-wire flight control system. The aircrew consists of two pilots and one loadmaster. The flight deck has the capacity for one relief crew plus two additional crewmembers. High mounted engines and up-and-forward reverse thrust allow backing while fully loaded and reduce blown debris and potential foreign object ingestion during ground operations with the engine(s) running.

The fuselage consists of aluminum alloys, titanium, steel, and composite materials. The wingspan at the winglet tips is 169.8 feet (ft), total aircraft length is 174 ft, and the height at the tip of the tail section is 55.1 ft. The aircraft has a maximum takeoff gross weight of 585,000 pounds (lbs), a maximum payload of 172,000 lbs, a maximum design landing weight of 428,600 lbs, and has the capacity of a maximum of 184,336 lbs of Jet Propulsion (JP)-8 fuel (about 28,000 gallons [gals]). Each of the four engines produces 40,700 lbs of thrust. The cargo compartment can accommodate eighteen 108 inches (in.) by 88 in. cargo pallets in a double row configuration. The aerial delivery system provides the capability to airdrop equipment and troops. The cargo compartment can seat up to 102 passengers, with provisions for 36 litter and 54 ambulatory patients.

On the ground, the C-17 can make a 180-degree “U-Turn” in 143 ft, and a 180-degree “Star Turn” (with backing) in 80 ft. With a 130,000-lb payload, the C-17 has an unrefueled range of 3,200 mi.

Figure 1.1.3-1 General Characteristics of the C-17



Primary Function: Cargo and troop transport

Prime Contractor: Boeing Company

Power Plant: Four Pratt & Whitney F117-PW-100 turbofan engines

Thrust: 40,700 lbs, each engine

Wingspan: 169 ft 10 in (to winglet tips) (51.75m)

Length: 174 ft (53 m)

Height: 55 ft 1 in (16.79 m)

Cargo Compartment: length: 88 ft (26.82 m); **width,** 18 ft (5.48 m); **height,** 12 ft 4 in (3.76 m)

Speed: 450 knots at 28,000 ft (8,534 m) (Mach .74)

Service Ceiling: 45,000 ft at cruising speed (13,716 m)

Range: Global with in-flight refueling

Crew: Three (two pilots and one loadmaster)

Maximum Peacetime Takeoff Weight: 585,000 lbs (265,352 Kilograms (Kg))

Load: 102 troops/paratroops; 36 litter and 54 ambulatory patients and attendants; 170,900 lbs (77,519 Kg) of cargo (18 pallet positions)

Unit Cost: \$236.7 million (FY98 constant dollars)

Date Deployed: June 1993

Inventory: Active duty, 58; Air National Guard, 6; Air Force Reserve, 0

1.2 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA requires federal agencies to take into consideration the potential environmental consequences of proposed actions in their decision making process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The CEQ was established under NEPA to implement and oversee federal policy in this process. The CEQ subsequently issued the Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] Sections 1500-1508). These regulations specify that an EA be prepared to:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI);
- Aid in an agency's compliance with NEPA when no EIS is necessary; and
- Facilitate preparation of an EIS when one is necessary.

This EA, prepared to support the decision-making process, includes a description of the Proposed Action and the alternative (the No Action Alternative). It also includes a characterization of the affected environment and potential impacts, if the Proposed Action, or the alternative, is implemented. The alternative to the Proposed Action is identified and its potential impacts are also evaluated.

The proposed aircraft beddown and construction projects addressed in this EA constitute a Federal action and therefore must be assessed in accordance with NEPA. To comply with NEPA, as well as other pertinent environmental requirements, the decision-making process for the Proposed Action includes the development of this EA to address the environmental issues related to the proposed aircraft beddown and construction projects for Hickam AFB, HI. In addition, those areas considered for use as Assault Landing Zone (ALZ) / SAAF will also be addressed in this EA.

1.3 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING

Both NEPA and CEQ regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of IICEP, the Air Force must notify concerned federal, state, and local agencies of a proposed action and the alternative and allow them sufficient time to evaluate potential environmental impacts. Comments from these agencies are subsequently incorporated into the USAF EIAP. A list of agencies participating in this process and a sample transmittal letter are provided in Appendix A.

1.4 OTHER REGULATORY COMPLIANCE

In addition to NEPA, there are other regulatory laws that are applicable. Federal agencies are required to determine the conformity of proposed action and the alternative with respect to State Implementation Plans (SIPs) for attainment of air quality goals. Under the Clean Air Act (CAA) of 1990, the US Environmental Protection Agency (EPA) has promulgated regulations (40 CFR 51, Subpart W) that require the proponent of a Proposed Action to perform an analysis to determine if the Proposed Action and the alternative conform with the SIP. To comply with this requirement and to determine conformity, the decision-making process includes a study of air emissions associated with the Proposed Action and the alternative.

The Hawaii CZM Program was enacted as Chapter 205A, Hawaiian Revised Statutes (HRS). This program was promulgated in 1977 in response to the Federal CZM Act of 1972. The CZM area encompasses the entire state including all marine waters seaward to the extent of the state's police power and management authority, including the 12-mile US territorial sea and all archipelagic waters.

The Endangered Species Act (ESA) of 1973 is the primary federal legislation regarding threatened and endangered biological resources. The Act protects all listed threatened and endangered species, as well as the habitats that support such species.

The Clean Water Act (CWA) of 1977 regulates pollutant discharges that could affect aquatic life forms or human health and safety. The CWA and Executive Order (E.O.) 11990, on the Protection of Wetlands, provide authorization to regulate development activities near streams or wetlands to protect them from adverse impacts.

The National Historic Preservation Act of 1966 established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation. The NHPA requires federal agencies to consider potential impacts to cultural resources that are listed, nominated to, or eligible for listing on the NRHP, designated a National Historic Landmark, or valued for maintaining native and traditional cultures.

This document also reviewed compliance of the Proposed Action and the alternative with other environmental legislation and regulations, including the Protection of Wetlands; E.O. 11988, Floodplains Management; 36 CFR 800, Protection of Historic and Cultural Properties; E. 13007, Indian Sacred Sites; E.O. 13084, Consultation and Coordination with Indian Tribal Government; E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; and E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks.

The American Indian Religious Freedom Act, 1978, protects and preserves the inherent and constitutional rights of the American Indian, Eskimo, Aleut, and native Hawaiian people to exercise their traditional religions. Other than requiring an evaluation of federal procedures and policies, the statute imposes no specific procedural duties on federal agencies.

The Native American Graves Protection and Repatriation Act (25 United States Code [U.S.C.] Subsection 3001-3013) requires museums and Federal agencies to: 1) document certain native American human remains and cultural items within their collections; 2) notify all Indian Tribes and native Hawaiian organizations that are or are likely to be affiliated with these holdings; and 3) provide an opportunity for the repatriation of appropriate human remains or cultural items.

1.5 ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT

The environmental assessment is organized into seven major chapters and five supporting appendices.

- This chapter, Chapter 1, states the purpose of and need for the proposed action; background information and a description of the C-17; the general location of the proposed action; a description of the NEPA; a description of the IICEP; a description of other environmental compliance regulations that are related to this action; and a description of the organization of this EA.
- Chapter 2 provides a detailed description of the Proposed Action and the alternative; a description of elements affecting Hickam AFB and the associated airspace; a description of the alternative identification process and selection criteria used for evaluating the alternative; alternatives considered but not carried forward, and; the alternatives carried forward for detailed analysis.
- Chapter 3 provides a description of the environment – both natural and cultural – resources that are in the area of potential effect.
- Chapter 4 is an analysis of the environmental consequences of the proposed action and the alternative.

- Chapter 5 provides the cumulative impacts analysis.
- Chapter 6 provides a list of the preparers of this document.
- Chapter 7 provides a list of references, persons, and agencies used in developing this document.

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2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter provides a detailed description of the Proposed Action and Alternatives; a description of elements affecting the Base and the associated Airspace; a description of the alternative identification process and selection criteria used for evaluating alternatives; alternatives considered but not carried forward and the alternatives carried forward for detailed analysis.

2.1 DETAILED DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action consists of the beddown of eight C-17 aircraft at Hickam AFB, Hawaii, the continued use of an existing DZ and use of military airspace for training, and construction of associated support facilities. The development of the Proposed Action consisted of the determination of the beddown basing location. The following sections describe the process followed to develop the Proposed Action.

2.1.1 C-17 Beddown Basing Assessment

An airlift fleet with new capabilities, able to move forces over intercontinental distances and deliver directly as required, is needed to provide rapid deployment of personnel and equipment. The C-17 aircraft was designed to combine the attributes of a strategic airlifter with those of a tactical airlifter. Large bodied aircraft such as the C-17 are considered strategic assets. Presently, and in the past, no large bodied aircraft have been stationed outside the boundaries of the United States. Stationing C-17s within PACAF will provide PACOM commanders more flexibility in meeting their mission requirements. The decision to place the C-17 in the Pacific is the issue that needs to be analyzed from an environmental impact perspective. The results of this NEPA process will be part of the information provided to Air Force decision makers on whether to proceed with the establishment of a squadron of C-17s within PACAF.

2.1.2 C-17 Beddown Basing Selection Criteria

Concurrent with the Defense Acquisition Board's decision to buy the C-17, the Air Force and Air Mobility Command defined the operational and physical elements needed to support aircraft operations. Proposed basing of the C-17 in Hawaii is a reallocation of strategic assets to support the Air Force contingency mission. In accordance with Title 32, Code of Federal Regulations, Part 989 (32 CFR Part 989), Environmental Impact Analysis Process (EIAP) (formerly referenced as AFI 32-7061, Environmental Impact Analysis), "The Air Force may expressly eliminate alternatives from detailed analysis, based on reasonable selection standards (for example, operational, technical, or environmental standards suitable to a particular project). In consultation with the EPF, the appropriate Air Force organization may develop written selection standards to firmly establish what is a "reasonable" alternative for a particular project, but they must not so narrowly define these standards that they unnecessarily limit consideration to the proposal initially favored by proponents. This discussion of reasonable alternatives applies equally to EAs and EISs." The primary requirements, listed in Table 2.1.2-1, were identified as the focus of the alternative identification process. These criteria were used to evaluate the existing active airfields within the PACAF area of control.

Table 2.1.2- 1 Selection Criteria for Beddown Location

Screening Criterion
<p>Geographic Location Located within PACAF and the borders of the United States Located near a metropolitan area</p>
<p>Existing Base Infrastructure Adequate existing facilities without requiring extensive construction or land acquisition Space available for new construction Relatively low cost of renovations or new construction</p>
<p>Military Airspace and Training Areas Required Existing Military Training Routes Drop Zones in proximity to Installation Access to a site for Short Austere Airfield (SAAF) training Other areas available for establishment of additional airspace</p>
<p>Community Considerations Noise Safety Infrastructure demand (increase in water, electricity and other needs)</p>

As stated previously, as a strategic airlift asset, it is desired that the C-17 be located within the boundaries of the United States and be centrally located within the PACAF Command. The C-17 beddown location should be able to host the aircraft and its support infrastructure without extensive facility construction or land acquisition. Basing the C-17 near a major metropolitan area provides access to a large civilian labor workforce and community for support. The local economy is strengthened by the presence of the unit.

The Base must be able to support large-scale cargo movement and handling. A Base with an existing mobility infrastructure best suits the needs of PACAF and its customers. This infrastructure includes: passenger handling areas; a large cargo handling facility; cargo marshaling, processing, and storage areas; a dedicated indoor cargo storage facility; as well as a system that provides intermodal transfer of cargo to and from the Base via roadway, rail line, and/or seaport. Additionally, the Base must have adequate aircraft parking and refueling system capabilities for large body aircraft.

The Base and its surrounding environment must be able to support the intensive C-17 aircrew training requirements. Many factors determine the adequacy of the airspace surrounding the installation to support C-17 operations. Use of restricted airspace and Military Training Routes (MTR), aerial refueling corridors, DZs, and accomplishment of practice takeoffs and landings place demands on the airspace infrastructure. Flying training missions for C-17 aircrews include low-level navigation training flights, airdrop approaches and landings to SAAFs with adequate runways. DZs are used to train aircrews in actual or simulated cargo or personnel airdrops. Access to aerial refueling tracks and tanker aircraft is necessary for aerial refueling training required for all C-17 aircrews. An essential capability of the C-17 aircraft is that it can operate into and from airfields with short runways. The ideal Base should either possess, have access to, or have the capability to develop an adequate SAAF runway. While SAAF landings can be practiced on a large runway, an actual SAAF runway is essential for realistic training and to meet current training requirements. No SAAF runway has been selected for use by Hickam's aircrews; this decision will be made in the future upon completion of a separate NEPA document.

The C-17 basing must consider the potential impact on the surrounding community. A primary concern is development and encroachment in the areas immediately surrounding the Base. Noise from aircraft operations can be an irritant to nearby residents. Safety is of prime importance to the Air Force. The ability of the local community infrastructure to accommodate resultant increases in personnel assigned to the Base must also be considered. From an environmental standpoint, the C-17 beddown and aircraft operation cannot place excessive demands on or significantly affect resources such as air quality, earth resources, water resources, biological resources, and cultural resources.

2.1.3 Basing Locations Evaluated

Utilizing the criteria above, the active DoD military bases identified in Table 2.1.3-1 were evaluated for potential basing of the C-17.

Table 2.1.3- 1 Potential Basing Locations Within PACAF

BASING LOCATION EVALUATION							
Evaluation Criteria		Hickam AFB	MCBH	Elmendorf AFB	Andersen AFB	Yakota AB	Osan AB
Geographic Location							
	Located within PACAF and the borders of the United States	Y	Y	Y	N	N	N
	Located near a metropolitan area	Y	Y	Y	N	Y	N
Existing Base Infrastructure							
	Adequate existing facilities without extensive construction or land acquisition	Y	N	Y	Y	Y	Y
	Space available for new construction	Y	Y	Y	Y	Y	Y
	Relatively low cost of renovations or new construction	Y	N	Y	N	N	N
Military Airspace and Training Areas Required							
	Existing Military Training Routes	Y	Y	Y	Y	Y	Y
	Drop Zones in proximity of installation	Y	Y	Y	N	N	N
	Access to a site for SAAF training	Y	Y	Y	N	N	N
	Other areas available for establishment of airspace	Y	Y	Y	N	N	N
Community Considerations							
	Noise	Y	Y	Y	Y	Y	Y
	Safety	Y	Y	Y	Y	Y	Y
	External infrastructure demand	Y	Y	Y	Y	Y	Y

Y - Yes N - No

2.1.4 Basing Locations Considered and Carried Forward

Hickam AFB and Elmendorf AFB both met all the evaluation criteria for C-17 beddown. Separated by 4,445 Km, (2,762 mi), each base serves separate sectors of PACAF. Hickam was chosen to support the tactical and strategic

mission of the C-17 for the southern reaches of PACAF. Elmendorf AFB is being evaluated under another EA to host a squadron of C-17s to support the northern sector of the command.

2.1.5 Basing Locations Considered and Not Carried Forward

Other sites and/or options eliminated from further evaluation are listed below with the rationale:

MCBH was considered and eliminated for consideration as a beddown location due to lack of existing infrastructure and current inability to support large-scale cargo movement and handling. Base Realignment and Closure (BRAC) of Naval Air Station (NAS) Barbers Point has increased air traffic on MCBH over 354 percent since 1998. This increase in air traffic, coupled with a lack of corresponding available cargo aircraft infrastructure dictates extensive and costly facility construction. MCBH has limited land area available for required facility location.

Other PACAF bases considered, Andersen AFB, Yakota Air Base (AB), and Osan AB, are located beyond the boundaries of the United States and were eliminated from further consideration as beddown locations.

2.1.6 Other Alternatives Considered and Not Carried Forward

Replacing existing C-130 aircraft on a one-for-one basis, thereby proposing beddown facilities for only four aircraft, was considered as an alternative beddown option. On the surface, this option appeared plausible since one C-17 has the cargo carrying capacity of over four C-130s. From this perspective, a one for one replacement would triple the current tactical capacity at Hickam. However, the strategic mission of the C-17 must also be considered in any beddown scenario. The strategic mission of the US Air Force, as outlined in the MRS 2005, in its current role of supporting global and humanitarian aid, dictate a squadron of at least eight C-17 aircraft. In addition, economies of scale dictate that the capital costs necessary to support the proposed beddown of eight C-17 aircraft are not significantly lessened by reducing the number of aircraft by 50 percent. Therefore the consideration of bedding down four C-17 aircraft in lieu of eight was eliminated due to mission-related issues and consideration of cost-effective facility construction.

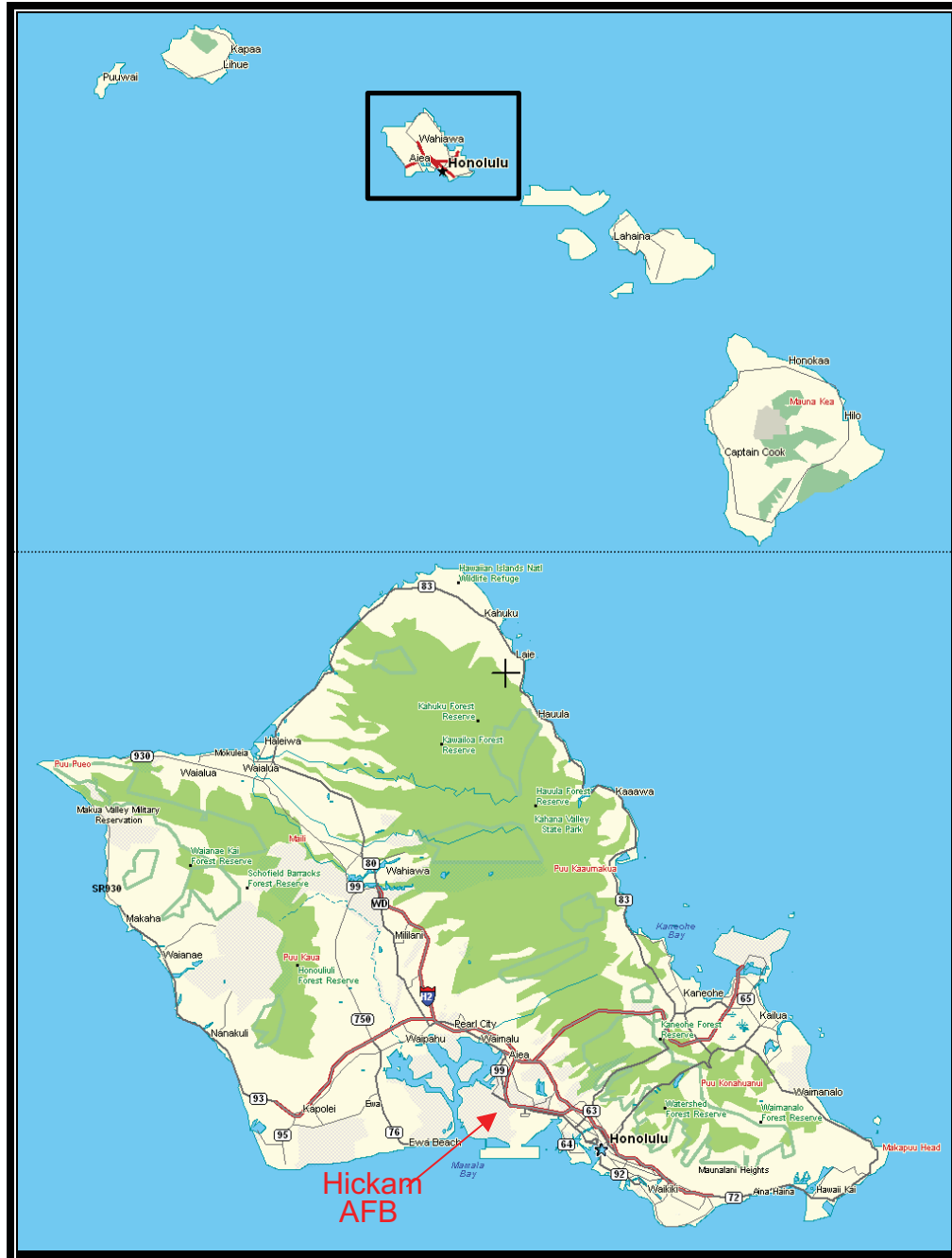
2.1.7 Location Of The Proposed Action

As shown in Figures 2.1.7-1, and 2.1.7-2, Hickam AFB, Oahu, HI is located on the island of Oahu (south side), approximately 9 mi. from downtown Honolulu, situated between Pearl Harbor and HIA. The Base is situated on approximately 1093 Hectares (ha), (2,700) acres (ac) and is located on a low-lying coastal plain bounded by Pearl Harbor to the north and west, the city of Honolulu and the HIA to the east, and the Pacific Ocean to the south. Hickam AFB is located at 21 degrees, 20 minutes north latitude and 158 degrees, 00 minutes west longitude.

The Proposed Action consists of the beddown of eight C-17 aircraft, the use of a DZ for training, use of military airspace, and construction of associated support facilities. The aircraft will become part of the 15 AW and will be supported by the HIANG. The peacetime mission of the proposed C-17 unit would be to train and maintain a high state of readiness for prompt reaction in the event of a national emergency or natural disaster.

The Proposed Action includes all of the elements to replace a squadron of four existing C-130 tactical airlift-type aircraft with eight modern C-17, aircraft under the 15 AW and the HIANG. This replacement addresses maintenance, training, and routine operations. Evaluations of available airfield facilities and established aircrew training areas have determined that modifications are necessary in order to adequately provide C-17 aircrews and supporting activities with safe and efficient working environments. Concurrent with this action, the HIANG will transfer four C-130 aircraft to another ANG unit. The HIANG would serve as an associate unit and would provide aircrew and maintenance support for the C-17 operations. It should be noted that HIANG currently employs the C-130 whose tactical mission is very close to that of the C-17.

Figure 2.1.7- 1 Hickam AFB, HI General Location



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2.1.8 Construction of C-17 Support Facilities at Hickam AFB

The proposed beddown would require modification and construction of several facilities and buildings. The proposed construction would be directly associated with the requirements for the beddown of the C-17. Table 2.1.8-1 briefly describes the proposed construction program at Hickam AFB. Figures 2.1.8-1, 2.1.8-2, 2.1.8-3, 2.1.8-4, and 2.1.8-5 shows the proposed construction location on the Base.

Table 2.1.8- 1 C-17 Beddown Construction Projects

Projects	Quantity	Construction
1. C-17 Support Utilities, Phase I	LS	FY-04
2. C-17 Corrosion Control Hangar	4,784 m ² (51,494 ft ²)	FY-04
3. C-17 Flight Simulator	1,170 m ² (12,589 ft ²)	FY-04
4. C-17 Squadron Operations	3,542 m ² (38,112 ft ²)	FY-04
5. C-17 Consolidated Maintenance Complex	2,215 m ² (23,833 ft ²)	FY-04
6. C-17 Kuntz Gate and Road	56 m ² (603 ft ²)	FY-04
7. C-17 Home Station Check Maintenance Hangar (Wide Body Aircraft Hangar)	4,366 m ² (46,978 ft ²)	FY-05
8. C-17 Fuel Cell Nose Dock	3,187 m ² (34,292 ft ²)	FY-05
9. C-17 Alter Maintenance/Supply Areas	9,357 m ² (100,717 ft ²)	FY-05
10. C-17 Munitions Storage	1018 m ² (10,957 ft ²)	FY-05
11. C-17 Clear Water Rinse	LS	FY-05
12. C-17 Utilities Support, Phase II	LS	FY-05
13. Ramp Realignment	28,693 m ² (308,737 ft ²)	FY-05
14. C-17 Maintenance Repair Shops	2,439 m ² (26, 244 ft ²)	FY-05
15. Repair Construction Roads	15,675 m ² (168,663 ft ²)	FY-06
16. C-17 Access Road and Parking	17,731 m ² (190,785 ft ²)	FY-06

m² – square meters

ft² – square feet

LS – lump sum

Brief descriptions of these facilities are provided below:

1. C-17 Support Utilities, Phase I. A safe, reliable electrical distribution system with adequate commercial backup; a reliable sanitary sewerage collection system; a safe and reliable potable water distribution system; and reliable communications (telephone and computer network) systems with adequate uninterruptible backup power are required to support future planned activities. These utilities must be designed with adequate capacity, security, and dependability to support the C-17 complex for eight permanently assigned operational aircraft, maintenance hangars, computerized training facilities, and squadron operations and administrative activities. The C-17 beddown includes the construction of training apparatus that uses environmentally sensitive electronic components with large electrical requirements and also air conditioning systems that adequately maintain air quality and ambient air temperatures. This is Phase 1 of a two-phase C-17 utilities support plan.

2. Corrosion Control Hangar. The base requires an adequate facility for C-17 corrosion control and maintenance functions, as well as shop areas to handle composite materials maintenance, structural repair, and associated training. In addition, the C-17 aircraft has a projected 60-day scheduled wash cycle requirement, which is driven by the highly corrosive local sea air environment. The aircraft's exterior surfaces are comprised of composite materials, which require frequent maintenance upkeep and spot painting to prevent and limit structural/surface damage. An entirely enclosed facility is required that provides climatic temperature control, hot water supply, and

regulatory pollutant controls such that the aircraft can be properly washed, composite maintenance performed, and appropriate corrosion control maintenance accomplished to ensure prolonged aircraft life and serviceability. This facility must have sufficient lighting, ventilation, fire protection/suppression, and environmental systems to effectively and safely support the aircraft's mission. This facility may include articulating maintenance stands to allow maintenance on C-17 nose, wings, and tail structures.

3. Flight Simulator. The base requires a facility to house a new 6-axis flight simulator for the C-17 aircrew-training program. The simulator will provide initial training, qualification, proficiency, and effective mission procedures training. This simulator is essential to provide hazardous/emergency-training procedures that otherwise could not be provided. Formal training for C-17 aircrews is based on a higher simulator-to-flying ratio than other weapon systems. Functional areas include a simulator bay, computer room, hydraulic pump room, simulator maintenance shops, training/briefing rooms, and administration rooms. Upon construction completion, an additional six to eight months is required for installation and testing of the simulator equipment, cadre training, and familiarization before the facility is fully operational.

4. C-17 Squadron Operations. The C-17 squadron operations facility would be properly sized and configured to support all squadron operations functions, as well as Aero Medical Evacuation functions and Life Support/Survival Equipment functions. Co-location of the Life Support function and the Survival Equipment function will allow for cross utilization of life skill sets to enhance management and workload completion. The C-17 aircrew ensembles and aircrew protection gear are extensive for each aircrew member, and co-location of life support with squadron operations enhances efficient management of required flying equipment/ensembles.

5. C-17 Consolidated Maintenance Complex. The addition of the new C-17 mission requires dedicated flight line maintenance management and aircrew space near the C-17 hangar complex. Co-location of the facility will enhance maintenance and span of control, in addition to more efficient use of transportation resources, especially flight line dispatch operations.

6. C-17 Kuntz Gate and Road. An entrance to Hickam AFB designed to accommodate large vehicles and construction equipment and in compliance with current security regulations is necessary to adequately route vehicular traffic safely and efficiently. Current vehicular entries onto Hickam AFB are sufficient for personnel in automobiles and small trucks, but do not provide adequate facilities for receiving and inspecting large transports and construction machinery. Reinforced gates, security barriers, and pavement as well as structures for gate security personnel are required for compliance with stringent anti-terrorism/force protection (at/fp) directives. The new gate design includes electronically activated pop-up barriers, tire shredders, and drop-arm barriers substantial enough to deter and contain large, heavy vehicles.

7. C-17 Home Station Check Maintenance Hangar (Wide Body Aircraft Hanger). Hickam AFB requires a general-purpose enclosed hangar maintenance facility to support C-17 aircraft. Wind conditions (prevailing, often continuous trade winds) often restrict flight line operations for routine maintenance such as aircraft jacking for tire/brake changes, control surface work and general maintenance workload requirements. A general maintenance hangar allows for maintenance operations, regardless of external weather. Heavy maintenance workload, such as control surface changes or landing gear removal, is required to be accomplished with proper jacking conditions, aircraft leveling, and/or use of overhead crane capability. Scheduled maintenance inspections with supporting shops aircraft maintenance specialties are best utilized with an established aircraft dock location in a covered hangar work area.

8. C-17 Fuel Cell Nose Dock. Hickam AFB requires an enclosed, adequately sized and configured fuel cell maintenance facility for C-17 fuel cell maintenance requirements. A C-17 aircraft requires large fuel cell maintenance aerospace equipment (ASE), which requires ample space adjacent to operations parking space for maintenance

efforts; and articulated fuel cell air-handling stations to be positioned from a stored configuration for over wing position to enhance fuel cell maintenance.

9. C-17 Alter Maintenance/Supply Areas. In order to provide adequate support to the C-17 aircraft, properly sized and configured areas for forward supply storage, avionics electronic countermeasures (ECM), propulsion, metals repair shop, survival equipment repair shop, and parachute shop are required. These work areas also require space for administration, technical orders, secure storage, training, and latrines. These shops need to be provided to accomplish metal fabrication for airframe repairs, repairs to survival equipment, repair to parachutes required for cargo airdrop missions, and to accommodate the supply, avionics, and propulsion support. These shops will be constructed within existing facilities.

10. C-17 Munitions Storage. Munitions storage facilities for C-17 do not exist at Hickam AFB. Multiple munitions storage capabilities must be made available for C-17 operations. These storage facilities will be located in previously identified explosive quantity distance arcs. The beddown of the C-17s at Hickam AFB will require handling and storage of the unique ballistics device set known as the flotation explosive deployment system (FEDS). The FEDS has a time change requirement, and storage capabilities must exist for out-year support. A facility must be constructed for pre-positioned flares on the flight line. The requirement to support unscheduled load/download of countermeasures should be offset by providing a flight line staging area for countermeasures. Igloos will also be required to support bulk storage. These facilities must be located on Hickam AFB to provide rapid response capability and ensure unimpeded contingency support.

11. C-17 Clear Water Rinse. Currently, no clear water rinse facility exists on Hickam AFB. Aircraft are currently rinsed at the aircraft wash rack that entails towing aircraft and scheduling access and manpower. Manpower and equipment limitations dictate the scheduling of aircraft rinses and washes. Consequently, aircraft are not washed immediately after flight and high rates of corrosion occur. This results in increased corrosion maintenance costs and aircraft downtime. This facility is undersized for C-17 aircraft.

12. C-17 Utilities Support, Phase II. The proposed site for construction of the C-17 support facilities does not currently contain a domestic water supply adequate for the maintenance hangars, consolidated maintenance complex, and squadron operations structures needed. The existing water distribution system is nominal for the current activities (two C-130 "nose dock" hangars, the flight services facilities, the fire station, and the air passenger terminal) and will not suffice for the proposed structures and activities due to large demands for domestic water and fire protection. Greater capacity is needed because of the specialized maintenance that includes: corrosion control on the C-17 aircraft's composite surfaces (e.g. painting and fabrications) and fire suppression.

13. Ramp Realignment. Based on an airfield structural report from 1993, the existing asphalt pavement cannot support fully loaded C-17s nor the number of passes required based on a squadron of these aircraft. There have been numerous airfield pavement projects at Hickam, however the sub-base was never strengthened during any of these projects, and it is not known if the pavement meets the criteria for C-17 operations. The least expensive and best mission-oriented solution is to realign the apron to provide eight parking spots for C-17s and the access to the C-17 hangars. This could be primarily accomplished on an open field, therefore, reducing the cost of removing existing asphalt. The project would provide Hickam AFB with a more cohesive apron that eventually facilitates over 30 more wide-body aircraft, makes the ramp safer for associated personnel, and vastly increases the capabilities of Hickam AFB. This project will provide for eight additional parking spaces.

14. C-17 Maintenance Repair Shops. This project will construct new maintenance shops required to service the arriving eight, C-17 aircraft to Hickam AFB. This building will include enough space to accommodate the inspection shop, Non-Destructive Inspection (NDI) shop, Electro/environmental shop, Aero Repair shop, and the Pneudraulics shop. All shops will have full accommodations to include: general shop space, storage, and space for specialized

equipment needed to perform maintenance functions. In all cases, special utilities services are required for equipment operation.

15. Repair Construction Roads. This project will repair all roads that were used as a haul route during the construction of all previous C-17 projects. The heavy trucks and equipment that transverse the exiting roads numerous times during the facility construction period of three to four years will cause a premature failure of the structure, driving the need for a complete road replacement. The existing road will need to be saw cut, excavated and disposed, followed by sub-grade preparation, base course work, prime and tack coat, placement of asphalt concrete pavement, and any other incidental work needed to complete the project.

16. C-17 Complex Access Road and Parking. This project will change and enhance the existing O'Malley road layout to be able to safely handle increased traffic flow into the C-17 project area caused by the increase of new facilities and personnel. Work will include, but not limited to, installation of required traffic control devices, signs, road stripping, drainage, curbs, and sidewalks. An addition to the existing parking area will also be constructed as part of this project to accommodate the new demand needed to service the proposed new facilities.



PROPO

TABLE REF

2	INSTALL
3	C-17
4	C-17
5	C-17
6	C-17
7	C-17
8	C-17
9	C-17
10	C-17
11	C-17
13	C-17
14	C-17

Note: 1,12,15,16

500

ENV
for P





DETAILED LOCATION

PPROPOS

- 1 UTILITY
 - EL
 - W
 - ST
 - SE
- 2 C-17 CC
- 3 C-17 FL
- 4 C-17 SS
- 5 C-17 CC
- 7 C-17 HC
- 8 C-17 FL
- 9 C-17 AI

- ADDITIONAL PROPOSED
- INSTALLATION
- BUILDING
- ROADS

Note: 1, 6, 10, 11, 12

500'

Env. for P



3

4

8

7

5

9

2

(AIRCRAFT PKG APRON)

Mamiya Ave.

TAXILANE "HA"

Bldg. 2140

Bldg. 2141

Bldg. 2138

Bldg. 2133

Bldg. 2135

Bldg. 2132

Bldg. 2130



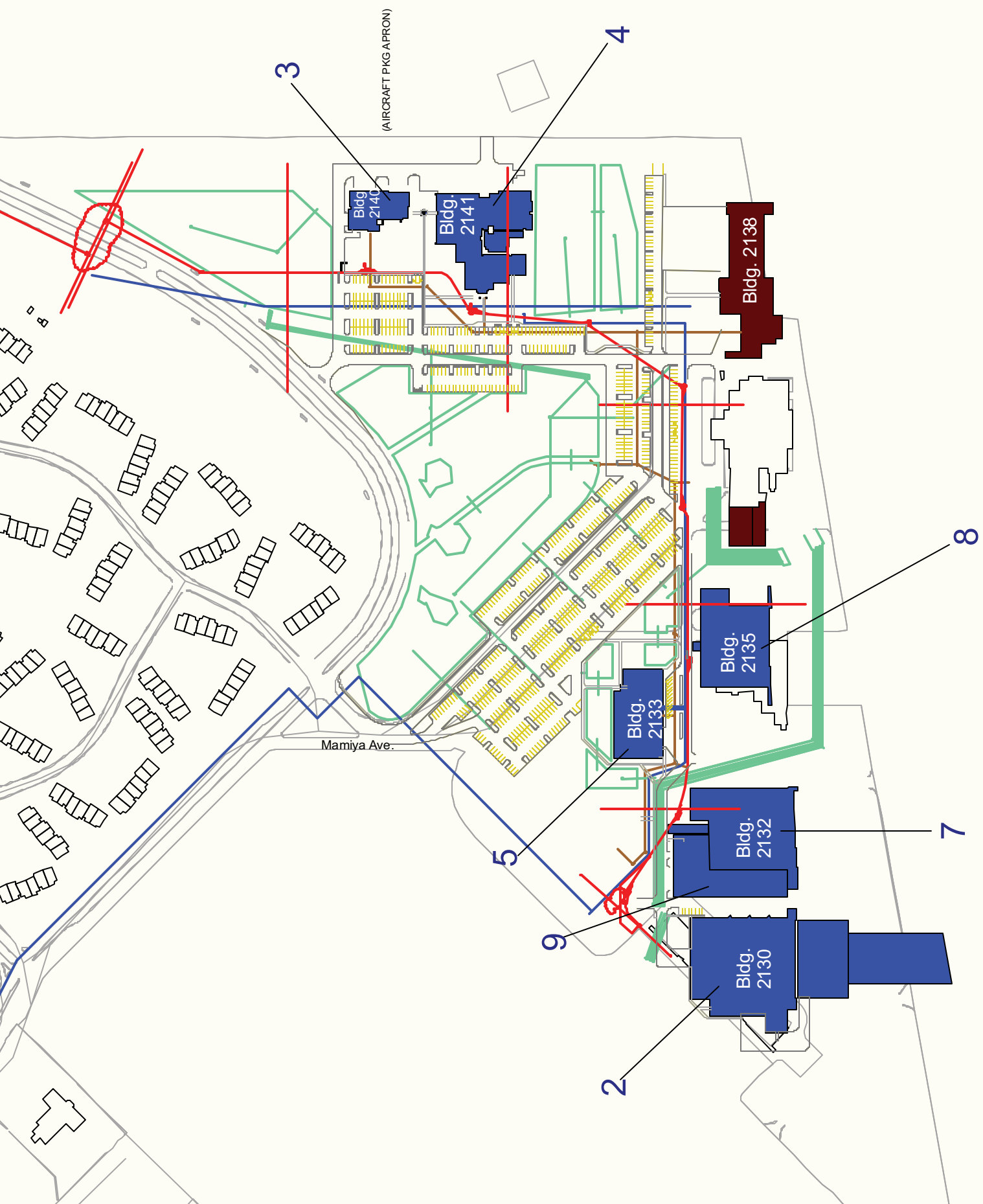
DETAILED PROJECT

- PROPOSE
- 1 C-17 UTIL
 - 2 C-17 CO
 - 3 C-17 FLI
 - 4 C-17 SQ
 - 5 C-17 CO
 - 7 C-17 HO
 - 8 C-17 FUR
 - 9 C-17 ALT
 - 13 C-17 RA
- Note: 6,10,11,12,14

- ADDITIONAL
- PROPOS
 - INSTALL/
 - BUILDING
 - ROADS

500

Eny for P



(AIRCRAFT PKG APRON)

3

4

Bldg. 2138

Bldg. 2141

Bldg. 2140

Mamiya Ave.

Bldg. 2133

Bldg. 2135

8

Bldg. 2132

7

Bldg. 2130

2

9

5

2.1.9 Personnel Requirements to Support the C-17 Beddown at Hickam AFB

Personnel requirements to support the operation of the C-17 at Hickam AFB would be met by utilizing both active duty (AD) and HIANG personnel. A five to one aircrew to aircraft position ratio would be utilized consisting of three AD and two HIANG. Maintenance would be a joint operation of both AD and HIANG personnel.

Utilizing the operation requirements for an 8 aircraft squadron the following personnel numbers are required:

Wing Staff	7
Operations	152
Maintenance	368
Security	20
Base Operating	
Support	<u>29</u>
Total	576

The HIANG will supply 160 of the total 576 personnel. Additional active duty personnel will be assigned to Hickam AFB. Personnel currently employed at the HIANG to support the C-130 operations would transition to support the C-17 operations.

2.1.10 Currently Existing Training Requirements

The proposed C-17 squadron training would involve a high percentage of transition training requirements (typical take offs, approaches, and landings) and a portion of the tactical training in a land-based simulator. The majority of the training to be flown in actual C-17 aircraft would be tactical training. The proposed C-17 training routes would include established low-level routes and approaches in Warning Areas and Restricted Air Spaces currently used during airdrops. C-17 aircrews will require currency training for SAAF runway operations; however, the SAAF site will be determined in the future in accordance with NEPA. The primary proposed locations for airdrop training operations would include established DZs. The C-17 would fly the same type missions currently being flown by the C-130 aircraft using the same air refueling (AR) routes and existing open and approved DZs. . With the use of the land-based simulator under the Proposed Action, no foreseeable significant modifications or increased usage are anticipated to the existing training routes, DZs, or currently used training areas.

2.1.11 Airspace Use

Training operations would involve the use of Hickam AFB in combination with one or more existing military and civilian airports and training areas. Training requirements may involve the use of six Warning Areas: W188/189/190/192/193/194, one Restricted Area: R3103, five air refueling tracks: AR900/901/902/903/ 904E/W, one alert area: A311, and the creation of one MTR (converted from existing locally published 154 WG low-level route). There are usage changes anticipated only for the Lightning DZ with no changes anticipated for four other DZs: Kanes, PMRF, Pokai Bay Water, and Mikilua that is located within R3103. Additional airspace potentially affected is that of one (1) SAAF Runway at a location to be determined in accordance with NEPA. The anticipated use of military airspace as a result of the beddown of C-17s should change only slightly.

2.1.12 Aircrew Training Requirements

Aircrew training requirements would include low altitude flight operations in existing available airspace and DZs, SAAF operations and aerial refueling activities, as described below.

Training Areas

C-17 aircraft are designed to fly at low altitudes during SAAF and DZ operations and other training missions. The majority of the low altitude flying training would occur within existing Special Utilization Areas (SUA) (see Table 2.3.1.5-1). The Proposed Action would include the establishment of one MTR that starts at an SUA and ends at the

Lightning DZ. The proposed 15 AW / HIANG Associated unit combined with existing units would fly an estimated 2,400 low altitude sorties annually.

Potential Modifications to Existing Aircraft Operations Areas

Potential modifications to existing aircraft operations areas to accommodate C-17 training include the alteration of the approach profile at Lightning DZ training area and the creation of one MTR.

Small Austere Air Field Operations

When selected, existing airspaces in Hawaii or at another location will include Warning and Restricted Areas, i.e. approaches from both low, 500 ft agl, and high, 10,000 feet agl, altitudes into the SAAF. The frequency for SAAF training is estimated to be 180 SAAF landings and 180 take-off operations monthly.

Aerial Refueling

The C-17 is designed so that it can be refueled while airborne. The AR training would be conducted within existing AR routes. The proposed 15 AW/HIANG Associated unit would fly an estimated 500 AR sorties annually.

2.2 DETAILED DESCRIPTION OF ALTERNATIVES

Alternative 1

No Action Alternative

Under this alternative, the C-17 beddown, associated construction and personnel requirements and airspace usage, would not occur, C-130 aircraft would remain, and conditions would remain as they are today. If the No Action Alternative was carried forward and the Proposed Action was not implemented, there would be no change to the HIANG, drop zones or military airspace. The No Action Alternative would result in no additional airlift capability being assigned to the central Pacific, resulting in slower response time to contingencies and possible late response to some time critical missions. The No-Action alternative would not fulfill the need for strategic airlift capability in the Pacific Theater as discussed in Chapter 1.

According to 32 CFR 989.8, the Air Force is required to analyze reasonable alternatives to the proposed action. "Reasonable" alternatives are those that meet the underlying purpose and need for the proposed action. In this particular case, the need for the action carries with it the need for a complex infrastructure to support the maintenance, operation, and cargo movement associated with the aircraft. A thorough analysis of all existing airfields in Hawaii indicates that the only suitable location is Hickam AFB (reference Table 2.2-1). Other potential airfields lack adequate facilities, or have limited potential for expansion, or would require extremely costly modifications to the point of being unreasonable candidates for further consideration. For these reasons, this EA analyzes the proposed action and only one alternative, which is the No Action Alternative.

Table 2.2-1 Existing Active Runways Evaluated

Airport	Island Location	Operating Agency	Crash Recovery	Runway Length X Width (ft)	Runway Lighting & Hrs of Operation	Lighting Intensity	Operationally Feasible?	Meets Criteria Table 2.2.1-1
Bradshaw AAF	Hawaii	US Army	Yes	3,700X 90	Prior Req.	Medium	No	No
Barking Sands PMRF	Kauai	Naval Facility	Yes	6,000X 150	RDT-CTL Req.	High	Yes	No
Dillingham	Oahu	Joint Military	Limited	9,000X 75	None	NA	No	No
Ford Island NALF	Oahu	Private	No	4,000X150 (4)			No	No
Hana RCO	Maui	Hawaii	Limited	3,600X 100	Dusk to Dawn	Medium	No	No
Hilo Intl	Hawaii	Hawaii	Yes	5,600X150 9,800X150	Dusk to Dawn Dusk to Dawn	Medium High	No	No
Honolulu Intl	Oahu	USAF	Yes	9,000X150 6,900X150 12,000X200 12,300X200	Dusk to Dawn Dusk to Dawn Dusk to Dawn Dusk to Dawn	High Medium High High	No	No
Kahului	Maui	Hawaii	Yes	7,000X150 5,000X150	Dusk to Dawn Dusk to Dawn	High Medium	No	No
Kalaeloa	Oahu	Hawaii	Yes	8,000X200 4,500X200 6,000X200	Dusk to Dawn Dusk to Dawn Dusk to Dawn	High High High	No	No
Kalaupapa	Molokai	Hawaii	No	2,700X75	Phone Req.	Medium	No	No
Kaneohe Bay MCAS	Oahu	Marine Corps	Yes	7,700X200	Dusk to Dawn	High	Yes	No
Kapalua	Maui	Private	Limited	3,000X100			No	No
Kona Intl @ Keahole	Hawaii	Hawaii	Yes	11,000X150	Dusk to Dawn	High	No	No
Lanai	Lanai	Hawaii	Limited	5,000X150	Dusk to Dawn	Medium	No	No
Lihue	Kauai	Hawaii	Yes	6,500X150 6,500X150	Dusk to Dawn Dusk to Dawn	Medium High	No	No
Molokai	Molokai	Hawaii	Limited	4,500X100 3,100X100	Dusk to Dawn None	Medium None	No	No
Port Allen	Kauai	Private	No	2,450X 60	None	None	No	No
Upolu	Hawaii	Hawaii	No	3,800X 75	Dusk to Dawn	Medium	No	No
Waimea Kohala	Hawaii	Hawaii	Limited	5,200X100	Dusk to Dawn	Medium	No	No
Wheeler AAF	Oahu	U.S Army	Yes	5,600X295	Dusk to Dawn	High	No	No

2.3 DISCUSSION OF ALTERNATIVES PREVIOUSLY PRESENTED IN THE DRAFT EA

The Draft EA for the proposed action raised the prospect of alternative sites for a possible SAAF. The selection of an SAAF location has yet to be determined and will be deferred to the future upon completion of a separate NEPA document. The decision to beddown C-17 aircraft at Hickam is being made independent of SAAF selection. During the NEPA analysis for this proposed action, it became apparent that more information about potential SAAFs was needed in order for the decision-maker to make an informed decision. Accordingly, the Air Force will seek to obtain further information relating to formal comments, technical feasibility, technical requirements, funding availability, and other matters, and address those in a future NEPA document. In addition, the future NEPA document will include the following information:

A selection process to meet the mission profile and SAAF training requirements of the C-17 aircraft. References for developing a potential SAAF site which will include AFI 11-2C-17 Vol. I, Flying Operations C-17 Aircrew Training; AFI 11-23-17 Volume (Vol.) 3, C-17 Operations Procedures; UFC 3-260, Unified Facilities Criteria Airfield And Heliport Planning And Design, and Air Force Handbook (AFH) 32-1084, Civil Engineering Facilities Requirements. Selection criteria may prefer active runways that have certain in-place facilities and infrastructure to accomplish SAAF training.

Table 2.3-1 provides example criteria for identifying candidate sites for use by the C-17 for SAAF runway operations.

These runways will be used for realistic training. Additional, or less restrictive, criteria may be used in the analysis of selecting a SAAF. Additional airspace that would be affected by a SAAF Runway location will also be evaluated when a site is selected.

Table 2.3-1 SAAF Narrowing Criteria Existing Runways

Criteria	Minimum
Runway Length	3,500 ft – 5,000 ft (+300 ft overruns)
Runway Width	90 ft – 100 ft
Lighting Infrastructure	Must Have
Hours Operation	Day/Night
Owning Agency	Federal/State
Crash Recovery	Must Have
Runway Status	Active

During the process of selecting a SAAF Runway location, all of the existing runways within a 250-mi radius of Hickam AFB will be evaluated. Candidate sites are identified in Table 2.2-1 above.

3 AFFECTED ENVIRONMENT

This chapter describes the existing environmental and human resources that would be affected by the proposed action and alternatives. The environment described in this chapter is the baseline for the comparisons to be presented in Chapter 4. The region of influence (ROI), or study area, for each resource category guides the scope of the descriptions for the environmental baseline conditions. An ROI consists of the geographic area in which the Proposed Action or alternatives might reasonably be expected to directly or indirectly affect the resource.

For the purposes of this EA, a resource or area of environmental analysis may not exist at a particular location where the Proposed Action or Alternative would take place. For example, the Lightning DZ is located in an inland area, so at this location "Coastal Zone Management" resources would not apply. Therefore, within the narrative text of this chapter under the section "Coastal Zone Management – Lightning DZ", the phrase "Not Applicable" is used where no further description of impacts for this location is necessary.

3.1 GEOLOGICAL RESOURCES AND CLIMATE

Geological resources consist of the earth's surface and subsurface materials. Within a given physiographic area these resources typically are described in terms of topography and geology.

3.1.1 Topography

Topography is the change in vertical relief (elevation) over the surface of a land area. The topography of an area may be influenced by human activity, underlying geologic material, seismic activity, climatic conditions, and erosion. Topography encompasses descriptions of surface elevations, slope, aspect, and distinct physiographic features (i.e., mountains, ravines, or depressions) and their influence on human activities.

Hickam AFB, Oahu

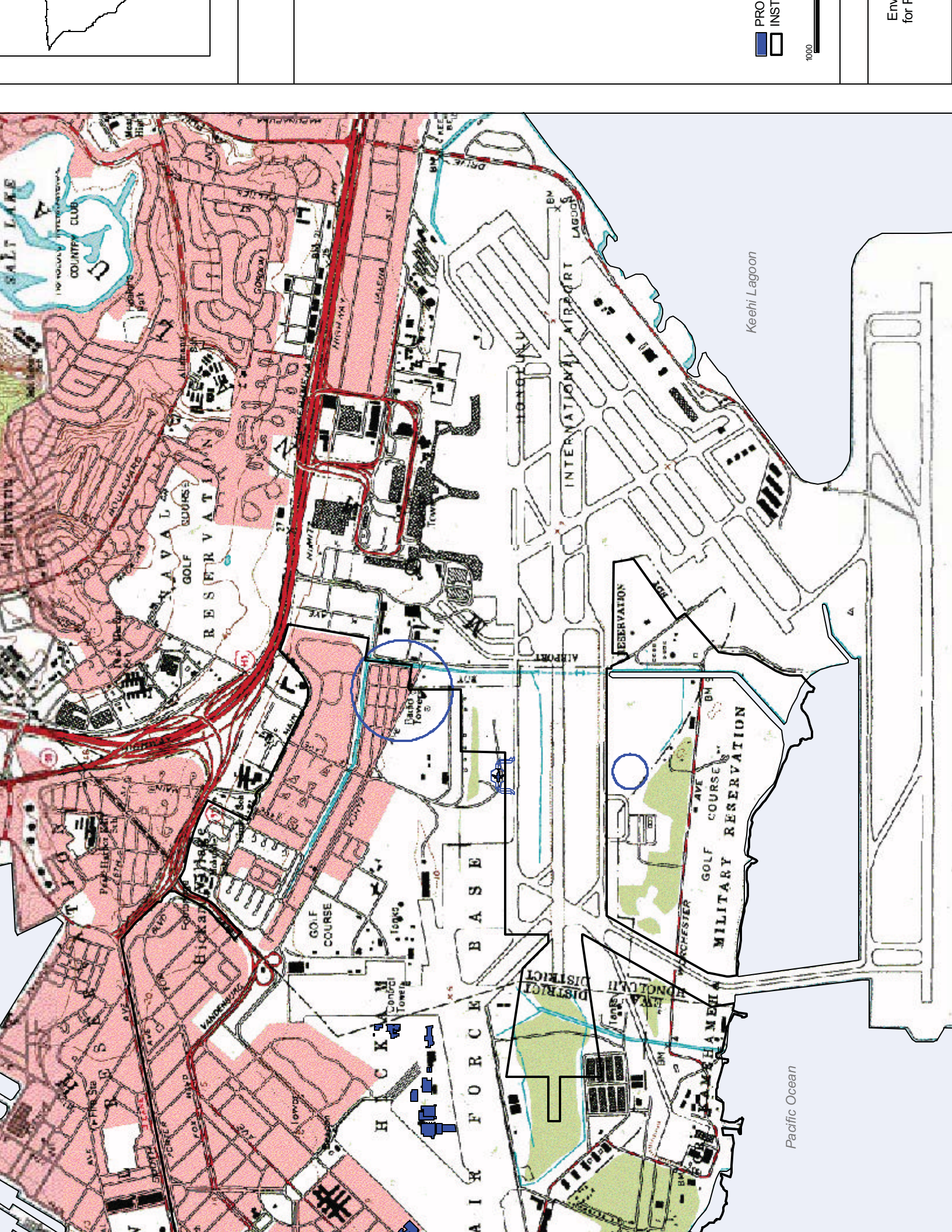
Oahu is an island formed from volcanic activity that created the mountains of the Waianae Range in the west and Koolau Range in the east. Hickam AFB is located in the coastal plain west of the Koolau Range and along the eastern shore at the mouth of Pearl Harbor, directly west of the city of Honolulu, on the southern coast of the island of Oahu. This plain, extending from the northern shore of the island between the two mountain ranges, is the largest flat expanse of land on Oahu with elevations ranging from 0 to 6 meters (m), or 0 to 20 ft, above msl. The coastal plain is the culmination, in geologic time, of a succession of marine sedimentary and terrestrial alluvial layers that formed during subsidence of the island and fluctuating sea levels. The exposed reef represents a present-day lower sea level stand and contains a wedge of sediments known as caprock. This caprock contains strata of alluvium, lagoonal mud, beach sands, volcanic tuff, and corals. At depth, these strata overlay volcanic bedrock of the Honolulu volcanic series. In addition to these natural strata, many areas of Hickam AFB contain dredge-fill material. Hickam AFB is situated on approximately 1094 ha / 2,700 ac.

Most of the land areas, approximately 770 ha (1,900 ac), on Hickam AFB have soils that are mapped as fill land. The fill, which consists of dredge material from Pearl Harbor and other sources, changed the natural topography from an uneven series of low lying coastal ridges and swales to a level plateau. Figure 3.1.1-1 shows the topography of the area at Hickam AFB.

Lightning DZ, Oahu

The Lightning DZ is located within the Schofield Barracks Military Reservation on the Schofield Plateau region of Central Oahu. The DZ is situated on a plateau between the North Fork and South Fork of Kaukonahua Stream and south of the community of Wahiawa. The DZ is situated at approximately 336 m (1,100 ft) above msl. The stream channels west and south of the DZ are within steep gullies with banks up to 37 m (120 ft) high that have eroded into the alluvial deposits from the slopes of the Koolau Range. The

topographic relief of the plateau is level to slightly graduated with the downslope trending toward the west. Figure 3.1.1-2 shows the topography of the area at Lightning DZ.



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SALT LAKE
COUNTRY CLUB

RESERVATION

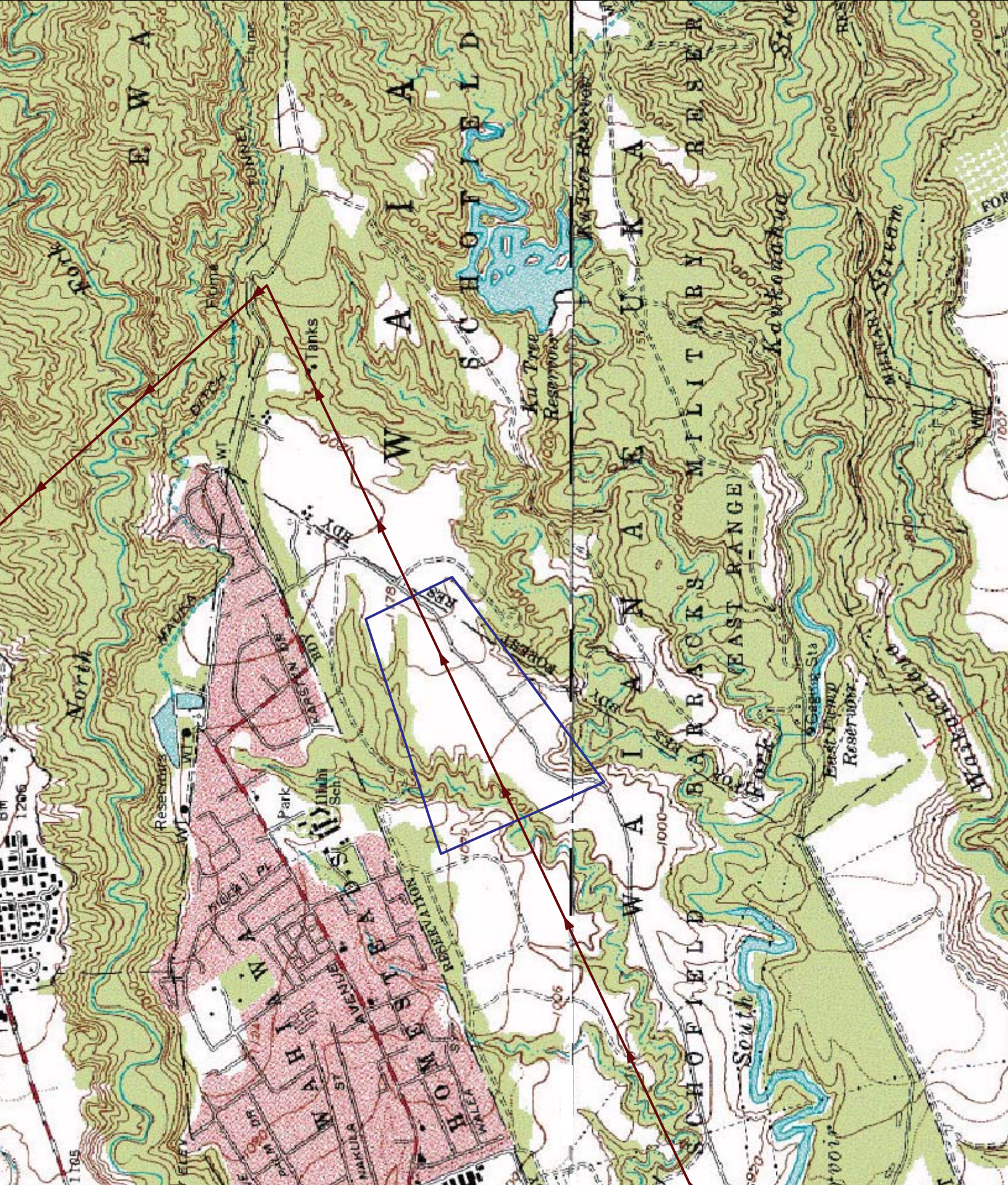
INTERNATIONAL AIRPORT

Keehi Lagoon

MILITARY RESERVATION

HICKAM AIR FORCE BASE

Pacific Ocean



FLIGHT LIGHT

500

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3.1.2 Soils

Information regarding soils was obtained from the *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, published by the US Department of Agriculture Soil Conservation Service in August 1972. The term soil, in general, refers to unconsolidated native materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil structure, elasticity, strength, shrink-swell potential, corrosivity, and erodibility, all determine the ability for the ground to support man-made structures and facilities. Soils typically are described in terms of their complex type, slope, physical characteristics, and relative compatibility or constraining properties with regard to particular construction activities and types of land use. Soils are also categorized by particle size and fertility with regard to agricultural and horticultural characteristics.

Hickam AFB, Oahu

The soils at Hickam AFB are varied, with most of the land area soils mapped as fill land mixed, on approximately 774 ha (1,910 ac). Fill land areas were leveled by depositing material dredged from nearby estuaries, the ocean, or other sources into depressions and channels. Other soil types on the base are related to the natural coastal plain setting and coral reef substratum over which the base lies. These soil types include Mamala stony silty clay loam, 0-12 percent slopes; Makalapa clay, 2-6 percent slopes; Keaau stony clay, 2-6 percent slopes; Jaucus sand, 0-15 percent slopes; and coral outcrop.

Hickam AFB soils are generally considered to be of low value for most vegetation and they tend to limit the diversity of the opportunistic flora. Most of the maintained landscape on Hickam AFB was established on topsoil fill imported from off-site sources. The erosion potential for nonfill soil types found on the base is generally slight to moderate, with the exception of Jaucus sand, which has high erosion potential in barren areas that lack vegetation cover. Surface storm water runoff ranges from very slow to medium in these soil types.

Lightning DZ, Oahu

The Lightning DZ is located within the Schofield Barracks Military Reservation on the Schofield Plateau region of Central Oahu. The DZ is situated on a plateau between the North Fork and South Fork of Kaukonahua Stream south of the community of Wahiawa. The soil is known as Leilehua silty clay on 2 to 6 percent slopes, has a USDA texture of "silty clay", and its Unified Classification code is MH-CH. It is in the clayey, oxidic, isothermic family of soils and in the order utisols. This soil type is typically found on uplands, is well drained, and adjoining topographical features include steep gullies. Leilehua silty clay is reddish-brown with concentrations of heavy minerals. This soil is highly acidic (pH range is 4.0 to 4.5) throughout its profile and is highly corrosive to uncoated steel and concrete. Permeability is moderately rapid [5 to 16 cm per hour (2.0 to 6.3 in per hour)], its shrink-swell potential is moderate, runoff is slow, and the erosion hazard is slight. The available water capacity is about 10.83 cm per m (1.3 in per ft) of soil. Its suitability as road fill is good.

3.1.3 Climate

Climate includes the meteorological conditions, including temperature, precipitation, and wind, that characteristically prevail in a particular region.

Hickam AFB, Oahu

The tropical climate at Hickam AFB is typically mild and predominantly consistent throughout the year. There is very little diurnal or seasonal variation in temperature on Oahu because of its location in the tropical latitudes, the marine influence, and the prevailing northeasterly trade winds. The average daytime temperatures range between 22 to 27 degrees Celsius (°C) [72 and 81 degrees Fahrenheit (°F)]. Rainfall varies dramatically on Oahu, as on the other major islands in the Hawaiian chain, due to the "rain shadow" effects of the mountain ranges. The windward sides of the islands, the northeastern shore, capture the tropical marine moisture from the prevailing winds and precipitation is caused by the influences of the mountains that condense the moisture into rain. In contrast, the leeward side of the mountain ranges are

much drier, particularly in the lower elevations. The average annual precipitation on Hickam AFB is approximately 56 cm (22 in). December is typically the wettest month of the year, and the least amount of precipitation usually occurs in June.

Lightning DZ, Oahu

The climate at Schofield Barracks, including Lightning DZ, located south of the Tropic of Cancer at approximately 21 degrees north latitude, is characterized by moderate temperatures that remain relatively constant throughout the year. The average annual rainfall in the area is 1.2 meters, greater than half of this falls during the rainy season from November through February. The trade winds have an average speed of 12 knots and prevail from the northeast or east approximately 70 percent of the time.

3.2 LAND USE

Natural land uses and land uses that reflect human-caused modifications are considered in this section. Natural land use classifications include wildlife areas, forests, and other open or undeveloped areas. Human land uses include residential, commercial, industrial, utilities, agricultural, recreational and other developed uses. Management plans, policies, ordinances, and regulations determine the types of uses that are allowable, or protect specially designated or environmentally sensitive uses. The attributes of land use addressed in this EA include general land use patterns, land ownership, and special use areas. General land use patterns characterize the types of uses within a particular area.

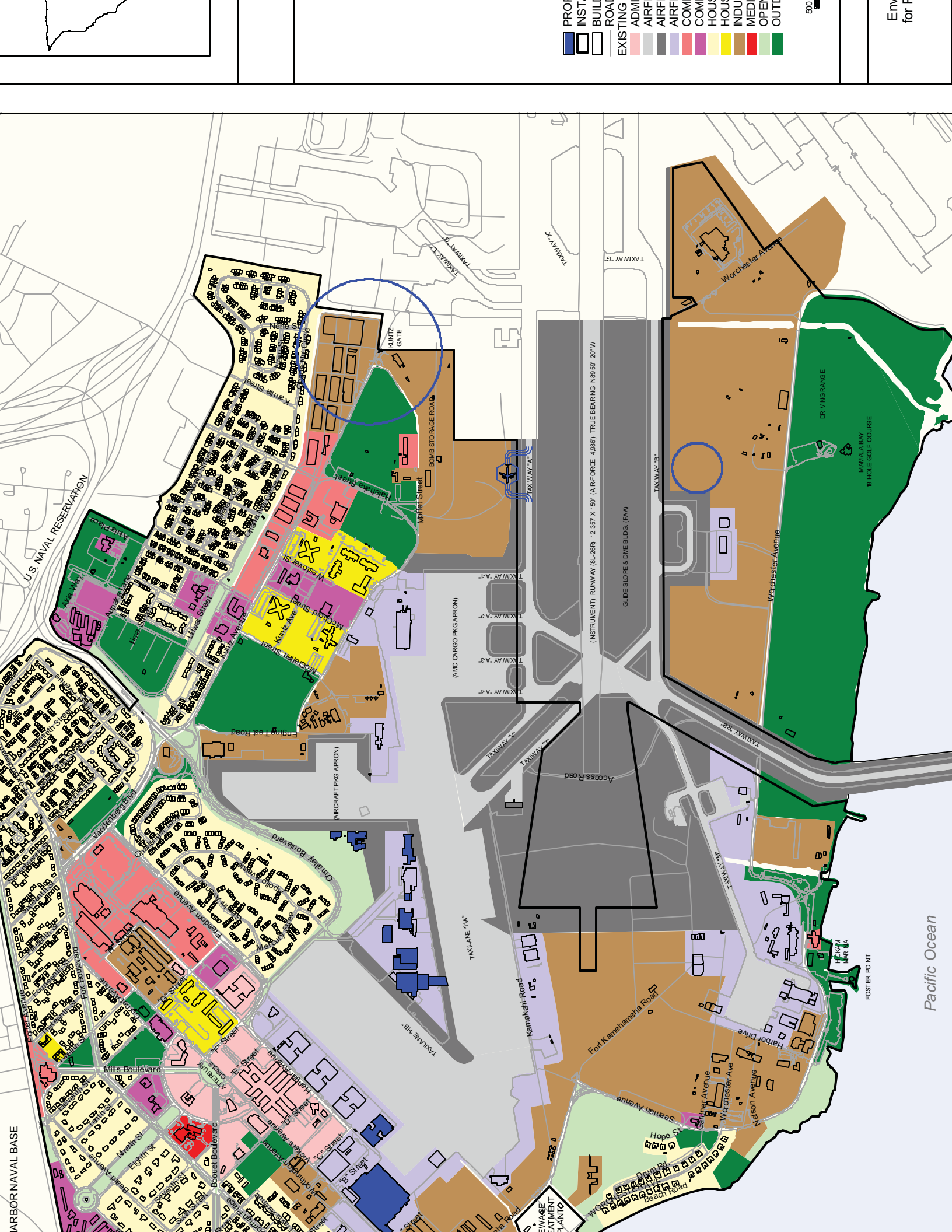
Hickam AFB, Oahu

Existing lands uses are herein identified that could potentially be affected by the proposed action. Table 3.2-1 shows the land use classification for Hickam AFB. Figure 3.2-1 provides a map of Existing Land Use at Hickam AFB. As indicated, Hickam AFB's main development area consists of two distinct land use areas. Accompanied military personnel housing occupies a large area in the northern vicinities while the remainder of the Base is characterized by a heterogeneous land use pattern. South of the airfield, industrial land uses such as aircraft operations and maintenance are the dominant activities. The Hickam AFB golf course and other recreational areas also comprise the land use in this area located on the southern shoreline of Oahu.

Table 3.2-1 Land Use Classification for Hickam AFB

Grounds Categories	Land Use Categories	Description
I	Housing (Accompanied)	Family dwellings, playgrounds
I	Housing (Unaccompanied)	Apartments, temporary housing (TLFs)
I	Community (Service)	Schools, day care, pool, recreation centers, bowling alley, chapel, library, post office
I	Community (Commercial)	Base exchange, shopette, gas stations, theater, officers and enlisted clubs, restaurants
I	Medical	Clinics, hospitals, veterinarian
I	Administrative	Offices, engineering, Major Command
I, SI	Outdoor recreation	Playgrounds, parks, ball fields, open lawns, parade grounds, golf courses, picnic areas, beaches
I, SI, UI	Open Space/Roads	Roads and boulevards in landscaped areas of base; road right-of-ways in remote areas of base; unimproved parks, scrublands, fields, forests, and wetlands
SI	Light Industrial	Motor pool, POL, supply depot, wastewater plant, ammunition storage, warehouses, antennas
SI	Aircraft Operations and Maintenance	Hangars, maintenance shops, ASE storage and maintenance, hush house, electronics shops, fire fighting
SI	Airfield	Runways and buffer zones
UI	Open Water	Wetlands, riparian zones, ditches, and ponds

I = Improved, SI = Semi-improved, UI = Unimproved



- PROJ. INST. BUILD. ROAD EXISTING ADMI. AIRF. AIRF. COM. HOUS. INDU. MEDI. OPER. OUT.

