

Final Environmental Assessment

Relocate Marine Unmanned Aerial Vehicle Squadron Three to Hawaii



Photo by: Sgt. Eric Warren

Prepared for:

**Naval Facilities Engineering Command Pacific
and
United States Marine Corps**



March 2014

**DEPARTMENT OF THE NAVY
UNITED STATES MARINE CORPS**

Finding of No Significant Impact (FONSI) for the Relocation of United States Marine Corps Unmanned Aerial Vehicle Squadron Three from Marine Corps Air Ground Combat Center, Twentynine Palms, California to Hawai'i

Pursuant to the Council on Environmental Quality (CEQ) (Code of Federal Regulations [CFR] Title 40, Parts 1500-1508 et seq.) regulations implementing the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] §4321, et seq.); Marine Corps Order P5090.2A, Change 3, Environmental Protection and Compliance Manual; and the USMC National Environmental Policy Act (NEPA) Manual, version 2.0, the United States Marine Corps (USMC) gives notice that an Environmental Assessment (EA) has been prepared for the Relocation of USMC Unmanned Aerial Vehicle Squadron Three (VMU-3) from Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California to Hawai'i. Based on the results of the EA, the action will result in no significant impacts to the human or natural environment; therefore, an Environmental Impact Statement is not required.

Proposed Action

The Proposed Action is the relocation of VMU-3, including 274 active-duty USMC and U.S. Navy personnel, an estimated 202 dependents, and approximately three contract/civilian personnel, from MCAGCC Twentynine Palms, California to the state of Hawai'i, and the conduct of unmanned-aircraft training activities within existing training ranges in the region. The purpose of the Proposed Action is to address an existing Aviation Combat Element (ACE) deficiency in Hawai'i by adding Unmanned Aircraft Systems (UAS) under the ACE, thereby achieving a balance in the USMC's capabilities in the Pacific and ensuring that Marine forces are sufficiently manned, trained, and equipped to meet any crisis or conflict. The need for the Proposed Action is to ensure that the III Marine Expeditionary Force (MEF) operational commander is supported by a balanced, geographically collocated Marine Air Ground Task Force (MAGTF) in Hawai'i.

Under the Proposed Action, VMU-3 will be based at Marine Corps Base Hawaii Kaneohe Bay (MCB Hawaii Kaneohe Bay). Renovation of existing facilities at MCB Hawaii Kaneohe Bay will satisfy operational and administrative requirements. Additionally, VMU-3 will establish a temporary facility followed by a planned permanent facility at Wheeler Army Air Field (WAAF), an existing U.S. Army base at Wahiawa on O'ahu. The temporary and permanent facility will support VMU-3 operational and training requirements. Housing for personnel and dependents will be provided on-base at MCB Hawaii Kaneohe Bay, at other Navy/Marine Corps housing areas on the island of O'ahu, or within the local community, as needed and available.

The Proposed Action includes the use of three RQ-7B UAS, at four aircraft per system, and nine RQ-21A UAS, at five aircraft per system, for a total of 57 unmanned aircraft (12 RQ-7B and 45 RQ-21A). The Proposed Action includes UAS flight training activities in the state of Hawai'i, primarily within Special Use Area restricted airspace, at MCB Hawaii Kaneohe Bay and WAAF on the island of O'ahu; at the U.S. Navy training range (Pacific Missile Range Facility [PMRF],

Barking Sands) on the island of Kaua'i; and at the U.S. Army training area (Pohakuloa Training Area [PTA]) on the island of Hawai'i.

The squadron, with its dependents and contractors, is scheduled to relocate to Hawai'i with RQ-7B systems beginning in June/July 2014. The delivery of the initial RQ-21A systems is scheduled for 2015.

Alternatives Analyzed

Site and operational selection criteria were identified and applied to potential basing locations in Hawai'i. Five other alternatives were considered, but eliminated from further consideration because they did not fulfill the minimum objectives and criteria to achieve the purpose of and need for the Proposed Action. These alternatives were: 1) relocating VMU-3 to WAAF; 2) relocating VMU-3 to Joint Base Pearl Harbor-Hickam (JBPHH); 3) relocating VMU-3 to Dillingham Airfield, O'ahu; 4) relocating VMU-3 to PMRF; and 5) relocating VMU-3 to PTA.

No-Action Alternative

The No-Action Alternative is the only other alternative evaluated in this EA. Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and would remain at MCAGCC Twentynine Palms, CA. The No-Action Alternative would not address the ACE deficiency in Hawai'i nor achieve balance in the USMC's capabilities in the Pacific. The No-Action Alternative would not meet the purpose of and need for the Proposed Action.

Environmental Effects

The Proposed Action will not result in significant impacts on airspace; air quality; noise; topography and soils; groundwater; surface water; wetlands; biological resources; population; housing and education; surrounding land use; cultural resources; traffic and circulation; recreational facilities; utilities, infrastructure, and solid waste; visual and aesthetic resources; and hazardous materials and waste. The Proposed Action will not create environmental health or safety risks that could disproportionately impact children, minority populations, or low-income populations. The Proposed Action is listed among the *de minimis* activities agreed upon between the Department of the Navy and the State of Hawai'i Coastal Zone Management (CZM) Program and, as such, is not subject to further review under the State CZM Program.

Under Section 106 of the National Historic Preservation Act (NHPA), the Proposed Action will have an adverse effect on Hangar 102 at MCB Hawaii Kaneohe Bay, which is eligible for listing on the National Register of Historic Places (NRHP). MCB Hawaii Kaneohe Bay has complied with NHPA Section 106 by affording the Hawai'i State Historic Preservation Officer (SHPO), the National Trust for Historic Preservation, the Advisory Council on Historic Preservation (ACHP), the Historic Hawai'i Foundation, and Native Hawaiian Organizations an opportunity to comment on the Proposed Action and consult to resolve the adverse effect. The consultation resulted in an executed Memorandum of Agreement (MOA) between MCB Hawaii Kaneohe Bay and the Hawai'i SHPO that commits the USMC to measures that mitigate the adverse effect. Accordingly, the impact of the Proposed Action on Hangar 102 is not considered to be a significant impact to cultural resources under NEPA.

Public Involvement

Public involvement consisted of publication of the draft EA for a 30-day review period between January 8 and February 10, 2014, during which five comment submissions were received. Two comments were in support of the proposal to relocate VMU-3 to Hawai'i. Other comments expressed concerns regarding: NHPA Section 106 consultation with Native Hawaiian groups on Moloka'i; potential cumulative noise impacts in Kaneohe; potential impacts to land use near PTA; and concern regarding the USMC's public involvement for this EA. Minor changes to the EA were made in response to the comment on land use near PTA.

Finding

Based on the information gathered during the preparation of this EA and the analysis presented, the USMC has determined that the Proposed Action will have no significant impacts on the quality of the human or natural environment. Consequently, an EIS is not required.

Point of Contact:

Interested parties may download an electronic copy of the EA addressing this action from the Marine Corps Base Hawaii website at <http://www.mcbhawaii.marines.mil/UnitHome.aspx>. The EA and FONSI are on file at Naval Facilities Engineering Command Pacific, 258 Makalapa Dr, Suite 100, Pearl Harbor, HI 96860-3134 (Attention: Project Manager, VMU-3 EA, Code EV21).



BRIAN ANNICHARIKO
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Base Hawaii



Date

SUMMARY

Proposed Action	Relocate United States Marine Corps (USMC) Marine Unmanned Aerial Vehicle Squadron Three (VMU-3) from Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California to Hawai'i.
Type of Document	Environmental Assessment
Lead Agency	United States Marine Corps
For Further Information	Planner in Charge, VMU-3 EA, Code EV21 Naval Facilities Engineering Command, Pacific Pearl Harbor, Hawai'i 96860-3134

To ensure that the Third Marine Expeditionary Force (III MEF) operational commander is supported by a balanced, geographically collocated Marine Air-Ground Task Force (MAGTF) in Hawai'i and to address the Aviation Combat Element (ACE) deficiency in Hawai'i, the United States Marine Corps (USMC) proposes to relocate an Unmanned Aircraft System (UAS) squadron from California to Hawai'i, thereby achieving a balance in the USMC's capabilities in the Pacific and ensuring that Marine forces are sufficiently manned, trained, and equipped to meet any crisis or conflict.

Proposed Action. The Proposed Action is the relocation of the existing Marine Unmanned Aerial Vehicle Squadron Three (VMU-3), including 274 active-duty USMC and Navy personnel, an estimated 202 dependents, and approximately three contract/civilian personnel, from Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, California, to the state of Hawai'i, and the conduct of unmanned-aircraft training activities within existing training ranges in the region.

Under the Proposed Action, VMU-3 would be based at Marine Corps Base Hawaii Kaneohe Bay (MCB Hawaii Kaneohe Bay). Renovation of existing facilities would satisfy operational and administrative requirements. Housing for personnel and dependents would be provided on-base at MCB Hawaii Kaneohe Bay, at other Navy/Marine Corps housing areas on the island of O'ahu, or within the local community as needed and available.

The Proposed Action includes the use of three RQ-7B UAS at four aircraft per system and nine RQ-21A UAS at five aircraft per system for a total of 57 unmanned aircraft (12 RQ-7B and 45 RQ-21A). The Proposed Action includes UAS flight training activities in the state of Hawai'i, at an existing USMC base (MCB Hawaii Kaneohe Bay) and U.S. Army base (Wheeler Army Air Field [WAAF], Wahiawa) on the island of O'ahu; at an existing U.S. Navy training range (Pacific Missile Range Facility [PMRF], Barking Sands) on the island of Kaua'i; and a U.S. Army training area (Pohakuloa Training Area [PTA]) on the island of Hawai'i. Operation of UAS requires Federal Aviation Administration (FAA)-designated controlled airspace and Special Use Airspace (SUA), so that there would be no conflicts between commercial and military aircraft or between manned and unmanned aircraft. An Airspace Certificate of Authorization (COA) must be obtained from the FAA to allow UAS operations within currently

defined airspace used by traditional fixed-wing and rotorcraft. The USMC would coordinate with the FAA to apply for COAs for UAS operations where required.

The squadron would relocate to Hawai'i with RQ-7B systems in June/July 2014. The delivery of the initial RQ-21A systems is proposed for February/March 2015.

Alternatives. The No-Action Alternative is the only other alternative evaluated by this Environmental Assessment (EA). Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and would remain at Twentynine Palms.

Five other alternatives were considered, but eliminated from further consideration because they did not fulfill the minimum objectives and criteria to achieve the purpose of and need for the Proposed Action. They failed to meet the immediate need to provide adequate training and continued mission readiness or to create more efficient operational processes. These alternatives were: 1) relocating VMU-3 to WAAF; 2) relocating VMU-3 to Joint Base Pearl Harbor-Hickam (JBPHH); 3) relocating VMU-3 to Dillingham Airfield, O'ahu; 4) relocating VMU-3 to PMRF; and 5) relocating VMU-3 to PTA.

Environmental Consequences. The Proposed Action is not expected to have any significant adverse impacts or unresolved issues. Potential impacts by topic are summarized below.

Airspace. Implementation of the Proposed Action would have minimal effects on current airspace use at MCB Hawaii Kaneohe Bay, WAAF, PMRF, or PTA.

No SUA is located within the vicinity of MCB Hawaii Kaneohe Bay. Therefore, any UAS training activities to be conducted at this airfield, such as operator qualification/proficiency in launch and recovery maneuvers would require a COA issued by the FAA that would confine these operations within the existing Class D/E airspace environment. Such training would consist of approximately 480 operations annually and, at less than one percent, would not be a significant increase to the 52,000-plus annual operations currently conducted at this airfield. A separate COA would be required for the RQ-7B and RQ-21A UAS operations, and it would define the area within which VMU-3 training activities must be confined, along with those conditions and stipulations that govern these respective operations. Confining these operations to the airfield Class D/E airspace would not interfere with other nonparticipating air traffic in the surrounding area. UAS operators must ensure that there is a safe operating distance between manned and unmanned aircraft at all times. It is anticipated that no significant impacts would occur at this airfield as a result of implementing the Proposed Action.

Use of the WAAF, PMRF, and PTA airfields for proposed regular and exercise training activities would have a minimal effect on current airfield and Class D/E airspace uses. Regular training would occur at WAAF for two weeks per month. Proposed training at PMRF on the island of Kaua'i would occur up to two times per year for three weeks at a time, for a total of up to six weeks per year, while other training would occur at PTA up to four times per year for three weeks at a time, for a total of up to 12 weeks per year. A separate COA would be required to operate the RQ-7B and RQ-21A UAS within the Class D/E airspace for each of these airfields and defined corridors for transiting between the airfields and existing SUA. Use of these airfields and associated SUA for UAS training could be effectively coordinated and integrated with other

Army, Navy, Army National Guard, and USMC mission needs for this airspace. Activating the COA transit corridors would not conflict with other nonparticipating air traffic operations in the surrounding airspace where UAS operators/observers must ensure a safe operating distance from those aircraft. No significant impacts on airspace would be expected and no mitigation measures would be required.

Air Quality. Air quality impacts would occur from both construction and operational/training activities. Proposed construction/renovation activities at MCB Hawaii Kaneohe Bay, WAAF, and PMRF would generate combustive emissions and fugitive dust. Due to the mobile and/or intermittent nature of construction sources and their low emission rates, combined construction emissions would result in less than significant impacts on existing conditions. To minimize fugitive dust emission during construction, the contractor for proposed construction activities would comply with HAR 11-60.1-33, *Fugitive Dust*. In addition, to minimize combustive emissions from construction equipment, the contractor would use Best Management Practices (BMPs) to minimize the idling of equipment engines. As a result, emissions from proposed construction activities would not be expected to contribute to an exceedance of any ambient air quality standard. Significant impacts on air quality would not occur as a result of proposed construction/renovation activities associated with the Proposed Action.

Proposed operational and training activities at MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA would generate combustive emissions from: 1) the use of on-road and non-road vehicles in support of the UAS; 2) UAS operations; 3) on-road vehicles and stationary sources associated with the increase in personnel and dependents at MCB Hawaii Kaneohe Bay; and 4) transport of equipment and personnel to and from proposed training areas by on-road vehicles and cargo aircraft. The mobile and intermittent nature of these sources and their low emission rates would produce minimal impacts. As a result, emissions from proposed UAS training activities would not contribute to an exceedance of any ambient air quality standard. Significant impacts on air quality would not occur as a result of implementing the Proposed Action.

Noise. Construction/renovation activities at MCB Hawaii Kaneohe Bay, WAAF, and PMRF would result in a short-term increase in noise. However, construction noise would occur in the context of an active military installation in locations exposed to military training noise. Proposed construction sites are distant from the boundaries of the installations, and construction noise levels would not be expected to be of concern at off-installation locations. Long-term average noise levels would not be affected by temporary construction noise. Construction noise impacts (as well as impacts to operators of the UAS from the aircraft engines) would be minimized by using proper hearing protection.

Proposed UAS training activities would utilize existing runways and/or related paved areas at MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA, and would occur within existing controlled airspace or SUA, primarily at altitudes between 5,000 and 10,000 feet (1,524 and 3,048 meters) above mean sea level (MSL). The RQ-7B and RQ-21A are 10 and 17 decibels (dB) quieter, respectively, than the quietest manned aircraft operating within the proposed airspace, and UAS aircraft primarily operate at high altitudes. VMU-3 training would take place in the context of existing and continuing military training operations and UAS noise would not be expected to have any measurable effect on overall noise levels or to add measurably to the existing

Day-Night Average Sound Level (DNL). Significant noise impacts would not occur as a result of implementing the Proposed Action.

Topography and Soils. In the short-term, impacts on soil and topography would be caused by land-disturbing activities such as demolition, clearing, excavating, grading, stockpiling soil, filling, and soil compaction associated with construction or renovation at MCB Hawaii Kaneohe Bay, WAAF, and PMRF. With the appropriate implementation of BMPs, significant impacts on soils would not result from proposed construction activities. No significant long-term, adverse impacts on topography or soils would occur as a result of construction or UAS training associated with the Proposed Action.

Groundwater. No significant adverse impacts on groundwater would occur as a result of implementing the Proposed Action.

Surface Water. Implementation of the Proposed Action could result in a minor increase in impermeable surfaces at MCB Hawaii Kaneohe Bay, WAAF, and PMRF. Consequently, there could be a resultant increase in the volume of surface runoff. However, facilities would be constructed in compliance with the Department of the Navy's (DoN) Low Impact Development (LID) policy, the goal of which is to manage stormwater on-site and result in no net increase in stormwater volume, rate, sedimentation, or nutrient loading from construction or renovation projects. In accordance with this policy, site design strategies and features intended specifically to address stormwater runoff would be incorporated within the proposed projects to reduce the rate and volume of runoff, and levels of pollutants. Thus, significant impacts related to drainage and flooding would not occur as a result of implementing the Proposed Action.

During UAS training, the application of appropriate site drainage control measures and development of, and compliance with, Standard Operating Procedures (SOPs) would minimize the potential for contaminants to be discharged into surface water from runoff. In addition, SOPs would minimize potential spills of petroleum products and hazardous substances during UAS training operations. Significant impacts on surface water would not occur as a result of implementing the Proposed Action.

Wetlands. Adherence to the DoN LID policy and implementation of appropriate BMPs during construction would prevent significant impacts on wetlands at MCB Hawaii Kaneohe Bay as a result of implementing the Proposed Action. No wetlands are present in the vicinity of the Proposed Action at WAAF, PMRF, or PTA; therefore, no impacts on wetlands would occur at these installations as a result of the Proposed Action.

Biological Resources. Proposed construction/renovation activities at MCB Hawaii Kaneohe Bay, WAAF, and PMRF would occur mainly within currently developed areas and no federally listed species inhabit any of the project areas.

Proposed UAS training activities would utilize existing runways and/or related paved areas at MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA, and would occur within existing controlled airspace or SUA, primarily at altitudes between 5,000 and 10,000 feet (1,524 and 3,048 meters) above MSL. The RQ-7B and RQ-21A are 10 and 17 decibels (dB) quieter, respectively, than the quietest manned aircraft operating within the proposed airspace. Proposed training is not expected

to adversely affect any listed or protected species in or around the airfield. In addition, many of these species are already exposed to, and likely habituated to, military flight training activities in the area. Natural resources management programs currently in place to protect listed and other sensitive species through the installations' Integrated Natural Resources Management Plan (INRMP) would be applied as necessary. In addition, UAS training operations would follow measures as required by regulations and SOPs to avoid impacts on Endangered Species Act (ESA)-listed and Migratory Bird Treaty Act (MBTA)-protected species. Significant impacts on biological resources would not occur as a result of implementing the Proposed Action.

Population and Housing. The proposed VMU-3 squadron relocation would add approximately 480 residents to the City and County of Honolulu. Personnel would not be relocated to WAAF, PMRF, or PTA. On-base housing demand would be accommodated at MCB Hawaii Kaneohe Bay or other Navy/Marine Corps housing areas on the island of O'ahu. Off-base housing, if required, would be accommodated in the private sector. The potential housing need could easily be absorbed by O'ahu's available housing. Significant impacts on population and housing would not occur as a result of implementing the Proposed Action.

Education. The Proposed Action would support the relocation of 274 military personnel, approximately 3 contract personnel, and approximately 202 dependents to MCB Hawaii Kaneohe Bay. Personnel would not be relocated to WAAF, PMRF, or PTA. For the purposes of this analysis, it is estimated that 67 of the 202 (33 percent), dependents are non-spousal dependents (based on the general formula for estimating dependents for married Marines used by the MCB Hawaii Kaneohe Bay Family Housing Department: 1.5 dependents/married Marine [USMC 2011]), including school-aged children, and that all of these children are or will become school-aged. Over a five-year period, the resulting increase can be accommodated by the local school system and would be small relative to annual enrollment ranges. Significant impacts on enrollment would not occur as a result of the Proposed Action.

Land Use. Facility construction/renovation at MCB Hawaii Kaneohe Bay, WAAF, and minor upgrades to the runway at PMRF would be designed and sited to be compatible with the existing base master plans and airfield safety guidelines. No construction is anticipated to occur on sites not previously developed. In addition, the proposed basing and UAS training activities at MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA would not represent a change in existing land use designations and would not conflict with surrounding land use or base master plans. Significant impacts on land use would not occur as a result of the Proposed Action.

Cultural Resources. Facility construction/renovation at MCB Hawaii Kaneohe Bay and WAAF, minor upgrades to the runway at PMRF, and flight training would not result in significant impacts on cultural resources, including Hawaiian Traditional resources and sacred sites. The proposed construction/renovation at MCB Hawaii Kaneohe Bay would not result in adverse effects to archaeological resources. Areas known to have buried cultural deposits or Native American Graves Protection and Repatriation Act (NAGPRA) cultural items would be monitored by a professional archaeologist during ground-disturbing activities. If NAGPRA cultural items are discovered, all work in the vicinity would stop and the remains would be stabilized and protected. Treatment would proceed under the authority of NAGPRA. The proposed construction/renovation at MCB Hawaii Kaneohe Bay would result in an adverse effect on Hangar 102, which has been determined eligible for listing on the National Register of

Historic Places (NRHP). In compliance with Section 106 of NHPA, USMC has consulted with the Hawai'i State Historic Preservation Officer (SHPO), the National Trust for Historic Preservation, the Advisory Council on Historic Preservation (ACHP), the Historic Hawai'i Foundation, and Native Hawaiian Organizations, which resulted in an executed Memorandum of Agreement (MOA) between MCB Hawaii Kaneohe Bay and the Hawai'i SHPO that commits the USMC to measures that mitigate the adverse effect to Hangar 102 (Appendix E). The incremental increase in flight activities that would occur as a result of proposed UAS training would have no impacts on cultural resources. Significant impacts on cultural resources would not occur as a result of the Proposed Action.

No adverse effects to cultural resources at PMRF would be expected to occur as a result of runway improvements and periodic flight training activities. Pursuant to the stipulations in the *Programmatic Agreement among the Commander Navy Region Hawaii, The Advisory Council on Historic Preservation and the Hawaii SHPO regarding Navy undertakings in Hawaii* (as amended 2012), NAVFAC Pacific has determined that the Proposed Action does not require further Section 106 review under the NHPA (Appendix E).

No adverse effects to cultural resources at PTA would be expected to occur as a result of periodic flight training activities.

Traffic. The increased on-base activity at MCB Hawaii Kaneohe Bay from squadron relocation would result in increased traffic volume. The addition of VMU-3 would increase projected peak hour volume on Interstate H-3 and on Mōkapu Road, but volume would remain well below the capacities of these roadways. At the MCB Hawaii Kaneohe Bay gates, combined traffic volume through the H-3 and Mōkapu gates is projected to increase by 4.3 percent, which would increase congestion and could extend the period of peak traffic conditions. Increased traffic from the VMU-3 relocation at the signalized intersections on the base would result in increased delay, but with implementation of previously identified mitigation measures, acceptable conditions would still be attained. Traffic impact analysis was not conducted for WAAF, PMRF, or PTA, since significant impacts from periodic squadron training events at those facilities are not expected.

Utilities, Infrastructure, and Solid Waste. Solid waste generation/disposal and demand for utilities (i.e., wastewater, water, and electricity) are anticipated to increase slightly as a result of the relocation of approximately 480 additional personnel and dependents to O'ahu. However, the additional demand for these services is not anticipated to exceed the operational capacities of MCB Hawaii Kaneohe Bay's nor the island's existing utility distribution systems. Significant impacts on the supply or capacity of utilities, infrastructure, or solid waste would not occur as a result of the Proposed Action.

The proposed UAS training activities would not significantly increase demand on utilities (i.e., water, wastewater, electricity, or solid waste) at WAAF, PMRF, or PTA such that existing supply or capacity would be inadequate. Significant impacts on utilities, infrastructure, or solid waste would not occur at these locations as a result of the Proposed Action.

Hazardous Materials and Waste. Several buildings programmed for demolition or renovation at MCB Hawaii Kaneohe Bay could contain asbestos-containing material and/or lead-based paint. In addition, there is the possibility that undocumented contaminated soils from past fuel spills could

be present beneath the various project areas of the Proposed Action. Any potential impacts associated with unknown contamination would be mitigated through worker awareness and safety training. Proper removal, handling, transport, and disposal of hazardous materials from the premises of buildings that contain lead-based paint and/or asbestos-containing materials would be conducted by qualified professionals in compliance with all applicable state and federal health, safety, and environmental regulations. In accordance with HAR 11-501, *Asbestos Requirements*, the State of Hawai'i Department of Health would be notified of any demolition or renovation work involving asbestos, if required. BMPs would be employed during demolition or renovation work to prevent and/or minimize the release of hazardous materials and to protect workers. This would minimize the risk of persons on base being exposed to health hazards associated with these hazardous materials.

VMU-3 operations would require sheltered flammable liquid drum fuel storage at MCB Hawaii Kaneohe Bay and the use of fuel at existing facilities at WAAF, PMRF, and PTA. The storage, handling, and use of fuel at all locations would be done in accordance with each installation's Hazardous Waste Management Plan (HWMP), Spill Prevention, Control, and Countermeasure Plan (SPCCP), and associated policies and procedures. Plans and procedures would be modified, if necessary, to accommodate the particular needs of the UAS. The types of hazardous materials used and the hazardous waste generated would be managed in accordance with existing procedures, which conform to federal and State of Hawai'i requirements. With implementation of the environmental control measures described, and compliance with existing regulations and procedures, significant impacts related to hazardous materials and waste would not occur as a result of the Proposed Action.

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TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
Summary	S-1
Acronyms and Abbreviations	v
1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION	1-1
1.1 Introduction	1-1
1.2 Project Location and Surrounding Environment	1-1
1.2.1 Project Background	1-3
1.3 Purpose of and Need for the Proposed Action	1-4
1.3.1 UAS Background.....	1-5
1.4 Environmental Permits and Consultations	1-8
1.5 Public Involvement.....	1-8
2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES	2-1
2.1 Summary of the Proposed Action.....	2-1
2.2 VMU-3 Requirements.....	2-1
2.2.1 Basing Requirements.....	2-1
2.2.2 Training Requirements	2-2
2.3 Selection of Alternatives	2-2
2.3.1 Alternative Selection Criteria.....	2-3
2.3.2 Alternatives.....	2-4
2.3.3 Application of Selection Criteria to Alternatives.....	2-4
2.3.4 Summary Application of Selection Criteria	2-9
2.4 Details of the Proposed Action	2-10
2.4.1 Summary	2-10
2.4.2 Details of Facility Modifications	2-11
2.4.3 Details of UAS Training Operations	2-23
2.5 Scope of Resource and Issue Analysis.....	2-30
3.0 EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	3-1
3.1 Airspace	3-1
3.1.1 Affected Environment.....	3-4
3.1.2 Potential Impacts	3-7
3.2 Air Quality	3-9
3.2.1 Affected Environment.....	3-9
3.2.2 Potential Impacts	3-11
3.3 Noise.....	3-14
3.3.1 Affected Environment.....	3-15
3.3.2 Potential Impacts	3-17
3.4 Topography and Soils.....	3-20
3.4.1 Affected Environment.....	3-20
3.4.2 Potential Impacts	3-22
3.5 Water Resources	3-23
3.5.1 Affected Environment.....	3-23
3.5.2 Potential Impacts	3-28
3.6 Biological Resources.....	3-34
3.6.1 Affected Environment.....	3-34

3.6.2	Potential Impacts	3-48
3.7	Population and Housing	3-50
3.7.1	Affected Environment.....	3-50
3.7.2	Potential Impacts	3-50
3.8	Education.....	3-52
3.8.1	Affected Environment.....	3-52
3.8.2	Potential Impacts	3-55
3.9	Land Use	3-56
3.9.1	Affected Environment.....	3-56
3.9.2	Potential Impacts	3-59
3.10	Cultural Resources	3-62
3.10.1	Definition of the Area of Potential Effects or Region of Influence	3-62
3.10.2	Affected Environment.....	3-62
3.10.3	Potential Impacts	3-64
3.10.4	Mitigation Measures	3-67
3.11	Traffic and Circulation.....	3-67
3.11.1	Affected Environment.....	3-68
3.11.2	Potential Impacts	3-68
3.11.3	Mitigation.....	3-71
3.12	Utilities, Infrastructure, and Solid Waste	3-71
3.12.1	Affected Environment.....	3-71
3.12.2	Potential Impacts	3-75
3.13	Hazardous Materials and Waste.....	3-78
3.13.1	Affected Environment.....	3-78
3.13.2	Potential Impacts	3-81
3.14	Cumulative Impacts	3-84
3.14.1	Airspace	3-88
3.14.2	Greenhouse Gas (GHG) Emissions and Climate Change	3-89
3.14.3	Air Quality	3-90
3.14.4	Noise.....	3-91
3.14.5	Topography and Soils.....	3-91
3.14.6	Water Resources	3-92
3.14.7	Biological Resources.....	3-92
3.14.8	Population, Housing, and Education.....	3-92
3.14.9	Land Use	3-93
3.14.10	Cultural Resources	3-93
3.14.11	Traffic and Circulation.....	3-94
3.14.12	Hazardous Materials and Waste	3-95
3.14.13	Summary of Environmental Impacts	3-95
3.15	Short-term Uses versus Long-term Productivity	3-97
3.16	Irreversible and Irretrievable Commitment of Resources.....	3-97
4.0	LIST OF PREPARERS.....	4-1
5.0	REFERENCES	5-1

FIGURES

<u>SECTION</u>	<u>PAGE</u>
Figure 1.2-1. Proposed Action Location Map	1-2
Figure 1.3-1. RQ-7B Landing with Arresting Gear	1-7
Figure 2.4-1. Location of Facilities and Construction Projects Associated with the Proposed Action at MCB Hawaii Kaneohe Bay	2-13
Figure 2.4-2. Demolition Projects Associated with the Proposed Action	2-14
Figure 2.4-3. Construction/Renovation Projects Associated with the Proposed Action	2-15
Figure 2.4-4. Wheeler Army Air Field	2-19
Figure 2.4-5. Proposed Site for VMU-3 Use, Wheeler Army Air Field Hill Climber Ramp Area	2-20
Figure 2.4-6. Proposed VMU Training Location at Pacific Missile Range Facility	2-21
Figure 2.4-7. Proposed Launch/Recovery Area and Runway Improvements at PMRF	2-22
Figure 2.4-8. Detail of PMRF Runway Shoulder Proposed for Improvement	2-22
Figure 2.4-9. Aerial View of Cooper Airstrip, Pohakuloa Training Area	2-24
Figure 2.4-10. Special Use Airspace in Hawai'i	2-26
Figure 2.4-11. Special Use Airspace near Wheeler Army Airfield, O'ahu	2-27
Figure 2.4-12. Special Use Airspace near Pacific Missile Range Facility, Kaua'i	2-28
Figure 2.4-13. Special Use Airspace at Pohakuloa Training Area, Hawai'i	2-29
Figure 3.5-1. Wetlands in the Vicinity of MCB Hawaii Kaneohe Bay	3-25
Figure 3.5-2. Wetland and Sensitive Species Areas at PMRF	3-29
Figure 3.6-1. PMRF Critical Habitat	3-45
Figure 3.8-1. Kalaheo Public Schools Complex Enrollment Trends from 1996 to 2012	3-53
Figure 3.8-2. Castle Public Schools Complex Enrollment Trends from 1996 to 2012	3-54
Figure 3.8-3. Pearl City Public Schools Complex Enrollment Trends from 1996 to 2012	3-54