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HARBOR NAVAL BASE

U.S. NAVAL RESERVATION

BASE DEVELOPMENT PLAN

Pacific Ocean

The site of the proposed C-17 Support Facilities at Hickam AFB is located in a roughly triangle-shaped area at the northeast corner of the intersection between Taxilane "HB" and Taxilane "HA" of the flightline and is accessible from O'Malley Boulevard via Mamiya Avenue. Existing structures on the site are two C-130 "nosedock" hangars (Buildings 2020 and 2021), the flight services facility (Bldg. 2037), the fire station (Bldg. 2036), and the AMC Passenger Terminal (Bldg. 2028). A windsock (Bldg. 13409) is also located in the southwest corner of the site. The site is traversed by electrical distribution, sanitary sewer collection, water distribution, storm water drainage, and communication system components. In addition, portions of a fuel hydrant system, that are abandoned in place traverse the site. These existing utility systems are described in further detail within the section that addresses infrastructure in this chapter.

Lightning DZ

The Lightning DZ is located within the Schofield Barracks East Range (SBER) that is undeveloped and reserved as a military training area. Adjacent land uses include the residential communities of Wahiawa north of the DZ and Mililani Mauka south of the DZ. The Ewa Forest Reserve borders the eastern portion of the area. Of the 2,232 ha (5,514 ac) at SBER, 900 ha (2,224 ac) are considered suitable for maneuver training. One inactive landfill is located on SBER in the maneuver area, but its contents are being removed for disposal in a municipal landfill. Other land uses in the SBER include education facilities, light infantry training command, an 18-hole golf course, the Noncommissioned Officer (NCO) Academy, the 25th Infantry Division, warehouses, and a maintenance facility. All ammunition and explosives for SBER are stored off-site at Wheeler Army Airfield, to the west of and adjacent to SBER. The Lightning DZ is within an undeveloped area.

3.3 COASTAL ZONE MANAGEMENT

A coastal zone consists of land and waters adjacent to the coast that exert an influence on the uses of the sea and its ecology or whose uses and ecology are affected by the sea. The National Coastal Management Program is a federal-state partnership dedicated to comprehensive management of the nation's coastal resources, ensuring their protection for future generations while balancing competing national economic, cultural and environmental interests. Coastal Zone Management Plans (CZMPs) are authorized by the Coastal Zone Management Act of 1972 and administered at the federal level by the Coastal Programs Division within the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management. The purpose of the CZMA is to encourage states to manage and conserve coastal areas as unique, irreplaceable resources. A Federal Consistency provision of the CZMP requires that federal activities, permits and financial assistance be consistent with the Hawaii CZMP to the maximum extent practicable. The Hawaii Department of Business, Economic Development, and Tourism (DBEDT) Office of Planning (OP) administers the State CZM program and reviews the consistency determination along with the final management plan developed for the proposed action, as appropriate.

The Hawaii CZMP is built upon ten policy areas:

- Recreational Resources
- Historic Resources
- Scenic and Open Space Resources
- Coastal Ecosystems
- Economic Uses
- Coastal Hazards
- Managing Development
- Public Participation
- Beach Protection
- Marine Resources

The Special Management Areas (SMA) and Shoreline Setback Areas are designated for more intensive protection by the four counties of Hawaii. The SMA originally encompassed all lands extending not less than 91.4 m [100 yards (yd)] inland from the shoreline.

Hickam AFB, Oahu

The offshore area that coincides with the Hickam AFB boundary consists of three distinct habitats: a stand of mangrove vegetation, an extensive shallow reef flat, and a deeper reef slope. Two deep-dredged channels, the Pearl Harbor main entrance channel and the Hickam Harbor entrance channel, cut through the reef known as Ahua Reef. The shallow reef flat is heavily silted inshore and the sediment deposits progress offshore to become a mixture of limestone reef, coral rubble, and sand.

Hickam AFB manages and preserves coastal resources as part of the overall goal of its Integrated Natural Resources Management Plan. Potential threats and concerns to the coastal and reef areas along and adjacent to the base include: sedimentation from dredging of access channels into Pearl Harbor and Hickam Harbor; potential over-harvest of the reef fishery; and pollution from canals emptying into Mamala Bay.

Lightning DZ, Oahu

The Lightning DZ is not within a Coastal Zone Management Area.

3.3.1 Coral Reef Ecosystem

Coral reefs are unique ecosystems. In Hawaiian waters, marine organisms living on and within coral reefs are the sole source of sand for beaches and nearshore environments. Reefs are important natural resources that protect coastlines, and provide habitat for marine plants and animals. Corals and calcareous algae build a submerged reef framework that is constantly undergoing breakdown by physical and biological erosion. The product of such reef erosion is rubble, sand, and fine sediment. Environmental factors that determine accretion pattern and ecology of coral/algal communities control reef growth in Hawaii. These controls include: high nutrient and sediment loading and fresh water discharge from island watersheds; sea level changes; high wave events; land tectonic movements; and fossil reefs limiting accommodation space.

E.O. 13089, Coral Reef Protection, recognizes the significant ecological, social, and economic values provided by the Nation's coral reefs. The Hawaii Coral Reef Initiative Research Program was established to investigate and recommend methods for managers to mitigate threats to the health of Hawaii's coral reef ecosystems. The management of coral reefs is to include them as part of a comprehensive integrated coastal zone management plan, and not managing them in isolation.

Hickam AFB, Oahu

Ahua Reef near Hickam AFB has been dredged on both its west and east margins. A stand of mangroves extends approximately 100 m (328 ft) from shore, with a gravel spit of coral rubble running perpendicular from the mangroves for 225 m (738 ft). The dredged, eastern edge of the reef is encrusted with coralline algae, and there are sabellid worms in the cracks in the reef. Most of the reef flat consists of very shallow, highly sedimented reef flat. Dominant substrate types on the reef include sand, limestone reef, and coral rubble. Living hard coral makes up a very small portion of the entire reef area (less than 2 percent). The reef slope substrate is dominated by limestone reef with some coral rubble.

Lightning DZ, Oahu

The Lightning DZ is not located within or near a coral reef ecosystem. Not applicable.

3.3.2 Other Marine Resources

In 1991, the Hawaii and Marine Resources Council developed the Hawaii Ocean Resources Management Plan (ORMP), which contains objectives, policies, implementing actions, and recommendations for a comprehensive, integrated ocean policy and management framework. The 1995 enactment of Act 104, Session Laws of Hawaii integrated the ORMP with the Hawaii CZMP to strengthen the state's ability to coordinate marine and coastal policy development and resources management responsibilities. Resources

contained within these natural environments are diverse and numerous including marine mammals, birds, fish, plants, coral reefs, estuaries, wetlands, offshore islets, anchialine pools, scenic land and seascapes, beaches, rugged shorelines, and underwater lava formations. In addition to protecting surrounding waters and coral reefs, the bases are also responsible for the marine fisheries resource under their jurisdiction, and for managing direct and indirect, human or natural threats to their mission and their natural resource programs. Examples include oil spills and control of exotic species such as mangrove, invasive jellyfish (*Cassipoea* species), and alien red algae (*Kappaphycus* species). None of the proposed actions or alternative locations are anticipated to involve an encroachment upon any marine resources.

3.4 FLOODPLAINS

A floodplain is that portion of a river valley, lake, or marine shoreline that is built of sediments deposited during the present geological and climatic regime. Based on statistically derived hydrologic recurrence intervals, a portion of the land adjacent to the watercourse experiences overflow or inundation during flood stage or storm surge episodes. The term "floodplain" generally refers to the 100-year floodplain. The 100-year floodplain designates the area that would be subjected to inundation from a flood having a 1 percent chance of occurring in any given year based on historical records and calculated statistical probabilities. This flood event is referred to as the "100-year flood" or "base flood" and theoretically may occur at an average frequency of one time within a 100-year period.

The NEPA compliance process requires federal agencies to consider direct and indirect impacts to floodplains that may result from federally funded actions. E.O. 11988, Floodplain Management, requires federal agencies to take action to minimize occupancy and modification of floodplains. Furthermore, E.O. 11988 requires that federal agencies proposing to locate a project in the 100-year floodplain must consider alternatives to avoid adverse effects and incompatible development in the floodplain.

Hickam AFB, Oahu

Though not officially classified as a floodplain, there is an area of Hickam AFB that has been identified as a potential flood inundation zone (reference the wetlands Figure 3.5.2-1). This zone, which covers the Fort Kamehameha and Hawaii Air National Guard portions of the base, indicates the potential for flooding as a result of a major Pacific storm or seismic (tsunami) event.

The 100-year return period flood hazard zone was determined in the Flood Insurance Study prepared by the Federal Emergency Management Agency (FEMA). This study shows the area of inundation associated with tsunami in the coastal area between the Reef Runway Lagoon and Motor Pool Canal.

Lightning DZ, Oahu

No floodplains exist in the area of the DZ. However, the access road that is used to enter the SBER to the DZ traverses the South Fork of Kaukonahua Stream, a tributary that feeds into Wahiawa Reservoir and Lake Wilson that could flood under certain conditions and make accessibility to the DZ infeasible.

3.5 BIOLOGICAL RESOURCES

The term biological resources incorporate living, native or naturalized, plant and animal species (excluding livestock) and their habitats, including wetlands, within which they occur. This section focuses on plant and animal species or vegetation types that typify or are important to the function of the ecosystem, are of special societal importance, or are protected under federal or state law or statute. Vegetation consists of plant species and assemblages of plant species that define natural communities. It provides a convenient framework for the discussion of habitats occurring within the area of potential effect. A description of wetland habitats is provided in a following section.

3.5.1 Vegetation

Hickam AFB, Oahu

Vegetation at Hickam AFB has been disturbed or removed throughout the installation and there are no significant naturally occurring, native plant communities in the vicinity of the Base. Native plant species have occasionally been used in landscaping projects, but no native communities have been created on the Base. Much of the Base was constructed on a filled area that previously had been a coral reef and low-lying coastal areas so the lower-elevation area of the Base has had little or no previously existing terrestrial vegetation.

Managed vegetation or turf consists of herbaceous ruderal vegetation and other landscaped areas. These include median strips between roads and aircraft runways, golf courses, housing area lawns, athletic fields, and other open fields or groves of trees not categorized as unmanaged vegetation. Turf areas are divided into landscape-low maintenance and landscape-high maintenance areas, depending on their requirements for mowing and watering.

Unmanaged vegetation exists mostly in the southern portion of the base and includes buffleggrass/kiawe woodland (*Pennisetum ciliare/Prosopis pallida*), kiawe forest, pickleweed flats (*Batis maritima*), and mangrove (*Rhizophora mangle*). Left undisturbed, kiawe vegetation can form closed-canopy forests that reach 9 to 12 m (30 to 40 ft) in height. Regular mowing keeps the kiawe suppressed, with vegetation dominated by herbaceous, ruderal species. Pickleweed flats are predominantly found in the southern portion of the base, where a shallow, brackish groundwater table forms wet, saline soils. Mangroves are found along the banks of canals and along the marine shoreline.

Lightning DZ, Oahu

The DZ, as stated earlier, is located on a plateau dissected by a tributary of the South Fork of Kaukonahua Stream. The area immediately surrounding the DZ has been cleared of vegetation to facilitate drops of supplies and personnel. Areas outside of the DZ, but within SBER, are vegetated, particularly in the drainages.

Botanical surveys have been contracted out by the Army since 1977 to fulfill requirements under the Endangered Species Act. The Hawaii Natural Heritage Program (HINHP) conducted a comprehensive biological survey of SBER from January 1992 to May 1993. They chose survey areas to represent native-dominated ecological zones at SBER and also surveyed for rare species in their preferred habitats. Six native natural vegetation communities were identified on SBER, one of which is considered rare. In addition, 71 rare and endangered plant species were observed at SBMR and SBER. The results from these surveys provided the foundation for the biological inventory information found in the Endangered Species Management Plan Report. The only other comprehensive botanical survey on record at SBER was completed in 1996 by the Center for Environmental Management of Military Lands. The 520 person-hour surveys covered 61 sites at SBER and SBMR combined, collecting 632 specimens from 102 families, 286 genera, and 384 vascular plant taxa. There are no threatened or endangered species within the DZ. See Appendix C for more details on rare, threatened and endangered species in the SBER vicinity.

3.5.2 Wetlands

“Wetlands” is a collective term for marshes, swamps, bogs, and similar areas characterized by perennial water-saturated soils and vegetated with plants that have adapted to these conditions. Wetlands may exist in poorly drained areas, in depressions on the landscape, and between water and dry land along the edges of streams, rivers, lakes, and coastlines. Inland wetlands receive water from precipitation, ground water, and/or surface water. Coastal and estuarine wetlands receive water from precipitation, surface water, tides, and/or ground water. Surface water sources include storm water runoff.

Section 404 of the CWA established a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated

under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. The federal regulations implementing Section 404 of the CWA define wetlands as: "those areas that are inundated or saturated by surface or ground water (hydrology) at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytes) typically adapted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas." E.O. 11990, Protection of Wetlands, requires federal agencies, including the USAF, to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

Hickam AFB, Oahu

Most of the wetlands located at Hickam AFB are located in flat or depressed areas in the southern portion of the base, along the coastline, and along the edge of the channel in Kumumau`u Canal and Manuwai Canal. Wetlands are divided into three habitat types: shoreline wetlands, ephemeral emergent wetlands, and canal wetlands.

Shoreline wetlands at Hickam AFB include mangrove-dominated shrublands and sand beaches. Two mangrove wetlands occur along the shoreline of Mamala Bay near the entrance to Pearl Harbor. These wetlands are tidally inundated on a regular basis and a shallow, brackish water table is present. The National Wetlands Inventory (NWI) has determined that the mangrove portion of these wetlands should be classified as "marine or estuarine, intertidal, scrub-shrub, regularly inundated."

Nonvegetated sand beaches are generally considered not to be jurisdictional wetlands. The sand beaches along the shoreline of Hickam AFB, comprising about 6 ha (14.5 ac), are largely unvegetated and do not display hydric soil characteristics. However, they are regularly flooded by tidal inundation and storm surge events. These wetlands are classified by the NWI as "estuarine, intertidal, and unconsolidated."

Ephemeral emergent wetlands are temporarily ponded and vegetated with rooted herbaceous plant species. Three wetland areas occur in the flat plain that comprises Fort Kamehameha. A fourth wetland occurs south of the drainage ditch near the explosives storage area. All have similar hydrology, receiving surface runoff from higher elevations and brackish groundwater from the shallow water table. Rainy seasons produce more or less continuous surface water with scattered ponded areas, and dry seasons cause the exposed soil to dry out and become highly saline with a thin salt crust formed by the evaporation process. Pickleweed is the dominant vegetation in these wetlands with scattered kiawe shrubs occurring primarily in elevated areas.

Wetlands occur within the channels of the Manuwai and Kumumau`u canals, and are well-defined by the canal banks. Mangrove, the dominant vegetation in these wetlands, has been cut back in an effort to maintain water conveyance. These canals are classified by the NWI as "estuarine, subtidal, open water, subtidal inundation, excavated". Emergent vegetation, including cattail (*Typha* species) and California grass (*Bromus* species) is found in the upper regions of the Manuwai Canal.

Wetlands at Hickam AFB are generally disturbed by human activities and of low value for wildlife, except for the coastal mangrove shrubland and sand beaches. Figure 3.5.2-1 shows wetlands and water bodies at Hickam AFB.

Lightning DZ, Oahu

Due to its location on the top of the plateau, there are no wetlands in the immediate vicinity of Lightning DZ. A tributary of the South Fork Kaukonahua Stream lies to the west and northwest of the Lightning DZ and the South Fork of Kaukonahua Stream lies to the south. There are possible perennial and seasonal/intermittent palustrine wetlands associated with these streams that are characterized by native trees, shrubs and emergent vegetation. Possible palustrine wetlands associated with Ku Tree and Wahiawa reservoirs have not been identified.

3.5.3 Wildlife

Wildlife includes those animals living in a natural, undomesticated state. Fish are included as wildlife in this section.

Hickam AFB, Oahu

Fish and wildlife resources on Hickam AFB are managed through the Integrated Natural Resources Management Program (INRMP) in cooperation with the US Fish and Wildlife Service (USFWS) and the State of Hawaii. Suitable habitat exists on Hickam AFB for a variety of fish and wildlife species. Notable fish and wildlife management activities on Hickam AFB include: the preservation and enhancement of sandflats and wetlands; a predator control program (non-native feral cats and mongoose, *Herpestes* species); recreational fishing in Mamala Bay; access to Ahua Reef for recreational fishing, nature watching; and maintenance of the interpretive trail.

Sampling conducted in 1996 in Manuwai and Kumumau`u Canals revealed 31 species of aquatic fauna at Hickam AFB, including 20 species of fish, six crustaceans, three mollusks, and an amphibian. Seven of these species were introduced, 10 were native freshwater species and 14 were marine species that used brackish water for juvenile rearing. Ten species were found only in Manuwai Canal, 13 species were found only in Kumumau`u Canal and 8 species were common to both canals.

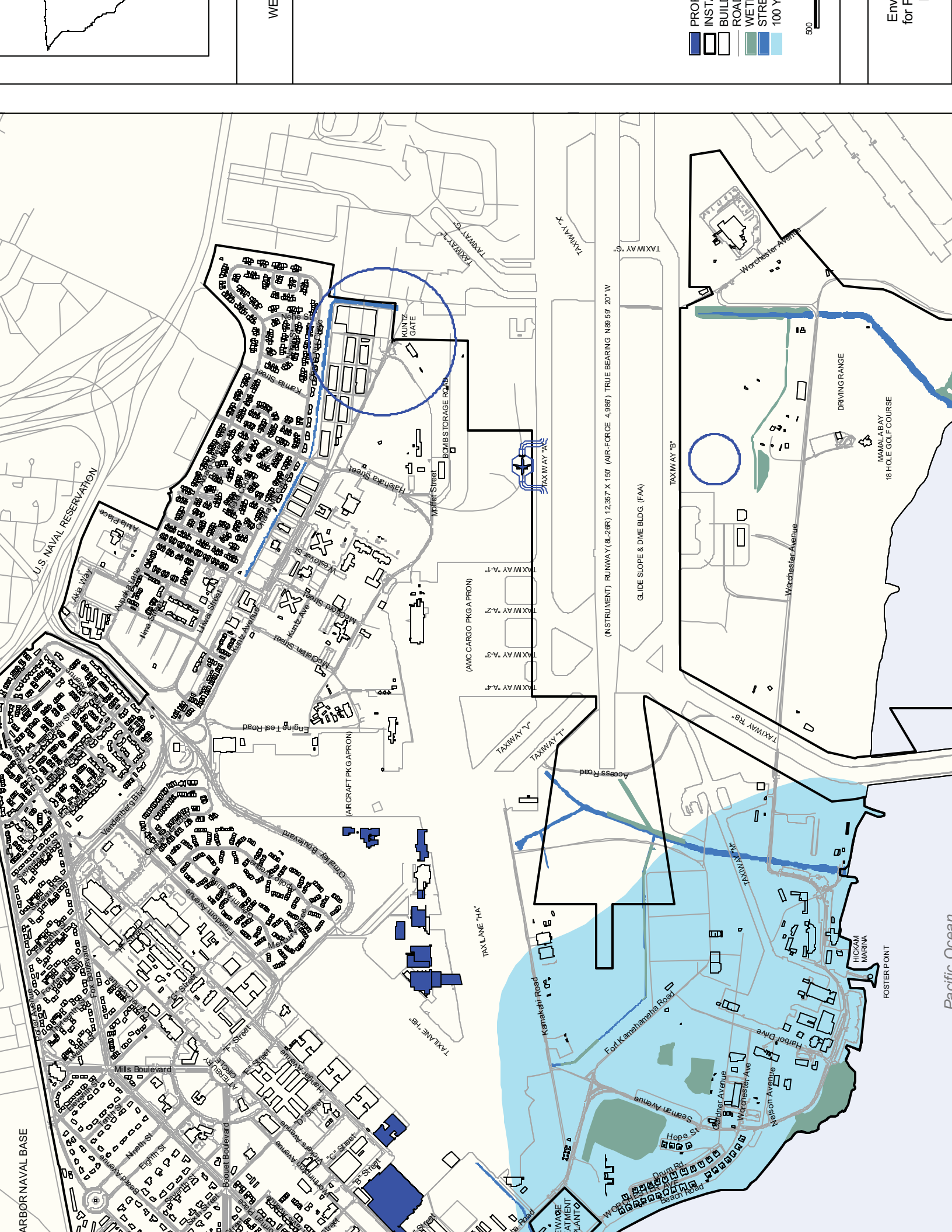
Over 80 species and 24 families of fish were observed in transects in marine waters off Hickam AFB. The number of species, number of individuals, biomass, and diversity, indicated a large degree of variability, particularly between habitats. Overall, the biomass density for the entire study area was relatively low, approximately 50 grams/m² (1.0 lb/100 ft²). This is a reflection of the fact that several of the individuals observed were juveniles, and the reef flat productivity is low. Diversity and biomass were significantly higher in the reef slope.

Three terrestrial habitat types were classified on Hickam AFB; wetlands, second-growth forest, and turf areas. The shoreline wetlands provide a limited amount of cover, nesting, and feeding habitat for songbirds. Inundated prop roots in mangrove stands also provide cover for juvenile marine and brackish-water fish.

Lightning DZ, Oahu

The Lightning DZ, as stated earlier, is located on a plateau dissected by a tributary of the South Fork of Kaukonahua Stream. The area immediately surrounding the DZ has been cleared of vegetation to facilitate drops of supplies and personnel. The cleared area that comprises the Drop Zone itself is generally not good wildlife habitat. However, due to the relatively large amounts of undeveloped land outside of the Drop Zone, combined with a large amount of vertical relief, areas outside of the Drop Zone, particularly to the east, have the potential to support diverse and abundant flora and fauna. Undisturbed natural vegetation is found primarily in the steep gulches on the south and west sides. These steep ravines support birds and other fauna, and blocks of forestry plantings and dense understory. These areas have the potential to contain the species as described in the following paragraphs.

The endangered 'Ope'ape'a or Hawaiian hoary bat (*Lasiurus cinereus semotus*) may occur at SBER based on descriptions in the HINHP biological database for Schofield Barracks, and the HINHP Database of Rare and Endangered Plants, Animals, and Natural Communities of the Hawaiian Islands; the Hawaii Wildlife Plan.



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- WETT. [Symbol]
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Env. for P

HARBOR NAVAL BASE

U.S. NAVAL RESERVATION

(INSTRUMENT) RUNWAY (8L-26R) 12,357 X 150' (AIR-FORCE 4,968') TRUE BEARING N89.59° 20' W

GLIDE SLOPE & DME BLD.G. (FAA)

FOSTER POINT

Pacific Ocean

The following birds have been observed at SBER, based on descriptions in the HINHP biological database for Schofield Barracks Military Reservation and the HINHP Database of Rare and Endangered Plants, Animals, and Natural Communities of the Hawaiian Islands: the Oahu 'elepaio (*Chasiempis sandwichensis gayi*), Oahu creeper (*Paroreomyza maculatus*), Oahu `akepa (*Loxops coccineus wolstenholmi*), the 'i'iwi (*Vestiaria coccinea*), Oahu `amakihi (*Hemignathus virens chloris*), and the `apapane (*Himatione sanguinea sanguinea*); but to date the Oahu 'elepaio, Oahu creeper, and Oahu `akepa have not been observed by SBER natural resources staff. Other indigenous birds at SBER include koa'ekea/white-tailed tropicbird (*Phaethon lepturus dorotheae*), `auku'u or black-crowned night heron, and the Pacific golden-plover.

Endemic invertebrates observed at SBER include six Oahu tree snails: *Achatinella apexfulva*, *A. byronii*, *A. decipiens*, *A. leucorraphe*, *A. sowerbyana*, *A. swiftii*; and three species of Achatinellid land snails: *A. perpusilla*, *A. pulchra*, and other *Achatinella* species. Native insects include the Oahu megalagrion damselfly (*Megalagrion oahuensis*), the unique yellow-faced bee (*Hylaeus unica*), and opae oeha' a or the Hawaiian prawn (*Macrobrachium grandimanus*).

3.5.4 Rare, Threatened, and Endangered Species

Before a plant or animal can receive protection under the Endangered Species Act (ESA), it must first be placed on the Federal list of endangered and threatened wildlife and plants. This listing program managed by the U.S. Fish and Wildlife Service follows a strict legal process to determine whether to list a species, depending on the degree of threat it faces. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future. Table 3.5.4-1 lists threatened and endangered plant and animal species on or in close proximity to Hickam AFB; and the Lightning DZ according to the United States Fish and Wildlife Service in a letter dated March 4, 2003 (written in response to the DOPAA of this EA). There are no threatened or endangered species within the DZ.

Table 3.5.4-1 Threatened and Endangered Plant and Animal Species in the Project Areas

Installation Name	Location	Common and / or Hawaiian Name	Scientific name
Hickam AFB	On the Base	Hawaiian Stilt, Ae'o	<i>Himantopus mexicanus knudseni</i>
	On the Base	Hawaiian Monk Seal, 'Ilio-holo-I-ka-uaua	<i>Monachus schauinslandi</i>
Lightning DZ	Not Applicable	None in the area	<i>Not Applicable</i>

Source: United States Fish and Wildlife Service, Honolulu Office, in a letter dated March 4, 2003

Hickam AFB, Oahu

The USFWS maintains a list of T&E species' presence on or in the vicinity of Hickam AFB. Two federally listed species, the Hawaiian stilt and the green sea turtle were observed on Hickam AFB during field surveys in January 1996. The stilt observations were made in the Reef Runway Lagoon area in the vicinity of the Manuwai Canal. Stilts were previously observed in ephemeral ponds on other parts of the installation.

The state-listed endangered Hawaiian short-eared owl, the pueo (*Asio flammeus sandwicensis*), was captured at the base commissary, and the current number and distribution of these owls on Oahu is unknown. These owls are very important in Hawaiian culture and are considered sacred. Several areas of Hickam AFB are suitable for habitat by the pueo, but are limited due to predation. A few scattered occurrences of the Hawaiian hoary bat have been reported on Oahu. It is possible that this endangered bat species would utilize portions of Hickam AFB, but such use is thought to be infrequent. This animal is usually found on Kauai and the Big Island.

Habitat for the federally listed Hawaiian coot and the Hawaiian common moorhen exists at the Manuwai Canal but these species have not been recorded at this location. The common moorhen has been recorded

in the tidal flats near Fort Kamehameha, and both species have been observed on Waipio Peninsula in Pearl Harbor, 3 to 5 km (2 to 3 miles) away from Hickam AFB. The Hawaiian duck has also been recorded on Waipio Peninsula.

Three federally protected marine species occur or could occur in waters off Hickam AFB: green sea turtles, Hawaiian monk seals, and humpback whales. No known occurrences of threatened or endangered invertebrate species have been recorded at Hickam AFB. A dead green sea turtle was found in 1996 off Fort Kamehameha, and another was found again in 2001 in the same area, but the turtle was determined to have tumors. The U.S. Fish and Wildlife Service was notified in both cases.

In response to the scoping process for this environmental assessment, the USFWS indicated that wedge-tailed shearwaters (*Puffinus pacificus*), a federally protected migratory seabird, have been downed by lights at Hickam AFB. Anecdotal observations and experimental evidence have shown that artificial lighting can disorient night flying seabirds. This disorientation is caused by excessively bright outdoor lighting and can result in seabird collisions with man-made structures such as light poles and wires. Injured seabirds that “fall out” due to such collisions are highly vulnerable to predation by dogs and cats.

Table 3.5.4-2 summarizes the federally listed animals species observed or determined to be potentially occurring at Hickam AFB. None of these species have been observed to breed or nest on the installation, rather they use the area for foraging and resting.

Lightning DZ, Oahu

The DZ, as stated earlier, is located on a plateau dissected by a tributary of the South Fork of Kaukonahua Stream. The area immediately surrounding the DZ has been cleared of vegetation to facilitate drops of supplies and personnel. Areas outside of the DZ are vegetated, particularly in the drainages. Several rare species were observed on SBER during reservation-wide surveys including a very rare type of honey creeper (bird), the 'I'iwi (*Yestiaria coccinea*), native tree snails (*Achatinella spp.*), and the Hawaiian hoary bat. However, the Lightning DZ itself does not provide habitat for these species.

Table 3.5.4- 2 Federally Listed Animal Species Observed or Potentially Occurring at Hickam AFB, HI

	Scientific Name	Common Name	Federal Status	Hawaii Status
Mammals				
	<i>Lasiurus cinereus semotus</i>	Hawaiian hoary bat, ope'ape'a	E	E
	<i>Monachus schauinlandi</i>	Hawaiian monk seal, 'ilio-holo-i-ka-uaua	E	E
	<i>Megaptera novaeangliae</i>	Humpback whale, kahola	E	E
Birds				
	<i>Fulica americanus alai</i>	Hawaiian coot, 'alae ke'oke'o	E	E
	<i>Gallinula chloropus sandvicensis</i>	Common moorhen, 'alae'ula	E	E
	<i>Asio flammeus sandwicense</i>	Hawaiian short-eared owl, pueo	SOC	E
	<i>Anas wyvilliana</i>	Hawaiian duck, koloa maoli	E	E
	<i>Himantopus mexicanus knudseni</i>	Black-necked stilt, ae'o	E	X
Reptiles				
	<i>Chelonia mydas</i>	Green sea turtle, honu	T	X

= Endangered; T = Threatened; SOC = Species of Concern

3.6 WATER RESOURCES

Water resources include surface and groundwater resources. Surface water includes oceans, bays, lakes, rivers, canals, and streams and is important for economics, ecology, recreation, and human health considerations. Groundwater comprises the subsurface hydrogeologic resources of the physical environment and is an essential resource in many areas.

3.6.1 Surface Water

Hickam AFB, Oahu

There are no natural stream channels on Hickam AFB, but several man-made canals and numerous underground storm drains convey storm water from the Base to Mamala Bay. None of the canals is believed to have perennial water sources other than groundwater seepage. The canals and open ditches are man-made watercourses that serve primarily to transport storm water and irrigation runoff to the ocean. With the exception of the lower portion of Manuwai Canal, immediately adjacent to the golf course, the three canals have no natural-looking features. Water quality conditions for aquatic life are poor in Kumumauu and Manuwai Canals, and may be impacted by hazardous substances. Although the pH and temperature were both within acceptable levels, the dissolved oxygen levels were considerably lower than 5.0 mg/L, which is an accepted standard required for diverse aquatic life. Past measurement of Kumumauu Canal indicated detectable levels of two semivolatile and three volatile organic compounds, 10 polynuclear aromatic hydrocarbons, 10 pesticides, and 10 metals. Samples from Manuwai Canal had detectable levels of phenols in 1988, with cadmium, silver, selenium, mercury, and lead detected at various times. Salinities measured in 1996 ranged from 13.5 to 34.0 parts per thousand (ppt) at Kumumauu Canal, and 0.0 to 31.2 ppt at Manuwai Canal. Signs are posted to prevent fishing and fish consumption.

Watercourses on Hickam AFB are considered opportunities for possible nonpoint source pollution control and cleanup, including sediment dredging. Aiea Stream near Hickam AFB is listed on the 2002 CWA Section 303(d) List of Impaired Water Bodies due to turbidity and trash based on a visual assessment and is a high priority area for water quality improvement through the development of Total Maximum Daily Loads. Mamala Bay is also listed as an impaired water body for nitrogen and chlorophyll a based on a numeric assessment and is listed as a low priority for water quality improvements.

Lightning DZ, Oahu

There are a number of significant bodies of water in the vicinity of the Lightning DZ. South of the Drop Zone, the primary drainage is the South Fork of the Kaukonahua Stream, which originates in the Koolau Mountains east of SBER, flows northwest toward the city of Waialua and empties into the Wahiawa Reservoir (Lake Wilson) west of SBER. Several Reservoirs, Canon, East Pump, Koolau and Ku Tree, are all located on South Fork of the Kaukonahua Stream, but none of them are currently being used. The upper portion of the South Fork of the Kaukonahua Stream is classified as Class 1 water. This classification extends to the eastern boundary of SBER at the Koolau ridgeline. All other portions of the South Fork on SBER are classified as Class 2. Class 1 waters are considered pristine (i.e. wilderness state) and receive the highest level of protection. Class 2 waters are protected for recreational purposes, support and propagation of aquatic life, use in agriculture and industry, and navigation. To the North lies the North Fork of the Kaukonahua Stream. Anecdotal evidence and aerial photographs suggest there have been water quality problems at SBER (i.e. increased turbidity and suspended solids). The South Fork of the Kaukonahua Stream is considerably more turbid than the North Fork upon entry into the Wahiawa Reservoir. Probable sources of turbidity include denuded areas including bivouac sites, landing zones (LZ), DZs; roads and other concentrated flow sites; digging activity by feral hogs; and natural erosion from upper watershed areas. The Army is actively working to decrease erosion by revegetating areas, installing check dams, removing feral hogs, and by conducting road drainage improvements. There are no water bodies for this area listed on the 303(d) list for 2002.

3.6.2 Groundwater and Wells

Groundwater is water that is found underground in cracks and spaces in soil, sand and rocks. The area where water fills these spaces is called the saturated zone. The top of this zone is called the water table. Groundwater is stored in, and moves through, layers of soil, sand and rocks called aquifers. Aquifers typically consist of gravel, sand, sandstone, or fractured rock, like limestone. In areas where material above the aquifer is permeable, pollutants can sink into the groundwater. Groundwater can be polluted by landfills, septic tanks, leaky underground gas tanks, and from overuse of fertilizers and pesticides.

Injection wells, where pressurized liquid wastes or other fluids are injected into aquifers, are a major method of disposal for industrial and hazardous wastes. Injection wells are also used to help recover oil, gas, and minerals. The Underground Injection Control (UIC) Program of the HDoH Safe Drinking Water Branch oversees underground injection of fluid waste in order to prevent contamination of drinking water resources. These wells must be placed below drinking water aquifers.

Hickam AFB, Oahu

The groundwater resources beneath the island of Oahu are the result of the infiltration of precipitation through surface soils into permeable rock materials. Groundwater is the principal source of potable water on Oahu and occurs in two modes, either as high-level groundwater that is perched atop low-permeability strata or confined within a dike system, or as a freshwater basal aquifer.

The basal aquifer is the primary source of potable water on Oahu. The freshwater percolates down through the permeable basalt rocks of the mountains then floats as a lens on the heavier seawater. The basal aquifer in the Pearl Harbor area occurs in the lava flows of the Koolau volcanic series, at a depth of approximately 214 to 305 m (700 to 1,000 ft) below ground surface (bgs) in the vicinity of Hickam AFB. It is separated from the surface by a caprock of coastal plains deposits, which form a confining layer directly over the basalt. Hydraulic conductivity in this aquifer range from 77 to 464 m/day (252 to 1,520 ft/day). Groundwater at Hickam AFB occurs as a lens of brackish water floating on seawater. The brackish water surface is quite flat, being approximately .6 m (2 ft) above MSL at a distance of up to 3,050 m (10,000 ft) from the coast. Depth to groundwater in the vicinity of the Base ranges from 1.5 to 31 m (5 to 100 ft) bgs. Groundwater in the coral reef has a seaward gradient, ultimately seeping out into the coastal perimeter of Mamala Bay, Keehi Lagoon, Pearl Harbor Entrance Channel, and locally into drainage channels. The coral aquifer extends throughout Hickam AFB and the Honolulu International Airport region from, or just below the surface, to an average depth of about 61 m (200 ft). Its maximum elevation is 9 m (30 ft) MSL. Immediately below the coral reef, a relatively thick clay layer occurs under Hickam AFB and the coastal region.

Due to the high hydraulic conductivity of the coral deposits, the water table experiences significant tidal influence, generally the same magnitude as the ocean. This results in difficulties in determining groundwater flow direction from water level measurements in monitoring wells. Hydraulic conductivity of the shallow aquifer ranges from 6.1 cm/day (0.2 ft/day) in the shallow, alluvial soil to 183 m/day (600 ft/day) in a deeper coral formation.

Lightning DZ, Oahu

Three types of groundwater systems exist in central Oahu: 1) the Schofield High Level Water Body, 2) basal groundwater, and 3) dike-impounded groundwater. The Schofield High Level Water Body is located beneath the Schofield Plateau. This water body is bound to the east and west by dike-impounded groundwater, and to the north and south by basal groundwater. Lower permeability rocks (possibly volcanic dikes and/or buried ridges) structurally separate these groundwater systems from one another. The Schofield High Level Water Body has a relatively high transmissivity and hydraulic conductivity. The depth to groundwater at the site is approximately 185 m (600 ft) bgs and is approximately 82 m (270 ft) below MSL.

In the past, the Army's industrial activities at Schofield Barracks have resulted in volatile organic compounds (VOCs) entering groundwater. In 1985, the HDoH notified the Army that VOCs were present in groundwater

being utilized by Schofield Barracks. In 1986, the Army began removing the contaminants using an air stripping facility on four existing production wells. The HDoH has been monitoring groundwater since the contamination was discovered. The water in this region comes from the Wahiawa Hydrologic unit in the central physiographic province. The Lightning DZ is located upgradient of the areas with contamination. [Note: this information comes from the EPA Website for Hawaii and the Department of Land and Natural Resource Management, State of Hawaii, Commission on Water Resource Management's Website.]

3.7 AIR QUALITY

In accordance with the CAA requirements, air quality within a given region is evaluated by the concentration of various pollutants. Pollutant measurement is expressed in units of parts per million (ppm), or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Air quality in a region is a result, not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, size of the air basin, and the prevailing meteorological conditions.

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. The significance of a pollutant concentration in a region or geographical area is determined by comparison with federal and/or state ambient air quality standards. Under the authority of the CAA, the EPA has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS), represent the maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM) less than or equal to 10 microns in diameter (PM_{10}), sulfur dioxide (SO_2), and lead (Pb).

The EPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Former nonattainment areas that have recently achieved attainment of the NAAQS are designated as maintenance areas. Areas are designated as unclassifiable for a pollutant when there is insufficient ambient air quality data for the EPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

Under the CAA, state and local agencies may establish air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements. The Proposed Action would involve airspace over the State of Hawaii Air Quality Control Region (AQCR). The State of Hawaii AQCR consists of the territorial area encompassed by the outermost boundaries of the State of Hawaii (including the territorial area of all municipalities (as defined in section 302(f) of the CAA, 42 U.S.C. 1857h(f)). A summary of the EPA Office of Air Quality Planning and Standards (OAQPS) and state ambient air quality standards that apply to the area potentially affected by the Proposed Action are presented in Table 3.7-1.

Section 162 of the CAA further established the goal of prevention of significant deterioration (PSD) of air quality in national parks which exceeded 2,430 ha (6,000 ac); and national wilderness areas which exceeded 2,025 ha (5,000 ac) if these areas were in existence on August 7, 1977. These areas were defined as mandatory Class I areas, while all other attainment or unclassifiable areas were defined as Class II areas. Under CAA Section 164, states or tribal nations, in addition to the federal government, have authority to redesignate certain areas as (nonmandatory) PSD Class I areas, i.e., a National Park or national wilderness area established after August 7, 1977, which exceeds 4,050 ha (10,000 ac). Class I areas are areas where any appreciable deterioration of air quality is considered significant. Class II areas are those where moderate, well-controlled growth could be permitted. There is a third category, Class III, but to date no area has been so designated. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. The determination of the significance of an activity on visibility in a Class I area is typically associated with evaluation of stationary source contributions. Major emitting facilities are required to submit a preconstruction permit application to the State of Hawaii if emissions would potentially impact a PSD Class I area.

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with the each state's SIP for attainment of the NAAQS. Federal activities must not (a) cause or contribute to any new violation; (b) increase the frequency or severity of any existing violation; or (c) delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS. General conformity applies only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area exceed annual thresholds identified in the rule, a conformity determination is required of that action. The thresholds become more restrictive as the severity of the nonattainment status of the region increases.

Table 3.7- 1 State and Federal Ambient Air Quality Standards

Air Pollutant	State of Hawaii	Federal
Carbon Monoxide 1-hour 8-hour	10 mg/m ³ (9 ppm) 5 mg/m ³ (4.4 ppm)	40 mg/m ³ (35 ppm) 10 mg/m ³ (9 ppm)
Nitrogen Dioxide Annual	70 µg/m ³ (0.04 ppm)	100 µg/m ³ (0.05 ppm)
Sulfur Dioxide 3-hour 24-hour Annual	1300 µg/m ³ (0.5 ppm) 365 µg/m ³ (0.14 ppm) 80 µg/m ³ (0.03 ppm)	365 µg/m ³ (0.14 ppm) 80 µg/m ³ (0.03 ppm)
Ozone 1-hour 8-hour	157 µg/m ³ (0.08 ppm)	235 µg/m ³ (0.12 ppm) 157 µg/m ³ (0.08 ppm)
PM 10 24-hour Annual	150 µg/m ³ (0.06 ppm) 50 µg/m ³ (0.12 ppm)	150 µg/m ³ (0.06 ppm) 50 µg/m ³ (0.12 ppm)
Lead Calendar Qtr	1.5 µg/m ³	1.5 µg/m ³
Hydrogen Sulfide 1-hour	35 µg/m ³ (25 ppb)	
PM 2.5 24-hour Annual		65 µg/m ³ 15 µg/m ³

Source: Hawaii Administrative Rules, Chapter 59, Code of Federal Regulations, Title 40, Part 50

µg/m³ - Micorgrams per cubic meter

ppm - parts per million

ppb - parts per billion

Hickam AFB, Oahu

An Air Emissions Assessment Report was conducted at Hickam AFB and completed in March 1997 and the Air Emissions Inventory (AEI) was updated in December 2000. Hickam AFB operates under Covered Source Permit (CSP) Number 0209-01-C. The State of Hawaii CSP is analogous to the Federal level Title V permit. CSP 0209-01-C has been amended as required by the HAR. Table 3.7-2 details the 2002 summary emission results as reported the "Draft Air Emission Inventory for Permitted Point Sources at Hickam AFB, Hawaii" prepared by Air Force Institutive for Operational Health (AFIOH). A source in Hawaii is considered to be a "Covered Source" if it emits, or has the potential to emit, the following:

- 100 tons per year (tpy) of any of the following criteria pollutants: CO, NO_x, PM, PM₁₀, SO_x, or VOC
Note - for criteria pollutants, only nonfugitive emissions are considered for Major Source determination purposes
- 10 tpy of any single Hazardous Air Pollutants (HAP), or 25 tpy total HAPs.

In accordance with EPA Memorandum titled "Major Source Determining for Military Installations under the Air Toxics, New Source Review, and Title V Operating Permit Programs of the Clean Air Act," 2 August 1996, and concurrence with the State of Hawaii, AFIOH is currently analyzing the division of Hickam AFB area into three sources. The three sources for air emissions would be Hickam AFB, HIANG, and Non-military entities. The Air Force emission entity on Hickam AFB, as shown in Tables 3.7-3 and 3.7-4, can be classified as a "Minor Source," contingent on the revised inventory totals. The request for this segregation, based on initial data found in the 1999 Air Emission Inventory prepared by the Air Force Institute of Environmental, Safety and Occupational Health Risk Analysis (AFIERA) (currently known as AFIOH), is expected to be submitted to the State of Hawaii within the next 120 days and may be in place before the start of facility construction.

Table 3.7- 2 Summary of 2002 Air Pollutant Emissions from Hickam AFB Permitted Sources

Pollutant	Emissions By Source Type (lb/yr)						Total Emissions (lb/yr)
	Boilers	Internal Combustion Engines	Aircraft Engine Test Operations	Incinerators	Tank Truck Loading Racks	Organic Solvent Cleaning Units	
Criteria Pollutants							
CO	343.77	1,785.40	467.98	53.52			2,650.67
Pb	0.05						0.05
NO _x	1,320.15	46.33	700.78	16.05			2,083.31
PM (Total)	182.96	2.8476	56.08	37.46			279.3476
PM ₁₀	144.96	2.8476	56.08	25.15			229.0376
SO _x	493.65	2.3956	47.55	13.38			556.9756
VOC	33.62	86.332	321.11	16.05	2,686.40	1,709.00	4,852.512
Hazardous Air Pollutants							
Acetaldehyde			2.36				2.36
Acrolein			1.00				1.00
Benzene			1.13		16.77		17.90
Cumene					7.88		7.88
Ethylbenzene			0.10		6.75		6.67
Formaldehyde			8.79				8.79
Hexane (n-hexane)					1.71		1.71
Hydrogen Chloride				53.52			53.52
Lead	0.05						0.05
Methyl tert-butyl ether					14.64		14.64
MEK			0.30				0.30
Naphthalene			0.69		0.07		0.76
Styrene			0.05				0.05
Toluene			0.39		29.46		29.85
2,2,4-Trimethylpentane					2.47		2.47
Xylenes			0.95		45.12		46.07
Total HAPs	0.05	0.00	15.76	53.52	124.69	0.00	194.02

a No emissions of Hydrogen Sulfide were found from the covered sources (i.e. there were no applicable EPA emissions factors for hydrogen sulfide).
 b Lead is regulated as both a criteria pollutant and as a hazardous pollutant.

Table 3.7- 3 Summary of Hickam AFB's 2002 Air Pollutant Emissions Subject to Permit Fees

Pollutants	Emissions By Source Type (tons/yr)						
	Boilers	Internal Combustion Engines	Aircraft Engine Test Operations	Incinerators	Tank Truck Loading Racks	Organic Solvent Cleaning Units	Total Emissions(tons/yr)
Criteria Pollutants							
NO _x	0.6601	0.0232	0.3504	0.0080			1.0417
PM (Total)	0.0915	0.0014	0.0280	0.0187			0.1397
SO _x	0.2468	0.0012	0.0238	0.0067			0.2785
VOC	0.0168	0.0432	0.1606	0.0080	1.3432	0.8545	2.4263

a For permit fee purposes, CO and HAPs (air toxics) are not included because they are currently specifically exempt under HAR 11-60.1, Subchapter 6. PM₁₀ is not included because it is a subset of PM. Although lead is also considered a criteria pollutant, it is not included because of the insignificant quantity emitted from the covered sources in 2001 (0.05lb).

From Air Force Sources at Hickam AFB

Table 3.7- 4 Summary of Actual 1999 Criteria Pollutant Emissions, Hickam AFB

Source Type	CO	NO _x	PM	PM ₁₀	SO _x	VOC
Total Emissions (lb/yr)	3,289	4,805	6,086	6,051	500	13,835
Total Emissions (tons/yr)	1.64	2.40	3.04	3.03	0.25	6.92
Non-Fugitive Emissions (lb/yr)	3,289	4,805	4,410	4,375	500	6,023
Non-Fugitive Emissions (tons/yr)	1.64	2.40	2.20	2.19	0.25	3.01

From Air National Guard Sources at Hickam AFB 1999

Source Type	CO	NO _x	PM	PM ₁₀	SO _x	VOC
Total Emissions (lb/yr)	25,964	40,727	3,308	3,308	2,647	8,273
Total Emissions (tons/yr)	12.98	20.36	1.65	1.65	1.32	4.14
Non-Fugitive Emissions (lb/yr)	25,964	40,727	3,205	3,205	2,647	6,177
Non-Fugitive Emissions (tons/yr)	12.98	20.36	1.60	1.60	1.32	3.09

From Non-military Services Sources at Hickam AFB 1999

Source Type	CO	NO _x	PM	PM ₁₀	SO _x	VOC
Total Emissions (lb/yr)	348	2,170	2,403	2,386	282	61,792
Total Emissions (tons/yr)	0.17	1.09	1.20	1.19	0.14	30.90
Non-Fugitive Emissions (lb/yr)	348	2,170	2,402	2,385	282	60,651
Non-Fugitive Emissions (tons/yr)	0.17	1.09	1.20	1.19	0.14	30.33

From All Sources at Hickam AFB

Source Type	CO	NO _x	PM	PM ₁₀	SO _x	VOC
Total Emissions (lb/yr)	29,601	47,702	11,797	11,745	3,429	83,900
Total Emissions (tons/yr)	14.79	23.85	5.89	5.87	1.71	41.96
Non-Fugitive Emissions (lb/yr)	29,601	47,702	10,017	9,965	3,429	72,851
Non-Fugitive Emissions (tons/yr)	14.79	23.85	5	4.98	1.71	36.43

Lightning DZ, Oahu

As stated above, the Hawaii is in attainment with the National Ambient Air Quality Standards established for carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), ozone (O₃) and lead. Air quality at SBER and SBMR should be similar because they are in close proximity to one another (central Oahu). However, the air quality at SBMR is affected temporarily by emissions from transportation and explosives used during troop and vehicular movement and by using helicopter simulators, pyrotechnics and ammunition. Since most of these types of activities are not conducted at SBER, emissions are confined to those resulting from dropping supplies and personnel as well as emissions from occasional vehicular traffic.

3.8 AIRSPACE MANAGEMENT

The USAF describes airspace management as the coordination, integration, and regulation of the use of airspace of defined dimensions. The objective of airspace management is to meet military training requirements through the safe and efficient use of available navigable airspace. This is to be accomplished in a peacetime environment, while minimizing the impact on other aviation users and the public (AFI 13-201).

There are two categories of airspace, or airspace areas; regulatory and non-regulatory. Within these two categories, further classifications include controlled, uncontrolled, special use, and airspace for special use. The categories and types of airspace are dictated by:

- the complexity or density of aircraft movement
- the nature of the operations conducted within the airspace
- the level of safety required
- national and public interest in the airspace

Controlled Airspace.

Controlled airspace is a generic term that encompasses the different classifications (Class A, B, C, D, and E) of airspace and defines dimensions within which air traffic control service is provided to flight under instrument meteorological conditions (IMC), and to flights under visual meteorological conditions (VMC). All military and civilian aircraft are subject to Federal Aviation Regulations (FARs).

Class A Airspace

This includes all operating altitudes of 5,490 m (18,000 ft) MSL and above. Class A airspace is most frequently utilized by commercial aircraft using altitudes between 5,490 to 13,725 m (18,000 to 45,000 ft) MSL.

Class B Airspace

Typically, this airspace comprises contiguous cylinders of airspace, stacked one upon another and extending from the surface up to 3,050 m (10,000 ft) agl. To operate in Class B airspace, pilots must contact appropriate controlling agencies and receive clearance to enter the airspace. Additionally, aircraft operating within Class B airspace must be equipped with specialized electronics that allow air traffic controllers to accurately track aircraft speed, altitude, and position. Class B airspace is typically associated with major airport complexes such as JFK International Airport, New York, and Baltimore-Washington International Airport, Maryland.

Class C Airspace

Class C airspace can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude. Class C airspace is designed and implemented to provide additional air traffic control into and out of primary airports where aircraft operations are periodically at high density levels such as Atlantic City International Airport, New Jersey. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local Air Traffic Control (ATC) facilities.

Class D Airspace

Class D Airspace encompasses a five-statute-mile radius of an operating ATC-controlled airport. It extends from the ground to 763 m (2,500 ft) agl or higher. All aircraft operating within Class D airspace must be in two-way communication with the ATC facility.

Class E Airspace

This can be described as general controlled airspace. It includes designated Federal airways consisting of the high altitude (J or "Jet" Route) system and low altitude (V or "Victor" Route) system. Federal airways have a width of four statute miles on either side of the airway centerline and can be structured between the altitudes of 214 m (700 ft) agl and 5,490 m (18,000 ft) MSL.

These airways frequently intersect approach and departure paths from both military and civilian airfields. Class E airspace may range from ground level at nontowered airfields up to 5,490 m (18,000 ft) MSL. The majority of Class E airspace is where more stringent airspace control has not been established.

Uncontrolled Airspace.

Uncontrolled airspace (Class G) is not subject to restrictions that apply to controlled airspace. Limits of uncontrolled airspace typically extend from the surface to 214 m (700 ft) agl in urban areas, and from the surface to 366 m (1,200 ft) agl in rural areas. Uncontrolled airspace can extend above these altitudes to as high as 4,423 m (14,500 ft) MSL if no other types of controlled airspace have been assigned. ATC does not have authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating under VMC.

Special Use Airspace.

Special Use Airspace consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. With the exception of Controlled Firing Areas (CFAs), special use airspace is depicted on aeronautical charts. Chart depictions include hours of operation, altitudes, and the agency controlling the airspace. All special use airspace descriptions are contained in FAA Order 7400.8.

Examples of special use airspace in the local flying area of Hickam AFB are restricted areas (R-5001), military operations areas (MOA) (Drum MOA), prohibited areas (P-56), and warning areas (W-107).

Airspace for Special Use.

Airspace for Special Use refers to areas used by military aircraft, but do not put restrictions on nonparticipating aircraft. They are designated as such for informational purposes for general aviation. Examples of airspace for special use are Military Training Routes (MTRs), Slow Routes (SRs), and air-to-air refueling tracks.

MTRs are flight paths that provide a corridor for low-altitude navigation and training. Low altitude navigation training is important because aircrews may be required to fly at low altitudes for tens or hundreds of miles to avoid detection in combat conditions. To train realistically and safely, the military and the FAA have developed MTRs. This allows the military to train for low-altitude navigation at airspeeds in excess of 250 knots indicated airspeed (KIAS) (approximately 459 km/hr or 285 miles per hour [mph]). Warning and restricted airspace within the Hawaiian Island Chain can be identified in the Figure 3.8-1 that follows.

Hickam AFB, Oahu

During 2002, approximately 8,500 military aviation operations were conducted from Hickam AFB. These include transient aircraft as well as aircraft based at Hickam and operated by the 15 AW, 735 Air Mobility Squadron, and the HIANG. Hickam AFB utilizes the same runways at HIA but contributes significantly less to the overall traffic of the facility.

Lightning DZ, Oahu

The Lightning DZ is located in a high air traffic density area in central Oahu. The characteristics and precautions to be taken in this airspace have been published in the Department of Defense *Supplement Pacific, Australasia, and Antarctica Flight Information Publication*, the *Midair Collision Avoidance Plan* for Hickam AFB, and in other locally-published standard operating procedures such as the *Hawaii Tactical Airdrop/Airland TDY Aircrew Mission Planning Guide*. In addition to midair collision concerns, the nearby residential communities of Waialua, Haleiwa, and Wahiawa have been identified as noise-sensitive areas.

Local aircraft traffic includes gliders, recreational parachute jumping, and numerous sight-seeing flights. Communications with the Dillingham airfield, located west of the Lightning DZ approach route, is required. To ensure minimization of noise disturbances from aircraft using the Lightning DZ approach, the minimum flying altitude at the North Shore coastline (near Wialua/Haleiwa on Oahu) is 2,000 feet above MSL. It is recommended that aircraft entering the Lightning DZ approach pattern obtain radio contact while offshore and at 3,000 feet msl to ensure clear transmission signal reception. Aircraft approaching the Lightning DZ should align with the Wheeler AAF Runway 06. After the airdrop, aircraft maintain the DZ track for 0.5 nautical miles past the residential area of Wahiawa than turn left on a heading of 310° and climb to an altitude of 5,500 feet MSL. Radio contact with Honolulu Approach is required for returning to HIA and Hickam AFB.

3.9 NOISE

This section is a general discussion of the noise metrics associated with the proposed actions and alternatives. More detailed information regarding the characteristics of noise and noise analysis methods can be found in Appendix B.

Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive. It may be stationary or transient. Stationary sources are normally related to specific land uses, e.g., housing tracts or industrial plants. Transient noise sources move through the environment, either along established paths or randomly. There is wide diversity in responses to noise that not only vary according to the type of noise and the characteristics of the sound source, but also according to the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source (e.g., an aircraft) and the receptor (e.g., a person or animal).

Noise represents one of the most prominent environmental issues associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is readily identifiable. An assessment of aircraft noise requires a general understanding of how sound is measured and how it affects people and the natural environment. Appendix B provides a detailed discussion of noise and its effects on people and the environment.

Different sounds have different frequency content. When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to deemphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Table 3.9-1 depicts the typical A-weighted sound pressure levels for various sources.

DoD uses the Air Installation Compatible Use Zones (AICUZ) program to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting the public health, safety and quality of life. AICUZ reports describe three basic types of land use and facility constraints that affect, or result from, flight operations.

The first constraint involves areas in which the FAA and DoD have identified for height limitations. Air Force height obstruction criteria are based on those contained in Federal Aviation Regulation (FAR) Part 77. The second constraint involves noise contours (zones) based on the decibel (dB) metric and DoD and FAA noise models. The third constraint involves Clear Zones and Accident Potential Zones based on statistical analyses of past aircraft accidents.

The noise environment around a military or civil airfield normally is described in terms of the time-average sound level generated by the aircraft operating at that facility. These operations consist of the flight activities conducted during an average day at airfields where operations generally adhere to a fixed schedule (most commercial airports) or during a typical "busy day" at airfields where operations vary from day to day or between weekdays and weekends (most military airfields). Operations generally include fixed- and rotary-wing arrivals and departures at the airfield, flight patterns in the general vicinity of the airfield, and aircraft engine "run-ups" associated with engine preflight and maintenance checks.



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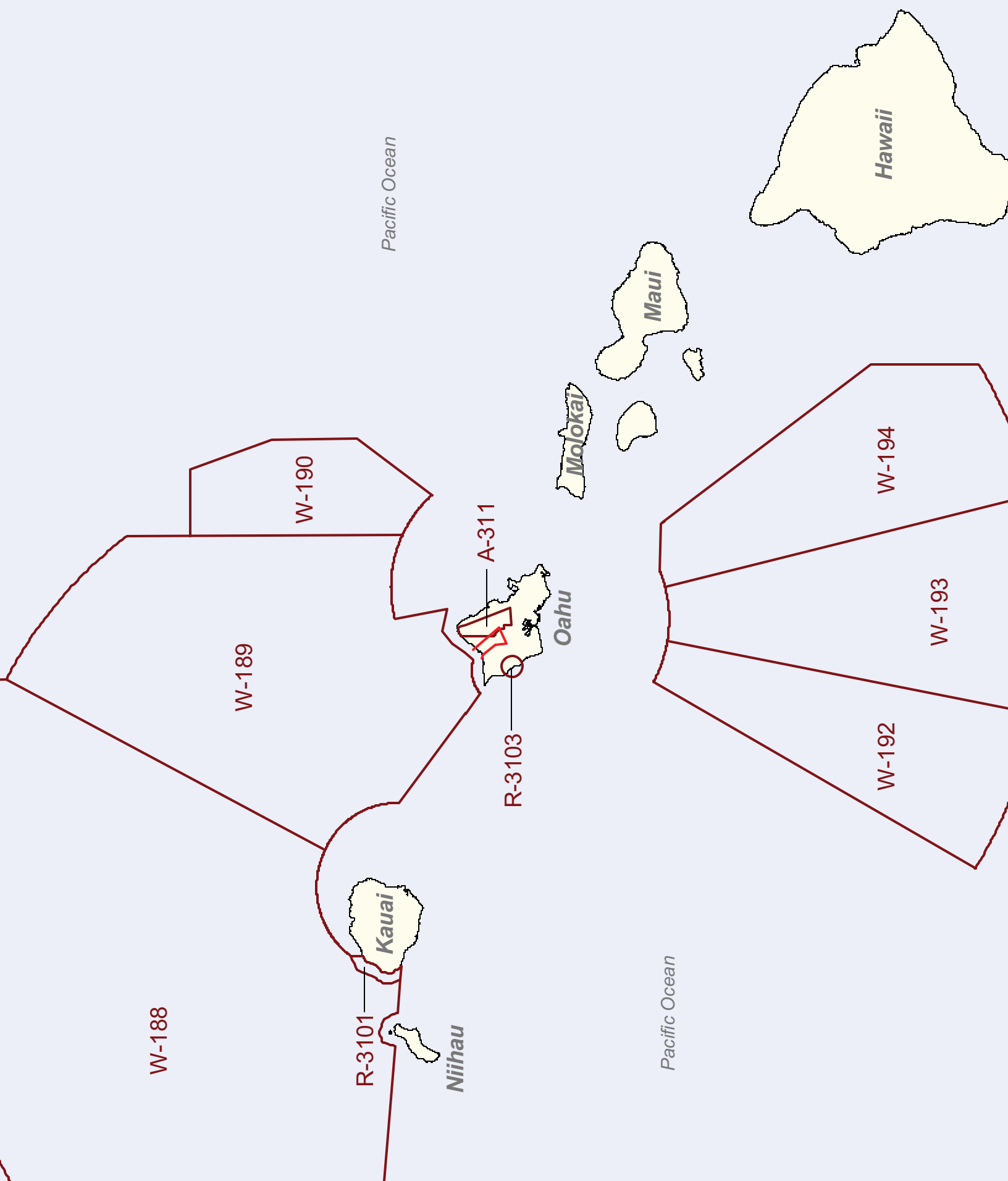


Table 3.9- 1 Typical Decibel Levels

Encountered in Daily Life and Industry	dBs
Rustling leaves	20
Room in a quiet dwelling at midnight	32
Soft whispers at 5 feet	34
Men's clothing department of large store	53
Window air conditioner	55
Conversational speech	60
Households department of large store	62
Busy restaurant	65
Evaporative swamp cooler	65
Typing pool (9 typewriters in use)	65
Vacuum cleaner in private residence (9 feet)	69
Ringling alarm clock (at 2 feet)	80
Loudly reproduced orchestral music in large room	82
Beginning of hearing damage if prolonged exposure of 85 dB(A)	
Printing press plant	86
Heavy city traffic	92
Heavy diesel-propelled vehicle (about 25 feet away)	92
Air grinder	95
Cut-off saw	97
Home lawn mower	98
Turbine condenser	98
150 cubic foot air compressor	100
Banging of steel plate	104
Air hammer	107
Jet airliner [500 ft (153 m) overhead]	115
F-15 aircraft [500 ft (153 m) overhead, afterburner power]	123

When distances are not specified, sound levels are the values at the typical location of the machine operators.
 Source: Newman and Beattie, 1985

Individual, single noise events are described in terms of the Sound Exposure Level (SEL), in units of decibels. SEL takes into account the amplitude of a sound and the length of time during which each event occurs. It provides a direct comparison of the relative intrusiveness among single noise events of different intensities and duration. Appendix B provides a more complete discussion of SEL.

The federal noise measure used for assessing aircraft noise exposures in communities in the vicinity of airfields/airports is the Day-Night Average Sound Level (Ldn), in units of the dB. Ldn is an average sound level generated by all aviation-related operations during an average or busy 24-hour period, with sound levels of nighttime noise events emphasized by adding a 10-dB weighting. Nighttime is defined as the period from 10 PM to 7 AM the following morning. The 10-dB weighting accounts for the generally lower background sound levels and greater community sensitivity to noise during nighttime hours. Ldn has been found to provide the best measure of long-term community reaction to transportation noises, especially aircraft noise.

The metrics used to describe the noise associated with airbase operations differ from that used for special-use airspace operations. Because military aircraft have a requirement for combat training over land and water at low altitudes and high speeds, the FAA has approved the establishment of Special Use Airspace areas, which allow aircraft to operate at speeds in excess of 250 knots at altitudes below 3,050 m (10,000 ft) MSL. Military aircraft require the use of a modified noise metric to appropriately account for the "surprise"

effect that occurs under these conditions. The SEL (and the Ldn metric) is adjusted to account for this effect of the onset-rate of aircraft noise on humans. Onset-rate adjusted SEL is denoted SEL_r. The adjusted LDN is designated as Onset-Rate Adjusted Day-Night Average Sound Level (Ldn_r).

Another characteristic of military aircraft is that they operate in a sporadic fashion in designated low-altitude airspace. Sporadic occurrences may vary, from as frequently as tens of times per day in a range to less than a couple of times per year in a temporary MTR designed for exercises. Because of the sporadic occurrences of aircraft, the number of average daily operations is determined from the number of flying days in the calendar month with the highest number of operations in the affected airspace. This metric is designated Onset-Rate Adjusted Monthly Day-Night Average Sound Level (Ldn_{mr}). SEL, Ldn, and Ldn_{mr} employ A-weighted sound levels. As stated previously, "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the average frequency range perceived by the human ear.

Aircraft Activity

The form of noise exposure analyzed in this section at Hickam AFB is the noise exposure caused as the result of aviation activities. The following terms are defined to provide a better understanding of how data is developed for input into the NOISEMAP aircraft noise modeling software.

Aircraft Operations

Takeoffs, landings, or closed patterns (which could include activities such as touch-and-gos or low approaches). Each takeoff or landing constitutes one operation.

Closed Pattern

When the pilot of the aircraft approaches the runway as though planning to land, but then applies power to the aircraft and continues to fly as though taking off again, this is referred to as a closed pattern. The pilot then flies a circular or rectangular track around the airfield, and again approaches for landing. Since a closed pattern consists of a landing and a takeoff, it is considered two operations. Due to the large amount of traffic at Hickam AFB and HIA, there are relatively few closed patterns conducted at this location.

Sortie

A sortie consists of a takeoff, performance of a mission, and a landing. During mission performance, the aircraft may fly in several elements of airspace. For noise analysis, each training event in each specific element of airspace is considered a sortie in that airspace.

Sortie Operation

A sortie operation in the airspace is a flight operation conducted in the airspace that did not originate from the airfield.

Hickam AFB, Oahu

In order to create a hypothetical noise contour for Hickam AFB, flight operations from 1997 were modified to include the current level of operations. Once information regarding flight tracks, power settings, runways, meteorological conditions, and usage were collected, the Air Force's NOISEMAP program was used to generate grids of noise exposure. This is the information used to develop hypothetical noise contours and calculate areas adversely impacted by aircraft noise. Average daily aircraft operations for Hickam AFB are summarized in Table 3.9-2.

Table 3.9-2 Average Daily Operations Hickam AFB-2002

Aircraft Type	Operations	Aircraft Type	Operations
2S3	0.14	DC-8	1.43
AV-8	0.26	E-6	0.17
B-1	0.23	F-111	0.49
B-2	0.16	F-14	0.28
B-52	0.15	F-15	0.71
B-747	0.63	F-16	0.45
B-767	0.46	F-18	0.72
C-12	0.55	GULFSTREAM 4	0.91
C-130	3.51	GULFSTREAM 5	0.72
C-141	2.43	H-1 HELICOPTER	0.25
C-17	1.79	H-46 HELICOPTER	0.23
C-20	0.79	H-53 HELICOPTER	0.22
C-40	0.16	H-60 HELICOPTER	0.37
C-5	2.15	KC-10	0.89
C-9	0.36	KC-135	3.78

Current operations at Hickam AFB have a slight adverse impact on Sand Island which is entirely within the 55 Ldn contour and portions of which are within the 65 Ldn contour. Sand Island State Park is the only portion of the island that is not currently being used by the Coast Guard which is adversely affected by the noise from Hickam AFB. The western edge of noise impacts from Hickam AFB contains a large portion of Ewa Beach. However, Ewa Beach is not within a 65 Ldn contour. Figure 3.9-1 illustrates the approximate noise contours created by Hickam military operations and Table 3.9-3 summarizes the areas of land outside of Hickam AFB that are impacted by the aircraft noise generated by military aircraft operations.

Table 3.9-3 Land Area Exposed to Indicated Sound Levels (Hickam AFB Military Operations-2002)

Sound Level (In L _{dn})	Acres of Land
55 - 60	858
60 - 65	249
65 - 70	33
> 70	0

These statistics are based solely upon the military operations and completely disregard the background ambient noise of the area created by HIA.

Noise created by aircraft at Hickam AFB contributes to the total noise generated by aircraft operations at HIA. HIA conducts in excess of 350,000 aircraft operations per year. Military operations originating from Hickam AFB amount to less than 5 percent of the total air traffic from the Hickam AFB/HIA complex. On an average day, HIA conducts 983 nonmilitary operations, in accordance with Table 3.9-4, and is one of the 30 most active airports in the United States.

Table 3.9 4 Average Daily Operations Honolulu International Airport

TYPE	Total Operations
727	1.24
737	171.24
747	96.01
757	0.04
CNA441	218.84
CONCRD	0.04
DC10	63.53
DC8	16.60
DC9	118.42
DHC6	62.21
DHC7	85.91
L1011	18.86
MD81	37.00
BEC58P	60.74
CL600	0.35
COMSEP	26.23
LEAR25	6.19

Due to the extremely large amount of nonmilitary aircraft operations conducted at HIA relative to military operations, civilian and commercial operations dominate the noise contours created by HIA and Hickam AFB. The noise impact of HIA is in the range of 5 to 15 dBA higher than standard outdoor ambient conditions throughout the entire affected area. Table 3.9-5 details the area contained within various noise contours caused by civilian and commercial traffic from HIA.

Table 3.9-5 Land Area Exposed to Indicated Sound Levels (Honolulu International Airport)

Sound Level (In L_{dn})	Acres of Land
55 – 60	2,593
60 – 65	1,236
65 – 70	221
70 – 75	85
> 75	0

As noted in the above Table and noise contours on the next page, areas adversely impacted by HIA are much larger than the areas affected by operations originating from Hickam AFB. Comparisons of the logarithmically scaled units used to measure noise indicate that the current noise impacts of Hickam AFB on areas within the modeled noise contours are relatively minimal. Figure 3.9-2 illustrates noise at HIA from commercial and general aviation aircraft.

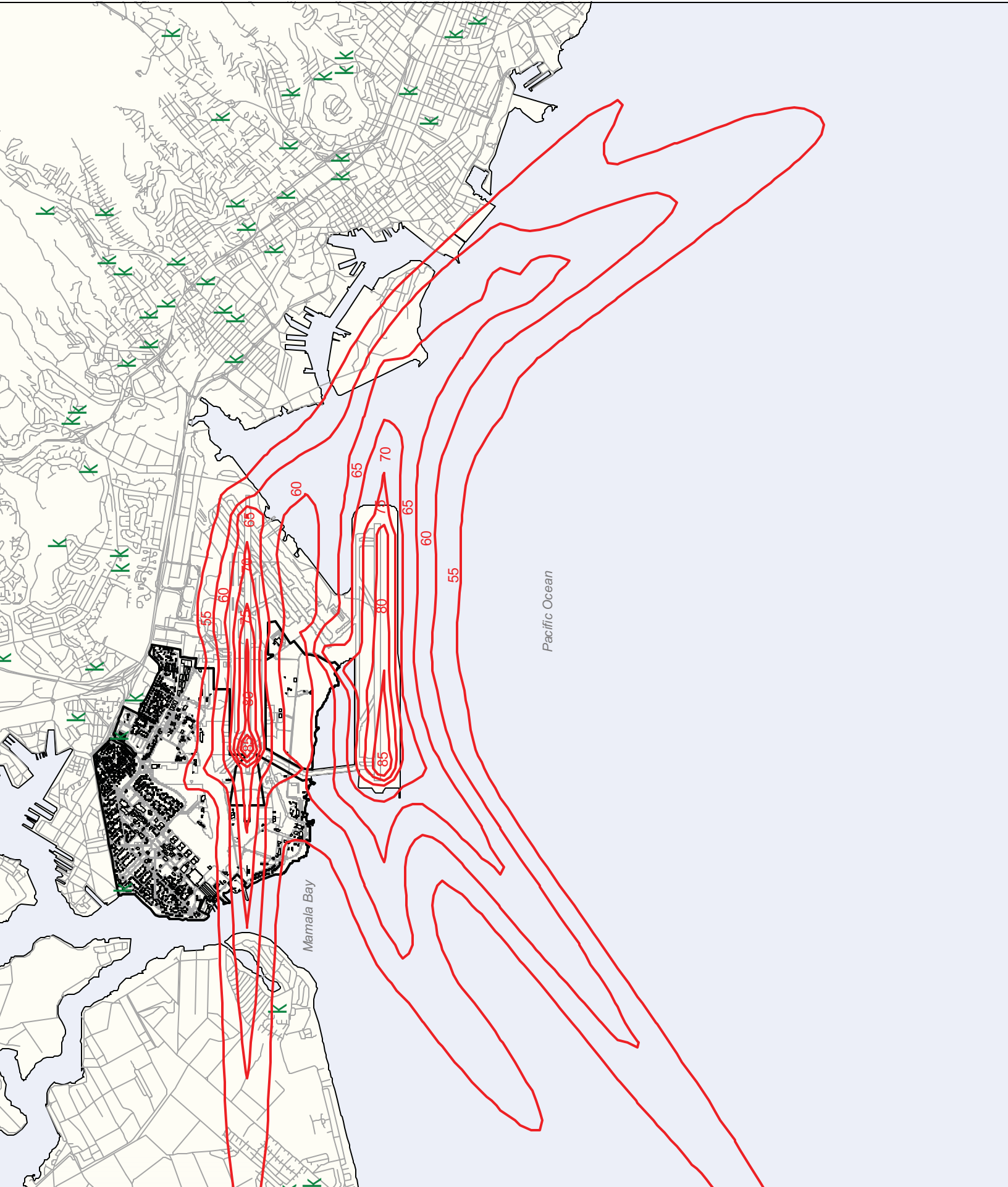


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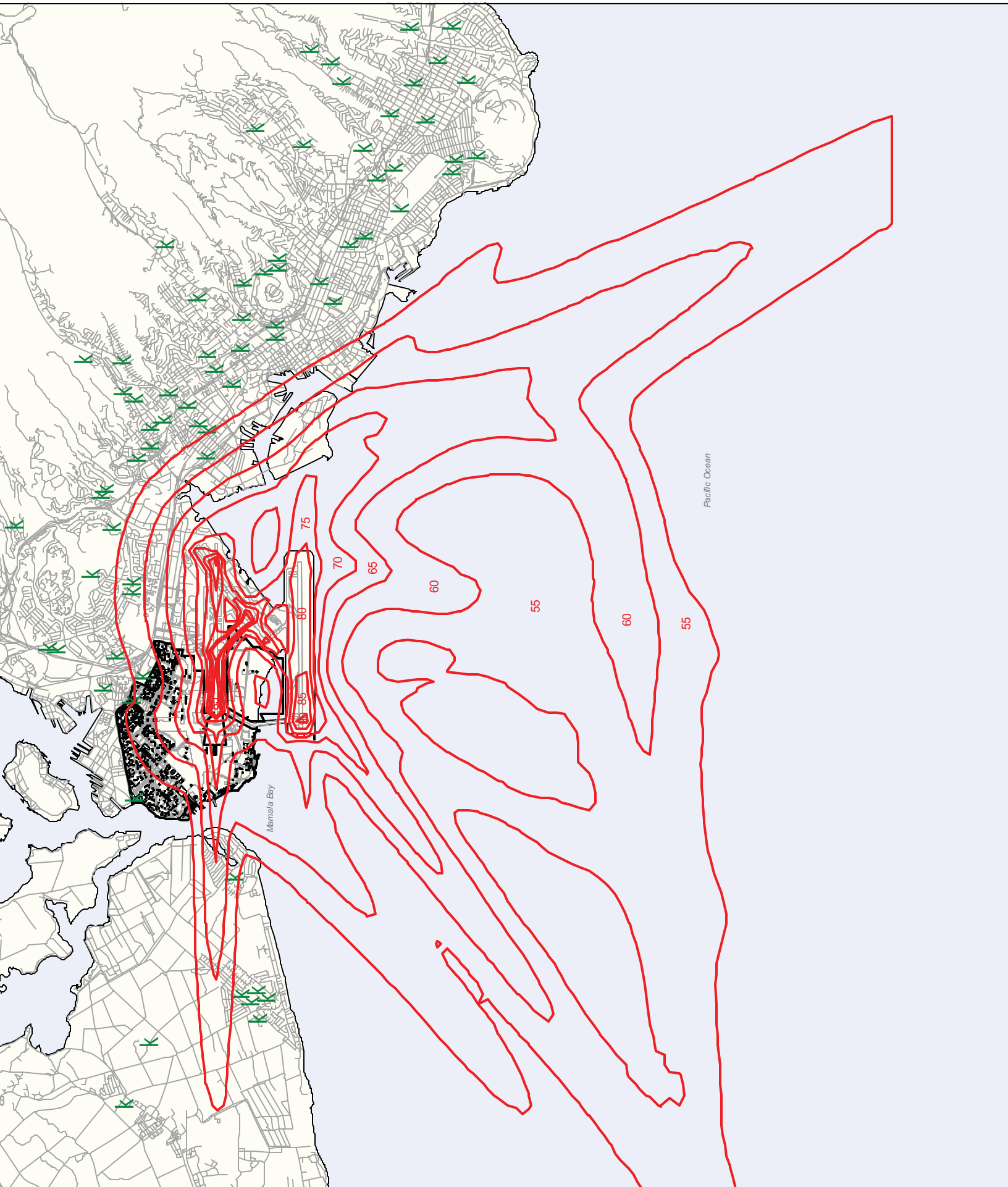




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Lightning DZ, Oahu

The current Ldn noise levels of the Lightning DZ are below 65 dBA. The Lightning DZ is approached through airspace controlled by Wheeler Army Airfield. The DoD Flight Information Publication (FLIP) Supplement: Pacific, Australasia, and Antarctica contains remarks regarding noise abatement and identifies this airspace as an "extremely noise sensitive area" and to "avoid overflight of communities near Wheeler AFB". The route for Lightning DZ operations is within 1,000 m (3,280 ft) of the Wahiawa community and the Iliani School.

Noise in SBER and SBMR should be similar because of their close proximity to one another. Noise at SBMR, associated with artillery from firing ranges and aircraft from Wheeler AAF, produced noise levels in Zone II that encroached greater than 1,000 m (3,280 ft) into housing, schools and other facilities not compatible with the Zone II noise environment (United States Army Environmental Hygiene Agency, 1988).

The locally published, low-level route used for the Lightning DZ takes off from Hickam AFB, flies around the western edge of Oahu, makes a straight line for the drop zone, turns left, drops the cargo, turns left again, and returns to Hickam AFB through the same route. The route makes a loop around Wahiawa when entering and exiting the drop zone. This route to the Lightning DZ is flown at an altitude of 300 feet and speed of 150 knots Total Lightning DZ operations are presented in Table 3.9-6.

Table 3.9 6 Lightning DZ Operations March 2002 to February 2003

Month - Year	Lightning DZ
March – 02	38
April – 02	55
May – 02	32
June – 02	11
July – 02	16
August – 02	30
September – 02	19
October – 02	34
November – 02	16
December – 02	19
January – 03	49
February – 03	33
Total	352

As noted in the above Table, there were 352 operations conducted at Lightning DZ for the twelve-month period starting in March of 2002 and ending in February of 2003. 352 operations a year is an average of 29.33 operations per month. The impact these operations have on noise is minimal and doesn't exceed 40 Ldn over any portion of the route. Figure 3.9-3 illustrates the noise contours created by the current military aircraft operations along the flight path at Lightning DZ.

3.10 SAFETY

Safety issues are concerned with freedom from dangers, hazards, and risks of injury.

3.10.1 Flight Safety

The primary public concern with regard to flight safety is the potential for aircraft accidents and accidental drops over non-military areas. Such mishaps may occur as a result of mid-air collisions, collisions with man-made structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird-aircraft strikes.

The USAF defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of \$1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than \$200,000, but less than \$1 million, or result in permanent partial disability, but do not result in fatalities. Class C mishaps involve costs of more than \$10,000, but less than \$200,000, or a loss of worker productivity of more than eight hours. HAP represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and HAP, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public.

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. The probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. Several factors are relevant: the ROI and immediate surrounding areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleum, oils, and lubricants (POL) not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils will determine how rapidly contaminants are absorbed. The specific geologic structure in the region will determine the extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area will also affect the extent of contamination to those resources.

Based on historical data on mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. It should be noted that these mishap rates do not consider combat losses due to enemy action. In the case of training operations in areas of airspace, an estimated average sortie duration may be used to estimate annual flight hours in the airspace. For MTRs, the length of the route and the average flight speed of the aircraft using the route may be used to determine the amount of flight time each specific type aircraft will spend on the route each year. Then, the Class A mishap rate per 100,000 flying hours can be used to compute a statistical projection of anticipated time between Class A mishaps in each applicable element of airspace. In evaluating this information, it should be emphasized that those data presented are only statistically predictive. The actual causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

Hickam AFB, Oahu

Statistics indicate that up to 90 percent of aircraft accidents occur within 3,050 m (10,000 ft) of runway thresholds. Therefore, these areas are required to be clear of occupied structures and other land uses associated with high traffic density. These specially designated areas are known as accident potential zones (APZ) and include the clear zone, APZ I, and APZ II. A review of aircraft accidents and incidents reported to the National Transportation Safety Board (NTSB) since 1962 documents a total of 647 reported accidents and incidents for the entire state of Hawaii. The total reported accidents and incidents for the Honolulu vicinity (around the Hickam AFB area) is 167. Of these, 23 involved fatalities, 61 involved commercial aircraft, and 106 involved privately owned or other general aviation aircraft. One US Air Force aircraft was involved in a nonfatal accident in the Honolulu area in 1968.

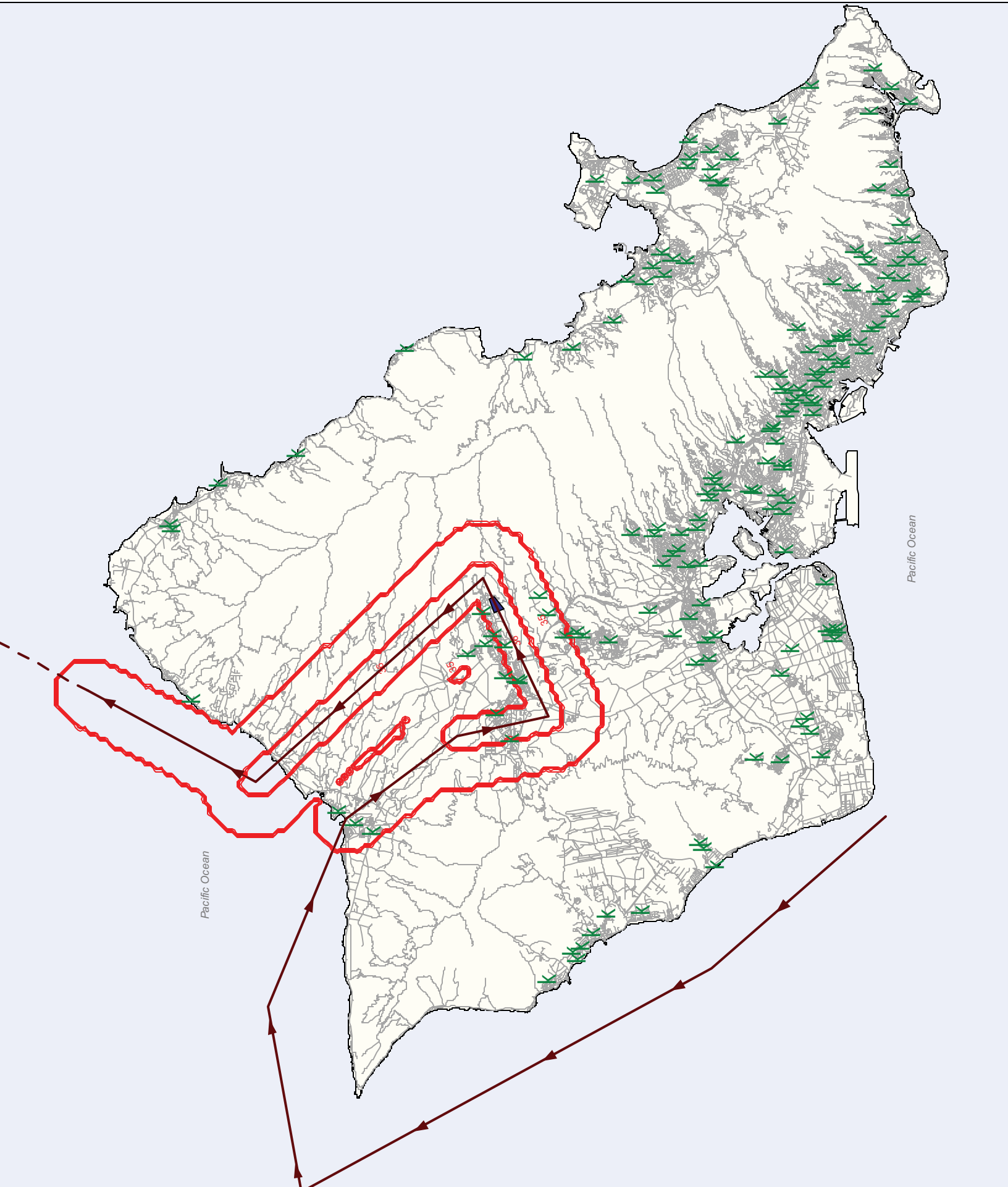


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Lightning DZ, Oahu

The Lightning DZ is located in a high air traffic density area in central Oahu. In addition to midair collision concerns, the nearby residential communities of Waialua, Haleiwa, and Wahiawa have been identified as noise-sensitive areas. Local aircraft traffic includes gliders, recreational parachute jumping, and numerous sight-seeing flights. Communications with the Dillingham airfield, located west of the Lightning DZ approach route, is required. It is recommended that aircraft entering the Lightning DZ approach pattern obtain radio contact while offshore and at 3,000 feet MSL to ensure clear transmission signal reception. For safety, aircraft should leave airdrop doors closed until well onshore and past Waialua. All exterior lights on the aircraft should be illuminated for maximum visibility. The Schofield Barracks Military Reservation, West Range on the slopes of the Waianae Range is within military restricted airspace designated R-3109 and R-3110 on the western side of the Lightning DZ approach pattern, and is regarded as "hot" for live weapons fire at all times. In addition to live fire, severe wind turbulence occurs near the mountainous areas of Hawaii. Aircraft approaching the Lightning DZ should align with the Wheeler AAF Runway 06. After the airdrop, aircraft maintain the DZ track for 0.5 nautical miles past the residential area of Wahiawa than turn left on a heading of 310° and climb to an altitude of 5,500 feet msl. Radio contact with Honolulu Approach is required for returning to HIA and Hickam AFB.

The total accidents and incidents reported to the NTSB for the Central Oahu area (Lightning DZ flight path) is 26. Of these, 4 involved fatalities, 25 involved general aviation aircraft, and 1 involved a commercial aircraft. No military aircraft were reported.

3.10.2 Ground Safety

Hickam AFB, OAHU

Ground, explosive, and flight safety associated with operations conducted by the 15 AW and its associate unit, the HIANG, located at Hickam AFB include activities at the airport itself, as well as training conducted in other areas of training airspace and shortfield runway. Ground safety considers issues associated with operations and maintenance activities that support these operations, including fire and crash response. Explosive safety discusses the management and use of ordnance or munitions associated with airbase operations and training activities conducted in various elements of training airspace. Flight safety considers aircraft flight risks such as aircraft accidents, and bird-aircraft strikes (see Section 3.10.3).

Ground Safety

Day-to-day operations and maintenance activities conducted by the 15 AW are performed in accordance with applicable USAF safety regulations, published USAF Technical Orders, and standards prescribed by Air Force Occupational Health and Safety (AFOSH) requirements.

The 15 AW military fire department provides fire and crash response at HIA. The unit has a sufficient number of trained and qualified personnel, and possesses all equipment necessary to respond to aircraft accidents.

All but a few base facilities that require automatic fire suppression capability are so equipped. Two facilities are currently awaiting funds for the installation of a fire suppression system. Crash responders are located on the Hickam ramp at the flightline.

Explosives Safety

The term "Quantity-Distance" (Q-D) refers to protection requirements from potential explosive sites (PES) to different kinds of exposed sites (ES). The Q-D standards were developed over many years and are based on explosives mishaps and tests. When an appropriate degree of protection can be provided either by hardening (strengthen with concrete and reinforced steel) an ES, or construction of a PES, to suppress explosion effects, these factors may be taken into account and the distance required by the standard Q-D tables may be reduced. Construction designs are submitted along with rationale or test results with the explosives site plan. The Inhabited Building Distance (IBD) is the minimum distance required to protect

non-explosives related facilities and personnel. At this distance some damage may still be expected in the event of a maximum explosion event (i.e. standard glass windows will shatter and non-strengthened buildings will receive 5 percent damage). The IBD separation is also applied to the Base boundary. If a proposed PES would create an IBD clear zone extending beyond the base boundary, the hazard becomes a legal issue and the installation must obtain a restrictive easement from the landowner for the off-base land encumbered by the clear zone prior to establishing or constructing the PES. The only exception is if the area (land or water) is open and both manifestly unsuitable for habitation and for public gatherings. Only appropriate local government agencies for public safety, environment, and health, can declare land outside the base boundary unsuitable for habitation or public gatherings. Documentation determining this land unsuitable for habitation must be maintained with real property records. Other features and factors that are used in establishing safety zones include:

- Existing restrictive easements, buildings and operations involving people not related to munitions or explosives work;
- Main power houses providing vital utilities to a major part of the installation;
- Essential warehouses, shops and other facilities that must not be placed at risk because of their vital nature in supporting the mission;
- Functions that would cause an immediate secondary hazard because of their failure to operate;
- Joint DoD/non-DoD use runways;
- Electrical transmission lines carrying 69kv or more, and the tower or poles supporting them, if the line in question is part of a grid system serving a large off-base area (this distance is based on blast overpressure only, fragment distances will not be used);
- Existing explosive ordnance demolition (EOD) facilities (offices, classrooms, shops) if they support multiple locations or organizations; high density public traffic routes (routes are considered "high density" if they have 10,000 or more car and/or rail passengers per day, or 2,000 or more ship passengers per day);
- Ground control approach (GCA), radar approach control (RAPCON), and air traffic control towers that support a joint use airfield (from all PESs);
- Flight-line passenger terminals;
- Structures such as concession stands or bleachers at open recreational sites.

The 15 AW controls, maintains, and stores small-arms ammunition on the base. Ordnance is handled and stored in accordance with USAF explosive safety directives (AFI 91-201), and all munitions maintenance is carried out by trained, qualified personnel using USAF-approved technical data. Ample storage facilities exist, and all facilities are fully licensed for the ordnance they store. No storage facility waivers are currently in effect.

During shipment of ordnance, while aircraft are being uploaded or downloaded, a "hot cargo pad" is activated at the north end of Runway 16R. The runway is closed when the "hot pad" is active and these activities are underway.

Safety constraints at Hickam AFB result from airfield safety zone criteria and explosives safety zone criteria. Applicable airfield safety clearance criteria are defined in Armed Forces Joint use Manual (AFJM) 32-8008, which outlines detailed planning and design criteria and standards for airfields. These criteria and standards include dimensions, clearances, and grades for airfield operational areas.

The remaining safety considerations at the Hickam AFB revolve around designated areas constrained by explosive safety Q-D zones. These clear zones include the area within a safety arc surrounding an

explosives storage facility, reference Figure 3.10.2-1, Explosive Safety Quantity Distance Zones at Hickam AFB.

The Q-D zones at Hickam AFB encompass the following areas: explosives storage facilities, hazardous cargo parking, suspect vehicle parking areas, and build-up and preload areas. Combat aircraft “hot gun/hung ordnance,” and arming/de-arming areas are located south of the runway overruns. In addition, there are two arming/de-arming areas north of the flight line. Hickam AFB’s Q-D zones are primarily located south of the flight line, away from the main cantonment area. The zones’ arcs range in size from 35 m (115 ft) to 381 m (1,250 ft) in radii surrounding individual sites; variations in an arc’s radius depend upon the type and quantity of explosives and armaments.

The Q-D zones encompass large portions of the airfield and adjacent areas and existing land uses within the arcs are mission-critical functions generally consisting of industrial support and maintenance operations.

3.10.3 Bird-Aircraft Strike Hazards (BASH)

Bird-aircraft strikes constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. Most birds fly low altitudes. Over 95 percent of reported bird strikes occur below 915 m (3,000 ft) agl. Approximately 50 percent of bird strikes happen in the airport environment, and 25 percent occur during low-altitude flight training (1990 Worldwide Bird-Aircraft Strike Hazard [BASH] Conference).

A BASH exists in the Hawaiian Islands due to resident and migratory bird species. Normally, the daily and seasonal bird movements create very little hazard to aircrews operating in the vicinity of Honolulu International Airport/Hickam AFB. Occasionally, bird conditions do present an elevated hazard in this area. In addition, other areas in Hawaii present a significantly greater chance of bird strikes.

Migratory waterfowl (e.g. ducks, geese, and swans) present the most danger to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. Waterfowl vary considerably in size, from .45 to .90 kg (1 to 2 pounds) for ducks, 2.25 to 3.6 kg (5 to 8 lbs) for geese, and up to 9 kg (20 lbs) for most swans. There are two normal migratory seasons, fall and spring. Waterfowl are usually only a hazard during migratory seasons. These birds typically migrate at night and generally fly between 305 to 915 m (1,500 to 3,000 ft) AGL during the fall migration and from 458 to 915 m (1,000 to 3,000 ft) AGL during the spring migration.

In addition to waterfowl, raptors, shorebirds, gulls, herons, and songbirds also pose a hazard. Songbirds are small birds, usually much less than one pound. During nocturnal migration periods, they navigate along major rivers, typically between 153 to 915 m (500 to 3,000 ft) agl.

The potential for bird-aircraft strikes is greatest in areas used as migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, and wetlands).

While any bird-aircraft strike has the potential to be serious, many result in little or no damage to the aircraft, and only a minute portion result in a Class A mishap. During the years 1985 to 1996, the USAF BASH Team documented 31,522 bird strikes worldwide. Of these, 23 caused Class A mishaps. These occurrences constituted approximately 0.07 percent of all reported bird-aircraft strikes (BASH Team 1997).

Hickam AFB, Oahu

The Hickam Flight Safety Office, 15 AW/SEF, Bird Hazard Working Group (BHWG) coordinates closely with the airport authority and Air Traffic Control Tower to maintain awareness of the presence and population density of birds around the airfield. During periods when bird numbers are very high, flight operations that cause repetitive exposure to the risk of bird-aircraft strikes are curtailed.

Occasionally, more than 75 cattle egrets are present in the grassy areas between the runways and on the approach to 08L. Between late August and late April, the Pacific golden plover is the most abundant bird on

the airfield and is normally present in flocks of 400 plus birds at the approach end of 26L. Soaring Frigate birds are occasionally seen at traffic pattern altitudes near runway 8L.

The USAF's BASH Team has developed a Bird Avoidance Model (BAM) *Operation Plan 91-2, Bird-Aircraft Strike Hazard Plan* (1 October 2000). The BASH Plan considers extensive operational (exposure potential) and biological (bird populations and densities) data and indicates the relative risk of bird-aircraft strikes in specific geographic areas at varying times of the year and hours of the day. The same office has also prepared a "Midair Collision Avoidance Plan" as a resource to show the routine operations of Air Force aircraft around the islands, and to provide techniques for pilots to scan the airspace as they fly through.

In general, the military training airspace proposed for use by the 15 AW is located in areas classified by the BASH as having generally moderate risk during the fall and winter months, and low to moderate risk during the remainder of the year. Overall, risk is assessed generally lower at night than during the day.

Low-level flight operations are not conducted by 15 AW assigned aircraft. However, both the HIANG and transient aircraft conduct low-level operations. Standardized, preferred low-level operating areas and routes have been designed using inputs from the users of this airspace.

Lightning DZ, Oahu

BASH information is not available for Lightning DZ and therefore not evaluated for this EA.

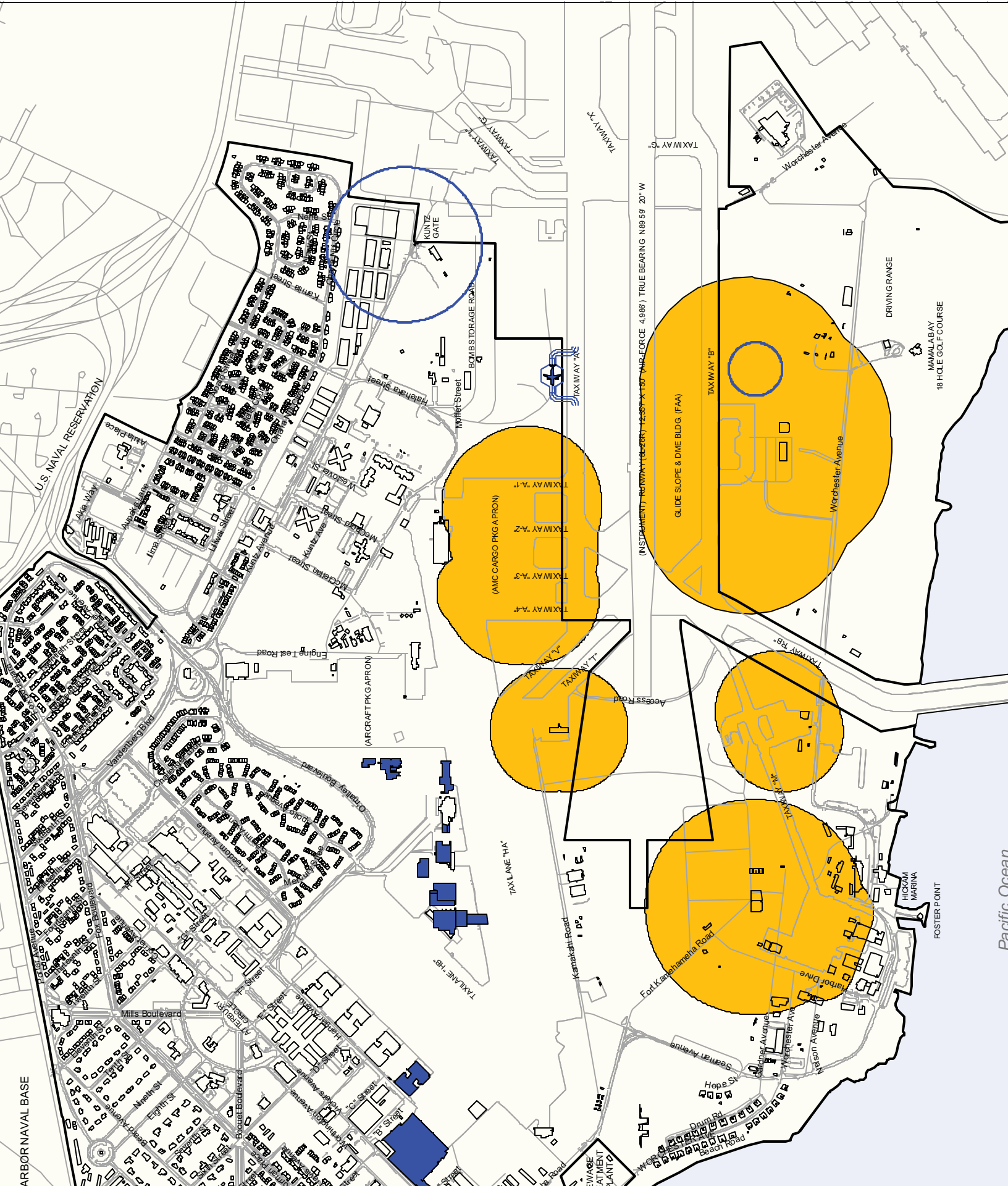


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3.11 INFRASTRUCTURE

3.11.1 Transportation

Transportation and circulation refer to the movement of vehicles throughout a road and highway network. Primary roads are principal arterials, such as major interstates, designated to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads are arterials such as rural routes and major surface streets that provide access to residential and commercial areas.

Hickam AFB, Oahu

The Hickam AFB roadway system should safely handle and distribute vehicular movements with a minimum amount of congestion and delay. This includes traffic movements on to and off of the base as well as movements within the base. Pavement conditions should not inhibit these movements. A Traffic Engineering Study was performed for Hickam AFB in October 1980. The findings of this study stated that base engineers have successfully established primary travel routes that carry peak hour traffic with very little congestion and a minimum number of major conflicts. In addition, parking is not considered to be a base-wide problem. Although the heavily utilized community and employment center parking lots experience localized congestion, utilization rates indicate that adequate numbers of parking spaces exist within a reasonable walking distance.

Roadway pavements on Hickam AFB are primarily constructed of asphalt and concrete pavement and the majority of the streets are in good or excellent condition. The condition of parking lot pavements is considered to be an important transportation issue at Hickam AFB. Many parking lots need resurfacing and several have been identified as warranting extensive repairs or replacement.

The airfield complex consists of a complex of joint-use runways shared with the state of Hawaii, Department of Transportation, Airports Division (Honolulu International Airport), two parallel taxiways (Taxiway A and B) on either side of the runway and several connecting taxiways leading to various parking aprons.

Lightning DZ, Oahu

Aircraft Operations

At Lightning DZ, two types of aircraft, C-130s and occasionally C-141s, are used to drop men and supplies. Generally ten jumpers on static lines (SL) are dropped. Less frequently, 10 jumpers with static lines are dropped from high altitude with low [610-305 m (2000-1000 ft)] parachute openings (HALO). Supplies on pallets are dropped on some of the flights. Planes normally fly almost every day and sometimes twice a day. Flights occur generally between 7:00 am and 7:00 pm and occur all year round.

Roadways

The Lightning DZ is located in an undeveloped area of the East Range of Schofield Barracks Military Reservation. No unauthorized public access is permitted and no public roadways exist near the DZ. The only access to the DZ is by vehicle along an unpaved improved road. There is a bridge over the South Fork of the Kaukonahua Stream. Off-road activity is concentrated in the actual area of the Drop Zone.

3.11.2 Utilities

3.11.2.1 Solid Waste

Solid waste includes household wastes (common garbage), and waste derived from industrial and manufacturing processes (such as animal wastes and medical waste).

Hickam AFB, Oahu

Hickam's solid waste is collected in bulk collection containers, domestic garbage cans, and metal dumpsters. A private contractor collects all solid waste from dumpsters or curbside. No active landfills are located at the installation. Waste from Hickam AFB is taken to H-Power, a waste-to-energy facility operated

by Honolulu Resource Recovery Venture and the City and County of Honolulu, or to the Waimanalo Gulch Sanitary Landfill, also operated by Waste Management of Hawaii. Hickam AFB operates four underground injection wells at the 18-hole golf course located adjacent to Worcester Avenue. These wells are operated in full compliance with the provisions of the Safe Drinking Water Act, Chapter 340D, HRS, as amended, and HAR, Title 11, Chapter 23, Underground Injection Control.

Lightning DZ, Oahu

The Lightning DZ utilizes waste disposal facilities provided by Schofield Barracks Military Reservation and designated contractors as necessary. Normal operations of the Lightning DZ do not generate solid wastes.

3.11.2.2 Sanitary Sewer

Sewage is composed of liquid and solid waste transported in sewers or drains.

Hickam AFB, Oahu

The sanitary sewer collection system consists of gravity and pressure mains, and 28 lift stations. The mains are constructed of vitrified clay, cast iron, concrete, asbestos cement and polyvinyl chloride (PVC) in various sections based primarily on date of installation. Sewage generated in the Earhart Village and Capehart Military Family Housing areas is pumped to the Pearl Harbor collection system; the combined sewage is then pumped to the Fort Kamehameha Tri-service Sewage Treatment Plant. The remainder of the Base sewage is pumped directly to the treatment plant.

All sanitary sewage from Hickam AFB, except for storage in cesspools and septic tanks, is treated at the Fort Kamehameha Tri-service Sewage Treatment Plant, which is owned and operated by the United States Navy. The treatment plant generates a daily volume of approximately 24.6 m³/s (6.5 million gallons) and the effluent is discharged into Mamala Bay. Current plant capacity is sufficient to handle sanitary sewage from Hickam AFB, approximately 8.33 m³/s (2.2 million gallons per day [mgd]) or 34 percent of the total volume, and the additional sewage from Pearl Harbor Naval Base.

Some of the sewer lines on Hickam AFB, originally installed around 1940, are broken and penetrated by tree roots. Inflow and infiltration to the system from groundwater infiltration and during storm events contribute up to 50 percent of the flow from Hickam AFB to the treatment plant. According to a recent Infiltration and Inflow Study (November 2000), the field investigation found evidence of possible excessive inflows to the sewer system at Hickam AFB that would have the potential to cause occasional releases of untreated sewage to groundwater or the surface. However, the study did not find any reported incidents or regulatory violations. Wastewater is also disposed in permitted injection wells as described previously in this chapter under the section describing groundwater.

Lightning DZ, Oahu

If needed, the Lightning DZ utilizes portable wastewater disposal facilities provided by SBMR and designated contractors as necessary. No wastewater pipelines or treatment systems exist at the Lightning DZ. Normal operations of the Lightning DZ do not generate wastewater.

3.11.2.3 Storm Drainage System

Storm drainage systems are designed to convey runoff that may cause damage to installation facilities, property, or adjoining land. They consist of pipe, inlets, catch basins, and other drainage structures to carry the surface runoff and subsurface water to a point of disposal.

Hickam AFB, Oahu

In September 1997, Hickam AFB submitted a Notice of Intent (NOI) to renew its NPDES Permit No. HI R80A438 under the Clean Water Act and to obtain a permit for industrial storm water outfalls. In response to the permit renewal application, the Clean Water Branch of the Environmental Management Division of the HDoH reissued NPDES Permit No. HI R80A438 in February 1998. This permit contains requirements for 24 storm water outfalls. On September 6, 2002, HDoH administratively extended the Notice of General Permit

Coverage (NGPC) (File No. HI R80A-438) until notice of renewal coverage under the applicable general permit is issued. The HDoH Environmental Management Division administers the NPDES program in Hawaii.

In March 2003 Hickam AFB forwarded a request to the HDoH to extend the compliance deadline for meeting the NOI requirements established by the NPDES General Permit for small municipal separate storm sewer systems. This program is detailed in HAR, Chapter 11-55. The Hawaii State program is well defined along the lines prescribed in 40 CFR 122 and requires Hickam AFB to address a number of storm water and erosion control measures including the development of a storm water management plan (SWMP). As outlined in HAR 11-55 Appendix K (6), the SWMP details the minimum control measures required by the NPDES Storm Water Program. The control measures required by HAR 11-55-06 include:

- Public Education and Outreach
- Public Participation/ Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

A critical component of the SWMP is the requirement for construction site runoff control. As required by the new Rule, the Base must implement, and enforce a program to reduce pollutants in storm water runoff from construction activities that result in a land disturbance of greater than or equal to one acre. EPA is currently developing a new Construction General Permit, expected to be finalized in May 2003, that will include both large and small construction. Specifically, the Base should have:

- A mechanism, possibly a 15 AW Instruction supplementing AFI 32-7041, requiring the implementation of proper erosion and sediment control
- Procedures for site plan review of construction plans
- Procedures for site inspection and enforcement of control measures
- Procedures for the receipt and consideration of information submitted by the public
- BMPs and measurable goals

Inherent in the Rule is the requirement to develop a mechanism for permitting construction activities that disturb between one and five acres. The permit program has the following requirements:

- Requirements for construction site operators to implement appropriate erosion and sediment control
- Requirements for construction site operators to control waste that may cause adverse impacts to water quality
- Requirements for construction site operators to develop and implement a storm water pollution prevention plan
- Requirements to submit a site plan for review that incorporates consideration for potential water quality impacts

The constructed portion of the Hickam AFB storm drainage system consists of a series of pipes that collect surface water through catch basins, manholes and other surface inlets. Individual sections of pipe are constructed mainly of reinforced concrete pipe (corrugated metal in limited areas) and range in size from 15 to 76 cm (6 to 30 in). Storm water from the installation drains to Mamala Bay through several outfalls.

The installation east of the Main Gate primarily drains to Manuwai Canal. Manuwai Canal outfalls to Mamala Bay, south of the golf course. Manuwai Canal, the largest watercourse on the Base, follows the boundary between the Base and HIA on the eastern edge of the installation. It provides drainage to roughly the eastern third of the Base through a series of open canals and culverts, and it also receives a portion of

the runoff from HIA. The watercourse passes beneath the main runway of the airport through a culvert. A large number of drainage swales and underground storm drains are tributary to the canal along its length. The canal empties into the Reef Runway Lagoon, which is connected to Mamala Bay.

The flight line facilities south of Hangar Avenue, the northern most part of Hickam Field NCO housing, Onizuka Village housing, and Capehart housing, drain to the Kumumauu Canal. Kumumauu Canal is an open watercourse throughout its length and is connected to numerous drainage swales and underground storm drains. The drainage area of the canal is entirely contained within the Base boundaries, draining roughly the middle third of its area. Kumumauu Canal outfalls to Mamala Bay east of Harbor Haven Beach.

The Transportation Canal drains a small portion of the western third of the Base. Like the other Base canals, it is fed by drainage swales and underground storm drain systems. The remainder of the western third of the Base is drained by underground storm drains that flow directly into Mamala Bay or Pearl Harbor.

No long-term gauging records for any of the canals on the Base are known to exist. Consequently, no flood frequency information was identified for any of the watercourses. The canals have relatively flat slopes, and are significantly affected by tidal conditions due to their close proximity to the coast and the low topographic elevation of Hickam AFB. Manuwai Canal is the largest watercourse on Hickam AFB.

A total of 40 external storm water outfalls and 84 internal outfalls drain the Hickam AFB installation. Of the 124 outfalls, 45 serve areas that contain industrial activities as defined by Hawaii and federal storm water regulations. Three of the 45 industrial outfalls are exempt from coverage by the HDoH. Additionally, nine of the 45 outfalls are not located on Air Force property. All of the outfalls discharge into either the Mamala Bay or to one of the three man-made canals, previously described, that traverse Hickam AFB.

Lightning DZ, Oahu

Storm water drainage at the Lightning DZ occurs as sheet flow across the plateau and is channeled through natural ravines and gullies into tributaries of the Kaukonahua Stream. No designed drainage systems or culverts exist at the Lightning DZ.

3.11.2.4 Drinking Water

Potable water can be defined as water fit for drinking, and not containing a sufficient quantity of saline material to be regarded as a mineral water. In addition, the EPA requires that drinking water contamination does not exceed their Maximum Contamination Levels.

Hickam AFB, Oahu

Hickam AFB is supplied potable water from the Navy water distribution system at Pearl Harbor. There are seven connections to the Hickam AFB from the Navy facility at Pearl Harbor that obtain water primarily from wells located at Waiawa, Red Hill, and Halawa. The Navy system at Pearl Harbor chlorinates and fluoridates the water prior to distribution through these metered connections. An estimated 0.27 m³/s (6.15 mgd) of potable water are produced for Hickam AFB. Up to approximately 0.7 m³/s (1.5 mgd) are consumed for domestic uses, 0.15 m³/s (3.5 mgd) are used for irrigation, 0.03 m³/s (0.65 mgd) are used for industrial purposes, and approximately 0.02 m³/s (0.5 mgd) are lost through system leaks, evaporation, or other uncontrolled occurrences. An alternate or backup source of water is provided by the Honolulu Board of Water Supply System via a connection to the distribution system of Honolulu International Airport. Prior to 1994, the Base received water through a connection near the airport tower, but shifted demand to the Navy based on rate structure. The valve controlling flow from Honolulu International Airport there is closed but could be opened in case of emergency.

The Hickam AFB water distribution system is registered in the Safe Drinking Water Information System under ID HI0000350. The infrastructure consists of cast iron, asbestos cement, ductile iron and PVC pipes, with mains ranging in size from 10 to 46 cm (4 to 18 in). Several pipelines in the Fort Kamehameha area south of the airfield have been abandoned in place. Hickam AFB does not operate or provide any treatment

system or storage for the drinking water. The supply from the Pearl Harbor facility provides adequate pressure and flow for routine uses and firefighting.

Water sampling is conducted regularly by the Bioenvironmental Engineering Flight to ensure standards of water quality are maintained. The provision of a safe, high-quality potable water supply should not present any limitations to future development.

Lightning DZ, Oahu

No potable water system exists at Lightning DZ. Water is brought to the site by individuals or in small portable containers during DZ operations when necessary.

3.11.2.5 Electrical Systems

Hickam AFB, Oahu

Hickam AFB receives commercial power from Hawaiian Electric Company (HECO) through a HECO-owned 42 Megavolt Amperes (MVA) transformer station. This station is served by two 46kV HECO feeders (one is an alternate and normally open). Though both feeders originate from the same HECO substation (Makalapa), either can be served from three others. The 42 MVA transformer station consists of three 14 m/MVA transformers. The Hickam AFB load on this station is 25.7 MVA.

Electrical service from the transformer station enters the primary distribution system through the front switching station, located in Building 165 at corner of Fox Boulevard and 18th Street. Eleven feeders from this station service the northern part of the Base. Two feeders serve a second switching station, known as the back station. Nine feeders from this station serve the southern part of the Base.

Deficiencies in the electrical distribution system at Hickam AFB include aging distribution lines, high voltage oil-cooled switches, and pad-mounted pole transformers. These items are scheduled for upgrading and/or replacement as funding becomes available and improved systems are engineered.

Two principal concerns exist surrounding the ability of the system to meet existing and future demands, and to provide reliable power to mission-critical activities. The first is the load on the back transformer station. The new HIANG and sewage treatment plant construction have the station approaching capacity. The proposed solution is a connection with HECO service at the FAA tower and upgrading of lines from there to the station. The second concern is the primary power source. Reliability of the transformers at the HECO transformer station is questionable. The proposed solution is restoration of a connection at Navy Station K that could direct alternate power to either of the switching stations from Pearl Harbor.

The electrical distribution system at Hickam AFB is currently in the process of being upgraded to modernize outmoded and outdated switch gears at the front and back stations, preclude loss of power to various portions of the base; provide flexibility in power distribution, enhance system maintainability, and extend usable life of the existing distribution system.

Lightning DZ, Oahu

No permanent electrical utilities exist at Lightning DZ. If necessary, electrical power is provided by portable power units or battery-operated equipment during DZ operations.

3.11.2.6 Communication Systems

A communication system is a system or facility capable of providing information transfer between persons and equipment. The system usually consists of a collection of individual communication networks, transmission systems, relay stations, tributary stations, and terminal equipment capable of interconnection and interoperation so as to form an integrated whole. These individual components must serve a common purpose, be technically compatible, employ common procedure, respond to some form of control, and generally operate in unison.

Hickam AFB, Oahu

The 15th Communications Squadron is the principal organization responsible for the communications system at Hickam AFB. The communications system consists of twisted pair copper cable and fiber optic cable; the cable is mostly underground with some aerial and direct buried cable.

The issues at the forefront of the Hickam AFB communications system are the evolution of the fiber optic cable, the Hickam Base Area Network, secure networking, and the Hawaii Information Transfer System (HITS). There are also problem areas in the communications system. The most prominent obstacle is the lack of a comprehensive fiber optic system.

Hickam's communications system is adequate to meet the immediate needs of the Base; however, the existing, limited fiber connectivity is incomplete and the backbone components and technology currently used are dated. The need to consolidate servers and ease the server administration burden, also demands attention. Building an integrated secure network is among the top priorities.

Lightning DZ, Oahu

No permanent communications systems exist at the Lightning DZ. Not Applicable.

3.11.2.7 Liquid Fuels

Liquid fuels are those fuels in a liquid state that may be used with oxidizers to form explosive materials.

Hickam AFB, Oahu

Hickam AFB receives its JP-8 jet fuel from the Fleet Industrial Supply Center's Pearl City Fuel Annex. Two 25 cm (10 in) pipelines cross under Pearl Harbor from Pearl City and enter the Base in the northwest corner by the Pearl Harbor Naval Base. The side-by-side lines terminate at Fuels Area 12, from which fuel is directed either to Fuels Area 5 or 11. Fuels Area 11 can also receive jet fuel from tanker trucks by way of four unloading stations. Figure 3.11.2-1 shows the existing liquid fuels pipelines and storage areas.

Fuels Area 5 contains three horizontal cut-and-cover 189,500 L (50,000 gal) tanks that serve as operational storage for the AMC aircraft parking apron. A Type II hydrant refueling system dispenses or defuels through three dual-hydrant outlets.

A portion of an abandoned hydrant fuel system traverses the proposed C-17 Support Facilities construction site. Other petroleum storage tanks for fuel and lubricants have been identified in the proposed construction area. These potential environmental areas of concern are described in further detail in the section describing hazardous materials and waste in this chapter.

Fuels Area 11 contains four aboveground JP-8 tanks that serve as bulk storage and operational storage for the main aircraft parking apron and cargo apron. A Type II hydrant refueling system dispenses or defuels through five single hydrant outlets at the main parking apron. A Phillips hydrant system dispenses or defuels through 18 dual hydrant outlets at the cargo apron.

There is no natural gas at Hickam AFB.

Other than jet fuel storage at Hickam AFB, there are underground and aboveground storage facilities for diesel fuel and gasoline. One diesel storage tank is located in Fuels Area 11 and two are located at the Base Service Station. Gasoline storage is located at the Base Service Station and the Base Exchange Service Station.

Principal concern with the liquid fuels system is the age of supply lines and dispensing components. The fiberglass line from Fuels Area 12 to Fuels Area 11 is specifically identified for replacement along with operational lines from Fuels Area 11 to hydrant outlets. Older hydrant systems are identified for replacement with Type III pressurized systems.

Lightning DZ, Oahu

Not Applicable.

3.12 HAZARDOUS MATERIALS, HAZARDOUS WASTE, AND ENVIRONMENTAL RESTORATION SITES

Hazardous substances are those corrosive, toxic, flammable, and reactive materials that, when spilled or released, are dangerous to public health or the environment. Hazardous substances include those materials used in cleaning, maintenance, and repair of aircraft and vehicles. Hazardous materials are usually housed in designated hazardous materials storehouses or pharmacies. Hazardous wastes are generated when substances, usually originating as hazardous materials, are disposed and no longer useable or recyclable and exhibit hazardous characteristics as defined by the USEPA. The Air Force program created to identify areas on Hickam AFB that constitute environmental concerns under various federal laws (e.g. RCRA, CERCLA, etc.) is the Environmental Restoration Program (ERP) and the sites are called Environmental Restoration Program sites.

The program goal of the Air Force ERP is to "reduce risks to human health and the environment due to contamination from past Air Force activities in a cost effective manner and in a manner that fosters community support." The scope of the Air Force ERP includes:

- Cleanup and restoration of sites contaminated with toxic and hazardous substances, low-level radioactive materials, petroleum, oils, lubricants and other pollutants and contaminants. Releases known to have occurred entirely after 1 January 1984 are ineligible under the Air Force Environmental Restoration Program
- Air Force installations in the United States, its territories, and possessions under the management and control of active Air Force, Air Force Reserves, or Air National Guard
- Government-owned, contractor-operated facilities located on real property managed and controlled by the Air Force
- Third party sites that are off-installation areas or locations within the United States that are not owned, leased or otherwise possessed by the United States Government, at which the Air Force is alleged to be liable for the costs of response actions to clean up releases of hazardous substances under the CERCLA and/or other applicable law
- Off-installation areas where Air Force contaminants may have migrated from within Air Force, Air Force Reserve, or Air National Guard facility boundaries

The Air Force ERP mission is to identify, investigate, and clean up contamination associated with past Air Force activities as necessary to protect human health and the environment. The Air Force executes cleanup and completes site close-out using a "risk plus other factors" approach for setting priorities, through building productive partnerships with regulators, community based decision making, and implementation of effective and efficient cleanup technologies.

Hickam AFB, Oahu

At Hickam, the Hazardous Materials Pharmacy, or (HAZMART), is located in Building 1070. This facility acts as an effective single point of control for the issue, tracking, and receipt of hazardous substances. Hickam does not treat or directly dispose of any hazardous waste.

The Base Hazardous Waste Management Plan details Hickam's hazardous waste stream inventory and identifies all types of hazardous waste generated at specific authorized locations. The plan includes operational procedures applicable to the collection and temporary storage of hazardous wastes at initial accumulation sites and outlines the respective roles and responsibilities of the HAZMART, Satellite Accumulation Points, and Accumulation Points.

Hickam AFB is registered with the USEPA as a Large Quantity Generator of hazardous waste under identification number (ID) HI8570028722. According to available data, Hickam AFB generated and shipped 39 tons of hazardous waste in 1997. Hickam AFB does not have a permit as a treatment, storage, or disposal facility (TSDF). Several contracted transporter and disposal/treatment service companies are employed by Hickam AFB to remove hazardous wastes. Hickam AFB is also registered in the PCB Activity Data System (PADS) under ID 3068 and in the National Compliance Database under IDs I09#19880616049471 and C09#09-88216-02-WR.

Hickam AFB maintains an Integrated Hazardous Materials Contingency Plan that provides guidance on minimizing the quantity and effects of hazardous materials releases. Included within this plan is the Spill Prevention Control and Countermeasures (SPCC) Plan.

Other programs that exist at Hickam AFB that involve the management of hazardous substances and wastes include the Lead-Based Paint Management Plan and the Asbestos Management and Operating Plan. These plans and associated programs were recently updated and implemented in March 2001. Prior to renovations and demolition, structures are to be evaluated and hazardous materials removed in accordance with these programs and other applicable laws and regulations.

The Management Action Plan (MAP) for the Hickam AFB Environmental Restoration Program identifies several subsurface features in the area of the proposed C-17 Support Facilities complex with potential environmental concerns. Pipelines for an inactive hydrant fuel system traverse the site east to west and then northwest across Taxilane "HB" in the vicinity of Bldg. 2021. Site 028 contains runway underground storage tanks, areas of concern (EA41, EA56I, and EA56J), and other known contamination sites (AM06, southwest of C-17 Support Facilities area).

3.13 SOCIOECONOMIC

3.13.1 Economic Activity

The economy of the ROI of the City and County of Honolulu is diverse, including services such as hotels and health services, trade, government, and transportation, communications and utilities. The Air Force employs approximately 2,000 civilians in the City and County of Honolulu. In the County of Kauai, the Air Force employs fewer than 50 people. The tourism industry is one of the primary employers in Hawaii. The Federal government employs approximately 10 percent of the population of Hawaii. Employment characteristics for the City and County of Honolulu and Kauai County are presented in tables 3.13.1-1 and 3.13.1-2 below.

Table 3.13.1-1 Selected Job Count by Industry

Employment Type	State Total	City and County of Honolulu	Kauai County
Manufacturing	17,200	13,350	500
Transportation, Communications, and Utilities	42,400	33,300	1,750
Trade	136,950	99,000	7,450
Services (Hotels and Health Services)	183,400	130,950	9,500
Air Force	2,100	2,000	<50

Table 3.13.1-2 Selected Employment Status Characteristics

Status/County	City and County of Honolulu	Kauai County
Civilian Labor Force	423,500	29,400
Civilian Employed	407,600	27,500
Civilian Unemployed	15,900	1,900
Percent Unemployed	3.8	6.5

3.13.2 Population and Housing

Hickam AFB, Oahu

For Census 2000, the population of the City and County of Honolulu was 876,156. The population counts for Census 2000 in the selected cities and towns are shown in Table 3.13.2-1 below.

Table 3.13.2-1 Population of Selected Cities/Towns in the Hickam AFB Surrounding Area

Neighborhood Board/Community	Population
Aiea	9,019
Pearl City	30,976
Aliamanu (including Mapunapuna)	12,651
Foster Village	5,473
Salt Lake	7,931
Airport	1,073
Mililani Mauka	11,181
Makakilo	13,156
Mililani Town	28,608

Housing includes all apartments, houses, and mobile homes available whether they are owner-occupied, rented, or vacant. The number of housing units and their associated occupancy data are provided in Table 3.13.2-2 below.

Table 3.13.2-2 Number of Housing Units in the Hickam AFB Surrounding Area

County or City/Town	Number of Units	Occupied	Vacant	Vacancy Rate (%)
City and County of Honolulu	315,988	286,450	29,538	9.35
Aiea	2,831	2,758	73	2.58
Pearl City	9,181	8,921	260	2.83
Aliamanu	10,667	9,677	1,000	9.4%
Salt Lake	2,869	2,720	149	5.19
Airport	5,627	5,001	626	11.12
Mililani Mauka	4,042	3,852	190	4.7
Makakilo	4,119	3,898	221	5.37
Mililani Town	9,280	9,010	270	2.91

On-base housing for active duty personnel is available at Hickam AFB for military personnel and dependents. According to the "Economic Impact Statement" for FY02, prepared by the 15th Comptroller Squadron at HAFB, on-base family housing includes 621 units for officers (97 2-BR, 385 3-BR, 139 4-BR). There are 2005 units available for enlisted personnel (584 2-BR, 694 3-BR and 727 4-BR). Dormitory quarters include 758 rooms for Airmen/NCOs, 115 rooms for visiting Airmen, 155 rooms for visiting officers, 48 rooms for visiting aircrews, 65 rooms for visitors (all ranks), and 40 rooms in the temporary lodging

facilities. A total of 2,221 personnel (including HIANG) and their dependents live on base, or 34 percent of all active duty personnel and their dependents associated with Hickam AFB. The Hickam AFB Housing Office (15 CES/CEH) reported that the occupancy rate for housing is currently 94 percent with enlisted personnel receiving immediate housing assignments and officer personnel are put on a waiting list that may be as long as eight months to a year. Personnel seeking local housing are referred to the Community Home Finding Referral and Relocation Services (CHRRS) office at Fort Shafter (US Army).

Lightning DZ

Not applicable

3.13.3 Public Services

Hickam AFB, Oahu

Schools

Hickam AFB currently has one school on-base, Hickam Elementary School. Schools in the area of HAFB include Aiea High School, Aiea Intermediate School, Aliamanu Elementary Schools, Aliamanu Intermediate School, Pearl Ridge Elementary School, Pearl City Elementary School, and Pearl City High School. Private schools are available as well. For higher education, Oahu hosts the University of Hawaii, Leeward Community College, Kapolei Community College, and Hawaii Pacific University (not inclusive). There is also a strong home school community present. During fiscal year 2001-2002, Hickam AFB contributed \$1,339 in impact aid per pupil to the State of Hawaii Department of Education.

Lightning DZ

Not applicable

Medical Facilities

The 15th Aeromedical-Dental Squadron runs a dental and medical clinic on Hickam AFB. For medical emergencies, active duty and dependents may go to the Tripler Army Medical Center (Tripler AMC). There are accessible community clinics and hospitals as well such as the Pali Momi Hospital in the vicinity of Hickam AFB.

3.13.4 Environmental Justice

This section reviews the baseline conditions for socioeconomic resources. E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed on February 11, 1994. It requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of their programs, policies, and activities. The accompanying memorandum states that federal agencies "shall provide opportunities for community input in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of meetings, crucial documents, and notices," thus affording the opportunity for meaningful involvement for the communities during the decision-making process. An Environmental Justice (EJ) analysis is included in this document to comply with the intent of E.O. 12898, Air Force, DoD, State and NEPA guidance.

Hawaii, and in specific Oahu and Kauai are unique in that the minority populations are 77 percent and 70 percent respectively, hence a majority population. This is in contrast to the usual situation on the mainland where minorities are truly a "minority" population based on numbers. Hawaii is a state where whites are not the majority but rather a third of the population. This ethnic diversity creates a different situation/society than is seen in the rest of the U.S. Numerically speaking, the native Hawaiian, kanaka maoli (indigenous people of Hawaii), population is the minority population. The definition of "native Hawaiian" is still being debated, whether it means having any Hawaiian blood or a quantum of 50 percent or more (as defined by

the Hawaiian Homelands Trust). The Office of Hawaiian Affairs (OHA) describes native Hawaiians as descendants of 1778 island inhabitants. The U.S. Census numbers include those of mixed Hawaiian ancestry with any measure of Hawaiian blood. It was not until the year 2000 Census that native Hawaiians had their own census category.

The community characterization includes an analysis of the native Hawaiian population, comparing the native Hawaiian population numbers of each community with those of the total community population, total Oahu or Kauai population, compared to the overall minority population and with the total Hawaiian populations of Oahu and/or Kauai. These results are presented in a separate Table. At this time there is no guidance on how to interpret these numbers, or what defines “disproportionate.”

3.13.4.1 Regions of Influence

Hickam AFB, Oahu

The ROI for this socioeconomic study includes the County of Kauai and the City and County of Honolulu. The area immediately surrounding Hickam AFB most affected by the proposed action includes several communities identified as Neighborhood Board areas: Airport, Aliamanu (including the Mapunapuna area), Foster Village, Salt Lake, and Hickam Housing. The Airport and Mapunapuna areas are mainly commercial and/or industrial in nature. Most Hickam AFB personnel that live off of the base reside within the local area including the communities of Aiea, Pearl City, Makakilo, Mililani Town, and Mililani Mauka. However, daily commuting to Hickam AFB from any part of the island of Oahu by employees is likely from any community on the island.

Communities within the regions of influence were evaluated for EJ in this EA as described below:

- (a) Hickam Air Force Base
 - a. Aliamanu/Salt Lake/Foster Village Neighborhood Boards #18
 - b. Airport Neighborhood Board #19 (not formed).
- (b) Lightning DZ
 - a. North Shore (Aircraft Approach)
 - (a) North Shore Neighborhood Board #27 and Profile Data
 - b. Central Oahu (Training Area)
 - (a) Wahiawa Neighborhood Board #26 and Profile Data
 - (b) Mililani/Waipio/Melemanu Neighborhood Board #25 and Profile Data
 - (c) Mililani Mauka/Launani Valley Neighborhood Board #35

A community block (census tract, city or town, Neighborhood Board area) is considered disproportionate under either of two conditions: (1) the percentage of persons in low-income or minority populations in the community block exceeds the percentage in the City and County of Honolulu, the regions of comparison, or (2) the percentage of low-income or minority populations in the community block exceeds 50 percent. Tables 3.13.4-1a and b, 3.13.4-2a and b, 3.13.4-3a and b, and 3.13.4-4a and b summarize the EJ analysis done for the ROIs of Hickam AFB, and Lightning DZ.

Table 3.13.4-1a Hickam AFB ROI EJ Analysis

Geographic Data	Percent Minority(1)	Disproportionate(2)	Percent Low-Income	Disproportionate	% Children Under 18
City and County of Honolulu	77%	N/A	18.3	N/A	24%
Aliamanu	80.5% / 0.5%	Yes > 50%	Mapunapuna = 41%	Yes Aliamanu No	26%
Foster Village	77.3% / 0.5%	Yes > 50%	7.4	No	21.5%
Salt Lake	89.1% / 0.75%	Yes . 50%	6.2	No	22%
Airport	31.6% / 0.05%	No	12.7	No	29%
Hickam Housing	29.72% / 0.04%	No	2.5%	No	40.4%

Notes:

1. Percent Minority is presented as X% / Y% where X% is percent minority in group population and Y% is percent minority of group population compared to Oahu
2. Disproportionate is Yes when % is greater than % for Oahu or when % for group population is greater than 50% of the group population

Table 3.13.4-1b Hickam AFB ROI Native Hawaiian EJ Analysis

	Airport	Aliamanu	Foster Village	Salt Lake	Hickam Housing
Percent of Native Hawaiians in Community	0.1	2.9	2.8	1.8	0.35
Percent of Total Oahu Population	0.00	0.10	0.02	0.02	0.00
Percent of Community Minority Population	0.3	19.12	3.6	2.0	1.2
Percent of Oahu Minority Population	0.00	0.13	0.02	0.02	0.003
Percent of Oahu Native Hawaiian Population	0.00	1.9	0.3	0.27	0.04

Table 3.13.4-1c Lightning DZ EJ Analysis

Geographic Data	Percent Minority(1)	Disproportionate(2)	Percent Low-Income	Disproportionate	Children Under 18 %
City and County of Honolulu	77%	N/A	18.3	N/A	24%
North Shore Area					
Waialua	74.6% / 0.2%	Yes >50%	21.5%	Yes	24%
Hale'iwa	83.6% / 0.35%	Yes > 50%	30.7	Yes	26.2%
Mokule'ia	43% / 0.2%	No	See Waialua	See Waialua	21.5%
Waipi'o Acres	80% / 0.6%	Yes > 50%	19.79%	Yes	27.2%
Mililani Town	78% / 2.5%	Yes > 50%		No	27.2%
Whitmore Village	94% / 0.46%	Yes > 50%	18.248%	Yes	29.8%
Wahiawa	87% / 1.6%	Yes > 50%		Yes	26.1%
Mililani Mauka – Launani Valley	23% / 1.1%	No	2.9	No	31%
Wheeler/East Range	36.7% / 0.11%	No	13.8%	No	36.8%
Schofield Barracks	35% / 0.58%	No	17%	No	32.1%

Notes:

1. Percent Minority is presented as X% / Y% where X% is percent minority in group population and Y% is percent minority of group population compared to Oahu

Disproportionate is Yes when % is greater than % for Oahu or when % for group population is greater than 50% of the group population

Table 3.13.4-1d Lightning DZ Native Hawaiian EJ Analysis

	Wahiawa	Whitmore Village	Mililani Mauka – Launani Valley	Mililani Town	Waipio Acres	Wheeler/East Range	Schofield Barracks
Percent of Native Hawaiians in Community	5.6	3.8	3	3.3	5.3	0.63	0.46
Percent of Total Oahu Population	0.10	0.02	0.04	0.11	0.03	0.002	0.01
Percent of Community Minority Population	6.5	4.1	3.3	4.2	6.7	1.7	1.32
Percent of Oahu Minority Population	0.13	0.02	0.05	0.14	0.02	0.003	0.01
Percent of Oahu Native Hawaiian Population	1.8	0.3	0.63	2.0	0.6	0.36	0.14

Table 3.13.4-1d Lightning DZ Native Hawaiian EJ Analysis (continued)

	Haleiwa	Waialua	Mokuleia
Percent of Native Hawaiians in Community	9.1	3.4	4.46
Percent of Total Oahu Population	0.02	0.01	0.01
Percent of Community Minority Population	12.2	4.1	10.56
Percent of Oahu Minority Population	0.03	0.02	0.01
Percent of Oahu Native Hawaiian Population	0.4	0.3	0.2

The EJ analysis focused on the areas where there is a potential for environmental impacts. The analysis indicates that all locations of the proposed action and proposed alternatives have the potential to impact minority, low-income or minority and low-income populations.

3.13.4.2 Public Outreach

A public outreach program is being conducted by the U.S. Air Force to ensure that members of the public, including members of low-income and minority groups in the County of Kauai and the City and County of Honolulu are aware of this draft EA and that opportunities are available to the public to express concerns and to comment about the potential effects of the proposed action and the proposed alternatives. Neighborhood Board Meetings were held to inform the communities of the upcoming scoping meetings in February 2003, and four scoping meetings were held in February and March 2003.

3.13.5 Environmental Health Risks to Children

On April 21, 1997, the President issued E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks. This E.O. requires federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The E.O. further requires federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. The E.O. defines environmental health and safety risks as “risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on, and the products we use or are exposed to).” Such information aids in evaluating whether a proposed action would render vulnerable children targeted for protection in the E.O.

A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breath more air in proportion to their body weight than adults. Children's size and weight may diminish their protection from standard safety features; and children's behavior patterns make them more susceptible to accidents because they are less able to protect themselves. Examples of risks to children include increased traffic volumes and industrial or production-oriented activities that would generate substances or pollutants that children may come into contact with or ingest.

Hickam AFB and Community Areas

The labor force of the Hickam AFB community areas (Aliamanu, Airport, Aiea, and Pearl City) consists of employable persons 16 years or older and is estimated to be 84,398 persons. Twenty-four percent of that labor force was employed by the US military. Twenty-seven percent of the other employed residents in the community areas were employed in retail trade and 20 percent in other services. Ten percent were employed in public administration and 10 percent in the transportation, communications, and utilities industries. Less than one percent were employed in agriculture, forestry, and fishing.

Hickam AFB and Community Areas Protection of Children from Environmental Health Risks and Safety Risks

The Hickam AFB *Lead Based Paint (LBP) Management Plan* is a program concerned with the metal lead as a hazardous material. Although LBP is no longer used at Hickam AFB, several older facilities were painted with these paint products. The LBP Plan focuses on the safe management of these materials and the elimination of potential hazards to the residents and environment.

The Hickam AFB *Asbestos Management Plan* provides guidance on and outlines procedures for asbestos-related management and abatement programs. The Plan also calls for a current survey of all Hickam AFB facilities with asbestos-containing materials (ACM) in order to facilitate the location and removal of asbestos as well as protect the Hickam AFB military and civilian community.

The Hickam AFB *Environmental Restoration Program (ERP)* identifies, characterizes, and remediates identified environmental contamination sites on the base. A *Management Action Plan (MAP)* was prepared in September 2000 to provide comprehensive information about the environmental restoration activities ongoing at Hickam AFB. The MAP includes an extensive and detailed description of the 41 ERP Sites and 23 Areas of Concern (AOC).

The Radon Assessment and Mitigation Program at Hickam AFB was completed in 1988. A representative sample of 15 facilities showed no occurrences above 1.9 picocuries/liter. Additional radon sampling was conducted in 1994 at several bunkers located at Hickam AFB. All results were less than 0.5 picocuries per liter, which is below the action standard of 4 picocuries per liter. The 1994 radon sampling records are maintained in the 15th Aerospace Medicine Squadron Bioenvironmental Engineering Flight; however, there are currently no radon program requirements.

3.14 CULTURAL RESOURCES

Cultural resources are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. These resources include archaeological sites, historic structures, and traditional cultural places.

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures in this part define how Federal agencies meet these statutory responsibilities. The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing

at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. Only significant cultural resources (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action.

3.14.1 Prehistoric

Hickam AFB, Oahu

The current location of Hickam AFB straddles two traditional Hawaiian land divisions (ahupua'a), Halawa and Moanalua. Both Halawa and Moanalua ahupua'a have rich oral traditions that tell not only of important personages associated with the area, but also provide insight into land use patterns. The earliest known settlement dates between 1200 and 1500 A.D. The legends of Halawa and Moanalua describe these valleys to be bountiful in resources, and home to both ali'i (royalty) and maka'ainana (commoners). The valleys were extensively cultivated, home to several battles, and a land where gods and spirits roamed.