TABLES

<u>SECTION</u>	<u>PAGE</u>
Table 1.3-1. The RQ-7B System	1-7
Table 1.3-2. The RQ-21A System	1-8
Table 1.4-1. Environmental Permits or Consultations	1-8
Table 2.2-1. VMU Facilities Requirements	2-1
Table 2.3-1. Summary of the Selection Criteria Application	2-9
Table 2.4-1. Baseline and Proposed Annual Aircraft Training Flights	2-11
Table 2.4-2. Projected RQ-7B and RQ-21A Operational Altitudes	2-23
Table 3.2-1. National and Hawai'i Ambient Air Quality Standards	3-10
Table 3.3-1. Aircraft Characteristics Related to Noise Level	3-18
Table 3.3-2. Direct Overflight Maximum Noise Levels (L_{max})	3-18
Table 3.7-1. 2010 Population and Housing Data	3-50
Table 3.7-2. Projected Population and Housing on O'ahu, 2010 to 2020	3-51
Table 3.8-1. Schools in Related Areas, Grades K-12	3-53
Table 3.8-2. Schools Over Capacity in 2012	3-55
Table 3.9-1. Existing and Future Land Use	3-57
Table 3.11-1. Roadway Improvements for Existing Conditions	3-70

Table 3.11-2.	Roadway Improvements to Support GTF	3-70
Table 3.11-3.	Roadway Improvements to Mitigate MV-22/H-1 EIS Project Impacts	3-70
Table 3.14-1.	Projects at MCB Hawaii Kaneoyhe Bay	3-85
Table 3.14-2.	Projects at WAAF/SBMR	3-87
Table 3.14-3.	Non-DoD Actions	3-88
Table 3.14-4.	Comparison of Alternatives.....	3-95
Table 3.14-5.	Summary of Project Features that Minimize Potential Impacts.....	3-96

APPENDICES

- A Federal Policies and Executive Orders
- B Interagency Communication
- C Airspace Management
- D Biological Resources – Species Lists
- E National Historic Preservation Act - Section 106 Correspondence
- F Navy/Marine Corps *de minimis* Activities Under the CZMA
- G Traffic Impact Assessment Report

Acronyms and Abbreviations

µg/m ³	micrograms per cubic meter
1st MAW	First Marine Aircraft Wing
I MEF	First Marine Expeditionary Force headquartered at MCB Camp Pendleton, California
II MEF	Second Marine Expeditionary Force headquartered at MCB Camp Lejeune, North Carolina
III MEF	Third Marine Expeditionary Force headquartered at MCB Camp Butler, Okinawa
IV MEF	Fourth Marine Expeditionary Force (Reserves) headquartered at MCB New Orleans, Louisiana
ACE	Aviation Combat Element
ACHP	Advisory Council on Historic Preservation
AGL	Above Ground Level
AIRFA	American Indian Religious Freedom Act
AOR	Area of Responsibility
APE	Area of Potential Effect
ARPA	Archaeological Resources Protection Act
ASOC	Air Support Operations Center
AST	Aboveground Storage Tank
ATC	Air Traffic Control
AT/FP	Anti-Terrorism/Force Protection
AVGAS	Aviation Gasoline
AvPlan	Aviation Plan
BAAF	Bradshaw Army Airfield
BASH	Bird/Wildlife-Aircraft Strike Hazard
BEQ	Bachelor Enlisted Quarters
BFR	Basic Facility Requirement
BMP	Best Management Practice
BN	Battalion
CAA	Clean Air Act
CAB	Clean Air Branch
CDP	Census Designated Place
CE	Command Element
CEMML	Center for Environmental Management of Military Lands
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF	cubic feet
CFR	Code of Federal Regulations
CH ₄	methane
CHMRIMP	Consolidated Hazardous Materials Reutilization and Inventory Management Program
CLB-3	Combat Logistics Battalion 3
CNIC	Commander Navy Installations Command
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
COA	Certificate of Authorization
CONUS	Continental United States
CPRW-2	Commander, Patrol, and Renaissance Wing 2
CTIT	Turbine Inlet Temperature in Degrees Celsius
CWA	Clean Water Act
CWB	Clean Water Branch
CY	cubic yards

CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dB	decibel
DBEDT	Department of Business, Economic Development and Tourism
DLNR	Department of Land and Natural Resources
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DOE	Department of Education
DOH	Department of Health
DoN	Department of the Navy
DPRI	Defense Policy Review Initiative
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act of 1973
ESHP	Engine Shaft Horsepower
FAA	Federal Aviation Administration
FACSFAC PH	Fleet Area Control & Surveillance Facility, Pearl Harbor
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
FSRG	Force Structure Review Group
FY	Fiscal Year
GCE	Ground Combat Element
GCS	Ground Control Station
GDT	Ground Data Terminal
GHG	Greenhouse Gas
GPCD	Gallons Per Capita Demand
GPD	gallons per day
GSE	Ground Support Equipment
GTF	Ground Task Force
GWP	Global Warming Potential
H ₂ S	hydrogen sulfide
Ha	hectare
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	Hazardous Air Pollutant
HAR	Hawaii Administrative Rules
HAZMIN	Hazardous Materials Minimization
HIARNG	Hawaii Army National Guard
HMLA	Helicopter Marine Light Attack
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HP	Horsepower
HPOWER	Honolulu Program of Waste Energy Recovery
HWMP	Hazardous Waste Management Plan
ICRMP	Integrated Cultural Resources Management Plan
IFR	Instrument Flight Rule
INRMP	Integrated Natural Resources Management Plan
IRH	Indoor and Radiological Health
IRP	Installation Restoration Program
ISR	Intelligence, Surveillance, and Renaissance

JBPHH	Joint Base Pearl Harbor-Hickam
JO	Joint Order
JP-5	Jet Propellant Grade 5
KIAS	Knots Indicated Airspeed
KIUC	Kaua'i Island Utility operative
KTF	Kauai Test Facility
KTS	Knots
kV	kilovolts
LBS	Pounds of Thrust
LCE	Logistics Combat Element
LEED®	Leadership in Energy and Environmental Design
LHD	Landing Helicopter Dock
LID	Low Impact Development
L _{max}	maximum noise level
LOS	Levels of Service
LSV	Logistic Support Vessel
MACG	Marine Air Control Group
MAG-24	Marine Aircraft Group 24
MAGTF	Marine Air-Ground Task Force
MALS-24	Marine Aviation Logistics Squadron-24
MAW	Marine Aircraft Wing
MBTA	Migratory Bird Treaty Act
MCAF	Marine Corps Air Facility
MCAGCC	Marine Corps Air Ground Combat Center
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCCS	Marine Corps Community Services
MCDC	Mōkapu Central Drainage Channel
MCTAB	Marine Corps Training Area Bellows
MEF	Marine Expeditionary Force
MGD	million gallons per day
MILCON	Military Construction
MILVAN	Military-Owned Demountable containers
MMA	Multi-Mission Maritime Aircraft
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
MOGAS	motor gasoline
MSL	Mean Sea Level
MV-22/H-1 EIS	The 2012 Environmental Impact Statement for the Basing of MV 22 and H 1 Aircraft in Support of III MEF Elements in Hawaii
MW	Megawatts
MWSD	Marine Wing Support Detachment
MWSD-24	Marine Wing Support Detachment-24
MWSS	Marine Wing Support Squadron
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emissions Standards for Hazardous Air Pollutants

NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NOx	nitrogen oxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
O ₃	ozone
OOMA	Optimized-Organizational Maintenance Activity
OPNAVINST	Chief of Naval Operations Instruction
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
PK	Pre-kindergarten
PM _{2.5}	particulate matter 2.5 microns or less in diameter
PM ₁₀	particulate matter 10 microns or less in diameter
PMRF	Pacific Missile Range Facility
POL	petroleum, oil, and lubricants
POV	Privately-Owned Vehicle
PPV	Public/Private Venture
ppm	parts per million
PTA	Pohakuloa Training Area
RA	Restricted Area
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
RIMPAC	Rim of the Pacific Exercise
ROD	Record of Decision
ROI	Region of Influence
RPM	Revolutions per Minute
RPV	Remotely Piloted Vehicle
SATCOM	Satellite Communication
SAIA	Sikes Act Improvement Act
SBMR	Schofield Barracks Military Reservation
SCIF	Secure Compartmentalized Information Facility
SECNAVINST	Secretary of the Navy Instruction
SHPO	State Historic Preservation Officer
SO ₂	sulfur dioxide
SO ₄	sulfate
SOP	Standard Operating Procedure
SPCCP	Spill Prevention, Control, and Countermeasure Plan
STUAS	Small Tactical Unmanned Aircraft System
SUA	Special Use Airspace
SWM	Solid Waste Management
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TTP	Tactics, Techniques, and Procedures
U.S.	United States

UAS	Unmanned Aircraft System
UFC	Unified Facilities Criteria
USAEC	United States Army Environmental Command
USACE	United States Army Corps of Engineers
USAG	United States Army Garrison
USAG-HI	United States Army Garrison-Hawaii
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USMC	United States Marine Corps
USN	United States Navy
UST	Underground Storage Tank
V/C	Volume/Capacity
VFR	Visual Flight Rule
VMM	Marine Medium Tilt-Rotor Squadron
VMU-1	Marine Unmanned Aerial Vehicle Squadron One assigned to I MEF
VMU-2	Marine Unmanned Aerial Vehicle Squadron Two assigned to II MEF
VMU-3	Marine Unmanned Aerial Vehicle Squadron Three assigned to I MEF
VMU-4	Marine Unmanned Aerial Vehicle Squadron Four assigned to IV MEF
VOC	Volatile Organic Compound
Vog	volcanic smog
WAAF	Wheeler Army Air Field
WBR	Whole Barracks Renewal
WMA	Wildlife Management Area
WQC	Water Quality Certification
WRF	Water Reclamation Facility
WWTP	Wastewater Treatment Plant

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1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) addresses the proposed relocation of United States Marine Corps (USMC) Unmanned Aerial Vehicle Squadron (VMU)-3¹ from the state of California to the state of Hawai'i. This EA was prepared pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C] 4321 et seq.), its implementing regulations issued by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Part 1500 - 1508), Marine Corps Order 5090.2A (with Change 3), and the USMC NEPA Manual (September 2011).

The goal of this EA is to ensure that comprehensive and systematic consideration is given to potential environmental impacts that may result from implementing the Proposed Action, or any reasonable alternative action, upon the natural, man-made, or social environment. The information presented in this EA will result in a Finding of No Significant Impact (FONSI), lead to preparation of an Environmental Impact Statement (EIS), or no action on the proposal.

1.2 PROJECT LOCATION AND SURROUNDING ENVIRONMENT

The Proposed Action would be implemented in the State of Hawai'i at an existing USMC base (Marine Corps Base Hawaii Kaneohe Bay [MCB Hawaii Kaneohe Bay]) and U.S. Army base (Wheeler Army Air Field [WAAF], Wahiawa) on the island of O'ahu; at an existing U.S. Navy (USN) training range (Pacific Missile Range Facility [PMRF], Barking Sands) on the island of Kaua'i; and at a U.S. Army training area (Pohakuloa Training Area [PTA]) on the island of Hawai'i. Refer to Figure 1.2-1 for a map of the project locations.

MCB Hawaii Kaneohe Bay encompasses 2,951 acres (1,194 hectares) on O'ahu's northeastern shore, on Mōkapu Peninsula. Mōkapu Peninsula is bounded by Kāne'ohe Bay on the west, the Pacific Ocean to the north, Kailua Bay to the east, and residential development to the south. Kailua and Kāne'ohe are the communities nearest to MCB Hawaii Kaneohe Bay. MCB Hawaii Kaneohe Bay provides programs and services that support combat readiness for all operating forces and tenant organizations. Marine units based at MCB Hawaii Kaneohe Bay include Marine Aircraft Group-24 (MAG-24), Combat Logistics Battalion-3 (CLB-3), the 3D Marine Regiment, 1st Battalion 12th Marine Regiment, and 3D Radio Battalion; tenants such as the U.S. Navy's Commander, Patrol and Reconnaissance Wing-2 (CPRW-2) are also based there.

¹ Properly termed "Unmanned *Aircraft System*" or UAS by joint doctrine, the VMU squadrons employing these systems have retained the description of "Unmanned *Aerial Vehicle*" squadrons. *UAS*, as either singular or plural, will be used hereafter within this EA.

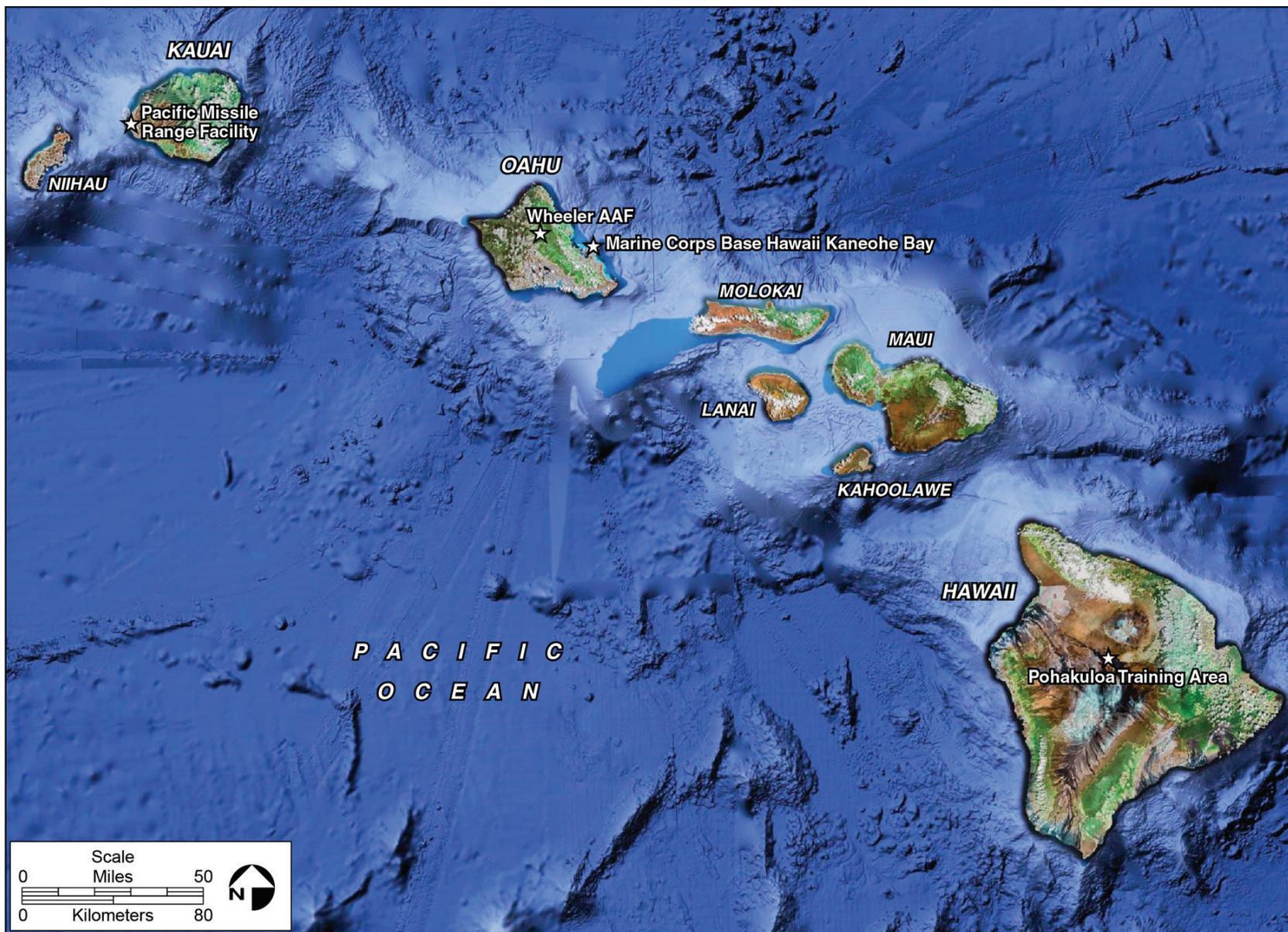


Figure 1.2-1. Proposed Action Location Map

WAAF encompasses 1,398 acres (566 hectares) on the Central O'ahu Plateau adjacent to the Army's Schofield Barracks Military Reservation (SBMR) (17,725 acres [7,173 hectares]), and the town of Wahiawa. WAAF is bounded on the northwest by the SBMR Main Post and on the northeast by the SBMR East Range and Kamehameha Highway. WAAF provides administration, housing, maintenance, training, flight facilities, and security and law enforcement support. WAAF houses the 25th Infantry Division's Combat Aviation Brigade, as well as various cargo and air ambulance units (U.S. Army 2012). The 25th Infantry Division provides combat units in support of operation and planning exercises as part of a designated Joint Forces Command (U.S. Army 2012).

PMRF encompasses 2,040 acres (825.6 hectares) adjacent to the Pacific Ocean on the western side of the island of Kaua'i. Kaunali'i Highway and North Nohili Road roughly parallel PMRF's eastern boundary, with agricultural fields between the installation and the eastern edge of the coastal plain. The town of Kekaha lies to the south and to the north is Polihale State Park. PMRF is the world's largest instrumented multi-environment range, capable of supporting surface, subsurface, air, and space operations simultaneously. PMRF has over 1,100 square miles (2,849 square kilometers) of instrumented underwater range and over 42,000 square miles (108,780 square kilometers) of controlled airspace (CNIC 2012).

PTA encompasses 132,000 acres (53,418.5 hectares) in the north-central part of the island of Hawai'i, between the volcanic mountains of Mauna Loa, Mauna Kea, and Hualalai. It extends up the lower slopes of Mauna Kea to approximately 6,800 feet (2,073 meters) in elevation and to about 9,000 feet (1,744 meters) on Mauna Loa. The training area is about midway between Hilo on the east coast and the Army boat-docking site at Kawaihae Harbor on the west side of the island. PTA is the largest Department of Defense (DoD) installation in Hawai'i (Global Security 2012).

PTA includes an 80-acre (32-hectare) cantonment area with a fuel yard, fire and police departments, and an airfield with a 3,700-foot (1,128-meter) runway. The cantonment area also provides units with task-force headquarters, dining facilities, a troop medical clinic, a theater, and a chapel. The installation can support up to 2,300 military personnel with fuel and limited life and logistical services to allow units to conduct expeditionary field training with small arms and crew-served weapons, artillery, mortars, and aviation ordnance on designated ranges (USAG-HI 2012).

1.2.1 Project Background

An Unmanned Aircraft System (UAS) is composed of one or more unmanned aircraft, controlled from the ground, and a variety of ground-support and communication equipment that supports single or multiple-site flight operations. UAS are found in a variety of shapes and sizes, and serve diverse purposes.

The USMC has utilized UAS since establishing its first UAS unit in 1984². The UAS increases the effectiveness of the air-ground team by extending the team's influence over time and space on the battlefield. The persistence and reach of current systems are key characteristics that

² VMU-2 was originally formed in June 1984 as Detachment T, Target Acquisition Battery, 10th Marine Regiment, 2nd Marine Division, Fleet Marine Forces Atlantic, thus becoming the first Remotely Piloted Vehicle (RPV) unit within the Marine Corps.

provide improved aerial reconnaissance and command-and-control capability exceeding that of manned aviation assets.

VMU squadrons are organized within a Marine Air Control Group (MACG) under a Marine Aircraft Wing (MAW), which is the Aviation Combat Element (ACE) component of a Marine Expeditionary Force (MEF). There are four MEFs within the USMC: I MEF is headquartered at MCB Camp Pendleton, California; II MEF is headquartered at MCB Camp Lejeune, North Carolina; III MEF is headquartered at MCB Camp Butler, Okinawa (supported by MCB Hawaii); and IV MEF is a Marine Corps Reserve MEF, headquartered in New Orleans, Louisiana. Currently, there are four VMU squadrons within the USMC, with VMU-1 and VMU-3 assigned to I MEF, VMU-2 assigned to II MEF, and the newest-VMU 4-assigned to IV MEF. The existing VMU-3, created in 2008, is currently assigned to MACG-38/3D MAW, located at Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California. The USMC's decision to add UAS capability to all of its MEFs, per the USMC Fiscal Year (FY) 2012 and 2013 Aviation Plans (USMC 2011, 2012), led to the proposal to relocate VMU-3 to the Pacific in support of III MEF. Accordingly, the Proposed Action would balance Marine Corps VMU apportionment across all the MEFs and would project Marine UAS capability into the Pacific Area of Responsibility (AOR).

While III MEF is headquartered on the island of Okinawa, the USMC presence and future force lay-down posture in Japan is continuing to evolve. The discussions regarding reductions in the USMC presence on Okinawa that led to agreements between the governments of the U.S. and Japan several years ago did not include an agreement to relocate USMC VMU units to Okinawa or to mainland Japan. Additionally, the Marine Corps is not authorized to operate, deploy, or base UAS in Japan. Accordingly, the Proposed Action is to relocate VMU-3 to Hawai'i, rather than to mainland Japan or Okinawa.

1.3 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The *purpose* of the Proposed Action is to address the ACE deficiency in Hawai'i by adding a UAS squadron under the ACE, thereby achieving a balance in the USMC's capabilities in the Pacific and ensuring that Marine forces are sufficiently manned, trained, and equipped to meet any crisis or conflict. The Proposed Action would meet the need by addressing this deficiency.

The *need* for the Proposed Action is to ensure that the III MEF operational commander is supported by a balanced, geographically collocated Marine Air Ground Task Force (MAGTF) in Hawai'i, to carry out legally-mandated responsibilities³ and maintain the highest state of readiness. Currently, III MEF is the only MEF in the USMC that lacks Group 3 UAS (Section 1.3.1) aerial reconnaissance capability. The Proposed Action enhances III MEF's ability to sufficiently man, train, and equip Marines to meet any future crisis or conflict. Additionally, the Proposed Action would allow III MEF units based in Hawai'i to more completely train as they fight, as a single unit combining the four elements of a MAGTF: Command Element (CE), Ground Combat Element (GCE), ACE, and Logistics Combat Element (LCE). The Proposed Action would allow a Marine UAS squadron to enhance this training and readiness by completing a role necessary to support the six functions of Marine aviation (assault support,

³ 10 USC. Section 5063 (Title 10, Subtitle C, Part I, Chapter 506, Section 5063) defines the composition and functions of the USMC.

anti-aircraft warfare, offensive air support, electronic warfare, control of aircraft and missiles, and aerial reconnaissance) that the ACE brings to the MAGTF. Collocating these capabilities in Hawai'i would allow frequent, integrated, and cost-effective training to maximize operational effectiveness of III MEF and its state of readiness to meet any future crisis or conflict.

MCB Hawaii Kaneohe Bay serves to support overseas contingency operations and provide the MAGTF, tenant, and joint operations and training with adequate and unencumbered maneuver space and live-fire ranges. Relocation of VMU-3 to MCB Hawaii Kaneohe Bay would ensure that all ACE components and equipment are in place for troop training in Hawai'i for the foreseeable future, so that the MAGTF could "train as we fight."

1.3.1 UAS Background

UAS are categorized into groups, numbered from 1 to 5, based on aircraft gross takeoff weight, normal operating altitude Above Ground Level (AGL), and airspeed. Group 1 UAS (e.g., Wasp and Raven) can generally be characterized as hand-launched vehicles with a wingspan of as little as two feet (0.61 meter), and being less than 20 pounds (9.1 kilograms) maximum gross takeoff weight, with a payload of about four pounds (1.8 kilograms). They operate at less than 1,200 feet (366 meters) AGL, with a maximum airspeed of 50 Knots Indicated Airspeed (KIAS) (93 kilometers per hour), a range of 5-plus nautical miles (9.3 kilometers), and have limited visual, infrared, or motion-detection capabilities.

Group 2 UAS (e.g., Silver Fox, Scan Eagle) typically have wingspans in the range of 10 feet (3 meters) and a length of about 4 to 5 feet (1.2 to 1.5 meters). They are catapult-launched, carry optical/infrared cameras, have a payload weight of up to 10 pounds (4.5 kilograms), a gross takeoff weight of between 21 and 55 pounds (9.5 and 25 kilograms), operate at less than 3,500 feet (1,067 meters) AGL, have a maximum airspeed of 250 KIAS (463 kilometers per hour), may have a range of 50-plus nautical miles (93 kilometers), and have the capability to remain airborne for up to 24 hours.

Group 3 UAS (the RQ-7B "Shadow" and RQ-21A "Blackjack" are included in this group) weigh an average of 400 pounds (181 kilograms) – although the Blackjack is well below this at about 135 pounds (61 kilograms) maximum takeoff weight - with a 14-foot (4.3-meter) wingspan and a typical 100-pound (45-kilogram) payload (up to several hundred pounds possible) of sensors, and have a gross takeoff weight of between 56 and 1,320 pounds (25 and 599 kilograms). They are catapult-launched, have a range of about 75 nautical miles (139 kilometers), a normal operating altitude below 18,000 feet (5,486 meters) above Mean Sea Level (MSL), and have a maximum airspeed of less than 250 KIAS (463 kilometers per hour). The RQ-7B requires a short landing strip for recovery whereas the RQ-21B utilizes a recovery system known as Skyhook, which uses a hook on the end of the wingtip to catch a cable hanging from a 30- to 50-foot (9.1- to 15.2-meter) pole. Group 3 UAS, similar to Group 1 and 2 UAS, are powered by small propeller engines.

Group 4 UAS (e.g., Predator) are sophisticated and propeller-driven. They require a runway of approximately 5,000 feet (1,524 meters), have a wingspan of about 50 feet (15.2 meters), an empty weight of about 1,100 pounds (499 kilograms), a payload of about 450 pounds (204 kilograms), a gross takeoff weight of greater than 1,320 pounds (599 kilograms), operate at

less than 18,000 feet (5,486 meters) MSL, and have a range up to 2,500 nautical miles (4,630 kilometers).

Group 5 UAS, typified by the Global Hawk, are generally jet-powered, high-altitude UAS with a wingspan of up to 130 feet (39.6 meters) and length of up to 48 feet (14.6 meters), a range of up to 13,000 nautical miles (24,076 kilometers), a gross takeoff weight of greater than 1,320 pounds (599 kilograms), an operating level greater than 18,000 feet (5,486 meters) MSL, and carry sensing equipment for a primarily Intelligence, Surveillance, and Reconnaissance (ISR) function.

Operation of UAS in the National Airspace System of the United States requires FAA-designated controlled airspace and SUA so that there would be no conflicts between commercial and military aircraft, or between manned and unmanned aircraft. An Airspace Certificate of Authorization (COA) must be obtained from the FAA to allow UAS operations within currently defined airspace used by traditional fixed-wing and rotorcraft.

UAS are not new to Hawai'i; the 3D Marine Regiment has been operating Group 1 UAS since 2007, while the U.S. Army's 2nd and 3rd Brigades and Hawaii Army National Guard (HIARNG) have operated Group 3 UAS out of WAAF since 2007 (USACE 2008). The 3D Marine Regiment's Group 1 UAS operate with COAs issued by the FAA in Marine Corps Air Facility (MCAF) controlled airspace at MCB Hawaii Kaneohe Bay, and within the confines of Marine Corps Training Area Bellows (MCTAB). Additionally, Marine VMU squadrons have deployed the RQ-7B system to Hawai'i in support of training exercises at PTA (USACE 2008), with the most recent deployment in January 2011 (VMU-3). The U.S. Army's 2nd and 3rd Brigades each have one RQ-7B system consisting of three unmanned aircraft each, and HIARNG has four RQ-7B unmanned aircraft (Army 2013). All of the U.S. Army and HIARNG UAS utilize the FAA-designated restricted airspace at Schofield Barracks/Makua Valley, and at PTA (U.S. Army 2004). The Army/Missile Defense Agency has flown Group 5 UAS at PMRF, utilizing the FAA-designated restricted airspace above PMRF (DoN 2008).

The proposal to relocate VMU-3 to Hawai'i involves only the Group 3 UAS: the RQ-7B and RQ-21A.

1.3.1.1 RQ-7B "Shadow"

The RQ-7B system provides dedicated airborne reconnaissance and surveillance, supporting arms coordination and control, and communications relay. The RQ-7B shares the same system baseline configuration as the Army's Shadow UAS.

One RQ-7B system consists of four unmanned aircraft, two Ground Control Stations (GCS), two Ground Data Terminals (GDT), one portable GDT, one portable GCS, two UAS-transports, one maintenance section multifunctional support vehicle, one mobile maintenance facility support vehicle, one catapult launcher, two support vehicles, and two tactical generator trailers (Table 1.3-1 and Figure 1.3-1). The RQ-7B aircraft is catapult-launched with a hydraulic launcher mounted on a trailer. Recovery (landing) of the RQ-7B requires a prepared runway surface with arresting gear, consisting of four recovery drums, two nets with stanchions, and cord to capture the unmanned aircraft (Figure 1.3-1).

Table 1.3-1. The RQ-7B System	
RQ-7B	Profile
	<ul style="list-style-type: none"> • Vehicle Type: Fixed Wing • Wingspan: 14 feet (4.3 meters) (20 feet (6.1 meters) with increased endurance aircraft) • Weight: 380 pounds (172 kilograms) • Launch: Catapult • Recovery: Prepared surface landing (710 x 50 feet) (216 x 15 meters) • Powered: Motor Gasoline (MOGAS) • Operated: Ground Control Station (GCS), four aircraft per system • Range: 67 nautical miles (124 kilometers) • Airspeed: 90-110 KIAS (167-204 kilometers per hour) • Endurance: 6 hours (9 hours with increased endurance aircraft) • Altitude: Normal (Above Ground Level [AGL]) 3,000-8,000 feet (914-2,438 meters)/Maximum 15,000 feet (4,572 meters) (Mean Sea Level [MSL])



Figure 1.3-1. RQ-7B Landing with Arresting Gear

1.3.1.2 RQ-21A “Blackjack”

The RQ-21A Small Tactical UAS will replace ISR services currently provided by the manufacturer, Boeing/Insitu, using the smaller Group 2 sized Scan Eagle system.

The RQ-21A system consists of five unmanned aircraft, four workstations, four GDTs, one launcher, one Skyhook, generators, and four support vehicles (Table 1.3-2). The RQ-21A differs from the RQ-7B in that it uses a unique pneumatic launcher and a recovery system known as Skyhook, which uses a hook on the end of the wingtip to catch a cable hanging from a 30- to 50-foot (9- to 15-meter) pole. This system eliminates the need for runways and enables a safe recovery and expeditionary capability for tactical missions on land or sea. This launch and recovery system design has been used since 2004 in combat and other extreme environments and has attained nearly 100 percent mission availability (Insitu 2012).