Agricultural land use of the area shows extensive taro cultivation along the slopes and valley floors. In addition to taro, bananas, yams, and 'awa (kava kava, an herb used in important rituals and ceremonies) were grown in the valleys. While the valleys were the focus of land based subsistence activities, a vast array of fishponds exclusive to Hawaiian culture, were maintained closer to the shore. A number of these fishponds are in the Hawaii State Register of Historic Places. In addition to fishponds, the Pearl Harbor-Hickam AFB area provided highly suitable conditions for shallow and deep-water fish-traps and was home to a variety of shellfish.

The sand dune deposits of the coastal areas at Hickam AFB, and especially of Fort Kamehameha, are traditional places of human interment. Excavations of sand dune burial areas indicate they were utilized continuously throughout pre-contact and post-contact times.

Lightning DZ

There are no known prehistoric resources in the DZ area.

3.14.2 Historic

Hickam AFB, Oahu

The historic period began in A.D. 1778. Changes took place after European contact that drastically altered the direction of Hawaiian culture. Historic maps and archaeological evidence indicate that there were sparse settlements in the area of Hickam AFB in the 1800s. Perhaps the most notable 1800s settlement in the area was the home of Queen Emma, as located on several early maps. The exact location of Queen Emma's house has yet to be determined.

In 1898 the Honolulu Sugar Company, which would later become the Honolulu Plantation Company of Halawa and Aiea was established. The workers of the company were housed in an area known as Pu'uloa Camp, which was located in the northeastern portion of the current base.

At the beginning of the twentieth century, the United States was entering into a new phase of military activity with the acquisition of overseas territories. It was moving into a position as a major world power, and defense of the Pacific territories was deemed to be an essential component of the national interest. Decisions were made to increase the nation's naval defense by implementing a "two-ocean" Navy, and extending air services to the Pacific region.

The official military use of the area began in 1905 when the Taft Board, under President Theodore Roosevelt, initiated the expansion of the coastal defenses in areas outside of the United States. Securing the islands from attack became a major priority. The naval base at Pearl Harbor was designated as the major defense installation for Hawaii. This eventually led to the construction of the coastal fortifications at Fort Kamehameha, along with various support activities.

In 1908 the village of Holokahiki was renamed Watertown for the fresh water piping system built for the dredging of Pearl Harbor. Watertown was a vibrant ethnic neighborhood that remained occupied until the mid 1930s when the land in the area was condemned for the construction of Hickam AFB.

Military aviation activity in the Hawaiian Islands began in 1913 when an Army Signal Corps Aviation station was assigned to Fort Kamehameha. On May 9, 1918, Major Harold Clark, Jr. completed the first interisland flight in Hawaii when he flew one of the squadron's planes to Molokai and back. The squadron moved to Ford Island in September 1918.

The Fort encountered its only active war experience on December 7, 1941, during the Japanese attack on Pearl Harbor. The anti-aircraft guns successfully shot down several Japanese planes. Several men were killed or injured, and the Fort received a fair amount of damage. Throughout WWII, the Fort served as a coastal defense for Pearl Harbor. With the arrival of atomic weapons at the end of WWII, the artilleries were considered obsolete and were scrapped, and the coastal defenses were abandoned. Along with many of the original buildings, the Fort's cantonment buildings were demolished. The officers' housing, batteries, and a few other buildings are all that remain of this historic defense installation.

Hickam Field was established on April 9, 1935. It was completed and officially activated September 15, 1938. It was the principal Army airfield in Hawaii and the only one large enough to accommodate the B-17 bomber. Since its designation as an U.S. Air Force facility, Hickam AFB has changed from the Pacific Air Command (Seventh Air Force) 1947-48, to the 1500th Air Transport Wing 1949-56, to the 6486th Air Base Wing, Pacific Air Forces 1957-1971, and finally the 15th Air Base Wing, Pacific Air Forces in November 1971.

For Hickam Field, the Cold War era began with its official designation as Hickam AFB after the establishment of the U.S. Air Force in 1947. The Truman Doctrine, which called for resisting Communist expansion through economic and later, military aid, represented a marked change in U.S. foreign policy. Under the Marshall Plan, the U.S. sent economic aid to war-devastated areas of Europe including Berlin. Stalin's reaction to these shipments was to blockade Berlin. In response to this, the Air Force, the Navy and the Army conducted joint airlifts and the blockade was ended in 1949. The airlift formally reinforced the need for greater US air power by US flights from Hickam.

Following the Berlin airlift, Hickam's next mission was during the Korean War. Along with Berlin, Korea presented another forefront for Communist activities. During the formative stages of the Cold War (1947-1950), activities in Berlin and Korea mounted increasing pressure on the newly formed Air Force. Flights carrying mainly supplies, took off from the Hickam flight line headed for Korea.

Although the Vietnam War was not officially part of the Cold War, it had an element of the Cold War in that the Soviet Union was closely monitoring events in Vietnam. Again the Base played an important role in this conflict by providing airlift support to bring American families home in 1965, and later aided in the evacuation of Vietnamese refugees and orphans from 1973 to 1975. In 1982, remains of US servicemen were brought from Hanoi to the US via Hickam AFB. Throughout the Cold War era, Hickam AFB served the nation from the Berlin blockade to the Vietnam War, in addition to supporting various manned space missions in the 1960s and 1970s.

Two historic districts have been established at Hickam AFB, the Hickam and Fort Kamehameha Historic Districts (Figure 3.14.2-1). The Hickam Historic District is located in the northwest portion of the Base near the entrance of Pearl Harbor. The Fort Kamehameha Historic District is located in the southwest corner of the Base of Mamala Bay. More details are provided on the important architecture of these districts in Section 3.14.3.

Lightning DZ, Oahu

The Lightning DZ area has been highly disturbed and its surface cleared of vegetation. It is unlikely to contain cultural resources except possibly along stream banks.

3.14.3 Architectural

Hickam AFB, Oahu

Hickam AFB is a unique installation, rich in military and architectural history, scenic beauty and operational importance. Its 1,094 ha (2,700 ac) at the entry to Pearl Harbor, Oahu, is a strategic and bustling location for the staging and deployment of personnel entering the Pacific Theater. As stated previously, Hickam has two historic districts. The Hickam Historic District includes the prominent Art Deco buildings such as the large entrance gate, Wing Headquarters, the hangars along Hangar Road, the Base Civil Engineering Building, the Base Security Building and the Base Operations Building. Stepped forms, rounded corners, triple striping, and black decoration characterize Art Deco buildings. These distinctive buildings are well maintained and are used primarily for mission or administrative activities and are all located in the same general area.

The Tropical Architectural style is a variant of the Bungalow or Craftsman style of architecture (circa 1905-1929) and is characterized by large and prominent overhanging hip or gable roofs, large windows, rooms with a sense of openness, wide projecting eaves, and broad overhanging porches with strong pillars that broaden at the base to provide a feeling of being connected to the earth. The Craftsman style of housing was ideal for this area and was easily adapted to the environmental conditions of tropical climates. The Officers Club, the Medical Clinic, and many older residential structures are of the Tropical Architectural style. The Hickam Historic District consists of a "garden city" design incorporating elements of the contemporary Art Deco Style, as can be seen in the elaborate entrance gate and wing headquarters, with the tropical bungalow style of architecture.

An Architectural Compatibility Study prepared in 1985 provides a tool for planning, programming and designing, and maintenance/repair of real property projects at Hickam AFB. Compliance with this Study's standards is required for a mission supportive, functional, harmonious and enriched environment, consistent with economy and energy conservation.

The other Historic District is Fort Kamehameha Historic District. The Fort Kamehameha Historic District consists of the batteries that helped defend Hawaii against the December 7, 1941, attack by the Japanese; and many historic buildings with the unique tropical architectural style as described above for Hickam. These fine buildings, which are a reflection of the old plantation days in Oahu, are 30 to 50 years older than their counterparts at Hickam and are extremely well constructed.

Lightning DZ, Oahu

There are no structures of any kind besides roads at the Lightning DZ.

3.15 OUTDOOR RECREATION

Outdoor recreation includes those activities such as swimming, fishing, picnicking, sailing, and golf.

Hickam AFB, Oahu

Hickam AFB's outdoor recreation resources are extensive due to the installation topography, water resources, climate, and constructed recreational facilities. Recreation facilities at Hickam AFB include a running trail, golf courses, athletic courts, and sports fields. Recreational playgrounds, parks, and the base beach and marina are located on the shores of Hickam Harbor. Outdoor recreation at Hickam AFB is generally characterized as a land resource, water resource, or recreation access facility.

Lightning DZ, Oahu

Not applicable.

3.16 VISUAL RESOURCES/AESTHETICS

A visual resource is usually defined as an area of unique beauty that is a result of the combined characteristics of the natural aspects of land and human aspects of land use. Wild and scenic rivers,

topography, and geologic landforms are components of the natural aesthetic aspects of land. Examples of human-created aesthetic aspects of land use include scenic highways and architectural elements within historic districts. The assessment of visual and aesthetic value involves a characterization of existing natural and man-made resources in the study area.

Changes in visual character are influenced by social considerations, including public value placed on the resource, public awareness of the area, and general community concern for visual resources in the area.

Visual resources can be regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or visually sensitive areas.

Hickam AFB, Oahu

Hickam AFB has potentially three Districts and one Landmark (the Landmark and Fort Kamehameha are in the Register and two others are in the process of being submitted). These Districts are protected by the completed Historic Preservation Plan and the Cultural Resources Management Plan (CRMP). These plans establish standard operating procedures to ensure compliance with applicable laws and regulations while facilitating the management and preservation of prehistoric, historic, and archaeological services.

Lightning DZ, Oahu

The Lightning DZ itself has little aesthetic appeal due to the nature of airdrop activities. However, outside the DZ, the mountainous terrain is quite scenic and attracts many tourists to the area.

4 ENVIRONMENTAL CONSEQUENCES

This chapter assesses the potential environmental consequences associated with the Proposed Action that may occur as a result of the C-17 aircraft conversion. The Proposed Action and Alternatives are briefly identified as:

- Proposed Action consists of the beddown of the C-17 aircraft at Hickam AFB, use of the Lightning DZ, Schofield Barracks, for training, use of military airspace, personnel requirements, and construction of associated support facilities at Hickam AFB.
- Alternative 1, the No Action Alternative, means that the C-17 beddown, associated construction, personnel requirements, and airspace usage, would not occur and the HIANG C-130 aircraft would remain at Hickam AFB.

A brief description of the impact severity criteria for each resource is provided and describes relative impacts considered to be negligible, minor, moderate, or major. Major impacts would include resources that are committed irreversibly and are irreplaceable.

Table 4-1 has been developed to assess the severity of a potential impact. Only those resources considered important to Hickam AFB are included on this table. Those resources not found in Table 4-1 are analyzed using the same severity criteria as briefly described below:

- Negligible – impact is imperceptible to natural or human environment, below levels of quantification
- Minor – relatively low in severity, requiring no or minimal mitigation actions
- Moderate – reasonable; not severely adverse, excessive, or extreme and can be minimized with mitigation actions
- Major – impact results in irreversible and irretrievable commitment of the resource or extensive mitigation actions and could require Environmental Impact Statement

In several cases a resource or area of environmental analysis does not exist at a particular location where the Proposed Action or alternative would take place. For example, the Lightning DZ is located in an inland area, so at this location "Coastal Zone Management" resources would not apply. Therefore, within the narrative text of this chapter under the section "Coastal Zone Management – Lightning DZ", the phrase "Not Applicable" is used where no further description of impacts for this location is necessary.

Table 4-1 Criteria for Rating Severity of Impacts

Impact Severity	Geology, Topography, Climate	Land Use	Coastal Zone/Floodplain	Natural Resources	Threatened, Endangered, or Candidate Species
Negligible	Impact localized and not detectable, or at lowest levels of detection	No change in land use or planned uses	Impact barely perceptible and not measurable. Crossing floodplains with overhead transmission lines is often unavoidable	Impact localized and not detectable, or at lowest levels of detection	Change in a population or individuals of a species; consequences to population not measurable or perceptible, or other changes not measurable or perceptible
Minor	Impact localized and slightly detectable but would not affect overall natural geologic structures, topography, soils, or climate	Proposed land use would not be optimal, but generally compatible with surrounding land use and planned uses	Impact perceptible and measurable, but would remain localized, affecting an area that is unavoidable, such as repairing a pipeline or burying an upgraded electrical line	Impact localized and slightly detectable but would not affect overall structure of any natural community	Change in a population or individuals of a species, if measurable, would be small and localized, or other changes would be slight but detectable
Moderate	Impact clearly detectable; could affect overall natural geologic structures, topography, soils, or climate appreciably. Mitigation may be necessary	Proposed land use would conflict with planned uses and may require changes to use designations. Mitigation may be necessary to be compatible with adjacent land uses	Impact sufficient to change a floodplain's features but with sufficient implementable mitigation that would not diminish the usefulness of the floodplain	Impact clearly detectable; could affect individual species, communities, or natural processes appreciably	Change in a population or individuals of a species measurable but localized
Major	Impact highly noticeable and would substantially influence overall natural geologic structures, topography, soils, or climate. Mitigations would be required	Proposed land use would require rezoning or potential relocation of existing structures or facilities to be compatible. Mitigations would be required	Change in the floodplain that is measurable and would result in permanent consequence to the environment. This impact would require mitigation and/or preparation of an EIS	Impact highly noticeable and would substantially influence natural resources, e.g. individuals or groups of species, communities, or natural processes	Change in a population or individuals of a species measurable and would result in permanent consequence to the population

Table 4-1 (continued)

Impact Severity	Wetlands	Water Resources	Air Quality	Airspace, Safety	Noise
Negligible	No perceptible impacts or effects are confined to small areas and would not fill or destroy a wetland	No water resource exists at this location under the alternative, no detectable impacts, no discernible effect on water resources	Impact not perceptible and not measurable; not affecting surroundings	No notable changes in current aircraft operations or existing safety protocols	Impact localized and not detectable, or at lowest levels of detection
Minor	Impact perceptible and measurable, but would remain localized; affecting a wetland that is unavoidable, such as repairing a pipeline or burying an upgraded electrical line	Impacts detectable but would not affect water resources long term and would not impact critical natural habitat or potable sources	Impact perceptible but not measurable; would remain localized	Changes in airspace management may elevate use of airspace but would be accommodated by existing published routes and air control systems	Impact localized and slightly detectable but would not affect overall community of Hickam AFB or outside Base
Moderate	Impact sufficient to change a wetland but would not diminish resource's integrity enough to jeopardize its viability. A Section 404 permit from the Corps of Engineers would be required and implementable, appropriate mitigation would be required	Impact clearly detectable and could have an appreciable effect on the water resource. Usability of potable source impacted short term or long term	Impact detectable and possibly affecting integrity of surroundings. Air quality testing would be required	Changes in airspace management and elevated use of airspace may need to be accommodated by modifying local routes or air control protocols	Impact clearly detectable; could affect local community; implementable mitigation provided to avoid impacts
Major	Substantial, highly noticeable change in the wetland, resulting in a significant impact to wetlands. This impact would require a permit and mitigation and/or the preparation of an EIS	Impact would have a potentially irreversible and permanent effect on the resource. This impact requires mitigation and/or the preparation of an EIS	Impact would have a significant impact on surroundings. This impact would require mitigation and/or preparation of an EIS	Changes in airspace management and elevated use of airspace could only be accommodated by creating new published routes or air control protocols through FAA coordination	Impact highly noticeable and would substantially influence individuals communities. This impact would require the preparation of a mitigation plan and/or preparation of an EIS

Table 4-1 (continued)

Impact Severity	Utility Systems	Hazardous Materials, Wastes & ERP Sites	Socioeconomic Resources	Cultural Resources	Visual and/or Aesthetics
Negligible	No measurable change to current use of utility system or demands on existing systems	Amount of waste from action is minimal (less than 1 percent of current volume), predominantly nonhazardous, and would be accommodated by current management systems	Impact not detectable, no discernible effect on socioeconomic environment	Impact barely perceptible and not measurable; confined to small areas or affecting a single contributing element of a larger National Register District with low-data potential	Impact not perceptible and not measurable; not affecting surroundings
Minor	Impact on demands to existing systems is measurable, but would remain localized, affecting an area that is unavoidable, such as repairing a pipeline or burying an upgraded electrical line	Amount of waste from action is less than 5 percent of current volume and would be accommodated by existing waste handling systems	Impact slightly detectable but would not affect overall socioeconomic environment	Impact perceptible and measurable, but would remain localized; affecting a single contributing element of a larger National Register District with low to moderate data potential, or would not affect character-defining features of a National Register eligible or listed property	Impact perceptible but not measurable; would remain localized.
Moderate	Impact sufficient to require changes in infrastructure components around local area of project	Amount of waste is 10 percent or more of existing waste stream or contains reportable quantities of hazardous waste	Impact clearly detectable and could have an appreciable effect on the socioeconomic environment	Impact sufficient to change a character-defining feature but would not diminish resource's integrity enough to jeopardize its National Register eligibility, or it generally would involve a single or small group of contributing elements with moderate to high data potential	Impact detectable and possibly affecting aesthetic integrity of surroundings.
Major	Impact or demands on existing system are sufficient to require changes in major infrastructure components on base or in the community	Amount of waste is over 50 percent of current waste stream; or existing waste handling system is near capacity or will exceed its capacity during implementation; or hazardous waste volume increases current levels that exceed current capacity to manage it	Impact would have a substantial, highly noticeable, potentially permanent influence on socioeconomic environment, or is perceived by another government agency as significantly affecting existing economic or social conditions	Substantial, highly noticeable change in character-defining features would diminish resource's integrity so much that it would no longer be eligible for National Register listing, or it would involve a large group of contributing elements or individually significant properties with exceptional data potential	Impact would have a significant impact on surroundings and would diminish the aesthetic qualities of the environment or resource permanently

4.1 GEOLOGICAL RESOURCES AND CLIMATE

An impact to topography is considered major if it would result in one or more of the following:

- Exposure of people or structure to major geologic hazards
- Occurrence of substantial erosion or siltation
- Uncontrolled release of chemicals/fuels into the environment
- Occurrence of substantial land sliding
- Substantial damage to project structures/facilities

A soil impact would be considered major if it would result in one or more of the following:

- Occurrence of substantial erosion or siltation
- Occurrence of substantial land sliding
- Substantial damage to project structures/facilities

An impact to climate is considered major if:

- It would result in an uncontrolled release of chemicals/fuels into the atmosphere

4.1.1 Potential Impacts

The following provides an evaluation of the environmental impacts to the topography, soils, and climate that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Topography

The potential impacts associated with the Proposed Action would occur from ground-disturbing activities in the project site within the airfield complex. Potential demolition and construction impacts associated with the beddown of the C-17 aircraft would not affect the overall topography of the area and therefore impacts are considered negligible.

Soils

Hickam AFB is located on land that has been filled, using weathered, hard, very broken coral under tan/gray silt topped off with coral sand. There is also a water table approximately 4-5 feet below the surface. Construction activities would involve soil disturbance. Most areas within the Hickam AFB airfield complex have been previously disturbed and are covered with either asphalt or concrete, some with minor vegetation. Unpaved areas with soil disturbance would undergo accelerated erosion, at least temporarily, until drainage structures are fully operational and vegetation has recovered in cleared areas. The use of erosion prevention BMPs, such as a silt barrier (filter fabric) around the construction site would minimize erosion and also prevent sediment loading of on-site drainage systems.

Runoff not collected and diverted to natural or man-made drainages would overflow on adjacent areas, increasing the local soil moisture regime. Increased runoff in these areas would result in localized increases in erosion, changes in soil nutrient transport and changes in the natural composition of vegetation. Altered vegetative composition would create changes in soil chemistry. These impacts have already occurred to a large degree at Hickam AFB because all the areas involved have been previously disturbed. Spillage of fuels, lubricates, hydraulic fluids and chemical substances (such as protective coatings to concrete and steel and bituminous sprays) could occur.

The physical disturbance of soils can arise from changes in ground conditions, land-take and clearance, compaction by heavy machinery during construction and soil movement, deep digging for foundations and piling. Such physical disturbance can lead to changes in the density and friability of soil, its moisture-

retaining ability, natural drainage and inorganic matter content. Measures such as applying water or barriers to restrict erosion of exposed soils would be used. Implementation of sediment and erosion control plan as well as BMPs would reduce the impact. Construction and demolition activities associated with the beddown activities would not affect the underlying geological structure of the area. Potential impacts to the soils at Hickam AFB would be minor and temporary.

Climate

Climatic conditions on Hawaii are extremely consistent. Fixed weather patterns can be attributed to the year-round warm sea temperature, which keeps the overlying atmosphere warm as well. Only two seasons are evident in Hawaii, summer and winter, with only an average temperature difference of seven degrees between the two. The Proposed Action would have negligible impacts on the climate. No uncontrolled releases of chemicals or fuels would be anticipated.

Lightning DZ, Oahu

The Lightning DZ is currently being utilized for parachute drops. Under the Proposed Action, similar operations would continue but with different aircraft. The number of drops is estimated to be 100 per month, using 2 planes for each mission. Because the area at the Drop Zone is already disturbed, there are no anticipated additional impacts to topography, soils, or climate. Impacts to topography, soil, and climate under the Proposed Action, are considered negligible.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on geological resources and climate.

4.1.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Potential demolition and construction impacts associated with the beddown of the C-17 aircraft would not affect the overall topography of the area and therefore impacts are considered negligible. Construction and demolition activities associated with the beddown activities would not affect the underlying geological structure of the area. Potential impacts to the soils at Hickam AFB would be minor and temporary. No uncontrolled releases of chemicals or fuels would be anticipated. The Proposed Action would have negligible impacts on the climate.

Alternative 1, No Action Alternative:

No impacts to topography, soil, or climate would result from implementation of Alternative 1.

4.2 LAND USE

Land use includes the land on and adjacent to each proposed project site, the physical features that influence current or proposed uses, pertinent land use plans and regulations, and land availability. Conformity with existing land use is of utmost importance.

An impact to land use would be considered major if one or more of the following occur as a result of the Proposed Action:

- Conflict with applicable ordinances and/or permit requirements;
- Nonconformance with the current Hickam AFB General Plan, land use plans, preclusion of adjacent or nearby properties being used for existing activities; or
- Conflict with established uses of an area requiring mitigation.

4.2.1 Potential Impacts

The following provides an evaluation of the environmental impacts to land use that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

The proposed demolition of facilities and the construction of C-17 support facilities would take place within the Aircraft Operations and Maintenance area, and is consistent with current land use designations in the Hickam AFB General Plan. However, the activities associated with C-17 support and maintenance would increase relative to the amount of current, but similar, activities.

The Hickam AFB *General Plan* that is used to designate land uses on the installation takes into account the findings of the *Air Installation Compatible Use Zone (AICUZ)* study. The AICUZ program was established to assist planners on military bases that contain airfield facilities by identifying areas that must be reserved because of safety and noise considerations. Computer models are employed to estimate the potential noise levels based on aircraft types and the frequency of operations. Additionally, areas that have the potential to be subject to aircraft accidents, such as near the ends of the runways and along adjoining taxiways, are delineated. Land uses are prescribed so that resident and employee populations are protected from these hazards by building occupied facilities away from these areas and only allowing airfield-related activities near the high-hazard areas.

The land use designation of the proposed C-17 aircraft maintenance facilities area would remain the same, as an area designated for "airfield operations and maintenance." The proposed construction sites for the Flight Simulator and Squadron Operations facilities are located in an area currently designated as "open space". Increases in the amount of aircraft operations and maintenance activities that are anticipated and the noise generated from the temporary construction and long term operation of aircraft at these sites would result in minor impacts to the land use and surrounding areas that include military family housing.

Therefore, a portion of the Proposed Action would require a change in current and future planned land use designations as they are shown in the Hickam AFB General Plan and, therefore, these changes to land use are expected to have a moderate impact.

Lightning DZ, Oahu

The Lightning DZ is currently being utilized for parachute drops. Under the Proposed Action, similar operations would continue but with different aircraft. Because the area at the Drop Zone is already disturbed, there are no anticipated additional impacts to land use. Impacts to land use at Lightning DZ, under the Proposed Action, are considered negligible.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on land use.

4.2.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Under the Proposed Action, increases in the amount of activities that are anticipated and the noise generated from the temporary construction and long term operation of aircraft at this site would result in moderate impacts to the land use of the site. A change in the current land use designation in the proposed construction areas of the Flight Simulator and Squadron Operations facilities would be necessary.

Alternative 1, No Action Alternative:

There will be no effect on land uses under the No Action Alternative.

4.3 COASTAL ZONE MANAGEMENT

An impact to the coastal zone is considered major if it would result in a deterioration of the coastal ecosystems by negatively affecting:

- The coral reef ecosystem;
- Coastal scenic and open space resources;
- The valuable coastal economy (harbors and ports, energy facilities, visitor facilities);
- Coastal ecosystem (resulting in stream flooding and erosion, subsidence, and pollution);
- Beaches (public use and beach recreation); and
- Ocean and other marine resources.

4.3.1 Potential Impacts

The following provides an evaluation of the environmental impacts to the coastal zone, coral reef ecosystem, and other marine resources that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

As appropriate, potentially impacted coastal zones will be addressed in the design package of the construction projects included in the Proposed Action. The environmental protection considerations and BMPs that are relevant to protection of the coastal zone resources that will be included in the final designs will be reviewed under the State CZM program by the DBEDT.

Coastal zone

According to the US Geological Survey's Hawaii Beach Monitoring Program, erosion is widespread and locally severe in Hawaii and other low-latitude areas. Typical erosion rates in Hawaii are in the range of 15 to 30 cm/yr. Recent studies on Oahu have shown that nearly 24 percent, or 27.5 km (17.1 mi) of an original 115 km (71.6 mi) of sandy shoreline (1940s) has been either drastically reduced (17.2 km; 10.7 mi) or lost (10.3 km; 6.4 mi). Nearly one-quarter of the islands' beaches have been degraded over the last half-century and all shorelines have been affected to some degree. Although no demolition or construction activities would take place near Hickam AFB's shoreline, BMPs will be employed to control construction runoff. Therefore, no impacts to the coastal zone are anticipated.

Coral reef ecosystem

Boat anchors, sewage discharges, and runoff from terrestrial sediments can smother and kill living coral reefs. Because the demolition and construction activities would take place within the airfield complex and BMPs will be employed, no impacts to the coral reef ecosystem are anticipated.

Marine resources

As stated above, demolition and construction activities would take place within the airfield complex with BMPs in place, and not near any coastal area where marine resources are located; therefore, only negligible impacts to marine resources would occur. The Proposed Action would not affect the Hawaiian monk seal or any other endangered species.

Lightning DZ, Oahu

The Lightning DZ is not within the coast zone management area.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on coastal resources.

4.3.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

BMPs will be employed to control construction runoff; therefore, no impacts to the coastal zone, coral reefs, or any other marine resources, are anticipated at Hickam AFB.

Alternative 1, No Action Alternative:

There will be no impact to marine resources of any kind, at any of the proposed sites, under the No Action Alternative.

4.4 FLOODPLAINS

Impacts related to floodplain management include:

- Potential damage to structures located in the floodplain; and
- Changes to the extent, elevation, or other features of the floodplain as a result of flood protection measures or other structures being sited in or removed from the floodplain.

E. O. 11988, "*Flood Plain Management*," requires federal agencies to avoid actions, to the extent practicable that will result in the location of facilities in floodplains and/or affect floodplain values. Crossing floodplains with overhead transmission lines or burying pipelines in floodplains is often unavoidable. Most impacts to floodplains can be mitigated.

4.4.1 Potential Impacts

The following provides an evaluation of the environmental impacts to floodplains that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Demolition and construction activities would not occur near a floodplain; therefore, the Proposed Action would have no impacts to floodplains at Hickam AFB.

Lightning DZ, Oahu

Not Applicable.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on floodplain resources.

4.4.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Implementation of the Proposed Action would have no impacts to floodplains at Hickam AFB.

Alternative 1, No Action Alternative:

There will be no effect on floodplain resources under the No Action Alternative.

4.5 BIOLOGICAL RESOURCES

An impact to biological resources would be considered major if the Proposed Action would:

- Affect a threatened or endangered species;
- Substantially diminish habitat for a plant or animal species;
- Substantially diminish a regionally or locally important plant or animal species;
- Interfere substantially with wildlife movement or reproductive behavior;
- Result in a substantial infusion of exotic plant or animal species;
- Destroy, lose, or degrade wetlands (as defined by Section 404 of the Clean Water Act);
- Fill a wetland.

4.5.1 Potential Impacts

The following provides an evaluation of the environmental impacts to vegetation, wildlife, rare, threatened and endangered species, and wetlands that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Vegetation

The proposed demolition and construction site for the Proposed Action has no vegetation and is a highly disturbed and mostly paved area. If necessary, BMPs to control possible runoff from small denuded areas will be employed. Therefore, negligible impacts to vegetation would occur.

Wildlife and Rare, Threatened and Endangered Species

The proposed demolition and construction at the C-17 beddown site contains no recognized wildlife resources or suitable habitat. Because of the bird air strike potential, birds and the type of habitat that attracts wildlife, are discouraged and rigorously managed, in this airfield complex area. The Hawaiian stilt is managed by the Hickam AFB INRMP and further studies in coordination with the USFWS are planned for proper management and protection. Neither the stilt, nor the Hawaiian monk seal are found within the airfield complex. Therefore, under the Proposed Action, negligible impacts to wildlife and rare, threatened and endangered species would occur.

Wetlands

The proposed demolition and construction site contains no jurisdictional wetlands; the area is mostly concrete paved. Therefore, under the Proposed Action, no impacts to wetlands would occur.

Lightning DZ, Oahu

The Lightning DZ is currently being utilized for parachute drops. Under the Proposed Action, similar operations would continue but with different aircraft. Because the area at the Drop Zone is already disturbed, there are no anticipated additional impacts to biological resources. Impacts to biological resources at Lightning DZ, under the Proposed Action, are considered negligible. According to correspondence dated 3 March 2003, from the USFWS, there is no critical habitat or federally listed species in the area.

Alternative 1 No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on wetlands, wildlife, or threatened or endangered species.

4.5.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Under the Proposed Action, negligible impacts to wildlife and rare, threatened and endangered species would occur at Hickam AF and Lightning DZ.

Alternative 1 No Action Alternative:

There will be no impact to wetlands, wildlife, and threatened or endangered species at any of the proposed sites, under the No Action Alternative.

4.6 WATER RESOURCES

Impacts to water resources, including surface water, groundwater, and wells, are considered major in severity if:

- Water resource availability, quality, and beneficial uses are irreversibly diminished;
- The action results in a reduction in water availability or interferes with a potable supply or water habitat;
- The action creates or contributes to overdraft of groundwater or exceeds a safe annual yield of water supply sources;
- The action results in an adverse effect on water quality or an endangerment to public health by creating or worsening adverse health hazard conditions;
- Results in a threat or damage to unique hydrological characteristics; or
- Violates an established law or regulation that has been adopted to protect or manage water resources of an area.

4.6.1 Potential Impacts

The following provides an evaluation of the environmental impacts to water resources that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Implementation of the Proposed Action is expected to have no adverse effects on water quality. The Proposed Action would cumulatively increase the impervious surface area and runoff on the base. Adherence to proper engineering practices, ordinances, and applicable codes would reduce storm water loading of adjacent surface waters to a level of insignificance. Compliance with HAR, Chapter 11-55, requires that erosion and sedimentation controls will be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. HAR compliance dictates:

- A mechanism requiring the implementation of proper erosion and sediment control
- Procedures for site plan review of construction plans
- Procedures for site inspection and enforcement of control measures
- Procedures for the receipt and consideration of information submitted by the public
- BMPs and measurable goals

Inherent in the Rule is the requirement to develop a mechanism for permitting construction activities that disturb between one and five acres. The permit program has the following requirements:

- Requirements for construction site operators to implement appropriate erosion and sediment control
- Requirements for construction site operators to control waste that may cause adverse impacts to water quality
- Requirements for construction site operators to develop and implement a storm water pollution prevention plan

- Requirements to submit a site plan for review that incorporates consideration for potential water quality impacts

The operator of each construction site must procure a construction permit in accordance with the Base's approved NPDES, Storm Water Phase II program.

The new construction, as part of the Proposed Action, will create approximately 9.6 ac. of new impervious surface. This surface will, on the average, generate an additional 5.4 million gallons of runoff per year. As part of its pollution prevention activities, Hickam AFB has implemented, or plans to implement storm water BMPs base-wide. These BMP are used in preventing or reducing pollution of storm water runoff. Monitoring potential contaminants in storm water is a critical element in storm water BMPs. Based on previously established monitoring locations by the Environmental Flight, storm water runoff from the new facilities may be uniquely characteristic and could require monitoring.

Lightning DZ, Oahu

Surface water in the area of the Lightning DZ exists as small streams within steep channels. Erosion of soil from bare surfaces of the DZ may result in increased turbidity during rainfall events. Under the Proposed Action, impacts to water resources near the Lightning DZ are considered negligible to minor.

Alternative 3, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on water resources.

4.6.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Implementation of the Proposed Action and associated operations and maintenance activities would not create extraordinary demands on water resources nor involve any activities that would significantly affect surface or groundwater resources provided that BMPs are instituted for minimizing waste and contamination in surface runoff. Impacts to water resources would be negligible to minor.

Alternative 1, No Action Alternative:

No impacts to water resources beyond existing baseline conditions would occur under the No Action Alternative.

4.7 AIR QUALITY

An impact to air quality is considered major if it would result in one or more of the following:

- Increase ambient air pollution above any NAAQS;
- Contribute to an existing violation of any NAAQS;
- Interfere with or delay timely attainment of NAAQS;
- Impair visibility within any federally mandated PSD Class I area.

With respect to the General Conformity Rule, impacts to air quality would be considered significant if emission increased a nonattainment or maintenance area's emissions inventory by ten percent or more for individual nonattainment pollutants; or exceeded *de minimus* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants for pollutants for which an area has been redesignated as a maintenance area. No Class I area is located within 100 miles of Hickam AFB, so an assessment of impacts from the new facility on Class I areas was not required. A conformity analysis is not required in an attainment area.

Air emissions resulting from the Proposed Action were evaluated in accordance with federal and state air pollution standards and regulations. The emissions were estimated and compared with baseline emissions to assess changes in emissions. The analysis included construction, demolition, paving, and worker commuting within the area affected by the Proposed Action and/or the Alternative. Operation of the largest single potential source associated with the Proposed Action, the Corrosion Control Facility, was also evaluated for emissions impact.

4.7.1 Potential Impacts

The following provides an evaluation of the environmental impacts to air quality that may result from implementation of the Proposed Action, and the use of the Lightning DZ. A conclusion further summarizes each alternative. The potential air quality impacts of the Proposed Action include temporary construction-related emissions. The majority of pollutants, including dust (i.e., PM₁₀, a criteria pollutant), generated from beddown-related activities would occur from demolition, construction, and paving. Other temporary emissions would occur from the operation of construction equipment and construction workers commuting to and from the work site.

Proposed Action

Hickam AFB, Oahu

The Proposed Action consists of 16 projects listed in Chapter 2. Planned projects include construction, demolition, and paving. Emissions from these activities were estimated based on composite calculations for emissions generated C-17 beddown planning and analysis for McGuire Air Force Base, McChord Air Force Base, and the Air National Guard Base located at Jackson, Mississippi International Airport. Emissions for these projects were based on using emission factors from the South Coast Air Quality Management District and USEPA developed models. Projected annual emissions include VOCs, NO_x, CO, SO_x, and PM₁₀ and are summarized in Table 4.7.1-1.

Table 4.7.1- 1 Annualized Construction Emissions

Project	Annualized Emissions (tpy)				
	VOC	NO _x	CO	SO _x	PM ₁₀
Construction of C-17 Facilities at Hickam ¹	8.69	11.89	21.19	1.69	11.29
Demolition of C-17 Project Related Facilities at Hickam ²	0.53	2.04	4.32	0.11	1.62
Paving of C-17 Project Related Facilities at Hickam ²	0.05	0.29	0.25	0.23	0.29

Note: 1. These estimates represent the total expected emissions from all construction projects contained in the facility beddown proposal. Estimated emissions will occur at this rate based on 24 construction/month schedule. 2. These estimated emissions will occur at this rate based on 12 construction/month schedule.

Facility Operations

Corrosion Control Facility Emissions

To assess potential impacts on air quality as a result of the proposed action, air emissions resulting from the operation of the proposed facilities were evaluated. Current designs indicate the negligible generation of emissions for all but the proposed Corrosion Control Facility. In assessing these emissions, information was accessed from multiple C-17 Beddown efforts, including a Paint and Strip Facility specific supplemental

environmental assessment conducted for the 172nd Airlift Wing, Mississippi Air National Guard, Jackson Mississippi, in January 2002 and an environmental assessment for the C-17 Beddown at McChord AFB, Washington in 1997. In general, the regulations that apply to assess impacts from the proposed facility include PSD and Title V (CSP). For both PSD and Title V (CSP), the emissions resulting from the Corrosion Control Facility were assessed against major source thresholds. This assessment included the changes in overall facility emissions by adding the new emissions to the existing emission baseline. The assessment included emissions generated from all operations that would occur in the Corrosion Control Facility (washing aircraft, spot painting aircraft, component repair and painting, and associated emission control and ventilation of the facility).

The approach to the air quality analysis was to estimate emission levels for the proposed Corrosion Control Facility and compare these emissions with the baseline emissions, Table 4.7.1- 2. The Corrosion Control Facility does not represent a major emission source. The potential air quality impacts of the Corrosion Control Facility include emissions generated from operational emissions from washing, spot painting of C-17 aircraft, and aircraft component maintenance. Emission estimates of criteria pollutants and HAPs were performed for the proposed Corrosion Control Facility.

The proposed Corrosion Control Facility will be designed to spot paint C-17 aircraft and associated support equipment. Emissions were based on this design basis, coupled with material and usage rates from similar activities conducted on C-17 aircraft by Boeing at the Boeing Aerospace Support Center (BASC) in San Antonio, Texas and Long Beach, California. BASC estimated paint usage for spot painting the C-17 is eight to sixteen gallons of paint per aircraft per year and four to eight gallons of primer per aircraft per year. Based on current design, the Hickam AFB corrosion control facility will parallel the requirements of the recent corrosion control effort contained in the EA for the C-17 beddown on McChord AFB, Washington. The C-17 will be fully painted as required at a depot level location.

Under the Proposed Action, the majority of dust (i.e., PM_{10} , a criteria pollutant) generated from construction activities would occur from vegetation removal and grading. The increased pollutant emissions resulting from construction would have short term adverse impacts that would be mitigated through BMPs such as soil stabilization, watering exposed soils, worker ride sharing, and seasonal scheduling of construction. Fugitive construction emissions would cease upon completion of the projects. Therefore, long term impacts resulting from the Proposed Action would be negligible. Other temporary emissions would occur from the operation of construction equipment and construction workers commuting to and from the work site.

Hickam AFB as is currently designated as a major air emission source. Pending the results of the most recent air inventory (and subsequent CSP amendment), the permit application to segregate Hickam AFB from other sources, and the PSD compliance review in progress, requirements for PSD permits to construct should be evaluated based on the final design of each project. It will take several months to complete the evaluations of Hickam AFB's compliance status. The Corrosion Control facility may require a PSD permit to construct and the subsequent application of Best Available Control Technology (BACT). If it is determined that the base is not mandated to install this technology, not doing so could severely restrict any future maintenance operations due to the impact of this operation on the current base totals. Designing for the BACT will ensure compliance today and in the future, whatever changes that may happen at Hickam.

Based on current information the Proposed Action would not change the requirement for a CSP. The impact of the Proposed Action is minor.

Table 4.7.1- 2 Summary of Hickam AFB Air Emissions with Proposed Corrosion Control Facility

	Carbon Monoxide (tpy)	Nitrogen Oxides (tpy)	Sulfur Oxides (tpy)	Volatile Organic Compounds (tpy)	Particulate Matter (tpy)
Current Baseline (Draft 2002 AEI)	1.32	1.04	0.28	2.43	0.14
Proposed Corrosion Control Facility Operation	4.2	19.3	0.0	1.3	1.4
TOTAL	5.52	20.34	0.28	3.73	1.54

Lightning DZ, Oahu

There are no anticipated additional impacts to air quality.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no change in air quality.

4.7.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

The impact of the Proposed Action is at Hickam is minor.

Alternative 1, No Action Alternative:

There will be no impacts to air quality under the No Action Alternative.

4.8 AIRSPACE MANAGEMENT

Impacts to airspace use are considered major in severity if the action would result in one or more of the following:

- Changes in airspace management that elevate frequency of use of airspace not currently accommodated by existing published routes and air control systems
- Proposed use of airspace would need to be established by modifying local routes or air control protocols
- Airspace use would require the creation of new published routes or air control protocols through FAA coordination.

4.8.1 Potential Impacts

The following provides an evaluation of the environmental impacts to airspace management that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

No changes to airspace management are proposed for Hickam AFB or HIA under the Proposed Action. The C-17 aircraft would follow the flight tracks and profiles currently used by C-130 aircraft. The traffic level would be similar to current C-130 aircraft traffic levels and would not require changes to current airspace management plans.

Lightning DZ, Oahu

Proposed action would include establishing an MTR corresponding with Lightning DZ approach and departure route. The centerline of this MTR would adhere to a currently utilized, locally published route. Aircraft utilizing the route would in VFR flight conditions under positive radar control. The actual amount of flights following this flight path would decrease which would not require any changes to current airspace management plans.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on airspace management.

4.8.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

No changes to airspace management would occur at HIA or Hickam AFB. The flight track to the Lightning DZ is proposed for conversion into an MTR but no significant changes to airspace and current flight patterns would occur. The impact to airspace under the Proposed Action would be negligible to minor.

Alternative 1, No Action Alternative:

No impacts to airspace would occur under the No Action Alternative.

4.9 NOISE

Noise impacts resulting from increased aircraft operations or changes in aircraft types are evaluated with respect to the potential for

- Annoyance; noise caused by aircraft operations can impact the performance of various every day activities such as communication and watching TV in residential areas.
- Hearing loss; the USEPA recommends limiting daily equivalent energy to 70 dBA, approximately 75 Ldn, to protect against hearing impairment over a period of 40 years.
- Sleep interference, which is of great concern in residential areas.
- Wildlife may show a startle response to high intensity, sporadic noise levels. However, studies have determined that there are no long term behavioral or breeding effects on animals caused by aircraft noise.

The standard threshold for determining at what point noise impacts become a nuisance is 65 Ldn. See Appendix B for a detailed discussion of how noise levels are measured and the reasoning behind the 65 Ldn threshold.

4.9.1. Potential Impacts

NOISEMAP Version 6.5, the Air Force aircraft noise prediction model was used to calculate the anticipated noise contours generated by aircraft landing at the specified airfields. Noise contours were modeled based on the flight tracks, altitudes, power settings, aircraft type and number of daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) flights per day.

The noise analysis was done based on 100 operations per month included with the current baseline conditions at each runway. In the event that the C-17 operations are going to be a replacement of current operations, the current operations were removed from the analysis.

The following provides an evaluation of the environmental impacts to noise that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Noise impacts from implementation of the Proposed Action at Hickam AFB would result during facility construction and during C-17 training and maintenance operations. Construction would occur over a two-year period. The impacts from the construction activities would be temporary in duration and would not create regional or permanent noise sources.

Maintenance activities for C-17 aircraft will create locally intense noise levels during engine run-ups and other operations and maintenance activities. These activities will be short in duration and occur infrequently and will not have an adverse impact on areas outside of Hickam AFB.

A switch from C-130 aircraft to C-17 aircraft at Hickam AFB would cause an increase in aircraft operation noise contours due to the jet engines on the C-17 that create more noise than the C-130 turbo prop engines. Completely disregarding the background noise created by HIA, the overall area of land within the 65 Ldn contour would increase by approximately 80 acres. About 14 acres of land currently within the 65 Ldn contour would be increased to the 70 Ldn contour. Table 4.9.1-1 summarizes the approximate areas of land within each contour. This information assumes that there is no impact on background noise contours by HIA.

Table 4.9.1- 1 Hickam AFB Approximate Future Noise Contour Area

Sound Level (In L _{dn})	Acres of Land	Percent Increase in Area
55 – 60	1,065	24 percent
60 – 65	237	- 5 percent
65 – 70	98	196 percent
> 70	14	NA*

***There was no land within the 70+ Ldn area under baseline military only operations.*

As noted in Chapter 3 the noise levels around Hickam AFB are dominated by the aircraft operations originating from HIA. The addition of 100 C-17 takeoff and landings each month amounts to less than 0.2 percent of the operations originating from HIA. When compared to the baseline impacts of HIA and taking into consideration the removal of C-130 operations, the impact of additional C-17 operations from Hickam AFB is negligible.

For example, in an area with a background noise level of 70 Ldn, such as many of the areas affected by noise from HIA, the addition of a 65 Ldn noise impact would only increase the noise level to 71.19 Ldn. This occurs due to the logarithmic scale on which noise is measured. The equation below details the formula for adding noise levels measured in Ldn.

$$P1 = \text{Noise Level 1}, P2 = \text{Noise Level 1}, P3 = \text{Combined Noise Level}, P3 = 10 \text{Log}_{10} [(10^{(P1/10)}) + (10^{(P2/10)})]$$

In order to dramatically increase the noise level of the surrounding areas, the noise from military operations at HIA would need to be of greater magnitude than the noise created by civilian aircraft. This effect could be compared to screaming next to a jet engine. Even with the additional noise created by a switch from C-130 to C-17 aircraft the contribution to noise levels around HIA would still be approximately 5 to 10 Ldn less than noise created by civilian aircraft, which dominate the noise profile of HIA. Potential noise contours at HIA and along the Lightning DZ flight track, based on computer modeling, are illustrated in Figures 4.9.1-1 and 4.9.1-2.

Lightning DZ, Oahu

Land under the route used for the Lightning DZ is currently not adversely impacted by aircraft operations. Under the Proposed Action, which includes 200 flights (100 drops with two planes) per month through the drop zone, the noise created by aircraft running operations would not increase to levels above 65 dBA Ldn.

The areas most impacted by the new operations would be land directly under the low level routes. The proposed route for the C-17 aircraft drops from 2,000 ft. (106.6 M) msl to 360 ft. (609.6 M) agl at the coast line and continues at this altitude until after the leaving the drop zone. Despite the low altitude of the aircraft they will not fly frequently enough to cause noise levels above 65 dBA Ldn. The most adversely impacted area would have a Ldn approximately 50 dBA, well below the standard 65 dBA threshold. This takes into account a removal of the HIANG C-130 operations, which account for approximately half of all operations at Lightning DZ, and the addition of 200 C-17 flights per month through the drop zone.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no change in noise generated at any of the sites.

4.9.2. Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Under the Proposed Action, the current noise contour originating from Hickam AFB would increase slightly, however these minor increases would be masked by the current operations originating from HIA that dominate the noise characteristics of the area surrounding Hickam AFB. Lightning DZ would have a increase in noise from the Lightning DZ MTR but none significant enough to increase any portion of the noise contour to over 65 Ldn. The highest anticipated impact of the proposed action would be minor.

Alternative 1, No Action Alternative:

There will be no impact on the current noise contours at any of the proposed sites, under the No Action Alternative.

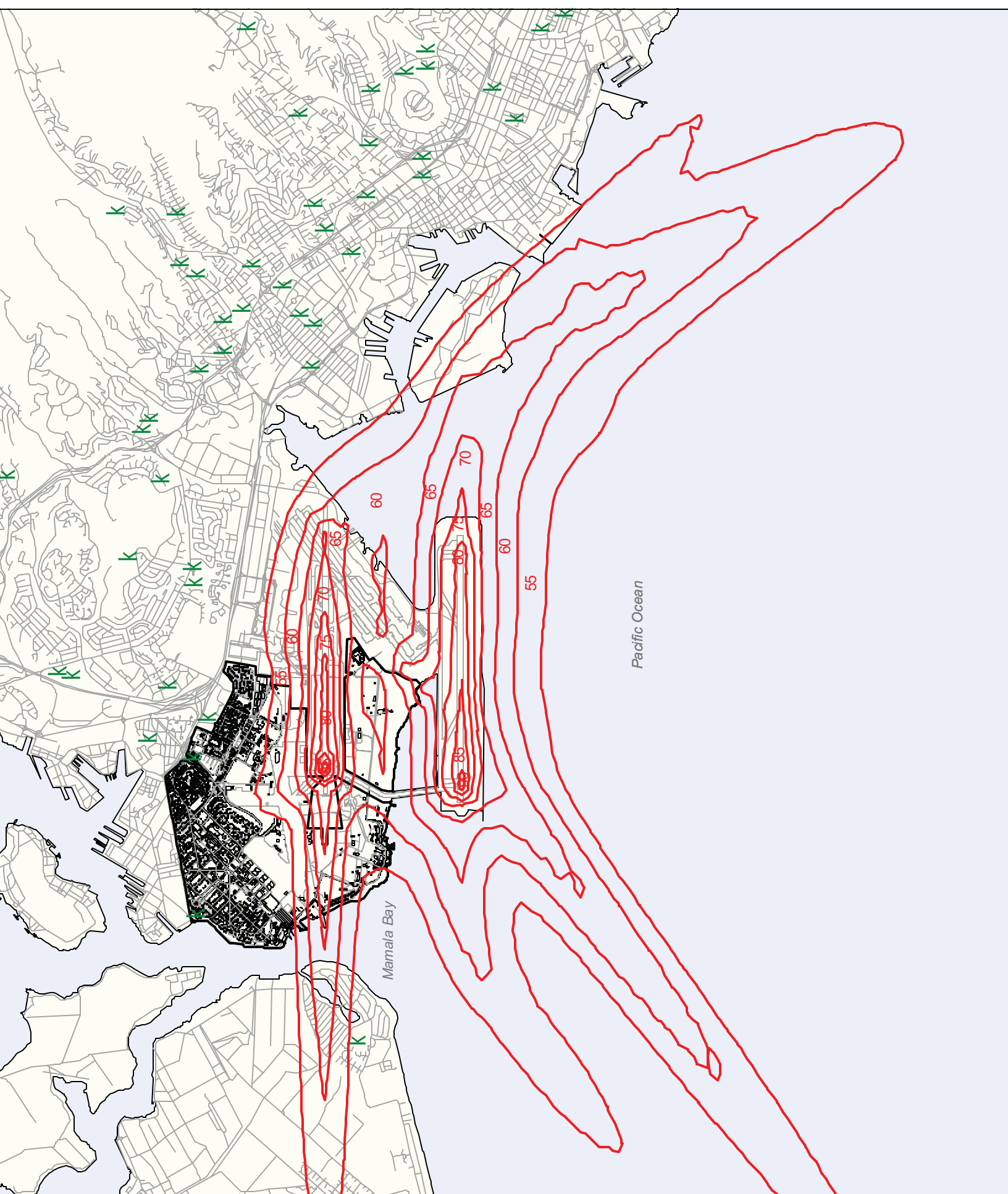


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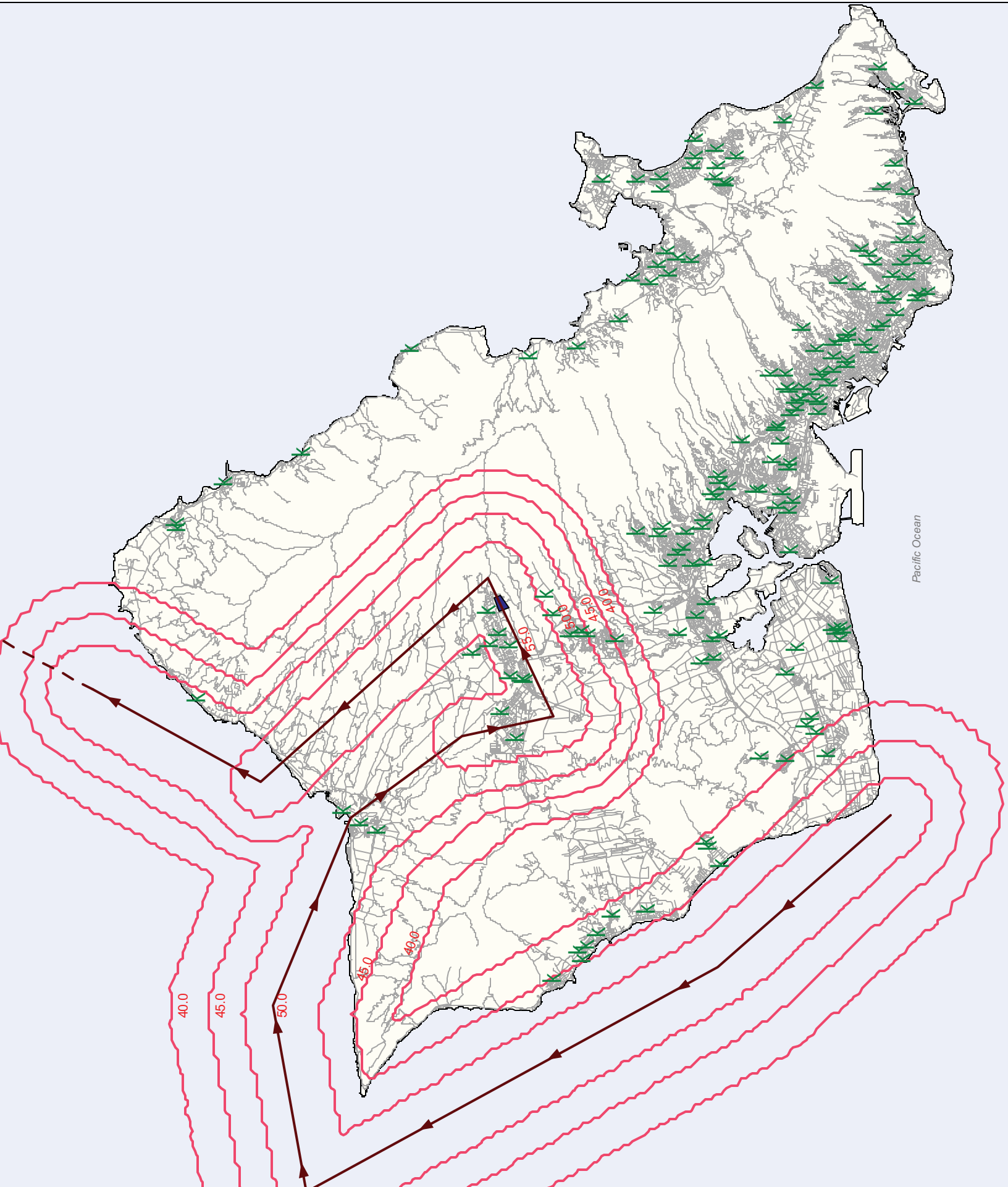


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4.10 SAFETY

An impact to safety would be major if it would result in one or more of the following:

- In an increase in risk to air crews, the public, and property
- In an increase in the likelihood of an aircraft accident, or other related mishap, that negatively affects air crews, the public or property over baseline conditions

4.10.1 Potential Impacts

The following provides an evaluation of the environmental impacts to flight safety, ground safety, and bird-aircraft strike hazards, that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Construction Safety

Implementation of the Proposed Action would slightly increase the short term risk associated with construction contractors performing work at Hickam AFB during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not pose a safety risk to base personnel or to activities at the base. Therefore, short term, minor negative effects on construction safety would be expected.

Flight Safety

Under the proposed action, in addition to Hickam AFB and HIA, the 15 AW/HIANG would continue to use other areas of military training airspace. These include the Low Altitude Tactical Navigation (LATN) and Lightning DZ on Schofield Barracks Military Reservation and four other drop zones. Based on statistics as of November 2002, the lifetime Class A Mishap rate for the C-17 model aircraft is 1.22 over a period of about 12 years in operation and over 410,690 cumulative flying hours. Considering this rate, and the estimated time spent in applicable airspace elements, Table 4.10-1 shows the statistically estimated time between Class A Mishaps for this aircraft operating in these airspace elements.

Table 4.10- 1 C-17 Mishap Projections

Airspace	Annual Sortie-Operations	Time in Airspace (In Hours per year)	Time Between Mishaps (In Equivalent Flying Years)
Hawaiian Airspace	1,200	1,600	10.5
Hickam AFB, HIA	1,200	200	84
Drop Zone Pattern	2,400	400	42

Given the current rate of C-17 Class A mishaps (1.22 per 410,690 hours = 46.882 years), this translates into about one mishap per 336,630 hours (= 38.43 years) of flying time. For eight C-17 aircraft stationed at Hickam AFB, this would be approximately one Class A mishap per 10.5 calendar years (336,000 hours) of its operation, given that each of the eight C-17 aircraft to be stationed at Hickam AFB could be expected to fly up to 4,000 hours per year, a total of 32,000 hours for the entire squadron per year. The anticipated amount of flying time for the C-17 aircraft will only be about 5 percent of the total squadron flight time (approximately 1,600 hours) in Hawaiian airspace due to the anticipated deployment of these aircraft elsewhere in accordance with current Air Force and AMC strategic policies. The rate of occurrence of a Class A mishap during 1,600 hours of flying time is calculated to be 0.0045 per year. Considering that flying time within a particular airspace (takeoff, landing, and DZ approach, etc.) are of very short duration (approximately 5 minutes per operation), the probability of a Class A mishap occurring during any one particular time frame is very low. This flying safety analysis is very general and does not include site-

specific factors such as weather conditions, topography, existing air traffic, navigational aids and radio capabilities, pilot experience, etc.

Ground Safety

Under this alternative, the 15 AW/HIANG associate unit would receive C-17 aircraft and modify their airlift mission. The fire and crash response capability currently provided by the HIANG at Hickam AFB is sufficient to meet all requirements. To support the mission change, some new facilities will be constructed, and other existing facilities will require modification. However, no construction activities will involve any unusual or extraordinary techniques. During construction and modifications, BMPs will be employed, and standard industrial safety requirements and procedures will be enforced, thereby minimizing any safety risks associated with these activities. Overall airport operations at HIA are anticipated to remain at a relatively stable level. No adverse impacts to ground safety are anticipated at the airfield.

Explosive Safety

The construction of ordnance storage facilities and appropriate designation of new Q-D buffer zones are included in the Proposed Action so that adequate storage and safety buffers will exist for all ordnance items that will be stored on the installation. Their design and site location would be in accordance with all federal regulations. No chaff or flares will be used in Hawaiian military training airspace associated with the Proposed Action. Use and handling of this ordnance during transport or actual emergency or wartime missions is governed by detailed operating procedures and coordinated with all applicable agencies, to ensure safety. The construction of new ordnance storage facilities and associated Q-D buffer zones in accordance with Air Force and other government regulations would be a minor long term impact to Hickam AFB safety.

Bird-aircraft Strike Hazards.

Continued implementation of the 15 AW Bird-Aircraft Strike Hazard Plan would minimize conditions giving rise to incidents involving birds. No significant, adverse effects would be expected as a result of the Proposed Action.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no change in noise generated at any of the sites.

4.10.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Implementation of the Proposed Action includes the construction of ordnance storage facilities to accommodate the ordnance related to the C-17 aircraft beddown. Establishment of additional Q-D safety zone would be required. Impacts to current flight, ground, explosive, and construction safety would be minor and long term.

Alternative 1, No Action Alternative:

There will be no affect on safety at any of the sites.

4.11 INFRASTRUCTURE

Effects on infrastructure are considered in terms of increases in demands on systems and the ability of existing systems to meet those demands. Potential effects to the environment could occur if the existing systems are insufficient to handle the increased demand requiring construction and operation of a new system that may affect the environment. Utility demands include both construction and operations usage. Utility demands during the operations phase are based on the additional facility square footage and

personnel requirements for any Proposed Action. Individual segments that comprise the totality of the infrastructure are discussed below.

Impacts to transportation are evaluated with respect to the potential for:

- Disruption or improvement of current transportation patterns and systems;
- Deterioration or improvement of existing levels of service;
- Changes in existing levels of safety; and
- Disruption and deterioration of airfield activities.

An impact to solid waste is considered major if:

- It results in an increase in solid waste such that it overwhelms H-Power, the City of Honolulu, and the Waimanalo Gulch Sanitary Landfill to a crisis situation.

Major sanitary sewer effects would include the following:

- Additional inflow and infiltration and increased loads on the WWTP that cannot be adequately treated
- Changes in wastewater composition that would alter WWTP processes or consistently cause upsets of the WWTP

Major effects on the potable water system could include:

- Reductions in potable water availability;
- Disruption of potable water distribution systems;
- Changes in water demands that affect regional potable supplies; and
- Negative effects on water quality due to contaminants generated by the Proposed Action or alternatives

Severity of impacts criteria for storm water conveyance systems would include:

- Flow obstructions and increases to the storm water drainage system
- Accelerated deterioration of the storm water drainage system
- Long term interruptions of storm water drainage system components

Severity of impacts on the electrical systems would include:

- Changes in regional electricity demands requiring major new components such as transmission lines, transformers, and substations
- Long term disruptions in available electrical services

Severity of impacts criteria for the heating and cooling system include:

- Increases in demand for heating and cooling above currently available capacities
- Long term interruptions in heating and cooling capacities and availability

Liquid fuel systems would pose major effects to the environment if there would be:

- Unsafe, inadequate, or noncompliant temporary or long term storage or distribution systems;
- Unreliable distribution of liquid fuels that cannot meet the mission and support requirements

4.11.1 Potential Impacts

The following provides an evaluation of the environmental impacts to transportation, solid waste, sanitary sewer, drinking water, storm water conveyance systems, electrical systems, and liquid fuels that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Implementation of the Proposed Action includes enhancements to the utility systems at Hickam AFB. Major impacts to all infrastructure elements would be realized as a result of implementing the Proposed Action if not for the infrastructure upgrades that have been designed into the overall scheme of the Proposed Action. These measures are scheduled for implementation in two separate phases for utilities along with two separate road projects to address transportation issues. Once implemented, these infrastructure upgrades will help alleviate potential negative impacts associated with the Proposed Action. These enhancements would be incorporated in the projects described briefly below:

Transportation

Implementation of the Proposed Action will include three road improvement projects. One project, designated as the Kuntz Gate and Road project, will expand Kuntz gate and provide an alternate, more direct route to the proposed C-17 Beddown Complex. Another project under the Proposed Action will change and enhance O'Malley Road to handle additional traffic flow in the area of the C-17 Beddown Complex. Lastly, transportation corridors that were utilized during the construction phase will be repaired.

Adverse potential impacts of transportation projects would include traffic congestion and detour routes resulting in longer commute times. Heavy trucks may also damage roads along designated hauling routes. The potential adverse effects as a result of transportation projects would be short term and temporary.

Positive potential impacts would be realized in additional force protection compliance measures engineered into the Kuntz Gate and Road project, which would bring Hickam AFB into compliance with ATRP directives. Traffic onto and around the base would be enhanced by the expanded road complex, especially for large transport vehicles, and parking would also be improved around the C-17 Beddown Complex. Implementation of the transportation projects described in the Proposed Action would result in minor and long term impacts.

Utilities Systems

Electrical Distribution Systems

The proposed C-17 Support Utilities, Phase I action would require approximately 1,000 meters (3,281 feet) of electrical distribution lines. A dedicated electrical distribution system with a 11.5 kV capacity would provide power to the C-17 squadron support complex. Components of the construction phase that are scheduled to be completed prior to the electrical system upgrade may create an additional load of 4 MVA to the Hickam AFB electrical system. After the completion of planned base-wide electrical system upgrades and implementation of the C-17 Beddown Support Utility Phase 1 action, the total electrical system capacity will be doubled to approximately 56 MVA. Cumulative impacts for a total new connected load of 13.1 MVA to the electrical utility system are summarized in Table 4.11.1-1.

Depending upon when the scheduled construction projects and utility upgrades are actually completed and come online, procedures for accommodating potential electrical overloads are proposed. The proposed Army LSV project would need to be connected directly to the Pearl Harbor "K" substation to alleviate the anticipated 2 MVA demand that otherwise would be imposed upon the Hickam AFB Bishop Point ("Back") substation. To avoid road and street closures, directional drilling for underground utility ducts would be employed where powerlines would cross. New transformers installed in the C-17 support areas would be designed to accept a dual radial service with integral primary switching. Sump pumps for dewatering utility ducts or manholes are not anticipated for the electrical system upgrades and new installations.

Sanitary Sewerage Collection System

Sewer mains would include 12-inch diameter pipes, lift stations, overflow alarms, and would be designed for proper gravity flow. Preliminary planning has proposed that the C-17 complex be provided with two main branches: one to service the corrosion control hangar (includes aircraft washing facility), aircraft

maintenance shops, home station check hangar, and the consolidated maintenance facility (total estimated population – 390); the other branch would service the flight simulator facility, squadron operations facility

Table 4.11.1- 1 Cumulative Impacts to Electric Utility System

FY	Project	Commission Date	Electrical Draw
03	Army Logistical Supply Vessel (LSV)/Bishop Pt.	Mar 04	2.0 MVA
04	C-17 Flight Simulator	Nov 05	1.0 MVA
04	C-17 Squad Ops	Feb 06	0.5 MVA
04	C-17 Consolidated Maintenance Complex	Mar 06	0.5 MVA
	TOTAL LOADING BEFORE ELECTRICAL UPGRADE		4.0 MVA (1.0 MVA over capacity)
05	Electrical Upgrade	Mar 06	Double Base Capacity
04	NAF Visitor's Quarters	Jun 06	1.5 MVA
04	C-17 Corrosion Control Hangar	Sep 06	4.0 MVA
05	Joint Mobility Center	Aug 06	1.5 MVA
05	PACAF HQ	Sep 08	0.5 MVA
05	C-17 Clear Water Rinse	Nov 05	0.5 MVA
05	C-17 Phase II Utilities (includes Pump House)	Mar 06	1.0 MVA
05	C-17 New MX Shop	Feb 06	0.75 MVA

(includes locker room, restrooms, and showers), fuel cell nose dock, and the proposed new fire station (total estimated population – 280).

The Proposed Action would require approximately 1,000 meters (3,281 feet) of sanitary sewer mains. The existing sanitary pump station No. 19 would be demolished and replaced with a two-pump system that will contain 6-inch diameter force mains. The Fort Kamehameha Sewage Treatment Plant has sufficient capacity to handle wastewater from the proposed C-17 support facilities.

A concurrent project to replace the aircraft hydrant fueling system pipelines in the area of the C-17 support area will involve the installation of 14-inch diameter fuel lines. Existing 6-inch and 10-inch diameter hydrant fuel lines are scheduled for removal from the proposed C-17 support area. Three underground storage tanks have also been identified in the construction area that include two near the existing C-130 nose hangars (Bldgs. 2020 and 2021) and one near the southeast corner of the AMC Passenger Terminal (Bldg. 2028). Soil contaminated with fuel from these pipelines, the storage tanks, and also two fuel system valve pits, identified as EA56J and EA56I, may be encountered during excavation and construction in the C-17 support area and during site work for the utility system upgrades. There is a potential and ongoing concern that wastewater contaminated with fuel is being introduced into the sanitary sewer system.

Communications (telephone and computer network)

These utilities would be designed with adequate capacity, security, and dependability to support the C-17 complex for eight permanently assigned aircraft, maintenance hangars, computerized training facilities, and squadron operations and administrative activities. The C-17 beddown includes the construction of training apparatus that uses environmentally sensitive electronic components with large electrical requirements and also air conditioning systems that adequately maintain air quality and ambient air temperatures.

Communications systems upgrades are planned as part of the Phase I utilities enhancements as described under the infrastructure portion of this chapter. Specific communications systems requirements for the C-17 Beddown support area components include the following:

System Requirements for C-17 Beddown Support Area Components:

- Compatibility with existing telephone and computer systems
- Provide communication pathways between the existing fiber optic networks
- Access points (TMH and THH) at not more than 450 ft. spacing intervals

Proposed communication system features

- The proposed Squadron Operations facility will be the main distribution point for all communication systems within the C-17 support area
- The proposed communication system will provide redundancy for backup and emergency purposes
- A common underground trench for the communication and electrical system lines will be used where feasible

The integration of the proposed communication system will be dependent upon the completion of the other component facilities in the C-17 support area. According to current schedules, the Flight Simulator Building may come online prior to completion of the Squadron Operations facility and may require a temporary communication system service link. Another potential issue regarding communication systems is satisfactory compatibility and integration between the HIANG-managed components with the 15 AW.

Potable Water and Storm Water Drainage

Operations and maintenance of the proposed facilities would create additional demands on water supply. These demands would be related to the additional increase of personnel working on Hickam AFB. There would also be an increased demand due to the operation of the clear rinse facility. The clear rinse facility will be designed to recycle the rinsate and should, based on current information, only minimal increase water/waste water resource demand. After all beddown facilities have been constructed and are operational, and all personnel brought onboard, the overall increase in demand for drinking water is estimated to be 3500 gallons per day.