Table 1.3-2. The RQ-21A System

RQ-21A	Profile
	<ul style="list-style-type: none"> • Vehicle Type: Fixed Wing • Wingspan: 16 feet (4.9 meters) • Weight (loaded): 135 pounds (61 kilograms) • Launch: Pneumatic Catapult • Recovery: SkyHook wingtip capture • Powered: Gasoline or heavy fuel • Operated: Ground Control Station (GCS), five aircraft per system • Range: 54 nautical miles (100 kilometers) • Airspeed: 55-80 Knots Indicated Airspeed (KIAS) (102-148 kilometers per hour) • Endurance: 15 hours • Altitude: Normal (Above Ground Level [AGL]) 3,000-8,000 feet (914-2438 meters)/maximum (Mean Sea Level [MSL]) 15,000 feet (4572 meters)

1.4 ENVIRONMENTAL PERMITS AND CONSULTATIONS

The list provided in Table 1.4-1 includes, but is not limited to, permits and agency consultations that may be required to implement the Proposed Action.

Table 1.4-1. Environmental Permits or Consultations

Permit or consultation	Agency
National Historic Preservation Act (NHPA), Section 106 consultation	Historic Preservation Division, Department of Land and Natural Resources, State of Hawai'i
National Pollutant Discharge Elimination Permit System	Department of Health (DOH), State of Hawai'i
Certificate of Authorization (COA)	Federal Aviation Administration

The Proposed Action is consistent with regulations, federal polices, and Executive Orders described in Appendix A.

1.5 PUBLIC INVOLVEMENT

A Notice of Availability (NOA) of the Draft EA was published in local newspapers (Honolulu Star-Advertiser, Garden Island Newspaper [Kaua'i], and Hawaii Tribune-Herald [island of Hawai'i]) on January 10-12, 2014 (available at <http://www.mcbhawaii.marines.mil/UnitHome/FeaturedInformation/UAV.aspx>). Publication of the Draft EA NOA began a 30-day public review of the Draft EA, during which the public could submit written comments on the EA via the website or regular mail. Five comment submissions on the Draft EA were received. Two comments were in support of the proposal to relocate VMU-3 to Hawai'i. Other comments expressed concerns regarding: NHPA Section 106 consultation with Native Hawaiian groups on Moloka'i; potential cumulative impacts in Kaneohe; potential impacts to land use near PTA; and concern regarding the USMC's public involvement for this EA. Comments received have been incorporated into the EA, but have not resulted in substantive changes. An NOA for the Final EA and FONSI was published in the same local newspapers, and the Final EA and FONSI were made available at <http://www.mcbhawaii.marines.mil/UnitHome/FeaturedInformation/UAV.aspx>.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 SUMMARY OF THE PROPOSED ACTION

The proposal being analyzed in this EA is to relocate an existing Unmanned Aerial Vehicle Squadron (VMU)-3, including 274 USMC and Navy personnel plus associated dependents, from Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California, to Hawai'i, and to conduct training activities within existing training ranges in the region. VMU-3 would become part of the First Marine Aircraft Wing (1st MAW) in support of Third Marine Expeditionary Force (III MEF).

2.2 VMU-3 REQUIREMENTS

VMU-3 currently operates the RQ-7B Shadow UAS and is projected to add the newly developed RQ-21A Small Tactical Unmanned Aircraft System (STUAS). The Proposed Action includes the use of three RQ-7B UAS and nine RQ-21A UAS (12 RQ-7B and 45 RQ-21A aircraft), for a total of 57 unmanned aircraft. Under the Proposed Action, the squadron would relocate to Hawai'i with RQ-7B aircraft in June/July 2014. The delivery of the initial RQ-21 systems would occur in February/March 2015. VMU-3 includes 274 active-duty USMC and Navy personnel, an estimated 202 dependents, and approximately 3 contract/civilian personnel.

2.2.1 Basing Requirements

Basing a VMU squadron typically requires various categories of space for operations, maintenance, offices, vehicle parking, a training facility, storage, vehicle washing facility, etc. (Table 2.2-1).

Facility Type	Building Sq. Ft. ¹ (meters) Required	Pavement Sq. Ft. (meters) Required
Line Vehicle (Ground Support Equipment) Parking		13,000 (1,208)
Aircraft Ready Fuel Storage	185 (17)	
Flight Simulator Facility	450 (42)	
Maintenance Hangar OH Space, High bay	27,600 (2,564)	
Maintenance Hangar 01 Space (Crew and Equipment)	3,850 (358)	
Maintenance Hangar 02 Space (Administrative)	4,325 (402)	
Aircraft Maintenance Spares/Storage	800 (74)	
Vehicle Holding Shed	840 (78)	
Automotive Org Shop (Vehicle Maintenance Shop)	6,278 (583)	
Vehicle Wash Platform (Vehicle Maintenance Shop)	1,680 (156)	
Grease Rack (Vehicle Maintenance Shop)	392 (36)	
Storage for Organic Units (covered Storage Building)	3,375 (314) ²	
Hazardous and Flammable Storehouse	800 (74)	
General Storage Shed (covered Storage Shed)	5,000 (465)	
Open Storage Area	3,000 (279)	
Parking Area, (Vehicle Parking Area, surfaced)		115,885 (10,766)
Runway/Aircraft Apron Area		25,000 (2,323)
Total Building Area	58,575 (5,442)	
Total Paved Surfaces		153,885 (14,296)
Grand Total	212,460 sq. ft. (19,738 sq. meters)	

Notes: 1 - sq. ft. = square feet
2 - Area measurement converted from cubic feet (CF) requirement (8,100 CF)

This includes space for about 165 pieces of “rolling stock” and Ground Support Equipment (GSE), consisting of UAS launchers, High Mobility Multipurpose Wheeled Vehicle (HMMWV) trucks, and trailers. Overall, a fenced compound of approximately 187,000 square feet (17,373 square meters) (combined indoor and outdoor) is the optimal requirement for facility space. Depending on aircraft type, the squadron also requires use of airfield pavement for recovery efforts for certain types of UAS. For example, RQ-7B recovery requires a paved or graded and improved surface measuring no less than 710 x 50 feet (216.4 x 15.2 meters). In contrast, the RQ-21A is recovered using a pole-and-hook device and does not require a paved landing area.

In addition to facility and space needs, other basing requirements for the VMU-3 squadron include aviation logistics support provided by Marine Aviation Logistics Squadron (MALS)-24 at MCB Hawaii Kaneohe Bay. No expansion of MALS-24 personnel, space, or facility upgrades would be needed to support VMU-3 basing at MCB Hawaii Kaneohe Bay.

2.2.2 Training Requirements

The typical training scenario for the VMU involves both “regularly scheduled” training (approximately two weeks each month of flight-related activities) and “intermittent” training consisting of combined-forces support during larger training evolutions in Hawai'i (e.g., the USMC's Lava Viper evolutions two times a year at PTA; the biennial joint Rim of the Pacific [RIMPAC] exercise, primarily using airspace associated with PMRF, Kaua'i; and exercises elsewhere in the western Pacific, Asia, and Australia). Transiting USMC units (i.e., those units en route to other destinations) with similar UAS aircraft may also participate in the training since they would operate within the same constraints as described within this EA. For such training, deployment is typically via aircraft (e.g., C-17 or C-130), but could be via Marine Corps helicopter and/or smaller surface ship, depending on the training location. To supplement the regularly scheduled and intermittent training, it is desirable that limited UAS flight operations, which consist of basic flight and payload operations, be conducted at the VMU home base.

Operation of UAS in the National Airspace System of the United States requires Federal Aviation Administration (FAA)-designated controlled airspace and Special Use Airspace (SUA), so that there would be no conflicts between commercial and military aircraft, or between manned and unmanned aircraft. There is no FAA-designated restricted airspace over MCB Hawaii Kaneohe Bay where regularly scheduled training could be performed. Such airspace does exist in the Hawaiian Islands at WAAF/Makua Valley on O'ahu, at PMRF on Kaua'i, and at PTA on the island of Hawai'i. Operation of unmanned aircraft in controlled airspace requires an FAA-issued Certificate of Authorization (COA). A COA must be obtained from the FAA to allow UAS operations within non-special use airspace used by traditional fixed-wing and rotorcraft (See Section 3.1, *Airspace*, for types of airspace and use restrictions). Operation of unmanned aircraft within SUA does not require a COA.

2.3 SELECTION OF ALTERNATIVES

This section develops and describes the alternatives evaluated in this EA. A set of selection criteria based on the purpose and need are applied to a set of potential alternatives to define viable alternatives for analysis. The application of the selection criteria resulted in the USMC's Proposed Action to relocate VMU-3 to MCB Hawaii Kaneohe Bay.

2.3.1 **Alternative Selection Criteria**

The following selection criteria are based on the established purpose to address an Aviation Combat Element (ACE) deficiency in Hawai'i by adding a VMU squadron under the ACE and ensuring that the III MEF operational commander is supported by a balanced, geographically – collocated Marine Air Ground Task Force (MAGTF) in Hawai'i to ensure strategic mission capabilities. Selection criteria consist of:

1. **Accessibility to Airfields and Seaports Supporting Global Deployment** - All operational Marine Corps units must have the ability to be globally deployed. The ability to be globally deployed refers to the deployment of aircraft, personnel, and required ground support equipment and logistical support (parts, cranes, ammunition, etc.) by means of strategic airlift or global sealift. To meet this requirement, the basing location for the VMU-3 squadron must have immediate access, via ground transportation, to a Department of Defense (DoD)-controlled airfield that supports strategic airlift (e.g., C-5, AN-124, and C-17 aircraft) and a DoD-controlled seaport that can support global sealift.
2. **Mission Support** - Reasonable alternatives must promote, support, or be consistent with national security, defense, and USMC mission requirements, and not cause unnecessary delays or disruptions in current installation mission or function. Alternatives must support combat readiness of a MAGTF in Hawai'i, which can only be assured through frequent and integrated training between the Command Element (CE), Ground Combat Element (GCE), ACE, and Logistics Combat Element (LCE) - a goal achieved only by having these units geographically collocated with one another to allow efficient planning and training. Geographic collocation of VMU-3 is defined as within about a 1-hour or 20-mile commute from MCB Hawaii Kaneohe (DoD 4165.3-M).
3. **Facility Capacity** - The relocation site for the VMU squadron must be capable of permanently basing the aircraft, personnel, and associated support infrastructure. It must have sufficient capacity in the form of existing facilities and infrastructure or space available to construct required facilities and infrastructure. Due to fiscal constraints, the use of existing facilities and infrastructure is preferred over the construction of new facilities and infrastructure.
4. **Access to Training Airspace** - The relocation site for the VMU squadron must have access to the FAA-designated controlled airspace and SUA required for UAS operations, so that there would be no conflicts between commercial and military aircraft, or between manned and unmanned aircraft. Due to the present limitation on use of national airspace by unmanned aircraft to access controlled airspace and SUA, access is defined as the ability to reach the required controlled-access training airspace for frequent, regularly scheduled training, via surface (i.e., road) transportation. Any option to access regularly scheduled training airspace via air or water transportation (e.g., via loading UAS equipment aboard C-17 or other aircraft or ship/boat) is considered unreasonable in terms of time, aircraft/ship availability, and cost.

It is desirable that the relocation site for the VMU squadron has associated controlled airspace with the potential for successful acquisition of a COA to perform limited home-based UAS flight operations described in Section 2.2.2.

All alternatives include training at infrequent or intermittent intervals on islands other than that where the particular alternative is located (e.g., Kauai and Hawaii). For such training, deployment is typically via aircraft (e.g., C-17 or helicopter) and/or smaller surface ship (the latter method generally limited to the port of Kawaihae on the island of Hawai'i).

2.3.2 Alternatives

A set of alternatives for basing VMU-3 in Hawai'i and ensuring strategic mission capabilities was identified. These alternatives are:

- Alternative A: Relocate VMU-3 to MCB Hawaii Kaneohe Bay
- Alternative B: Relocate VMU-3 to WAAF
- Alternative C: Relocate VMU-3 to Joint Base Pearl Harbor-Hickam (JBPHH)
- Alternative D: Relocate VMU-3 to Dillingham Airfield, O'ahu
- Alternative E: Relocate VMU-3 to PMRF
- Alternative F: Relocate VMU-3 to PTA

2.3.3 Application of Selection Criteria to Alternatives

Application of the selection criteria from Section 2.3.1 to the potential alternatives of Section 2.3.2 produces viable alternatives for analysis in this EA. This section applies the selection criteria to each alternative considered.

2.3.3.1 Alternative A: Relocate VMU-3 to MCB Hawaii Kaneohe Bay

As described in detail in Section 2.4, this alternative would relocate VMU-3 to MCB Hawaii; relocation would require accommodating all squadron operational and maintenance facility space needs and equipment storage requirements. Since MCB Hawaii Kaneohe Bay currently lacks FAA-designated SUA for regularly scheduled UAS training operations, VMU-3 would not be able to fulfill its UAS flight training at MCB Hawaii Kaneohe Bay adequately. Typically, regularly scheduled training would take place at WAAF for two weeks each month. To supplement the regularly scheduled and intermittent training, which require SUA, limited home-based UAS flight operations, consisting of basic flight and payload operations, as described in Section 2.2.2, could be conducted in the Class D airspace surrounding MCB Hawaii Kaneohe Bay with an FAA-issued COA.

Since training would occur at WAAF about two weeks per month, on average, the Proposed Action includes construction of a facility for storage of some UAS-related equipment at WAAF. Having such a facility at WAAF would reduce the requirement for transportation of equipment from MCB Hawaii Kaneohe Bay to WAAF for training for two weeks each month.

Criterion 1, Accessibility to Airfields and Seaports Supporting Global Deployment - MCB Hawaii Kaneohe Bay is one of three DoD aviation installations in Hawai'i that can support global deployment, the others being WAAF and JBPHH. The sole DoD-controlled seaport capable of supporting global deployment is Pearl Harbor. This alternative satisfies selection Criterion 1.

Criterion 2, *Mission Support* - This alternative satisfies selection Criterion 2 by geographically collocating VMU-3 with the other MAGTF units (GCE, ACE, and LCE) at MCB Hawaii Kaneohe Bay, and assuring frequent and integrated planning to facilitate training and thereby increasing combat readiness.

Criterion 3, *Facility Capacity* - This alternative satisfies selection Criterion 3, in that MCB Hawaii Kaneohe Bay has existing facilities to meet most of the requirements listed in Table 2.2-1. Existing facilities would be renovated for VMU-3 use, and housing for single enlisted personnel, as well as for married personnel and dependents, would be provided on base at MCBH Kaneohe Bay, other Navy/Marine Corps housing areas on O'ahu, or within the local community as needed and available.

Criterion 4, *Access to Training Airspace* - Although MCB Hawaii Kaneohe Bay lacks FAA-designated SUA for regularly scheduled UAS flight training, there is driving access for VMU-3 detachment training operations at WAAF where regular training would take place. MCB Hawaii Kaneohe Bay has FAA-designated controlled airspace (Class D) surrounding its airfield and could apply to the FAA for a COA for VMU-3 to conduct limited home-based UAS flight operations, as described in Section 2.2.2. This alternative satisfies the requirements of selection Criterion 4.

2.3.3.2 *Alternative B: Relocate VMU-3 to Wheeler Army Air Field*

This alternative would relocate VMU-3 to WAAF; relocation would require accommodating all squadron operational and maintenance facility space needs and equipment storage requirements. This alternative includes training operations as described in Section 2.2.2 and for Alternative A. Regular training would take place at WAAF.

Criterion 1, *Accessibility to Airfields and Seaports Supporting Global Deployment* – As described in Alternative A, WAAF can support global deployment with its airfield and immediate access to Pearl Harbor. This alternative satisfies selection Criterion 1.

Criterion 2, *Mission Support* - This alternative would locate VMU-3 on O'ahu within a one-hour one-way drive from MCB Hawaii Kaneohe Bay, allowing frequent and integrated planning to facilitate training and thereby increasing the combat readiness of the MAGTF in Hawai'i. However, locating VMU-3 at WAAF would be less desirable than Alternative A since it would not allow the unit to be located on the same base with its USMC parent command. Further, most Marine Corps events, training, and safety stand-downs are required to take place in facilities with other Marine Corps units at MCB Hawaii Kaneohe Bay, which would involve frequent vehicle trips for Marines between WAAF and MCB Hawaii Kaneohe Bay. Nevertheless, this alternative satisfies the minimum requirements of selection Criterion 2, *Mission Support*.

Criterion 3, *Facility Capacity* - The Army informed MCB Hawaii Kaneohe Bay that it does not have available facilities or space to meet the operational space requirements for basing VMU-3 (approximately 187,000 square feet [17,373 square meters]; Table 2.2-1) (see Appendix B). WAAF does have space available to grant permission to allow construction of a permanent facility to support VMU-3 regularly scheduled detachment training via a future Military Construction (MILCON) project, and construction of a temporary, tension-fabric structure to

meet this need in the near-term. This alternative to relocate VMU-3 to WAAF does not fulfill the minimum objectives of selection Criterion 3, *Facility Capacity*.

Criterion 4, Access to Training Airspace – Under this alternative, VMU-3 would have the required access to FAA-designated SUA for regular UAS training operations at WAAF to satisfy selection Criterion 4.

2.3.3.3 *Alternative C: Relocate VMU-3 to Joint Base Pearl Harbor-Hickam*

This alternative would relocate VMU-3 to JBPHH; relocation would require accommodating all squadron operational and maintenance facility space needs and equipment storage requirements. Training would be conducted as described for Alternative A.

Criterion 1, Accessibility to Airfields and Seaports Supporting Global Deployment – As described in Alternative A, JBPHH can support global deployment with its airfield and immediate access to Pearl Harbor. This alternative satisfies selection Criterion 1.

Criterion 2, Mission Support - While this alternative would locate VMU-3 on O'ahu within about a one-hour one-way commute from MCB Hawaii Kaneohe Bay, locating VMU-3 at JBPHH is less desirable than Alternative A since it would not allow the unit to be located on the same base with its USMC parent command. Additionally, since it is anticipated that VMU-3 would not be able to conduct any flight training at JBPHH, all VMU-3 training and integrated planning functions with other elements of the MAGTF would involve numerous driving commutes between JBPHH MCB Hawaii Kaneohe Bay, and WAAF. Nevertheless, this alternative satisfies the minimum requirements of Criterion 2, *Mission Support*.

Criterion 3, Facility Capacity - JBPHH informed Naval Facilities Engineering Command (NAVFAC) Pacific that it does not have available facilities or space to meet the operational requirements for basing VMU-3 at JBPHH, which does not fulfill the minimum objectives of selection Criterion 3, *Facility Capacity*.

Criterion 4, Access to Training Airspace – While JBPHH has an airfield, it is shared with Honolulu International Airport; UAS flights would be incompatible with heavy commercial and military jet-aircraft traffic and would be unlikely to receive an FAA-approved COA. This alternative would not provide the potential for successful acquisition of a COA to perform limited home-based UAS flight operations. However, VMU-3 would have access to FAA-designated SUA for regular UAS training operations at WAAF so the minimum objectives of selection Criterion 4, *Access to Training Airspace*, are met.

2.3.3.4 *Alternative D: Relocate VMU-3 to Dillingham Airfield, O'ahu*

This alternative would relocate VMU-3 to Dillingham Airfield; relocation would require accommodating all squadron operational and maintenance facility space needs and equipment storage requirements. Dillingham Airfield, located near the northwestern-point of O'ahu, is a DoD-owned airfield that is currently leased to the State of Hawai'i through July 2014. Dillingham operates as a joint military-civilian airport, serving civilian light-aircraft traffic and tourism-based activities such as parachuting and glider operations. Although some discussions have occurred between the State and the U.S. Army, returning the airfield to military control in

the near future is unlikely. Since Dillingham Airfield lacks FAA-designated controlled airspace or SUA, training would be conducted as described for Alternative A.

Criterion 1, *Accessibility to Airfields and Seaports Supporting Global Deployment* – Dillingham Airfield satisfies selection Criterion 1 with its proximity via ground transportation to the three DoD aviation installations supporting global deployment and to Pearl Harbor.

Criterion 2, *Mission Support* - This alternative would locate VMU-3 on O'ahu within about a one-hour commute from MCB Hawaii Kaneohe Bay. Locating VMU-3 at Dillingham Airfield would not allow the unit to be located on the same base with its USMC parent command. Nevertheless, this alternative satisfies the minimum requirements of Criterion 2, *Mission Support*.

Criterion 3, *Facility Capacity* - Dillingham Airfield is currently leased to the State of Hawai'i and lacks existing facilities to support equipment and personnel. Land in the vicinity of the control tower and the runway is leased to the State and the airfield does not have the capacity to support additional facilities required for basing VMU-3. This alternative does not fulfill the minimum objectives of selection Criterion 3, *Facility Capacity*.

Criterion 4, *Access to Training Airspace* – Dillingham Airfield lacks FAA-designated controlled airspace or SUA, which would not allow any of the required training. A COA to perform limited home-based UAS flight operations could not be obtained in the foreseeable future. However, VMU-3 would have access to FAA-designated SUA for regular UAS training operations at WAAF so this alternative meets the minimum criterion requirements.

2.3.3.5 *Alternative E: Relocate VMU-3 to Pacific Missile Range Facility, Kaua'i*

This alternative would relocate VMU-3 to PMRF; relocation would require accommodating all squadron operational and maintenance facility space needs, equipment storage requirements, and provide associated barracks and family housing for all squadron personnel. Similar to Alternatives A through D, this alternative includes training operations at other locations in Hawai'i, including WAAF and PTA. Typically, regular training would take place at PMRF. Training at WAAF and PTA would occur at less-frequent intervals. This alternative would not include construction of a storage facility at WAAF.

Criterion 1, *Accessibility to Airfields and Seaports Supporting Global Deployment* – PMRF does not satisfy selection Criterion 1 since it is not in close proximity via ground transportation to the three DoD aviation installations in Hawai'i that support global deployment, nor does it have immediate access to Pearl Harbor.

Criterion 2, *Mission Support* – Under this alternative, VMU-3 would not be geographically collocated with the other MAGTF units at MCB Hawaii Kaneohe Bay (GCE, ACE and LCE), nor would it assure frequent and integrated planning to facilitate training needed to increase the ACE's combat readiness. This alternative does not satisfy selection Criterion 2, *Mission Support*.

Criterion 3, *Facility Capacity* – The PMRF Facilities Master Plan does not account for the operational space requirements for basing VMU-3 there and PMRF has limited buildable area with frequent requests to host new facilities. Also, there is a lack of existing facilities that could be utilized for VMU-3 purposes. While it is possible that space could be identified at PMRF to

support basing VMU-3 there, it would require the construction of new facilities, including those for personnel housing. Nevertheless, this alternative could fulfill the minimum objectives of selection Criterion 3, *Facility Capacity*.

Criterion 4, *Access to Training Airspace* – Under this alternative, VMU-3 would have direct access to R-3107, an FAA-designated SUA above PMRF, for regular UAS training operations at PMRF, thus fulfilling the minimum objectives of selection Criterion 4.

2.3.3.6 *Alternative F: Relocate VMU-3 to Pohakuloa Training Area, Island of Hawai'i*

This alternative would relocate VMU-3, including all equipment, personnel, and dependents to PTA. Similar to Alternative E, this alternative includes training operations at other locations in Hawai'i, including WAAF and PMRF. Typically, regular training would take place at PTA. Training at WAAF and PMRF would occur at less-frequent intervals. This alternative would not include construction of a storage facility at WAAF.

Criterion 1, *Accessibility to Airfields and Seaports Supporting Global Deployment* – PTA does not satisfy selection Criterion 1 since it is not in close proximity via ground transportation to the three DoD aviation installations in Hawai'i that support global deployment, nor does it have immediate access to a DoD-controlled deep harbor. Kawaihae Harbor on the west side of the island of Hawai'i and the closest harbor to PTA, is not DoD controlled, nor does it typically support the types of ships used for global deployment. Such deployment would first have to involve transport of VMU-3 personnel and equipment to O'ahu via aircraft and/or small ship.

Criterion 2, *Mission Support* – Under this alternative, VMU-3 would not be geographically collocated with the other MAGTF (GCE, ACE and LCE) units at MCB Hawaii Kaneohe Bay on the island of O'ahu. This alternative also would not assure frequent and integrated planning between the elements of the ACE to facilitate training and increase combat readiness. This alternative does not satisfy the minimum objectives of selection Criterion 2, *Mission Support*.

Criterion 3, *Facility Capacity* – PTA is strictly an isolated training area. There is no permanent enlisted, officer, or dependent housing located at or near PTA, nor is there the existing basic infrastructure, such as a water supply (water is trucked to PTA in tankers) to allow development to accommodate the personnel or the operational space requirements for VMU-3 permanent basing. This alternative does not fulfill the minimum objectives of selection Criterion 3, *Facility Capacity*.

Criterion 4, *Access to Training Airspace* – Under this alternative VMU-3 would have direct access to R-3103, an FAA-designated SUA above PTA, for regular UAS training operations at PTA, as well as for the less frequent training occurring there. This alternative fulfills the minimum objectives of selection Criterion 4.

2.3.3.7 *No-Action Alternative*

NEPA and CEQ regulations for implementing NEPA require the No-Action Alternative be addressed. No-Action is the existing condition and reflects continuation of the VMU-3 mission at Twentynine Palms, California.

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and would remain at MCAGCC Twentynine Palms, California. With this alternative, the purpose of, and need for, the Proposed Action would not be met and III MEF training and readiness would remain compromised. The No-Action Alternative would not allow VMU and III MEF staff-level synchronization and tactical planning and training on a regular basis. VMU support for III MEF would only be provided by sending Continental United States (CONUS)-based detachments to train with ground and air units in the Pacific on an infrequent and costly basis. This condition would not allow a permanent rebalancing of III MEF to align its aviation capabilities with all other USMC MEFs. Additionally, this alternative would permanently tie III MEF to requesting all VMU support from either I MEF or II MEF to meet the peacetime training, contingency and humanitarian relief efforts required by III MEF in the Pacific Area of Responsibility (AOR).

2.3.4 Summary Application of Selection Criteria

Table 2.3-1 summarizes the application of the selection criteria to the potential alternatives to produce reasonable alternatives to be carried forward for evaluation in this EA.

Alternative	Supports Global Deployment (Criterion 1)	Mission Support (Criterion 2)	Facility Capacity (Criterion 3)	Access to Training Airspace (Criterion 4)
A - MCB Hawaii	Yes	Yes	Yes	Yes
B - WAAF	Yes	Yes	No	Yes
C - JBPHH	Yes	Yes	No	Yes
D - Dillingham	Yes	Yes	No	Yes
E - PMRF	No	No	Yes	Yes
F - PTA	No	No	No	Yes
No-Action	Yes	No	Yes	Yes

Alternative A is the only alternative that meets the objectives of all alternative selection criteria and thus achieves the purpose and need of ensuring that the III MEF operational commander is supported by a balanced, geographically collocated MAGTF in Hawai'i, which can only be assured through having the CE, GCE, ACE and LCE units geographically collocated with one another to allow frequent integrated planning in support of training. Alternative A, Relocate VMU-3 to MCB Hawaii Kaneohe Bay, is the USMC's Proposed Action.

Alternatives B, C, D, and F do not meet the facility requirements of selection Criterion 3, *Facility Capacity*. Alternatives E and F do not achieve the purpose and need mission support objectives of selection Criterion 2, nor the requirements for selection Criterion 1, *Global Deployment*. Accordingly, Alternatives B, C, D, E, and F were considered but not carried forward for further evaluation in this EA.

Relocation of VMU-3 to MCB Hawaii Kaneohe Bay would meet the purpose and need as outlined in Section 1.3, and would be consistent with the MCB Hawaii Kaneohe Bay stated mission "To provide facilities, programs and services in direct support of units, individuals and families in order to enhance and sustain combat readiness for all operating forces and tenant organizations aboard MCB Hawaii Kaneohe Bay".

2.4 DETAILS OF THE PROPOSED ACTION

2.4.1 Summary

2.4.1.1 Basing

The Proposed Action would relocate VMU-3 personnel and equipment to MCB Hawaii Kaneohe Bay, which has existing facilities to meet most of the requirements listed in Table 2.2-1. Existing facilities currently utilized by 3D Radio Battalion would be renovated for VMU-3 use, while new facilities would be constructed for 3D Radio Battalion at a different location on base⁴. Housing for single, enlisted personnel, as well as for married personnel and dependents, would be provided on base at MCB Hawaii Kaneohe Bay, at other Navy/Marine Corps housing areas on Oah'u, or within the local community as needed and available.

The relocation of VMU-3 to Hawai'i involves the transfer of 274 active-duty USMC and Navy personnel to be based in Hawai'i with an estimated 202 dependents and approximately 3 civilian support personnel. The transfer of 274 military personnel to MCB Hawaii Kaneohe Bay would represent about a 2.9 percent increase above the September 2012 baseline active-duty military population (approximately 9,261 persons) assigned to MCB Hawaii Kaneohe Bay. In addition to the active-duty military population at MCB Hawaii Kaneohe Bay, approximately 5,000 military dependents live on base. It is anticipated that approximately 40 percent of the VMU-3 squadron would be housed in barracks at MCB Hawaii Kaneohe Bay and approximately 164 USMC and Navy personnel and associated dependents would be housed at other Navy/Marine Corps housing areas on the island of O'ahu or within the local community as needed and available.

Under the Proposed Action, the squadron would relocate to Hawai'i with RQ-7B aircraft in June/July 2014. The delivery of the initial RQ-21 systems is proposed for February/March 2015.

2.4.1.2 Training

Since MCB Hawaii Kaneohe Bay lacks FAA-designated SUA, VMU-3 cannot adequately fulfill its UAS flight training at MCB Hawaii Kaneohe Bay. This alternative includes training operations at other locations in Hawai'i where SUA is designated, including WAAF, PMRF, and PTA (Table 2.4-1). Typically, regularly scheduled training would take place at WAAF for two weeks each month. Training at PMRF and PTA would occur at less-frequent intervals, generally in support of larger training exercises a few times per year. Since training is anticipated to occur at WAAF about two weeks per month, on average, the Proposed Action includes construction of a facility for storage of some UAS-related equipment at WAAF. The Army has agreed to allow construction of a temporary structure (i.e., tension fabric structure) to support VMU-3 detachment training until a permanent facility is completed under a future MILCON project. Having such a facility at WAAF would reduce the requirement for transportation of equipment from MCB Hawaii Kaneohe Bay to WAAF for regularly scheduled training. The bulk of the squadron's equipment, as well as squadron personnel and dependents, would remain at MCB Hawaii Kaneohe Bay. About 65 Marines would train with one or two UAS at WAAF, normally traveling there via personal and/or official vehicle from MCB Hawaii Kaneohe Bay. This alternative also allows the opportunity to train with and to collocate and utilize facilities of the

⁴ Construction of the new 3D Radio Battalion facility has been programmed and evaluated as a component of the EA for Grow the Force at MCB Hawaii-Kaneohe Bay (USN 2011), and will be further evaluated in this EA in Cumulative Impacts.