The proposed C-17 Utilities Support, Phase II will include upgrades to the potable water system also include storm water drainage improvements to accommodate anticipated runoff from the proposed structures and pavement. The proposed site for construction of the C-17 support facilities does not currently contain a domestic water supply adequate for the maintenance hangars, consolidated maintenance complex, and squadron operations structures needed. The existing water distribution system is nominal for the current activities (two C-130 "nose dock" hangars, the flight services facilities, the fire station, and the air passenger terminal) and will not suffice for the proposed structures and activities due to large demands for domestic water and fire protection. Greater capacity is needed because of the specialized maintenance that includes: corrosion control on the C-17s composite surfaces (e.g. painting and fabrications) and fire suppression.

Specifications and guidance that would be included in the contracts to upgrade and install the C-17 support area utility systems would include:

- Appropriate permits to dig and to interrupt existing utility systems are required.
- Streets, curbs, sidewalks, parking lots, and other pavements and pedestrian amenities temporarily removed during construction would be replaced to match the existing designs.
- Encroachments or disturbances of traffic areas would be minimized and any disruptions of vehicular traffic lanes would be coordinated with Hickam AFB military police and safety authorities.
- Existing landscaping and vegetation will be minimally disturbed, particularly trees, so that root systems will not be damaged and construction activities under tree canopies do not harm them.
- It is recognized that groundwater occurs near the surface in the proposed construction area and that dewatering pumps may be necessary. Designed subsurface access areas and manholes may require permanently installed pumps.
- It is recognized that areas near the proposed construction sites may have been previously contaminated from past uses or incidents. Guidance will be provided to contractors to ensure that

discovered contamination is reported appropriately and that health and safety precautions will be taken, as necessary.

- The proposed construction site occurs in an area that has a probability of containing buried archeological artifacts. Guidance will be provided to contractors to ensure that discovered artifacts, remains, or features are reported appropriately.

Lightning DZ, Oahu

No permanent utility or communication systems exist at the Lightning DZ. Not Applicable.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB. There would be no change to the infrastructure at any of the sites.

4.11.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Implementation of the Proposed Action would result in moderate and long-term impacts to infrastructure and utility systems on Hickam AFB. Short term impacts, such as interruption of service or rerouting of traffic, most likely would occur during construction and upgrades to systems. Upon completion of the Proposed Action, improvements to the infrastructure at Hickam AFB are anticipated to result in long-term positive impacts. The highest level of environmental concern regarding infrastructure is anticipated to be moderate but short term.

Alternative 1, No Action Alternative:

The implementation of the Proposed Action includes significant upgrades to existing utility systems within mission-critical areas of Hickam AFB. Under the No Action Alternative where these upgrades would not be achieved in association with the C-17 beddown, planned utility upgrades would be evaluated and accomplished as necessary under other project tasks. No impacts to other installations under this alternative would occur.

4.12 HAZARDOUS MATERIALS, HAZARDOUS WASTE AND ENVIRONMENTAL RESTORATION SITES

Impacts to hazardous materials management would be considered major if the Proposed Action or Alternative:

- Resulted in noncompliance with applicable federal and state regulations;
- Increased the amounts generated or procured hazardous materials beyond current permitted capacities or management capabilities.

Impacts to health, safety, and pollution prevention would be considered major if the Proposed Action or Alternative:

- Results in worker, resident, or visitor exposure to hazardous substances.

Impacts to the IRP would be considered major if the Proposed Action or Alternative:

- Disturbed or created a contaminated site resulting in adverse effects to human health or the environment;
- Caused regulatory noncompliance.

4.12.1 Potential Impacts

The following provides an evaluation of the environmental impacts to hazardous materials, hazardous waste, or environmental restoration activities that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Hazardous Materials

Products containing hazardous materials would be procured and used during the proposed construction of base facilities and during the operation of the C-17 aircraft. The quantity of hazardous material used during construction would be minimal and of short duration. Contractors are responsible for handling hazardous materials in accordance with local, state, and federal guidelines. Therefore, hazardous material management at Hickam AFB would not be impacted by the proposed construction activities.

Implementation of the Proposed Action would require the procurement and use of hazardous materials on a continuing basis. The hazardous materials used would be similar to those currently used in support of C-130 operations. However, Hickam AFB currently supports only four C-130 aircraft and the Proposed Action calls for the beddown of at least eight operational C-17 aircraft (and one non-flying spare). Therefore, considerably more hazardous materials would be stored and used in operational support of the C-17 as opposed to the C-130. Adequate facilities exist or are planned as part of the Proposed Action, so as not to have an adverse impact on hazardous materials management. Impact is minor on existing installation hazardous material management facilities.

Hazardous Wastes

The quantity of hazardous waste generated as a by-product of construction activities would be negligible. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and state laws and regulation. Construction of the proposed facilities would impact on the base's hazardous waste management program.

The type, classifications, and sources of hazardous waste associated with the Proposed Action would be similar in nature to that currently produced at Hickam AFB. The volume of hazardous waste would be increased due to additional aircraft being based at Hickam AFB as a consequence of implementing the Proposed Action. The increased generation of hazardous waste would be the result of hazardous materials being introduced in support of C-17 maintenance. Adequate hazardous waste storage facilities exist or are planned as part of the Proposed Action to negate any adverse impacts of the Proposed Action.

Installation Restoration

The MAP for the Hickam AFB Environmental Restoration Program identifies several subsurface features in the area of the proposed C-17 Support Facilities complex with potential environmental concerns. Pipelines for an inactive hydrant fuel system traverse the site east to west and then northwest across Taxilane "HB" in the vicinity of Bldg. 2021. Site 028 contains runway underground storage tanks, areas of concern (EA41, EA56I, and EA56J), and other known contamination sites (AM06, southwest of C-17 Support Facilities area). These areas of concern are currently considered "closed" by regulatory authorities. However, in the event that subsurface contamination is discovered or removal of abandoned pipelines or other structures results in a release of petroleum products or other potential contaminants, the construction activities would be halted until an assessment of the situation can be conducted. Guidance for the continuance of construction would be dependent upon the evaluation of the area and characterization of potential impacts to health and the environment. If subsurface contamination is encountered during the implementation of the Proposed Action, the impact to hazardous waste management is moderate and short term.

Lightning DZ, Oahu

There are no hazardous materials used, or hazardous waste generated, by the Proposed Action at the DZ or within the MTRs. There are no environmental consequences with respect to hazardous materials and wastes at the Lightning DZ.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no effect on Hazardous Materials / Hazardous waste usages at any of the sites.

4.12.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Implementation of the Proposed Action would involve the need to store and use additional hazardous materials and would generate new hazardous waste streams, both within the long term and short-term time frames. Additionally, the site of construction of the C-17 support facilities would occur in an area known to contain an abandoned fuel pipeline, underground storage tanks, and potentially contaminated soil and groundwater. The impacts to hazardous materials, waste, and environmental restoration sites are estimated to be moderate. However, the Hickam AFB *Management Action Plan*, and existing hazardous materials and waste management plans would provide the necessary guidance for the proper handling of these substances and conditions throughout the proposed construction and long term C-17 operations and associated activities.

Alternative 1, No Action Alternative:

No impacts to hazardous materials, hazardous waste, or environmental restoration sites would occur under the No Action Alternative.

4.13 SOCIOECONOMICS

Socioeconomic effects are evaluated in terms of their direct effects on the area's financial situation and related effects on other socioeconomic resources, such as housing availability and community services. The magnitude of potential impacts can vary greatly depending on the location and characteristics of the Proposed Action. Table 4.13-1 provides a checklist of economic concerns.

To comply with E.O. 12898, ethnicity and poverty status in the study area have been examined and compared to the City and County of Honolulu and County of Hawaii (as applicable) to determine if any minority or low-income groups could be disproportionately affected by the Proposed Action and alternatives. Potential environmental justice (EJ) impacts from the Proposed Action and alternatives are discussed in this section. Table 4.13-2 provides list of social concerns identified by the scoping process of this EA.

Environmental health risks and safety concerns to children would be a cause for concern if children would be exposed to or likely to come in contact with or ingest products or substances that are hazardous to their health.

4.13.1 Potential Impacts

The following provides an evaluation of the environmental impacts to socioeconomics, EJ, and environmental health risks to children that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

While EJ communities have been identified in the area of Hickam AFB, the proposed action of aircraft conversion and related activities at Hickam AFB are not expected to result in any major socioeconomic or

EJ impacts within the surrounding area (reference Table 4.13-1). The proportion of low-income persons in the ROI for Hickam AFB is less than the City and County of Honolulu, with the exception of the neighborhood of Mapunapuna. Minority populations, however, are generally greater than the average for the City and County of Honolulu. A positive effect is expected in an increase in employment during the construction phase and the potential for additional employment opportunities to support the C-17 activities. This in turn provides a positive effect on the local economy due to the increase in population resulting in an increase in the use of restaurants, hotels, shops, and other businesses.

Table 4.13-1 Environmental Impact Checklist for Economic Concerns

Economic Value	Potential Effect	Comments
Recreation value	No	
Ecological Value	No	
Commercial Value	No	
Subsistence Value	No	
Intangible Value	No	
Economic Impact Values:		
Employment	Yes	Positive effect in an increase in employment during construction phase
Consumer Income	Yes	Potential minor positive effect
Business Income/Costs	Yes	Increase in local purchase of construction supplies
Private Property Values	No	
Tax Revenue	Yes	Minor positive effect.
Distribution of Effects		
Types of Businesses	No	
Population Affected	No	
Tribal Governments	No	
Other Affected Agencies:		
Local	Yes	During construction process and during operation of new facilities, there would be a temporary increase in population thus resulting in an increase in use of restaurants, hotels, and other businesses.
County	Yes	Same as above
State	Yes	Same as above
Federal	Unknown	
Other		

Noise impacts would result from facility construction and during C-17 training and maintenance operations. The negative impact of increased noise and traffic due to construction activities will be temporary. The noise impact of additional C-17 aircraft operations on Hickam AFB will be generally localized to the base area and will be part of the overall background noise that includes HIA operations. Therefore, impacts with regard to EJ are negligible.

During construction activities, there is the potential for runoff into the Hickam AFB streams affecting the fish population and coastal resources. BMPs will be employed to prevent runoff and contamination of surface water resources. Therefore, impacts with regard to EJ and subsistence fishing activities in this area are negligible.

E.O. 13045 requires that federal agencies identify and assess environmental health and safety risks that might disproportionately affect children (reference Table 4.13-2). The Hickam AFB community itself has the largest percentage of children per family among the community areas near the base and is greater than the percentage of children for the City and County of Honolulu. The Hickam AFB military family housing areas and the Hickam Elementary School are located near the area of the construction activities and may be affected temporarily but are not expected to be impacted permanently. Construction areas will be

adequately marked and barricaded to prevent inadvertent access by children or other unauthorized personnel. The Proposed Action is not expected to produce permanent or debilitating noise impacts or health and safety risks to children living in the vicinity of Hickam AFB.

Table 4.13-2 Common Social Concerns

Social Concern	Potential Effect	Comments
Impacts to minority and low-income populations	Minor	
Changes in ethnic or racial composition	No	
Influx or outflow of temporary workers	Positive Effect	Positive effect on the local economy in employment.
Community disruption or disintegration	Negative negligible to minor	Construction will have a temporary increase in noise and traffic.
Changes in land use patterns	No	
Changes in lifestyle	No	
Changes in social interactions, family ties, kinship patterns	No	
Displacement/relocation of business	No	
Changes in the ability to provide and deliver social services	No	
Changes in aesthetics or perceived environmental quality	Temporary negative negligible to minor	Construction activities are usually not aesthetically pleasing to see.
Changes in public health, safety, or perceived well-being	Minor	
Displacement of community facilities	No	
Changes in public vehicular access	Negative negligible to minor impacts	Construction projects may require temporary detours.
Changes in public pedestrian access	Negative negligible to minor impacts	Construction projects may require temporary detours.
Changes in recreation	None perceived	
Changes in leisure-time activities	No	
Changes in local employment opportunities	Yes	Temporary positive effect on local economy during construction process.
Changes in community tax base	Yes	Temporary positive effect on local economy.
Changes in commerce, recreation, or related services	No	
Impacts to Native Hawaiians	No	

No disproportionate or adverse impacts to these specific demographic groups are expected as a result of the proposed action.

Lightning DZ, Oahu

Concerns voiced by participants during the EA scoping sessions included safety concerns such as potential crashes, cargo dropped in error, and increased noise. Impacts in the area of Lightning DZ are expected to be the same as for the Hickam AFB area. Increased noise from the C-17 aircraft is expected to reach 50 dBA in the most impacted area, well below the 65 dBA threshold established for environmental impacts.

The airspace over Central Oahu is more congested than the area surrounding Hickam AFB. Increases in aircraft traffic may affect activities within the local traffic pattern that is used by commercial and general aviation. At the time of this EA, minimal increases in military activity in this area as a result of the Proposed Action were identified; therefore, impacts with regard to EJ are minor.

E.O. 13045 requires that federal agencies identify and assess environmental health and safety risks that might disproportionately affect children. The Proposed Action is not expected to produce noise impacts at regulated levels or measurable health and safety impacts. The Proposed Action would not pose any

adverse or disproportionate environmental health risks or safety risks to children living in the vicinity of the Lightning DZ.

No disproportionate or adverse impacts to these specific demographic groups are expected as a result of the Proposed Action.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no affect on EJ at any of the sites.

4.13.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

No disproportionate or adverse impacts to these specific demographic groups are expected as a result of the Proposed Action.

Alternative 1, No Action Alternative:

No disproportionate or adverse impacts to these specific demographic groups are expected as a result of the implementation of Alternative 1.

4.14 CULTURAL RESOURCES

An impact on historic properties and/or archaeological resources would be considered major if it resulted in one or more of the following:

- Physical destruction, damage, or alteration of all or part of the property
- Physical destruction, damage, alteration or removal from archaeological context of archaeological remains
- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register of Historic Places
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
- Neglect of a property resulting in its deterioration or destruction
- Transfer, lease, or sale of the property (36 CFR 800.9[b])

4.14.1 Potential Impacts

The following provides an evaluation of the environmental impacts to cultural resources that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Prehistoric

The proposed demolition and construction activities would have little impact on prehistoric cultural resources at Hickam AFB. The project site is highly disturbed, currently paved. However, the project area is located in an area referred to as "moderate probability Archaeological Resources Area." If artifacts are found during ground disturbing activities, actions at Hickam AFB will comply with the requirements of Section 106 of the NHPA; cultural resources management staff at Hickam AFB will be notified and the guidance in the Cultural Resource Management Plan for Hickam AFB will be followed; and the State Historic Preservation Office (SHPO) will be notified. Therefore, the Proposed Action is anticipated to have minor impacts on prehistoric

resources at Hickam AFB. However, the Air Force is currently assuring compliance with the NHPA by conducting a Section 106 consultation with appropriate state agencies and interested local organizations.

Historic

The proposed demolition and construction activities would have no impact on historic properties at Hickam AFB. The project site is highly disturbed, currently paved and in a “moderate probability Archaeological Resources Area.” The Air Force is currently assuring compliance with the NHPA by conducting a Section 106 consultation with appropriate state agencies and interested local organizations. If historic artifacts are found during ground disturbing activities, as stated above, Hickam AFB will follow all protocols as required by its responsibilities under Section 106. Cultural resources management staff will follow protocols for notifying the SHPO. Therefore, the Proposed Action would have minor impacts on historic resources at Hickam AFB.

Architectural

The proposed demolition and construction activities would have no impact on the architectural integrity of any of the historic properties at Hickam AFB. The design of the new C-17 support facilities would be compatible with the design of buildings in Hickam AFB’s Historic District as required in the Cultural Resource Management Plan for Hickam and in consultation with the SHPO. Therefore, the Proposed Action would have negligible impacts on architectural structures at Hickam AFB. However, the Air Force is currently assuring compliance with the NHPA by conducting a Section 106 consultation with appropriate state agencies and interested local organizations.

Lightning DZ, Oahu

Not Applicable.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no affect on cultural resources at any of the sites.

4.14.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

Because the Proposed Action would occur in an area considered to have a moderate potential to contain archaeological resources, proponents of the Proposed Action would follow applicable requirements to avoid negative impacts to these resources at the Hickam AFB. The Proposed Action would have moderate impact on prehistoric, and historic resources at Hickam AFB. By following the architectural style of existing historic buildings as required in the CRMP, the impact on architectural resources at Hickam AFB should be negligible.

Alternative 1, No Action Alternative:

There will be no affect on any type of cultural resource at any of the sites under the No Action Alternative.

4.15 OUTDOOR RECREATION

An impact to outdoor recreation would be considered major if one or more of the following would result:

- An adverse deterioration of a recreational facility (either a land resource, water resource, or a recreation access facility)
- The elimination of a recreation facility, such as a running trail, golf course, athletic court, sports field, park, playground, marina, or a beach

4.15.1 Potential Impacts:

The following provides an evaluation of the environmental impacts to outdoor recreation that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

None of the areas considered under this Proposed Action are currently used as outdoor recreation areas. Therefore, there are no impacts to outdoor recreation.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no affect on outdoor recreation at any of the sites.

4.15.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

The area being considered for the construction of the C-17 beddown facilities under the Proposed Action is not used as an outdoor recreation area. Therefore, there are no impacts to outdoor recreation at Hickam AFB under the Proposed Action.

Alternative 1, No Action Alternative:

Under the No Action alternative, there will be no affect on outdoor recreation at any of the sites

4.16 VISUAL RESOURCES/AESTHETICS

An impact on visual resources/aesthetics would be major if it resulted in one or more of the following:

- A change in the visual character, public value, and public awareness in an area
- A change in general community concern for visual resources in an area

4.16.1 Potential Impacts

The following provides an evaluation of the environmental impacts to visual resources/aesthetics that may result from implementation of the Proposed Action, and the use of the Lightning DZ.

Proposed Action

Hickam AFB, Oahu

Demolition and construction activities could have some temporary minor visual impact as work proceeds. The extent of the visual intrusion would fluctuate as the type of activity being undertaken varies. In particular, areas where demolition activities are taking place may appear unsightly for periods of time until the area is cleared of debris. The aesthetics of the environment would not be permanently affected, only temporary minor impacts from the demolition and construction activities would occur.

Lightning DZ

No impact on visual resources/aesthetics is anticipated for the Lightning DZ.

Alternative 1, No Action Alternative:

Under the No Action Alternative, the C-17 beddown, associated construction and personnel requirements at Hickam AFB, and change to airspace usage would not occur. There will be no affect on visual resources / aesthetics at any of the sites.

4.16.2 Conclusion

Potential impacts for each alternative are further summarized below.

Proposed Action

The aesthetics of the environment would not be permanently affected, only temporary minor impacts from construction activities would occur under the Proposed Action at Hickam AFB. Hickam AFB architectural guidelines will be followed during construction of new buildings so that this type of aesthetic enjoyment is preserved as well. In addition, there will be no impact on visual resources at Lightning DZ.

Alternative 1, No Action Alternative:

Under the No Action Alternative, there will be no affect on visual or aesthetic resources at any of the sites.

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5 CUMULATIVE IMPACTS

5.1 INTRODUCTION

This chapter provides a definition of cumulative impacts, a description of past, present and reasonably foreseeable actions relevant to cumulative effects, an assessment of the nature of interaction of the Proposed Action or Alternatives with other actions, and an evaluation of cumulative effects potentially resulting from these interactions.

CEQ regulations stipulate that the cumulative effects analysis within an EA consider the potential environmental impacts resulting from the “incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what the agency or person undertakes such actions” (40 CFR 1508.7). The scope must consider geographic and temporal overlaps among the Proposed Action and other actions. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, and local) or individuals.

Cumulative impacts are expected to be negligible to minor for most resources with BMPs employed to protect the resources.

5.2 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTION

The scope of the cumulative effect analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. There are no planned activities at Lightning DZ that would be impacted by proposed or scheduled events. Cumulative effects have been analyzed for Hickam AFB. There are no anticipated cumulative impacts to Hickam AFB due to the planned SAAF and its associated operations. SAAF training operations will take place on an existing approved SAAF training site until a new site is selected or constructed.

Table 5.2-1 provides a comprehensive listing of projects scheduled to occur at Hickam AFB, including Proposed Action related construction, with the potential to interact. The qualitative designations in this table – negligible, minor, moderate, and major – reflect the highest level of environmental concern among all of the sub-categories under each resource and all of the locations considered within the Proposed Action and Alternatives described in this EA. Most cumulative effects have been evaluated to be “none” to “minor.” Proper implementation of BMPs and adherence to compliance requirements further minimizes any cross-project effects. However, potential interactions of note include cumulative impacts of C-17 projects with Military Construction Projects (MILCON) funded electrical system upgrades, main and satellite fire station upgrades, sanitary sewer system upgrades projects and other funded construction projects. Without definitive project start time, impacts can only be qualitatively described. Anticipated impacts to utilities should be moderate at worst, and can be mitigated with cooperative planning and scheduling.

Project Element	Resources																
	Geology, Soils, Climate w. BMPs	Land Use	Coastal Zone w. BMPs	Floodplain w. BMPs	Biological w. BMPs	Water w. BMPs	Air w. BMPs	Aesthetics	Noise	Safety w. OSHA Compliance	Transportation	Utilities	Haz-waste/Lead/Pest w. RCRA compliance	Soc/Econ	Cultural w. CRMP compliance	Outdoor Rec	Aesthetics
C-17 Beddown																	
Proposed Action																	
Hickam AFB					*	*				*	*	*					
Lightning DZ					*	*				*	*	*					
Non-Appropriated Funds Construction																	
AAFES Mini-Mall																	
O'Club Alterations	*		*	*	*	*	*	*	*	*	*	*					
AAFES BX Expansion																	
VQ																	
Marina Complex																	
O'Club Expansion	*		*	*	*	*	*	*	*	*	*	*					
Other MILCON																	
FY02 MFH																	
Privatize MFH																	
FY03 MFH																	
Life Skills Clinic	*		*	*	*	*	*	*	*	*	*	*					
Military Dog Kennel																	
FY02 DLA Fuel Hydrant																	
Electrical System Upgrade	*		*	*	*	**	*			*	*	*	*	*	*	*	*
Repair Water Mains	*		*	*	*	*	*			*	*	*	*	*	*	*	*
Repair Sanitary Sewer																	
AMC Strat Ramp Expansion	*						*	*	*	*	*	*	*	*	*	*	*
FY04 DLA Fuel Hydrant	*						*	*	*	*	*	*	*	*	*	*	*
Joint Mobility Complex	*						*	*	*	*	*	*	*	*	*	*	*
Main and Satellite Fire Sta.	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Re-align A/C Parking Ramp																	
Library, Ed Center																	
Main Gate, AT/FP																	
Hot Cargo Pad Expansion																	
ADAL Fitness Center																	
Reserve Complex																	
FY04 MFH improvements																	
FY06 MFH improvements																	
FY07 MFH improvements																	
Traffic Bollards	*				*	*	*	*	*	*	*	*	*	*	*	*	*
Parking	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Traffic Circle	*			*	*	*	*	*	*	*	*	**	*	*	*	*	*
O&M Relocations (Hangars 2, 4, & 11)																	
Demolitions (35 buildings)																	
HIANG Master Plan																	
Key to impacts:	none to negligible	minor	moderate	major	*= short term	**= long term											

Table 5.2- 1 Cumulative Impacts from Ongoing and Concurrent Actions

6 LIST OF PREPARERS

Table 6-1 provides the names of those individuals that were responsible for the preparation of this Environmental Assessment. This list includes the key management personnel from the lead agency.

Table 6-1 List of Preparers of the Environmental Assessment

Name	Degree	Professional Discipline	Years of Experience
O'Donnell, Gary Chief, Environmental Planning 15 CES/CEV Hickam AFB, HI	B.S. Architecture M.S. Urban Design	Chief, Environmental Planning, 15 CES/CEV	20
Hagge, Gloria JM Waller Associates	B.S. Biology M.S. Urban Planning	Environmental, Natural Resources & Land Use & Cultural, Historical	28
Merrill, Mark JM Waller Associates	B.U.S. Civil & Environmental Studies M.S. System Management	Environmental Science, Program Management	27
Seyfarth, David JM Waller Associates	B.S. Civil Engineering M.P.A. Public Administration	Environmental Engineering, Project Management, Air	23
Woehrle, Carl JM Waller Associates	B.S. Electrical Engineering	Infrastructure, Program Management	23
Moyer, Robert JM Waller Associates	B.S. Applied Science M.S. Natural Resource Management M.S. Civil Engineering	Environmental Engineering	21
Matolcsy, Katherin JM Waller Associates	B.S. Civil Engineering B.S. Biology-Ecology	Environmental Engineering, Economics, Environmental Justice, Public Outreach	20
Jeter, Julie JM Waller Associates	B.S. Biology M.S. Wildlife & Fisheries Science	Biologist, Wildlife, RT&E Species, Cultural Resources	16
Dixon, Gregory JM Waller Associates	B.S. Environmental Science	Environmental Scientist, Hazardous Material, Hazardous Waste	8
Lou Schiff JM Waller Associates	B.S. Civil Engineering	Infrastructure	7
Schneider, Mike JM Waller Associates	B.A. Geography	GIS/Graphics	4
Hartman, Bret JM Waller Associates		GIS/Graphics	1
Moss, Herb JM Waller Associates	B.S. Geography	Environmental Science Natural Resources	1
Schroeder, Jeffery JM Waller Associates	B.S. Environmental Engineering	Environmental Engineering, Noise Contouring, Infrastructure	1
Scott, Terry JM Waller Associates	B.S. Resource and Environmental Studies	Environmental Science, Natural Resources	1
Cook, William JM Waller Associates		Administrative Record	22

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7 LIST OF REFERENCES, PERSONS, AND AGENCIES USED IN DEVELOPING THIS DOCUMENT

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 - _____. 2002f. Deliverable 7, Environmental Assessment for Five Airfreight Terminal Construction/Repair Projects at Hickam AFB, Hawaii. April.
 - _____. 2002g. Draft Supplemental Environmental Assessment for Upgrade of Electrical Distribution Lines Hickam AFB, Hawaii, Construction of an Administration/Storage Facility at the Officer's Club, Hickam AFB, Hawaii, Construction of a New Main Fire Station and a Satellite Fire Station, Hickam AFB, Hawaii, The Upgrade to the Water Distribution Mains at Hickam AFB, Hawaii. March.
 - _____. 2002h. Draft Phase 1 Environmental Baseline Survey. March.
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APPENDIX A

**INTERAGENCY INTERGOVERNMENTAL COORDINATION
ENVIRONMENTAL PLANNING CORRESPONDENCE**

APPENDIX A INTERAGENCY INTERGOVERNMENTAL COORDINATION ENVIRONMENTAL PLANNING CORRESPONDENCE

A.1 MAILING ADDRESS TABLES

The following table A.1-1. provides those points of contact necessary to the development of requirement documents for the EA.

*Table A.1-1. Mailing Address' To Points Of Contact Utilized In The
Development Of Planning Documents For This EA*

Army and Pacific Islands Section EPA Region IX (EPA SFD-8-3) Mr. Mark Ripperda 75 Hawthorne Street San Francisco, CA 94105	City & County of Honolulu Board of Water Supply Community Relations Information Officer 630 S. Beretania Street Honolulu, HI 96813
Commander, Pacific Division Naval Facilities Engineering Command 258 Makalapa Drive Suite 100 Pearl Harbor, HI 96860-3134	Department of Agriculture James J. Nakatani, Chairperson 1428 South King Street Honolulu, HI 96814
Department of Business, Economic Development and Tourism Dr. Seiji F. Naya Director No. 1 Capitol District Building, 250 South Hotel Street Honolulu, HI 96813	Department of Defense Office of the Adjutant General Edward L. Correa, Jr. Adjutant General 3949 Diamond Head Road Honolulu, HI 96816
Department of Health Clean Water Branch 919 Ala Moana Blvd Honolulu, HI 96814	Department of Land and Natural Resources Division of Forestry and Wildlife 1151 Punchbowl Street Room 325 Honolulu, HI 96813
Department of Land and Natural Resources Historic Preservation Division 601 Kamokila Boulevard Kapolei, HI 96707	Department of Land and Natural Resources Land Division 1151 Punchbowl St. Room 220 Honolulu, HI 96813
Department of Land and Natural Resources Division of Conservation & Resource Enforcement 1151 Punchbowl Street Room 311 Honolulu, HI 96813	Department of Public Safety Ted Sakai, Director 919 Ala Moana Boulevard Ste 400 Honolulu, HI 96814

Department of Transportation
Brian Minaai
Aliiimoku Hale Director
869 Punchbowl Street
Honolulu, HI 96813

U.S. Fish & Wildlife Service
Pacific Island Division, Room 6307
Mr. Paul Henson
300 Ala Moana Blvd
Honolulu, HI 96813

Hawaii Coastal Zone Management
Program
P.O. Box 2359
Honolulu, HI 96804

Historic Hawai'i Foundation
Mr. David Scott Executive Director
P.O. Box 1658
Honolulu, HI 96806

Hui Malama I Na Kupuna 'O Hawai'i Nei
Mr. Edward Halealoha Ayau Esq.
2117 Piilani Place
Honolulu, HI 96822

Department of Commerce and Consumer Affairs
Kathryn S. Matayoshi, Director
Princess Kamamalu
1010 Richards Street
Honolulu, HI 96813

National Marine Fisheries Services
Pacific Island Area Office
Mr. John Naughton
1601 Kapiolani Blvd., Ste. 1110
Honolulu, HI 96814-4700

National Oceanic and Atmospheric
Administration (NOAA)
Ms. Lauri Sullivan
75 Hawthorne H-8-5
San Francisco, CA 94105

Office of Hawaiian Affairs
Mr. Randall Ogata
711 Kapi'olani Blvd.
Suite 155
Honolulu, HI 96813

Office of the Governor
Governor Linda Lingle
State Capitol
Honolulu, HI 96813

Office of the Lieutenant Governor
Lieutenant Governor James R. Aiona Jr.
State Capitol
Honolulu, HI 96813

Sierra Club, Hawaii Chapter
Attention: Mr. Jeff Mikulina
PO Box 2577
Honolulu, HI 97803

State Department of Transportation
Honolulu International Airport
Mr. Ben Schlapak Head Planning Engineer
HDOT-AIR-EP
400 Rodgers Blvd, #700
Honolulu, HI 96819

State of Hawaii
Department of Land and Natural Resources
Mr. Peter Young
Kalanimoku Bldg, Room 130
1151 Punchbowl Street
Honolulu, HI 96813

State of Hawaii
Department of Health Hazard Evaluation and
Emergency Response Office (HEER)
Mr. Keith Kawaoka
919 Ala Moana Blvd, Room 206
Honolulu, HI 96814

The Nature Conservancy of Hawaii
1116 Smith Street
Suite 201
Honolulu, HI 96817

HQ HIANG/CS
Colonel Darryll Wong (Traditional Guardsman)
3949 Diamond Head Road
Honolulu, HI 96816-4495

The Honorable Daniel Akaka
141 Hart Senate Office Building
Washington, DC 20510

The Honorable Daniel Inouye
722 Hart Senate Office Building
Washington, DC 20510

The Honorable Neil Abercrombie
1502 Longworth House Office Building
Washington, DC 20515-1102

The Honorable Ed Case
P.O. Box 61005
Honolulu HI 96839

EnviroWatch, Inc.
Mr. Carroll E. Cox
P.O. Box 89-3062
Mililani, HI 96789

Hawaii Audubon Society
850 Richards Street, #505
Honolulu, HI 96813

Kauai Economic Development Office
4280-B Rice St.
Lihue, HI 96766

Office of Environmental Quality Control
P.O. Box 3378
Honolulu, HI 96801

Environmental Health & Safety Office
2040 East-West Rd
Honolulu, HI 96822

Environmental Protection Agency
P.O. Box 50003
Honolulu, HI 96850

Ahupuaa Action Alliance
2502A La-I Road
Honolulu, HI 96816

Conservation Council for Hawaii
P.O. Box 2923
Honolulu, HI 96802

EARTHTRUST
1118 Maunawili Road
Kailua, HI 96734

Green Valley Conservancy
1100 Alakea St., Suite 1303
Honolulu, HI 96813

Kauai Historical Society
P.O. Box 1778
Lihue, HI 96766-0137

Enterprise Honolulu
Attn: Katy Lum Won
737 Bishop Street, Suite 2040
Mauka Tower
Honolulu, HI 96813

Mr. Allen Goo
Director of Public Works
Bldg. 400, Wheeler AAF
U.S. Army Garrison
Schofield Barracks, HI 96857-5013

Director
Attn: Steven Tome
Public Works Division (LF-PP)
Boc 6308
MCBH Kaneohe Bay, HI 96863-3082

Mr. Peter Young
State of Hawaii
Department of Land and Natural Resources
Kalanimoku Bldg., Room 130
1151 Punchbowl Street
Honolulu, HI 96813

Commanding Officer
Captain Stephen E. Barker
Navy Public Works Center
400 Marshall Road
Pearl Harbor, HI 96860-3139

A.2 DOCUMENTS

The following pages in this appendix are the copies (electronic and hardcopy) of documents that were sent or received from all of the involved offices during the planning and implementation of this EA.



**DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES**

December 6, 2002

Title of Person or Office Contacted
Street Address of Person or Office Contacted
City State Zip Code of Person or Office Contacted

SUBJECT: Request Review and Coordination of Description of Proposed Action and Alternatives (DOPAA) for Proposed C-17 Aircraft Beddown at Hickam AFB, Hawaii

Dear Name of Person or Office Contacted,

The 15th Air Base Wing (ABW) at Hickam AFB proposes to beddown 8 new C-17 aircraft to replace the departure of 4 C-130's. In addition to this proposed beddown, the proposal includes the following activities:

- Alternative 1: (1) Aircraft beddown and operations at Hickam AFB; (2) the construction of C-17 aircraft support facilities at Hickam AFB; (3) personnel requirements to support the C-17 aircraft operations, maintenance and training; (4) aircrew training requirements including the construction of a new assault runway at Pacific Missile Range Facility (PMRF) at Barking Sands, island of Kauai, Hawaii.
- Alternative 2: (1) Aircraft beddown and operations at Hickam AFB; (2) the construction of C-17 aircraft support facilities at Hickam AFB; (3) personnel requirements to support the C-17 aircraft operations, maintenance and training; (4) aircrew training requirements including the use of the existing runway at Kaneohe Marine Corps Hawaii (MCH) by painting the runway to simulate a 3,500 foot runway.

Attachment 1 is a detailed DOPAA for your review.

In accordance with Council on Environmental Quality regulations implementing the National Environmental Policy Act of 1969, and Air Force Instruction 32-7061, the 15th ABW is preparing an Environmental Assessment (EA) for the proposed actions.

We request your assistance by reviewing the attached information and responding with your comments within 30 days to our consultant, J.M. Waller Associates, Inc. (JMWA). The point of contact at JMWA is Mr. Carl Woehrle who can be reached at (808) 263-0200 and/or (808) 781-1949. Please forward written comments to Mr. Woehrle at:

J.M. Waller Associates, Inc.
Attn: Mr. Carl Woehrle
459 N. Kalaheo
Kailua, Hawaii 96734

Sincerely,
GARY O'DONNELL
Chief, Environmental Planning Element
15 CES/CEVP

1 Attachment:
DOPAA



Online archives from The Kauai Garden Island.

March 02, 2003

Air Force wants to use PMRF for aircraft training

By LESTER CHANG - TGI Staff Writer

Meeting on proposal at Waimea

The Air Force has scheduled a meeting at the Waimea Neighborhood Center on Thursday, March 6 from 7 to 9 p.m. to gauge public opinion about the possibility of using a runway at the Navy's Pacific Missile Range Facility for training missions.

The training missions are being considered as part of a larger proposal by Congress to station eight C-17 aircraft at Hickam Air Force Base on O'ahu.

"The evaluation is to see if Barking Sands could be an alternative for short field runway training for the new planes that are coming," said Lt. Christopher Anderson of the public affairs office at Hickam Air Force Base.

That option will be discussed at the Waimea meeting.

Hickam officials also will discuss the proposal to locate the C-17 aircraft at the O'ahu air base to replace four C-130s, to build support structures and a shortfield runway and to use drop zones for equipment and personnel, Anderson said.

Kaua'i residents will be asked to give comments before an environmental assessment on the proposal is completed, Anderson said.

"We want to keep the community involved so they can have their say on it," the Air Force official said.

The Air Force also must get approval from the Navy before the plan involving the training flights can be implemented.

Staff writer Lester Chang can be reached at 245-3681 (ext. 225) and <mailto:lchang@pulitzer.net>



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
1-2-2003-SP-103

MAR -4 2003

J. M. Waller Associates, Inc.
Attn: Mr. Carl Woehrle
459 N. Kalaheo
Kailua, HI 96734

Dear Mr. Woehrle:

The U.S. Fish and Wildlife Service (Service) has reviewed the Department of the Air Force's January 28, 2003, letter requesting a list of rare, threatened, and endangered species and critical habitat for the proposed C-17 Aircraft Beddown Project at Hickam AFB, Hawai'i. The project sponsor is the the Department of the Air Force (DAF), and the proposed project involves the beddown (establishment) of a squadron of eight C-17 aircraft at Hickam Air Force Base (AFB), Hawai'i to better meet military needs in the Pacific region. Establishment of the C-17 squadron would take place over approximately three years with construction beginning in 2004. It would involve the basing of the aircraft, along with the personnel needed to operate and maintain the aircraft and associated facilities for training. To facilitate preparation of the DEA, the DAF has requested from the Service, a species list for four installations and information on any critical habitat overlying those sites. The four installations include Hickam AFB, Kaneohe Bay Marine Corps Base Hawai'i (MCBH), Barking Sands Pacific Missile Range Facility (PMRF), and Wheeler AFB.

The Service has reviewed the information which was provided in the DAF letter and the description of the proposed action and alternatives, as well as pertinent information in our files, including maps and records prepared by the Hawai'i Heritage Program. We offer the following information regarding federally listed species and critical habitat overlap with the four identified potential project sites. This response to your request for informal section 7 consultation has been prepared under the authority of the Endangered Species Act of 1973 [16 USC 1531 *et seq.*; 87 Stat. 884], as amended.

1) Hickam AFB, O'ahu: This installation does not overlap with any proposed or designated critical habitat. According to the 2000 Hawai'i Heritage data, there are no federally listed species within the boundaries of this installation, however, the endangered Hawaiian stilt or Ae'o (*Himantopus mexicanus knudseni*) and the endangered Hawaiian monk seal or 'Ilio-holo-i-ka-uaua (*Monachus schauinslandi*) have been sighted nearby during recent years.

Mr. Carl Woehrle

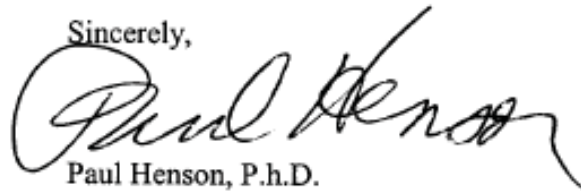
2) Kaneohe Bay MCBH, O`ahu: This installation does not overlap with any proposed or designated critical habitat. According to the 2000 Hawai`i Heritage data and recent surveys, there have been recent sightings of three federally listed species on this installation including the endangered Hawaiian monk seal, the endangered Hawaiian stilt, and the endangered Hawaiian coot or `Alae ke`oke`o (*Fulica alai*).

3) Wheeler AFB, O`ahu: This installation does not overlap with any proposed or designated critical habitat, and no federally listed species are located within the boundaries of this installation according to the 2000 Hawai`i Heritage data.

4) Barking Sands PMRF, Kaua`i: Critical habitat has been designated at PMRF for Lau`ehu (*Panicum niihauense*). Please see the enclosed map for exact location of overlap. According to the 2000 Hawai`i Heritage data and as identified by the Integrated Natural Resources Management Plan (INRMP) for the Pacific Missile Range Facility Final - October 2001, prepared by the Department of the Navy, several listed species do/may inhabit the PMRF including the endangered Hawaiian stilt; the threatened green sea turtle or honu (*Chelonia mydas*); and the endangered Hawaiian hoary bat or `Ope`ape`a (*Lasirus cinereus semotus*). Additionally, two species of endangered plants are located just outside of the PMRF boundaries, Oha`i (*Sesbania tomentosa*) is located just to the east of the installation, and within Polihale State Park adjacent to the northern boundary of PMRF, both *Sesbania tomentosa* and Lau`ehu can be found.

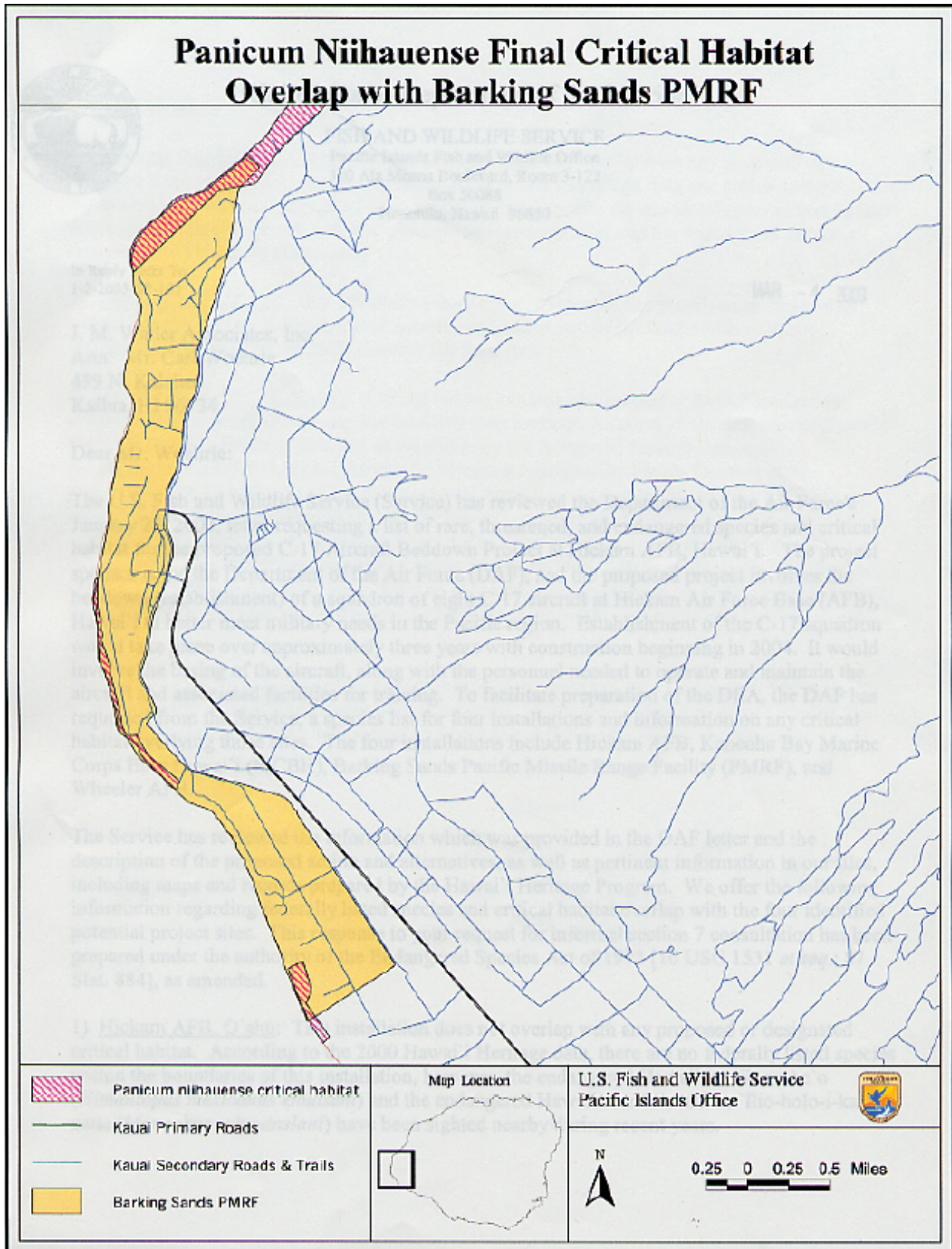
The Service encourages the early review of proposed projects and we appreciate the opportunity to provide early technical assistance on this proposal. If you have questions, please contact Fish and Wildlife Biologist Mike Richardson by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,



Paul Henson, P.h.D.
Field Supervisor

enclosure



Map produced by U.S. Fish and Wildlife Service. Pict date: March 3, 2003

LINDA LINGLE
GOVERNOR



GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENT QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

February 18, 2003

Gary O'Donnell
Chief, Environmental Planning Element
15CES/CEVP
% Carl Woehrle
JM Waller Associates
459 N. Kalaheo
Kailua, HI 96734

Dear Mr. O'Donnell:

Subject: Federal Draft EA, **Proposed C-17 Beddown at Hickam AFB Hawaii**

State environmental review law

The proposed activity does not appear to trigger Chapter 343, Hawaii Revised Statutes, the state's environmental review law. After reviewing the enclosed list of conditions (§§ 343-5), if you find that the project does indeed trigger the state law, please contact our office regarding the submission procedure.

Impacts to the surrounding community

The EA notes that noise can be an irritant to the neighbors. In addition, increased activity and personnel at either Hickam or Wheeler can lead to strain on the local infrastructure, as noted, as well as secondary impacts, such as increased traffic.

If the project does not require a state environmental review, but you wish to publicize notice and invite public input, contact our office about running a courtesy notice in our semi-monthly publication, *The Environmental Notice*. The public is sensitive to noise and traffic concerns, and running such a notice would be in keeping with a good-neighbor policy.

If you have any questions please call us at 586-4185.

Sincerely,

Handwritten signature of Genevieve Salmonson in cursive.

GENEVIEVE SALMONSON
Director

Enc.

Triggers to HRS Chapter 343, Hawaii State Environmental Review Law

§§343-5 Applicability and requirements. (a) Except as otherwise provided, an environmental assessment shall be required for actions which:

- (1) Propose the use of state or county lands or the use of state or county funds, Other than funds to be used for feasibility or planning studies for possible future programs or projects which the agency has not approved, adopted, or funded, or funds to be used for the acquisition of unimproved real property; provided that the agency shall consider environmental factors and available alternatives in its feasibility or planning studies;
- (2) Propose any use within any land classified as conservation district by the state land use commission under chapter 205;
- (3) Propose any use within the shoreline area as defined in section 205A-41;
- (4) Propose any use within any historic site as designated in the National Register or Hawaii Register as provided for in the Historic Preservation Act of 1966, Public Law 89-665, or chapter 6E;
- (5) Propose any use within the Waikiki area of Oahu, the boundaries of which are delineated in the land use ordinance as amended, establishing the "Waikiki Special District";
- (6) Propose any amendments to existing county general plans where such amendment would result in designations other than agriculture, conservation, or preservation, except actions proposing any new county general plan or amendments to any existing county general plan initiated by a county;
- (7) Propose any reclassification of any land classified as conservation district by the state land use commission under chapter 205; and
- (8) Propose the construction of new, or the expansion or modification of existing helicopter facilities within the State which by way of their activities may affect any land classified as conservation district by the state land use commission under chapter 205; the shoreline area as defined in section 205A41; or, any historic site as designated in the National Register or Hawaii Register as provided for in the Historic Preservation Act of 1966, Public Law 89-665, or chapter 6E; or, until the statewide historic places inventory is completed, any historic site found by a field reconnaissance of the area affected by the helicopter facility and which is under consideration for placement on the National Register or the Hawaii Register of Historic Places.

ED CASE
2ND DISTRICT, HAWAII

128 CANNON
HOUSE OFFICE BUILDING
202-225-4906

U.S. House of Representatives
Washington, DC 20515-1102

February 20, 2003

J.M. Waller Associates, Inc.
Attn: Mr. Carl Woehrle
459 North Kalaheo
Kailua, Hawai'i 96734

Dear Mr. Woehrle:

Mr. Gary O'Donnell, Chief, Environmental Planning Element of the Pacific Air Forces, provided me a copy of the Description of Proposed Action and Alternatives (DOPAA) for the beddown of C-17s at Hickam Air Force Base. He directed me to forward my comments on the proposal to you.

It is my sincere wish to see the military bring the C-17s to Hawai'i. To ensure that every significant issue is addressed as you move forward with this project, I strongly encourage you to examine the additional noise pollution that will be caused by replacing four C-130s with eight C-17s. The F117-PW-100 engines in the C-17s are much stronger than the Allison T56-A-15 turboprop engines in the C-130s. If the C-17s significantly raise the noise pollution near the base, it could become an irritant to individuals living near the base and could possibly affect endangered birds on O'ahu. As you research this issue, please consider the effects of noise pollution while evaluating the possible use of the Pacific Missile Range Facility and Kaneohe Marine Corp Base for an assault landing zone training runway.

If I can be of any further assistance, please feel free to contact my office at any time.

With aloha,



ED CASE
United States Congressman
Hawai'i, Second District

EEC:TMN:yk

LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD / CWB

02050PKP.03

February 20, 2003

Mr. Carl Woehrle
JM Waller Associates, Inc.
459 N. Kalaheo Road
Kailua, Hawaii 96734

Dear Mr. Woehrle:

**Subject: Review and Coordination Request of
Description of Proposed Action and Alternatives (DOPAA) for
Proposed C-17 Aircraft Beddown
Hickam Air Force Base , Hawaii**

The Department of Health, Clean Water Branch (CWB) has reviewed the subject submittal, dated January 23, 2003, and has the following comments:

1. The Army Corps of Engineers should be contacted to identify whether a Federal permit (including a Department of Army permit) is required for this project. If it is determined that a Federal permit is required for the subject project, then a Section 401 Water Quality Certification would also be required from our office.
2. If the construction project involves any of the following activities, National Pollutant Discharge Elimination System (NPDES) permit coverage is required for each activity:
 - a. Construction activities, including clearing, grading, and excavation that result in the disturbance of equal to or greater than one (1) acres of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. NPDES permit coverage is required before the commencement of the construction activities.
 - b. Discharges of hydrotesting water.
 - c. Discharges of construction dewatering effluent.
 - d. Discharges of treated effluent associated with well drilling activities.

Mr. Carl Woehrle
February 20, 2003
Page 2

3. If the operation of the proposed facility contributes to the discharge of process wastewater and/or storm water associated with industrial activity, then NPDES permit coverage is required.
4. If the discharges mentioned above enter Class 2 or Class A State waters, then NPDES general permit coverage for each type of discharge is required. If the discharges enter Class 1 or Class AA State waters, then one NPDES individual permit covering all discharges is required.

The CWB requires that Notices of Intent (NOI) for NPDES general permits and NPDES individual permit applications be submitted 30 days and 180 days, respectively, prior to the commencement of the discharges. The amendments to HAR, Chapter 11-55, may also require a copy of the NOI or NPDES permit application to be submitted to the State Department of Land and Natural Resources, State Historic Preservation Division. The NOI and NPDES permit application forms can be picked up at our office or downloaded from our website at <http://www.state.hi.us/doh/eh/cwb/forms/index.html>.

Should you have any questions, please contact Ms. Kris Poentis of the Engineering Section, CWB, at 586-4309.

Sincerely,



DENIS R. LAU, P.E., CHIEF
Clean Water Branch

KP:ndp

LINDA LINGLE
GOVERNOR OF HAWAII



PETER T. YOUNG, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCES MANAGEMENT

DEPUTY
ERNEST Y. W. LAU

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
801 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

FEB 26 2003

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

Mr. J.M. Waller Associates, Inc.
Attn: Mr. Carl Woehrle
459 N. Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO: 31741
DOC NO: 0302SC08

Dear Mr. Woehrle:

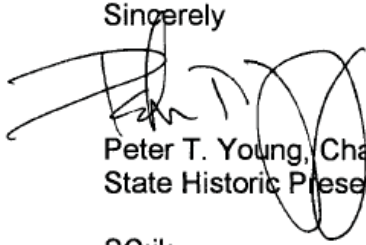
**SUBJECT: National Historic Preservation Act Section 106 Compliance –
Comment on Description of Proposed Action and Alternatives
(DPOAA) for Proposed C-17 Aircraft Beddown at Hickam Air
Force Base (HAFB)
`Kona and `Ewa Districts, O`ahu
TMKs: 1-1 & 9-9**

Thank you for the opportunity to review and comment on the DOPAA prepared for the proposed beddown of eight new C-17 aircraft by the 15th Air Base Wing at HAFB on O`ahu. Among the alternatives being considered are the construction of beddown facilities at HAFB, with runway construction being proposed, alternatively, at Pacific Missile Range Facility (PMRF) Barking Sands on Kaua`i, Marine Corps Base Hawaii (MCBH) Kaneohe Bay, or somewhere within the continental US. The subject action appears to be an undertaking as defined in 36 CFR 800, §800.16 although you are requesting comment pursuant to the National Environmental Protection Act. We received the subject document on January 29, 2003, via the US Postal Service, and provide the following comments.

Although you state that the DOPAA comprises eight chapters and five supporting appendices (page 1-8), we only received chapters one and two, and no appendices. In the materials that we did receive, there is no information whatsoever on historic properties. Furthermore, we cannot even determine from these documents where the proposed beddown facilities might be placed at Hickam or where the runways might be constructed at PMRF or at MCBH Kaneohe Bay. Consequently, there is insufficient information for us to render any opinion on the matter, so we shall await a complete notification of the proposed undertaking, prepared pursuant to 36 CFR 800, §800.3 and 800.4, before providing any further comment.

Should you have any questions about archaeology, please feel free to contact Sara Collins at 692-8026. Should you have any questions about architecture, please feel free to contact Tonia Moy at 692-8030.

Sincerely

A handwritten signature in black ink, appearing to read "Peter T. Young", is written over a circular stamp or seal.

Peter T. Young, Chairperson and
State Historic Preservation Officer

SC:jk

c: Dr. Fred L. McGhee, Chief Archaeologist, Environmental Flight, 15th Civil Engineering Squadron, Dept of the Air Force, 75 H. Street, Hickam AFB, HI 96853-5233.

Mr. Gary O'Donnell, Chief, Environmental Planning Element, 15 CES/CEVP, Dept of the Air Force, 75 H Street, Hickam AFB, HI 96853-5233



**DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES**

November 22, 2002

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson,

Attached is a notice of intent to prepare an environmental assessment for the proposed C-17 Beddown at Hickam Air Force Base, Hawaii.

Please publish this notice in *The Environmental Notice* on the December 8, 2002 issue date, according to your OEQC Submission Deadlines for 2002 Environmental Notice.

Our Point of Contact is our contractor:

Carl Woehrle, Program Manager
Telephone Number: (808) 449-2083

Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script that reads "Gary O'Donnell".

GARY O'DONNELL
Chief, Environmental Planning Element
15 CES/CEVP

Attachment:
Notice of Intent to
Prepare an Environmental Assessment



Notice of Intent to Prepare An Environmental Assessment for the Proposed C-17 Aircraft Beddown at Hickam AFB, HI

The United States Air Force (USAF) will prepare an Environmental Assessment (EA) with the potential for an Environmental Impact Statement (EIS) to identify and evaluate the potential environmental impacts of the basing of eight C-17 aircraft to Hickam AFB and the departure of four C-130 aircraft from Hickam AFB. The beddown of the C-17 aircraft at Hickam AFB is necessary to best support the Nation's military strategy and airlift needs. The proposed action would fulfill wartime requirements and peacetime training needs. The proposed action would require: (1) aircraft beddown and operations at Hickam AFB; (2) the construction of C-17 aircraft support facilities at Hickam AFB; (3) personnel requirements to support the C-17 aircraft beddown; (4) aircrew training requirements at existing facilities; and (5) the possible construction of a new assault runway or use of existing runways with painting to simulate a 3,500 foot runway.

The Air Force will conduct a scoping process to identify concerns of the public and federal, state and local agencies. The Air Force will prepare a Community Involvement Plan and will conduct public meetings at pertinent locations to ensure that the environmental analysis addresses the appropriate scope of issues and concerns. Public comments will be considered in the preparation of the EA. Notice of the date, time, and locations of the meetings will be made available to public officials, the communities, and the news media through the publication of a Newsletter and its dissemination and publication in the appropriate newspapers. Written comments on the scope of alternatives and impacts will be accepted and considered. The Air Force will accept appropri-

O'ahu Notices

DECEMBER 8, 2002

ate input any time throughout this scoping process. The Draft EA will be available for a 30-day public review period and will be advertised in The Environmental Notice and local newspapers.

Please direct any written comments of requests for further information concerning this action to:

Mr. Gary O'Donnell
Chief, Environmental Planning Element
15 CES/CEVP
75 H Street, Bldg 1204
Hickam AFB, Hawai'i 96853-5233

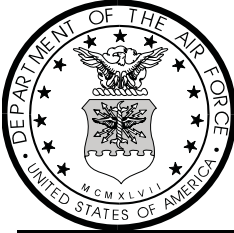
A.2.13. Notice of Availability for the Draft EA to the C-17 Beddown

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT FOR PROPOSED C-17 GLOBEMASTER III BEDDOWN IN HAWAII

The Air Force has prepared a draft environmental assessment evaluating potential impacts on the environment associated with the proposed project to beddown (base) eight C-17 Globemaster III aircraft in Hawaii, the continued use of an existing Drop Zone (DZ) and military airspace for training, and the construction of associated support facilities.

The proposed action would consist of the beddown of eight C-17 Globemaster III aircraft at Hickam Air Force Base (AFB). The beddown of the C-17 aircraft at Hickam AFB is necessary to best support the Nation's military strategy and airlift needs. The proposed action would require: (1) aircraft beddown and operations at Hickam AFB; (2) the construction of C-17 aircraft support facilities at Hickam AFB; (3) personnel requirements to support the C-17 aircraft beddown; (4) aircrew training requirements at existing facilities; and (5) the construction of a new short austere airfield (SAAF).

A copy of the draft environmental assessment for review will be available June 2, 2003 at the reference desks of the Wahiawa, Pearl City, Aiea, Kaneohe, Honolulu, and Waimea State Library reference desk on Kauai. The draft environmental assessment can also be found online at www.hickamc17.com. Only comments received by mail will be officially addressed. The public comment period ends on July 1, 2003. Individuals wishing further information or to submit comments, should contact Mr. Carl Woehrle at J.M. Waller Associates, 459 North Kalaheo, Kailua, HI 96734.



MEDIA ADVISORY

UNITED STATES AIR FORCE

15th Airlift Wing Public Affairs, 800 Scott Circle, Hickam AFB, HI 96853-5328

Tel: (808) 449-6367

ALL OAHU NEWS MEDIA

Release No: 0300504

May 20, 2003

C-17 Proposed Beddown Draft EA available

HICKAM AIR FORCE BASE, Hawaii— The Air Force has prepared a draft environmental assessment evaluating potential impacts on the environment associated with the proposed project to beddown (base) eight C-17 Globemaster III aircraft at Hickam Air Force Base, the continued use of an existing Drop Zone and military airspace for training, and the construction of associated support facilities.

The beddown of the C-17 aircraft at Hickam AFB is necessary to best support the Nation's military strategy and airlift needs. The proposed action would require aircraft beddown and operations at Hickam AFB; the construction of C-17 aircraft support facilities at Hickam AFB; personnel requirements to support the C-17 aircraft beddown; aircrew training requirements at existing facilities; and the construction of a new short austere airfield.

A copy of the draft environmental assessment will be available for review June 2, 2003 at the reference desks of the Wahiawa, Pearl City, Aiea, Kaneohe, and Honolulu State Libraries on Oahu, and the Waimea State Library reference desk on Kauai. Only comments received by mail will be officially addressed, and must be postmarked no later than July 1, 2003. Individuals requesting further information or wishing to submit comments, should contact Mr. Carl Woehrlé at J.M. Waller Associates, 459 North Kalaheo, Kailua, HI 96734.

LINDA LINGLE
GOVERNOR OF HAWAII



DECISIVE
10 8 JUL 2003

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

JUL -2 2003

Mr. James Tayon, Chief
Environmental Flight
15th Civil Engineering Squadron
Department of the Air Force
75 H Street
Hickam Air Force Base, Hawaii 96853-5333
[ATTN: Mr. Gary O'Donnell]

LOG NO: 2003.1034
DOC NO: 0306SC24

Dear Mr. Tayon:

SUBJECT: National Historic Preservation Act, Section 106 Compliance – Request for Standardized Notifications to the State of Hawai'i State Historic Preservation Office (SHPO)

We are hoping, with your cooperation, to improve our review process of federal undertakings. We are particularly interested in ensuring that historic properties listed on or eligible for listing on the National Register that may be affected by an undertaking receive due consideration, and that our review comments are transmitted to you in a timely manner.

In order to meet these goals, we would like to ask that all notifications sent to our office, pursuant to Section 106 of the National Historic Preservation Act, contain the following information. The requested information is described in detail in the implementing regulations of the statute at 36 CFR Part 800, Subpart B, §§800.3 through 800.5. While many of our federal partners already provide most or all of these items, we would appreciate it if all notifications to our office, pursuant to Section 106, follow this basic format. These materials should be submitted to the SHPO by the responsible Federal Agency.

- (1) Area of Potential Effect (APE) shown on a USGS quad map or other appropriate map. Please include the site plan of the APE with locations of historic sites and their relation to roads, public views, etc.
- (2) Tax Map Key number, including parcel and lot numbers, if relevant.
- (3) A description of the undertaking, and the nature of Federal involvement. The description should include architectural plans and elevations, if applicable.
- (4) The acreage of the APE
- (5) The steps taken to identify historic properties.
- (6) Photographs of the existing conditions of the APE, and other pertinent subjects such as known historic properties.
- (7) A summary of historic properties known or thought to be within the APE. If any historic buildings are within the APE, please include the date of construction, if known, or whether the age is known or an estimate.
- (8) A determination of effect made by the relevant federal agency, and the basis for the determination (e.g., follows the Secretary of the Interior's Standards).
- (9) A request for SHPO's review and comment on the determination of effect made by the relevant federal agency.

Mr. James Tayon, Chief
Page 2

- (10) Documentation showing consultation with local governments, Native Hawaiian Organizations, and other appropriate individuals and organizations, including discussion of any concerns raised.
- (11) Name, telephone and facsimile numbers, and email address of the point of contact at your agency.

Beginning August 1, 2003, if we receive a notification of a proposed undertaking, and any of these items is missing, the notification may be regarded as incomplete, and we will not commence our review of the proposed undertaking until the missing information is supplied. The 30-day review period will begin with the receipt of adequate and complete documentation on the proposed undertaking. We will use the information you provide on your agency point of contact to notify you, in writing, as soon as possible of the information needed to complete our review.

We have also found that the following types of information can be very helpful in our review of a proposed undertaking, so we recommend that you include them with the documentation provided to our office, as outlined above:

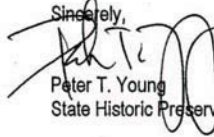
- Land use history of the APE.
- Reports or assessments of historic properties within or near the APE.
- Oral historical information on historic properties within or near the APE, gathered through cultural assessments or other ethnographic work.
- A statement on whether your agency believes that all of the historic properties in the APE have been identified, including Traditional Cultural Properties, and whether any group or individual has concerns about the possible destruction or damage to such properties.

We would appreciate it if you could ensure that any consultants who routinely work with your agency are made aware of these of information requests for the submission of Section 106 notifications to our office.

We thank you for your cooperation in this matter, and we hope that by providing you with standard expectations for Section 106 notifications, our review of your agency's undertaking will be improved. Please refer to 36 CFR Part 800, Subpart B for additional details.

Should you have any questions please feel free to call P. Holly McEldowney, Acting Administrator, at (808) 692-8015 or contact her by email at Holly.McEldowney@hawaii.gov.

Sincerely,



Peter T. Young
State Historic Preservation Officer

SC:jen

c: Chairpersons of the Hawai'i, Kaua'i/Ni'ihau, Maui, Moloka'i, and O'ahu Island Burial Councils
Cultural Resources Commission, Planning Dept, County of Maui, 250 S. High Street, Wailuku, HI 96793
Kaua'i Historic Preservation Review Commission, Kaua'i Ping Dept, 4444 Rice Street, Suite 473, Lihue, HI 96766
Ms. Lee Keatinge, Advisory Council on Historic Preservation
Mr. David Scott, Executive Director, Historic Hawaii Foundation
Mr. Peter L. Yee, Director, Nationhood & Native Rights, OHA, 711 Kapiolani Blvd, Ste 500, Honolulu, HI 96813



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR

MARY LOU KOBAYASHI
PLANNING PROGRAM ADMINISTRATOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-10143

July 7, 2003

J.M. Waller Associates, Inc.
Attention: Mr. Carl Woehrle
459 N. Kalaheo Avenue
Kailua, Hawaii 96734

Dear Mr. Woehrle:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency for the Proposed Department of the Air Force C-17 Aircraft Beddown at Hickam Air Force Base (AFB), Hawaii

We have reviewed the Draft Environmental Assessment dated May 2003, for the proposed C-17 Globemaster III Beddown at Hickam AFB, and concur with statements in Section 3.3 regarding the Coastal Zone Management Act and federal consistency regulations. In compliance with these regulations, we request the submittal of a federal consistency Negative Determination or Consistency Determination to our office, for the subject Department of the Air Force project.

Should you have any questions, please call Debra Tom of our CZM Program at 587-2840.

Sincerely,

A handwritten signature in cursive script that reads "Mary Lou Kobayashi".

Mary Lou Kobayashi
Planning Program Administrator

- c: U.S. Army Corps of Engineers, Regulatory Branch
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service, Pacific Islands Ecoregion
- U.S. National Marine Fisheries Service, Pacific Area Office
- Department of Health, Clean Water Branch
- Department of Land & Natural Resources,
State Historic Preservation Division
- Ms. Pua Aiu, Office of Hawaiian Affairs
- Department of Planning and Permitting, C & C of Honolulu

PHONE (808) 594-1888

FAX (808) 594-1865



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

HRD03/971

July 7, 2003

J.M Waller Associates, Inc.
Attn: Mr. Carl Woehrle
459 N. Kalaheo
Kailua, HI 96734

**RE: Draft Environmental Assessment for the C-17 Globemaster III Beddown,
Hickam Airforce Base, Hawaii.**

Dear Mr. O'Donnell,

OHA was able to attain a copy of the above referenced document off the web after a concerned beneficiary called to ask us to respond to the Draft EA. OHA questions why we were not consulted on this project, especially since portions of it have the potential to impact highly sensitive Native Hawaiian burial and cultural sites.

According to the Secretary of Interior's Standards and Guideline for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (29 April 1988), OHA and Hui Malama I Na Kupuna o Hawaii Nei are defined as Native Hawaiian Organizations. We interpret this to mean that OHA and Hui Malama must be consulted in the NHPA Section 106 process if Native Hawaiian traditional or cultural resources will be affected by a Federal undertaking. OHA does not have a record of a request for 106 Consultation on this project, although we are listed as having received the DOPAA.

Comments on the Draft EA

Overall the draft EA fails to provide enough information for the citizen reader to evaluate the impacts of the proposed action. The location of specific improvements, such as runways, which may impact cultural sites, is never specified. Additionally, large scale infrastructure improvements, such as the need for additional water and sewer lines, which, according to the documentation, are included in the proposed action, are never evaluated. OHA does not believe this draft Environmental Assessment adequately

assesses the impacts of the proposed action, nor was there adequate opportunity for public comment. Our specific comments are below.

Cultural Impacts

It is very difficult to assess the impact of the proposed action on cultural sites since the actual location of the proposed runways, buildings and other improvements are never provided. Hickam Air Force Base is built on former fishponds and Native Hawaiian settlement areas. Parts of the Base have not been surveyed, despite being highly developed. Any ground excavation could impact buried cultural deposits. OHA requests that adequate information regarding the location of improvements, including clear water rinse facilities, hangars, fiber-optic, sewer and water lines proposed for Hickam Air Force Base be analyzed for their potential effect on Native Hawaiian historic and cultural sites.

At PMRF, Nohili Dupes is a recognized Native American Burial Ground. Any extension of the current runway into the dunes could potentially disturb burial sites. Additionally, landings and takeoffs have the potential to disturb burials. Without adequate information as to what building a SAAF runway entails, OHA cannot assess cultural impacts to the Dunes and to Native Hawaiian practices in the area. OHA requests that we be provided with information adequate to allow us to assess the potential impact of the proposed action on the burials at Nohili Dunes as well as on cultural and traditional sites in the Mana area.

Marine Corp Base Hawaii (MCBH) is also the site of extensive burials as well as cultural and historic sites. Again, details of improvements connected to the Proposed Action were not provided in the DEA, thus OHA is unable to assess the potential impact of the proposed action on Native Hawaiian cultural and traditional sites. OHA requests that we be provided with information adequate to allow us to assess the potential impact of the proposed action on traditional and cultural sites at MCBH, including the proposed reburial sites at Pu`u Hawai`i Loa.