Army's UAS unit, which has been operating the RQ-7B UAS at WAAF since 2007. WAAF would only be used for UAS-specific flight training and proficiency. All other squadron functions such as equipment and vehicle maintenance, logistics, integration, and coordination with Marine Aviation Logistics Squadron-24 (MALS-24) and USMC-specific annual training would occur at MCB Hawaii Kaneohe Bay.

Table 2.4-1. Baseline and Proposed Annual Aircraft Training Flights			
Airfield/Range	Baseline Airfield Operations/ Restricted Area (RA) Sorties	Proposed (VMU-3) Estimated Annual Sorties	Estimated Total Annual Sorties
MCB Hawaii			
Airfield Operations	52,669 ¹	480	53,149
WAAF			
Airfield/R-3109/R-3110	50,000 ²	720	50,720
PMRF			
Airfield/R-3101	6,947 ¹	120	7,067
PTA			
Airfield/R-3103	26,965 ¹	120	27,085
Sources:			
¹ DoN 2012a. The 2012 Final Environmental Impact Statement (EIS) for Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawaii) and			
² USACE 2004. The 2004 Army Transformation EIS (annual estimate for combined airfield/R-3109/R-3110 uses based on 207 average daily sorties cited in this document for WAAF and an average of 240 flying days per year for typical military flight operations).			

To supplement the regularly scheduled and intermittent training, which are conducted in restricted airspace, it is also important to conduct limited home-based UAS flight operations consisting of basic flight and payload operations, at MCB Hawaii Kaneohe Bay. As described in Section 2.2.2, an airspace COA must be obtained from the FAA to allow UAS operations within currently defined airspace used by traditional fixed-wing and rotorcraft. To accomplish all of these requirements, the USMC would coordinate with the FAA to apply for COAs for UAS operations where required. If/when a COA is approved authorizing VMU-3 to fly within MCB Hawaii Kaneohe Bay Class D airspace, it is anticipated that up to 480 sorties per year for basic training flights would be conducted.

It is possible that there could be a future need for the USMC to establish a transit route for UAS to fly between MCBH Kaneohe Bay and the SUAs R-3109 and R-3110 near WAAF. If the USMC identifies the need for and the location of this potential transit route, the USMC would coordinate with the FAA and perform the proper environmental review pursuant to NEPA.

The following provides additional information on the proposed facility modifications at MCB Hawaii Kaneohe Bay, WAAF, and PMRF; training operations; and personnel changes under the Proposed Action. Descriptions of the facility modifications are based on the Site Evaluation Report and the MILCON form prepared for the proposed relocation of VMU-3 to MCB Hawaii Kaneohe Bay.

2.4.2 Details of Facility Modifications

The proposed relocation of VMU-3 would likely require supporting facility renovation and/or construction at both the squadron home base and at one or more of the proposed training sites. In general, construction and/or renovation projects would incorporate the required anti-terrorism/force protection measures in accordance with Unified Facilities Criteria

(UFC) 4-010-01, *Minimum Anti-Terrorism Standards for Buildings*.⁵ Additionally, each project would incorporate, as applicable, sustainable design features to achieve, at a minimum, a Leadership in Energy and Environmental Design (LEED®) Silver rating; Low Impact Development (LID) features in compliance with UFC 3-210-10 and Section 438 of the Energy Independence and Security Act; and energy reduction features in compliance with the Energy Policy Act of 2005, Executive Order (EO) 13423 *Strengthening Federal Environmental, Energy, and Transportation Management*, and other pertinent regulations, laws and EOs.

2.4.2.1 MCB Hawaii Kaneohe Bay

The Proposed Action at MCB Hawaii Kaneohe Bay includes a combination of re-use and/or alteration of existing facilities, construction of new facilities, and demolition of some existing facilities to allow the new construction. The Headquarters and aviation functions of VMU-3 would be established at existing Hangar 102; the Motor Transport support functions would be established within the existing Building 373 compound, which would be shared with its current occupants, Marine Wing Support Detachment-24 (MWSD-24); and other facilities (runway, armory, fuel, storage, etc.) would be shared. Figure 2.4-1 illustrates the locations of the projects associated with the proposed relocation of VMU-3 to MCB Hawaii Kaneohe Bay. Figures 2.4-2 and 2.4-3 show the general plan of the facility demolition and construction/renovation projects, respectively, within the Building 373 compound discussed in the following paragraphs.

Site preparation for actions at MCB Hawaii Kaneohe Bay would include site clearing, excavation, earthwork, and preparation for construction. Electrical utilities for these facilities would include either new or upgraded existing primary and secondary distribution systems, area lighting, and electrical pad-mounted transformer/substation and renewable energy systems. Mechanical utilities would include domestic water, firewater, sanitary sewer, storm sewer, air conditioning and ventilation systems, building plumbing, and fire protection systems. Demolition work would include demolition of pavement, fencing, utilities, and structures. Site improvements would include grading and drainage, paving of organizational vehicle parking area and storage surfaces, gravel roadways, curbs, sidewalks, fencing and gates, subsurface drainage structures, water quality units, landscaping, trash enclosures, and exterior signage.

⁵ UFC 4-010-01, *DoD Minimum Anti-Terrorism Standards for Buildings* was implemented in 2004 (last updated 9 February 2012) to minimize mass casualties from terrorist attacks on DoD buildings. Major strategies include, but are not limited to, maximizing standoff distances, maintaining unobstructed space, and incorporating structural features into building design to prevent building collapse and resist blast effects.

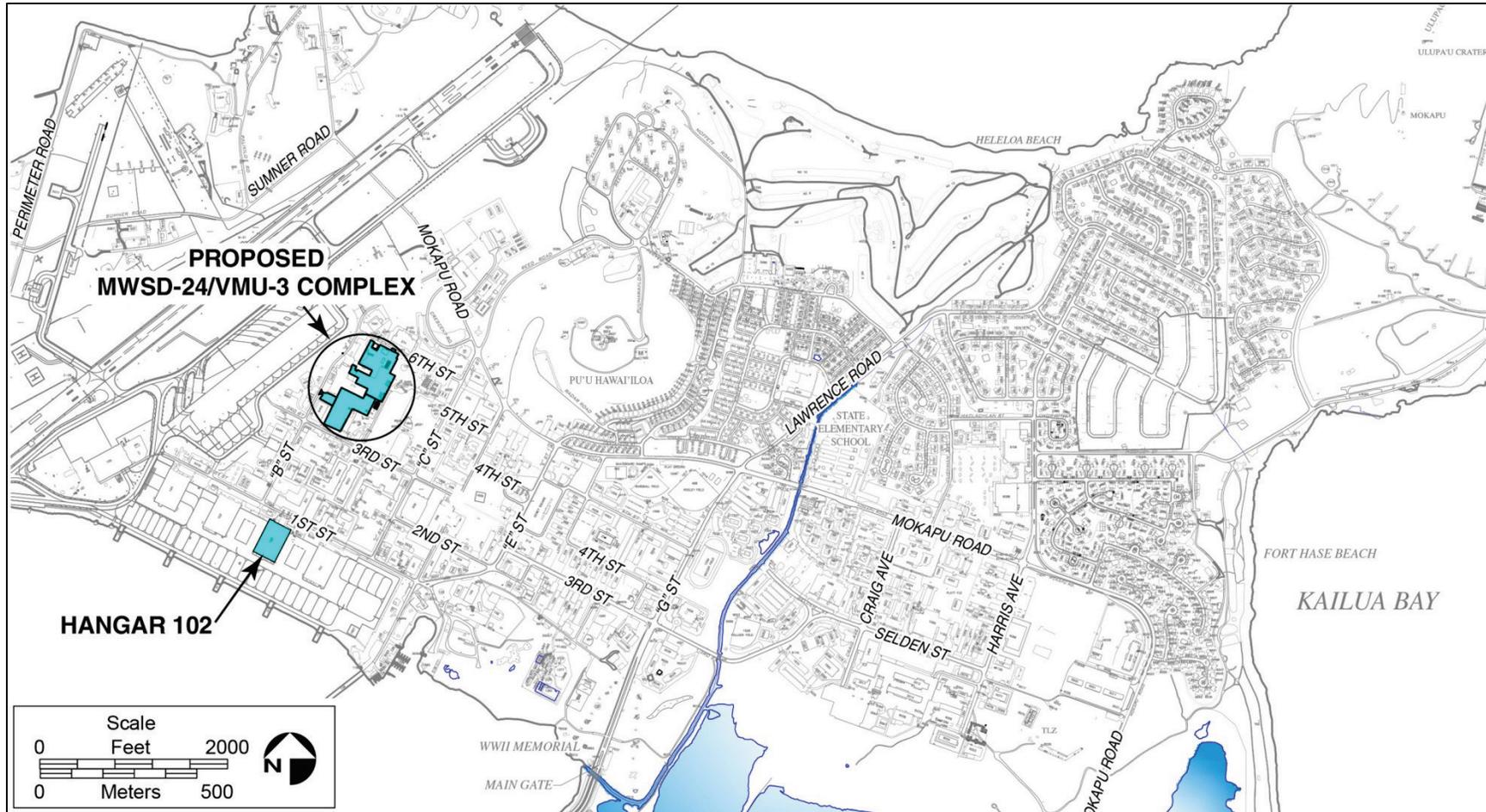


Figure 2.4-1. Location of Facilities and Construction Projects Associated with the Proposed Action at MCB Hawaii Kaneohe Bay

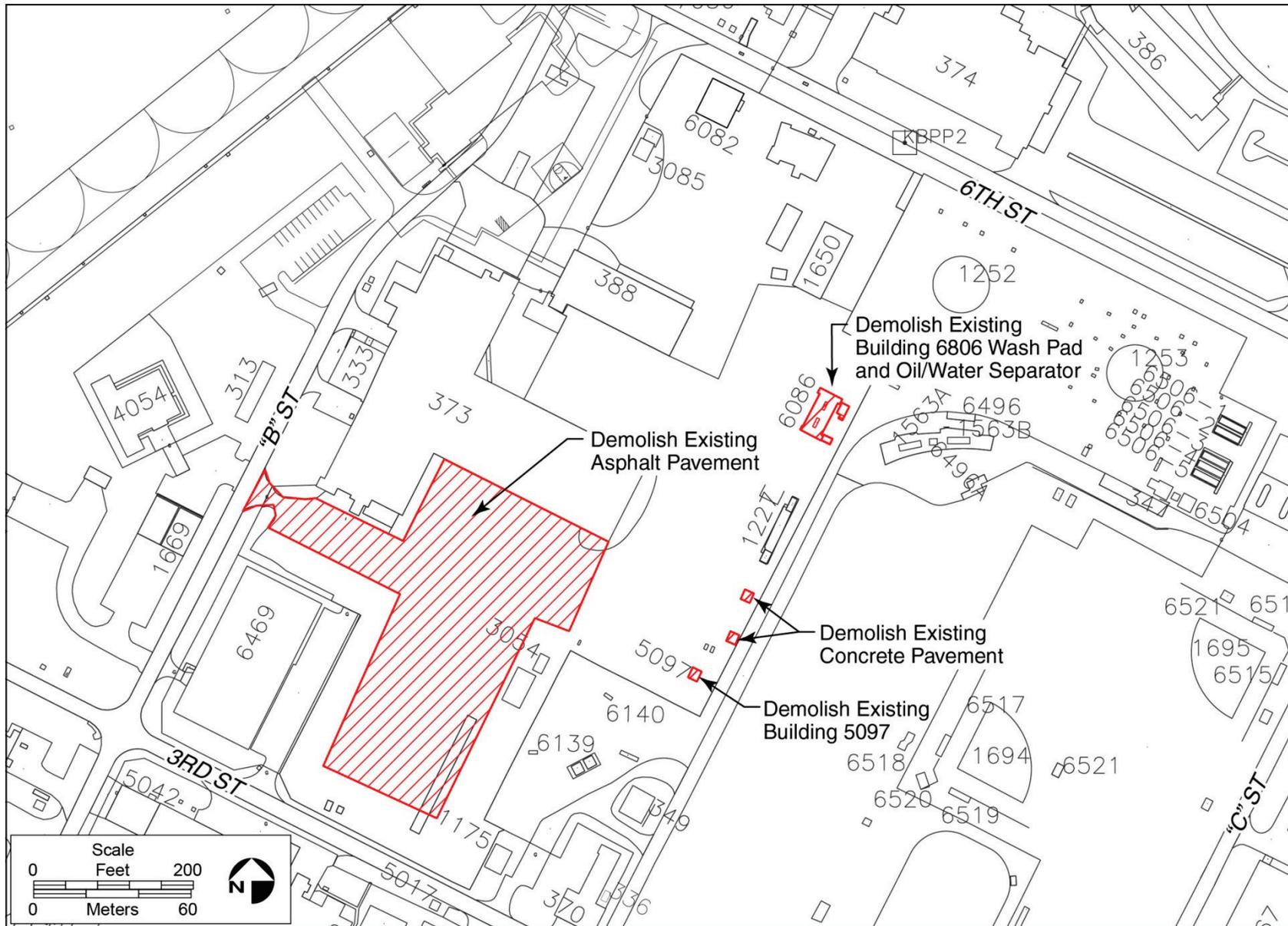


Figure 2.4-2. Demolition Projects Associated with the Proposed Action

2.4.2.1.1 Storage and Administrative Space, Hangar 102

VMU-3 hangar storage space requirements would be met by existing Hangar 102 with the following improvements: modernization of the existing two-story administrative space, including a two-stop passenger/freight combination elevator, repairs to deteriorated concrete surfaces, and demolition of non-historic interior features; creation of a Secure Compartmented Information Facility space on the street side of the Hangar; and installation of Optimized Organizational Maintenance Activity communication infrastructure. An emergency generator system would be installed in Hangar 102 to provide emergency power to the new elevator. Additional modifications to Hangar 102 to meet VMU-3 storage needs include one of the following:

1. Place four 8-foot by 40-foot by 8-foot (2.4-meter by 12.2-meter by 2.4-meter) MILVAN units (Military-Owned Demountable containers) on Hangar 102 Aircraft Access Apron; or
2. Install industrial shelving units in Hangar 102 space.

2.4.2.1.2 Aircraft Ready Fuel Storage, Building 191

Existing Building 191, a 185-square foot (17-square meter) building at the northeast corner of Hangar 102, would provide an enclosed, vented, and secured flammable storage building with concrete flooring suitable for bulk liquid drum storage of the small amounts of fuel needed for VMU-3 monthly operational requirements (about 350 gallons [1,325 liters] of 100-Octane low-lead fuel). No renovations or modifications would be required.

2.4.2.1.3 Armory, Building 4054

All USMC units are assigned small arms weaponry. The existing Armory (Building 4054) is currently undersized, but will be adequately sized to accommodate the requirements of the VMU-3 squadron when it is expanded via a MILCON project (not part of the proposed VMU-3 relocation). VMU-3 would use the existing temporary modular armories as an interim solution to accommodate their requirements until the expansion of Building 4054 is completed.

2.4.2.1.4 Storage and Auto Organizational Space (Vehicle Holding Shed, Automotive Organizational Shop, Grease Rack), Building 373

VMU-3 requires an Automotive Organizational Shop with six maintenance bays, a Vehicle Holding Shed with a two-vehicle capacity for holding equipment awaiting repairs, caged storage, and a mobile Grease Rack with a two-vehicle capacity. Building 373 would be renovated to provide this space, as well as required office and storage space. Building renovations would be designed to provide sheltered space for maintenance activities needed on VMU-3's rolling stock (about 165 pieces) such as trailers, launchers, forklifts, etc., but excluding 7-ton trucks. Renovations to Building 373 would include replacement of deteriorated exterior metalwork, construction of new wash racks with concrete-framed storage and water recycling building, and installation of a jib crane in the automobile organizational shop. Utility upgrades to Building 373 would include connection to the existing communication systems and a new electrical pad-mounted transformer/substation.

2.4.2.1.5 Vehicle Wash-Platform, Building 6086

The Vehicle Wash-Platform within the Building 373 compound is in need of repair and modernization, and is not of sufficient capacity to meet VMU-3 requirements for a four-platform capacity (based on number of vehicles assigned to the motor pool). The existing Vehicle Wash-Platform (i.e., Building 6086, wash pad and oil/water separator) would be demolished and a new platform and utility building would be constructed.

2.4.2.1.6 General Storage Shed and Open Storage Area (Alter Facility 5026)

VMU-3 requirements for a General Storage Shed and Open Storage space would be met by using Facility 5026, an existing poured concrete pad (approximately 84 feet long by 34 feet wide [25.6 meters by 10.4 meters]) located near the northeast (street side) corner of Hangar 102. Roofing and sheathing would be added to the existing steel framing on the western end of the pad to meet the needs for General Storage. The remainder of the concrete pad, without alteration, would meet the needs for Open Storage.

2.4.2.1.7 Organizational Vehicle Parking

VMU-3 requires 117,445 square feet (10,911 square meters) of paved Organizational Vehicle Parking. With the plan to maintain approximately 13 pieces of rolling stock at WAAF and possible availability to park air vehicle launchers in the vicinity of Hangar 102, the MILCON proposed 115,000 square foot (10,684 square meter) space would meet VMU-3 requirements. The existing asphalt pavement to the south of Building 373 would be demolished (Figure 2.4-2) and a new, larger organizational vehicle parking area constructed in the same location (Figure 2.4-3). The organizational vehicle parking area would include 48 spaces for Privately-Owned-Vehicles (POVs). The containment area would meet the requirements of the Spill Prevention, Control, and Countermeasures regulations outlined in 40 CFR 112. A storm drainage system and subsurface detention system would be installed in the parking area and connected to the existing storm sewer system located along 3rd Street and B Street. New drain lines and manholes would be installed along 3rd Street and B Street as part of the sewer system connection and upgrade.

2.4.2.1.8 3D Radio Battalion Motor Transportation Group

The 3D Radio Battalion Motor Transportation Group currently operates in Building 373 and occupies approximately one half of the organizational parking within the compound and approximately two thirds of the motor pool portion of Building 373. Due to the amount of space required by VMU-3, a new 3D Radio Battalion facility would be constructed in the southeastern part of the base. Construction of the new 3D Radio Battalion facility has been evaluated as a component of the EA for Grow the Force at MCB Hawaii (USN 2011), and will be further evaluated in this EA in Section 3.14, *Cumulative Impacts*.

2.4.2.2 WAAF

Currently, there are no facilities available to utilize in support of operational and storage space for proposed VMU-3 detachment training at WAAF. Based on the frequency of VMU-3 detachment training anticipated at WAAF (two weeks per month), a facility of approximately 4,000 square feet (372 square meters) would be needed there to store an estimated 13 pieces of training equipment in support of both the RQ-7B and RQ-21A UAS (launch trailers, trucks, etc.),

and provide a working space for approximately 65 operators, maintainers and support personnel needed to support VMU-3 UAS operations at WAAF. This facility would benefit both the Army and the USMC training efficiencies if it were located adjacent to the current U.S. Army UAS facility on the flight line (Figures 2.4-4 and 2.4-5).

A permanent operations building to support VMU-3 would be constructed at WAAF under a MILCON project. The building would be approximately 50 feet by 80 feet (15.2 meters by 24.4 meters) (4,000 square feet [372 square meters]) with 30-foot (4-meter) rollup doors at each end (a minimum of 14 feet [4 meters] high). The building would include potable water distribution, sanitary sewer collection system, fire protection water distribution, storm drains and storm drainage improvements, electrical distribution and facility lighting. Paving and site improvements would include new pavement connections to the existing aircraft apron and organizational and POV parking for 20 vehicles. The VMU-3 training detachment facility and parking for 20 POVs would require a total of approximately 16,146 square feet (1,500 square meters) at WAAF. This facility would significantly enhance VMU-3's ability to conduct required training and reduce costs associated with weekly convoy operations between MCB Hawaii Kaneohe Bay and WAAF.

VMU-3 would begin training operations at WAAF before construction of the VMU-3 training detachment permanent facility and parking area would be completed. A temporary structure (i.e., tension fabric structure) would be erected near the proposed permanent facility site to support the VMU-3 detachment until the permanent facility is completed.

2.4.2.3 PMRF

PMRF is considered acceptable for VMU-3 training based on planned use of an anticipated two times per year for three weeks at a time. VMU-3 training detachments would utilize existing facilities that are available in the area identified on Figure 2.4-6, which historically have been used by Navy and USMC training detachments. To improve the runway conditions for UAS operations, a minimum 710 by 50-foot (216 by 15-meter) section of the runway shoulder would be improved through paving or use of matting and installation of approximately 36 permanent 1-1/2 inch diameter holes for anchoring the RQ-7B arresting gear components used during UAS recovery (landing) (Figures 2.4-7 and 2.4-8). The arresting gear, which remains on the airfield during flight operations, consists of four recovery drums, two nets with stanchions, and cord used to capture the unmanned aircraft. The stakes used to anchor the RQ-7B arresting gear components are up to 1-1/2 inches in diameter and are inserted in the ground to a depth of between 12 and 28 inches. They would be removed at the conclusion of each three-week training evolution and the holes would be safely and securely capped.



Figure 2.4-4. Wheeler Army Air Field



Figure 2.4-5. Proposed Site for VMU-3 Use, Wheeler Army Air Field Hill Climber Ramp Area



Figure 2.4-6. Proposed VMU Training Location at Pacific Missile Range Facility



Figure 2.4-7. Proposed Launch/Recovery Area and Runway Improvements at PMRF



Figure 2.4-8. Detail of PMRF Runway Shoulder Proposed for Improvement

2.4.2.4 PTA

In addition to Bradshaw Army Airfield (BAAF), PTA also has an airfield designed specifically for UAS use⁶. Completed in January 2010, Cooper Airstrip is used exclusively for UAS operations. It is approximately 1,004 feet long by 86 feet wide (306 by 86 meters), with several concrete pads northwest of the runway for support vehicles and personnel, and three wooden structures southwest of the runway for support services and personnel shelter (Figure 2.4-9). The existing facility configuration is adequate to support proposed VMU-3 operations, and no construction is proposed under the Proposed Action.

2.4.3 Details of UAS Training Operations

Currently, WAAF, PTA, and PMRF are the three locations in the Hawaiian Islands that offer complete training opportunities for VMU-3. These locations, and their associated training areas, are desirable because they are associated with SUA and contain, or are adjacent to, ranges that allow all VMU-specific mission essential tasks to be accomplished in support of ground and aviation operations (Figure 2.4-10).

As described in Section 2.2.2, it is also important to conduct limited home-based UAS flight operations, consisting of basic flight and payload operations, at MCB Hawaii Kaneohe Bay. An airspace COA must be obtained from the FAA to allow UAS operations within currently defined airspace used by both fixed-wing and rotorcraft. In order to accomplish all of these requirements, the USMC would coordinate with the FAA to apply for COAs for UAS operations where required. If/when a COA is approved authorizing VMU-3 to fly within MCB Hawaii Kaneohe Bay Class D airspace, it is anticipated that up to 480 sorties per year for basic training flights would be conducted. These flight operations at MCB Hawaii Kaneohe Bay would be limited to very basic training for landing/recovery and possibly functional check flights. They would be contained within existing approach-departure patterns, within MCB Hawaii Kaneohe Bay Class D airspace (Figure 2.4-11), primarily over water.

The RQ-7B and RQ-21A normally operate between 5,000 and 10,000 feet (1,524 and 3,048 meters) MSL with a maximum of 15,000 feet (4,572 meters) MSL. The RQ-7B and RQ-21A would fly below 5,000 feet (1,324 meters) AGL no more than about 23 percent of total flight hours (Table 2.4-2).

Altitude (feet) (meters)	Percent of Flight Hours: RQ-7B	Percent of Flight Hours: RQ-21A (Anticipated)
10,000-15,000 (3,048-4,572) MSL	<2 %	<2 %
5,000-10,000 (1,524-3,048) MSL	75 %	75 %
2,000-5,000 (610-1,524) AGL	15 %	15 %
1,000-2,000 (305-1,524) AGL	6 %	6 %
500-1000 (152-305) AGL	<2 %	<2 %

Key: AGL=above ground level, MSL=above mean sea level

⁶ United States Army Garrison-Hawaii (USAG HI) completed environmental review of the initial construction of the airstrip (USAG HI 2009), and its subsequent paving (USAG HI 2010) with Records of Environmental Consideration (REC) in 2009 and 2010.



Figure 2.4-9. Aerial View of Cooper Airstrip, Pohakuloa Training Area

2.4.3.1 WAAF

Proposed training at WAAF is anticipated to occur for about two weeks a month. Flight operations would be conducted in Restricted Areas (RA) R-3109 and R-3110 (Figures 2.4-10 and 2.4-11). FAA COAs would be obtained that would allow transition from the Class D airspace above WAAF to these SUAs. The Army continues to develop improvements for UAS operations on their managed training lands and the USMC would utilize these training resources and capabilities, which allow increased flexibility for operations during UAS training.

VMU-3 would store vehicles (approximately 13) and equipment for one RQ-7B system and one RQ-21A system at WAAF. During training periods, up to 65 Marines who would operate the UAS would commute daily via personal or official vehicles from MCB Hawaii Kaneohe Bay.

2.4.3.2 PMRF

Proposed training at PMRF on the island of Kaua'i is anticipated to occur two times per year for three weeks at a time, for a total of up to six weeks per year. Each training deployment would consist of approximately 75 personnel, one RQ-7B system, and one RQ-21A system, and would involve training for electronic warfare and ACE integration.

Equipment for one RQ-7B system consists of 10 HMMWVs with eight trailers, four unmanned aircraft, and one launcher; support equipment consists of two seven-ton trucks, one waterbull, and two HMMWVs with two tactical generator trailers. Equipment for one RQ-21A system consists of four HMMWVs with four trailers, five unmanned aircraft, one launcher; one sky-hook recovery system; and three generators.

Flight operations would average approximately 20 sorties per week and would be conducted for up to 12 hours per day in SUA, primarily in RA R-3101, and less frequently in Warning Areas around Kaua'i and R-3107 (Figures 2.4-10 and 2.4-12). FAA COAs that would allow transition to these SUAs would be applied for. VMU-3 equipment and personnel would normally be transported from MCB Hawaii Kaneohe Bay to PMRF in military cargo aircraft.

2.4.3.3 PTA

Proposed training at PTA on the island of Hawai'i is anticipated to occur up to four times per year for three weeks at a time, for a total of up to 12 weeks per year. Each training deployment would be as described above for PMRF. Flight operations would be conducted in RA R-3103 (Figures 2.4-10 and 2.4-13). VMU-3 equipment and personnel would normally be transported from MCB Hawaii Kaneohe Bay to PTA in military cargo aircraft, Army Logistic Support Vessel (LSV) transport ship, or commercial cargo vessel from Pearl Harbor to Kawaihae Harbor.

VMU-3 would participate in approximately four to five exercises a year outside of Hawai'i, as requirements rotate detachments to other training locations, such as Australia, Guam, etc. These training rotations are not part of the Proposed Action analyzed in this EA.

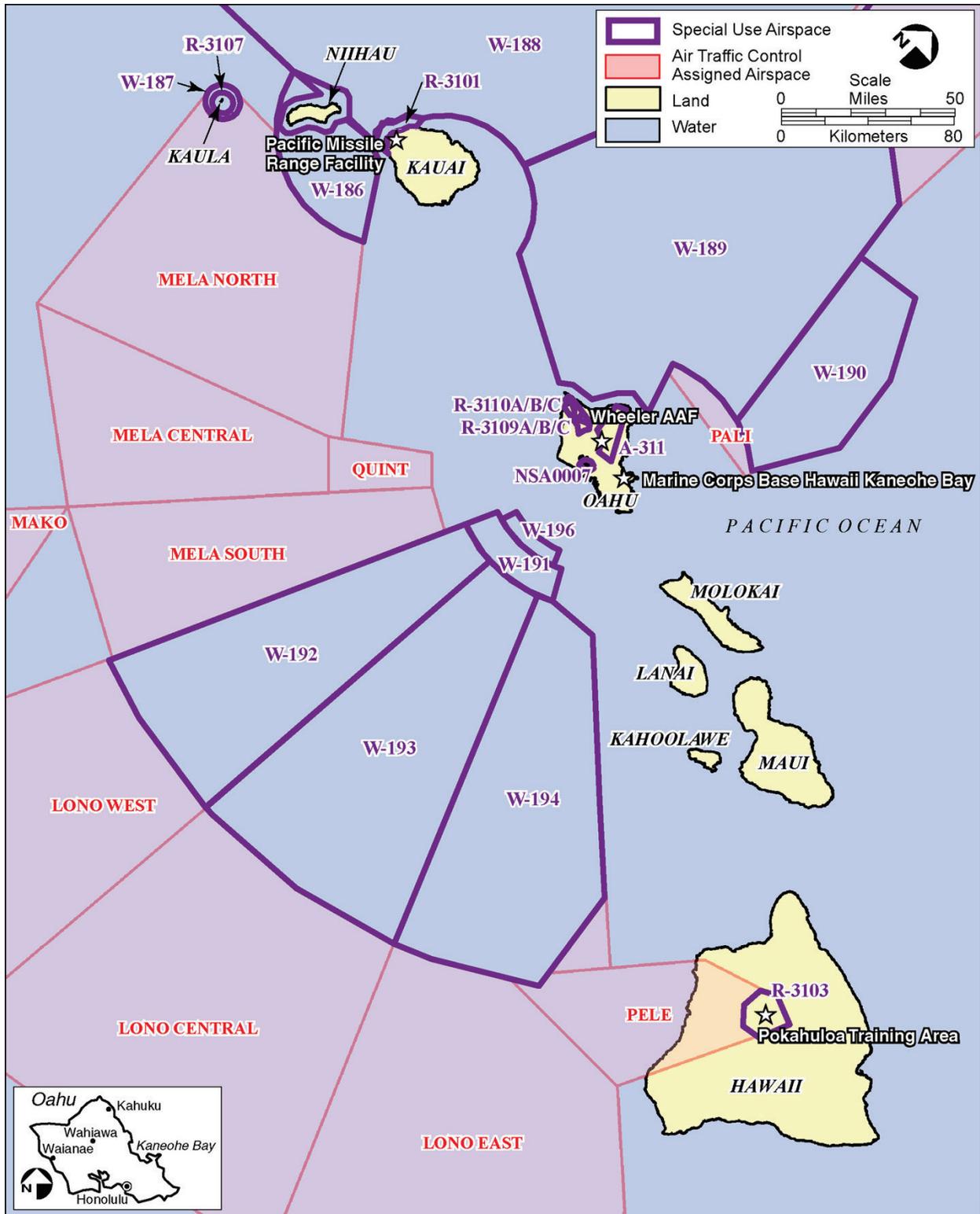


Figure 2.4-10. Special Use Airspace in Hawai'i



Figure 2.4-11. Special Use Airspace near Wheeler Army Airfield, O'ahu

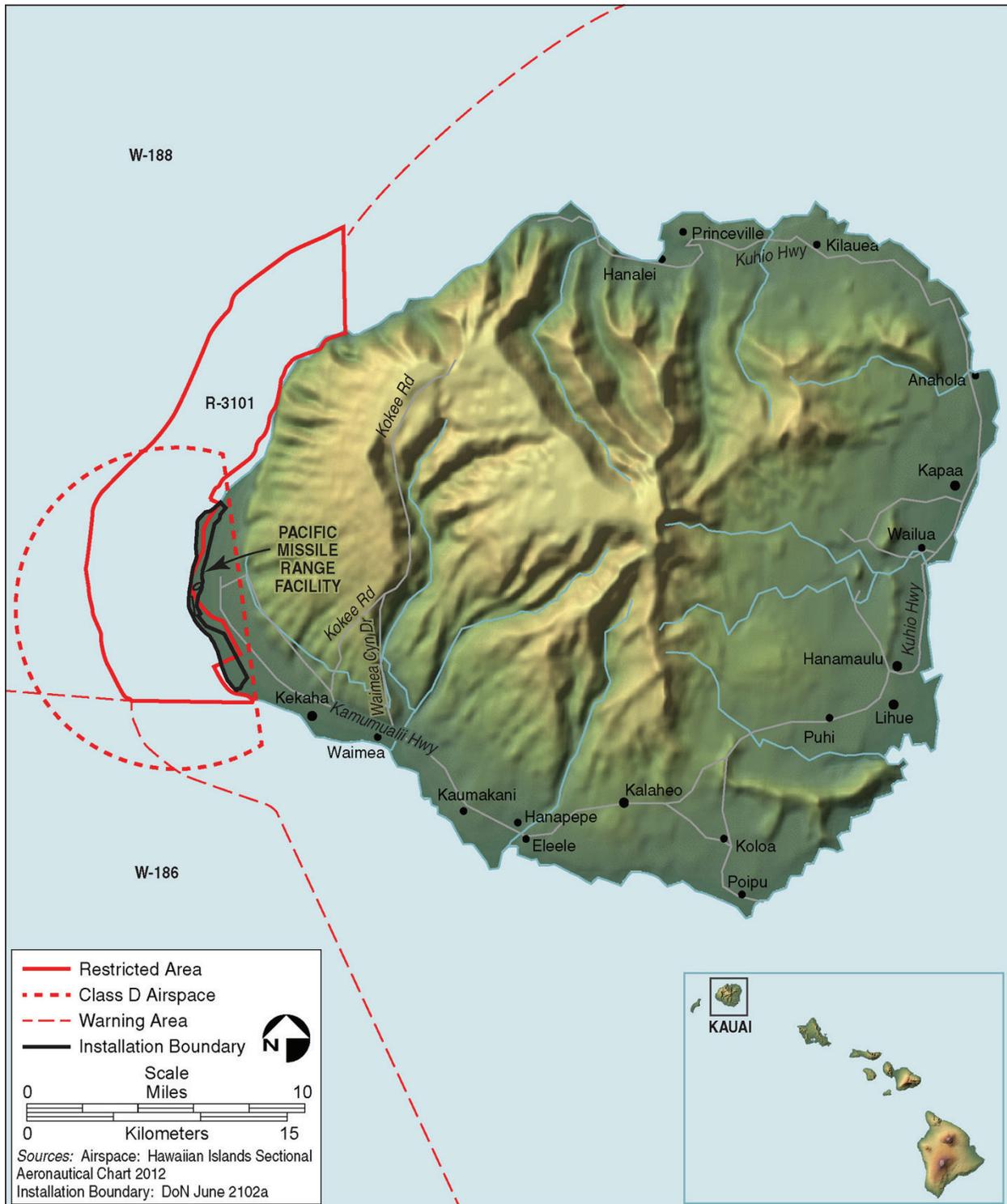


Figure 2.4-12. Special Use Airspace near Pacific Missile Range Facility, Kaua'i



Figure 2.4-13. Special Use Airspace at Pohakuloa Training Area, Hawai'i

2.4.3.4 Air-to-Ground Munitions

At present, the RQ-7B and RQ-21A do not have munitions capability. If/when weapons systems are fully developed and approved for use, VMU-3 would conduct air-to-ground ordnance delivery operations at locations where munitions training is authorized for military aircraft, and in accordance with applicable range safety and operational requirements. Further NEPA analysis of air-to-ground ordnance delivery operations would be conducted, as appropriate, should the Marine Corps pursue this capability for the RQ-7B and/or RQ-21A.

2.5 SCOPE OF RESOURCE AND ISSUE ANALYSIS

The Proposed Action has the potential to affect certain environmental resources and/or issues of concern. These potentially affected resources/issues were identified through review of past environmental documentation. Specific environmental resources and issues that could be impacted by the Proposed Action include airspace; air quality and climate; noise; topography and soils; groundwater; surface water; drainage; wetlands; biological resources; population; housing and education; surrounding land use; cultural resources; traffic and circulation; utilities, infrastructure, and solid waste; and hazardous materials and waste. Due to the nature of the Proposed Action, no impacts on recreation, visual, or aesthetic resources are anticipated, and no further analysis is provided in this EA.

The Proposed Action would comply with Executive Order (EO) 12898 (*Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*) and EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*). Due to the limited scope and location of the Proposed Action, which is contained entirely within military installations and training areas, the Proposed Action would not result in disproportionate impacts on minority or low-income populations nor result in environmental health or safety risks to children. As such, no impacts relative to environmental justice would occur.

The extent of the potential impacts of the alternatives focuses on 1) construction, renovation, and demolition activities, 2) training activities, and 3) changes in personnel.

3.0 EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 AIRSPACE

Congress has charged the Federal Aviation Administration (FAA) with the responsibility of governing and managing the nation's navigable airspace to ensure its safe and efficient use by all concerned. In doing so, the FAA has structured the National Airspace System in a manner that is regulated and managed to meet both the individual and common needs of all military, commercial, and general aviation interests, including UAS.

In general, all navigable airspace is categorized as Controlled, Special Use, Uncontrolled (or Class G), or Other, depending on the flight rules applying to the operational use of each category. This categorization is also dependent upon 1) the complexity or density of aircraft operations; 2) the nature of those operations; 3) the level of safety required; and 4) national and public interest.

Appendix C describes the different airspace categories and classifications contained in the FAA Aeronautical Information Manual (FAA 2012a) and various online resources. Specific rules and regulations concerning airspace designation and management are contained in FAA Joint Order (JO) 7400.2, while specific instructions for UAS operations are addressed in FAA JO 7610.4, *Special Operations* and FAA JO 7210.766, *Unmanned Aircraft Operations in the National Airspace System*. Airspace Management discussions in this chapter focus primarily on just those airspace classifications and rules/regulations that were considered most relevant to the Region of Influence (ROI) and examination of the Proposed Action. The airspace ROI includes controlled airspace encompassing each airfield and the Special Use Airspace (SUA) in which UAS training is conducted. Certificates of Authorization (COAs) are also used in this ROI where necessary to permit UAS operations within the airfield environment and while transiting to/from any training airspace not abutting this airfield airspace. Each of these airspace categories is defined below with the specific areas described for the affected environment of each candidate operating location.

Controlled Airspace

Controlled airspace is categorized into five separate classes: Classes A through E, where Class B, C, or D is established to regulate air traffic operations within an airport environment. Class B airspace is the most restrictive and is only established around larger, high-density airports (Honolulu International Airport is under Class B). Class B airspace use was not considered to be affected by the Proposed Action and is not discussed any further in this section. Class C or D areas are somewhat less restrictive and are associated with mid and lower density airports. Class A (18,000 feet and above) and Class E encompass the vast majority of the nation's airspace where aircraft operate while outside the airport Class B, C, or D airspace environment. Class G is completely uncontrolled airspace, from the surface to the lower base altitudes of Class E airspace. The different classes dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace. Of these classifications, only Class D and E airspace are relevant to the airfields considered for the VMU-3 UAS operations.

Class D airspace is generally airspace within five miles of an airport with an operational control tower and the elevation is from the surface to 2,500 feet above the airport. This airspace configuration can be individually tailored, as necessary, to protect airspace for published instrument procedures or not to overlap other adjacent airspace uses. Aircraft operating within Class D airspace must establish two-way radio communications with the control tower or other controlling Air Traffic Control (ATC) facility serving this area prior to entry, and thereafter while operating within this airspace. All four airfields proposed for use by VMU-3 are overlain by Class D airspace.

Class E airspace is generally controlled airspace below 18,000 feet above Mean Sea Level (MSL) that surrounds the terminal airport airspace, such as the Class D airspace surrounding the four airfields proposed for use by VMU-3. This airspace may extend to the surface or begin at either 700 or 1,200 feet Above Ground Level (AGL), as required, to safely regulate and control flight operations. Class D airspace reverts to Class E airspace when the control tower is closed or as other special conditions may dictate.

Special Use Airspace (SUA)

SUA is of defined dimensions wherein activities must be confined due to their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. SUA includes Prohibited Areas, Restricted Areas (RAs), Military Operations Areas, Warning Areas, Alert Areas, Controlled Firing Areas, and National Security Areas, which are identified on aeronautical charts for public awareness and avoidance. The ROI contains RAs, Warning Areas, and Alert Areas (Figures 2.4-10 through 2.4-13).

An RA, as designated under Title 14, Code of Federal Regulations (CFR) Part 73, supports ground or flight activities such as artillery practice, missile firing, and other such activities that could be considered hazardous to non-participating aircraft. While flight of non-participating aircraft within an RA is not wholly prohibited, it is subject to restriction. Most RAs are designated “joint-use” where ATC may authorize nonparticipating aircraft to operate within this airspace when it is not being utilized by the using agency (FAA 2012b). Typically, UAS train in RAs where they do not require constant monitoring by ground-based or airborne observers.

The off-shore ROI areas contain several Warning Areas (designated “W” followed by a dash and assigned number), which have defined dimensions extending three nautical miles outward from the coast of the U.S. Warning Areas are designated to contain activity that may be hazardous to nonparticipating aircraft and may be used, as necessary, for UAS training. The ROI also contains Alert Areas (designated “A” followed by a dash and assigned number), which are designated to alert nonparticipating pilots of areas that contain a high volume of pilot training operations or unusual aeronautical activity. Pilots are advised to be particularly alert when flying near or through these areas. UAS do not currently operate in Alert Areas because they are not established as restricted airspace.

Airfield and training airspace use is tracked individually by the FAA and DoD, as appropriate, by accounting for the number of aircraft activities occurring within each of these environments. Airport operations account for each time an aircraft departs or lands on the runway or crosses its landing/departing threshold when conducting practice touch-and-go and low-approach landings. Aircraft transiting through Class D airspace and in contact with the tower are counted separately.

Military aircraft flights within a training airspace area are accounted for by the number of aircraft sorties conducted within this airspace. A sortie refers to an operational mission conducted by a single aircraft from takeoff to landing. A sortie operation refers to a flight activity conducted by that single aircraft within each designated training airspace area it operates within during the entire sortie mission. Both airfield and sortie operations are addressed in Section 3.1.1, *Affected Environment*.

Certificate of Authorization (COA)

The FAA requires that the DoD obtain a COA waiver to conduct UAS operations outside of SUA, while conducting flight training activities within an airfield environment (i.e., Class D airspace), and when transiting between an airfield and SUA training areas. A COA permits an agency to operate a specific UAS type for a particular purpose within a defined area that ensures that such operations do not jeopardize the safety of other aviation operations. An agency's COA request requires an extensive FAA application process that addresses all of the technical, operational, and safety aspects of UAS operations. The FAA conducts a comprehensive review of the application and, upon approval, identifies those conditions/limitations that provide an equivalent level of safety as manned aircraft, while ensuring that the UAS do not operate over populated areas. These aircraft must be observed by someone in a manned aircraft or on the ground. A Notice to Airmen (NOTAM) is used to publicize the locations, times, and altitudes at which UAS operations will be conducted under a COA. COAs currently cover MCB Hawaii Kaneohe Bay and WAAF for the specific UAS types currently operated at those locations. Appendix C includes the COA for the RQ-11B Raven (Class 1 UAS) operations at MCB Hawaii Kaneohe Bay and Marine Corps Training Area Bellows (MCTAB), and the U.S. Army COA for RQ-7B operations within the WAAF Class D/E airspace and while transiting to/from R-3109 A/B/C and R-3110 A/B/C, which serve as examples for the individual COAs that would have to be obtained for the VMU-3 RQ-7B and the RQ-21A UAS within this airspace.

Flight Safety

The potential flight safety hazards and risks for UAS operations at MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA are very similar, as are the plans and procedures that the different military services have implemented to prevent and respond to aircraft accidents, mishaps, and incidents. For that reason, the following summarizes the flight safety aspects considered pertinent to all four proposed training locations under both current and future flight operations.

UAS are subject to accidents and mishaps resulting from engine failure, aircraft mechanical or data link malfunctions, operator error, Bird/Wildlife Aircraft Strike Hazards (BASH), collisions with other aircraft or objects, weather factors, or other such circumstances. Such occurrences can cause fires and other damage that can present a potential risk to populations, buildings/structures, wildlife, vegetation, and other land use within the airfield and transit/training area environments.

The USMC and other DoD services have implemented programs and Standard Operating Procedures (SOPs) to address the different flight safety hazards that could be encountered in both the airfield and training environments. These plans/procedures include specific emergency response actions to be taken by all responsible entities should a mishap occur. Section 3.6, *Biological Resources* and Appendix D, notes the bird, waterfowl, and other species most prevalent in the different training location regions. Bird/wildlife strikes most commonly occur

below 3,000 feet AGL and around an airfield environment. The USMC has established a BASH Plan for their Hawaii operations that addresses means for monitoring bird/wildlife activities, informing pilots and operators of these activities, and taking necessary actions to reduce the probability of any bird/wildlife strikes (MCAF 2006). In accordance with Navy policy, this plan will be reviewed and updated as necessary to reflect UAS flight operations at MCB Hawaii Kaneohe Bay, although the slow speeds of UAS flight reduce the probability of strikes. Wildlife management procedures and fire response protocols contained in the MCB Hawaii Kaneohe Bay Base Order 3302.1 are also incorporated into SOPs and range management plans. There is a cooperative agreement with the Honolulu Fire Department for response to fires at MCB Hawaii Kaneohe Bay (DoN 2012b). The *Integrated Wildland Fire Management Plan (2009-2013)* also lays out specific guidance, procedures, and protocol for the prevention and suppression of wildfires on the training areas of the three MCB Hawaii properties where military training is conducted (U.S. Army 2003).

Management plans/procedures that address flight safety hazards at WAAF, PMRF, and PTA, and their associated training environments would also be reviewed and updated, as appropriate, to include any VMU-3 UAS operations to be conducted at those locations.

Both FAA and DoD directives govern the manner in which UAS operations must be conducted to avoid those areas/conditions that would put any land and airspace use at risk. COAs contain detailed provisions and stipulations for operating UAS safely within the designated airspace established for those activities. Such provisions include actions to be taken by the operator and ground controller in the event a mechanical or data link malfunction occurs during a UAS flight.

3.1.1 Affected Environment

The affected airspace environment for the proposed VMU-3 UAS operations includes Class D and Class E controlled airspace surrounding the airfields and the SUA areas in which military training activities are conducted.

3.1.1.1 MCB Hawaii Kaneohe Bay

Marion E. Carl Field is the military airfield at MCB Hawaii Kaneohe Bay with one asphalt and Portland cement concrete runway (4/22), which is 7,771 feet (2,368 meters) in length. An operational control tower provides ATC services within the Class D airspace surrounding this airfield and extending from its surface up to 2,500 feet (722 meters) AGL as shown in Figure 2.4-10. This Class D airspace reverts to Class E airspace when the control tower is closed. The Kaneohe Approach control facility provides radar ATC services for Instrument Flight Rules (IFR) aircraft operating to and from this airfield. The FAA's Honolulu Control Facility provides those services when the Kaneohe facility is closed.

The aircraft types typically operating at MCB Hawaii Kaneohe Bay include CH-53E, H-1, and H-60A helicopters; P-3, C-20, and C-17 fixed-wing aircraft; and other transient aircraft types. As described in Section 1.3.1, *UAS Background*, Group 1 UAS also operate at this location. An annual average of 52,669 aircraft operations were conducted at this airfield between 1999 and 2010 (DoN 2012a).

A COA currently exists for conducting Group 1 UAS operations within the MCB Hawaii Kaneohe Bay Class D airspace (when tower is operational) and Class E airspace (when tower is closed) (Appendix C). No SUA is available near MCB Hawaii Kaneohe Bay for conducting any range training from this location so this COA defines airspace around the airfield where other training maneuvers can be performed. A COA must be reviewed and renewed bi-annually and is not transferable to other UAS types and uses. As shown in Appendix C, the MCB Hawaii Kaneohe Bay COA contains the following operational and safety provisions, which are generally typical of what is included in these waivers:

- For the purpose of see-and-avoid, visual observers must be utilized at all times except in Class A airspace, RAs, and Warning Areas. The observers may either be ground-based or in a chase plane. The UAS must remain within a lateral distance of no more than 0.5 nautical miles and 400 feet vertically from the visual observer. If the chase aircraft is operating more than 100 feet above/below and or 0.5 nautical miles laterally of the unmanned aircraft, the chase aircraft person in charge will advise the controlling ATC facility.
- The pilot-in-command and visual observers must be able to see the aircraft and the surrounding airspace throughout the entire flight. They must be able to determine the aircraft's altitude, flight path, and proximity to traffic and other hazards (terrain, weather, structures) sufficiently to exercise effective control of the aircraft to give right-of-way to other aircraft and to prevent the aircraft from creating a collision hazard.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Cloud clearances and Visual Flight Rule (VFR) visibilities for Class E airspace will be used regardless of airspace class. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.
- Dropping or spraying of aircraft stores or carrying hazardous materials outside of active Restricted, Prohibited, or Warning Areas is prohibited unless specifically authorized in the Special Provisions of the COA.

COAs also include specific pilot/observer qualification/proficiency requirements, operational responsibilities, ATC communications and coordination procedures, emergency procedures, accident/incident reporting, and any special provisions that may specifically apply to the waived operating environment. A COA does not waive any FAA, state law, or local ordinance. The USMC is responsible for resolving any UAS operations that may conflict with any state law or local ordinance or require the permission of local authorities or property owners (Appendix C).

3.1.1.2 WAAF

WAAF is a military airfield owned and operated by the U.S. Army, Schofield Barracks, with one asphalt runway (6/24) 5,607 feet (1,709 meters) in length. This airfield has an operational control tower with Class D airspace surrounding the airfield and extending from the surface up to 3,300 feet (1,006 meters) AGL (Figure 2.4-11). This Class D airspace becomes part of the larger Class E airspace surrounding the area when the control tower is not open. The FAA Honolulu Control Facility provides radar ATC services for IFR air traffic operating at WAAF. Military

flight activities at WAAF consist primarily of helicopters, UAS, and other transient aircraft types. Previous data (U.S. Army 2004) indicates a daily average of 207 aircraft operations conducted at this airfield. Assuming this daily average is based on an average of 240 days per year that the military typically conducts flight activities, this equates to approximately 50,000 operations annually.

The WAAF Class D airspace abuts R-3109 A/B/C and the adjoining R-3110 A/B/C to the west. R-3109 is subdivided horizontally so that the southern A and northern C subdivisions extend from the surface up to, but not including, 9,000 feet (2,743 meters) MSL. The B subdivision overlies both, extending this RA from 9,000 (2,743 meters) up to, but not including, 19,000 feet (5,791 meters) MSL. R-3110 is subdivided horizontally in the same manner. As the Using Agency for both RAs, the U.S. Army, Schofield Barracks, schedules the RA high/low subdivisions individually or collectively as needed to support the different mission activities conducted in these RAs. The intermittent use of these RAs is publicized by NOTAM (FAA 2012b). An estimate of the annual sortie operations for both RAs is generally considered to be within the range of WAAF operations noted above since many of those airfield operations are assumed to include flight training within the adjoining RA.

The U.S. Army holds a COA that permits specific UAS type operations within WAAF Class D/E airspace and while transiting to/from R-3109 A/B/C and R-3110 A/B/C (Appendix C). This COA includes operational and safety provisions similar to those discussed above for MCB Hawaii Kaneohe Bay and contained in Appendix C.

3.1.1.3 PMRF

The PMRF Barking Sands airfield is owned and operated by the U.S. Navy, and consists of one asphalt runway (16/34) approximately 6,000 feet in length. This airfield is open from 0700 to 1800 hours local time and has an operational control tower that is responsible for air traffic operations within the Class D airspace that extends from the surface up to 2,500 feet (762 meters) AGL (Figure 2.4-12). When the tower is closed, this airspace reverts to Class E airspace. Aircraft types operating at PMRF include helicopters, C-17s, F-16s, and UAS and average approximately 7,000 operations annually. These operations include the USMC's UAS biennial participation in the joint Rim of the Pacific (RIMPAC) exercises (DoN 2012a).

The PMRF airfield is located immediately adjacent to the R-3101 boundary while portions of the Class D airspace are within its boundaries. This RA extends from the surface to unlimited altitudes, as needed, to support various PMRF mission activities and is active from 0700 to 2200 hours local, Monday-Friday, unless otherwise activated by NOTAM six hours in advance. The adjacent Warning Areas W-186 and W-188 provide additional RA for military operations that may be required outside of R-3101. W-186 extends from the ocean surface to 9,000 feet MSL while W-188 extends from the surface to unlimited altitudes. Both are available for continuous use.

No COA is needed for UAS training flights to/from R-3101 since training flights can be fully conducted within the confines of the Class D airspace and the abutting R-3101 boundaries. However, any UAS flights outside of these boundaries while transiting to/from the Warning Areas would require a COA.

3.1.1.4 PTA

Bradshaw Army Airfield (BAAF) is owned and operated by the U.S. Army, Schofield Barracks and consists of one asphalt runway (9/27) approximately 3,700 feet (1,128 meters) in length. PTA also contains Cooper Airstrip, a runway that is approximately 1,004 feet (306 meters) in length and is used exclusively for UAS operations. This airfield is situated on the northeastern boundary of R-3103 with Class D airspace that extends from the surface up to 8,700 feet (2,652 meters) AGL (Figure 2.4-12). In 2009, there were approximately 27,000 aircraft operations at PTA, including helicopters, other aircraft, and general aviation aircraft transiting through the PTA airspace (DoN 2012a). These operations include the USMC's participation in Lava Viper activities that generally occur two times a year. R-3103 extends from the surface up to 30,000 feet (9,144 meters) MSL. Use of R-3103 is intermittent, as activated by NOTAM at least 12 hours in advance. Sortie operations within this RA are considered the same as noted above for the PTA airfield.

As noted in Section 1.3.1, both the Army and USMC have operated RQ-7Bs at this airfield. A COA is not required for these UAS operations since flights are contained within the bordering RA.

3.1.2 Potential Impacts

The analysis of potential consequences of the VMU-3 relocation on airspace management considered current use of the airfield Class D/E airspace and SUA environments relative to future use of this airspace under the Proposed Action. The significance criteria was considered the extent to which UAS operations may affect the safe, orderly, and expeditious flow of all civil and military air traffic within the ROI. Impacts would be considered significant if any aspects of the action presented a risk to flight safety or prevented, or substantially interfered with, current flight activities. Military scheduling agencies work closely with each other and the FAA, as required, to schedule and manage their airspace use to minimize any adverse effects on other military or civil air traffic in the affected areas.

3.1.2.1 Proposed Action

No additions or modifications would be required for the existing Class D/E airspace or SUA structure to support the proposed UAS operations. The manner in which the existing airspace environment would be affected and the need to obtain a COA for UAS operations at each location are discussed in the following paragraphs.

3.1.2.1.1 MCB Hawaii Kaneohe Bay

Basing of VMU-3 at MCB Hawaii Kaneohe Bay would not result in impacts on airspace management. Training and operating VMU-3 UAS at MCB Hawaii Kaneohe Bay would have minimal effects on current airfield and Class D/E airspace use. While no RA is located within close proximity to MCB Hawaii Kaneohe Bay, home base UAS training activities, as described in Section 2.4.3, would be conducted within this airfield airspace through an approved COA, as is currently done for other currently assigned UAS types.

As noted above, no SUA is located within the vicinity of MCB Hawaii Kaneohe Bay. Any UAS training that would be considered for this airfield, such as pilot qualification/proficiency in

launch and recovery maneuvers, would be limited to the airfield Class D/E airspace environment over the base and over water. The proposed 480 UAS annual training sorties reflected in Table 2.4-1 for this location would not be a significant increase, at less than 1 percent, to the annual 52,000-plus operations currently conducted within this airspace environment. The individual COA that would be required for the proposed UAS operations would define the area within which VMU-3 training activities must be confined, along with those conditions and stipulations that govern these operations. Confining any UAS operations to the airfield Class D/E airspace would not interfere with other nonparticipating air traffic in the surrounding area. No significant impacts on airspace would be expected to occur and no mitigation is proposed.

3.1.2.1.2 WAAF

Construction of a temporary tension-fabric structure followed by construction of the permanent 50 foot x 80 foot (15.2 meters x 24.4 meters) (4,000 square feet [372 square meters]) detachment facility and parking area would have no impact on airspace management. Operating the VMU-3 UAS at WAAF, or using this airfield periodically for regular training operations, would have a minimal effect on the use and management of this Class D/E airspace. The estimated annual UAS operations reflected in Chapter 2 for this location would be little more than a 1 percent increase over the estimated 50,000 operations currently conducted annually at this airfield. This UAS training would occur about two weeks per month, on average, which would be effectively scheduled and integrated with other military flight activities routinely conducted at WAAF. A COA would be required to operate each UAS within this Class D/E airspace within a defined transit corridor for transiting between the airfield and the R-3109 and R-3110 training areas.

Regular training would occur within the R-3109 A/B/C and R-3110 A/B/C airspace at altitudes below 18,000 feet MSL approximately two weeks per month. The estimated 360 VMU-3 sortie operations within each RA would only increase current operations by about 1 percent. Use of these RAs for UAS training missions would be effectively coordinated and integrated with other Army and USMC mission needs for this airspace. The USMC would be required to obtain a COA for transiting UAS to/from the RAs. Considering the close proximity of these RAs to the airfield, activating the COA transit corridors would not conflict with other nonparticipating air traffic operations in the surrounding airspace. No significant impacts on airspace would be expected to occur and no mitigation is proposed.

3.1.2.1.3 PMRF

Improvements to the PMRF runway for VMU-3 UAS use would have no impact on airspace management. Use of PMRF for temporary deployment of VMU-3 for conducting periodic UAS training activities, as described in Section 2.4.3, would have a minimal effect on the use and management of this Class D/E airspace environment. The projected annual UAS operations discussed in Table 2.4-1 for this airfield would account for about a 2 percent increase over current airfield operations. These activities could be effectively coordinated and integrated into other operations at this location so that respective mission requirements are met. A COA would not be necessary for UAS operations at PMRF since they could be contained within the R-3101 airspace that overlies this airfield environment.

VMU-3 training would have minimal effects on other operations currently conducted within R-3101 or within W-186, W-188, and R-3107. The projected use of this airspace two times a

year, each time for three weeks (six weeks total per year), could be scheduled and integrated into other operations performed routinely or during exercises within this SUA. This would only increase current RA use by about 2 percent. A COA would not be necessary for these UAS operations. The close proximity of this airfield with R-3101 negates any possible interference that UAS and other aircraft operations may have on other civil and military airspace use in the surrounding region. No significant impacts on airspace would be expected to occur and no mitigation is proposed.

3.1.2.1.4 PTA

Use of PTA for temporary deployment of VMU-3 (one RQ-7B system and one RQ-21A system) and using this airfield up to four times per year for training and exercise activities would have a minimal effect on baseline operational levels. The estimated annual sortie operations reflected in Chapter 2 would increase baseline airfield use by less than 1 percent. UAS operations would be coordinated and scheduled with the Army so that all service mission requirements are met. Use of this airfield would not require a COA for conducting these operations.

Training and participation in Lava Viper exercises at PTA and in the adjoining R-3103 airspace would also have little effect on the overall use of this training airspace environment since those operations would only increase by less than 1 percent. Such operations would be coordinated and scheduled for integration with other mission needs. No COA is required for UAS operations at this location. PTA, and its collocation with R-3103, do not present any air traffic conflicts with other nonparticipating military or civil aircraft operations in this region.

3.1.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and aircraft operations at the individual airfields and the RAs and Warning Areas identified for VMU-3 UAS training would continue to occur under the baseline conditions described for the Affected Environment in Section 3.1.1, *Affected Environment*.

3.2 AIR QUALITY

3.2.1 Affected Environment

The federal Clean Air Act (CAA) of 1969 and its subsequent amendments form the basis for the national air pollution control effort. The United States Environmental Protection Agency (USEPA) is responsible for implementing most aspects of the CAA. Basic elements of the act include National Ambient Air Quality Standards (NAAQS) compliance, Hazardous Air Pollutant (HAP) standards, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone (O₃) protection, and enforcement provisions. The CAA delegates enforcement of the federal standards to the states.

In Hawai'i, the Clean Air Branch (CAB) of the Hawai'i State Department of Health (DOH) is responsible for enforcing air pollution regulations. Under CAA, state and local agencies may establish ambient air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements (HDOH 2013). CAB conducts engineering analyses and permitting, performs air monitoring and investigations, and enforces the federal and state air pollution regulations.

The state laws and rules that CAB uses to regulate air pollution in Hawai'i are found in the Hawaii Administrative Rules (HAR) Title 11, Chapters 59, *Ambient Air Quality Standards*, and 60.1, *Air Pollution Control*. The state air rule that is most applicable to the Proposed Action (for construction activities) is HAR 11-60.1-33, *Fugitive Dust*. Since almost all of the proposed emission sources are mobile in nature, they are not subject to permitting requirements that apply to stationary sources, such as those found in HAR 11-60.1, Subchapter 5, *Covered Sources*.

Air quality is defined by concentrations of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The significance of a pollutant concentration is determined by comparing it to a national and/or state ambient air quality standard. These standards represent the maximum allowable atmospheric concentrations that may occur while protecting public health and welfare with a reasonable margin of safety. The national standards are established by USEPA and termed the NAAQS. The DOH has adopted standards that are the same as NAAQS except for the standards for carbon monoxide (CO) and nitrogen dioxide (NO₂), which have standards that are more stringent. They also have promulgated a state standard for hydrogen sulfide (H₂S) for which there is no national standard. The national and state ambient air quality standards are shown in Table 3.2-1.