Biological Resources

The DEA states that aircraft encounters with birds constitute a safety risks on each of the three potentially affected bases. The DEA is not clear on how the proposed action will affect endangered species such as the Newell's Shearwater, the Hawaiian Monk seal or endangered Hawaiian turtles. For example, there is no discussion in the draft EA of the potential effect of night lights on Newell's Shearwaters. There is also no discussion on how the effects of night lights could be mitigated. OHA requests that additional information on the potential effects of on-going operations on endangered species, including night lights, be provided in the final EA.

Water Resources

The discussion of the impact of the proposed action on water resources only analyzes the impact of construction on water resources. However, the Proposed Action includes the

need for large amounts of water for on-going operations, such as washing the planes. There is no analysis of the need for water for proposed on-going operations. The Pearl City Aquifer is reaching sustainable yield and water for the Waiahole Ditch is fully allocated. The final EA should include an analysis of the water needs for on-going operations, and actual availability of enough water for proposed operations.

Hazardous Wastes

There is no estimate in the DEA of how much hazardous wastes could be generated during construction or during on-going operations. Thus there is no assessment of whether current hazardous waste facilities on O'ahu or Kauai could handle the additional materials. Furthermore, the DEA suggests that the Kauai facility will not be able to handle the hazardous wastes generated during construction, and that such wastes will have to be shipped to Pearl Harbor. There is no analysis of the potential impact shipping hazardous wastes to O'ahu could have on the environment, on endangered species, or on cultural practices. Please include these analyses in the final EA.

Noise

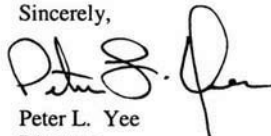
Discussion of noise impacts focuses on the fact that impacts are mainly at sea. However, the noise contour lines at PMRF impact Kekaha, parts of which are Hawaiian Homelands. OHA contends that the DEA does not provide an adequate assessment of noise impacts on Native Hawaiians, who already suffer disproportionately from hearing loss due to otitis media infections in young children. OHA would like to see a better analysis of noise impacts, including locating schools on noise contour maps.

Conclusion

The Draft Environmental Assessment does not provide the reader with enough information to adequately assess the impact of the proposed project in a number of areas. OHA is particularly concerned that there is inadequate information to assess whether or not important burial sites will be affected by the proposed action. OHA requests that we be provided information adequate to assess harm to cultural impacts. We also request that the Air Force consult with us as to the potential effects of this project on traditional and cultural places pursuant to the National Historic Preservation Act, Section 106.

If you have further questions, please contact Pua Aiu at 594-1931 or e-mail her at paiu@oha.org.

Sincerely,



Peter L. Yee
Director
Nationhood and Native Rights

CC Mr. Gary O'Donnell
Chief Environmental Flight
15 CES/CEVP
75 H Street
Hickam AFB, HI 96853-5233

Valerie Hauser
1100 Pennsylvania Ave. NW, Ste 809
Old Post Office Bldg
Washington, D.C. 20004

APPENDIX B

NOISE ANALYSIS INFORMATION

APPENDIX B NOISE ANALYSIS INFORMATION

B.1. AIRCRAFT NOISE ANALYSIS

Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (community annoyance). Noise analysis thus requires a combination of physical measurement of sound, physical and physiological effects, plus psycho- and socioacoustic effects.

Section 1 of this Appendix describes how sound is measured, and summarizes noise impact in terms of community acceptability and land use compatibility. Section 2 gives detailed descriptions of the effects of noise that lead to the impact guidelines presented in Section 1. Section 3 provides a description of the specific methods used to predict aircraft noise.

B.1.1. NOISE DESCRIPTORS AND IMPACT

Military aircraft can generate two types of sound. One is “subsonic” noise, which is continuous sound generated by the aircraft’s engines and also by air flowing over the aircraft itself. The other is sonic booms (only in MOAs and warning areas authorized for supersonic), which are transient impulsive sounds generated during supersonic flight. These are quantified in different ways.

Section 1.1 describes the quantities which are used to describe sound. Section 1.2 describes the specific noise metrics used for noise impact analysis. Section 1.3 describes how environmental impact and land use compatibility are judged in terms of these quantities.

B.1.2. QUANTIFYING SOUND

Measurement and perception of sound involves two basic physical characteristics: amplitude and frequency. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of a sound wave. Because sound pressure varies in time, various types of pressure averages are usually used. Frequency, commonly perceived as pitch, is the number of times per second the sound causes air molecules to oscillate. Frequency is measured in units of cycles per second, or Hertz (Hz).

Amplitude. The loudest sounds the human ear can comfortably hear have acoustic energy one trillion times the acoustic energy of sounds the ear can barely detect. Because of this vast range, attempts to represent sound amplitude by pressure are generally unwieldy. Sound is therefore usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as a sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Because of the logarithmic nature of the decibel scale, sounds levels do not add and subtract directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound’s intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

$$\begin{aligned} 60 \text{ dB} + 60 \text{ dB} &= 63 \text{ dB}, \\ \text{and } 80 \text{ dB} + 80 \text{ dB} &= 83 \text{ dB}. \end{aligned}$$

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB}.$$

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as “decibel addition” or “energy addition.” The latter term arises from the fact that combination of decibel values consists of first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

The difference in dB between two sounds represents the ratio of the amplitudes of those two sounds. Because human senses tend to be proportional (i.e., detect whether one sound is twice as big as another) rather than absolute (i.e., detect whether one sound is a given number of pressure units bigger than another), the decibel scale correlates well with human response.

Under laboratory conditions, the human ear can detect differences in sound level of 1 dB. In the community, the smallest change in average noise level, which can be detected, is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses).

Frequency. The normal human ear can hear frequencies from about 20 Hz to about 20,000 Hz. It is most sensitive to sounds in the 1,000 to 4,000 Hz range. When measuring community response to noise, it is common to adjust the frequency content of the measured sound to correspond to the frequency sensitivity of the human ear. This adjustment is called A-weighting (ANSI 1988). Sound levels that have been so adjusted are referred to as A-weighted sound levels. The amplitude of A-weighted sound levels is measured in dB. It is common for some noise analysts to denote the unit of A-weighted sounds by dBA or dB(A). As long as the use of A-weighting is understood, there is no difference between dB, dBA or dB(A). It is only important that the use of A-weighting be made clear. In this study, sound levels are reported in dB and are A-weighted unless otherwise specified.

Table 3.5-1 Typical Decibel [dB(A)] Values Encountered in Daily Life and Industry

	dBA)s
Rustling leaves	20
Room in a quite dwelling at midnight	32
Soft whispers at 5 feet	34
Men's clothing department of large store	53
Window air conditioner	55
Conversational speech	60
Household department of large store	62
Busy restaurant	65
Evaporative swamp cooler	65
Typing pool (9 typewriters in use)	65
Vacuum cleaner in private residence (9 feet)	69
Ringing alarm clock (at 2 feet)	80
Loudly reproduced orchestral music in large room	82
Beginning of hearing damage if prolonged exposure of 85 dB(A)	
Printing press plant	86
Heavy city traffic	92
Heavy diesel-propelled vehicle (about 25 feet away)	92
Air grinder	95
Cut-off saw	97
Home lawn mower	98
Turbine condenser	98
150 cubic foot air compressor	100
Banging of steel plate	104
Air hammer	107
Jet airliner (500 feet overhead)	115
F-15 aircraft (500 feet overhead, afterburner power)	123

When distances are not specified, sound levels are the values at the typical location of the machine operators. Source: Newman and Beattie, 1985

A-weighting is appropriate for continuous sounds, which are perceived by the ear. More than just the ear perceives impulsive sounds, such as sonic booms. When experienced indoors, there can be secondary noise from rattling of the building. Vibrations may also be felt. C-weighting (ANSI 1988) is applied to such sounds. This is a frequency weighting that is flat over the range of human hearing (about 20 Hz to 20,000 Hz) and rolls off above and below that range. In this study, C-weighted sound levels are used for the assessment of sonic booms and other impulsive sounds. As with A-weighting, the unit is dB, but dBC or dB(C) are sometimes used. In this study, sound levels are reported in dB, and C-weighting is specified as necessary.

Time Averaging. Sound pressure of a continuous sound varies greatly with time, so it is customary to deal with sound levels that represent averages over time. Levels presented as instantaneous (i.e., as might be read from the dial of a sound level meter), are based on averages of sound energy over either 1/8second (fast) or one second (slow). The formal definitions of fast and slow levels are somewhat complex, with details that are important to the makers and users of instrumentation. They may, however, be thought of as levels corresponding to the root-mean-square sound pressure measured over the 1/8-second or 1-second periods.

The most common uses of the fast or slow sound level in environmental analysis is in the discussion of the maximum sound level that occurs from the action, and in discussions of typical sound levels. Some (air conditioner, vacuum cleaner) are continuous sounds whose levels are constant for some time. Some (automobile, heavy truck) are the maximum sound during a vehicle pass by. Some (urban daytime, urban nighttime) are averages over some extended period. A variety of noise metrics have been developed to describe noise over different time periods. These are described in Section 1.2.

B.1.3. NOISE METRICS

B.1.3.1. Peak Sound Level

For impulsive sounds, the true instantaneous sound pressure is of interest. For sonic booms, this is the peak pressure of the shock wave, as described in Section 3.2 of this Appendix. This pressure is usually presented in physical units of pounds per square foot. Sometimes it is represented on the decibel scale, with symbol L_{pk} . Peak sound levels do not use either A or C weighting.

B.1.3.2. Sound Exposure Level

Individual time-varying noise events have two main characteristics—a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (abbreviated SEL or L_{AE} for A-weighted sounds) combines both of these characteristics into a single metric.

Sound exposure level is a composite metric, which represents both the intensity of a sound and its duration. Mathematically, the mean square sound pressure is computed over the duration of the event, then multiplied by the duration in seconds, and the resultant product is turned into a sound level. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that Sound Exposure Level measures this impact much more reliably than just the maximum sound level.

Because the sound exposure level and the maximum sound level are both used to describe single events, there is sometimes confusion between the two, so the specific metric used should be clearly stated. Sound Exposure Level can be computed for C-weighted levels (appropriate for impulsive sounds), and the results denoted CSEL or L_{CE} . SEL for A-weighted sound is sometimes denoted ASEL. Within this study, SEL is used for A-weighted sounds and CSEL for C-weighted.

B.1.3.3. Equivalent Sound Level

For longer periods of time, total sound is represented by the equivalent continuous sound pressure level (L_{eq}). L_{eq} is the average sound level over some time period (often an hour or a day, but any explicit time span can be specified), with the averaging being done on the same energy basis as used for SEL. SEL and L_{eq} are closely related, differing by (a) whether they are applied over a specific time period or over an event, and (b) whether the duration of the event is included or divided out.

Just as SEL has proven to be a good measure of the noise impact of a single event, L_{eq} has been established to be a good measure of the impact of a series of events during a given time period. Also, while L_{eq} is defined as an average, it is effectively a sum over that time period and is thus a measure of the cumulative impact of noise.

B.1.3.4. Day-Night Average Sound Level

Noise tends to be more intrusive at night than during the day. This effect is accounted for by applying a 10-dB penalty to events that occur after 10 PM and before 7 AM. If L_{eq} is computed over a 24-hour period with this nighttime penalty applied, the result is the day-night average sound level (DNL or L_{dn}). DNL is the community noise metric recommended by the U.S. Environmental Protection Agency (USEPA 1972) and has been adopted by most federal agencies (FICON 1992). It has been well established that DNL correlates well with community response to noise (Schultz 1978; Finegold *et al.* 1994). This correlation is presented in Section 1.3.

While DNL carries the nomenclature “average,” it incorporates all of the noise at a given location. For this reason, DNL is often referred to as a “cumulative” metric. It accounts for the total, or cumulative, noise impact.

It was noted earlier that, for impulsive sounds, C-weighting is more appropriate than A-weighting. The day-night average sound level can be computed for C-weighted noise, and is denoted CDNL or L_{cdn} . This procedure has been standardized, and impact interpretive criteria similar to those for DNL have been developed (CHABA 1981).

B.1.3.5. Onset-Adjusted Monthly Day-Night Average Sound Level

Aircraft operations in military airspace such as MOAs and warning areas generate a noise environment somewhat different from other community noise environments. Overflight are sporadic, occurring at random times and varying from day to day and week to week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events: noise from a low-altitude, high airspeed flyover can have a rather sudden onset.

To represent these differences, the conventional Day-Night Average Sound Level metric is adjusted to account for the “surprise” effect of the sudden onset of aircraft noise events on humans (Plotkin *et al.* 1987; Stusnick *et al.* 1992; Stusnick *et al.* 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of from 15 to 150 dB per second, an adjustment or penalty ranging from 0 to 11 dB is added to the normal Sound Exposure Level. Onset rates above 150 dB per second require a 11 dB penalty, while onset rates below 15 dB per second require no adjustment. The Day-Night Average Sound Level is then determined in the same manner as for conventional aircraft noise events and is designated as Onset-Rate Adjusted Day-Night Average Sound Level (abbreviated L_{dnmr}). Because of the irregular occurrences of aircraft operations, the number of average daily operations is determined by using the calendar month with the highest number of operations. The monthly average is denoted L_{dnmr} .

B.1.4. NOISE IMPACT

B.1.4.1. Community Reaction

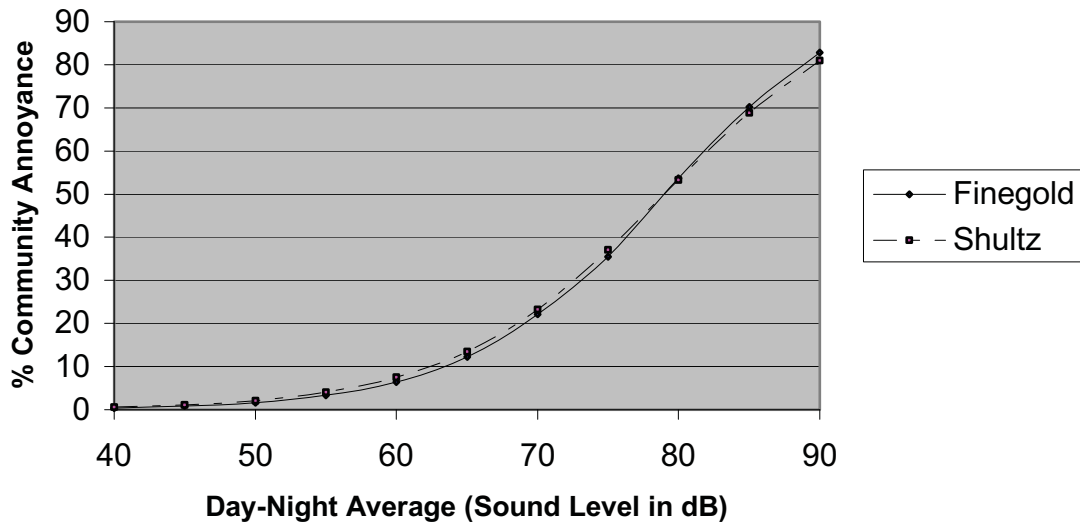
Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with impact. Schultz (1978) showed a consistent relationship between DNL and annoyance. Figure B-1 shows Schultz's original curve fit. This result shows that there is a remarkable consistency in results of attitudinal surveys, which relate the percentages of groups of people who express various degrees of annoyance when exposed to different Day-Night Average Sound Levels.

A more recent study has reaffirmed this relationship (Fidell *et al.* 1991). Figure B-2 (FICON 1992) shows an updated form of the curve fit (Finegold *et al.* 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors, which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using Day-Night Average Sound Level.

As noted earlier for Sound Exposure Level, Day-Night Average Sound Level does not represent the sound level heard at any particular time, but rather represents the total sound exposure. It accounts for the sound level of individual noise events, the duration of those events, and the number of events. Its use is endorsed by the scientific community (ANSI 1980; ANSI 1988; USEPA 1972; FICUN 1980; FICON1992).

While DNL is the best metric for quantitatively assessing cumulative noise impact, it does not lend itself to intuitive interpretation by non-experts. Accordingly, it is common for environmental noise analyses to include other metrics for illustrative purposes. A general indication of the noise environment can be presented by noting the maximum sound levels, which can occur, and the number of times per day noise events will be loud enough to be heard. Use of other metrics as supplements to DNL has been endorsed by federal agencies (FICON 1992).

Response of Communities to Noise; Comparison of Original (Schultz 1978) and Current (Finegold et al. 1994) Curve Fits



The Schultz curve is generally applied to annual average DNL. In section 1.2.6, L_{dnmr} was described and presented as being appropriate for quantifying noise in military airspace. In the current study, the Schultz

curve is used with L_{dnmr} as the noise metric. L_{dnmr} is always equal to or greater than DNL, so impact is generally higher than would have been predicted if the onset rate and busiest-month adjustments were not accounted for.

Sonic boom exposure is measured by C-weighting, with the corresponding cumulative metric being CDNL. Correlation between CDNL and annoyance has been established, based on community reaction to impulsive sounds (CHABA 1981). Values of the C-weighted equivalent to the Schultz curve are different than that of the Schultz curve itself. Table B-1 shows the relation between annoyance, DNL and CDNL.

Relation Between Annoyance, DNL and CDNL		
CDNL	% Highly Annoyed	DNL
48	2	50
52	4	55
57	8	60
61	14	65
65	23	70
69	35	75

There are several points of interest in the noise-annoyance relation. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes, and represents a compromise between community impact and the need for activities like aviation which do cause noise. Areas exposed to DNL above 65 dB are generally not considered suitable for residential use. The second is DNL of 55 dB, which was identified by EPA as a level below which there is effectively no adverse impact (USEPA 1972). The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible (USEPA 1972). The very high annoyance levels make such areas unsuitable for residential land use.

Interpretation of CDNL from impulsive noise is accomplished by using the CDNL versus annoyance values in Table B-1. CDNL can be interpreted in terms of an "equivalent annoyance" DNL, e.g., CDNL of 52, 61, and 69 dB are equivalent to DNL of 55, 65, and 75 dB, respectively. If both continuous and impulsive noise occur in the same area, impacts are assessed separately for each.

B.1.4.2. Land Use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the Day-Night Average Sound Level or Onset-Rate Adjusted Day-Night Average Sound Level for military overflights. Impulsive noise can be assessed by relating CDNL to an "equivalent annoyance" DNL, as outlined in section 1.3.1.

In June 1980, an ad hoc Federal Interagency Committee on Urban Noise published guidelines (FICUN 1980) relating Day-Night Average Sound Levels to compatible land uses. This committee was composed of representatives from the United States Departments of Defense, Transportation, as well as the Housing and Urban Development; the Environmental Protection Agency; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, the Department of Defense and the Federal Aviation Administration (FAA) adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). These guidelines are reprinted in Table B-2, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (note the footnote "*" in the table), they provide the best means for determining noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor Day-Night Average Sound Levels (DNL values) above 65 dB, and the extent of

land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions. In some cases, where noise change exceeds 3dB, the 1992 FICON indicates the 60dB DNL may be a more appropriate incompatibility level for densely populated areas.

B.2. NOISE EFFECTS

The discussion in section 1.3 presents the global effect of noise on communities. The following sections describe particular noise effects.

B.2.1. HEARING LOSS

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4,000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period (USEPA 1972). Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a Day-Night Average Sound Level of 75 dB, and this level is extremely conservative.

B.2.2. NONAUDITORY HEALTH EFFECTS

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have not been found to occur at levels below those protective against noise-induced hearing loss, described above.

Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss, held on 22–24 January 1990 in Washington, D.C., which states the following: "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour day). At the International Congress (1988) on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous.

Consequently, it can be concluded that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place (von Gierke 1990; parenthetical wording added for clarification).

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding thenonauditory health effects of aircraft noise are ambiguous, at best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two UCLA researchers found a relation between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise exposed" population (Meecham and Shaw 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Frerichs *et al.* 1980).

As a second example, two other UCLA researchers used this same population near LAX to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away

from the airport (Jones and Tauscher 1978). Based on this report, a separate group at the U.S. Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds 1979). A recent review of health effects, prepared by a Committee of the Health Council of The Netherlands(CHCN 1996) reviewed currently available published information on this topic. They concluded that the threshold for possible long-term health effects was a 16-hour (0600 to 2200) L_{eq} of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with DNL, this corresponds to DNL of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier. In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time average sound levels below 75 dB.

B.2.3 ANNOYANCE

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the U.S. Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (USEPA 1972). As noted in the discussion of Day-Night Average Sound Level above, community annoyance is best measured by that metric. Because the EPA Levels Document (USEPA 1972) identified DNL of 55 dB as ". . . requisite to protect public health and welfare with an adequate margin of safety," it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified DNL of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (FICON 1992). This corresponds to about 13percent of the exposed population being highly annoyed. Although DNL of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit and it is appropriate to consider other thresholds in particular cases. In this EIS, no specific threshold is used. The noise in the affected environment is evaluated on the basis of the information presented in this appendix and in the body of the EIS. Particular attention is given to the ideal 55 dB identified by EPA.

Community annoyance from sonic booms is based on CDNL, as discussed in Section 1.3. Particular effects often cited for sonic booms include startle and task interference. These effects are implicitly included in the "equivalent annoyance" CDNL values in Table C-1, since those were developed from actual community noise impact.

B.2.4. SPEECH INTERFERENCE

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the Sound Exposure Level metric will measure speech interference successfully, and that a Sound Exposure Level exceeding 65 dB will begin to interfere with speech communication.

B.2.5. SLEEP INTERFERENCE

Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning. Sleep interference may be measured in either of two ways. "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat higher noise level than does a change in sleep stage.

An analysis sponsored by the U.S. Air Force summarized 21 published studies concerning the effects of noise on sleep (Pearsons *et al.* 1989). The analysis concluded that a lack of reliable in-home studies,

combined with large differences among the results from the various laboratory studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions. A recent extensive study of sleep interference in people's own homes (Ollerhead 1992) showed very little disturbance from aircraft noise.

There is some controversy associated with the recent studies, so a conservative approach should be taken in judging sleep interference. Based on older data, the U.S. Environmental Protection Agency identified an indoor Day-Night Average Sound Level of 45 dB as necessary to protect against sleep interference (USEPA 1972). Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor Day-Night Average Sound Level of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of Sound Exposure Level (Kryter 1984). Figure B-3, extracted from Figure 10.37 of Kryter (1984), indicates that an indoor Sound Exposure Level of 65 dB or lower should awaken less than 5 percent of those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.

B.2.6. NOISE EFFECTS ON LIVESTOCK AND TERRESTRIAL WILDLIFE

Animal responses to aircraft are influenced by many variables including aircraft size, proximity (both height above the ground and lateral distance), engine noise, color, and flight profile. The type of aircraft (e.g., fixed-wing versus rotary-winged [helicopters]) and its flight mission may also produce different levels of disturbance and animal response (Smith *et al.* 1988).

Livestock

A large bibliography of studies on the effects of aircraft noise on large stock has consistently minimized the effects of noise and vibration on the health and well-being of many animal species. Without exception, these studies failed to provide conclusive evidence of any serious effect except trauma due to panic reaction. In the literature review of Mancini *et al.* (1988), behavior reactions observed in livestock exposed to low-altitude subsonic over flights have generally consisted of startle reactions that were considered minimal. Large livestock have been reported to respond to aircraft noise by sporadic jumping, galloping, vocalization, and random movement. Reactions of beef cattle to low-altitude over flights were comparable to the reactions to the presence of strange objects or persons.

Wildlife

The greatest impact to wildlife from aircraft overflights is from the visual effect of the approaching aircraft and the concomitant subsonic noise. Studies have shown that wildlife react to visual stimuli (e.g., aircraft overflights) that are below 1,000 feet AGL (Lamp 1989, Bowles 1995). Aircraft overflights and the associated noise can affect wildlife directly. Wildlife responses may include increased movement after an overflight, avoiding or leaving areas where overflights occur, changes in foraging patterns, and arousal of species-specific defensive behaviors (e.g., flight, aggression). Noise from aircraft overflights may also have indirect effects on wildlife such as masking. Masking occurs when noise interferes with the perception of a sound of interest. For example, masking may affect predator avoidance and the detection of social signals (Bowles 1995).

The effects of noise from aircraft overflights are difficult to assess because a number of adaptive responses may be involved, making the overt behavioral or physiological changes in response to noise highly variable. These responses include the acoustic startle, the orienting response, and other species typical and individual strategies for coping with novelty, species-typical defensive behaviors, and responses conditioned by previous exposures to noise.

Studies on the effects of noise on wildlife have been predominantly conducted on mammals and birds. Studies on subsonic aircraft disturbances of ungulates (e.g., pronghorn, bighorn sheep, elk, and mule deer), in both laboratory and field conditions, have shown that effects are transient and of short duration and suggest that the animals habituate to the sounds (Workman *et al.* 1992; Krausman *et al.* 1993, 1998; Weisenberger *et al.* 1996). Similarly, the impacts to raptors and other birds (e.g., waterfowl, grebes) from aircraft low-level flights were found to be brief and insignificant and not detrimental to reproductive success (Smith *et al.* 1988; Lamp 1989; Ellis *et al.* 1991; Grubb and Bowerman 1997).

The primary concern with aircraft overflights, and the associated noise, is the startle effect. For example, this occurs when birds are surprised by sudden, unexpected loud noises and leave the nest or perch suddenly. Possible negative impacts from this behavior include the expulsion of eggs or nestlings from the nest as the parent leaves suddenly, increased predation of eggs or young when parents are off the nest, and eggs or young may become chilled if the parent is off the nest for an extended period of time. Studies of seven raptor species (including gyrfalcon and peregrine and prairie falcons) exposed to low-level aircraft overflights found that raptor adults on nests tend to sit much more tightly than roosting adults and those that did fly usually left for less than 5 minutes.

In experiments using 211 nests exposed to gunshots, blasting, and low-level aircraft overflights, no eggs or young were ever rejected (Bowles 1995). However, adult peregrines have been known to step on eggs or young and occasionally kick eggs out of the nest during rapid exits following gunshots and other explosions (Smith *et al.* 1988). On the other hand, the U.S. Forest Service (USFS) found that eggs and young are only rarely ejected from the nest after a startle. Panic responses are induced only after close and abrupt approaches (e.g., an approach at 50 meters over a cliff face). Adults are very reluctant to leave the nest, and generally remain away for a minute or less (USFS 1992).

In studies on the impacts of low-level jet overflights on nesting peregrine and prairie falcons, Ellis (1981) and Ellis *et al.* (1991) found that responses to extremely frequent and nearby jet aircraft were often minimal and never associated with reproductive failure. Typically, birds quickly resumed normal activities within a few seconds following an overflight. While the falcons were noticeably alarmed by the noise stimuli in this study, the negative responses were brief and not detrimental to reproductive success during the course of the study.

Similarly, Lamp (1989) found in a study of the impacts to wildlife of aircraft overflights at Naval Air Station Fallon in northern Nevada, that nesting raptors (golden eagle, bald eagle, prairie falcon, Swainson's hawk, and goshawk) either showed no response to low-level flights (less than 3,000 feet AGL) or only showed minor reactions. Minor reactions consisted of the bird assuming an alert posture or turning its head and watching the aircraft pass overhead. Duration of raptor response to aircraft disturbances was monitored for one year and was found to average 14 seconds for low-level overflights. All raptor nests under observation successfully fledged young (Lamp 1989).

In a literature review of raptor responses to aircraft noise, Mancini *et al.* (1988) found that most studies of raptors did not show a negative response to overflights. When negative responses were observed they were predominantly associated with rotary-winged aircraft or jet aircraft that were repeatedly passing within one-half mile of a nest. A study on the potential impacts of a proposed airport on a large colony of federally endangered Florida snail kites (*Rostrhamus sociabilis plumbeus*), suggested that impacts to the habitat by land development associated with the airport could be more detrimental to the kites than the impact of aircraft overflights (Mancini *et al.* 1988).

In 1995, a 3 year study was initiated for the U.S. Air Force by the Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska, Fairbanks, and Alaska Biological Research to assess the effects of jet overflights on the behavior, nesting success, and productivity of nesting peregrine falcons beneath five MOAs in interior Alaska (Ritchie *et al.* 1998). To measure noise levels experienced by adult peregrines and their young, animal noise monitors (ANM) were positioned on the nest cliff approximately 50 meters from the

nest in a position with similar exposure and elevation characteristics of the nest site. Control nests, with no overflights, were also monitored for productivity and nest success.

An average of 34 nests per year were monitored over the 3-year study, with over 125,000 hours of overflight and ambient noise data recorded by ANMs. Data from 1996 and 1997 indicate that the number of overflights experienced by unsuccessful nests did not differ from successful nests and averaged 28 and 27 overflights each, respectively, through the nesting season. Daily sound exposure levels (SEL) were slightly higher at successful nests (89.5 dBA) compared to unsuccessful nests (89.1 dBA). The daily SEL, which is a time-averaged descriptor of the daily exposure of each nest to noise during the monitoring period, ranged from 60 to 109.6 dBA for successful nests that had at least one overflight, and from 60 to 110.6 dBA for unsuccessful nests. Overall, the average number of young per successful pair was greater at the experimental sites than at the control sites (Ritchie *et al.* 1998).

Even if proven significant, most of the effects of noise are mild enough that they may never be detectable as changes in population size or population growth against the background of normal variation (Bowles 1995). Many other environmental variables (e.g., predators, weather, changing prey base, ground based human disturbance) may influence reproductive success and confound the ability to tease out the ultimate factor in limiting productivity of a certain nest, area, or region (Smith *et al.* 1988). In contrast, the effects of other human intrusions near nests, foraging areas, dens, etc. (e.g., hiking, bird watching, timber harvesting, boating) are readily detected and substantial (USFS 1992).

B.2.7. SUBSONIC NOISE EFFECTS ON STRUCTURES

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonance. While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (NRC NAS 1977).

A recent study, directed specifically at low-altitude, high-speed aircraft showed that there is little probability of structural damage from such operations (Sutherland 1989). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) are rarely above 130 dB. Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle," of objects within the dwelling, such as hanging pictures, dishes, plaques, and bric-a-brac. Window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear of breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally incompatible with residential land use. Thus assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

B.2.8. NOISE EFFECTS ON TERRAIN

Members of the public often perceive that noise from low-flying aircraft can cause avalanches or landslides by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

B.2.9. NOISE EFFECTS ON HISTORICAL AND ARCHAEOLOGICAL SITES

Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment. One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house,

originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport (IAD). These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde airplane at Dulles (Wesler 1977). There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning within the building itself. As noted above for the noise effects of noise-induced vibrations of normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.

B.3. SUBSONIC NOISE MODELING

An aircraft in subsonic flight generally emits noise from two sources: the engines and flow noise around the airframe. Noise generation mechanisms are complex, and in practical models the noise sources must be based on measured data. The Air Force has developed a series of computer models and aircraft noise databases for this purpose. The models include NOISEMAP (Moulton 1992) for noise around airbases, ROUTEMAP (Lucas and Plotkin 1988) for noise associated with low-level training routes and MR_NMAP (Lucas and Calamia 1996) for use in MOAs and ranges. These models use the NOISEFILE database developed by the Air Force. NOISEFILE data includes SEL and L_{Amax} as a function of speed and power setting for aircraft in straight flight.

Noise from an individual aircraft is a time-varying continuous sound. It is first audible as the aircraft approaches, increases to a maximum when the aircraft is near its closest point, then diminishes as it departs. The noise depends on the speed and power setting of the aircraft, and its trajectory. The models noted above divide the trajectory into segments whose noise can be computed from the data in NOISEFILE. The contributions from these segments are summed.

MR_NMAP was used to compute noise levels in the MOAs and warning areas. The primary noise metric computed by MR_NMAP was L_{dnmr} averaged over each airspace. The program was also used to compute the number of times per day that SEL of 65 dB would be exceeded at any given location in the range complex. Supporting routines from NOISEMAP were used to calculate SEL and L_{Amax} for various flight altitudes and lateral offsets from a ground receiver position.

B.4. AICUZ OVERVIEW

B.4.1. INTRODUCTION

The Air Installation Compatible Use Zone (AICUZ) Program is a Department of Defense (DoD) planning program, which was developed in response to growing incompatible urban development (encroachment) around military airfields. The Air Force AICUZ program policy is to promote land use compatibility through participation in local, regional, state, and federal land use planning control and coordination processes.

Most Air Force installations were built in the 1940s and early 1950s and in relatively remote areas. Since then, urban growth has extended toward the boundaries of many of these installations. Problems result when complaints over the effects of aircraft operations (e.g., noise, low overflight, etc.) lead to operational changes, which negatively impact the flying mission. Incompatible encroachment has been contributor to the cessation of flying mission and base closures at installations such as Lowery AFB in Colorado, Chanute AFB in Illinois, and Laredo AFB in Texas. As communities grow and expand, it is only natural that they become more interested in orderly development. This should include adequate provisions to protect the Air Force facilities, which are an integral part of the community's physical and economic structure. The Air Force has been successful in encouraging the adoption of enabling legislation for planning compatible development around airfields in Arizona, Texas, and Alabama. Other states such as California have adopted legislation after recognizing the need to protect all airfields from encroachment. The Air Force encourages

the adoption of state-enabling legislation for this purpose, and will cooperate with the appropriate authorities regarding its implementation.

B.4.2. PROGRAM OBJECTIVES

The AICUZ program has two objectives:

- assist local, regional, state, and federal officials in protecting and promoting the public health, safety, and welfare by promoting compatible development within the AICUZ area of influence and
- protect Air Force operational capability from the effects of land use which are incompatible with aircraft operations.

The AICUZ study must be consistent with current land use planning principles and procedures as well as current techniques in noise assessment methodology. Also, it must adequately describe current air operations and procedures and provide recommendations for compatible land use development based on nationally recognized standards. In some cases, projections for future air operations are included in the AICUZ study if the community requests it. The inclusion of future projections in the AICUZ must avoid releasing new information scheduled to be released through the Environmental Impact Analysis Process (EIAP). If future projections are planned to be included, approval from the MAJCOM/CE is required. The AICUZ should relate to state laws, enabling legislation, and local economic and political conditions. The AICUZ is not an end in itself but rather one of many land use determinants used by local planners and decision makers. The AICUZ study must have a factual and rational basis.

B.4.3. REGULATORY BASIS

Several documents provide the regulatory basis for the AICUZ program:

- DoD Instruction (DoDI) 4165.57 established and requires the military departments to develop, implement, and maintain an AICUZ program for installations with flying operations. This DoDI:
 1. sets forth DoD policy on achieving compatible use of public and private lands in the vicinity of military airfields;
 2. defines
 - (a) required restrictions on the uses and heights of obstructions in the vicinity of air installations to provide for safety of flight and to assure that people and facilities are not concentrated in areas susceptible to aircraft accidents and
 - (b) desirable restrictions on land use to assure its compatibility with the characteristics, including noise, of air installations operations;
 3. describes the procedures by which AICUZ may be defined; and
 4. provides policy on the extent of government interest in real property within those zones which may be retained or acquired to protect the operational capability of active military airfields(subject in each case to the availability of required authorizations and appropriations).
- The General Services Administration (GSA), Federal Management Circular (FMC) 75-2 entitled "Compatible Land Uses at Federal Airfields" requires federal agencies, that operate airfields to work with local, regional, state, and other federal officials on compatible land use planning. It requires other federal agencies to ensure their programs serve and foster compatible land use according to plans (such as AICUZ) developed by the federal agency operating on airfield. It requires HUD, VA,FHA and other Federal agencies to implement the AICUZ program as they are able under their
- AFI 32-7063, "Air Installation Compatible Use Zone (AICUZ) Program" sets forth the policy, responsibilities, and requirements of the program. Topics covered include program objectives, responsibilities, land use compatibility guidelines, and AICUZ studies and updating.
- AFJM 32-8008 (formerly AFM 86-14), "Airfield and Heliport Planning Criteria" provides standardized criteria for all DoD service components for planning and developing the layout of runways, taxiways aprons, and related facilities for airfields and heliports. It provides criteria for

establishing planes and surfaces of navigational airspace surrounding the airfields and heliports for the purpose of controlling potential obstructions to aircraft operations.

- AFMAN 32-7067 (formerly AFM 19-10), "Planning in the Noise Environment" is a Tri-Service manual, which discusses noise characteristics, noise sources, effects of noise, noise monitoring, tools for noise analysis and reducing noise conflicts.
- AFI 13-201, "Air Force Airspace Management" establishes practices to decrease disturbances from flight operations that might cause adverse public reaction, and provides flying unit commanders with general guidance for dealing with local problems. This instruction sets forth the AICUZ responsibilities of the flying operation organizations at Air Force installations.

B.4.4. EVOLUTION OF THE AICUZ PROGRAM

The military services, particularly the Air Force, have been advocates of noise planning for a long time. Many aspects of the noise program presently used for civilian airports have their roots in the Air Force's experiences. As early as 1957, the Air Force began establishing procedures for estimating noise exposure and gauging community reaction to aircraft operations. By 1964, the Air Force was working on the relationship between land use planning and aircraft noise. Even at that early time, the Air Force recognized the need to address noise from a land use planning perspective. The Air Force's major concern is the threat posed to the flying mission at an installation as a result of incompatible development. The late 1960s and early 1970s marked the beginning of the environmental movement. Emphasis on incorporating environmental concerns into the planning process was of major concern to the U.S. Government. Notable events included Air Force research on sonic boom exposure in the 1960s, FAA civilian aircraft certification in 1969, the National Environmental Policy Act in 1969, and the Noise Control Act in 1972. These efforts only increased the awareness of the military on noise planning issues and provided the basis for institutionalizing its programs.

In 1971, the Greenbelt concept was initiated by the Air Force to address the growing problem of incompatible development around airfields (encroachment). The idea behind "Greenbelt" was to establish a buffer zone around the installation through the purchase of property. For obvious budgetary considerations, this concept proved to be economically infeasible.

B.4.4.1. Noise Description

The AICUZ study was first implemented by the Air Force in 1973. The Air Force adopted the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is one of two EPA-approved programs, the other being the Integrated Noise Model (INM), used by the FAA for civilian airports. The Air Force continues to improve the NOISEMAP program.

The next significant event in the development of the military noise program was the 1974 EPA designation of the noise descriptor "DNL," or Day-Night Average Sound Level. In that year, the EPA Administrator, under authority in the Noise Control Act of 1972, recommended federal agencies adopt the DNL noise descriptor system. The Air Force and EPA agreed upon an implementation procedure by which all future AICUZ studies would be prepared in DNL.

The development of DNL was an important milestone in the AICUZ program. It provides a single descriptor for the noise level. This reduced confusion, increased credibility, and allowed for comparative research efforts on the effects of noise.

B.4.4.2. Height Restrictions

Another aspect of the AICUZ program, which is paralleled in the civilian community, is the height obstruction criteria. U.S. standard instrument approach and departure procedures (Joint Air Force, Navy, Army, and FAA Criteria Handbook – AFM 55-9) prescribes flight path area and vertical clearances from terrain and manmade obstructions. The restrictions limit the height of buildings and other structures in the vicinity of the

airfield to ensure the safety of pilots, aircraft and individuals and structures on the ground. AFJM 32-8008 provides more details on the height restriction criteria.

B.4.4.3. Accident Potential Zones

Accident Potential Zones (APZs) are one aspect of the AICUZ program where military application differs from civilian airfields. An analysis of aircraft accidents within 10 nautical miles of an airfield for the period of 1968-1972 led to defining areas of high accident potential known as the Clear Zone (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). The majority of these accidents (62%) occurred either on or adjacent to the airfield or within the CZ, while only about 8% occurred in APZ I and 5% in APZ II. It was concluded that the CZ warranted special attention due to the high incident of accident potential that severely limited acceptable land uses. The Air Force has spent approximately \$65 million to acquire real property interests within the clear zones. The percentages of accidents within the two APZs are such that while purchase is not necessary, some type of land use control is essential. The Air Force recommendation is to limit the number of people exposed through selective land use planning.

B.4.4.4. Land Use Guidelines

Most complaints are related to noise generated by aircraft operations. Noise around an airport is a fact of life, however, as aircraft operations increase the noise exposure increases and complaints increase with demands for noise reductions. In most cases, noise reduction is accomplished by restricting airfield or aircraft operations.

The Federal Interagency Committee on Noise (FICON), published "Guidelines for Considering Noise in Land Use Planning and Control" in June 1980. The committee, now called FICAN (Federal Interagency Committee on Aircraft Noise) is made up of representatives from federal departments that include Transportation, Defense, Environmental Protection Agency, Veterans Administration, and Housing and Urban Development. The purpose of these guidelines is to encourage the best land use, consistent with community planning objectives, while minimizing exposure to excessive noise levels.

B.4.4.5. Noise Reduction Efforts

Military and civilian noise planning efforts have benefited from mutual interest and efforts. One area is research and development. Developing quieter engines for the KC-135, for example, came about through commercial efforts to reduce fuel costs and noise impacts of the Boeing 707. Other efforts have gone into developing engine test facilities, or hush houses, where engines can run at full power with dramatically reduced noise effects to the surrounding environment. Noise abatement procedures are also practiced in Air Force flight scheduling and aircraft operating procedures. Modification to flight tracks, imposition of quiet hours, and use of preferential runways are all techniques used by both the military and civilian airfields to reduce noise. At most installations, Air Force noise reduction efforts have been used to their maximum degree, and land use planning and controls are the answer for further protection of the community.

B.4.4.6. Conclusion

In summary, the difference between noise concerns for the military and the civilian sector continue to become less. The exchange of technical noise information and assistance is needed to address and solve similar problems. Requests from the civilian side to jointly use military airfields are increasing. The Air Force presently has several joint use airfields. Air National Guard and Air Force Reserve units operate from several major airports in the country. There are also large scale joint service operations that include activities at civilian airports. Therefore, both civilian and military airfield operators need to understand each other's mission requirements and their implication with regard to noise and land use planning. The overall goal of the Air Force AICUZ program is to reduce people's exposure to high levels of aircraft noise and accident potential through compatible land use controls adopted by the local communities. To this end, the Air Force initiated a program to assist local communities in implementing AICUZ recommendations. This program is called the Joint Land Use Study (JLUS) program. Meanwhile, the Air Force must continue to

provide the public with current information, which will assist them in making prudent land use decisions, and mutually work together to resolve the problems of growth and encroachment. Attachment 5 provides a list of policy letters and guidance's that apply to AICUZ program.

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APPENDIX C

RARE THREATENED & ENDANGERED SPECIES TABLE

APPENDIX C RARE THREATENED AND ENDANGERED SPECIES

C.1. This table provides a list of rare threatened and endangered species whose habitats lie within the affected areas.

Hawaii -- 317 listings

Animals -- 44

<u>Status</u>	<u>Listing</u>
E	Akepa, Hawaii (honeycreeper) (Loxops coccineus coccineus)
E	Akepa, Maui (honeycreeper) (Loxops coccineus ochraceus)
E	Akialoa, Kauai (honeycreeper) (Hemignathus procerus)
E	Akiapola`au (honeycreeper) (Hemignathus munroi)
E	Albatross, short-tailed (Phoebastria (=Diomedea) albatrus)
E	Amphipod, Kauai cave (Spelaeorchestia koloana)
E	Bat, Hawaiian hoary (Lasiurus cinereus semotus)
E	Coot, Hawaiian (Fulica americana alai)
E	Creepers, Hawaii (Oreomystis mana)
E	Creepers, Molokai (Paroreomyza flammea)
E	Creepers, Oahu (Paroreomyza maculata)
E	Crow, Hawaiian (=‘alala) (Corvus hawaiiensis)
E	Duck, Hawaiian (Anas wyvilliana)
E	Duck, Laysan (Anas laysanensis)
E	Elepaio, Oahu (Chasiempis sandwichensis ibidus)
E	Finch, Laysan (honeycreeper) (Telespyza cantans)
E	Finch, Nihoa (honeycreeper) (Telespyza ultima)
E	Goose, Hawaiian (Branta (=Nesochen) sandvicensis)
E	Hawk, Hawaiian (=‘Io) (Buteo solitarius)
E	Honeycreeper, crested (Palmeria dolei)
E	Millerbird, Nihoa (old world warbler) (Acrocephalus familiaris kingi)
E	Moorhen, Hawaiian common (Gallinula chloropus sandvicensis)
E	Moth, Blackburn's sphinx (Manduca blackburni)
E	Nukupu`u (honeycreeper) (Hemignathus lucidus)
E	`O`o, Kauai (honeyeater) (Moho braccatus)
E	`O`u (honeycreeper) (Psittirostra psittacea)
E	Paliia (honeycreeper) (Loxioides bailleui)
E	Parrotbill, Maui (honeycreeper) (Pseudonestor xanthophrys)
E	Petrel, Hawaiian dark-rumped (Pterodroma phaeopygia sandvicensis)
E	Po`ouli (honeycreeper) (Melamprosops phaeosoma)
T	Sea turtle, green (except where endangered) (Chelonia mydas)
E	Sea turtle, hawksbill (Eretmochelys imbricata)
E	Sea turtle, leatherback (Dermochelys coriacea)
T	Sea turtle, loggerhead (Caretta caretta)
E	Seal, Hawaiian monk (Monachus schauinslandi)
T	Shearwater, Newell's Townsend's (Puffinus auricularis newelli)
T	Snail, Newcomb's (Erinna newcombi)
E	Snails, Oahu tree (Achatinella spp.)
E	Spider, Kauai cave wolf or pe'e pe'e maka 'ole (Adelocosa anops)

Status Listing

- E Stilt, Hawaiian ([Himantopus mexicanus knudseni](#))
- E Thrush, large Kauai ([Myadestes myadestinus](#))
- E Thrush, Molokai ([Myadestes lanaiensis rutha](#))
- E Thrush, small Kauai ([Myadestes palmeri](#))
- E Whale, humpback ([Megaptera novaeangliae](#))

Plants -- 273

- E [Abutilon eremitopetalum](#) (No common name)
- E Ko`oloa`ula ([Abutilon menziesii](#))
- E [Abutilon sandwicense](#) (No common name)
- E Liliwai ([Acaena exigua](#))
- E [Achyranthes mutica](#) (No common name)
- E Chaff-flower, round-leaved ([Achyranthes splendens var. rotundata](#))
- E Fern, pendant kihi ([Adenophorus periens](#))
- E Mahoe ([Alectryon macrococcus](#))
- E Kuawawaenohu ([Alsinidendron lychnoides](#))
- E [Alsinidendron obovatum](#) (No common name)
- E [Alsinidendron trinerve](#) (No common name)
- E [Alsinidendron viscosum](#) (No common name)
- E [Amaranthus brownii](#) (No common name)
- E Silversword, Mauna Loa (=Ka'u) ([Argyroxiphium kauense](#))
- T `Ahinahina ([Argyroxiphium sandwicense ssp. macrocephalum](#))
- E `Ahinahina ([Argyroxiphium sandwicense ssp. sandwicense](#))
- E [Asplenium fragile var. insulare](#) (No common name)
- E Ko`oko`olau ([Bidens micrantha ssp. kalealaha](#))
- E Ko`oko`olau ([Bidens wiebkei](#))
- E [Bonamia menziesii](#) (No common name)
- E Olulu ([Brighamia insignis](#))
- E Pua `ala ([Brighamia rockii](#))
- E Uhiuhi ([Caesalpinia kavaense](#))
- E `Awikiwiki ([Canavalia molokaiensis](#))
- E Kamanomano ([Cenchrus agrimonioides](#))
- E Awiwi ([Centaurium sebaeoides](#))
- E `Akoko ([Chamaesyce celastroides var. kaenana](#))
- E `Akoko ([Chamaesyce deppeana](#))
- E [Chamaesyce halemanui](#) (No common name)
- E `Akoko ([Chamaesyce herbstii](#))
- E `Akoko ([Chamaesyce kuwaleana](#))
- E `Akoko ([Chamaesyce rockii](#))
- E `Akoko, Ewa Plains ([Chamaesyce skottsbergii var. kalaeloana](#))
- E `Oha wai ([Clermontia drepanomorpha](#))
- E `Oha wai ([Clermontia lindseyana](#))
- E `Oha wai ([Clermontia oblongifolia ssp. brevipes](#))
- E `Oha wai ([Clermontia oblongifolia ssp. mauiensis](#))
- E `Oha wai ([Clermontia peleana](#))
- E `Oha wai ([Clermontia pyrularia](#))
- E `Oha wai ([Clermontia samuelii](#))
- E Kauila ([Colubrina oppositifolia](#))

<u>Status</u>	<u>Listing</u>
E	Pauoa (Ctenitis squamigera)
E	Haha (Cyanea acuminata)
E	Haha (Cyanea asarifolia)
E	Haha (Cyanea copelandii ssp. copelandii)
E	Haha (Cyanea copelandii ssp. haleakalaensis)
E	Haha (Cyanea dunbarii)
E	Haha (Cyanea glabra)
E	Haha (Cyanea grimesiana ssp. grimesiana)
E	Haha (Cyanea grimesiana ssp. obatae)
E	Haha (Cyanea hamatiflora carlsonii)
E	Haha (Cyanea hamatiflora ssp. hamatiflora)
E	Haha (Cyanea humboldtiana)
E	Haha (Cyanea koolauensis)
E	Haha (Cyanea lobata)
E	Haha (Cyanea longiflora)
E	Haha (Cyanea macrostegia ssp. gibsonii)
E	Haha (Cyanea manni)
E	Haha (Cyanea mceldowneyi)
E	Haha (Cyanea pinnatifida)
E	Haha (Cyanea platyphylla)
E	Haha (Cyanea procera)
T	Haha (Cyanea recta)
E	Haha (Cyanea remyi)
E	Cyanea (=Rollandia) crispa (No common name)
E	Haha (Cyanea shipmannii)
E	Haha (Cyanea stictophylla)
E	Haha (Cyanea st-johnii)
E	Haha (Cyanea superba)
E	Haha (Cyanea truncata)
E	Haha (Cyanea undulata)
E	Pu`uka`a (Cyperus trachysanthos)
E	Ha`iwale (Cyrtandra crenata)
E	Mapele (Cyrtandra cyaneoides)
E	Ha`iwale (Cyrtandra dentata)
E	Ha`iwale (Cyrtandra giffardii)
T	Ha`iwale (Cyrtandra limahuliensis)
E	Ha`iwale (Cyrtandra munroi)
E	Ha`iwale (Cyrtandra polyantha)
E	Ha`iwale (Cyrtandra subumbellata)
E	Ha`iwale (Cyrtandra tintinnabula)
E	Ha`iwale (Cyrtandra viridiflora)
E	Delissea rhytidosperma (No common name)
E	Oha (Delissea rivularis)
E	Oha (Delissea subcordata)
E	Delissea undulata (No common name)
E	Diellia, asplenium-leaved (Diellia erecta)
E	Diellia falcata (No common name)
E	Diellia pallida (No common name)

<u>Status</u>	<u>Listing</u>
E	<i>Diellia unisora</i> (No common name)
E	<i>Diplazium molokaiense</i> (No common name)
E	Na`ena`e (<i>Dubautia herbstobatae</i>)
E	Na`ena`e (<i>Dubautia latifolia</i>)
E	Na`ena`e (<i>Dubautia pauciflora</i>)
E	Na`ena`e (<i>Dubautia plantaginea ssp. humilis</i>)
E	Love grass, Fosberg's (<i>Eragrostis fosbergii</i>)
E	Nioi (<i>Eugenia koolauensis</i>)
E	`Akoko (<i>Euphorbia haeleeleana</i>)
E	Heau (<i>Exocarpos luteolus</i>)
E	Mehamehame (<i>Flueggea neowawraea</i>)
E	<i>Gahnia lanaiensis</i> (No common name)
E	Gardenia (=Na`u), Hawaiian (<i>Gardenia brighamii</i>)
E	Nanu (<i>Gardenia mannii</i>)
E	Geranium, Hawaiian red-flowered (<i>Geranium arboreum</i>)
E	Nohoanu (<i>Geranium multiflorum</i>)
E	<i>Gouania hillebrandii</i> (No common name)
E	<i>Gouania meyenii</i> (No common name)
E	<i>Gouania vitifolia</i> (No common name)
E	Honohono (<i>Haplostachys haplostachya</i>)
E	Awiwi (<i>Hedyotis cookiana</i>)
E	Kio`ele (<i>Hedyotis coriacea</i>)
E	<i>Hedyotis degeneri</i> (No common name)
E	Pilo (<i>Hedyotis mannii</i>)
E	<i>Hedyotis parvula</i> (No common name)
E	Kopa (<i>Hedyotis schlechtendahliana var. remyi</i>)
E	Hedyotis, Na Pali beach (<i>Hedyotis st.-johnii</i>)
E	<i>Hesperomannia arborescens</i> (No common name)
E	<i>Hesperomannia arbuscula</i> (No common name)
E	<i>Hesperomannia lydgatei</i> (No common name)
E	Kauai hau kuahiwi (<i>Hibiscadelphus distans</i>)
E	Hau kuahiwi (<i>Hibiscadelphus giffardianus</i>)
E	Hau kuahiwi (<i>Hibiscadelphus hualalaiensis</i>)
E	Hau kuahiwi (<i>Hibiscadelphus woodii</i>)
E	Koki`o ke`oke`o (<i>Hibiscus arnotianus ssp. immaculatus</i>)
E	Ma`o hau hele, (=native yellow hibiscus) (<i>Hibiscus brackenridgei</i>)
E	Hibiscus, Clay's (<i>Hibiscus clayi</i>)
E	Koki`o ke`oke`o (<i>Hibiscus waimeae ssp. hannerae</i>)
E	Wawae`iole (<i>Huperzia mannii</i>)
E	Ischaemum, Hilo (<i>Ischaemum byrone</i>)
E	Aupaka (<i>Isodendron hosakae</i>)
E	Aupaka (<i>Isodendron laurifolium</i>)
T	Aupaka (<i>Isodendron longifolium</i>)
E	Kula wahine noho (<i>Isodendron pyriformium</i>)
E	Kohe malama malama o kanaloa (<i>Kanaloa kahoowawensis</i>)
E	Koki`o, Cooke's (<i>Kokia cookei</i>)
E	Koki`o (<i>Kokia drynarioides</i>)
E	Koki`o (<i>Kokia kauaiensis</i>)

<u>Status</u>	<u>Listing</u>
E	Kamakahala (Labordia cyrtandrae)
E	Kamakahala (Labordia lydgatei)
E	Kamakahala (Labordia tinifolia var. lanaiensis)
E	Kamakahala (Labordia tinifolia var. wahiawaensis)
E	Kamakahala (Labordia triflora)
E	`Anaunau (Lepidium arbuscula)
E	Nehe (Lipochaeta fauriei)
E	Nehe (Lipochaeta kamolensis)
E	Nehe (Lipochaeta lobata var. leptophylla)
E	Nehe (Lipochaeta micrantha)
E	Nehe (Lipochaeta tenuifolia)
E	Lipochaeta venosa (No common name)
E	Nehe (Lipochaeta waimeaensis)
E	Lobelia gaudichaudii ssp. koolauensis (No common name)
E	Lobelia monostachya (No common name)
E	Lobelia niihauensis (No common name)
E	Lobelia oahuensis (No common name)
E	Wawae`iole (Lycopodium (=Phlegmariurus) nutans)
E	Lysimachia filifolia (No common name)
E	Lysimachia lydgatei (No common name)
E	Lysimachia maxima (No common name)
E	Mariscus fauriei (No common name)
E	Mariscus pennatiformis (No common name)
E	Ihi`ihi (Marsilea villosa)
E	Alani (Melicope adscendens)
E	Alani (Melicope balloui)
E	Alani (Melicope haupuensis)
E	Alani (Melicope knudsenii)
E	Alani (Melicope lydgatei)
E	Alani (Melicope mucronulata)
E	Alani (Melicope munroi)
E	Alani (Melicope ovalis)
E	Alani (Melicope pallida)
E	Alani (Melicope quadrangularis)
E	Alani (Melicope reflexa)
E	Alani (Melicope saint-johnii)
E	Alani (Melicope zahlbruckneri)
E	Munroidendron racemosum (No common name)
E	Kolea (Myrsine juddii)
T	Kolea (Myrsine linearifolia)
E	Neraudia angulata (No common name)
E	Neraudia ovata (No common name)
E	Neraudia sericea (No common name)
E	`Aiea (Nothoctrum breviflorum)
E	`Aiea (Nothoctrum peltatum)
E	Kulu`i (Nototrichium humile)
E	Holei (Ochrosia kilauaeensis)
E	Panicgrass, Carter's (Panicum fauriei var. carteri)

<u>Status</u>	<u>Listing</u>
E	Lau `ehu (<i>Panicum niihauense</i>)
T	Makou (<i>Peucedanum sandwicense</i>)
E	<i>Phyllostegia glabra</i> var. <i>lanaiensis</i> (No common name)
E	<i>Phyllostegia hirsuta</i> (No common name)
E	<i>Phyllostegia kaalaensis</i> (No common name)
E	<i>Phyllostegia knudsenii</i> (No common name)
E	<i>Phyllostegia mannii</i> (No common name)
E	<i>Phyllostegia mollis</i> (No common name)
E	<i>Phyllostegia parviflora</i> (No common name)
E	Kiponapona (<i>Phyllostegia racemosa</i>)
E	<i>Phyllostegia velutina</i> (No common name)
E	<i>Phyllostegia waimeae</i> (No common name)
E	<i>Phyllostegia warshaueri</i> (No common name)
E	<i>Phyllostegia wawrana</i> (No common name)
E	Kuahiwi laukahi (<i>Plantago hawaiiensis</i>)
E	Kuahiwi laukahi (<i>Plantago princeps</i>)
E	<i>Platanthera holochila</i> (No common name)
E	Hala pepe (<i>Pleomele hawaiiensis</i>)
E	Bluegrass, Mann's (<i>Poa mannii</i>)
E	Bluegrass, Hawaiian (<i>Poa sandwicensis</i>)
E	<i>Poa siphonoglossa</i> (No common name)
E	Po`e (<i>Portulaca sclerocarpa</i>)
E	Lo`ulu (<i>Pritchardia affinis</i>)
E	Wahane (<i>Pritchardia aylmer-robinsonii</i>)
E	Lo`ulu (<i>Pritchardia kaalae</i>)
E	Lo`ulu (<i>Pritchardia munroi</i>)
E	Lo`ulu (<i>Pritchardia napaliensis</i>)
E	Lo`ulu (<i>Pritchardia remota</i>)
E	Lo`ulu (<i>Pritchardia schattaueri</i>)
E	Lo`ulu (<i>Pritchardia viscosa</i>)
E	Kaulu (<i>Pteralyxia kauaiensis</i>)
E	<i>Pteris lidgatei</i> (No common name)
E	<i>Remya kauaiensis</i> (No common name)
E	Remya, Maui (<i>Remya mauiensis</i>)
E	<i>Remya montgomeryi</i> (No common name)
E	<i>Sanicula mariversa</i> (No common name)
E	<i>Sanicula purpurea</i> (No common name)
E	Sandalwood, Lanai (=`iliah) (<i>Santalum freycinetianum</i> var. <i>lanaiense</i>)
E	Naupaka, dwarf (<i>Scaevola coriacea</i>)
E	Schiedea, Diamond Head (<i>Schiedea adamantis</i>)
E	Ma`oli`oli (<i>Schiedea apokremnos</i>)
E	<i>Schiedea haleakalensis</i> (No common name)
E	<i>Schiedea helleri</i> (No common name)
E	<i>Schiedea hookeri</i> (No common name)
E	<i>Schiedea kaalae</i> (No common name)
E	<i>Schiedea kauaiensis</i> (No common name)
E	Ma`oli`oli (<i>Schiedea kealiae</i>)
E	<i>Schiedea lydgatei</i> (No common name)

<u>Status</u>	<u>Listing</u>
E	<i>Schiedea membranacea</i> (No common name)
E	<i>Schiedea nuttallii</i> (No common name)
E	<i>Schiedea sarmentosa</i> (No common name)
E	<i>Schiedea spergulina</i> var. <i>leiopoda</i> (No common name)
T	<i>Schiedea spergulina</i> var. <i>spergulina</i> (No common name)
E	Lauhilihi (<i>Schiedea stellarioides</i>)
E	<i>Schiedea verticillata</i> (No common name)
E	Ohai (<i>Sesbania tomentosa</i>)
E	`Anunu (<i>Sicyos alba</i>)
E	<i>Silene alexandri</i> (No common name)
T	<i>Silene hawaiiensis</i> (No common name)
E	<i>Silene lanceolata</i> (No common name)
E	<i>Silene perlmanii</i> (No common name)
E	Popolo ku mai (<i>Solanum incompletum</i>)
E	`Aiakeakua, popolo (<i>Solanum sandwicense</i>)
E	<i>Spermolepis hawaiiensis</i> (No common name)
E	<i>Stenogyne angustifolia</i> var. <i>angustifolia</i> (No common name)
E	<i>Stenogyne bifida</i> (No common name)
E	<i>Stenogyne campanulata</i> (No common name)
E	<i>Stenogyne kanehoana</i> (No common name)
E	<i>Tetramolopium arenarium</i> (No common name)
E	Pamakani (<i>Tetramolopium capillare</i>)
E	<i>Tetramolopium filiforme</i> (No common name)
E	<i>Tetramolopium lepidotum</i> ssp. <i>lepidotum</i> (No common name)
E	<i>Tetramolopium remyi</i> (No common name)
T	<i>Tetramolopium rockii</i> (No common name)
E	`Ohe`ohe (<i>Tetraplasandra gymnocarpa</i>)
E	<i>Trematolobelia singularis</i> (No common name)
E	Opuhe (<i>Urera kaalae</i>)
E	Vetch, Hawaiian (<i>Vicia menziesii</i>)
E	<i>Vigna o-wahuensis</i> (No common name)
E	Pamakani (<i>Viola chamissoniana</i> ssp. <i>chamissoniana</i>)
E	<i>Viola helenae</i> (No common name)
E	Nani wai`ale`ale (<i>Viola kauaiensis</i> var. <i>wahiawaensis</i>)
E	<i>Viola lanaiensis</i> (No common name)
E	<i>Viola oahuensis</i> (No common name)
E	Iliau, dwarf (<i>Wilkesia hobbdyi</i>)
E	<i>Xylosma crenatum</i> (No common name)
E	A`e (<i>Zanthoxylum dipetalum</i> var. <i>tomentosum</i>)
E	A`e (<i>Zanthoxylum hawaiiense</i>)

Source: U.S. Fish and Wildlife Service, Pacific Region, Web Site, 2002

C.2. Table C.2. MCBH, Oahu Indigenous, and Endangered Plants and Some of their Current and Traditional Hawaiian Cultural Uses *

Scientific Name and Status (if applicable)	Hawaiian/Common Name	Plant description/Uses
<i>Achyranthes splendens</i> var. <i>rotunda</i> ; E (US)	'Ewa hinahina/Round-leaf Chaff flower	Landscape
<i>Abutilon incanum</i>	Ma'o/Hoary abutilon	Landscape
<i>Argemone glauca</i>	Pua kala/Hawaiian poppy	Medicine
<i>Artemesia australis</i>	Ahinahina/Wormwood	Shrub, rocky outcrops
<i>Bolboschoenus maritimus</i> (<i>Scirpus maritimus</i>)	Makai, Kuluha/seaside bulrush, sea clubrush	Medicinal and culinary
<i>Caperis sanwichiiana</i> ; SOC (HI)	Maiapio/Caper	Landscape, lei and medicine; sprawling shrub
<i>Chamaesyce degeneri</i> (<i>Euphorbia degeneri</i>)	Koko 'akoko/Beach Spurge	In ancient Hawaii, mothers used it because they thought it would help them produce more milk
<i>Chenopodium oahuense</i>	'Aheahea 'aweoweo/Goosefoot Species	Shrub-like
<i>Chrysopogon aciculatus</i> Noxious weed (US)	Pilipili-'ula/Golden beardgrass	
<i>Cibotium glaucum</i>	Hapu'u/Hawaiian Tree Fern	Landscape, small tree; edible core utilized during famine, pillow stuffing; wound dressing and embalming
<i>Cordia subcordata</i>	Kou	
<i>Cyperus trachysanthos</i> ; E (US)	Pu 'uka 'a	Landscape, lei and medicine
<i>Dianella sandwicensis</i>	'Uki 'uki	
<i>Dodonaea viscosa</i>	'A 'ali 'i	Landscape, medicine and lei; wood used for spears and posts
<i>Erythrina sandwicensis</i>	Wiliwili/Hawaiian coral tree	Landscape, lei; wood used for fishing floats and surfboards, etc.
<i>Fimbristylus cymosa</i> (<i>F. pynocephala</i>)	Mau'u 'aki'aki/Button Fimbristylus	
<i>Gossypium tomentosum</i>	Ma'o/Hawaiian cotton	Landscape and lei; used to introduce valuable genetic traits into domestic cotton
<i>Heliotropium anamalom</i>	Hinahina/Beach heliotrope	Succulent plant forms rosettes; landscape and lei
<i>H. currassavicum</i>	Nina, kupukai/Seaside heliotrope	
<i>Heteropogon contortus</i>	Pili, piligrass/twisted beardgrass/Black speargrass	Medicine and culinary
<i>Hibiscus amottianus</i> ssp. <i>immaculatus</i> E (US)	Koki 'o ke 'oke 'o/Native white hibiscus	Landscape, dye and lei, small tree/shrub; all native hibiscus species important in Hawaiian legends
<i>H. brackenridgia</i> ; E (US) State flower	M 'o 'ula 'ula/Native yellow hibiscus	Landscape, dye and lei, small tree/shrub
<i>H. kokio</i> ; SOC (HI)	Koki'o ke 'oke'o/Red Rosemallow	Landscape, dye and lei, small tree/shrub
<i>H. tillaceus</i>	Hau	Landscape, dye and lei, small tree/shrub; wood used for floats booms, canoe outriggers, cordage
<i>Ipomoea indica</i>	koali 'awa, koali awahia/morning glory species	Landscape
<i>I. pes-caprae</i> species	Pohuehue/Beach morning glory	Landscape and medicine
<i>Jacquemontia ovalifolia</i>	Pa 'u-o-hi'iaka, kakuaohi 'iaka	Landscape, medicine; sprawling prostrate

Appendix C Rare Threatened and Endangered Species Table

<i>sandwicense</i>		vine
<i>Lipochaeta integrifolia</i> (<i>Wollastonia integrifolia</i>)	Nehe	Groundcover, landscape, and lei
<i>Lycium sandwicense</i>	'Ohelo kai 'ae'ae	Woody shrub
<i>Lycopodium cemuum</i>	Waiwai 'ole/club moss	
<i>Mariscus javanicus</i> (<i>Cyperus javanicus</i>)	"Ahu'awa/March cyperus	
<i>Myoporum sandwicensis</i>	Naiu papa/False sandalwood	Landscape and wood; shrub to small tree
<i>Nama sandwicensis</i>	Hinahina kahakai/water-leaf family	Small succulent shrub/groundcover
<i>Nephrolepsis cordifolia</i>	Kupukupu fern	
<i>Nototrichium sandwicensis</i>	Kului/Amaranth family	Landscape, and lei; shrub to small tree
<i>Osteomeles anthyllidifolia</i>	"Ulei, u'ulei	Landscape, wood used for making musical instruments and fish hooks, and medicine; sprawling shrub
<i>Pandanus tectorius</i>	Hala/Screwpine	Fiber with many uses, edible fruit, landscape, lei and medicine; small tree
<i>Panicum torridum</i>	Kakonakona	
<i>Paspalum scrobiculatum</i> ; Noxious weed (US)	Mau'u laiki/Ricegrass	
<i>Peperomia remyi</i>	Ala'ala wai nui/Peperomia	Landscape, small succulent plant
<i>Plectranthus parviflorus</i>	Spurflower	Landscape; herbaceous perennial
<i>Plumbago zeylanica</i>	'Ilie'e, hillie'e/Leadwort	Shrub
<i>Prichardia</i> species; E (US)	Loulu/Loulu palm	Landscape and cordage used in weaving hats, fans, baskets, and edible seeds; medium-sized palm
<i>Ruppia maritima</i>	Widgeon grass/sea tassel	
<i>Sapindus saponaria</i>	Manela, A'e/Hawaiian soapberry	Landscape, seeds used in leis and jewelry, medicine, fish poison and insecticide, fruit used as soap substitute; large tree
<i>Scaevola sericea</i>	Naupaka/Beach naupaka	Landscape, and lei; forms groundcover
<i>Schoenoplectus lacustris</i>	"Aka 'akai/Great bulrush	
<i>Sesbania tomentosa</i> ; E (US)	'Ohai/Pea family	
<i>Sesuvium portulacastrum</i>	'Akulikuli/Sea purslane	
<i>Sida fallax</i>	'Ilima/Mallow family	Landscape, lei and medicine (all parts); prostrate to erect shrub
<i>Solanum americanum</i>	Popolo/Glossy nightshade	shrub
<i>Sporobolus virginicus</i>	'Aki'aki/Beach dropseed grass seashore rushgrass	
<i>Thepesia populnea</i>	Milo/Portia tree	Landscape and wood; shrub to small tree
<i>Tribulis cistoides</i>	Nohu	
<i>Vigna marina</i>	Nanea, mohihihi/Beach pea	
<i>Vitex rotundifolia</i>	Pohinihina, kolokolo/Beach vitex	Landscape, basket making, lei and medicine
<i>Waltheria indica</i>	'Uha loa, hi 'oloa, kanakaloa	Medicine; small shrub
<i>Wikstroemia uva-ursi</i>	'Akia	Landscape, lei, cordage, medicine, and also used to stupefy fish; ground cover

*Source: MCBH Integrated Natural Resource Management Plan, 2002-2006; USFWS Threatened and Endangered Species System (TEES), Listings by State and Territories as of 4/28/2003, hawaii

E = Endangered HI = Hawaii
T = Threatened US = United States
SOC = Species of Special Concern

Note: None of these rare and endangered species are regulated in the same way as if they were naturally occurring because they were planted in landscape setting.