The main pollutants of concern considered in this air quality analysis include Volatile Organic Compounds (VOCs), O₃, CO, nitrogen oxides (NO_x), sulfur dioxide (SO₂), particulate matter less than 10 microns in diameter (PM₁₀), and particulate matter less than 2.5 microns in diameter (PM_{2.5}). Although there are no ambient standards for VOCs or NO_x, they are important as precursors to O₃ formation.

Table 3.2-1. National and Hawai'i Ambient Air Quality Standards

Air Pollutant	Averaging Time	Standards			
		Unit of Concentration	Hawai'i	National Primary	National Secondary
Carbon Monoxide (CO)	8-hour	ppm	4.4	9	---
	1-hour		9.0	35	---
Nitrogen Dioxide (NO ₂)	Annual	ppm	0.04	0.053	0.053
	1-hour		---	0.1	---
Sulfur Dioxide (SO ₂)	Annual	ppm	0.03	---	---
	24-hour		0.14	---	---
	3-hour		0.5	---	0.5
	1-hour		---	0.075	---
Particulate Matter 10 microns or less in diameter (PM ₁₀)	Annual	$\mu\text{g}/\text{m}^3$	150	150	150
	24-hour		50	---	---
Particulate Matter 2.5 microns or less in diameter (PM _{2.5})	Annual	$\mu\text{g}/\text{m}^3$	---	12	15
	24-hour		---	35	35
Hydrogen sulfide (H ₂ S)	1-hour	ppb	25	---	---
Ozone (O ₃)	8-hour	ppm	0.08	0.075	0.075
Lead (Pb)	Calendar Quarter Running 3 Months	$\mu\text{g}/\text{m}^3$	1.5 ---	0.15	0.15

Key: $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter; ppb = parts per billion
Source: HDOH 2013

USEPA designates areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Upon achieving attainment, areas are considered to be in maintenance status for a period of ten or more years. Areas are designated as unclassifiable for a pollutant when there is insufficient ambient air quality data for USEPA to form a basis for an attainment designation. When applying air quality regulations, unclassifiable areas are treated as similar to areas that are in attainment of the NAAQS.

The DOH CAB maintains a statewide air-monitoring network to measure ambient air pollutant concentrations. The primary purpose of this effort is to ensure compliance with the ambient air quality standards. USEPA has determined from data collected by CAB that the state of Hawai'i attains all NAAQS. This attainment status is largely due to the ventilating effects of the prevailing tradewinds and the absence of substantial sources of air emissions. However, locations on the island of Hawai'i experience elevated levels of SO₂ and H₂S due to continuing eruptions from the Kilauea Volcano complex (UH 2013). These eruptions can produce a visible haze called volcanic smog, or "vog". Vog is primarily a mixture of SO₂ gas and sulfate (SO₄) aerosol. SO₂ reacts with sunlight, oxygen, and moisture to produce SO₄ in the form of PM_{2.5}. SO₂ and H₂S emissions are problematic for locations in proximity to Kilauea eruption points. Light or southeasterly wind conditions can transport vog to the Kona (southwest) coast of Hawai'i and to the islands to the northwest and can degrade air quality in those areas.

3.2.1.1 MCB Hawaii Kaneohe Bay

Ambient air pollutant levels at MCB Hawaii Kaneohe Bay are generally low due to the absence of substantial air emission sources and the ventilating effects of the tradewinds. The primary sources of air emissions from operations at the MCB Hawaii Kaneohe Bay include: 1) aircraft; 2) aircraft Ground Support Equipment (GSE); 3) non-road equipment; 4) on-road vehicles; 5) boilers and electrical generators; and 6) fuel storage tanks.

3.2.1.2 WAAF, PMRF, and PTA

Ambient air pollutant levels at WAAF, PMRF, and PTA are generally low due to the absence of substantial air emission sources and the ventilating effects of the tradewinds. The primary sources of air emissions from operations at WAAF include: 1) aircraft; 2) Ground Support Equipment (GSE); 3) non-road equipment; 4) on-road vehicles; 5) boilers and electrical generators; and 6) fuel storage tanks. The primary sources of air emissions from operations at PMRF include: 1) aircraft; 2) vessels; 3) non-road equipment; 4) on-road vehicles; 5) boilers and electrical power plant; and 6) fuel storage tanks. The primary sources of air emissions from operations at PTA include: 1) aircraft; 2) non-road equipment, 3) on-road vehicles; 4) electrical generators; 5) fuel storage tanks; and 6) fugitive dust.

3.2.2 Potential Impacts

The Proposed Action would result in air quality impacts from 1) combustive emissions due to the use of fossil fuel-powered construction equipment and operational sources, and 2) fugitive dust emissions during construction activities. Air quality impacts are significant if they contribute to an exceedance of an ambient air quality standard.

3.2.2.1 Proposed Action

3.2.2.1.1 MCB Hawaii Kaneohe Bay

Basing

Air quality impacts due to the proposed construction at MCB Hawaii Kaneohe Bay would occur from both construction and operational activities. Proposed construction activities would generate 1) combustive emissions due to the use of construction equipment, and 2) fugitive dust emissions due to the demolition of structures and the disturbance of exposed soils. Subsequent to construction, proposed operational activities would generate combustive emissions from 1) the use of on-road and non-road vehicles in support of the UAS, and 2) on-road vehicles and stationary sources associated with the increase in personnel and dependents on base.

Due to the mobile and/or intermittent nature of construction sources and their low emission rates, combined construction emissions would result in low ambient pollutant impacts. To minimize fugitive dust emissions during construction, the contractor for proposed construction activities would comply with the requirements of HAR 11-60.1-33, *Fugitive Dust*. This regulation requires that no one shall cause or permit visible fugitive dust to become airborne without taking reasonable precautions. Examples of reasonable precautions are:

- Use of water or suitable chemicals for control of fugitive dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land;
- Application of asphalt, water, or suitable chemicals on roads, material stockpiles, and other surfaces that may result in fugitive dust;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Reasonable containment methods shall be employed during sandblasting or other similar operations;
- Cover all moving, open-bodied trucks transporting materials that may result in fugitive dust;
- Conduct agricultural operations, such as tilling of land and the application of fertilizers, in such manner as to reasonably minimize fugitive dust;
- Maintain roadways in a clean manner; and
- Prompt removal from paved streets of earth or other materials that have been transported there by trucking, earth-moving equipment, erosion, or other means.

In addition, except for persons engaged in agricultural operations or persons who can demonstrate that the best practical operation or treatment is being implemented, no person shall cause or permit the discharge of visible fugitive dust beyond the property lot line on which the fugitive dust originates.

To minimize combustive emissions from construction equipment, contractors would use Best Management Practices (BMPs) to minimize the idling of equipment engines. As a result, emissions from proposed construction activities would not contribute to an exceedance of an ambient air quality standard. No significant impacts on air quality would be expected to occur as a result of proposed construction activities at MCB Hawaii Kaneohe Bay.

Due to the mobile and intermittent nature of proposed operational sources and their low emission rates, combined operational emissions would result in low ambient pollutant impacts. As a result, emissions from proposed operational activities would not contribute to an exceedance of any ambient air quality standard. No significant impacts on air quality would be expected to occur as a result of proposed operational activities from basing at MCB Hawaii Kaneohe Bay and no mitigation is proposed.

Training

Air quality impacts due to proposed training activities at MCB Hawaii Kaneohe Bay would occur from 1) on-road vehicles used to transport equipment and personal, and 2) UAS operations. The mobile and intermittent nature of these sources and their low emission rates would produce low ambient pollutant impacts. As a result, emissions from proposed training activities at MCB Hawaii Kaneohe Bay would not contribute to an exceedance of any ambient air quality standard. No significant impacts on air quality would be expected to occur and no mitigation is proposed.

3.2.2.1.2 WAAF

Air quality impacts due to the proposed construction at WAAF would occur from minor amounts of construction and operational activities. Proposed construction activities would generate 1) combustive emissions due to the use of construction equipment, and 2) fugitive dust emissions due to earthmoving and the disturbance of exposed soils. Subsequent to construction, proposed operational activities would generate combustive emissions from the use of on-road vehicles and non-road equipment.

Due to the mobile and/or intermittent nature of construction sources and their low emission rates, combined construction emissions would result in low ambient pollutant impacts. To minimize fugitive dust emissions during proposed construction, the construction contractor would comply with HAR 11-60.1-33, *Fugitive Dust* and use BMPs to minimize the idling of equipment engines. As a result, emissions from proposed construction activities would not contribute to an exceedance of any ambient air quality standard. No significant impacts on air quality would be expected to occur as a result of proposed construction activities from basing at WAAF.

Air quality impacts due to proposed training activities at WAAF would occur from 1) on-road vehicles used to transport equipment and personal, 2) UAS operations, and 3) non-road equipment. The mobile and intermittent nature of these sources and their low emission rates would produce low ambient pollutant impacts. As a result, emissions from proposed training activities at WAAF would not contribute to an exceedance of any ambient air quality standard. No significant impacts on air quality would be expected to occur and no mitigation is proposed.

3.2.2.1.3 PMRF

Air quality impacts could occur from proposed construction (minor improvements to the runway shoulder) and training activities, similar to those described for WAAF. There are fewer proposed construction activities at PMRF than those described for WAAF and emissions from the proposed construction activities would not contribute to an exceedance of any ambient air quality standard. No significant impacts on air quality would be expected to occur as a result of proposed construction activities at PMRF.

Due to the infrequency of UAS flight training activities that are anticipated to be conducted at PMRF, air quality impacts would be less than the air quality impacts estimated for training at WAAF. No significant impacts on air quality would be expected to occur as a result of proposed training activities and no mitigation is proposed.

3.2.2.1.4 PTA

No facility upgrades are proposed at PTA. Due to the infrequency of UAS flight training activities that would be conducted at PTA, air quality impacts would be less than the air quality impacts estimated for training at WAAF. No significant impacts on air quality would be expected to occur and no mitigation is proposed.

3.2.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and none of the construction or renovation activities associated with basing and training of VMU-3 would occur. Baseline air quality conditions as described in Section 3.2.1, *Affected Environment*, would be expected to continue.

3.3 NOISE

Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Measurement and perception of sound involve two basic physical characteristics: amplitude and frequency.

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. Due to this vast range, attempts to represent sound amplitude by pressure are generally unwieldy. Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 db.

Due to the logarithmic nature of the decibel scale, sound levels do not add and subtract directly and are somewhat cumbersome to handle mathematically. However, some simple rules 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, for example:

$$\begin{aligned}60 \text{ dB} + 60 \text{ dB} &= 63 \text{ dB, and} \\80 \text{ dB} + 80 \text{ dB} &= 83 \text{ dB}\end{aligned}$$

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two, for example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB}$$

Since 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 the 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.

Under laboratory conditions, differences in sound level of 1 dB can be detected by the human ear. In the community, the smallest change in average noise level that can be detected is about 3 db. A change in noise level of 0.4 dB would not be detected under field or laboratory conditions.

Frequency - The frequency (i.e., pitch) of a sound is also important in determining how the sound will be perceived. All dB values referenced in this document can be assumed to be “A-weighted”, meaning that they have been adjusted to emphasize frequencies heard most clearly by the human ear.

This document uses two noise level metrics to describe noise events and overall noise environments: maximum noise level (L_{max}) and Day-Night Average Sound Level (DNL). L_{max} is the sound level at the loudest point during an event, such as an aircraft overflight. It is an intuitively understood metric that is useful for predicting interference with conversation and other common activities. The DNL metric averages noise levels over a 24-hour period, adding a 10 dB “penalty” to those events that occur between 2200 and 0700 to account for the increased intrusiveness of late-night noise. The DNL metric is useful for predicting the percentage of a population that will become highly annoyed by noise and has been adopted by several federal agencies as the primary descriptor of overall noise level. The FAA, DoD, and several other federal agencies have adopted 65 dB DNL as the threshold noise level above which residences are not considered compatible. Since the DNL metric uses the logarithmic dB scale, adding a noise source that is more than 10 dB quieter than the dominant noise source will generally have an inconsequential effect on overall DNL.

3.3.1 Affected Environment

Noise impacts analysis must take into account both the characteristics of the noise itself and the environment in which the noise would occur. Relevant aspects of the affected environment include existing noise levels and the sensitivity of affected areas to noise.

3.3.1.1 MCB Hawaii Kaneohe Bay

MCB Hawaii Kaneohe Bay is an active military installation, and regularly occurring aircraft operations and munitions training events are the dominant noise sources at and near the installation. The fleet of aircraft based at MCB Hawaii Kaneohe Bay is currently changing with the USMC in the process of home-basing V-22 and H-1 aircraft. In the same general timeframe, USMC CH-53 squadrons have been converted from D-model to E-model aircraft and reduced in number from three to one. The Navy intends to replace all P-3 aircraft based at MCB Hawaii Kaneohe Bay with P-8 aircraft, pending the outcome of the P-8 Supplemental EIS Record of Decision (ROD). Other aircraft currently located at MCB Hawaii Kaneohe Bay include H-60 helicopters and C-20 fixed-wing aircraft. A detachment of USMC Reserve 4th Force Reconnaissance company based at MCB Hawaii Kaneohe Bay operates UAS at a low operations tempo (USMC 2012a). A total of approximately 53,000 sorties are flown from MCB Hawaii Kaneohe Bay annually (USMC 2012a). Upon completion of the actions analyzed in the EIS for Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawai'i, the installation was projected to support approximately 11,676 sorties per year (DoN 2012a).

The airfield at MCB Hawaii Kaneohe Bay is located at the tip of the Mōkapu Peninsula and much of the area adjacent to the runway is part of either Kāneʻohe Bay or the Pacific Ocean. Computer modeling of aircraft operations noise at MCB Hawaii Kaneohe Bay indicates that both before and after proposed fleet mix changes, land areas affected by noise levels of 65 dB DNL or greater would be limited to portions of MCB Hawaii Kaneohe Bay, Coconut Island, and the tip of Kealohi Point (USMC 2012a). Coconut Island, located in the middle of Kāneʻohe Bay, is the site of the Hawai'i Institute of Marine Biology. Kealohi Point, located on the southern shore of Kāneʻohe Bay, is part of Heʻeia State Park.

Land use in areas adjacent to MCB Hawaii Kaneohe Bay is primarily residential, educational, and recreational and ambient noise levels (i.e., noise levels experienced when military operations are not audible) are typically fairly low. Ambient DNL values measured in quiet residential areas have been found to be approximately 50 dB and ambient noise levels in remote rural areas were measured at approximately 44 dB (USEPA 1974).

3.3.1.2 WAAF

WAAF is an active military airfield primarily supporting operations of rotary-wing aircraft, including CH-47, OH-58, CH-53, and UH-60. Fixed-wing aircraft based at WAAF cumulatively make up less than 10 percent of total operations; these aircraft include C-130, RQ-7B unmanned aircraft, single-engine propeller-driven aircraft, and dual-engine propeller-driven aircraft (U.S. Army 2011a). In total, the installation handles about 50,000 sorties per year (U.S. Army 2004). In addition to aircraft noise, the area regularly experiences large-arms and small arms munitions noise generated at nearby Schofield Barracks Military Reservation (SBMR).

Aircraft noise levels exceed 65 dB DNL on much of WAAF, including the military family housing area located south of the runway. Areas not owned by the DoD that are affected by noise levels exceeding 65 dB DNL include agricultural and industrial areas. Military aircraft training remains a prominent noise source in other areas near WAAF, but is at levels below 65 dB DNL (U.S. Army 2011a).

Agricultural areas near WAAF are typically relatively quiet when military training is not audible. Densely settled residential areas and those areas along Interstate H-2 experience civilian vehicle noise as well as other human-generated noise at varying intensities.

RAs R-3109 and R-3110 are used for aircraft training at an operations tempo similar to WAAF, and also contain the target areas for SBMR munitions training. Most of the area beneath these airspace units is geographically remote and relatively quiet when military training is not under way.

3.3.1.3 PMRF

Operations of aircraft, including the SH-3 and C-26, are a primary noise source on and near PMRF. Approximately 7,000 sorties are flown per year from PMRF (USMC 2012a). Missile launches at PMRF are a less frequent occurrence than aircraft operations but generate substantially higher noise levels. The area immediately surrounding PMRF is used for agriculture and ambient noise levels in these areas are typically low.

Warning Areas near PMRF are used for a wide variety of military training that takes place over a large area. When military training is not under way, the sound environment is characterized by natural sounds such as wind and waves.

3.3.1.4 PTA

Military training at PTA includes aircraft operations, live and inert munitions training, and ground vehicle operations. Aircraft operations consist primarily of helicopter training, but also include manned fixed-wing and UAS operations. PTA supports approximately 27,000 aircraft sorties per year (USMC 2012a). Aircraft operations noise levels exceed 65 dB DNL in portions of PTA, Mauna Kea Forest Reserve, and Mauna Loa Forest Reserve (U.S. Army 2011a). PTA is located in a remote portion of the island of Hawai'i and ambient sound levels are typically very low.

3.3.2 Potential Impacts

Potential impacts are assessed in the context of the existing noise environment. In this analysis, the “existing noise environment” reflects operations for which environmental impacts have been assessed in accordance with NEPA. For example, as described in Section 3.3.1.1, existing conditions include full-strength operations of MV-22 and H-1 flying units at MCB Hawaii Kaneohe Bay. Proposed individual event noise levels, which are stated using the L_{max} metric, are compared to noise levels associated with continuing activities. Overall noise levels are assessed in terms of the DNL metric. Noise impacts would be considered significant if they resulted in substantial increases in a noise-sensitive area exposed to greater than 65 dB DNL.

3.3.2.1 Proposed Action

Noise-generating elements of the Proposed Action include construction associated with basing and training of VMU-3 and aircraft operations associated with unit training.

3.3.2.1.1 MCB Hawaii Kaneohe Bay

Basing

The primary noise source associated with unit basing would be construction activities. Construction noise is typically dominated by the operation of heavy equipment such as cranes, backhoes, and jackhammers. At a distance of 100 feet, L_{max} generated by these representative types of equipment are 75, 72, and 83 dB, respectively (FHWA 2006). Construction noise would occur in the context of an active military installation in locations exposed to military training noise. Furthermore, construction noise would be temporary, lasting only the duration of the construction project, and would be expected to be limited to normal working hours (i.e., 0700 to 1700). Proposed construction sites are distant from the boundaries of the installation and construction noise levels on land not owned by the DoD would not be expected to be significant. Construction workers would wear hearing protection, as required, in compliance with applicable regulations. Long-term noise levels would not be affected by temporary construction noise. No significant noise impacts would be expected to occur and no mitigation is proposed.

Training

The RQ-7B and RQ-21A are propeller-driven aircraft powered by single 38-horsepower (HP) and 8-HP engines, respectively (Table 3.3-1). Noise level measurements have not yet been conducted

that would support the addition of these two aircraft types to the DoD NOISEFILE aircraft source noise database. In this situation, it is standard DoD procedure to select a noise surrogate for use in noise impact analysis. Surrogates are selected based on having a similar type of propulsion and engine power, factors that are strongly linked to aircraft noise level. After reviewing aircraft available in the NOISEFILE database, the Cessna T-41 (military version of the Cessna 172) was selected as the most appropriate basis for noise surrogates for the RQ-7B and RQ-21A. The T-41 included in the NOISEFILE database is propeller-driven and powered by a 145 HP engine. Other aircraft types available in the NOISEFILE database are less similar to the RQ-7B and RQ-21A in terms of propulsion type. For use as a surrogate for the UAS, the noise levels were scaled according to the engine power.

	RQ-7B Shadow	RQ-21A Blackjack	Cessna 172 (Military version)
Propulsion	Gasoline-powered engine and propeller	Gasoline-powered engine and propeller	Gasoline-powered engine and propeller
Engine Power	38 HP	8 HP	145 HP

Key: HP - horsepower

Table 3.3-2 lists direct overflight noise levels (L_{max}) associated with several of the aircraft currently operating at locations in Hawaii, plus the T-41 and the surrogate UAS noise levels. Estimated UAS noise levels are more than 10 dB below noise levels generated by nearly all aircraft types currently based at MCB Hawaii Kaneohe Bay.

Aircraft	Aircraft configuration	Maximum Noise Level (L _{max}) at Overflight Distance in Feet				
		500	1,000	2,000	5,000	10,000
Fixed-Wing Aircraft						
T-41 ¹	100% RPM	77	70	63	53	45
RQ-7B ²	100% RPM	71	64	57	47	39
RQ-21A ²	100% RPM	64	57	50	40	32
C-20 ¹	14000 LBS	111	105	97	86	77
C-130H ¹	970 CTIT	92	85	77	66	57
P-3C ¹	3500 ESHP, 285 KTS	92	85	78	68	60
RC-12 ¹	100% RPM	79	73	67	57	50
Rotary-Wing Aircraft						
CH-47D ¹	Level Flight at 100 KTS	84	78	71	61	54
CH-53E ³	Level Flight at 80 KTS	99	95	91	85	80
H-60 ²	Level Flight at 80 KTS	77	70	63	53	45
OH-58D ¹	Level Flight at 120 KTS	81	75	68	57	48
UH-3 ¹	Level Flight at 100 KTS	81	74	67	55	45
V-22 ³	60 degree nacelle tilt, 80 KTS	97	93	89	82	71

Notes:
 1. Maximum Omega 10 (flight noise calculation component of NOISEMAP) result
 2. Scaled from T-41
 3. Rotorcraft Noise Model; used standard acoustic propagation conditions (59°F and 70% relative humidity)

Key: CTIT=turbine inlet temperature in degrees Celsius, ESHP=engine shaft horsepower, KTS=knots, LBS=pounds of thrust, L_{max}=maximum noise level; RPM=revolutions per minute

Under the Proposed Action, VMU-3 would conduct up to 480 sorties per year at MCB Hawaii Kaneohe Bay, as described in Section 2.4.3. These sorties would occur in the context of the total of 11,676 sorties per year under baseline (existing) conditions (Section 3.3.1.1). Proposed operations would increase the overall number of sorties flown from the installation by about 3 percent. All else being equal, a 3 percent change in operations corresponds to about a 0.1 dB change in noise level (DNL). The lower noise levels of the UAS would reduce the change to less than 0.01 db.

UAS operations noise would be qualitatively similar but less intense than noise generated by small, single-engine, propeller-driven civilian aircraft that currently operate in the affected area. If UAS operations were to be under way at a time when no other aircraft operations were occurring, the UAS may be audible in nearby areas but would not be expected to be disruptive. Based on the low proposed frequency of operations and the relatively low noise levels of UAS aircraft, increases in DNL near the installation would be minimal. Potential noise impacts to operators of the UAS from the aircraft engines would be minimized by using proper hearing protection. No significant noise impacts would be expected to occur and no mitigation is proposed.

3.3.2.1.2 WAAF

Impacts associated with the proposed construction at WAAF would be similar to the impacts described at MCB Hawaii Kaneohe Bay. Construction noise levels would not be expected to exceed State of Hawai'i community noise standards on land not owned by the DoD. No significant noise impacts would be expected to occur and no mitigation is proposed.

Noise impacts associated with VMU-3 UAS training at WAAF would be similar to those described at MCB Hawaii Kaneohe Bay in that UAS operations would take place in the context of current military training operations. Under the Proposed Action, 360 sorties per year would be flown by VMU-3 UAS at WAAF. Under baseline (existing) conditions, about 50,000 sorties are flown per year at WAAF. Most of the aircraft operating at WAAF are substantially louder than the UAS at equivalent distances (Table 3.3-2). Furthermore, UAS training is conducted primarily at high altitudes (Table 2.4-1). UAS overflight would be substantially quieter than the existing aircraft operations, particularly when operating at high altitudes.

Noise levels generated by UAS operations are greater than 10 dB less intense than noise levels for existing aircraft operations and would not be expected to result in measurable change to DNL in areas near the airfield. Similarly, in RAs R-3109 and R-3110 military aircraft operations and munitions detonations are common events. The number of baseline sorties flown in R-3109 and R-3110, and the number of UAS sorties that would be flown in R-3109 and R-3110, are similar to the number flown at WAAF. UAS sorties would be expected to increase total sorties in the RAs by less than 1 percent. The addition of RQ-7B and RQ-21A UAS operations would not be expected to have any measurable effect on overall noise levels. No significant noise impacts would be expected to occur and no mitigation is proposed.

3.3.2.1.3 PMRF

Impacts associated with proposed runway improvements at PMRF would be similar to impacts described for basing at MCB Hawaii Kaneohe Bay. Construction noise levels would not be

expected to exceed State of Hawai'i community noise standards on land not owned by the DoD. No significant noise impacts would be expected to occur as a result of construction activities and no mitigation is proposed.

VMU-3 UAS operations at PMRF would take place in the context of an active military airfield and occasional rocket launches. UAS operations would occur primarily at high altitudes (Table 2.4-1) and in offshore SUA. UAS noise levels are expected to be less than noise levels generated by propeller-driven aircraft that currently operate at PMRF (Table 3.3-1). VMU-3 UAS would fly about 120 sorties per year at PMRF; about 7,000 sorties by all types of aircraft are flown per year under baseline (existing) conditions. Proposed UAS operations would not be expected to result in increased DNL in affected areas. No significant noise impacts would be expected to occur and no mitigation is proposed.

3.3.2.1.4 PTA

UAS training operations would be conducted at PTA within R-3103. As mentioned previously, RQ-7B and RQ-21A aircraft are propelled by relatively small 38 HP and 8 HP engines, respectively. When audible in areas adjacent to PTA, current UAS operations and proposed VMU-3 UAS operations would generally be heard as a distant “droning” or “buzzing” sound. The RQ-7B and RQ-21A generate less noise than the manned military aircraft types that currently use R-3103 at equivalent distances (Table 3.3-1). Furthermore, UAS operations would primarily occur at high altitudes (Table 2.4-1). Proposed UAS operations would be in addition to UAS operations that have been occurring in R-3103 for several years. Under the Proposed Action, about 120 VMU-3 UAS operations would be conducted per year at R-3103; baseline (existing) sorties total about 27,000 per year. In the context of louder aircraft operations and munitions training in R-3103, proposed VMU-3 UAS training would not be expected to increase overall time-averaged noise levels (DNL). No significant noise impacts would be expected to occur and no mitigation is proposed.

3.3.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and noise levels at MCB Hawaii Kaneohe Bay, WAAF, PMRF, PTA and associated training airspace would be expected to remain as described in Section 3.3.1, *Affected Environment*.

3.4 TOPOGRAPHY AND SOILS

3.4.1 Affected Environment

3.4.1.1 MCB Hawaii Kaneohe Bay

The geology of much of the Mōkapu Peninsula consists of a relatively thin layer of surface soil with an underlying layer of rock and sediments. According to the *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* (USDA 2014), the soils in the project areas consist of Fill land, Ewa silty clay loam, and Mamala stony silty clay loam. The Fill areas are typical of land developed for airports on O'ahu. Areas consistent with this soil type are usually filled with material dredged from the ocean, excavated from nearby areas, or refuse (USN 2011).

The topography of the peninsula varies from mean sea level to approximately 600 feet (182.3 meters) at the top of Ulupa'u Crater, the highest point on the peninsula. Other prominent geologic features on the base are Pyramid Rock, located at the northwestern tip of the peninsula, and Pu'u Hawai'i Loa, an approximately 400-foot (121.9 meters) volcanic cone near the center of the base. Developed areas of MCB Hawaii Kaneohe Bay are generally flat, with elevations ranging from mean sea level to about 20 feet (6.1 meters) MSL. Typical of central portions of the base, the topography of the project area is generally flat, with an average elevation of 10 feet (3.05 meters) MSL (USN 2011).

3.4.1.2 WAAF

WAAF is located near the southern edge of the Schofield Plateau, a broad saddle of land between the Ko'olau Mountains to the east and the Wai'anae Mountains to the west. The plateau elevation is between approximately 250 to 800 feet (76.2 to 243.8 meters) MSL and consists mainly of alluvial deposits shed from the Wai'anae Mountains to the east and lava flows from the ancient Ko'olau volcanoes to the west. The thickness of the alluvium increases toward the center of Schofield Plateau. More specifically, WAAF is underlain by a 100-foot (30.5 meters)-thick sequence of saprolite (intensely weathered basalt), with an overlying approximately 10-foot (3.05 meters)-thick layer of clay rich soil. Wahiawa soils underlie the project site; this soil series consists of well drained, very deep soils that formed in residuum and alluvium weathered from basalt (USDA 2014).

3.4.1.3 PMRF

The project area is located on a strip of low-lying coastal terrace called the Mana Plain. This plain bounds the western flank of Kaua'i, forming gentle westerly slopes, ranging from about a 2 percent grade near the volcanic uplands to relatively flat over the coastal margin. The topography along the shoreline at PMRF consists of low beach barrier dunes, mildly undulating blanket sands, and the Nohili Dune. With the exception of the much higher Nohili Dune, ground elevations average 10 to 20 feet (3.05 to 6.1 meters) MSL (U.S. Army 2010a).

The Mana Plain is composed of alluvium, lagoon, beach, and dune deposits that overlie volcanic basement rocks. This sedimentary sequence forms a wedge that thickens east to west, attaining an approximate thickness of 200 feet (61 meters) at the eastern base boundary, increasing to about 400 feet (121.9 meters) at the coast. The dominant soil within the PMRF area has been mapped as Jaucas loamy fine sand, which occurs on old (inactive) beaches and on windblown deposits, up to 5 feet (1.5 meters) thick. The soils are permeable and infiltration is rapid. Wind erosion is severe where vegetation has been removed (U.S. Army 2010a).

3.4.1.4 PTA

VMU-3 would utilize existing facilities at Cooper Airstrip, which is currently used exclusively for UAS operations, to support UAS flight training activities. No changes to the existing topography or soils environment would occur. Therefore, the baseline topography and soils conditions at PTA are not discussed in this section.

3.4.2 Potential Impacts

Project actions could have a significant adverse impact on soils if there is an increase in erosion and transport of soils and sediment off-site, particularly if the resulting transport would cause significant impacts on water quality or aquatic habitats. Project actions could have a significant adverse environmental impact on topography if construction associated with the project actions makes significant changes to the topography. Significant topographical changes are changes of such a degree that they adversely impact on-site or adjacent land use, infrastructure, or drainage patterns. Topographical changes may include such actions as creating excessively steep slopes that produce unstable ground conditions.

3.4.2.1 Proposed Action

3.4.2.1.1 MCB Hawaii Kaneohe Bay

Basing

In the short-term, impacts on soils in the vicinity of Building 373 could be caused by land-disturbing activities such as demolition of existing asphalt pavement and structures, grading, excavations, temporary stockpiling of soil, and soil compaction associated with demolition, construction, or renovation. Exposed soils would be susceptible to erosion during heavy rain, resulting in siltation of local drainages and adjacent marine waters. Wind erosion could also result in some unavoidable soil loss. With appropriate implementation of BMPs, significant impacts on soils would not result from proposed construction activities. BMPs may include berms, cut-off ditches, silt fences, vegetative ground cover, dust fences, and soil stabilization. No significant, long-term, impacts on soils would be expected to occur as a result of implementing the Proposed Action and no mitigation is proposed.

The topography at the project site is generally flat so substantial topographic alteration would not occur. No significant, long-term impacts on topography or soils would be expected to occur as a result of implementing the Proposed Action and no mitigation is proposed.

Training

Proposed UAS flight training would have no significant impacts on topography or soils at MCB Hawaii Kaneohe Bay and no mitigation is proposed.

3.4.2.1.2 WAAF

In the short term, impacts on soils in the vicinity of the proposed storage facility could be caused by land-disturbing activities associated with clearing, grading, and construction. With appropriate implementation of BMPs (as described for MCB Hawaii Kaneohe Bay in Section 3.4.2.1.1), no significant, long-term impacts on soils would be expected to occur. In addition, the topography is generally flat at the project site so substantial topographic alteration would not occur. No significant impacts on topography or soils would occur as a result of the Proposed Action and no mitigation is proposed.

3.4.2.1.3 PMRF

Proposed minor improvements to the runway shoulder at PMRF would be located on an existing runway shoulder paved with a soil-concrete material. In the short term, impacts on soils in the

vicinity of the proposed runway improvements could be caused by land-disturbing activities, including removal of existing pavement, grading, excavations, the temporary stockpiling of soil, and soil compaction. Exposed soils would be susceptible to erosion, potentially resulting in siltation of local drainages and nearby marine waters. However, onsite soils are sandy and the topography relatively flat which enhance surface water infiltration and reduce runoff. In addition, with appropriate implementation of BMPs (as described in Section 3.4.2.1.1), no significant, long-term, impacts on soils would be expected to occur a result of the Proposed Action and no mitigation is proposed.

3.4.2.1.4 PTA

No construction would occur under the Proposed Action, no significant impacts on topography or soils would be expected to occur, and no mitigation is proposed.

3.4.2.2 *No-Action Alternative*

Under No-Action, VMU-3 would not relocate to Hawai'i and no demolition, construction, or renovation activities associated with basing and training would occur. Baseline conditions for topography and soils as described in Section 3.4.1, *Affected Environment*, would be expected to continue.

3.5 WATER RESOURCES

3.5.1 *Affected Environment*

3.5.1.1 *MCB Hawaii Kaneohe Bay*

3.5.1.1.1 Groundwater

Groundwater is the principal source of potable water in Hawai'i and occurs on O'ahu as 1) high-level groundwater that is perched atop low permeability strata or confined within a dike system, or 2) as a basal aquifer. The Mōkapu Peninsula is underlain by a thin layer of permeable sediments, providing little depth for groundwater storage. The peninsula is underlain by two aquifers: an unconfined, low salinity caprock aquifer above a confined, freshwater basalt aquifer. There are no potable groundwater wells on base because the peninsula sits atop an area known to have brackish basal groundwater. Over the years, groundwater recharge has been reduced as stormwater runoff has been channelized into an extensive system of box culverts, pipes, and ditches (USN 2011).

3.5.1.1.2 Surface Water

MCB Hawaii Kaneohe Bay is located on Mōkapu Peninsula with Kāne'ohe Bay to the west and Kailua Bay to the east. The Mōkapu Peninsula is located within the Mōkapu Central Watershed, which spans freshwater, marine, and estuarine ecosystems. The peninsula features two distinct drainage basins; Nu'upia Basin, which encompasses a portion of the southeastern area of the peninsula and Mōkapu Drainage Basin, which accounts for most of the central and northern areas of the peninsula.

Surface waters within MCB Hawaii Kaneohe Bay consist of 1) the eight delineated ponds of the Nu'upia Ponds complex (Figures 3.5-1 and 3.5-2) the Mōkapu Central Drainage Channel (MCDC); a man-made, muddy-bottomed channel approximately 6,235 feet (1,900 meters) long. The MCDC was designed to facilitate rapid flow of stormwater runoff from the relatively flat,

low-lying inland areas of the peninsula to the Nu'upia Ponds complex, where it eventually empties into the marine waters of Kāne'ōhe Bay. The northern end of the MCDC originates at the southern edge of the Klipper Golf Course. From there, the channel flows south through the central area of the base where an extensive system of box culverts, pipes, swales, and ditches conveys surface runoff into the MCDC. The MCDC captures and releases roughly 100 acre-feet of surface water to the Nu'upia Basin and the Mōkapu Drainage Basin during a single storm event. The MCDC receives surface runoff from approximately 482 acres (195 hectares) that include the Mōkapu Drainage Basin (USN 2011).

Stormwater runoff conveyance features at MCB Hawaii Kaneohe Bay include 22 outlets ranging in size from a 24-inch (61-centimeter) pipe draining one catch basin to a 10-foot by 4-foot (3-meter by 1.2-meter) box culvert that drains much of the airfield area. Four of the storm drain outlets discharge into Nu'upia Ponds, 14 discharge into Kāne'ōhe Bay, two discharge into the ocean at Ulupa'u Crater and two discharge into Kailua Bay. Stormwater drainage from this area is regulated under MCB Hawaii Kaneohe Bay's stormwater NPDES permit (USN 2011).

Ocean waters on all sides of Mōkapu Peninsula are regulated by the State of Hawai'i. Both Kāne'ōhe and Kailua Bays are used for recreation and as wildlife refuges. HAR 11-54, *Water Quality Standards* classifies Kailua Bay and the outer portions of Kāne'ōhe Bay as "class A waters". Class A waters are protected for the purpose of recreation and aesthetic enjoyment, and "shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class". Inner portions of Kāne'ōhe Bay are classified as Class AA waters, which are to "remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions" (HDOH 2012, USN 2011).

Mōkapu Peninsula receives an average of 40 inches of rainfall per year. This leaves low-lying, open areas throughout the base subject to flooding. Depending on the volume and duration of precipitation, temporary areas of surface water, including pools, puddles, or transitory marshes may form. These temporary areas of surface water have been documented to provide short-lived waterbird and shorebird habitat and are considered a healthy part of the natural hydrologic system (USN 2011).

3.5.1.1.3 Wetlands

Of Mōkapu Peninsula's 2,951 acres, approximately 131 are protected, jurisdictional wetlands, pursuant to the Clean Water Act (CWA) and administered by the U.S. Army Corps of Engineers (USACE) (USN 2011). The wetlands, including mudflats, shallow ponds, and estuarine and coastal wetlands, provide habitat for waterbirds and other native and non-native species. A ground-based wetland survey was conducted between 2001 and 2002 and updated in 2009. This survey delineated boundaries for eight wetland complexes identified at MCB Hawaii Kaneohe Bay 1) Hale Koa Wetland, 2) Sag Harbor Wetland, 3) Salvage Yard Wetland, 4) Percolation Ditch Wetland, 5) Motor Pool Wetland, 6) Kaneohe Klipper Golf Course Ponds, 7) Temporary Lodging Facility Wetland, and, 8) Nu'upia Ponds complex. The Nu'upia Ponds complex is a wetland habitat, an established historic property, and a protected Wildlife Management Area (WMA) that harbors endangered flora and fauna. The complex consists of eight ponds/delineated wetlands, including Nu'upia 'Ekahi, Heleloa, Halekou, Nu'upia 'Elua, Nu'upia 'Ekolu, Nu'upia 'Eha, Kaluapuhi, and Pa'akai. Wetlands on Mōkapu Peninsula provide essential habitat for many federally protected native and migratory birds, native fish, and other aquatic fauna and flora. The wetlands also filter sediments and pollution, and help reduce shoreline erosion.

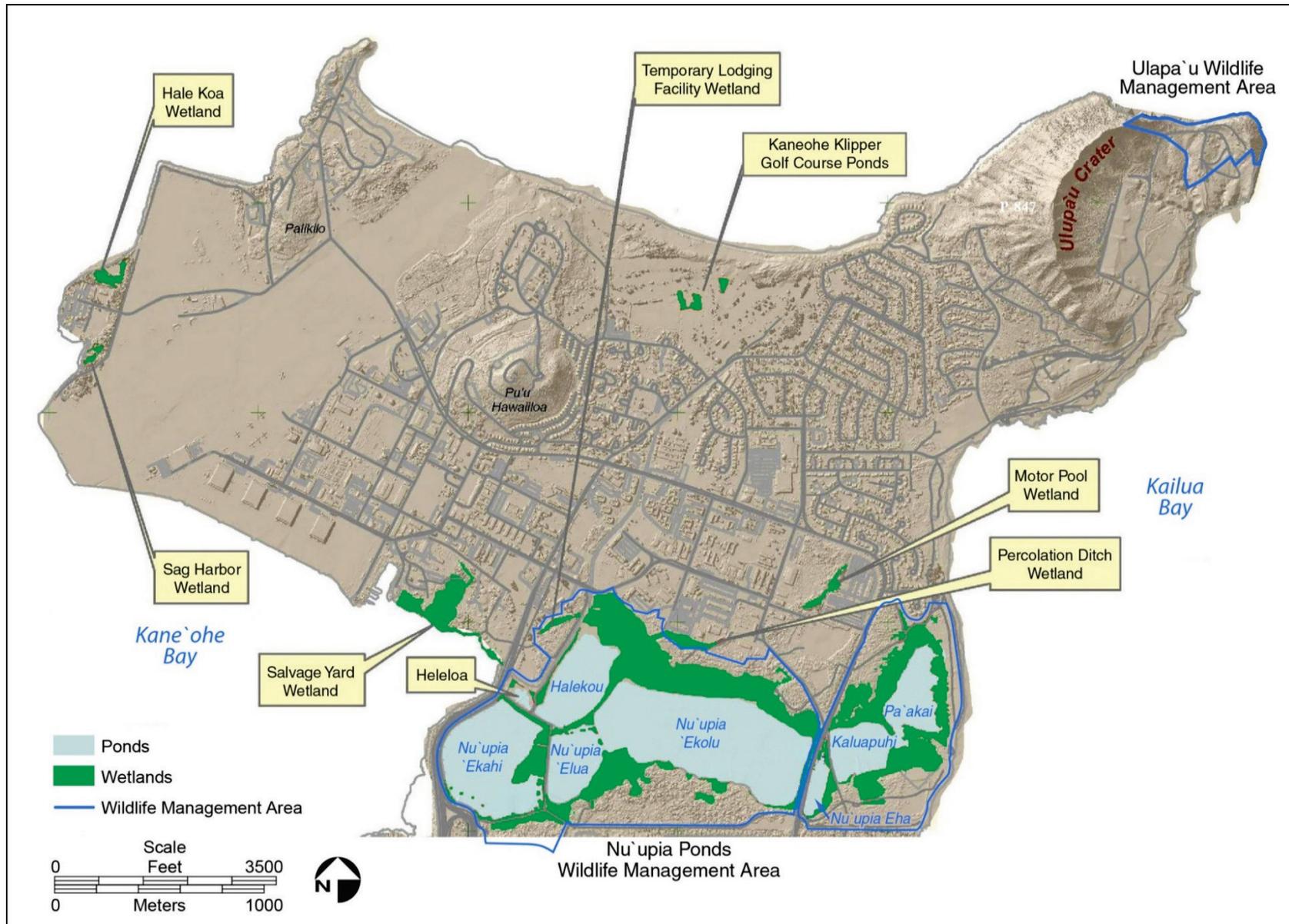


Figure 3.5-1. Wetlands in the Vicinity of MCB Hawaii Kaneohe Bay

3.5.1.2 WAAF

3.5.1.2.1 Groundwater

WAAF overlies the Schofield Plateau groundwater area of the central O'ahu groundwater flow system, the largest and most productive flow system on O'ahu. The central O'ahu groundwater flow system is bounded on the east by the crest of the Ko'olau Mountains and on the west by the crest of the Wai'anae Mountains. On the southeast, the groundwater flow system is bounded by the Ka'au rift zone, which transects Diamond Head. The Schofield Plateau subsurface is bounded on the north and south by vertical, low permeability features that reduce or prevent groundwater flow. Since the groundwater elevation within the confines of these barriers is higher than outside the barriers, the groundwater in the Schofield Plateau is called high-level groundwater, as groundwater occurs up to 275 feet MSL, but at a depth of 600 feet or more. Localized, perched aquifers are also present above the high-level groundwater (USACE 2011).

3.5.1.2.2 Surface Water

WAAF lies near the drainage divide between the Kaukonahua and Waikele watersheds. These watersheds extend across the Schofield Plateau, from the ridgeline of the Ko'olau Mountains to the ridgeline of the Wai'anae Mountains. The Kaukonahua watershed is bordered on the north by the Poamoho watershed. The principal surface water feature of the Kaukonahua watershed is the Wahiawa Reservoir (Lake Wilson), which lies just outside the eastern boundary of SBMR, east of Highway 99. The reservoir stores drainage from tributaries of Kaukonahua Stream, which originates in the Ko'olau Mountains. The reservoir receives small amounts of surface drainage from the eastern side of SBMR (USACE 2011).

The main drainages at WAAF are Waikoloa Gulch and Waikele Stream. Waikoloa Gulch drains the area just north of the cantonment and joins Kaukonahua Stream below Wahiawa Reservoir. Two other streams that drain the north part of SBMR are tributaries to the Kaukonahua Stream-Mohiakea Gulch and Haleanau Gulch. Kaukonahua Stream drains northward through the area underlain by the Waialua aquifer system, joining Poamoho Stream to form Ki'iki'i Stream, which discharges to Kaiaka Bay, just east of Waialua (USACE 2011).

Waikele Stream, which originates in the Honouliuli Forest Preserve along the east slope of the Wai'anae Range south of SBMR, drains the south boundary of the reservation. The stream flows south along the west side of WAAF, across land overlying the Waipahu-Wahiawa aquifer system, and eventually discharges to the West Loch of Pearl Harbor (USACE 2011).

The State of Hawai'i classifies the Kaukonahua and Waikele watersheds as second tier Category I under the Hawai'i Unified Watershed Assessment. Category I watersheds do not meet, or face imminent threat of not meeting, clean water and other natural resource goals. The classification of the Kaukonahua watershed was based largely on the fact that the coastal receiving water, Kaiaka Bay, is an impaired water body. The Waikele watershed drains to Pearl Harbor, which is also an impaired water body (USACE 2011).

An impaired water body is one that is not attaining water quality standards after technology-based discharge limits on point sources are implemented. Section 303(d) of the Clean Water Act (CWA) requires each state to maintain a list of impaired water bodies and to revise the list on even-numbered years. The priority level of a listed water body indicates the level of information

available about it. Priority 1 water bodies have sufficient data to support a listing or delisting decision. Priority 2 water bodies have limited data and decisions for listing or delisting must be based on a weight-of-evidence approach. Priority 3 water bodies have extremely limited data and require further monitoring before a decision for listing is made (USACE 2011).

Kaukonahua Stream is listed as a Priority 2 impaired water body. Section 303(d) of the CWA requires states to develop Total Maximum Daily Loads (TMDLs) for impaired water bodies. Levels of suspended solids in both wet and dry conditions have been exceeded in Kaukonahua Stream, which has been given a medium priority for TMDL development. Waikele Stream is listed as a Priority 1 impaired water body, with total nitrogen and nitrite/nitrate levels exceeded in both wet and dry conditions. As a result, this stream has been given a high priority for TMDL development (USACE 2011).

3.5.1.2.3 Wetlands

There are no wetlands or areas of any significant biological resource value located at WAAF. This is due to a history of significant disturbance and development, leaving the habitats at the site severely altered (USACE 2011).

3.5.1.3 PMRF

3.5.1.3.1 Groundwater

Groundwater in the PMRF region is generally potable at the base of the cliffs, increasing in salinity closer to the coast. Bedrock, alluvium, and sand dunes make up hydraulically connected aquifers. The basalt bedrock is highly permeable, containing brackish water that floats on seawater. A dune sand aquifer beneath PMRF has a moderate hydraulic conductivity and moderate porosity of about 20 percent. This aquifer consists of a lens of brackish groundwater that floats on seawater and is recharged by rainfall and by seepage from the underlying sediments (U.S. Army 2010b).

3.5.1.3.2 Surface Water

The project area is not traversed by perennial or ephemeral streams. Surface water within the PMRF boundary is limited to the pump discharges into canals that connect the Mana Plain with the Pacific Ocean. The Kinikini Ditch and Nohili Ditch outfalls allow the agricultural land to the east of PMRF to dewater to an elevation 1.5 feet (.46 meters) below mean sea level. Throughout the coastal plain, a series of interconnected drainage ditches converge at two pumping stations that are within an area leased to the Navy. In addition, there are several irrigation ponds within the agricultural lands (U.S. Army 2010b).

A surface water quality study for chloride was conducted in the Mana Plain/Kauai Test Facility (KTF) area located at PMRF. The chloride levels do not indicate residual hydrochloric acid effects from past launches at the KTF. Surface water on the southern half of PMRF is expected to have similar chemical characteristics. Since the drainage ditches are designed to move water away from agricultural fields during irrigation and rainfall and to leach salts from the soil, no residual effects of past launches are expected. Typically, the water from the canals that drain the agricultural fields is brackish (U.S. Army 2010b).

Water quality along the PMRF shoreline was within DOH standards, with the exception of two locations where shallow groundwater, pumped from the adjacent agricultural fields to reduce groundwater elevations to approximately 1.5 feet (.46 meters) below mean sea level, was discharged to the ocean. In these areas, DOH water quality limits were exceeded within 164 feet (50 meters) of the shoreline. However, mixing processes are sufficient to dilute the drainage water to near background levels. These outfall locations are currently monitored under a National Pollutant Discharge Elimination System (NPDES) permit that is held by the Agribusiness Development Co-operative (U.S. Army 2010b).

3.5.1.3.3 Wetlands

Although no USACE wetlands delineations have been done at PMRF, the U.S. Fish and Wildlife Service (USFWS) has included wetland types located at PMRF in their inventories of the Barking Sands installation (Figure 3.5-2) (HHFP 2010). However, manmade features support small corridors of wetland vegetation, including two ditches (Nohili and Kawaiele) that cross the base and the sewage oxidation pond (HHFP 2010). Wetland areas that exist adjacent to, but outside of PMRF boundaries, include the Mana Base Pond, located outside the industrial area of the facility boundary, and Kawaiele Waterbird Sanctuary, a refuge for Hawai'i's four endangered waterbird species (U.S. Army 2010a). Two wetlands (classified as marine system, subtidal subsystem, reef class, coral subclass) exist along part of the coastline west of PMRF. Several ditches and man-made oxidation ponds located off-base support protected bird species.

3.5.1.4 PTA

3.5.1.4.1 Groundwater, Surface Water, and Wetlands

VMU-3 would utilize existing facilities at Cooper Airstrip, which is currently used exclusively for UAS training activities. No changes to the existing groundwater or surface water environments would occur. Groundwater and surface water at PTA are not discussed in this section. There are no wetlands, surface streams, lakes, or other bodies of water at PTA.

3.5.2 Potential Impacts

Project actions could be considered to have an adverse impact on the ground water environment if 1) the basic functions of groundwater systems would be altered, 2) groundwater would be contaminated, or 3) the area available for groundwater recharge would be significantly reduced.

Impacts on surface water quality are considered to be significant if operational activities cause pollutants to be discharged into receiving waters. Specific actions or occurrences that could be considered significant impacts related to drainage include the placement of structures and the alteration of existing site drainage patterns such that an increase in the rate or volume of surface water or stormwater runoff would substantially exceed the capacity of existing or planned stormwater drainage systems. This could result in increased potential for flooding on- or off-site and increased erosion and/or siltation, thereby causing sediment-bound pollutants to be discharged to receiving waters.

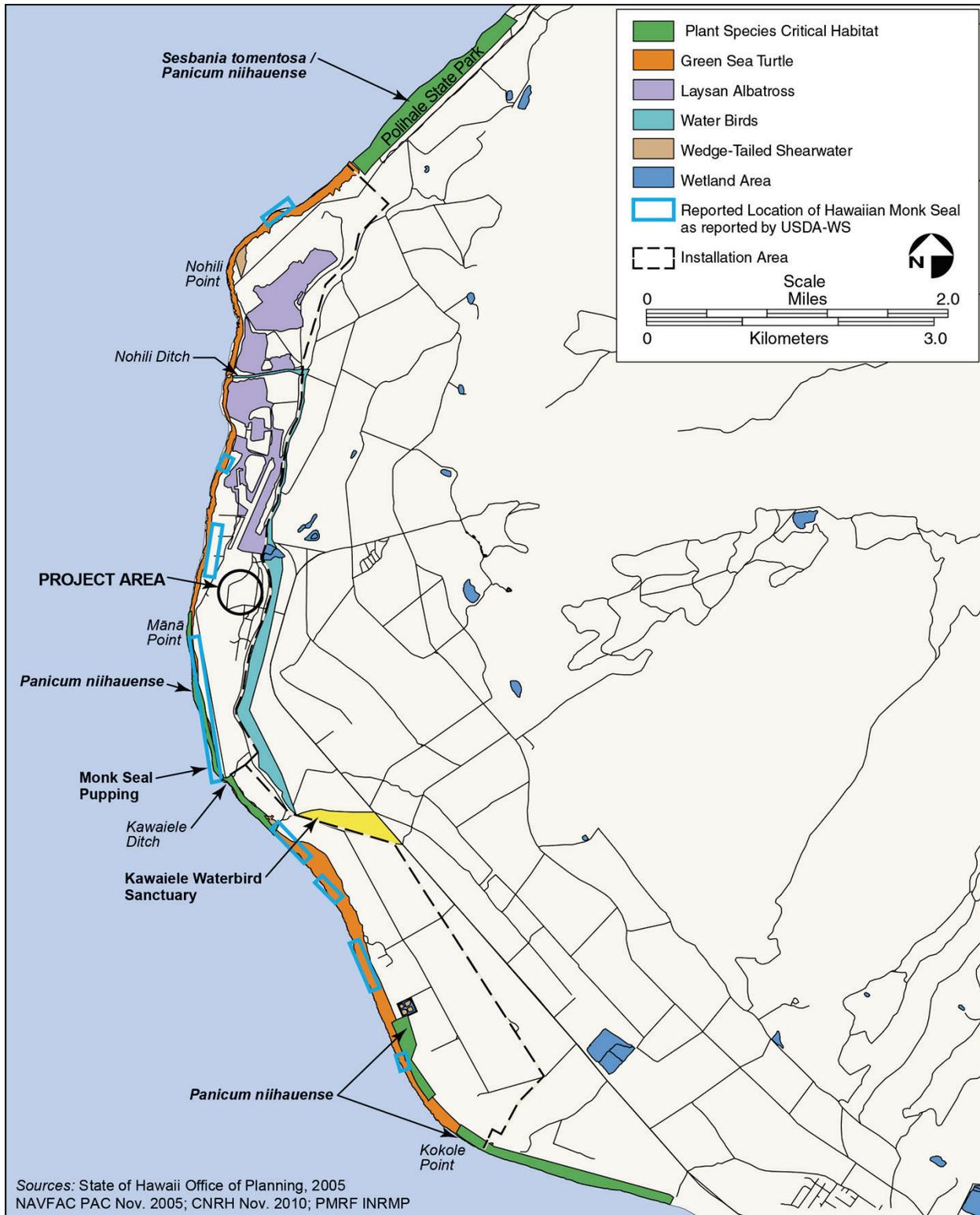


Figure 3.5-2. Wetland and Sensitive Species Areas at PMRF

3.5.2.1 MCB Hawaii Kaneohe Bay

3.5.2.1.1 Ground Water

Basing

Implementing the Proposed Action would include interior upgrades to Hangar 102, re-use of Building 191, interior renovations to Building 373 and improvement of the adjacent parking area, and replacement of the existing Vehicle Wash-Platform. The proposed vehicle parking area located adjacent to Building 373 would not substantially increase the amount of impermeable surfaces with respect to the size of the existing parking area, as illustrated in Figures 2.4-2 and 2.4-3. Proposed paving and Vehicle Wash Rack replacement, in the Building 373 complex would result in an increase in impermeable surfaces and stormwater runoff. A new drainage system meeting EISA requirements and UFC 3-210-10 Low Impact Development (LID) requirements will be installed to collect runoff from the site. The system will consist of a network of inlets and piping that will convey runoff around the development to a subsurface detention system (Figure 2.4-3), which will promote surface water infiltration and groundwater recharge. Proposed construction and renovation would not involve deep excavations, filling, or grading that would breach the caprock aquifer and contaminate the underlying, non-potable groundwater. No significant impacts on groundwater quality or groundwater recharge would be expected to occur and no mitigation is proposed.

Training

Proposed training would be conducted within airspace above MCB Hawaii Kaneohe Bay and takeoff and landing would occur within the existing flight line. No significant impacts on groundwater would be expected to occur at MCB Hawaii Kaneohe Bay and no mitigation is proposed.

3.5.2.1.2 Surface Water

Basing

Under the Proposed Action, the building footprints would not be increased; however, a minor increase in impermeable surfaces would occur as a result of construction of a larger parking lot adjacent to Building 373 (Figures 2.4-2 and 2.4-3). The Proposed Action would be implemented in compliance with the DoN Low-Impact Development (LID) policy, the goal of which is to manage stormwater on-site and result in no net increase in stormwater volume, rate, sediment, or nutrient loading from major construction or renovation projects. In accordance with this policy, site design strategies and features intended specifically to address stormwater runoff would be incorporated within the proposed projects to reduce the rate and volume of runoff, and levels of pollutants such that no significant drainage/flooding impacts would occur and no mitigation is proposed.

Materials, debris, and soil removed during proposed demolition and construction activities would be stored, managed, and disposed of in accordance with applicable regulations. However, the potential for temporary erosion, sedimentation, and runoff from the project site could result if storm events occur during the construction period. Hangar 102 and Building 373 are partially surrounded by existing development, so existing paved areas, roads, walkways, or parking lots

could facilitate the movement of sediment-bound pollutants contained in runoff into drainage lines that discharge into the MCDC or the Nu‘upia Pond complex.

CWA-mandated protective measures, such as a general or individual NPDES permit for construction projects at Hangar 102 or Building 373, would necessitate development of a site-specific Construction BMP Plan for stormwater runoff, prior to commencing construction activities. The site-specific Construction BMP Plan would identify the erosion, sedimentation, and runoff control measures that would be the most effective at minimizing the amount of soil and sediment transported off-site as a result of demolition, grading, and construction activities. BMPs for sediment control include the use of silt fences, storm drain inlet protection measures, sediment traps, and sediment basins. In addition, LID design strategies and project features intended specifically to address stormwater runoff would be incorporated within the proposed projects to reduce the rate and volume of runoff and levels of pollutants, and could include drain inlet infiltration inserts for removing sediments and petroleum hydrocarbons. Application of BMPs and LID design strategies would minimize the potential for degradation of the quality of any surface water within or surrounding the base during construction for the Proposed Action. As a result, no significant impacts would be expected to occur on surface water quality resulting from demolition, construction, or renovation activities.

Training

Proposed training would have no significant impact on drainage and flooding at MCB Hawaii Kaneohe Bay and no mitigation is proposed. Application of appropriate site drainage control measures, as discussed previously for VMU-3 basing, and compliance with SOPs would minimize the potential for contaminants to be discharged into surface water from runoff. In addition, Section 3.13, *Hazardous Materials and Waste* includes information related to potential spills of petroleum products and hazardous substances during training operations. No significant impacts on surface water would be expected to occur.

3.5.2.1.3 Wetlands

Basing

There are no wetlands located within the proposed VMU-3 complex construction areas. To minimize the potential for downstream runoff and sedimentation from construction sites, appropriate BMPs are in place and would be applied during and following construction. In addition, the Proposed Action would comply with NPDES permit conditions and LID site design features that minimize runoff and prevent or minimize the pollutants and sediment conveyed by surface runoff. With implementation of these environmental measures, no significant impacts on wetlands would be expected to occur as a result of construction.

Training

The proposed UAS flight training activities at MCB Hawaii Kaneohe Bay would have no significant impacts on wetlands.

3.5.2.2 WAAF

3.5.2.2.1 Ground Water

The proposed storage facility would be located on an unpaved area that currently contributes to surface water infiltration and groundwater recharge. Construction of the storage facility would comply with NPDES permit conditions and LID site design features that promote surface water infiltration and groundwater recharge. Construction of the storage facility would not involve deep excavations, filling, or grading that would affect the underlying potable, high-level groundwater, which occurs at a depth of approximately 600 feet (183 meters). No significant effects on groundwater quality or groundwater recharge would be expected to occur as a result of the Proposed Action and no mitigation is proposed.

3.5.2.2.2 Surface Water

Proposed construction of a new storage facility and parking would increase impermeable surfaces on the base by approximately 16,146 square feet (1,500 square meters). The Proposed Action would be implemented in compliance with the DoN's LID policy, as described previously for MCB Hawaii Kaneohe Bay in Section 3.5.2.1.1. No significant impacts related to drainage and flooding would be expected to occur and no mitigation is proposed.

The Proposed Action could result in temporary erosion, sedimentation, and runoff from the project site as a result of storm events during proposed construction activities. A site-specific Construction BMP Plan (as described in Section 3.5.2.1.1) would be developed if CWA-mandated protective measures were required (e.g., a general or individual NPDES permit). The project site is surrounded by existing paved areas, including runways, tarmacs, roads, walkways, or parking lots. Sediment-bound pollutants contained in runoff from these paved areas could be carried into drainages that discharge into the Kaukonahua and/or Waikele watersheds, both of which have impaired water bodies downstream. Application of BMPs and LID design strategies would minimize the potential for degradation of surface water quality within or surrounding the base during construction for the Proposed Action so that no significant impacts on surface water quality would be expected to occur and no mitigation is proposed.

Application of appropriate site drainage control measures, as discussed above and in compliance with SOPs, would minimize the potential for contaminants associated with UAS training to be discharged into surface water from runoff. In addition, Section 3.13, *Hazardous Materials and Waste*, includes information related to potential spills of petroleum products and hazardous substances during training operations. No significant impacts on surface water would be expected to occur and no mitigation is proposed.

3.5.2.2.3 Wetlands

No wetlands have been identified at WAAF, so no impacts on wetlands would occur as a result of the Proposed Action.

3.5.2.3 PMRF

3.5.2.3.1 Ground Water

Minor improvements to the runway shoulder would be required for proposed UAS flight training activities at PMRF. Proposed improvements, consisting of AM-2 matting or new pavement, would be located in an area already paved with a semi-permeable soil-concrete material. The area proposed for improved pavement would be approximately 35,500 square feet, which would moderately inhibit groundwater recharge in the project area. However, groundwater beneath the project site is saline and non-potable. No significant adverse effects on groundwater quality or groundwater recharge would be expected to occur as a result of the Proposed Action and no mitigation is proposed.

3.5.2.3.2 Surface Water

The increase in potentially impermeable surfaces due to proposed runway shoulder improvements could result in increased stormwater runoff. However, onsite soils are permeable sand and the topography is relatively flat, which enhance surface water infiltration and result in minimal runoff. No significant impacts related to drainage and flooding would be expected to occur from proposed runway shoulder improvements and no mitigation is proposed.