C.3. TABLES SPECIFIC TO LOCATIONS BEING CONSIDERED FOR THE SAAF

TABLE C.3-1 RARE ANIMALS FOUND ON SCHOFIELD BARRACKS EAST RANGE*

Scientific Name	Common Name	Federal Status	Heritage Global Rank	Date Last Observed
Snails				
<i>Achatinella apexfulva</i>	Pupu Kuahiwi, Pupu Kanioe, Kahuli, Oahu Tree Snail	E	G1	1953
<i>Achatinella byronii</i>	Pupu Kuahiwi, Pupu Kanioe, Kahuli, Oahu Tree Snail	E	GH	2000
<i>Achatinella decipiens</i>	Pupu Kuahiwi, Pupu Kanioe, Kahuli, Oahu Tree Snail	E	G1	2000
<i>Achatinella leucorraphe</i>	Pupu Kuahiwi, Pupu Kanioe, Kahuli, Oahu Tree Snail	E	G1	1989
<i>Achatinella sowerbyana</i>	Pupu Kuahiwi, Pupu Kanioe, Kahuli, Oahu Tree Snail	E	G1	2000
<i>Achatinella swiftii</i>	Pupu Kuahiwi, Pupu Kanioe, Kahuli, Oahu Tree Snail	E	GH	1970s
<i>Auriculella persusilla</i>	Achatinellid land snail	None	G1	1966
<i>Auriculella pulchra</i>	Achatinellid land snail	None	G1	1953
Dragonflies and Damselflies				
<i>Megalagrion oahuensis</i>	Oahu Megalagrion Damselfly	None	G1G3	1958
Birds				
<i>Chasiempis sandwichensis ibidis</i>	Oahu 'Elepaio	E	G4T?	1977
<i>Loxops coccineus wolstenholmii</i>	'Akepeu 'ie, Oahu 'Akepa	None	G2TH	1976
<i>Paroreomyza maculata</i>	'Alauahio, Oahu Creeper	E	G1	1977
<i>Vestiaria coccinea</i>	'I 'iwi	None	G4	2000
Mammals				
<i>Lasiurus cinereus semotus</i>	'Ope'ape a, Hawaiian hoary bat	E	G5T2	1976

* Source: Endangered Species Management Plan Report, SBER (R.M. Towill Corporation, 1997b); the Research Corporation of the University of Hawaii (RUCH) natural resources staff; the listed and candidate species list for the Hawaiian Islands, updated April 18, 2000.

1 Key to Federal Status: E = endangered.

2 Key to Global Ranks as defined by Hawaii Natural Heritage Program: G1 = species critically imperiled globally (typically 1-5 occurrences);

G4 = species apparently globally secure (typically > 100 occurrences); G2TH = species imperiled globally, but subspecies only known from historical occurrences; G5T2 - species globally secure but subspecies or variety imperiled globally (typically 6-20 occurrences); G1 G3 = more information needed to accurately rank this species; G4T? = more information needed to accurately rank this subspecies; GH = species known only from historical occurrences (no observations in past 15 years).

3 Species designated as last observed in 2000 are those that are actively managed.

Table C.3-2 Rare Plants Found on Schofield Barracks East Range*

Scientific Name	Common Name	Federal Status	Heritage Global Rank	Date Last Observed
<i>Chamaesyce rockii</i>	Akoko	E	G1	1993
<i>Cyanea acuminata</i>	'Oha, haha, 'ohawai	E	G1	Unknown
<i>Cyanea koolauensis</i>	'Oha, haha, 'ohawai	E	G1	2000
<i>Cyanea lanceolata</i> spp. <i>calycina</i>	'Oha, haha, 'ohawai	C(6)	G3T1	2000
<i>Cyanea longiflora</i>	'Oha, haha, 'ohawai	E	G1	1916
<i>Cyanea st.-johnii</i>	'Oha, haha, 'ohawai	E		1947
<i>Cyrtandra subumbellata</i>	Ha'iwale, kanawao, ke'oke'o	E		2000
<i>Doodia lyonii</i>				2000
<i>Gardenia mannii</i>	Nanu, na'u			1992
<i>Hesperomannia arborescens</i>		E	G1	2000
<i>Isodendron laurifolium</i>	Aupaka	E	G1	2000
<i>Joinvillea ascendens</i> spp. <i>ascendens</i>	'Ohe	E	G3GST1	1930
<i>Lobelia hypoleuca</i>	'Opelu, mo 'owahie	none	G2	1993
<i>Lobelia oahuensis</i>	'Oha, haha, 'ohawai	E	G1	1926
<i>Phlegmarius nutans</i> (<i>Lycopodium nutans</i>)	Wawae 'iole	E	G1	2000
<i>Phyllostegia hirsuta</i>		E	G 1	2001
<i>Platydesma cornuta</i> var. <i>cornuta</i>		C (6)	G2T1	2000
<i>Pteris lidgatei</i>		E	G1	2001
<i>Sanicula purpurea</i>		E	G1	2001
<i>Tetraplasandra gymnocarpa</i>	'Ohe' ohe	E	G1	2000
<i>Viola oahuensis</i>		E	G1	2001
<i>Zanthoxylum oahuense</i>	Hea 'e, a 'e	E	G1	2001

*Source: Endangered Species Management Plan Report, SBER (R.M. Towill Corporation, 1997b); the Research Corporation of the University of Hawaii (RUCH) natural resources staff; the listed and candidate species list for the Hawaiian Islands, updated November 29, 1999.

1 Key to Federal Status: E = endangered; C = candidate for listing.

2 Key to Global Ranks as defined by Hawaii Natural Heritage Program: G1 = species critically imperiled globally (typically 1-5 occurrences); G2 = species imperiled globally (typically 6-20 occurrences); G2T1 = species imperiled globally and subspecies or variety critically imperiled globally (typically 1-5); G3T1 = species very rare with restricted range and subspecies or variety critically imperiled globally (typically 1-5); G3G5T1 = species global rank uncertain, but subspecies or variety critically imperiled globally (typically 1-5).

Species designated as last observed in 2000 are those that are actively managed.

APPENDIX D
ABBREVIATIONS, ACRONYMS, AND TERM DEFINITIONS

APPENDIX D ABBREVIATIONS ACRONYMS AND TERM DEFINITIONS

Acronym	Definition	Primary Location
15 AW	15 th Airlift Wing	ES-2
65 AS	65 th Aerial Squadron	2-17
154 WG	154 th Wing	ES-2
A		
AAF	United States Army Airfield	2-15
AAV	Amphibious Assault Vehicles	3-62
AB	United States Air Base	2-4
ac	acres	2-4
ACHP	Advisory Council on Historic Properties	3-95
ACM	asbestos-containing materials	3-86
AD	United States Active Duty military personnel	2-12
ADC	Animal Damage Control	3-73
AEI	Air Emissions Inventory	3-44
AFB	United States Air Force Base	ES-1
AFH	United States Air Force Handbook	2-13
AFI	United States Air Force Instruction	ES-1
AFIERA	Air Force Institute of Environmental, Safety and Occupational Health Risk Analysis	3-38
AFIOH	Air Force Institute of Environmental, Safety and Occupational Health Risk Analysis	3-38
AFJM	Armed Forces Joint Manual	3-68
AFOSH	Air Force Occupational Safety and Health	3-67
agl	Above Ground Level	1-3
Air Force	United States Air Force	ES-1
AICUZ	Air Installation Compatible Use Zones	3-52
ALZ	Assault Landing Zone	ES-1
AMC	United States Air Force Air Mobility Command	ES-1
ANG	United States Air National Guard	ES-2
AOC	Areas Of Concern	3-94
APZ	Accident Potential Zones	3-66
AQCR	Hawaii Air Quality Control Region	3-42
AR	Aerial Refueling	2-12
Army	United States Army	2-16
ASE	Aerospace Support Equipment	2-9
ATC	Air Traffic Control facilities	3-49
ATFP	Anti-Terrorism/Force Protection	2-8
B		
BACT	Best Available Control Technology	4-21
BAM	Bird Avoidance Model	3-71
BASH	Bird-Aircraft Strike Hazard	3-72
bgs	below ground surface	3-42
BHWG	Bird Hazard Working Group	3-72
Bldg.	Building / Facility	3-5
BMP	Best Management Practices	ES-3

C

°C	degrees Celsius	3-4
C-17 Globemaster III	United States Air Force Cargo Aircraft	ES-1
C-17	United States Air Force Cargo Aircraft	ES-1
C-130	United States Air Force Cargo Aircraft	ES-1
C-130 Hercules	United States Air Force Cargo Aircraft	ES-2
CAA	Clean Air Act	1-5
CAAA	Clean Air Act Amendments	3-47
CEQ	Council on Environmental Quality	1-5
CEQA	Council on Environmental Quality Act	ES-1
CES	Civil Engineering Squadron	3-87
CFA	Controlled Firing Areas	3-49
CFR	Code of Federal Regulations	1-5
CHRRS	Community Home Finding Referral and Relocation Services	3-88
cm	centimeter	3-3
CO	Carbon Oxides	3-43
CONUS	Contiguous United States of America	ES-1
CRMP	Cultural Resources Management Plan	5-2
CSP	Covered Source Permit	3-37
CWA	Clean Water Act	ES-3
CZ	Clear Zone	3-72
CZM	Coastal Zone Management	ES-3
CZMP	Coastal Zone Management Program	1-5

D

dBA	decibels average	3-51
dB	decibels	3-54
DLNR	Hawaii Department of Land and Natural Resources	3-39
DME	Distance Measuring Equipment	2-15
DoD	Department of Defense	ES-1
DOPAA	Description of Proposed Actions and Alternatives	2-1
DRMO	Defense Reutilization and Marketing Office	3-86
DSN	Defense Switched Network	3-82
DZ	Drop Zone	ES-2

E

EA	Environmental Assessment	ES-1
ECM	Electronic Counter Measures	2-9
EIAP	Environmental Impact Analysis Process	ES-1
EIS	Environmental Impact Study	1-5
EJ	Environmental Justice	3-88
E.O.	Executive Order	1-6
EOD	Explosive Ordnance Disposal	3-68
EPA	U.S. Environmental Protection Agency	1-5
ERP	Environmental Restoration Program	3-85
ESA	Endangered Species Act	1-6
ES	Explosive Site	3-67

F

°F	degrees Fahrenheit	3-4
FAA	Federal Aviation Administration	2-15
FACSFAC	Fleet Area Control and Surveillance Facility	3-50

APPENDIX D ABBREVIATIONS, ACRONYMS, AND TERM DEFINITIONS

FAR	Federal Aviation Regulations	3-52
FEDS	Flotation Explosive Deployment System	2-9
FEMA	Federal Emergency Management Agency	3-19
FFP1	Fire Fighting Pit 1	3-85
FIRM	Flood Insurance Rate Map	3-19
FLIP	Flight Information Publication	3-62
FONSI	Finding of No Significant Impact	1-5
ft	Foot or Feet in measurement	1-3
ft ²	Square Feet	2-7
G		
gals	Gallons	1-3
GCA	Ground Control Approach	3-68
H		
ha	hectares	2-4
HAP	High Accident Potential	3-44
HAR	Hawaii Administrative Rules	3-42
HAWTELCO	Hawaii Telephone Company	3-82
HAZMART	Hazardous Materials Pharmacy	3-85
HINHP	Hawaii Natural Heritage Program	3-24
HDoH	Hawaii Department of Health	3-24
HECO	Hawaiian Electric Company	3-80
HI	Hawaii	ES-1
HIA	Honolulu International Airport	ES-4
HIANG	Hawaii Air National Guard	ES-2
HITS	Hawaii Information Transfer System	3-81
HRS	Hawaiian Revised Statutes	1-5
HSIHP	Hawaii State Inventory of Historic Places	3-94
I		
IBD	Inhabited Building Distance	3-67
IFR	Instrument Flight Rules	2-16
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning	1-1
ILS	Instrument Landing Systems	2-15
IMC	instrument meteorological conditions	3-48
in	inches	ES-2
INRMP	Integrated Natural Resources Management Plan	3-30
Intl	International	2-16
J		
JP-8	Jet Propulsion Fuel Grade 8	1-3
K		
KBAC	Kailua Bay Advisory Council	3-41
Kg	Kilograms	1-4
KIAS	knots indicated airspeed	3-50
km	kilometers	3-1
kV	kilovolts	3-80
kW	kilowatts	3-82
L		
LATN	Low Altitude Tactical Navigation	4-38
LBP	Lead Based Paint	3-85

APPENDIX D ABBREVIATIONS, ACRONYMS, AND TERM DEFINITIONS

lbs	Pounds	1-3
LCAC	Landing Craft, Air Cushioned	3-62
Ldn	Level day-night	3-54
Ldnmr	Ldn Monthly Ratio	3-55
Ldnr	Ldn Rate Adjusted	3-54
LS	Lump Sum	2-7
LSV	Logistical Supply Vessel	4-42
M		
µg/m ³	micrograms per cubic meter	3-43
m	meter	3-1
m ²	Square Meters	2-7
m ³	Cubic Meters	3-43
MAP	Management Action Plan	3-86
mgd	million gallons per day	3-76
MILCON	Military Construction Projects	5-1
mi	miles	1-5
ml	Million liters per day	3-77
MOA	military operations areas	3-49
MRS 2005	Mobility Requirements Study 2005	ES-1
msl	mean sea level	2-16
MTR	Military Training Route	2-2
MVA	Megavolt Amperes	3-80
mwh	megawatt-hours	3-80
N		
N/A	Not Applicable	2-15
NAAQS	National Ambient Air Quality Standards	3-41
NAGPRAI	Native American Graves Protection and Repatriation	3-94
NCO	Noncommissioned Officer	3-16
NDI	Non-Destructive Inspection	2-10
NEPA	National Environmental Policy Act	ES-1
NGPC	Notice of General Permit Coverage	3-77
NHPA	National Historic Preservation Act	1-6
NMFS	National Marine Fisheries Service	3-38
NOI	Notice of Intent	3-77
NOISEMAP	Software for Mapping Noise Contours	3-55
NO _x	Nitrogen Oxide	3-41
NPDES	National Pollutant Discharge Elimination System	3-43
NRHP	National Register of Historic Places	1-6
NTSB	National Transportation Safety Board	3-66
NWI	National Wetland Inventory	3-25
O		
O ₃	Ozone	3-41
O&M	Operations and Maintenance	5-2
OAQPS	Office of Air Quality Planning and Standards	3-41
OHA	Office of Hawaiian Affairs	3-88
ORMP	Ocean Resources Management Plan	3-18
OTS	Oahu Telephone System	3-82
P		
PA	Preliminary Assessment	3-85

PACAF	United States Air Force Pacific Air Forces Command	ES-1
PACOM	United States Pacific Command	ES-1
PADS	PCB Activity Data System	3-86
Pb	Periodic Symbol for Lead	3-41
PCB	Polychlorinated Biphenyl	3-86
PES	Potential Explosive Sites	3-67
PM	Particulate Matter	3-41
PM10	Particulate Matter with an aerodynamic diameter of less than 10 microns	3-41
POL	Petroleum, Oil, or Lubricant	3-65
ppb	parts per billion	3-42
ppm	parts per million	3-41
ppt	parts per thousand	3-40
PSD	prevention of significant deterioration	3-44
PVC	Poly Vinyl Chloride	3-79
Q		
Q-D	Explosive Site-Quantity Distance	3-67
R		
RAPCON	RADAR Approach Control	3-68
RCO	FAA, Remote Communications Outlet	2-16
RDT-CTL		2-16
RMP	Risk Management Plan	3-47
ROI	Radius of Influence	3-1
RT&E	Rare, Threatened, & Endangered	3-34
S		
SAAF	Small Austere Airfield	ES-1
SBER	Schofield Barracks East Range	3-15
SBMR	Schofield Barracks Military Reservation	3-15
SEL	Sound Exposure Level	3-53
SELr	SEL rate adjusted	3-53
SHPO	State Historic Preservation Office	3-94
SIP	State Implementation Plan	1-5
SMA	Special Management Area	3-16
SOC	Species of Concern	3-36
SO _x	Sulfur Oxide	3-43
SPCC	Spill Prevention Control and Countermeasures	3-86
SR	Slow Routes	3-49
Star Turn	Multi-point short radius ground turnaround maneuver	2-
SUA	Special Utilization Areas	2-12
SWMP	Storm Water Management Plan	3-7
T		
TLF	Temporary Lodging Facility	3-5
tpy	tons per year	3-44
TPRF	Torpedo Post-Run Facility	3-86
TSDf	Treatment, Storage, or Disposal Facilities	3-85
U		
UIC	Underground Injection Control	3-42
USAF	United States Air Force	ES-1
USACE	United States Army Corps of Engineers	ES-3
U S Army	United States Army	2-15

APPENDIX D ABBREVIATIONS, ACRONYMS, AND TERM DEFINITIONS

USC	United States Code	1-6
USEPA	United States Environmental Protection Agency	1-5
USFWS	United States Fish and Wildlife Service	3-30
USMC	US Marine Corps	3-38
V		
VOC	Volatile Organic Compounds	3-43
Vol.	Volume	2-13
W		
WMA	Wildlife Management Area	3-37
WWTP	Waste Water Treatment Plant	3-77
Y		
yd	yard or yards in measurement	3-9

APPENDIX E

PUBLIC SCOPING MEETING COMMENTS AND TRANSCRIPTS

APPENDIX E PUBLIC SCOPING MEETING COMMENTS AND TRANSCRIPTS

E.1 The following pages contain information and public news releases that were sent out to inform the public of the programs extent of information and direction / avenues of filing comments or locations to attend to receive and make comments used for development of the EA.

**Online archives from The Kauai Garden Island.**

March 02, 2003

Air Force wants to use PMRF for aircraft training

By LESTER CHANG - TGI Staff Writer

Meeting on proposal at Waimea

The Air Force has scheduled a meeting at the Waimea Neighborhood Center on Thursday, March 6 from 7 to 9 p.m. to gauge public opinion about the possibility of using a runway at the Navy's Pacific Missile Range Facility for training missions.

The training missions are being considered as part of a larger proposal by Congress to station eight C-17 aircraft at Hickam Air Force Base on O'ahu.

"The evaluation is to see if Barking Sands could be an alternative for short field runway training for the new planes that are coming," said Lt. Christopher Anderson of the public affairs office at Hickam Air Force Base.

That option will be discussed at the Waimea meeting.

Hickam officials also will discuss the proposal to locate the C-17 aircraft at the O'ahu air base to replace four C-130s, to build support structures and a shortfield runway and to use drop zones for equipment and personnel, Anderson said.

Kauai residents will be asked to give comments before an environmental assessment on the proposal is completed, Anderson said.

"We want to keep the community involved so they can have their say on it," the Air Force official said.

The Air Force also must get approval from the Navy before the plan involving the training flights can be implemented.

*Staff writer Lester Chang can be reached at 245-3681 (ext. 225) and
mailto:lchang@pulitzer.net*

<http://www.kauaiworld.com/archives/index.inn?loc=detail&doc=/2003/March/02-660-news...> 3/5/2003

Thursday, March 6[Back to top](#)

KAUAI CHAMBER OF COMMERCE -- invites you to a breakfast with its Board of

8. U.S. AIR FORCE NOTICE OF SCOPING MEETINGS The U.S. Air Force, Hickam Air Force Base (HAFB), Hawaii, will hold scoping meetings in four communities on the islands of Oahu and Kauai in February and March 2003. The public is invited to attend these meetings, intended to help collect information and offer the public an opportunity to comment on the proposal to beddown (establish) eight C-17 aircraft at HAFB, to replace the current 4 C-130s. The proposal includes C-17 support facility construction at Hickam AFB, the use of existing airspace by the C-17, the construction of a shortfield runway, and the use of a drop zone for dropping equipment and personnel. A detailed description of the proposed action and alternatives (DOPAA) will be provided at the meetings. The meeting dates, times, and locations are as follows: Meeting 1 - Aliamanu/Salt Lake, Oahu: Date: February 26, 7:00 p.m. - 9:00 p.m. Place: Aliamanu Intermediate School Cafeteria 3271 Salt Lake Blvd. Meeting 2 - Wahiawa, Oahu: Date: February 27, 7:00 p.m. - 9:00 p.m. Place: Wahiawa Recreation Center 1139-A Kilani Avenue Meeting 3 - Kaneohe, Oahu: Date: March 4, 7:00 p.m. - 9:00 p.m. Place: Windward Community College, Hale Akoakoa 107-109 45-720 Kea`ahala Road, Kaneohe Meeting 4 - Waimea, Kauai: Date: March 6, 7:00 p.m. - 9:00 p.m. Place: Waimea Neighborhood Center 4556 Makeke Road, Waimea During each meeting there will be a brief presentation by the Air Force representatives. Each meeting will offer attendees an opportunity to comment, both orally and in written format. For additional information, please contact 1Lt. Christopher Anderson or Ms. Bette Kalohi, telephone 808-449-6367. (Hon. Adv.: Feb. 20, 2003)(A-409432)

Subclassification: Legal Ads 2/20/2003

READY TO BE SCOPED?

U.S. Air Force

Notice of Scoping Meetings

The U.S. Air Force, Hickam Air Force Base (HAFB), Hawaii, will hold scoping meetings on the islands of Oahu and Kauai in February and March 2003. The public is invited to attend these meetings which are intended to help collect information and offer the public an opportunity to comment on the proposal to beddown (establish) eight C-17 aircraft at HAFB, to replace the current 4 C-130s. The proposal includes C-17 support facility construction at Hickam AFB, the use of existing airspace by the C-17, the construction of a shortfield runway, and the use of a drop zone for dropping equipment and personnel. A detailed description of the proposed action and alternatives (DOPAA) will be provided at the meetings. The ONLY meeting location on O'ahu is:

March 4, 7 pm - 9 pm
University of Hawai'i - Windward Community College, Hale `Akoakoa 107-109
45-720 Kea'ahala Road, Kaneohe

During each meeting there will be a brief presentation by the Air Force representatives. Each meeting will offer attendees an opportunity to comment, both orally and in written format. For additional information, please contact 1st Lt. Christopher Anderson or Ms. Bette Kalohi, telephone 808-449-6367.

E.2 This is the General Contents of the Brief provided at all four locations.

_____)
In Re: United States Air Force C-17 Globemaster III)
Phase I Public Scoping Meetings)
_____)
Held on February 26, 2003 at Aliamanu Intermediate School Cafeteria, Honolulu, Hawai'i, commencing at 7:10 p.m.

REPORTED BY: HOLLY M. HACKETT, RPR, CSR #130
Certified Shorthand Reporter
A P P E A R A N C E S

Air Force Personnel
Colonel Torres
Major Belk
Lieutenant Colonel Ann Greenlee, HIANG
Gary O'Donnell

I N D E X

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PUBLIC COMMENT PERIOD	13
Howard Shima	
Glenn Murata	

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MAJOR BELK: We will start off this evening with a video presentation. And then we'll go from there.
(C-17 Globemaster III video shown)

MAJOR BELK: I hope you enjoyed the video. Welcome, everyone. Thank you very much for coming. I'm Major Almarah Belk. I'm the Public Affairs Officer at Hickam Air Force Base.

I'm just going to kind of walk you through a couple of things we'd like to cover with you tonight and administrative procedures, how this will work, how we will take your comments, if you wish to provide them written or verbal.

Colonel Torres, our Ops Group Commander will present the C-17 road map, mobility road map briefing to give you an idea of the beddown plan as we foresee it now.

We also have a representative from our Environmental Flight and Civil Engineering Squadron at Hickam, Mr. O'Donnell, who will give you the environmental process on that, including the proposed action and some alternatives that we're looking at and in the schedule for how things will proceed for the environmental process. He'll present all of that to you.

At the end there will be a point of contact as well, if you wish to mail a comment. If you think of something later and you want to take a card you can mail them as well.

First of all, scoping meetings, kind of a little bit of an idea as to what the purpose of this meeting is. I want to emphasize, you'll hear this several times tonight, that everything we're doing we fully intend and will comply with the National Environmental Policy Act in terms of the scoping process and the environmental studies that will be done.

This is an opportunity. We advertised we were going to have these meetings. We bring the community in. It's an opportunity for you to become involved to see what we're looking at, what we're planning for and you can provide your comment on that.

We're looking for your issues and your comments, anything that you can think of. You can provide those verbal or written to us.

We've got a stenographer present this evening who will be recording that, and they're going to be placed in the official meeting transcript. And they will become an official record as part of the Environmental Assessment as an appendix to that. So it's a formal public meeting to take your comments.

Just quickly in terms of how you can provide your comments. Verbal comments, you've got an attendance card that we asked you if you would graciously complete for us. You can just mark "verbal" on there.

We will collect them from you and then we'll call the names at random. We will also ask you to use the microphone for the stenographer so she can be sure and hear you clearly, your comments.

If you would just prioritize them, five minutes or so. If you need more time or you have more comment we can take those written as well, which is the other option. There's a written comments form that you can leave with us or you can mail it in.

The name and address on those are optional. You don't have to provide that. Those are mainly for if for some reason we can't read your handwriting or we need clarification we could contact you. But it's not the intent to take personal information beyond for that reason only.

After, again Colonel Torres will give you the road map briefing. And then we will have the environmental part. And then we will take your comments again. So Colonel Torres, he's our Ops Commander.

COLONEL TORRES: Thanks. I'm Ray Torres. Everybody can hear me I hope? Great. Thanks for taking your time tonight. We are going to click through a few slides. To be honest, the environmental folks are going to click through a few slides but really what we are here for is addressing your concerns or questions.

Partnership with the community is extremely important to the military and extremely important to Hickam Air Force Base.

In the Air Force and the Air Mobility Command in the Pacific we identified some years ago, in fact years ago, there was a shortfall of mobility capability around the world.

As you saw in part of the film we realized pretty quickly, especially in Afghanistan, that it's difficult to get to some of those parts of the world because they don't have nice highways, rails, buses, that kind of infrastructure.

So a lot of those parts of the world where sometimes you might want to provide humanitarian rations or whatever else our war fighters need we can only access by air.

So the plan that we're looking at -- and it is just a plan, we have to go through the process first. There isn't a decision made. I don't want to put in anybody's mind that this is a firm thing.

This is just the military planning. So all the numbers, all the information that you're going to get is just a plan. That's all it is.

It calls for having 8 C-17s here. The good news about C-17s, at Hickam Air Force Base at least, there's one sitting on the ramp now and they're there all the time. They transient through Hickam Air Force Base. So we're used to seeing them coming and going. The difference here would be, and I apologize --

LT. COLONEL GREENLEE: Ann Greenlee.

COLONEL TORRES: -- Ann Greenlee, Colonel Greenlee from the Hawaii National Guard here who's our partner on the base in this effort.

The concept is, of course, that we turn in 4 C-130s right now owned and operated by the Hawaii Air National Guard and modernize those with C-17s. There's a partnership between the active duty and the Hawaii Air National Guard to operate those C-17s. Next.

Again, details still are being determined. Site surveys are being done at Hickam and Elmendorf. So the exact dollar or manpower figures, we can discuss those but they're not finite by any stretch of the imagination because it's still just a plan at this point.

We've already highlighted it once but we will highlight it again. Environmental Assessment has to be done before a final decision is made.

That's the process we're right in the midst of right now discussing with the community, make sure we are following the law. The Air Force, of course, is going to fully comply with the National Environmental Policy Act.

Hickam has had a long relationship with the community, obviously not just here at Honolulu but also up at Bellows. Oddly we're the smallest of the services, probably the Navy and the Army 25th Infantry being the biggest.

But we have always valued our relationship with the community and that won't change as these aircraft, if the plan goes through. Next.

Okay. We're going to go to the environmental impact analysis with Gary and then we'll be ready to take your questions.

MR. O'DONNELL: Thank you, Colonel Torres for giving us the background on the C-17. I'm Gary O'Donnell. I'm an architect by training and I head the Environmental Planning Department at Hickam Air Force Base.

The National Environmental Policy Act is the national charter to protect the environment. The key thing on this slide is involving the public. That's why we're all here tonight, the scoping meeting.

What we need is feedback from you. Your comments here tonight or in writing will allow us to incorporate those comments into the, consider them in the Environmental Assessment. And then there will be a draft of that. There will be a 30-day chance to comment on that also.

And also that has to consider all environmental factors and reasonable alternatives. And the Air Force instruction is the agency's implementing regulation to complying with the National Environmental Policy Act. So everything has to be in plain language.

The key thing on this slide is that this is not a new mission. We're replacing 4, C-130s with 8, C-17s which give us better capacity. It's an improvement all the way around. It's a strategic aircraft that allows us to go further than that C-130.

So a lot of these planes, the 8 of them, you will not see here in Hawai'i a good part of the time once the training is

completed.

We're also going to have to do some construction but it's all within the base boundaries. As an architect I don't consider what I've seen so far to be a lot of construction.

And personnel requirements. We need to increase the personnel to come in to man the planes. There will be training requirements.

For the training requirements we have to have a shortfield runway. That will be a modification of an existing runway. So, again, there's no acquisition of land or anything else on boundaries.

Next. Then all the alternatives, actually the first three alternatives all include basing the planes at Hickam. So they're assigned to Hickam. As I said a good part of the time after the training is complete they will be in other parts of the Pacific.

And the 'no action' alternative would be just to continue with what we have here now, the C-130s. But that wouldn't give us the distance that we need to cover all the places in the Pacific.

With the C-130 it's not a tactical aircraft. You have to switch the cargo over.

This plane can land on a short runway and go right to the area. You don't lose that time when you have to switch the cargo over.

Now, the first three alternatives, the shortfield runway will be modified at Barking Sands in the first alternative.

The second alternative would use modification of a runway at Kaneohe Marine Corps Air Base or Marine Corps Hawaii now.

The third alternative would be to do the training within the 48 contiguous states. Obviously that's a bit of distance from Hawaii.

So those are what we see now as being the reasonable alternatives.

This is the process. A Notice of Intent was sent out on December 8th. It was sent to various government agencies, U.S. Fish and Wildlife Services, the Department of Land and Natural Resources, to the State of Hawaii. There was about a 30 different agencies that the letter was mailed to notifying them of the intent to do this.

Here we are now at the scoping process. This is us today, the 26th of February, just trying to get your input.

And the Draft EA will actually come out in June sometime. And then there will be 30 days after that until July that you will have the opportunity to comment again. Then once we have all those comments incorporated we will finalize the EA.

And in August there will be either a FONSI, a Finding of No Significant Impact, and we'll proceed or we'll decide that this project really needs a full-blown Environmental Impact Statement. That will be determined at the end of the EA process.

This is the community involvement plan (indicating). That's what I hope you all picked up on your way in. It looks like this. It gives you the basic information that we have on the project now. This is basically a chance for us to communicate to the public, also for the public to communicate their concerns and dialogue with us.

Then there's a newsletter to keep you informed of any status changes. There's a newsletter. If you provide your mailing address we will see that you get a newsletter of any changes to this project. So that's what the mailing list is for.

It's also going to be in public libraries. There is about six public libraries including the main state library downtown on King Street, I believe that is.

Then if you vocalize your comments here tonight we will take them, but also you can write your comments. That's the address to our contractor.

When we do an EA, when any agency does an Environmental Assessment we basically try to have an impartial contractor do it that can look at it with the perspective outside of the agency and consider both the agency's mission as well as the public's concerns.

So we will take a look at all the comments that are written to J.M. Waller. Carl Woehle is here tonight. We have other people here too to take your questions. Thank you very much.

MAJOR BELK: Thank you. My apologies, Lieutenant Colonel Greenlee. She's my counterpart, Public Affairs Officer for the Hawaii Air National Guard unit that is at Hickam. This would be a partner relationship as plans move along.

So now if anybody has any comments I can take your attendance cards if anybody wishes to. We don't have a lot of people so it's not logistically as difficult as it is when there's many. But I can do that now. Does anybody want to comment?

MR. SHIMA: I'm Howard Shima. I'm a member of Neighborhood Board #18. I've several questions. One is the eight C-17s will replace four of the C-130s which is now under the Hawai'i Air National Guard. So is it my understanding that these eight will be under, the eight C-17s will be under the Hawai'i Air National Guard or be flown by Hawai'i Air National Guard pilots? Or will you have additional personnel coming in for that?

COLONEL TORRES: A lot of questions. Let me start maybe with the first one and if I miss one of your questions, please repeat it. It's an associate relationship is what we call in the military. Meaning we both, the Hawaii National Guard and the active duty United States Air Force both will fly the C-17. You asked about people coming to -- did you mean --

MR. SHIMA: Additional Air Force personnel will be coming to Hickam.

COLONEL TORRES: Yes, sir. Additional personnel will be coming to Hickam.

MR. SHIMA: How many will that be?

THE WITNESS: Because it's only a plan we don't have definitive numbers. But Jackson, Mississippi back on the mainland has a like-sized unit and that number is roughly 400 plus or minus folks, 400 people roughly. But, again, I can't say that's what's going to come to Hickam. A like-sized unit in Jackson, Mississippi is 400 people roughly.

MR. SHIMA: On the environmental side how much more of a noise impact will these planes have compared to the C-130?

COLONEL TORRES: Very good question, sir. As the film pointed out there are planes still in production, meaning these airplanes that will replace the C-130s, because they're brand new are actually quieter than the C-130s we currently have stationed at Hickam Air Force Base. They're new production airplanes that we receive at Hickam so they're quieter than that prop aircraft that are out there now.

MR. SHIMA: My last question. Is the training shortfield?

COLONEL TORRES: Yes, sir.

MR. SHIMA: That's going to be at Hickam or on Kauai?

COLONEL TORRES: No, sir. And we went through those slides pretty quick. It's a great question. In the plan, and we're not sure, but in the handout that you have it goes through it fairly well, but we looked at five fields within the State of Hawai'i that could do that kind of training. We quickly eliminated three of those. And really just came down to two. So I'm coming around to your answer. So, no, that training cannot be conducted at Honolulu International at Hickam Air Force Base because of the commercial traffic. We don't fit in well with that. The two locations that are being looked at are Barking Sands and Kaneohe Bay. The good news at least in our assessment of that is both are capable of supporting that training within the boundaries within their current structure of their current field. In other words, this isn't, at least within the plan there isn't an intent to say we need to buy more land or the government needs more land. Both of those we're planning, we're looking at right now, it's only at the beginning of that state. The training can be conducted within the confines of the current field.

MR. SHIMA: So it won't be necessary to have additional construction of a new airfield. They can operate with the present airfields out there?

COLONEL TORRES: Sir, it's likely going to require either location with cement being poured. Meaning as you saw on the film when the plane contacts it's actually a fairly hard landing (indicating). And years and years of doing that what we have learned is the tar runways at most civilian fields or normal fields can't stand that kind of landing. So at either location we would have to perform some kind of building up with gravel and then pouring cement to make within the confines of the field either an old runway at Kaneohe Bay possibly, possibly or a modification to some of the concrete at Barking Sands, again within the confines. But, yes, it would mean pouring a new runway for the training. Yes, sir.

MR. SHIMA: Do you have any kind of schedule for a finalizing the implementation of the program?

COLONEL TORRES: What would you define as final? You mean when the planes arrive?

MR. SHIMA: Yes, when they're operational.

COLONEL TORRES: Yes, sir. We would think about a little over three and a half years from now. Again, we're back to the plan. There's steps along the way. This is a significant part of that plan, communicating with the community and going through the environmental process, sir, roughly in three and a half years when we can see C-17s begin training.

MR. SHIMA: Thank you.

COLONEL TORRES: Those are a lot of good questions, sir. You might have covered it. But I'm not sure. But, please.

MAJOR BELK: Is there anyone else who would like to provide a verbal comment or ask a question? If you could state your name, please, for the stenographer.

COLONEL TORRES: The reason we're stating the name for the stenographer is this goes in the record with the assessment. So when it's public, put in the library, we're trying to answer your questions and be completely forthright.

That's the reason we are going through the mic process. Obviously the cafeteria isn't full, it would be easy for us just to talk. So we record it to make sure we're properly answering your questions.

MR. MURATA: My name is Glenn Murata. I've just got some questions. I heard something about C-130's not a tactical aircraft. What is the difference between a tactical or non-tactical?

COLONEL TORRES: That is actually a mistake. It's the other way around. The C-130 *is* a tactical airplane.

MR. MURATA: What's the definition of tactical?

COLONEL TORRES: Usually we look at tactical, this is a test for me, I believe, usually we look at the deference between tactical and strategic at least in ability or airlift mostly associated with ranging capability.

The C-130s have a range roughly the Hawaiian Islands, Johnston Atoll, Wake, without stopping for fuel, without moving cargo over a great distance.

The C-17 actually carries three times the amount of pallets that a C-130 does and roughly twice that range of a C-130. And a C-17 is air refuelable. You saw it moving Keiko 8600 nautical miles from Washington State all the way to Iceland.

So we look at tactical, strategic and mobility being associated mostly with capacity of range.

MR. MURATA: Assuming the C-17 takes over this, is there a mission or something unique about the C-17s being at Hickam versus at another Air Force base or someplace else?

COLONEL TORRES: It's a very good question. I probably did a poor job of covering that. I didn't get into military specifics of why it would be important to have C-17s here.

Hawai'i and Alaska, as you saw in my slides I mentioned both states, are the furthest western states in the United States. It gives the military and civil agencies, the governor, congressmen, senators the furthest reach possible by stationing the aircraft still on U.S. territory both in the Pacific and for the Pacific. Meaning I know we have had a few hurricanes, typhoons go through the islands in its past history. In fact somewhat recently. The C-17 has the capability the C-130 has plus a much bigger volume capability to help. So there's two real reasons. One is it gives us much more range of capability to support in the military theater out in the Pacific and that theater is sizeable. Really that goes all the way west out to India for us, quite a ways and obviously all the way to the west coast to the mainland. But it also allows us to serve within the Pacific humanitarian issues much quicker by being so far west. So if there was a reason it would be because Hawai'i and Alaska are as far west as we can base United States' aircraft on U.S. soil still.

MR. MURATA: Thank you.

COLONEL TORRES: And if I miss your question or don't answer it, please hit me, ask me to answer it again if I miss your point.

MAJOR BELK: Okay. Would anybody else like to offer a verbal comment? All right. Well, thank you very much for coming. Again, if you think of something if you want to take a card, you can mail it in. We would be happy to take a look at it later. Thank you very much for coming tonight. We appreciate your involvement.

COLONEL TORRES: Thank you.

(Meeting concluded at 7:45 p.m.)

C E R T I F I C A T E

I, HOLLY HACKETT, R.P.R., C.S.R. in and for the
State of Hawai'i, do hereby certify;

That I was acting as shorthand reporter in the
foregoing matter on the 26th day of February, 2003;

That the proceedings were taken down in
computerized machine shorthand by me and were
thereafter reduced to print by me;

That the foregoing represents, to the best of my
ability, a correct transcript of the proceedings had in
the foregoing matter.

DATED: This ____ day of _____ 2003

HOLLY M. HACKETT, R.P.R., C.S.R. #130
Certified Shorthand Reporter

LIEUTENANT ANDERSON: At this time we would like to address any issues or comments you may have. There have been two cards that have been filled out. Do you have any issues or comments you would like to address at this time?

MR. BURRESS: Questions.

LIEUTENANT ANDERSON: We can go questions first or comments that you would like to be part of the assessment record.

MS. KEARNS: Why would you need an Environmental Assessment?

MR. O'DONNELL: It's required by law. You'd be surprised the things we do Environmental Assessments on. And each agency submits to the federal government, you know, their criteria for what gets environmentally assessed. One of the things is operations. When there's a change of operations normally we do an Environmental Assessment. This program was a change of operations but it also requires bringing in four more additional aircraft. We're doing some modifications. It's a little more extensive than just flopping out on a one-for-one basis. It's a new airplane, actually a better airplane, actually quieter than the airplanes we have now. But the law says to notify the public and give them an opportunity to comment. That's why we're here to make sure we address the public's concern.

LIEUTENANT ANDERSON: Did that answer your question, ma'am?

MS. KEARNS: Hmm-hmm.

LIEUTENANT ANDERSON: Sir, you had a question?

MR. BURRESS: My name is Jim Burress. My interests are more from the stimulus this might give to the community in terms of projects. So I was curious, of course you're in the EA phase now, how does the congressional approval stand now? How is that going to fold in the process?

LIEUTENANT COLONEL KANABAY: Are you asking where in the political process is the congressional approval?

MR. BURRESS: Yeah. This is not a done deal, right?

LIEUTENANT COLONEL KANABAY: That's correct.

MR. BURRESS: So where is that proposal?

LIEUTENANT COLONEL KANABAY: It's in Congress. I think it's part of the budget that they're going ahead and reviewing now. Congress only approved two portions of the 13, I think, bills that they put through for all the fiscal year of 2003. Buried in one of those bills is this proposal. As soon as Congress gets out from under, I don't know which one's in, but as soon as Congress gets one of the 11 other bills remaining approved, then we will have congressional approval. Congress is looking at 2003 in this process.

MR. BURRESS: What interested me was what would come with the planes, the squadron. It seems to be a lot of infrastructure support. There is an article in the "Star Bulletin" and it started addressing monies to be appropriated for what seemed to be beyond just the planes themselves. The article talked about 10.8 million for squadron ops, 30.5 million for approach and control maintenance facility, 5.7 million for flight simulator, 8.4 million for maybe different types of maintenance facilities, and 4.5 million to begin support utilities. So I mean it seemed like there's a pretty good chunk of change that could evolve into the project. I was wondering what's your understanding.

MR. O'DONNELL: There are some projects. Again, it's not like building a whole new college campus or a whole new base or anything like that. It's just basically what you got there's a few new buildings. It cost a lot of money to do these things these days. But I think maybe Colonel Kanabay may be able to address some of that.

LIEUTENANT COLONEL KANABAY: What exactly is the question?

MR. BURRESS: Well, it seems like there's going to be a lot of facilities that are going to be built. My interest is being part of that process to provide a service.

LIEUTENANT COLONEL KANABAY: From a business standpoint.

MR. BURRESS: Hmm-hmm.

LIEUTENANT COLONEL KANABAY: I think, Carl, when we go out to bid for these buildings, if the plan is approved, they'll be in a competitive bid.

MR. WOHRLE: Yes. And because they're large projects considered MILCON, military construction, this is managed by the Corps of Engineers.

By law MILCON is directed by the Corps of Engineers. That will be the agency that will advertise this work all the way through design and construction.

MR. BURRESS: Is there any indication how the Corps would administer in terms of design and build?

MR. WOEHRLER: It's more than likely they'll do both.

LIEUTENANT COLONEL KANABAY: You need to understand we're very, very early in the planning stages --

MR. BURRESS: Oh, yeah. I understand.

LIEUTENANT COLONEL KANABAY: -- on the type of contract that relates to the buildings. Again, what we're working from at Hickam is other bases that have already done that. There are a couple of other bases that have done it. We're kind of taking that template saying, okay, this is what they did. What do we have to do to accommodate that if this were to pass? I think the numbers that you're looking at are based on historic numbers. They're based on estimates. Again this is all in the planning stages. Until we get to authorization, we see exactly what is authorized we're guessing. You know, the numbers I gave you are based on what other units of this type and size have been. We have not been directed to go ahead. We have not been given numbers of people yet. We are saying okay, it's a plan. You got to start from something with a plan. We took the model from these other units, said, okay, we're going to start from here. How would we change things if we were given an authorization to go? Like I told you in the briefing that's \$425 million that they're looking at between the two bases. There will be some work out there. Like Mr. Woehrle said, the Corps of Engineers will go through standard notices, all standard dailies that we put out for the appropriate amounts.

MR. BURRESS: You talked about you're going to be issuing newsletters. Are you going to be continuing that past the EA or EIS? Kind of keep the community updated as to what's going on down the road? As opposed to going to the paper, looking for RMs, RFPs?

MR. WOEHRLER: We would stop our newsletters at the end of the EA. If the FONSI is signed we would stop there. If it goes to an EIS we will continue to do that to that extent.

Beyond that I guess the PA would handle news.

LIEUTENANT ANDERSON: Correct. Beyond that we would engage with the community and keep engaged with the community. Now, on certain construction projects or whatever is required to support, if the proposal is approved to support the C-17, whatever agency is responsible for contracting or sending out information on the bids, whether they be the Army Corps of Engineers, probably, they would have me sending out public notices and other information out to the public or businesses that are able to bid for those projects.

LIEUTENANT COLONEL KANABAY: I would expect a PA if Congress authorizes it or if they don't as well.

LIEUTENANT ANDERSON: Definitely. There will be public involvement and media, lots of media interaction either way, whatever Congress decides to do.

Ma'am, did you have any more questions?

MS. KEARNS: Is that plane to be built here?

LIEUTENANT ANDERSON: The plane, ma'am?

MS. KEARNS: Hmm-hmm.

LIEUTENANT ANDERSON: Actually if Congress approves it it would be based at Hickam. The plane would come off the assembly lines at Boeing and we would get brand new aircraft at Hickam, stationed at Hickam. They wouldn't be built here. They would be built at the facilities that Boeing already has in place.

MS. KEARNS: One project could take years, this one project?

MR. O'DONNELL: 2006.

LIEUTENANT ANDERSON: If Congress approves it they could come as early as 2006, if Congress approves it.

LIEUTENANT COLONEL KANABAY: Does that answer your question?

MS. KEARNS: Wasn't it appropriated in this 2003 budget?

LIEUTENANT COLONEL KANABAY: The entire budget has not been passed.

MS. KEARNS: I thought the defense budget was.

LIEUTENANT COLONEL KANABAY: You're right. There are other portions to all the bills. There's like 13 different bills. In order to make changes like this you get authorization to spend the money. Then you need authorization to execute the project.

The part that authorizes us to execute the project has not been authorized by Congress.

MS. KEARNS: Okay.

LIEUTENANT ANDERSON: Any more questions? I want to thank you all for attending tonight's scoping meeting. If you have further questions or comments or issues you'd like to send to Mr. Woehrle, comments or issues, please feel free to take one of these forms with you. And send your comments in using the form and/or give us a call. We would be glad to work with you on any issues. Thank you, again, for coming to tonight's scoping meeting.

(Meeting concluded at 7:55 p.m.)

C E R T I F I C A T E

I, HOLLY HACKETT, R.P.R., C.S.R. in and for the State
of Hawai'i, do hereby certify;

That I was acting as shorthand reporter in the
foregoing matter on the 4th day of March, 2003;

That the proceedings were taken down in
computerized machine shorthand by me and were
thereafter

reduced to print by me;

That the foregoing represents, to the best
of my ability, a correct transcript of the proceedings
had in the foregoing matter.

DATED: This ____ day of _____ 2003

HOLLY M. HACKETT, R.P.R., C.S.R. #130
Certified Shorthand Reporter

Aloha Mr. Woehrle

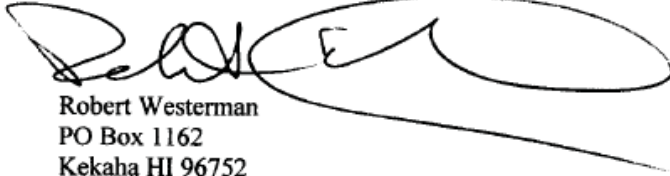
I am writing to let the US Air Force know that "Kauai" is not against the C-17 project as was stated by other members of the community.

Several times (one) I person stated that "Kauai" does not want this project. It needs to be understood that this individual and in fact everyone that attended was speaking in the singular. Not one person identified themselves as representative of more than themselves.

I am happy to see that the military is being very proactive in their approach to this project and see this as a sign of good faith. I have faith that the system will work and the project will not come to the west side if it adversely affects the community, the environment, or the mission already set for PMRF.

It is obvious that the one segment of the community wants to use this as a wedge to return to a pre 9/11 world. I, as do most Americans, understand that this is not possible. I was disappointed to see that members of our community feel that it is their right to issue ultimatums in the name of the island as a whole. I for one do not feel that anyone has the right to hold hostage the United States of America for their own selfish personal agenda.

In short I support the current alternative 1, Hickam AFB C-17 beddown and the construction of an ALZ runway within the current base boundaries of PMRF Barking Sands.



Robert Westerman
PO Box 1162
Kekaha HI 96752
808-337-9586
bwes@aloha.net

Written Comment Card
Meeting Location and Date: Waimea Neighborhood Center, March 6, 2003

If you would like to submit written comments regarding the proposed C-17 beddown at Hickam AFB, please complete this form. Your written comments will be reviewed and considered by the Air Force managers in scoping this project. Please submit this completed form to a scoping official or mail it to the address below. Your comments must be received no later than March 21, 2003. Thank you for your time and interest.

J.M. Waller Associates, Inc
Attn: Mr. Carl Woehrlé
459 N. Kalaheo
Kailua, Hawaii 96734

Name (last, first): Gonsalves, Puanani Mrs. Telephone: _____

Address: POB 464 E-Mail: _____

City, State: Waimea, HI 96796 Zip Code: _____

Organization (if applicable): _____

Comments (Attach additional sheets as necessary):

An excellent presentation by your Air Force "public relations" trio -
- outstanding video: the C-17 plane.
- clearly stated goals.
- in the Q&A segment, answers were directed to facts stated for those
of us who were attending to gain information on the proposal.
IMUA - my name is on the list to receive newsletters on progress!


Signature

MAJOR BELK: Okay. We have a second microphone here. I believe it's active as well. I'm going to go ahead and by random we have about five or six people who have elected to provide verbal comment. So I will call names. And please pardon me if I mispronounce, I don't mean any offense by that.

Mr. Bruce Pleas, is that right?

BRUCE PLEAS: Yeah. I'd like to go to the Community Involvement Plan. This would be Section 2.2. It says "only five runway locations meet the basic criteria for construction of an ALZ runway, PMRF Barking Sands." Now does this mean there'll be a new runway constructed?

COLONEL TORRES: It's possible.

BRUCE PLEAS: Okay. Where would it be? Would it be on the -- they have an existing 350.

COLONEL TORRES: Right.

BRUCE PLEAS: There's an old 320.

COLONEL TORRES: Right. Let me try and be specific about the runway. We've been doing this now for about ten years. What we've learned in ten years is that the C-17 because of its size and the way we train, and it's been validated since Afghanistan and flying into a lot of the old Soviet Union countries that we need to land on concrete that's very thick, 90 feet wide and 3,500 feet long, with a special paint job, 90 feet wide and 3,500 feet long, to a maximum of 5,000 feet.

How did we learn that and why aren't the runways currently good enough for that? Typically most of us fly on commercial airplanes. We prefer to have a nice smooth landing. Every now and then you get a bumpy one, and I know as a pilot in the Air Force I've given you bumpy ones every now and then, or the people I was flying with.

You noticed in probably the film that you saw the plane touching down really hard (gesturing). That's so that they can stop in 3,500 feet but still bring that massive airplane and all that load to a stop. So when we reviewed the runways in the islands, and it's actually no different than the runways that were looked at back on the mainland, most of them are tar. And most of that tar, especially in warmer climates, can't handle. So what it does is it ruts after a very, very short period of time.

So the reason that the runway has to be constructed, and don't misunderstand, it's possible in some of these runways that there's always substructure or something underneath, that it's not that you're possibly taking bare land, putting in gravel, putting in a substructure and building it up to the cement. For instance, at Barking Sands to the east side of the active runway there's already a cement ramp. That's a possibility, again just in the planning and looking at it. But if your question is does a new runway need to be assembled in the Hawaiian Islands the answer is yes, sir.

BRUCE PLEAS: Okay. Yes. And so it would be, from what you're saying, somewhere on the same bounds as the runway exists now, either the 350 or 320. Both of them are asphalt?

COLONEL TORRES: Yes, sir.

BRUCE PLEAS: And there is the old ramp from World War II?

COLONEL TORRES: Yes, sir.

BRUCE PLEAS: Okay. Drop zones on Kauai?

COLONEL TORRES: None.

BRUCE PLEAS: None.

COLONEL TORRES: Let me address that further if I can. And I'll -- we'll count it against my time because you're bringing up a lot of good questions that maybe other people have.

There are no military training routes over your island. There is going to be no military training routes over your island. The plane, because of the training it's going to perform, is going to come in largely from the west. Meaning it's going to come in over the water. You have no route around or over your island. And we would be forthright with you and I would tell you right here right now if we had any intent of putting a route over your island. And there is none.

In fact there is none on any of the islands to add a route. There are military training routes and drop zones on other islands, specifically the Big Island and on the island of Oahu. There is no intent and no plan at all any place in this plan for any air drop on your island nor is there an intent to overfly your island.

Maybe more than you wanted. Yes, sir?

BRUCE PLEAS: Okay. So that was the thing other people mentioned to me about the route.

COLONEL TORRES: Yes, sir.

BRUCE PLEAS: And I know you guys did drop zones in Kekaha about 15 years ago. I used to watch them go down.

COLONEL TORRES: Yes.

BRUCE PLEAS: Now my comments here. We have had, back in the 1970s we had Kaneohe come in and Air National Guard from the northern United States come in in the winter to do landings here. Okay. During that time we ran into an access problem. What we have directly in front of the runway, the 350 runway, is a surfing area called Kinikini. We went round and round. For many years we were restricted from that area because of planes coming in, and finally we worked it out, because of the flight pattern.

So that would be what I would need clarified from the Air Force is that if you do come in that we will still be able to access this surfing area that would be if the runway is on or next to the 350.

Also there's fishing areas in rec areas 1 and 2, which is on the northwest side of the runway. And those I would like to know what effect it will have on the people to go fishing there.

Currently we have, since September 11th we have had a drastic decrease in the amount of access we've had to this base. For your information before September 11th this base was almost 100 percent open except during operational hours to the public for use. We have fought back now and we have four days out of seven to go surfing. And we don't want to lose any more. And we feel that we are not a security risk.

And so we, that's what I would like you to know, that there is a surfing area and we don't want to have -- you know, I support you.

COLONEL TORRES: Yes, sir.

BRUCE PLEAS: But I won't support you if I can't go surfing.

COLONEL TORRES: Yes, sir.

BRUCE PLEAS: I mean, you know, I'll just put it bluntly.

Environmental and health. I worked out there and I've been a resident at PMRF for 30 years. I've only worked there for about two or three off and on.

The jet fuel emissions. Historically the pattern of the areas affected by your emissions from the planes as they land it will affect employees, the Pacific Missile Range Facility, PMRF, visitor cottages, family housing to a small point, and recreational users. For the employees what you have is in a synopsis during the mornings the waves are generally out of the east or downslope. So if you have landings in the morning their emissions will go out into the ocean. During the afternoon the prevailing winds are light on shore. So what happens, and I've been there when C-5s and 141s and jet fighters have come in, the smell, the exhaust smell will come in. It will come into housing, which they're military so I imagine that they will, you know, live with it because that's what they're there for.

The biggest problem I could see would be with the Navy visitor cottages. They are directly -- well, they're within a thousand feet, some of them, of the end of the runway. And that's where you could have a problem for, you know, with the Navy and with the visitors that are staying there.

As for family housing, the farther down and it takes only a -- it takes just the right amount of west wind to get it down there. But you can notice they're there.

For the recreational users, for myself, I used to hold my breath when they come by and I still can. And sometimes we get an oil slick from the emissions if it was repeated one after another.

Noise factor is Kekaha, as far as I can see it wouldn't be that much of a problem as long as you adhere to your fly zones. If it's usually three miles outside of Kekaha there's no -- the noise would affect PMRF and also would affect to a point if you go directly off the runways and go over Polihale Beach. If you did a bank off to the left it would not affect Polihale as much. But that would be your noise effect.

For new employees I hope that you would hire local residents. Okay? Because we have some out of work ag workers, high school, KCC and University of Hawaii graduates.

For your personnel that come in that are Air Force I would hope that those personnel would be housed on base and you would make facilities for them. Our housing, we have a shortage of housing over here, and also most people cannot compete with the allocation for housing that the military has. I don't know how much you have that you usually allocate, but I know a lot of times the military come out and over pay what the local people can't.

COLONEL TORRES: That rises the price for everybody?

BRUCE PLEAS: Yeah, it rises the price. It already has. And that is a concern there. So, you know, I wish you'd -- that's a concern I have for that.

Information release on what's happening over here. I'm very much disturbed by the front page news we get. Coverage on the antiballistic missile tests we have. Loose lips sink ships and loose lips can sink Kauai.

If you're going to do this over here, we know it's happening, you know it's happening, do what you have to do to do your public, your EA, but we don't need the world to know that we could be a target. Because that's a concern I have. I have a lot of friends who work out there. And I, you know, that's, you know, just a service. We're in the front page all the time. All this is happening on Kauai. And with North Korea wanting to test their second stage rocket now, which puts them in range of here, I don't feel like being a target.

And at that point thank you for letting me talk for longer than you probably wanted me to.

COLONEL TORRES: Not at all. No, that's fine. Obviously I didn't give you responses as you went along, but you asked a lot of great questions. The good news is she's got them down. And we have to respond to those. And we will. When it hits the library those are recorded and we'll go through.

You bring up a lot of issues that are exactly why we want to come to the community. Meaning from Hickam Air Force Base I don't know how much surfing is done north and south, I don't know how much fishing is done north or south. I'm not privy to those things because I don't work and live on the island, unfortunately. It's a beautiful island. And I'm not part of the Barking Sands Navy knowing some of those community pieces. But a lot of valid questions that we'll respond to and obviously do our best to come back and say here's how we expect to operate the airplane.

As I mentioned to a large degree the airplane is planned to come in from the west. The planes are brand new if the plan works out. They are quieter than the C-130 is currently. Which is also quieter than the C-5 or the 141. Meaning it is a quieter airplane.

If it came to Barking Sands it's for training. It's not to be based. So you're not going to see it typically sitting there for days. What you're going to likely see it do, if you see it at all, or hear it at all, is you'll see it come in, do a landing stop and probably a few minutes later take back off.

Again the good news is it's a new airplane, which means new airplanes are built much more environmentally conscious from noise, from emissions of both vapor and fuel. But I'm not going to disagree at all and say yes, there's still going to be fuel and there's still going to be vapor. Every airplane has that capability just like every car has. Without a doubt.

So I appreciate your comments, sir, and we'll work through them.

BRUCE PLEAS: I'd just like to -- when you say it's going to land from the west, well, it's kind of hard to land from the west on a 350 runway. And you can't land from the west because there's not enough. Your need is -- your north to south is your landing.

COLONEL TORRES: I should say approach from the west. I apologize. You're right. Approach from the west.

BRUCE PLEAS: Yeah. And we have winds that go either way. So, you know, on that. And also if you ever want to go out there and check it out you have my name and address and I'll be glad to take you out there on the days they let me in. And the days they don't let me in I'll be glad to take you out there and we can go surfing.

COLONEL TORRES: Appreciate it. Thank you. I don't know if I'd come back in one piece from that, but I appreciate it.

BRUCE PLEAS: I guarantee you'll come back in one piece.

MAJOR BELK: Okay. Thank you. Next I have

George Taguma. Or is that a G?

GEORGE TAGUMA: With a T.

MAJOR BELK: With a T. Taguma?

GEORGE TAGUMA: Yes. Question.

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: The direction of the new runway that they're going to build?

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: I have a map here.

COLONEL TORRES: Okay.

GEORGE TAGUMA: Can you show me on the map where you intend to put that new airfield?

COLONEL TORRES: Only because everyone else can't see it, pretty much the runway runs -- there are two runways there, an old one, and one is still in use. One runway runs northwest/southeast.

GEORGE TAGUMA: Can you show me?

COLONEL TORRES: You bet. This is a different map than I used. Is the runway on here now?

GEORGE TAGUMA: Yeah. There it is.

COLONEL TORRES: I don't see it.

GEORGE TAGUMA: It says Mana airport and the runway is there.

COLONEL TORRES: Okay. It would be built only a few feet to either side of it and directly parallel to it.

GEORGE TAGUMA: Parallel to it?

COLONEL TORRES: Parallel to it within the confines of Barking Sands. Right next to it. Possibly either right next to the one that's active right now that runs northwest/southeast, sir. Or right on the one. There's also a possibility of rebuilding the one that's closed that the helicopters land on that runs northeast/southwest. One of those two, sir.

GEORGE TAGUMA: And now --

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: -- after you built that new runway you're going to be training there?

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: And you want -- that PMRF system is right in line with your training exercises. If there is any kind of a problem you're going to smash right into them. And you know what kind of damage it will cause?

COLONEL TORRES: The good news, at least from some respect is, as you've mentioned, for years all the services have learned and created very, very robust and aggressive safety programs. I'm not going to say that just like a hurricane coming through the islands it can't happen, but what I will say is as we build runways we're pretty advanced technology now. We know how to do it. We know how accidents occur.

GEORGE TAGUMA: It's not the runway that I'm concerned about.

COLONEL TORRES: I understand.

GEORGE TAGUMA: It's the problem if you have an accident.

COLONEL TORRES: Yes, sir, if the buildings too close I understand. There are clear zones that are built. And this is still a plan, but we are right in the phase of what you're talking about right now. In siting the runways there are certain restrictions on how close we can be to buildings and how high those buildings can be for exactly what you're saying.

If a plane gets in trouble and has an engine problem and it starts to veer there's an analysis done to say these buildings can only be so high and so close. And as the Air Force does that, and we're not complete on that at all, I mean I can't give you the data back and tell you which buildings would have to be moved or be rebuilt or moved back, but as the Air Force does that analysis it identifies how far or how close those buildings are, how high, and if in fact they need to move or not.

GEORGE TAGUMA: Well, it's not just the proximity of the buildings to the runway, but the direction that the runway is. The direction of the runway is directly pointing to the established PMRF system over there.

COLONEL TORRES: Even on the size there's also clear ways that get planned for the exact same issues of safety.

In large airplanes in the Department of Defense, and it's an FAA directive as well, that your airlines flying all the time, all airplanes have to have clear ways built in for departures and arrivals a clear route that ensure that they're accounting for buildings, that they're accounting for cranes, like the Matson cranes in Oahu, so they plan both the size and the departure and the arrival patterns. In fact it's so strict they plan -- they plan -- for an engine failure.

This airplane has four engines. If it was to lose an engine on departure or arrival it's planned, not today, because we're not done with the analysis, but it's planned to go ahead and clear both on arrival and

departure and laterally to avoid and have clearances from any buildings or any structures on departure, arrival or lateral.

GEORGE TAGUMA: You know, if you have a problem

you're not in control of it.

COLONEL TORRES: Today. You're absolutely right today. And I can speak from experience. I've flown large airplanes for 20 years. C-5s and KC-10s that are bigger than C-17s. And I've had engines shut down. The good news is in April I go train in simulators and fly airplanes all the time shutting down engines, and have it happen in real life often.

So I'm not going to say I'm always in control. What I'm going to say is I've never hit one yet and I've never departed a runway yet. It does occur. Absolutely right, sir. I completely agree. But we train

extensively to still control, especially larger airplanes.

GEORGE TAGUMA: This is what I'm afraid of. Training. When you're training you're not an expert yet. You're training. And if - if -- it's just like a five-year old or four-year old training bicycles, they put all the supports on it because they have accidents. And they can't control these accidents.

COLONEL TORRES: Well, knock on wood today. We haven't had a C-17 yet in 11 years depart a runway or --

GEORGE TAGUMA: I'll tell you something. I was in -- I was in Saudi Arabia when the C-130s were being used extensively. And they were training there. But they said it's not going to happen. There will never be an accident because there's Americans on the aircraft. And you know what? Two of them crashed. And they were all killed.

COLONEL TORRES: Yes, it's true. I am not --

GEORGE TAGUMA: It's an accident.

COLONEL TORRES: I am not --

GEORGE TAGUMA: The same thing can happen over here.

COLONEL TORRES: Oh, it's possible. I didn't say never. All I'm saying is that they are highly trained.

GEORGE TAGUMA: What I'm afraid of is the direction that the runway is running.

COLONEL TORRES: No different than the direction the --

GEORGE TAGUMA: Pointing directly at the established PMRF.

COLONEL TORRES: I understand. And we've got that recorded. The direction is not changed, meaning whatever is built, should it be built in Barking Sands, will be parallel to what's existing today. But I appreciate your comments and they will be recorded. You bet. I appreciate it, sir. And your concerns.

MAJOR BELK: Okay. Raymond Miyata?

RAYMOND MIYATA: Yeah, that's me. I don't think I need a microphone either. There's nobody here tonight from PMRF.

COLONEL TORRES: They were invited. In fact I visited Captain Connolly and your mayor two weeks ago, with Captain Connolly, the commander, and invited the Navy and asked them to come. All we can do as the Air Force is invite our sister service. Obviously, at least from a civil engineering perspective, we've spent quite a bit of time with those folks. Not quite a bit of time but over the last month as we started to try to flesh this out we visited with them.

So, yes, sir, they are aware of it. Meaning they've been given the same brief that you saw. And we've been over here two times, I've been here

personally two times, to both visit the Navy base and visit with Captain Wilson, the previous commander, I visited with him last fall and your new commander out there, Captain Connolly.

RAYMOND MIYATA: Well, hopefully, you know, because what I've got to say really is directed towards them.

COLONEL TORRES: Yes, sir.

RAYMOND MIYATA: My understanding is that the base, I'm going to refer to it as the base, is planning, according to some discussions I've had, is planning to expand the footprint of the base, which means it wants more property out there and it wants to put more buildings up. Which may be separate from what you're doing, but they want to expand.

What you guys want to do over here or talk to about tonight is just expanding the use of some of the services, of some of the facilities and adding more services, more activity out there.

You know, it's difficult for me, and I think a lot of people, to support any expansion either way out there without, you know, looking at acknowledging the fact that much of what fronts that base is public property. It's recreation property. And for the last year and a half the public has not been able to get to it. Since shortly after 9/11 we've been locked out for a good percentage of the last year and a half. We used to be able to drive in, through the base, from this side of the beach and from the Polihale side of the beach. We can't do that any more. We used to be able to camp out there. Can't do that any more. We used to be able to have barbecues. There's a lot of surfing that we no longer have access to because of this.

And I just can't see until we are given back the ability to utilize that area and then for whatever expansion takes place, either in footprint or in service, extended services like you folks want to do. Bruce touched on it a little bit, but I think there needs to be some kind of guarantee that as that base grows it's not going to be -- they're not going to come up with more excuses to lock people out of what is public area. It's been a year and a half.

The base has done little or nothing of significance to really build on the security for that base. They've done some superficial stuff that mitigates, which you have to do, it makes sense, you lock the front door first. But they're exposed on the ocean. I mean there's not a restriction as to how close boats can come. There's people out there on jet skis, there's people out there on Zodiacs, there's tour boats. If they're concerned about security that's an Achilles heel. People are flying over the base in motorized hang gliders. There's no restriction to that.

But they've locked everybody out except for four days a week, 12 hours a day. They've got us restricted to one surfing area. And this is better than what we've had. We're restricted to one surfing area. We've got a parking area for ten, 15, 20, 30 vehicles that used to be spread out over miles of beach because we can't drive on the beach any more. We're locked into a parking space not much bigger than what we have out there.

And what is pretty disrespectful is just adjacent to where we are, the area that the public is restricted to, they're building a whole series of what I would refer to as vacation cottages or some kind of military housing there for, I would think would be just for -- it's ocean front. They're lining them up. They're new structures. I'm just going to call them vacation cottages, you know, because I don't know exactly what they're going to be used for.

It's another indication that they're not really concerned about security because whoever's going to be in those cottages, using them, if they were worried about their welfare they would have built them in the middle of the base, well away from the beach, with some type of protection and some limited access. But they're right there because it's ocean front. They're obviously built for recreational and nothing functional.

We've been patient here. It's been a year and a half. When Captain Wilson came up with the plan that we are currently using he said that shortly we're going to start out this way with these passes and we're going to have limited hours and limited days available, and there's no reason why this shouldn't work. And once it works we're going to go back to normal. Now there was 300, a couple hundred people in the room. Everybody may have their definition of normal, but my definition of normal is what it was prior to the restrictions.

COLONEL TORRES: Yes, sir.

RAYMOND MIYATA: And it's just really difficult for me to think that, you know, and I'm sorry if I'm lumping you guys together with those guys, but you're all the same, you're asking for more. What we want back is the beach. We want the ability or the freedom that we had, the access that we had prior to 9/11. I'd like to see a real effort on the base to secure their -- their part. They have a right. It's an investment. You know, it's a financial investment. There's people living there. There's people working there. There's assets there. They have a right to be safe. They have a right to be secure. They have a right to be protected.

There's ways of doing it without keeping the recreational areas, the beach areas, off limits to the general public. You know, they could put up perimeter fences, perimeter barriers. They could put up electrified fences, barbed wire fences. They can put cameras on them. They can put motion detectors on them. They can patrol a small area that, you know, that will contain anybody from going into the base.

What they have now is security personnel traversing the base in Ford Rangers. There's two of them, and they're not even in physical contact with each other because they're separated. They can't drive around the point. It's not impressing me with having a, you know, a security plan or a security operation that really is serious and really is functional. They have not been successful I think in securing the base. What they've been successful in doing is keeping people out of the beach adjacent to the base.

And I just can't support whatever it is you guys want to do until our access is given back and then there's a plan in place that's going to be honored for that will keep us having access to the beaches there as -- as the base grows.

COLONEL TORRES: Yes, sir.

RAYMOND MIYATA: And that's all I got to say .

COLONEL TORRES: The majority of what you're addressing is Navy issues, but the good news is you've recorded it.

RAYMOND MIYATA: Yeah.

COLONEL TORRES: Meaning it comes out as public 4 record and the services collectively have to come back 5 and address those issues and say what about it? But --

RAYMOND MIYATA: It's been a year and a half --

COLONEL TORRES: Sure.

RAYMOND MIYATA: -- we've had this pass thing going. And I guess it works for some people and it's better than nothing. But Captain Wilson said this is the place we're going to start and before too long we're going to get back to normal. It's been long enough, it's about time we get back to normal.

COLONEL TORRES: Yes, sir.

RAYMOND MIYATA: You know, anything can happen, and I can't tell the future, but everybody who arrives and departs from the island in the -- in the airports they're photographed as they come on and off the planes. It's a well known fact. You know, no terrorist in their right mind is going to take an Aloha flight or Hawaiian flight over here and walk through those cameras and, you know, take a fertilizer bomb over to the tower. It just seems like a lot of excuses to me.

Thank you for listening.

COLONEL TORRES: Thank you for the time, sir.

MAJOR BELK: Okay. Cynthia Hubbard?

CYNTHIA HUBBARD: I just have a really brief statement. And that is that you mentioned what we're going to see is an occasional plane landing and stopping?

COLONEL TORRES: Yes, ma'am.

CYNTHIA HUBBARD: And I figure everyone who's ever been out to Majors has sat there and watched planes go around and around and around for several hours.

COLONEL TORRES: Yes, ma'am.

CYNTHIA HUBBARD: So if you're training people to learn how to land airplanes, as this gentleman pointed out, they're not going to just pull in and land and then take off and leave.

COLONEL TORRES: Let me be more specific. This runway is not being built to do what you see as touch-and-go's or approaches like you see at other airfields. This runway is being built for only one purpose, and in fact you cannot do a touch-and-go on the runway because it is so short. It is only being built for training to do a full stop landing, one, and do a take off. That's it. It is not being -- not being built for two or three hours of continual radar patterns which is what you're seeing them doing it again and again and again.

CYNTHIA HUBBARD: So somebody's going to land, turn around and take off and go back to Hickam?

COLONEL TORRES: Yes, ma'am. Because if it's built here it will be the only runway in the islands that has that concrete depth and that length to simulate landing in those foreign countries that have smaller airfields. So it's not being built for that training activity.

CYNTHIA HUBBARD: But wouldn't everybody that -- how do people get trained to fly that plane in the short fields then if they're only going to go over and land once? I mean --

COLONEL TORRES: Maybe I should -- I don't want to -- I don't want to not answer your question. And maybe I'm giving you an incorrect answer in fact.

It's continuation training, meaning the pilots just don't do it once. But they don't, as you're saying, they don't do what you typically see as aircraft doing touch-and-go's. That's what you typically see. You typically see the airplane coming to Barking Sands, it touches down, you hear the power come back up and it comes back up. That runway is not long enough to do that, should it be built here. That's not what that runway is planned for. That runway is only planned for stopping.

I should also mention, and Gary just reminded me, if the plan is approved the first thing that is built at Hickam Air Force Base is a C-17 simulator to practice all these type of maneuvers as you've addressed, properly so, with malfunctions, with emergencies. The first thing that's built on Hickam Air Force Base is not a hangar, it's not a ramp, it's not a building for people. The first thing that's built is a simulator building for us to do all that training where you step away from the building and nothing's happened, whether you've crashed or not. It all happened electronically.

But I'm also not going to see you doing repeated landings and take offs from that runway. They're not touch-and-go's that you typically see being done at some of the other fields.

The nice news in the Hawaiian Islands is there are roughly 16 airfields that can handle the C-17 for the touch-and-go training. Maui, both Kona and Hilo, Hickam. There's a lot of the fields throughout the islands that can conduct that kind of training. Including Barking Sands, your longer runway.

But the proposal that we're discussing, at least for this island, is focused on that shorter one.

Thank you.

MAJOR BELK: Elaine?

COLONEL TORRES: And there is a mike there, ma'am, if you'd like it.

ELAINE: No, thank you. With all due respect to your position, Colonel, I come from a military background all my life. My father was a captain. He also was at the Pentagon for five years. He retired as JAG. My brother was a SEAL stationed in Bahrain and Tehran. And my mother was a Wave. I'm familiar with how the military lies, okay?

I have a question for you. A few questions. How long would it take to implement this plan, this, this project?

COLONEL TORRES: At Jackson, Mississippi, and I don't know exactly what you mean by implement but --

ELAINE: Well, from start to finish. Plan to completion.

COLONEL TORRES: I would estimate for construction roughly two years or less, if that's what you mean specifically for Barking Sands. If you mean to bring the planes in, build all the buildings on Hickam, that's going to take closer to five years, ma'am, if it's approved. And that's the yardstick from Jackson, Mississippi. Meaning it's a longer process.

There were numerous building plans for Hickam Air Force Base. Obviously more than one runway, hangars and buildings for folks and people and then obviously bringing the planes in as well. But the planes are currently in production.

So if your question is specific for runway, roughly two years, a little bit less. In fact the engineers tell me a year and a half, eighteen months. If the whole project is what we're talking about, roughly five years, ma'am.

ELAINE: So how many years are we into the project?

COLONEL TORRES: We are only in the planning part of the project. So there are no buildings being built. There is no ground being --

ELAINE: How long will the planning -- excuse me. How long will the planning part take?

COLONEL TORRES: I don't know if he had a time line up on the slide. But we go through the environmental process that we're in right now. That should take roughly six more months, depending on how that works out, and then buildings will be planned likely for the next couple of years, if that's approved, and then construction would start one to three years after that.

ELAINE: Can we quote you on that?

COLONEL TORRES: That?

ELAINE: That construction will start in one to two years after that? Or would it be a lot sooner?

COLONEL TORRES: I actually have no idea. Meaning the decision isn't made yet so I can't say. If you're asking me in what fiscal year will the building be built or runway be built the decision hasn't been made so I can't tell you it will occur this year.

ELAINE: Okay. Now, would be fair to say that it takes a bit of time to actually give birth to this proposal, the need for it and whatnot?

COLONEL TORRES: Yes, ma'am.

ELAINE: And how long would that time -- how long has that time been? How long have you folks, you folks, been thinking about this?

COLONEL TORRES: I don't think Hickam Air Force Base ever thought about the C-17. Basing decisions are made by usually the Pentagon headquarters Air Force in conjunction with congress. Just as in Jackson, Mississippi.

ELAINE: And these things don't just happen overnight?

COLONEL TORRES: No, ma'am.

ELAINE: Okay. All right.

COLONEL TORRES: And I wouldn't know when that decision was even considered or made.

ELAINE: You did say that you visited with Captain Wilson at PMRF last fall?

COLONEL TORRES: Yes, ma'am.

ELAINE: What was that regarding?

COLONEL TORRES: We brought our current wing commander.

ELAINE: This proposal, right?

COLONEL TORRES: No, no. We did come out to visit. We discussed a lot of things about the bases. We did go up in the tower and look at the runways. But there was no -- the proposal that you have, or the slides that you have seen, that was not discussed.

ELAINE: But you were scoping out the runways at that time when you visited Captain Wilson last fall?

COLONEL TORRES: We looked at the runways.

ELAINE: Okay. So the thought had already been born, am I correct?

COLONEL TORRES: I don't know what you exactly mean by "thought."

ELAINE: The Pentagon had already initiated this?

COLONEL TORRES: True. True.

ELAINE: Excuse me, am I asking the wrong questions?

MAJOR BELK: No, you're not asking the wrong questions. I just want to make sure that it's clear that the intent here is not for us to even be able to answer all of your questions.

COLONEL TORRES: It's to record them.

MAJOR BELK: The intent is to take your concerns and record them and make sure they're part of --

ELAINE: Don't worry, this is not a deposition. I'm trying to get to something.

COLONEL TORRES: Sure. Go ahead, ma'am.

ELAINE: What I'm getting at is --

COLONEL TORRES: Was the decision made for C-17s in the last six months or a year? I'm sure at headquarters Air Force back at the Pentagon, with congress, that decision was made before '03. And '02 and '01 I don't know.

ELAINE: Okay.

COLONEL TORRES: I'm not privy.

ELAINE: Okay. Thank you. I thought so, too.

COLONEL TORRES: Yes, ma'am.

ELAINE: Because these things you don't just plan overnight. And what I'm getting at is I believe the public was severely deceived. All this time we're being told that there's a fear of a terrorist that might sneak on the base and he might be disguised as a surfer. But all this time you folks had this project planned and you were building up to it. Another deception by the military.

COLONEL TORRES: So you believe there's a connection between security at the base and --

ELAINE: I sure do. I sure do.

COLONEL TORRES: We'll record it, ma'am.

ELAINE: And that needs to be addressed severely.

COLONEL TORRES: Yes, ma'am.

ELAINE: Seriously. Okay. I'm also concerned about the accidents. I'm very concerned about the accidents. And can -- roughly just by what you've read in the newspapers how many accidents would you say the military has had with their aircraft in the last year?

COLONEL TORRES: Percentage or numbers?

ELAINE: Numbers. Helicopters, you name it.

COLONEL TORRES: Oh, the Air Force has very, very few helicopters. The Navy --

ELAINE: A lot of planes have been bumping into each other and crashing. And there's been an awful lot of accidents. So you, you couldn't really guarantee there wouldn't be any accidents with this big elephant flying in the sky, huh?

COLONEL TORRES: Ma'am, I believe I was clear that I never said never. And I never said guarantee.

ELAINE: All right. Now, this CIP, does our community input really matter or is the military going to attempt to shove this down everyone's throat anyway?

COLONEL TORRES: I wouldn't take either extreme. Clearly your input matters, that's why we're here tonight. And we appreciate your time.

Is the decision already made? No, the decision cannot have already been made by federal law.

ELAINE: And through the federal law what, what guidelines do you have there that --

COLONEL TORRES: The NEPA ones that Gary discussed, ma'am.

ELAINE: Now, you realize that this will upset and destroy the delicate balance of nature over here in Kauai? You do?

COLONEL TORRES: I don't know if I can define "destroy." I'm positive it will have an effect. As all of you have brought out it will have an effect.

ELAINE: Yes, it will. Therefore that's validation, and we can stop right there since you've admitted it, that this project shouldn't go through. This is not Jackson, Mississippi. It is nothing like Jackson, Mississippi.

Another question I have is what will the C-17s be picking up? Will they be picking up missiles or nuclear warheads or whatever else is buried out there at PMRF?

COLONEL TORRES: Ma'am, the training -- there is not cargo indigenous to Kauai that either is received or departs from your island. The training is to do that landing. It is not to receive or depart cargo from the airplane.

I'll give you one example of a mission, though. Just as your C-130s from Oahu helped significantly when we had the hurricane that closed Lihue and closed the majority of Barking Sands, this airplane has three times the capability to help you again on this island should you have another humanitarian crisis. That would be one

ELAINE: Well, that one, now --

COLONEL TORRES: That one is discounted, I'm sure.

ELAINE: Yeah, not much of a comfort.

COLONEL TORRES: Yes, ma'am.

ELAINE: You know, it seems that you don't really need this locale then. It could be anywhere, right?

COLONEL TORRES: No, ma'am, it can't be anywhere. And, yes, we do need a locale. This one in particular the decision hasn't been made but, no, it can't be anywhere, and, yes, we do need a locale to conduct the training.

ELAINE: Okay. This is making Kauai a target, a direct target, just like Pearl Harbor. All right. I object to that. There's a whole lot of people on this island that will also object to that. There's a lot of people getting petitions ready at this time to stop this project.

Also, can I ask you, are you aware of Public Law 103-150?

COLONEL TORRES: I'm not.

ELAINE: You're not. Oh, that's too bad. Because this is a de facto state of Hawaii. That is congress' apology to the Hawaiians for the takeover of these islands. Now, further occupation by the military in these islands seems to be positioning for martial law.

MAJOR BELK: Okay. Ma'am --

ELAINE: -- against citizens.

COLONEL TORRES: Ma'am, what I'd like to do is let me address it. What I'd like to do, if it's okay, is I'd like to let everyone else, and I have nothing else to do tonight, you and I, or whoever you would like to stay with, we can discuss further. What I'd like to do is I'd like to open it up for everyone else who has questions to continue. If that's okay.

ELAINE: Okay. My final on this is I think that you should go to alternative No. 3. That is take it elsewhere. You do not belong here in Kauai. All right. Thank you.

COLONEL TORRES: Thank you for your time.

MAJOR BELK: Shawn Garcia?

SHAWN GARCIA: My main opposition is due to the fact that the fuel farm is straight north I think of the runway over there existing.

COLONEL TORRES: The fuel farm north of the field at Barking Sands?

SHAWN GARCIA: Yeah, the existing runway. You're saying that you're thinking about expanding that runway and using that one to bring in the planes.

COLONEL TORRES: So your concern is?

SHAWN GARCIA: Safety.

COLONEL TORRES: Safety. Because the fuel farm is to the north?

SHAWN GARCIA: It's right on the end of the runway.

VOICE: End of the 320.

SHAWN GARCIA: Have you been out there?

COLONEL TORRES: I've landed on it many times.

SHAWN GARCIA: So you see the fuel farm is right at the end of the runway?

COLONEL TORRES: True. But if the runway is at Barking Sands it would be parallel to the current runway, meaning it's the exact same risk you face today with Barking Sands. Meaning the runway's already aligned.

SHAWN GARCIA: There's a runway out there.

COLONEL TORRES: Right.

SHAWN GARCIA: That the helicopters use. This is the one on the north side of the base.

COLONEL TORRES: The old one?

SHAWN GARCIA: The old runway, okay. So right at the end of that runway there's a fuel depot right over there. That's what's happening over there right now. They're building it up even more. So they're making it so you can put more of the jet fuel out there.

COLONEL TORRES: Yes, sir.

SHAWN GARCIA: That's what they have over there is jet fuel.

COLONEL TORRES: I don't know.

SHAWN GARCIA: It's right at the end of the runway.

COLONEL TORRES: Yes, sir.

SHAWN GARCIA: So just posing a general safety hazard. I would think if you're going to bring in planes you're either -- you're going to have to move that fuel farm someplace or figure out a different place to put that airstrip because it's -- it's just right there right at the end. It just doesn't make any sense to bring planes in on a runway that you know is short, you know that it's simulating, say, I don't want to say inadequate, but not really what the plane was originally designed to land on as far as the length of the runway, right?

COLONEL TORRES: It was actually designed to do this exact profile. It was built with the landing gear, the brakes and the capability to do this exact line of delivery. So, no, the plane was. And I'm not at all saying your concern isn't valid, but what I am saying is that the plane was built to land on 3,500 feet by 90 feet wide. Specifically to do that kind of delivery.

SHAWN GARCIA: Well, my concern is just for the note that over the -- just seems like bringing a plane in right over that fuel farm, if it overshoots or undershoots or whatever, it's not going to land in the bushes, it's going to land right on top of a bunch of tanks of jet fuel, which is, I mean loss of life, environmental, whatever. Whatever way you look at it something's got to give. Because it's not safe.

COLONEL TORRES: I understand. Thank you.

MAJOR BELK: Randy Wolfshogen?

RANDY WOLFSGOGEN: Hi. I guess one question I have is how many training missions do you expect per month when this thing's up and running? How many times will a plane land at Barking Sands and take off at Barking Sands? I assume that's a round trip. How many round trips do you expect a month?

COLONEL TORRES: I can't give you an accurate estimate.

RANDY WOLFSGOGEN: How many are being done at Jacksonville right now?

COLONEL TORRES: Jackson, Mississippi roughly runs, on average, fifty a month.

RANDY WOLFSGOGEN: Fifty a month. And how many planes are stationed in that area? We're going to have eight, right?

COLONEL TORRES: Same.

RANDY WOLFSGOGEN: So potentially, things go like efficiently, we could be doing 50 runs a month, round trips a month?

COLONEL TORRES: Two landings a day.

RANDY WOLFSGOGEN: Two landings a day. Okay. Is there any -- you know, obviously I don't understand as to why we need to have a separate runway to practice on the short takeoffs and landings different than the runway that they're stationed at with just an imaginary line saying that's the end of the runway. Why can't you do it over there and just beef up that runway so that it won't damage it, destroy it, whatever, and leave the entire operation in one place? Is there a reason for that?

COLONEL TORRES: Yes, there is. Originally Hickam Field, World War II, didn't have Honolulu International, where all your commercial traffic currently departs most of the islands. Hickam Air Force Base only owns the ramp in Oahu. The runways are owned by the FAA and by the state of Hawaii.

The state of Hawaii, and I don't blame them, meaning the commerce that would be lost in the state of Hawaii if we attempted to modify those runways.

And again, as you have pointed out, those long asphalt runways are not the deep substructure cement runways 3,500 feet long that the C-17 needs to train on. So the military doesn't have that type of a field nor access to that type of a field.

And the state of Hawaii for its help and benefit Oahu on the island and the runways at Honolulu International aren't adequate to support C-17s. And it would disrupt commercial traffic that's to some degree a lifeblood that brings a lot of people into the islands.

RANDY WOLFSGEN: So what you're saying is that the runways at Kaneohe -- I'm sorry, at Hickam are not owned by the military?

COLONEL TORRES: True.

RANDY WOLFSGEN: So you can't modify because the state doesn't want to lose the commerce?

COLONEL TORRES: Yes, sir.

RANDY WOLFSGEN: Okay. Can you tell us why PMRF is a better or your No. 1 proposal versus Kaneohe or Bradshaw?

COLONEL TORRES: Kaneohe, yes, sir. Part of the training that they do, as we've discussed before, is we don't want to fly the airplane over housing, we don't want to fly the airplane over land. Barking Sands is unique in the islands of Hawaii because it is out on the edge of a peninsula, meaning at least from the perspective of people and housing it has the least amount of, both on approach and departure, housing associated with the field.

RANDY WOLFSGEN: So what you're saying is it would be easier to get past the public because it won't make so much noise for so many people?

COLONEL TORRES: I didn't say that. But what I did say is it will obviously have a lesser effect than at Kaneohe. And we had one at Kaneohe with this exact same meeting. And obviously the housing is much larger there, a lot more people in that area. And because of it's kind of a hook that it's on out there, the Kaneohe runway, the approach takes you a lot closer to land and a lot closer to housing, a lot closer to people, yes, sir.

RANDY WOLFSGEN: I guess the last question I have is for the gentleman here making the EIR report. What, based on the rules associated with NEPA --

GARY O'DONNELL: National Environmental Policy Act.

RANDY WOLFSGEN: -- would constitute not getting through the first gate, which is the gate of, what do you call it, no -- what type of objections would you have to have so it would have to go through an entire EPA?

GARY O'DONNELL: Well, this is early in the process in terms of the environmental process.

RANDY WOLFSGEN: Okay. Let me put it another way. What has prevented the Air Force from building a runway in the past from this statute, this public --

GARY O'DONNELL: Okay. I'm not familiar with the history of what's gone on in other places, I only know what we have to comply with here, so I can't answer that particular aspect.

RANDY WOLFSGEN: You know what I'm trying to ask?

GARY O'DONNELL: Oh, I know what you're trying to ask. Let me just try to answer your question the best I can. And again this is early in the process so we're taking input, we're not necessarily have all the answers. That's -- that's what the EA is for. And that's what's going to determine whether an environmental impact statement is needed.

In fact what we're doing is rather proactive because normally at the environmental assessment phase you don't have a scoping meeting to get the public involved, you wait until the environmental impact statement. But we felt we should get the public input so that we can try to address your concerns.

RANDY WOLFSGEN: One iteration instead of ten?

GARY O'DONNELL: What's that?

RANDY WOLFSGEN: One iteration instead of ten.

GARY O'DONNELL: Obviously if we can, you know, address the concerns in the EA, we don't want to write an environmental assessment that does not have the public input. And therefore we felt it was better to address the public early in the environmental process and not do an EA and wait for the EIS for the scoping process.

Now, what determines whether an EIS is needed is really based on the environmental assessment. There's so many factors that go into an environmental assessment.

RANDY WOLFSGOGEN: Who makes the decision? Is it a committee? Is it a pseudo person? Is it the EPA? Who makes the decision whether it has to go to the next step?

GARY O'DONNELL: Basically whether the environmental -- first of all you have to find out in each of these things like endangered species act, cultural resources. There's -- there's probably, you know, it depends upon the environmental assessment and what the action is. Here there's basically the beddown at Hickam and then a modification of a runway, there's training, there's personnel.

You also take into effect the socioeconomics, both positive and negative. One man said that, you know, having people here is good, but if you don't provide housing for them it raises the cost of living for everybody else. So -- so those are things that are considered in the environmental assessment.

Now, you look at all those factors, our department looks at them, and we basically, you know, if there's too many negatives then we recommend to the Air Force that, you know, we go to the fullblown environmental impact statement.

Now, the nature of the National Environmental Policy Act is that we have to -- all federal agencies have to make an informed decision. It doesn't mean they have to make the right decision, or the best decision, they just have to make an informed decision.

And so even if we go to environmental impact statement, you know, congress can always, or somebody, it's not necessarily congress, I'm not going to put the blame on them, but somebody else could always say yes, but because of this factor we're going to proceed anyway.

So the Environmental Policy Act is really to involve everybody, the general public, the different agencies, the proponent agency, you know, and -- and take into all consideration all these factors.

COLONEL TORRES: If you're asking in the end who makes the decision, your congress writes into law purchase of the airplanes and basing of the airplanes, sends that to the president of the United States and he signs it into law.

RANDY WOLFSGOGEN: Okay. But from what I remember you saying earlier -- and thank you very much. It was very educational. But didn't you say that the airplanes are already being purchased and that the budget has just been approved?

COLONEL TORRES: Maybe I misspoke or didn't explain well enough.

RANDY WOLFSGOGEN: A hundred and 30 planes I thought you said.

COLONEL TORRES: Well, the planes are already in production. Not for Hickam. The planes are in production for other bases. Jackson, Mississippi doesn't in fact have planes based there yet.

All I meant was there aren't planes in production for Hickam Air Force Base. That's possible. If congress and the president decide they want to produce more and procure more then they also have to figure out where to base them. Which is where we are now.

They're in production. They started basically about 1991 and been in production for about 12 years. So they are being produced. But there's not a plane right now in Long Beach being produced that says it's going to Hickam Air Force Base. That would be incorrect.

Is it possible that congress and the president in the future budget will say these eight are coming to replace the C-130s? That's why we're here today saying that in the plan that's a possibility.

RANDY WOLFSGOGEN: Okay. Thank you.

COLONEL TORRES: Yes, sir.

MAJOR BELK: Mitch Skaggerberg?

MITCH SKAGGERBERG: Yes. Thank you for including us early, hopefully. I am against alternative one of having it here. I'm just recently retired. I purposely chose the west end of Kauai because it's one of the last places where there's peace and quiet without a lot of interference.

Secondly, I acquired a tour company here just recently. Almost half of our one point one million visitors come to -- well, all of them come to Kauai because it's one of the last, quote, kind of unspoiled places in the island. My feeling it will have a dramatic impact in disturbing over half of them, about 400,000, that come out here every year to go up to Kokee and Waimea. Increasingly they're using the Kekaha Beach at Polihale.

Tourism is our mainstay in Kauai. And many of our other industries have shut down. So there's no doubt in my mind as a former businessman here for some 20 years that it will have a real negative effect on people coming to Kauai in the future if we have this intrusion, which will in my opinion create a lot of noise, a lot of support facilities, and much more congestion on that road.

The other comment I want to make is --

COLONEL TORRES: Sir, if I could answer one of your -- there is no additional buildings being built at Barking Sands. The only reason that we would adjust any of the buildings if they don't meet clear zones on approach, departure or laterally. There are no additional houses, there are no additional support buildings, there's no additional fueling. The only thing in the environmental assessment and the only thing that's being considered, not decided upon, is a runway. That's all. No additional buildings, no more people for Kauai.

Sir, go ahead. I'm sorry to interrupt.

MITCH SKAGGERBERG: That's all right. The other thing is the Na Pali coast of course wraps around there. And one question I wanted to ask before I make this comment is what's the noise radius expected to be from the C-17 as far as the circumference or the radius on each side?

COLONEL TORRES: Good question. Planes are always noisiest on two times, landing and takeoff. The planes that are being produced right now are brand new airplanes. They're what we call stage three compliant. They are quieter than the Aloha and Hawaiian airplanes which fly, in fact, over a hundred into Lihue here on your island every day. So they are quieter than all the airlines coming in and quieter than the C-130s that they're replacing today.

MITCH SKAGGERBERG: But how many miles from the proposed runway would the noise carry?

COLONEL TORRES: You won't hear the plane miles away.

MITCH SKAGGERBERG: Within would you say two miles you will hear it?

COLONEL TORRES: No, sir, you will not hear the airplane within two miles. If the plane flew over right now at a thousand feet you wouldn't hear it. It's stage three compliant. It's built to go into fields where it can't be heard specifically. No, sir, typically you will hear it at a few hundred yards, at a couple, 300 yards. And most of that noise is going to be on landing and on takeoff. But at altitude once it's taken off it's very quiet. Quieter than the C-5s we have coming through that are built with 1950s engines or the 141s, or the helicopters that you hear currently have a higher decibel level than the C-17s.

MITCH SKAGGERBERG: Okay. Thank you.

COLONEL TORRES: Yes, sir.

MITCH SKAGGERBERG: With that in mind I -- my approach is to go to an existing military base for this expansion. One, Hawaii already I think carries more of a burden than many states in terms of the amount of military installations we have here for the number of people on the island. And I understand strategically.

So I would like to see it either placed at

Kaneohe, because it's an existing military, it's been created for that. And this is for a military purpose.

Keep it on a military base.

COLONEL TORRES: So I might have misled you. We're asking or considering putting it on Barking Sands, a military base.

MITCH SKAGGERBERG: Right. I'm against that. I've already said I'm against that for these reasons.

COLONEL TORRES: Oh, oka. Well, you said put it on a military base.

MITCH SKAGGERBERG: For Kaneohe.

COLONEL TORRES: Another military base?

MITCH SKAGGERBERG: Yeah, another military base. Kaneohe. I think they can absorb it better than we can. But I don't know, you've had an meeting with the Kaneohe residents I assume?

COLONEL TORRES: Yes, we have.

MITCH SKAGGERBERG: And how did they respond to this proposal for Kaneohe?

COLONEL TORRES: Just as this community, and we visited the Honolulu community, we visited the Wahiawa community and here, I think that's it, I think that's it, every community has a lot of questions and a lot of concerns. And that's why we've come. They asked specific questions just as you did. And they're curious about the why's, what was going to be built and asked a lot of specific questions about their community.

MITCH SKAGGERBERG: Okay. And I've lived over there for a few years. So my recommendation is to find an existing military facility on the mainland that is in a -- is not in a tourist area or a sensitive environmental area where millions of people come to visit and recreate every year.

COLONEL TORRES: Yes, sir.

MITCH SKAGGERBERG: Thank you.

COLONEL TORRES: Yes, sir.

GARY O'DONNELL: If I could I'd just like to clarify a couple of points that you brought up and I've heard from a couple of other people when they were talking too. In terms of the environmental process just because you see something listed as an alternative one, two, three and four, doesn't mean that one has greater weight than four. I'm not saying that there's, you know, different people have different opinions and some people may be favoring two over four and some people may be favoring one over two. But basically my job as the Air Force environmental planner is to see that all four alternatives get considered objectively and equally. So just because you see Barking Sands at the top that doesn't mean that that has greater weight than four or two.

MITCH SKAGGERBERG: And I didn't take it that way.

GARY O'DONNELL: Yeah, I just felt there might be some confusion in the audience because I've heard people say, well, alternative one is Barking Sands. And that's the way it's listed, but that doesn't mean it's priority one necessarily.

The other thing I think that needs to be clarified, too, is that when congress authorized the production of these planes one of the reasons Alaska and Hawaii is being looked at is because the planes according to congress need to be in the 50 states. And Alaska and Hawaii are the most west, you know, the most forward areas west within the 50 states. And that's why congress was, you know, asking that we look at those areas. So that we can reach other parts of the Pacific quicker than if they were based, you know, on the mainland or somewhere else.

MITCH SKAGGERBERG: Just one other comment then. H-3 was specifically built so that the military could operate more efficiently between Kaneohe and Hickam, the other side of the island. We spent millions and millions of dollars for that. Again if Hawaii is chosen it seems then that Kaneohe has been placed in that position already because of the new freeway to utilize it more effectively for future needs. So if Hawaii is chosen, as far as I'm concerned, as being a former military person myself, Kaneohe would be the location. And in my opinion it may be less resistant to its neighbors than Barking Sands would be to Kauai residents and visitors. But that's just my opinion.

COLONEL TORRES: Yes, sir. Thank you. Yes, ma'am?

MRS. W. LAIDLAW: I have some questions. It's just to clarify something that you said.

COLONEL TORRES: Yes, ma'am.

MRS. W. LAIDLAW: You kept speaking of 3,500 feet.

COLONEL TORRES: Length of the runway.

MRS. W. LAIDLAW: Your page 2 says 3,000.

COLONEL TORRES: Does it say 3,000?

GARY O'DONNELL: You're talking about the length of the runway?

MRS. W. LAIDLAW: Yes, as short as 3,000.

GARY O'DONNELL: Okay. Again, we're just here to take input. But from what I've heard on this is I think it's as short as 3,000 and as long as 5,000.

COLONEL TORRES: The optimal length is 3,500 feet by 90 feet wide.

MRS. W. LAIDLAW: So what is the length now at Mana? What is the landing area at Mana that you want to extend?

VOICE: The old runway.

MRS. W. LAIDLAW: The old runway, how long is that?

COLONEL TORRES: It's not a question of length, it's a question of strength and depth on the old runway.

GARY O'DONNELL: They're improving the old runway.

COLONEL TORRES: Can't land on tar, it will rut. That old runway has grass growing through it and it would be ripped up very, very quickly, ma'am.

MRS. W. LAIDLAW: So you're telling me the length is all right, you just have to --

COLONEL TORRES: I don't actually know the length of that runway, but I'm pretty sure it's either long enough or very, very close to being long enough.

MRS. W. LAIDLAW: Because at one end, as one gentleman spoke about, is a missile facility as well as where the albatross nest and at the other end is a ditch. Okay. That was one question.

COLONEL TORRES: Yes, ma'am.

MRS. W. LAIDLAW: The other question I had was who will be responsible for the base? Will this be a joint Navy/Air Force?

COLONEL TORRES: No. Meaning Hickam Air Force Base hosts hundreds of Navy movements every year. You might have heard of Rim of the Pacific. We bring through hundreds of Navy personnel as well as, especially since Ford Island starts to shut down, it's the major airfield for the United States Navy. Not Barking Sands or another field in the islands.

So it will remain a Navy base. The only thing that will be built will be the runway. There'll be no additional buildings unless ones have to be rebuilt and moved due to safety associated with the Air Force.

So, no, ma'am, you won't see an increased Air Force presence or additional people added for the Air Force or buildings. So it will have a joint mission but we all end up sharing each other's bases for training activities. Especially now.

MRS. W. LAIDLAW: Fine.

COLONEL TORRES: Yes, ma'am. Thank you. There are no cards but if you've got a question please just -- we've got no other place to go so we're here.

ELAINE: One quick one. Excuse me, you said there would be no -- earlier you said there would be no additional buildings built unless?

COLONEL TORRES: Unless, as you addressed earlier, sir, the clear ways laterally or on approach or departure don't meet safety standards, then buildings have to be moved. In other words, if there's a Navy structure that supports a Navy operation and the Navy says we have to retain that structure, then that structure has to be moved a safe distance from the training runway at any location, Kaneohe Bay, at any location that it would be built.

What I'd like to do is give the stenographer a break and if you don't want to be recorded and you just want to ask a question, but it won't go down on public record I'll still be here available.

(Brief recess taken.)

COLONEL TORRES: For those of you who have further questions the stenographer is back. We don't have any cards.

And what we've had in the other groups is some people want to stay after we're closed up and ask questions one-on-one, they don't want to ask them in a group. And that's fine as well. We're not in a rush to leave your community or get out of here or close the door. So if there's other questions or concerns.

Let me try to recap a little bit, because I think maybe in the briefing we weren't all that clear or maybe we didn't answer the questions that well.

First, if Aloha or Hawaiian Airlines said to your island we want to do two more landings a day you'd say, two more landings? Probably not that much. What's it going to do to the environment? Are the whales going to pass away? Is it going to affect the coral? What's going to occur?

In fact they don't even come and ask you to do that. They could increase it 50% out of Lihue, which is a very, very noisy airport. I live by Honolulu International. Very, very noisy airport. They wouldn't even ask. Our attempt is to share with you and address your concerns.

Optimal runway is 3,500 feet long by 90 feet wide. It can be built as short as 3,000 or as long as 5,000 when it's built. Whether it's Barking Sands or Kaneohe there is no need for an Air Force presence beyond that assault runway being built. Meaning you won't see more blue people start to invade the island, kind of like Martians or something. That's not part of it.

There are no new buildings being built unless, as you accurately addressed earlier, sir, laterally or on the approach or departure we find out that it's unsafe. And that's part of the decision making process. As we look at these different facilities smart civil engineers, not pilots, look and say when crashes have occurred where have they occurred, how far do buildings have to be away, how far laterally, how many -- how close should people be allowed to work, how close should people be? That's how they build runways. They go through that.

I'm never going to say never. Can an accident occur? Absolutely, yes. Are we always positive that training is perfect, that one might occur? Yes, of course it can. Just like it can occur with Aloha and Hawaiian Airlines over Lihue. No different than that.

So any other questions you have the recorder, the stenographer, is back. Yes, ma'am?

ELAINE: Do you know specifically what the legal status of that land at PMRF is? Is that ceded land?

COLONEL TORRES: Ma'am, I have no idea.

ELAINE: Wouldn't that be part of the criteria?

COLONEL TORRES: Well, right now, at least as far as I know from our civil engineers and from at least what's been written to date, that land right now is for public use for the Department of Defense. And as we said earlier --

ELAINE: That land is for --

COLONEL TORRES: As far as I know. But I'm not --

ELAINE: -- public use for DOD? Who said?

COLONEL TORRES: I'm just running under the assumption since there's a couple gates there and there's Department of Defense buildings and a Department of Defense runway that the Department of Defense pretty much uses that land.

ELAINE: Occupies it.

COLONEL TORRES: Yes, ma'am.

ELAINE: Occupies it.

COLONEL TORRES: But I don't know if -- I'm not here to defend the Department of Defense to you about whether the state of Hawaii was created legally or not.

ELAINE: No, I wasn't saying that. There are different land issues in Hawaii.

COLONEL TORRES: Yes, ma'am. And I'm pretty positive that congress as it goes through law, which has nothing to do with the Air Force, your senators and your congressmen review those laws and ensure that the Department of Defense and the Air Force comply with those laws. Whether it's ceded land, private or public land I'm not privy to that.

I know that right now it's a Department of Defense base and I know that it's going to go through congress and they're going to decide. They're the law makers. The Department of Defense is not.

ELAINE: Congress has already decided, and that's what I was referring to earlier by Public Law 103, has already decided that these lands were never relinquished by the owners.

COLONEL TORRES: Ma'am, I don't think that has anything to do with tonight.

ELAINE: It has a lot to do with it. Because there was an objection filed. An objection to the occupation.

COLONEL TORRES: And I'm familiar with that.

ELAINE: Is this on record?

COLONEL TORRES: Yes, ma'am.

ELAINE: So you will be researching my questions?

COLONEL TORRES: Yes. I personally won't. They will go back and research, yes, they will.

GARY GARY O'DONNELL: That's actually what I wanted to comment on. These are good questions and that's why we're here is to get the questions. And we, when we can, we'll try to answer them.

Colonel Torres, I'm real glad to have him here because he's a pilot and he can answer questions about planes and stuff, you know, much better than I. I wouldn't be able to answer those questions.

So, but on the question on real estate that's a good question. And the Barking Sands is a Navy installation. And since we're the Air Force, I work with Air Force real estate office and I know what lands are ceded and what are not for the Air Force. But I couldn't answer that question tonight on the Barking Sands. I'd have to go to the Navy.

I know like the Air Force actually leases land from the state of Hawaii. Some of our -- our smaller installations are leased. So I don't know whether the Navy is leasing that land from the state or whether they actually have federal control of it. But that's a question that --

ELAINE: Excuse me, what did you just say?

GARY O'DONNELL: I don't know whether --

ELAINE: Could you repeat that last line, you don't know if you have --

(Requested record read.)

ELAINE: You do not have federal control. I can answer that question for you right now.

GARY O'DONNELL: Okay. Well, I didn't know the answer to that.

ELAINE: That -- that's a good one.

GARY O'DONNELL: So, anyway, but we have to go back and research the answer to that one. I don't know the answer to that.

ELAINE: I just gave you the answer.

GARY O'DONNELL: Well, again I have to look at it objectively. I'm hearing your input but I also have to see what's on the record.

ELAINE: Ask Congress.

BRUCE PLEAS: For the record, Bruce Pleas again, I hope the Air Force will obtain a copy of the lease, as

I have, of Pacific Missile Range Facility and notice the conditions for public access. And also I have talked to people that I'm trying to remember their last name, but you need to research the history of that area of Kauai from the present Pacific Missile Range Facility to the field in 1940s.

And I believe that field was originally set up in the early 1900s. Which family that was taken from and whether -- whether they have legal proceedings with that issue from going from a private person to a military base. And also then the history from the private person back to the sovereign Hawaiian nation.

So this is a request for the EA to take all that into consideration and get this all down on paper as to what has happened in the history. Because I believe a lot of this is unclear and it needs to be brought out so the local people and the military and the government know exactly what has happened. So that is a request I have for the EA.

COLONEL TORRES: Yes, sir. Yes, sir?

GEORGE TAGUMA: All the input is good, but most importantly, most importantly, you guys are not addressing the fact that the direction of that runway is pointing right at PMRF. And if an accident is going to happen it's like a bullet right, aimed right at PMRF. And what goes on at PMRF is a hell of a lot more important than that runway, what you guys are going to be doing on that runway.

You can put that runway in California desert and do your training there. And you'll have the long range refueling practice. You'll kill four birds with one stone.

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: You don't need it here. You're endangering PMRF. You're endangering the people over here. And you're not only endangering but you're destroying the quietness of this area, the island.

COLONEL TORRES: The island. Yes, sir. Yes, sir?

LARRY MILLER: Colonel, doesn't the Air Force already have access to hundreds of airfields that are perfectly suitable for what you want to do all across the United States?

COLONEL TORRES: No, sir, I wouldn't say hundreds.

LARRY MILLER: Well, I've flown across the United States looking out the window of the plane --

COLONEL TORRES: Yes, sir.

LARRY MILLER: -- and there is a lot of military airfields out there in the middle of nowhere.

COLONEL TORRES: Yes, sir.

LARRY MILLER: Why are you guys picking Kauai, of all places, or Hawaii, of all places, when you have facilities that are perfectly suitable, already built, can handle the weight of that plane, has the length of the runway? Why do you need Kauai?

COLONEL TORRES: As the young lady pointed out, your congress, not the Air Force, said we should have military capability, large transportation strategic capability, further west in the 50 states.

LARRY MILLER: But this is, your request is for training out here. It's for training specifically.

COLONEL TORRES: True.

LARRY MILLER: It's not to base planes here.

COLONEL TORRES: That's true. The planes are being based at Hickam. Absolutely right. You're asking?

LARRY MILLER: You have facilities for training already. Why are they even considering Kauai for the training facility?

GARY O'DONNELL: That's one of the alternatives. When you do an environmental assessment you have to look at reasonable alternatives. And we try to have more than one alternative. And so, you know, the ones that came up as being reasonable are Barking Sands, Kaneohe, 48 contiguous states. And you always consider the no action alternative.

GEORGE TAGUMA: Most importantly you're doing what goes on at PMRF. And that is more important than what you guys are doing.

COLONEL TORRES: And the good news -- and the good news in response to that is this isn't decided. The Navy and the Air Force have to decide and deconflict or not what occurs at PMRF, if that decision is made. Meaning the Department of Defense, the Secretary of defense, when two services look and say what mission, how can it be done and how can it be deconflicted? If it averages out like Jackson, Mississippi -- and I know this isn't Jackson, Mississippi -- but if the training numbers are the same, you're talking two landings a day at Barking Sands to deconflict against all the other activities occurring at Barking Sands. You're not talking about basing them there and you're not talking about operations that are occurring every hour 24 hours a day and seven days a week. You're talking on average of two landings and two takeoffs.

GEORGE TAGUMA: It's not the number that is of concern, it's the possibility of an accident you guys are not addressing.

COLONEL TORRES: Oh, it gets addressed but it gets considered. It gets considered.

GEORGE TAGUMA: You're pushing it on the side. Whenever you have training you have accidents.

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: That's a guarantee.

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: You can't guarantee a safety zone. No way.

COLONEL TORRES: I have kids approaching teenage, and as I take them out for their permit am I concerned? Yes, I'm concerned. But am I never going to let them drive? No, I'm going to let them drive. Maybe not a bad -- maybe not a good simile, but I will. Yes, sir?

LARRY MILLER: You're not going to teach them to drive in a residential area with little children playing on the side of the streets. You take them out in an area which is very remote, it's a safe place for them to learn how to drive. To use Kauai for training, on a plane of this size for training, and have to build a whole facility makes no sense to me.

COLONEL TORRES: Initial training, and you pointed it out, is done at Altus, Oklahoma. The crews that you get to Hawaii, should that decision be made and should it end up here with your island, the crews are already trained in very, very flat space, initially back in Oklahoma.

LARRY MILLER: I mean what -- why do they have to come over to Kauai? I don't understand.

COLONEL TORRES: Because when the crews come here to Hawaii, and I don't know what --

LARRY MILLER: If the --

COLONEL TORRES: Let me try and address why you'd want to add the planes here and why the training has to occur here. I think back to Oklahoma, it's roughly a seven-hour flight. So round trip it would be 14 hours. Not really practical sense. Anybody in here who's a businessman if I told you that it's inconvenient to have your trucks add more pollution to the island or to the state and said could you do your business back on the mainland, you'd scratch your head and say it's not economically feasible for me to do that.

Is it being considered? Of course it's being considered. But if we went back to the mainland for training the aircraft would never get to be used for humanitarian missions or missions for the Department of Defense further west or further east from here. We would spend all our time back in the mainland training.

So at Hickam, not here, there are crews that are going to be replacing those C-130 crews and being trained initially at Altus, Oklahoma in the C-17 and then to be based here. It's roughly a seven-hour flight there and back. We would spend almost all the time just flying the airplanes back and forth to the mainland to get that training on the mainland.

Yes, ma'am?

ELAINE: So again it appears there's another deception. Because the pilots are already trained previously in Oklahoma but these planes need to be here anyway. Again I'm going to ask you, these planes will be picking up or dropping off?

COLONEL TORRES: Picking up or dropping off what, ma'am?

ELAINE: I don't know. I asked you before.

COLONEL TORRES: Here on your island?

ELAINE: Warheads and missiles they will be picking up or dropping off?

COLONEL TORRES: The runway is --

ELAINE: Are we getting fed another bowl of jello here?

COLONEL TORRES: The runway is being built for training.

ELAINE: But you said they were already trained in Oklahoma.

COLONEL TORRES: Yes, ma'am. Initial training. Just like when you initially learn to drive you're probably going to take your son or daughter to an open parking lot and practice stopping, going. That's what Oklahoma is like. Then as you move from state to state or city to city they drive in those areas.

Initial training for the pilots, which is the most risky, is done out in Oklahoma. Once the crews come to McChord Air Force Base in Washington, Charleston Air Force Base in the Carolinas, then they do continuation training. They have to keep flying about once a month and do certain maneuvers, including which this runway supports that level of training. So it is a -- yes, sir?

BRUCE PLEAS: Bruce Pleas for the record. Another question, which I think you've answered but I'd just like to have it more specifically, the training will be limited to the Hickam units or will other units come over to also train from the mainland? You don't have to answer it now but it can just be in the EA.

COLONEL TORRES: Yes, sir.

BRUCE PLEAS: Also for your information for training this base has a bad wind sheer. It is not unusual for one end of the runway to be 360 degrees at 15 knots and the other end to be 130 at 15 knots. This is a well known fact for anybody that lives out here. So you need to be well aware of that. And your pilots need to be aware of that too.

It's -- I have been out there personally at the

weather station. They have five wind reporting stations. All five of them are going five different directions at one time. So that may be a reason why you may not want to bring it out here, because you do not have a stable air flow a hundred percent of the time. It could cause an accident.

COLONEL TORRES: Appreciate it.

BRUCE PLEAS: But it would also be another reason maybe to have them come out to run into adverse conditions, as long as they are aware of what can be happening from one end of the runway to the other.

COLONEL TORRES: Yes, sir?

MITCH SKAGGERBERG: Has the Navy already consented? Have they given their consent to the Air Force that they would grant you use of this?

COLONEL TORRES: Sir, we're not to that stage.

MITCH SKAGGERBERG: Okay.

COLONEL TORRES: The Air Force has to do analysis on all these alternatives, and it crosses the whole spectrum, and then approach actually to some degree here on the islands, but mostly back at the Pentagon for both the services, for the Navy and the Air Force to say is it manageable to do the training? What's the effect?

So, no, that decision has not been made. And the Air Force and the Navy have not come together and said yes, we agree that it's going to occur in effect in Kaneohe Bay, the Marines, involving the United States Navy as well. No, sir, that hasn't been -- come to a decision yet, or the services haven't directly addressed that yet, because we're still collecting information of which part of it is right here collecting information.

Yes, sir? Yes, ma'am?

ELAINE: What is the objective? One of the objectives of the CIP is to take what you've heard tonight and work it?

COLONEL TORRES: If you mean respond to it or research it, yes, ma'am.

ELAINE: Respond? No, I mean work it.

COLONEL TORRES: Work? I don't understand.

ELAINE: Find ways around the objections.

COLONEL TORRES: I would say --

ELAINE: Was this a feeler meeting? You know, kind of to see what kinds of objections are out there so that you can transform them and minimize them?

COLONEL TORRES: I don't consider it in that manner. Meaning I think it's an honest attempt to meet with the community and discuss your concerns and record them publicly.

ELAINE: All right. I will give you an honest attempt to get this message across to you. Kauai doesn't want you here. Kauai does not want this. Please find somewhere else.

COLONEL TORRES: Yes, ma'am. Thank you for the input. Yes, ma'am.

ELAINE: All right.

COLONEL TORRES: Anybody else? And we're in no rush. I'm not in a rush to leave if you've got other questions.

MITCH SKAGGERBERG: Can we request a copy of the transcript tonight?

COLONEL TORRES: You won't get it tonight, sir, no. But you don't have to request. If you filled out a card with your address you'll be sent a newsletter. And it gets put in your library here as well as in your library on the main island.

MITCH SKAGGERBERG: Oh, okay.

COLONEL TORRES: Or Oahu, not the main island.

BRUCE PLEAS: And the newsletter would contain the transcript of this or we have to make a special request for that?

COLONEL TORRES: No. The transcript will be public and it will be put in your library and then anyone can go there and make a copy of it. It's public record.

ELAINE: When? A year from now or a couple years from now?

COLONEL TORRES: No, probably this fall, ma'am. Probably this fall.

ELAINE: And you'll be making decisions before then?

COLONEL TORRES: No. This fall sound right?

VOICE: First of April.

GARY O'DONNELL: First of April. So about the time the first newsletter comes out we probably could make the transcript available with that.

COLONEL TORRES: But it goes to your public libraries. Obviously it doesn't just include your community, your neighborhood, it includes all the questions and all the communities and all the transcripts.

And then there's a period of time, you've got the transcript, but then there's a period of time we go back and research your questions and address them and say here's what we learned about whether it's the land or the environment or safety, what we learned about those issues.

MITCH SKAGGERBERG: Have our congressional delegation inputted yet into this process, Senator Inouye, Senator Akaka, Senator Abercrombie?

COLONEL TORRES: To us at Hickam, no. Where your congress makes the input is deciding back in the beginning of the brief, A, to continue purchasing airplanes. And basic.

And, yes, your Senator Inouye, just like Senator Stevens in Alaska, sits on the Senate Armed Services Committee. So not only do they have a vote in caucus but they have a vote in their committee. Yes, they do. I mean they are the law makers, not the Department of Defense. They're the ones who make that decision.

GEORGE TAGUMA: We should build a house for them right next to the runway.

COLONEL TORRES: Yes, sir. Actually I think one or two of them live close enough to Honolulu that they get a lot of that sense. They're used to noise or traffic. Vehicle traffic. Yes, sir.

I don't want to belabor the facts, and I don't have a lot of facts because decisions aren't made, but not more people if it came to this island, only a runway, short runway, and not for use by other aircraft. Somebody was asking me can C-5s use that runway? Can 141s use that runway? Can commercial airplanes use that runway? Big commercial, 747s? 3,500 feet prevents the bigger airplanes from using that runway. Meaning it's just for training for that specific airplane.

And at least for this area, the construct is that it's built within the confines of Barking Sands, not external to the land that's already there. Whoever owns or leases or whoever, whether that land is ceded, and I'm not aware of that, I don't know the specifics.

But it's been recorded as a good question and we'll find that out.

Yes, sir?

LARRY MILLER: The primary mission out at the PMRF is testing missiles, launching missiles and tracking submarines. It seems to me that adding more training facility for landing aircraft is kind of a conflict of the use of the base. I mean they do quite a bit of missile launching out there as it is now, and they launch missiles every day for testing for the submarines to track and stuff and they go out and pick them up. It seems that, I mean that's the primary mission of the base.

And you guys are trying to add in this aircraft training thing. I mean I'm going back to you already have facilities set up that are suitable to train these aircrafts, that landing and takeoffs for the short runway thing. You already have these facilities now.

COLONEL TORRES: Not in the state of Hawaii.

LARRY MILLER: Yeah, not in Hawaii. But they are there?

COLONEL TORRES: Back in the mainland, yes, sir.

LARRY MILLER: I mean I -- I still can't understand why they're considering PMRF for this. They have to build a runway. It's already being used for other purposes. I just don't understand it.

COLONEL TORRES: I think we've gone through at least three base closures. There are no bases, Navy, Marine, Air Force or Army that aren't being used to date. If there was it would be closed. So there is no base that doesn't have any training or activity going on, otherwise we'd -- the Department of Defense would close it and give it back to public use. And we've done a lot of that. I'm not going to say the decision is made for Barking Sands. But you're absolutely right meaning the training has to be considered by the Navy and the Air Force jointly to figure out how to work that end.

The distance is what makes it so difficult for the state of Hawaii. Even unlike Alaska. Alaska is only about two and a half hours from the coast and what you've seen is there are C-17s based at McChord, which is Seattle, Washington. Elmendorf, Alaska, is only about two and a half hours away. So their training fields, should we decide to go back to the mainland, are much closer.

Here the training fields, as you well know, any flight from the state of Hawaii is a five-hour flight just to the coast of California. Not inland to a field that has this kind of capability that we're discussing. It's really the distances.

Now will it be considered? Yes, obviously training back on the mainland will be considered. But, again, it's the concept of if you've got the crews and the airplanes based here to replace the C-130s the training has to occur here within the islands to be effective, to have that capability to do whatever those missions are, be they humanitarian, be they Department of Defense, whatever they are. Because the ranges are so distant back to the mainland.

Yes, ma'am?

ELAINE: So it is for the strategic location and that they will be carrying weapons that need to go Asia direction?

COLONEL TORRES: I'll try to answer the two questions as I heard them. One is is it a strategic airplane, does it do strategic missions?

ELAINE: Strategic location PMRF.

COLONEL TORRES: Oh. I don't think PMRF as a strategic location is why it's being considered for training. There's no link between strategic location and training here. It has everything to do with you're on the west coast and it doesn't have a lot of flight activity such as Honolulu International airport.

So, no, ma'am, I don't connect those two as far as strategic and then this. Strategic for the state of Hawaii, to have it this far west to react more quickly both for humanitarian and Department of Defense missions further west in the Pacific, yes. Yes, ma'am.

ELAINE: Will these planes be carrying weapons?

COLONEL TORRES: I think every airplane and cargo airplane in the Air Force at one time or another carries weapons, yes, ma'am.

ELAINE: What kind?

COLONEL TORRES: I have no idea.

ELAINE: What kind of weapon would a plane this big carry?

COLONEL TORRES: It will carry munitions, A-10s, A-10 munitions, meaning bullets. It will carry --

GEORGE TAGUMA: Tanks.

COLONEL TORRES: Yes, it can carry a tank. I guess I was thinking of actually smaller weapons. It carries tanks. It carries howitzers. Fortunately we don't have any of those on the island.

Now, does that mean that they're not going to roll down the hill from the Army or the Navy and then be put on airlines at Hickam and flown globally? Yes, that's a possible mission. Is that a mission for the island here? Unless you have something on the island that I don't know about. I don't know of you having tanks, howitzers. I don't know of you having nuclear weapons. There might be but I don't know of it. I don't know of weapons that you have on this island.

This is a training runway with 3,500 feet that we're discussing. If we wanted --

ELAINE: So they need to practice carrying heavy weight like tanks.

COLONEL TORRES: Please allow me to finish.

ELAINE: Okay.

COLONEL TORRES: If we wanted to do a mission like move torpedoes or armament in and out of Barking Sands I don't need to build a runway. You've already got one sitting right there and it's longer and more capable for me to do it.

So if your concern is being linked at all to me starting to fly munitions or nuclear weapons in and out of these islands, I'm not going to say that's going to occur, I have no idea, but I don't need to build a runway for that. It's already there.

Yes, ma'am?

ELAINE: Okay. So these -- but these planes could carry a lot of tanks?

COLONEL TORRES: One tank, ma'am, at a time.

ELAINE: All right. And the weight that it will be carrying you will need an extension on the runway for it to be able to support that, correct?

COLONEL TORRES: No. Two different things. The runway you already have out there is long enough to support some weaponry. Tanks are extremely heavy. I don't think the runway out here has the length in the summertime to support that kind of weight.

ELAINE: Okay. So you need to rebuild the runway to support those planes carrying tanks over here?

COLONEL TORRES: No, ma'am. The runway is only being built between 3,000 and 5,000 feet for those short field landings and those short field departures, not to move cargo in and out.

If we want to move cargo in and out we don't need to build a runway we could use the runway that's existing right now. The runway at Barking Sands and what you have in the Department of Defense on this island. You don't have heavy equipment on this island.

I think what we've brought out here a few times is I think we've brought some of the diving equipment out here for the Navy. I'm not positive. I don't know what comes out here in the cargo airplanes that do. I suppose if you get a C-5 every now and then they're likely supporting the tests or the training that's going on at Barking Sands.

ELAINE: Excuse me. You know, I really got lost in your response to that.

COLONEL TORRES: Ma'am.

ELAINE: You said that the runway would only need to be expanded and built upon to carry heavy equipment, correct? First you said that it was already there, it was equipped to do that.

COLONEL TORRES: You have a runway out there that already accepts C-5s now and brings large cargo in and out. That was done for --

ELAINE: What about tanks, though?

GARY O'DONNELL: We're not lengthening the runway. But I believe what Colonel Torres was saying is that if we were going to be carrying tanks in and out of Kauai then you'd have greater weight on board the plane so, you know, it would go back to physics. It's going to go further down the runway. Then you would need to lengthen the runway. But we're not lengthening the runway.

ELAINE: But you're reinforcing the runway.

GARY O'DONNELL: That would need to be done anyway for this. And in order to do the tanks you'd have to lengthen it as well as --

COLONEL TORRES: This is a short training runway. Runways have largely two facets to them. Length: The larger the airplane, like a 747, big, big airplane, C-5, you need a longer runway. Usually 8,000 to two miles long. Very, very long.

The other thing that runways have is depth. The substructure built underneath them is largely gravel, typically some cement, which is very expensive, and then quite often asphalt. The runway you already have out there supports cargo now, whatever those requirements are for the island. I don't know what those are.

The runway that we're discussing tonight has nothing to do with that. 3,500 feet long by 90 feet wide for cement for planes to land full stop and then come back around and take back off and depart.

The two missions of training versus moving cargo are not associated with what we're talking about tonight. This is just a training mission. If we wanted to bring cargo in, if there was some reason for the cargo in or out of the island, we would use the runway that's already in existence.

Now, planes, depending on how much weight you put on them, need longer runways. The more fuel, the more weight you put on them you need a longer runway. Out at Barking Sands here you have a fairly confined runway. It's only 6,500 feet long I'm pretty sure. It can't support big, big movements of the Army or Navy. And the good news is you don't have a large presence of Navy or Army here to support that kind of weight.

So it's -- I don't want to confuse anybody in here. It's two totally different things. The runway that we're talking about is for training. If we wanted to move cargo in or out of we'd use the existing runway. Now we're not extending the existing runway. We're not making what's out there longer to bring cargo in or out of the island. This is to bring planes just to train.

ELAINE: But you have already established that pilots have already been trained elsewhere so the only --

COLONEL TORRES: Initial training only.

ELAINE: So this is starting to sound like a lot of doubletalk.

COLONEL TORRES: If we haven't presented it clearly or in an orderly manner -- we're here to talk clearly, not to try and confuse it. The crews initially train in Altus, Oklahoma.

ELAINE: Will the transcript appear on a website anywhere?

COLONEL TORRES: No, ma'am. It will be published at your public library for you to copy, review, take the extracts that you desire.

Yes, sir?

GEORGE TAGUMA: You guys are missing the whole gist of this thing here. It's not the width of the runway or the length of the runway, it's the possibility of an accident.

COLONEL TORRES: Yes, sir.

GEORGE TAGUMA: That's why they have that word accident around. And what it can do to PMRF. Like I says, if it ever happens it will be a disaster. PMRF is more important than what you guys, ten times what you guys are intending to do.

COLONEL TORRES: Every base and every international airfield and every airport around the world faces safety risks. Every place, including our islands.

GEORGE TAGUMA: So place it someplace else, where if an accident does happen it won't decimate that area.

COLONEL TORRES: Yes, sir.

GARY O'DONNELL: We're getting the -- we hear the safety concerns and the other concerns here tonight. It's not a decision making meeting. It's to record and if I came myself most of this stuff would have been just said "I'll take your question back and get you an answer, try to get you an answer," but basically because Colonel Torres came along we're able to try to answer some of these questions.

COLONEL TORRES: We'll start to pack up. If there are other questions that somebody wants to come up and ask individually, now those won't be recorded. If you have any questions you still want to be asked in a recorded manner before we do let the stenographer go. But anybody's welcome. Yes, sir?

LARRY MILLER: Is this the only form or can we attach a statement to this form and mail it in?

COLONEL TORRES: Yes, sir, you can. You can 9 mail it in. And that will go in the transcript, in 10 fact. Meaning if you make a written statement and send 11 it in that also gets entered just as if you discussed it tonight. Yes, sir.

We'll start to close up. Feel free as we're doing that to come up and ask us any other questions, one-on-one if you'd like to. Thanks again for your time tonight. Appreciate your comments and they are recorded and we'll look through that.

Thank you very much for your time.

(The scoping meeting was concluded at 9:30 p.m.)

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CERTIFICATE

STATE OF HAWAII)
) ss.
CITY AND COUNTY OF HONOLULU)

I, MADELINE B. GABLE, Certified Shorthand Reporter and Notary Public in and for the State of Hawaii, do hereby certify:

That I was acting as a shorthand reporter in the foregoing matter on the 6th day of March, 2003.

That the proceedings were taken down in computerized machine shorthand by me and were thereafter

reduced to print under my supervision; that the foregoing represents, to the best of my ability, a correct transcript of the proceedings had in the foregoing matter.

I further certify that I am not counsel for any of the parties hereto, nor in any way interested in the outcome of the cause named in the caption.

Dated: March 24, 2003.

MADELINE B. GABLE
Notary Public, State of Hawaii
My Commission Expires: 4-24-2006

If nobody wants to make verbal comments, we thank you very much for coming tonight. If you think of something later, you know, you've got our point of contact and drop it in the mail. Thank you very much.

(Meeting concluded at 7:40 p.m.)

C E R T I F I C A T E

I, HOLLY HACKETT, R.P.R., C.S.R. in and for the
State of Hawai'i, do hereby certify;

That I was acting as shorthand reporter in the
foregoing matter on the 27th day of February, 2003

That the proceedings were taken down in
computerized machine shorthand by me and were thereafter
reduced to print by me;

That the foregoing represents, to the best
of my ability, a correct transcript of the proceedings
had in the foregoing matter.

DATED: This ____ day of _____ 2003

HOLLY M. HACKETT, R.P.R., C.S.R. #130
Certified Shorthand Reporter

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APPENDIX F

RESPONSE TO COMMENTS

APPENDIX F RESPONSE TO COMMENTS

F.1 The following pages contains a table developed to correlate comments made by the public to the draft EA and responses to those comments by the Air Force.

APPENDIX F RESPONSE TO COMMENTS

Service or Organization	Section Commented On	Comment Provided	Response to Comment
State Offices			
Peter L Yee Office of Hawaiian Affairs	Entire Document	Overall the draft EA fails to provide enough information for the citizen reader to evaluate the impacts of the proposed action.	The EA has been performed in accordance with all applicable federal and state regulations. Beyond the statutory requirements, the EA process included a series of public scoping meetings on both Oahu and Kauai and a public internet web site. The Air Force has sought public comment and included a large volume of critical information in this assessment. In addition, portions of the EA were removed, while other information was added and expanded.
Peter L Yee Office of Hawaiian Affairs	Non-Specific	The location of specific improvements, such as runways, which may impact cultural sites, is never specified.	Due to its size, the web-based, electronic version of the DEA may not have clearly reflected the exact locations of the beddown construction sites. The DEA provides specific locations for improvements at Hickam AFB and proposed location options at PMRF within 100 feet. Infrastructure upgrades and additional, more detailed building positions (within 5 feet ±) are a function of the final design process. This process cannot legally proceed until completion of the Environmental Assessment. Maps and images have been modified to more closely approximate project locations.
Peter L Yee Office of Hawaiian Affairs	Non-Specific	Additionally, large scale infrastructure improvements, such as the need for additional water and sewer lines, which, according to the documentation, are included in the propose action, are never evaluated.	Additional information, maps, and images have been added to the EA.
Peter L Yee Office of Hawaiian Affairs	Non-Specific	OHA requests that adequate information regarding the location of improvements, including clear water rinse facilities, hangars, fiber optic, sewer, and water lines proposed for Hickam Air Force Base be analyzed for their potential effect on Native Hawaiian historic and cultural sites.	Due to its size, the web-based, electronic version of the DEA may not have clearly reflected the exact locations of the beddown construction sites. The DEA provides specific locations for improvements at Hickam AFB and proposed location options at PMRF within 100 feet. Infrastructure upgrades and additional, more

APPENDIX F RESPONSE TO COMMENTS

			<p>detailed building positions (within 5 feet ±) are a function of the final design process. This process cannot legally proceed until completion of the Environmental Assessment. Maps and images have been modified to more closely approximate project locations.</p>
<p>Peter L Yee Office of Hawaiian Affairs</p>	<p>Non-Specific</p>	<p>OHA requests that we be provided with information to allow us to assess the potential impact of the proposed action on the burials at Nohili Dunes as well as on cultural and traditional sites in the Mana area.</p>	<p>The Air Force has begun the Section 106 consultation process to aid in the further assessment of impacts to these and other sites. Due to the re-scoping of the EA, the Nohili Dunes and Mana area are not impacted by the Proposed Action.</p>
<p>Peter L Yee Office of Hawaiian Affairs</p>	<p>Non-Specific</p>	<p>OHA requests that additional information on the potential impacts of on-going operations on endangered species, including night lights, be provided in the final EA.</p>	<p>There will be no increased lighting as a result of the proposed action. Because the Proposed Action is limited to the industrial area of Hickam AFB, in the vicinity of H/A, on-going operations are not expected to impact endangered species.</p>
<p>Peter L Yee Office of Hawaiian Affairs</p>	<p>Non-Specific</p>	<p>The final EA should include an analysis of the water needs for on-going operations, and actual availability of enough water for proposed operations.</p>	<p>Additional water demand estimates have been added to Section 4 of the EA.</p>
<p>Peter L Yee Office of Hawaiian Affairs</p>	<p>Non-Specific</p>	<p>There is no estimate in the draft EA of how much hazardous waste could be generated during construction or during ongoing operations. Thus there is no assessment of whether current hazardous waste facilities on O'ahu or Kauai could handle the additional materials. Furthermore, the draft EA suggests that the Kauai facility will not be able to handle the hazardous wastes generated during construction, and that such wastes will have to be shipped to Pearl Harbor. There is no analysis of the potential impact on endangered species, or on cultural practices. Please include these analyses in the Final EA.</p>	<p>The volume of hazardous waste generated during construction will be limited to waste generated as a result of contractor equipment operations and maintenance. These wastes include waste oil and other petroleum products, coatings, and adhesives. These are routinely generated as local contractors provide support to all aspects of the economy, and will not significantly impact current state levels of hazardous waste. The Air Force employs the most stringent pollution prevention methods currently available when conducting all maintenance operations. An integrated pollution prevention team specifically for the C-17 has been created. Wastes generated as a result of introducing the C-17 will be handled internally by Air Force and constantly analyzed for reduction</p>

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				opportunities. The volume of waste generated internally by Air Force operations will not exceed the Base's handling capacity.
Peter L Yee Office of Hawaiian Affairs	Non-Specific		OHA would like to see a better analysis of noise impacts, including locating schools on noise contour maps.	School locations have been added to the noise contour maps.
Mary Lou Kobayashi, Planning Program Administrator, State of Hawaii, Department of Business Economic Development & Tourism, Office of Planning	Non-Specific		"We request the submittal of a federal consistency Negative Determination or Consistency Determination to our office for the subject Department of the Air Force project."	A federal consistency Negative Determination is currently being drafted by the 15 AW for submittal to the State of Hawaii Department of Business Economic Development & Tourism.
General Public				
Cheryll Lovell-Obatake	Entire Document		I was a member of the Kauai / Niihau Islands Burial Council from 1992 – 2000. I am aware of the historical and cultural sensitivity of the area. The environmental assessment is insufficient and lacks Hawaiian cultural and historical knowledge. A Cultural Impact Assessment is necessary and the methodology of that process can be found at the Office of Environmental Quality Control, State of Hawaii.	The Air Force has begun the Section 106 consultation process to aid in the further assessment.

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<p>Cheryl Lovell-Obatake</p>	<p>Entire Document</p>	<p>The Draft EA was not circulated through the proper agencies Office of Hawaiian Affairs Kauai County Council Mayor Brian Baptiste Other State Libraries</p>	<p>Opportunity for public involvement has exceeded NEPA requirements for an Environmental Assessment. Public scoping meetings were held in all effected areas. Public notices have been posted as required. Copies of the DEA have been made available as dictated by regulation. In addition, a public website was created to enhance public involvement. OHA will receive a copy of the final EA.</p>
<p>Comments were received by the general public and two state agencies during the draft EA review period reflecting a version of the EA that included alternatives that have since been deleted, and the comments are no longer applicable. (Due to insufficient or unavailable information, the proposed SAAF site locations will be completed evaluated in a subsequent NEPA.) Comments on that draft version of the EA were received by the following:</p>			

APPENDIX F RESPONSE TO COMMENTS

Commenter	Residence
Bill Hartfell	Lawai, HI
William Null	Tacoma, WA
William Georgi	Kalaheo, HI
Sara Smith	Princeville, HI
Kim Headley	Hanapepe, HI
Angela Headley	Hanapepe, HI
Neevy Arora	Honolulu, HI
Beryl Blaich	Kailua, HI
Gary Blaich	Kailua, HI
David Martin	Kapaa, HI
Madelein Migenes	Kailua, HI