The Proposed Action could result in temporary erosion, sedimentation, and runoff from the project site as a result of storm events during proposed construction activities. The proposed project area topography and extremely porous carbonate-derived sandy soil are such that there will be no potential for runoff or the requirement for any NPDES Solid Waste Management (SWM) permit (PMRF 2013). Onsite soils are sandy and the topography relatively flat, which enhance surface water infiltration and minimize runoff. The runway is at a lower elevation than the berm between the runway and nearby shoreline, preventing runoff from reaching drainages that discharge into drainage channels and nearby marine waters. No significant impacts on surface water would be expected to occur and no mitigation is proposed.

Training is not expected to result in adverse impacts on surface water. Application of appropriate site drainage control measures, as described above, and development of SOPs for management of petroleum products and hazardous substances during training operations would minimize the potential for contaminants from use of aircraft and vehicles during training to be discharged into surface water from runoff. In addition, Section 3.13, *Hazardous Materials and Waste*, includes information related to potential spills of petroleum products and hazardous substances during training operations. No significant impacts on surface water quality would be expected to occur as a result of training activities and no mitigation is proposed.

3.5.2.3.3 Wetlands

No USACE wetlands have been delineated at PMRF, so no impacts on wetlands would occur as a result of the Proposed Action.

3.5.2.4 PTA

3.5.2.4.1 Ground Water, Surface Water, and Wetlands

The Proposed Action would utilize existing facilities at Cooper Airstrip, which is currently used exclusively to support UAS flight training activities, and no construction would occur. No significant impacts on groundwater or surface water would be expected to occur and no mitigation is proposed. No wetlands have been identified at PTA so no impacts on wetlands would occur as a result of the Proposed Action.

3.5.2.5 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and no construction or renovation activities associated with basing and training of VMU-3 would occur. Baseline conditions for water resources as described in Section 3.5.1, *Affected Environment*, would be expected to continue.

3.6 BIOLOGICAL RESOURCES

3.6.1 Affected Environment

Native or naturalized vegetation and wildlife, and the habitats in which they occur, are collectively referred to as biological resources. Existing information on plant and animal species and habitat types in the vicinity of the proposed activity sites was reviewed. Special emphasis was placed on the presence of species listed by federal or state agencies as threatened or endangered.

This section has been divided into the following subsections (when applicable by location):

- Terrestrial and Marine Flora;
- Terrestrial and Marine Fauna;
- Threatened and Endangered Species and Migratory Bird Treaty Act (MBTA)-Protected Birds, with a focus on threatened and endangered species listed under the Endangered Species Act (ESA) of 1973, as amended, and birds protected under the MBTA of 1918, as amended. For coastal locations, Marine Mammal Protection Act (MMPA) species were also evaluated;
- Invasive Species (plant and animal, terrestrial and aquatic); and
- Sensitive Habitat (designated critical habitat and coral reefs, when present).

Incidents of BASH and wildland fires are covered under Section 3.1, *Airspace*.

3.6.1.1 MCB Hawaii Kaneohe Bay

The Region of Influence (ROI) for biological resources encompasses the areas proposed for building demolitions, renovations, and construction. Adjacent land and water that provide habitat for local plants and animal species are also included in the ROI. UAS would take off from and land on airfield pavement with adequate buffer areas to avoid effects on natural resources, as is the current practice.

3.6.1.1.1 Terrestrial and Marine Flora

Much of the vegetation at MCB Hawaii Kaneohe Bay has been previously disturbed by human activities and is dominated by invasive or planted species, with the exception of certain coastline and dune areas that provide habitat for largely native communities of seastrand vegetation. The existing non-native vegetation cover in much of the occupied land and open space on base consists of planted landscape trees, shrubs, and Bermuda grass.

The non-managed dry land vegetated areas are dominated by non-native koa haole (*Leucaena leucocephala*) shrubland. This dominant plant is an invasive tree species that regenerates rapidly after fire and is prone to forming dense thickets that exclude all other plants. Other common plants on base include kiawe (kiawe, *Prosopis pallida*), Christmas berry (*Schinus terebinthifolius*), and patches of invasive grasses such as guinea grass (*Panicum maximum*) and California grass (*Brachiaria mutica*).

During a USFWS-led coastal and marine resources inventory completed for MCB Hawaii Kaneohe Bay in 2008, dense native seagrass beds were found growing on soft sediment offshore from the Hale Koa recreational camping area (DoN 2012a). This area has been highly modified by past dredging. Two species of seagrass occur in the dredged area but do not co-mingle. In addition, within the 500-yard offshore security buffer zone around Mōkapu Peninsula, culturally important plant species and a native seagrass meadow (used for foraging by the endangered green sea turtle) are also present.

3.6.1.1.2 Terrestrial and Marine Fauna

Two areas supporting important habitat for native and other species have been designated as WMAs on Mōkapu Peninsula—Nu‘upia Ponds and Ulupa‘u Head WMAs. Vegetation in the Nu‘upia Ponds WMA is dominated by invasive pickleweed, while invasive grassland species are dominant in the Ulupa‘u Head WMA. Wildlife species that occur at MCB Hawaii Kaneohe Bay are most concentrated along the base’s 11 miles (17.7 kilometers) of shoreline, within the Nu‘upia Ponds and Ulupa‘u Head WMAs, and within the 500-yard (457.2 meters) offshore security buffer zone. More than 50 species of waterbirds, shorebirds, and seabirds have been recorded along the MCB Hawaii Kaneohe Bay shoreline and within the Nu‘upia Ponds WMA (DoN 2008). Currently, there are no identified native terrestrial amphibians or reptiles on the Hawaiian Islands, although many species have been introduced. Sixteen native fish species inhabit the Nu‘upia Ponds WMA, including mullet (‘ama‘ama, *Mugil cephalus*), milkfish (awa, *Chanos chanos*), ladyfish (awa‘aua, *Elops hawaiiensis*), Pacific threadfin (moi, *Polydactylis sexfilis*), flagtail (aholehole, *Kuhlia sandvicensis*), bonefish (o‘io, *Albula vulpes*) goby (o‘opu-kai, *Oxyurichthys lonchotus*), and barracuda (kaku, *Sphyrna barracuda*).

Abundant populations of estuarine and marine fish, urchins, mollusks, algae, sponges, and invertebrates inhabit the marine waters surrounding MCB Hawaii Kaneohe Bay (DoN 2008, 2011). Important sensitive resources in the 500-yard offshore security buffer zone include bryozoan habitat, habitat for the endemic squid, a portion of an area used by hammerhead sharks for pupping, and by foraging sting rays (*Dasyatis lata*) (DoN 2008). Large platform boulders have broken away from the seaward cliffs on the northern shoreline forming a reef that is highly sculpted with overhangs and ledges where green sea turtles (*Chelonia mydas*) rest (DoN 2011).

3.6.1.1.3 Threatened and Endangered Species, MMPA Species, and MBTA-Protected Birds

Appendix D lists ESA-listed threatened and endangered plant and animal species observed at MCB Hawaii Kaneohe Bay and the surrounding waters in the 500-yard (457.2 meters) offshore security buffer zone, as well as the regulatory status for each species. Appendix D also lists the MBTA-listed birds that occur at MCB Hawaii Kaneohe Bay (DoN 2012a). This list can be found in the INRMP (DoN 2011) as well. The two WMAs provide habitat for ESA-listed and MBTA-protected species. Until 2008, there were no known natural occurrences of plants listed or pending listing as threatened or endangered under the ESA at MCB Hawaii Kaneohe Bay. In January 2008, a self-established plot of the federally listed *Sesbania tomentosa* (Ohai) plant was discovered within the Nu'upia Ponds WMA. In addition, the 2011 INRMP lists two hibiscus species that are federally listed as endangered as occurring at MCB Hawaii Kaneohe Bay (DoN 2011). Caper (*Capparis sandwichiana*), an endemic plant identified by the state as a "species of concern", is also listed as present on the base.

The Nu'upia Ponds complex supports numerous waterfowl and Ulupa'u Head is used by an MBTA-protected seabird colony. A population of approximately 3,000 red-footed boobies (*Sula sula rubripes*) nest in a colony in the Ulupa'u Head WMA. This colony is one of two red-footed booby colonies in the main Hawaiian Islands and has been active since the 1940s (DoN 2008). The Ulupa'u Head WMA is not in the vicinity of the proposed construction or ground-disturbing activities under the Proposed Action. Listed species of note include the endangered waterbirds Hawaiian stilt (aeo, *Himantopus mexicanus knudseni*), Hawaiian gallinule (alae ula, *Gallinula chloropus sandvicensis*), Hawaiian coot (alae keokeo, *Fulica americana alai*), and Hawaiian duck (koloa moali, *Anas syvilliana*), and the Newell's shearwater (*Puffinus auricularis newelli*), which is listed as threatened (DoN 2008, 2012a). Prominent indigenous migratory bird species observed at the base include great frigate birds (iwa or *Fregata minor palmerstoni*), black-crowned night herons (aukuu or *Nyctirax nyctirax hoactli*), and Pacific golden-plovers (kolea, *Pluvialis fulva*).

Two ESA-listed endangered whales, the sperm whale (*Physeter catodon*) and humpback whale (*Megaptera novaeangliae*), have been observed in the MCB Hawaii Kaneohe Bay 500-yard (457.2 meters) offshore security buffer zone (DoN 2012a). The Hawaiian monk seal (*Monachus schauinslandi*) has been documented around the northern and eastern sides of Mōkapu Peninsula (DoN 2011). These and all marine mammals are also protected under the MMPA. Although green turtles are frequently seen in offshore waters, haul outs by these turtles at MCB Hawaii Kaneohe Bay are infrequent. In 2009 an olive ridley turtle (*Lepidochelys olivacea*), federally listed as threatened, successfully nested at Pyramid Rock Beach, which yielded 55 hatchlings (DoN 2011). This is only the third recorded occurrence of an olive ridley turtle nesting in Hawai'i.

3.6.1.1.4 Invasive Species

Invasive plant and animal species are a constant control concern at MCB Hawaii Kaneohe Bay. Invasive species dominate the terrestrial area of MCB Hawaii Kaneohe Bay. Introduced plant species are typical of vegetation on base (koa haole, kiawe, invasive grasses such as guinea grass, California grass, and Christmas berry). Other plants of concern on O'ahu include strawberry guava (*Psidium cattleianum*), Koster's curse (*Clidemia hirta*), Pinkfringe

(*Arthrostemma* sp.), thimbleberry (*Rubus rosifolius*), and Kahili ginger (*Hedychium gardnerianum*) (U.S. Army 2013). There is a continuing focus on invasive plant control efforts for Nu'upia Ponds WMA, Ulupa'u Head WMA, and other wetlands frequented by endangered waterbirds and migratory waterfowl (DoN 2012a). SOPs, including education, monitoring, and control, are in place to deter the transport of invasive species to and from MCB Hawaii Kaneohe Bay. These include the inspection of vehicles that are transported to and from PTA for plant materials such as fountain grass (*Pennisetum setaceum*), a highly flammable invasive plant prevalent on the island of Hawai'i (DoN 2012a).

Existing invasive animal species control programs include regular removal of mongoose, feral cats, and rats from protected bird sanctuaries. An invertebrate of particular concern is the rosy wolf snail (*Euglandina rosea*), which was introduced to Hawai'i from Florida to control the invasive African snails but has since also begun preying on native tree snails.

In the marine environment, the spread of invasive alien species is considered a threat to biological diversity. Invasive algae species are established in some shoreline areas, such as the seaplane ramp area and the nearshore of the Hale Koa Recreation Area. The USFWS inventory of coastal and marine resources at the base documented 12 marine nonindigenous species considered invasive, including five algae, four invertebrates, and three fish species (DoN 2011, 2012a).

3.6.1.1.5 Sensitive Habitat

Critical Habitat

MCB Hawaii Kaneohe Bay does not contain federally designated critical habitat. The National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), has published a proposed rule (FR 2011) to expand critical habitat for the endangered Hawaiian monk seal (*Monachus schauinslandi*) around the main Hawaiian Islands, potentially including shorelines and offshore waters around MCB Hawaii Kaneohe Bay where monk seals are found. However, NOAA has determined that MCB Hawaii Kaneohe Bay is "ineligible" for such designation, citing that the MCB Hawaii Kaneohe Bay INRMP "demonstrated potential conservation benefits for the species, a strong history of plan implementation, and a clear structure to ensure plan effectiveness so the plan was found to be a benefit to the species" (50 CFR 226).

Coral Reefs

The USFWS completed a quantitative inventory of the coastal and marine resources in 2008 and in 2010 within the 500-yard (457.2 meters) offshore security buffer zone around Mōkapu Peninsula, and also completed a qualitative benthic community and habitat-mapping project of the coastal and marine resources in 2012. The offshore security buffer zone survey focused on nearshore coral reef species and habitats. During the 2012 benthic community and habitat-mapping project, two species of indigenous rice coral, *Montipora flabellate* and *M. patula*, proposed for listing as endangered species, were identified in MCB Hawaii Kaneohe Bay's 500-yard buffer zone. Coral reef colonies occur throughout the zone, with coral species type and abundance varying based on wave conditions, freshwater input, and bathymetry. The highest coral coverage is believed to be offshore of the northwest end of Mōkapu Peninsula and offshore of Ulupa'u Head, followed by some portions of Kailua Bay (DoN 2008). Studies of

marine species conducted in the security buffer zone have identified numerous sensitive coral resources, including an area of finger coral (*Porites* spp.), coral colonies with high conservation value, and an area that supports a high diversity of corals (DoN 2008, 2011).

3.6.1.2 WAAF

3.6.1.2.1 Terrestrial Flora

The site on WAAF for construction of the proposed VMU-3 facility consists primarily of disturbed areas containing buildings, paved areas, landscaped features, roadways, runways, and open fields planted in grasses. These areas are generally heavily managed and support introduced and maintained grasses and ornamental trees and shrubs.

The flora at WAAF is limited in diversity and is dominated by non-native species or by species habituated to human disturbance and maintenance. The vegetation community at WAAF consists of three vegetative types: managed land, Leucaena Scrub Forest, and Plantain Forest (USACE 2011). The overall vegetation in the airfield area consists of managed land that is usually kept mowed due to the presence of the airfield and other operational activities. The Army manages vegetation at WAAF to control pests and wildfire and to maintain the military training mission. Species found at WAAF include koa haole, as described for MCB Hawaii Kaneohe Bay in Section 3.6.1.1.1. Another species present is molasses grass (*Melinis multiflora*), which also regenerates quickly after fire and can inhibit the growth of other plants by its dense matting and by producing chemicals that inhibit other plants from taking root. Other species include introduced forest species, such as silk oak (*Grevillea robusta*) and eucalyptus (*Eucalyptus* spp.) (USACE 2011). Fields and lawns also support Bermuda grass (*Cynodon dactylon*), Christmas berry, Formosa koa (*Acacia nfusa*), and Norfolk Island pine (*Araucaria heterophylla*), a vegetation community that generally offers little habitat value. The vegetation located in areas dominated by grasses is routinely mowed and tends to be weedy or non-native, with low plant diversity.

WAAF contains numerous “exceptional trees”, distinguished by their nomination to the City and County of Honolulu Register of Exceptional Trees by the Division of Urban Forestry. These trees include pagoda (*Mimusops elengi*), narra (*Pterocarpus indicus*), kamani (*Calophyllum inophyllum*), monkeypod (*Samanea saman*), royal palm (*Roystonea regia*), white ash (*Fraxinus americana*), guachapele (*Albizia guachapele*), albizia (*A. procera*), and date palm (*Phoenix canariensis*). None of these exceptional trees occurs within or near the project site.

3.6.1.2.2 Terrestrial Fauna

Vegetation typically planted for landscaping generally does not provide high-quality forage or habitat for wildlife species. Since the habitat available for wildlife at WAAF is of low quality, wildlife abundance and diversity is low. Wildlife is dominated by non-native species or by species habituated to human disturbance.

Wildlife at WAAF primarily consists of birds, with the greatest diversity found in the forested gully areas outside the site proposed for VMU-3 use. Naturalized bird species, including the spotted dove (*Streptopelia chinensis*), common mynah (*Acridotheres tristis*), red-vented bulbul (*Pycnonotus cafer*), and red-crested cardinal (*Paroaria ronata*), may occur at WAAF (USACE 2011). Primarily non-native and common birds are expected to use areas around the

runways due to their tolerance of, and attraction to, highly disturbed areas. Some other typical non-native bird species known to occur at WAAF are the red-billed leiothrix (*Leiothrix lutea*), white-rumped shama (*psychus malabaricus*), Japanese bush warbler (*Cettia diphone*), rock dove (*lumbia livia*), zebra dove (*Geopelia striata*), Japanese white-eye (*Zosterops japonicus*), nutmeg manikin (*Lonchura punctulata*), chestnut manikin (*L. malacca*), barn owl (*Tyto alba*), Erchel's francolin (*Francolinus erckelii*), ring-necked pheasant (*Phasianus lchicus*), house sparrow (*Passer domesticus*), and northern cardinal (*Cardinalis cardinalis*). These species have been introduced onto O'ahu by humans.

3.6.1.2.3 Threatened and Endangered Species and MBTA-Protected Birds

There are no reported ESA-listed species or areas of significant biological resource value near the project site. Since the area has been disturbed and the habitat so altered, it is unlikely that habitat capable of supporting any listed species remains on the project site. No species with other special status have been identified at WAAF (USACE 2011). No sensitive plant species occur, and any sensitive wildlife species that may occur would be rare or incidental.

The Pacific golden-plover (*Pluvialis fulva*), which is protected by the MBTA, has been observed at WAAF. This migratory bird is in greatest abundance in Hawai'i from August through May and is commonly found on mudflats, lawns, fields, and grassy mountain slopes from sea level to 10,000 feet.

The Hawaiian short-eared owl (*Asio flammeus sandwichensis*), also known as pueo, is an indigenous bird listed as endangered by the State of Hawai'i and known to occur on all the main Hawaiian Islands; it is most common on Moloka'i, Hawai'i, and Kaua'i, and is rare on O'ahu. It has, however, been recorded near WAAF (USACE 2011). It is active throughout the day and evening and is most often seen hunting in grasslands. It is a ground-nesting bird and inhabits dry forests and rainforests. Since its occurrence is so rare, the Hawaiian short-eared owl is not expected to be found near WAAF.

3.6.1.2.4 Invasive Species

Invasive species present at WAAF are similar to those listed for MCB Hawaii Kaneohe Bay. These include introduced plant species such as koa haole, kiawe, invasive grasses such as guinea grass, California grass, and Christmas berry. There is a continuing focus on management of invasive species through SOPs, including control, education, and monitoring to deter their spread to and from WAAF. These include the inspection of vehicles that are transported to and from other installations for invasive plant material (USACE 2011).

Non-native mammals identified in the vicinity of WAAF include feral pigs, feral goats, feral cats, feral dogs, Indian mongoose (*Herpestes auropunctatus*), Polynesian rat (*Rattus exulans hawaiiensis*), Norway rat (*R. norvegicus*), black rat (*R. rattus*), and common mouse (*Mus musculus*) (USACE 2011). Other non-native species introduced into O'ahu from other countries include several snails, amphibians, and reptiles.

3.6.1.2.5 Sensitive Habitats

There are no sensitive or specially designated habitats present in or near WAAF.

3.6.1.3 PMRF

The region of Kaua'i containing PMRF is known as the Mana Plain and is historically associated with extensive wetlands separated from the coastal beach by high sand dunes. The landscape that PMRF occupies on the beach side of the dunes is a long, narrow property that extends from Nohili Point on the north to Kokole Point on the south, and is bounded on the east by agricultural land. The majority of the base is developed with large, open, grassy lawn areas bordering the airfield and buildings. About 600 acres are undeveloped and scattered throughout the facility.

3.6.1.3.1 Terrestrial and Marine Flora

Six vegetation types are recognized on the undeveloped portions of PMRF, including the kiawe-koa haole scrub, a'ali'i-nama scrub, pohinahina, naupaka dune, strand, and drainage-way wetlands. Kiawe-koa haole and a'ali'i-nama scrub are the dominant vegetation in this portion of PMRF and in the adjacent Polihale State Park, primarily on sand dunes (DoN 2010b). A well-developed native strand community exists along the shoreline supporting common plants such as beach naupaka, pohinahina, pohuehue, milo, and hau. Stands of a'ali'i occur in the southern half of PMRF but the dominant woody vegetation through much of the Barking Sands beach area consists of kiawe (kiawe) and koa haole scrub (DoN 2010b). Drainage-way wetlands vegetation occupies only a small area at PMRF.

Within kiawe-koa haole scrub, landscape plants and ruderal vegetation (weedy fields) dominate in disturbed areas and on the edges of developed areas, especially in PMRF's airfield area near the project site. Ruderal vegetation is found alongside paved and unpaved roads and on disturbed parcels; much of this vegetation is maintained by mowing on a regular basis.

Common plants found in rocky intertidal habitats offshore of PMRF include sea lettuce, sargasso or kala, coralline red algae, red fleshy algae, brown algae, and fleshy green algae (DoN 2010b). Algal species on the limestone bench fronting Nohili Point preferred by the green sea turtle include, but are not limited to, lipuupuu, kala-lau-nunui, pahalahala, and mane'one'o. An algal and macro invertebrate survey conducted in Majors Bay noted that four macro algal and eight macro invertebrate species were present (DoN 2010b).

3.6.1.3.2 Terrestrial and Marine Fauna

Rich areas of wetlands that provide habitat for numerous waterbirds occur off base but adjacent to the inland boundary of PMRF at Mana Point. Another valuable habitat area occurring outside but adjacent to the PMRF boundary is the Kawaiete Waterbird Sanctuary. Birds identified at PMRF include non-native, migratory, and species endemic to Hawai'i. Other fauna species have been introduced and are covered in Section 3.6.1.3.4, *Invasive Species*.

The pueo, or Hawaiian short-eared owl, is the only endemic non-migratory bird species that occurs in the region and is listed as endangered by the State of Hawai'i. Reptiles observed at PMRF during recent surveys include the introduced species house gecko (*Hemidactylus frenatus*), mourning gecko (*Lepidodactylus lugubris*), and snake-eyed skink (*Cryptoblepharus poecilopleurus*). The only amphibian observed was the marine toad (*Bufo marinus*).

3.6.1.3.3 Threatened and Endangered Species, MMPA Species, and MBTA-Protected Birds

There are no occurrences of plants at PMRF that are currently federally listed or pending listing as threatened or endangered species under ESA. However, there is unoccupied USFWS-designated critical habitat for the lau 'ehu (*Panicum niihauense*), an endangered grass species, within the range. Portions of the critical habitat are located along the shoreline fronting the airfield (DoN 2012a).

Complete lists of federally listed faunal and MBTA-protected species at PMRF are provided in Appendix D (DoN 2012a). Species of note that use habitats in and near PMRF include the green sea turtle (*Chelonia mydas*), federally listed as threatened in Hawai'i, which hauls out along beaches adjacent to PMRF, and the Hawaiian monk seal (*Monachus schauinslandi*), which is federally listed as endangered. Both of these species use beaches on a seasonal basis. Green and hawksbill (*Eretmochelys imbricate*, listed endangered) sea turtles are the most common sea turtles in offshore waters around the main Hawaiian Islands, as they prefer reef-type environments that are less than about 330 feet (100.6 meters) deep. For the green turtle, nesting in Hawai'i occurs from April through October, with a peak between mid-June and early August (NatureServe 2013a). Up to three sea turtle nests have been documented on the beach near PMRF each year between 2010 and 2012 (DoN 2013a). Green turtles primarily use the beaches in the vicinity of Nohili Ditch for haul-out and basking. The freshwater discharge at Nohili Ditch appears to be at least partially responsible for sea turtle use of this foraging habitat, since it stimulates filamentous algae growth on the nearshore reef bench (DoN 2010b).

The Hawaiian monk seal is the only endangered marine mammal that occurs exclusively within the U.S. The majority of the monk seal population occurs in the Northwestern Hawaiian Islands, with lower numbers occurring in the main Hawaiian Islands, including Kaua'i (DoN 2008). The first Hawaiian monk seal birth recorded on a Kaua'i beach since 1993 occurred at PMRF in 1999. Since then, from one to four pups have been recorded each year on Kaua'i beaches (DoN 2010a, NMFS/NOAA 2007). Pups are primarily born between February and August, but the monk seal has a long pupping season beginning as early as late December (NatureServe 2013b). The Hawaiian monk seal recovery plan states that increasing numbers of monk seals in the main Hawaiian Islands are very important for recovery of the species if another functional subpopulation can be added to boost genetic diversity for the overall metapopulation (NMFS/NOAA 2007).

The Hawaiian hoary bat (*Lasiurus cinereus* spp. *semotus*) is listed as a federal and state endangered species and is Hawai'i's only native terrestrial mammal. This species primarily roosts in native and non-native vegetation and, rarely, in lava tubes, cracks in rocks, and man-made structures (DoN 2008). Watercourses and edge habitats are considered important foraging areas for the hoary bat, and it has been recorded at PMRF foraging around the sewage oxidation ponds in the southern section of the base and just offshore of the Nohili Ditch outfall in the northern portion of the base (DoN 2010b). Hoary bats also use Polihale State Park north of the base. A U.S. Geological Survey (USGS) study using Anabat II Bat Detectors and Song Meter Digital Field Recorder Platforms to sample during 486 station-nights at seven stations at PMRF found bat activity to be highest between September and December (DoN 2013a).

Seven federally-listed bird species are potentially present or confirmed in the PMRF area (DoN 2010b). According to the Navy and USFWS, the endangered Hawaiian goose, or nēnē (*Branta sandvicensis*), is present at PMRF. An active nēnē nest was found at PMRF on the northeast edge of the Hawaii Air National Guard complex in 2009, less than one mile from the south end of the active runway. Approximately 20 additional adult nēnē were also observed, many of them less than 1,500 feet from the south end of the runway (DoN 2010b). Under an Agent Designation Letter issued by the USFWS to reduce the incidents of BASH, the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service, Wildlife Services, has worked with the Navy to haze nēnē from areas near the runway (DoN 2010b). The Navy has also experimented with translocation of one family of nesting nēnē and goslings from PMRF to Kilauea National Wildlife Refuge with little success because natal site imprinting has still occurred. Consultation with USFWS and a base-wide Biological Assessment (BA) are in progress to continue to address this issue.

From April to November, Kaua'i provides the majority of Hawai'i's nesting habitat for the threatened Newell's shearwater (*Puffinus auricularis newelli*) in the interior mountains. Adults leave the nesting grounds at sunrise to forage in the open ocean and return after dusk (DoN 2013a). PMRF has experienced some issues with shearwaters "falling out", which describes birds that migrate at night becoming disoriented by artificial lighting and striking objects in their paths (DoN 2013a). Since 2010, most outdoor lighting has been retrofitted with hoods that direct light downward, and most high intensity fixtures have been replaced with full-cutoff LEDs. These actions have substantially reduced fall outs of seabirds heading to and from the open ocean. In addition, PMRF continues to test the efficacy of green-wavelength lamps for reducing disorientation.

The Hawaiian dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*), which is listed as endangered, nests from mid-February until late November and may traverse the project area. Similar to Newell's shearwaters, adults leave the nest every dawn to forage on the ocean and return before dark (DoN 2013a). The Hawaiian coot, Hawaiian black-necked stilt, Hawaiian common moorhen, and Hawaiian duck are endangered waterbirds that have been observed in the drainage ditches and the oxidation ponds at PMRF. In March of 2000, a juvenile endangered short-tailed albatross was observed at PMRF resting in the grass near the runway (DoN 2010b), but there have been no sightings since.

Several species of migratory seabirds and shorebirds protected by the MBTA are present during some portion of the year at PMRF. Brown boobies (*Sula leugaster*), sanderlings (*Calidris alba*), wandering tattlers (*Heteroscelus incanus*), ruddy turnstones (*Arenaria interpres*), and Pacific golden-plovers are commonly observed at PMRF. The black-footed albatross (*Phoebastria nigripes*), a seabird that is state-listed as threatened, has also been observed at PMRF (DoN 2010b). Wedge-tailed shearwaters (*Puffinus pacificus*) are Hawaiian indigenous seabirds that nest in the Nohili Dunes area near PMRF. Nesting colony restoration efforts began in 2006, including removing non-native trees and planting native vegetation. The Navy fenced off an acre near the center of PMRF and provided artificial nest burrows to encourage wedge-tailed shearwater nesting and provide some protection. There were an estimated 276 breeding pairs in the compound in 2006 (DoN 2010b). The Laysan albatross (*Phoebastria immutabilis*), also protected under the MBTA, uses ruderal vegetation areas at PMRF for courtship and nesting. With high mortality rates and breeding distribution primarily restricted to the Hawaiian Islands,

the Laysan albatross is listed as vulnerable to extinction by the World Conservation Union (Audubon 2013), but does not have federal status. The Laysan albatross is being discouraged from nesting near the runway at PMRF to prevent incidents of BASH and albatross and their viable eggs are relocated to Kilauea National Wildlife Refuge in cooperation with the USDA Animal and Plant Health Inspection Service and the USFWS (DoN 2010b). Twenty-three eggs were placed with surrogate parents during the 2009/2010 season (U.S. Army 2010b).

The Hawaiian Distinct Population Segment of the band-rumped storm-petrel (*Oceanodroma castro*) is a candidate for federal listing. Historically, the species was abundant and widespread throughout the Hawaiian Islands but the current breeding population is unknown and likely very small. The population on Kaua'i was estimated at between 171 and 221 breeding pairs in 2005 (DoN 2010b).

A small-boat based survey for odontocetes (toothed dolphins and whales, protected under MMPA) was undertaken off the islands of Kaua'i and Ni'ihau in 2005. Survey coverage was from shallow coastal waters out to over a 9,842-foot depth, though almost half was in water less than 1,640 feet deep. There were 56 sightings of five species of odontocetes: 30 spinner dolphins, 14 bottlenose dolphins, six short-finned pilot whales, five rough-toothed dolphins, and one pantropical spotted dolphin (U.S. Army 2010b). Humpback whales are known to occur offshore and are an MMPA-protected species and ESA-listed as endangered. Peak abundance around the Hawaiian Islands for humpback whales is from late February through early April. During the autumn-winter period, primary occurrence is expected from the coast to 50 nautical miles offshore, including the areas off PMRF (DoN 2010b).

3.6.1.3.4 Invasive Species

Invasive species have been identified at PMRF and common predators such as rats pose a threat to native species on the installation. Kiawe-koa haole scrub, with the dominant species kiawe and koa haole, occupies roughly 400 acres of the main base. The non-native lantana (*Lantana camara*) is found in the Kiawe-koa haole scrub areas. The long-thorned kiawe (*Prosopis juliflora*) is present along a portion of the PMRF coastline and has been deemed a hazard at the base (DoN 2012a).

Feral dogs and cats occur in the region and prey on native and introduced species of birds. Rodents, including the Polynesian black rat, Norway or brown rat, and the house mouse are also known to occur in the region (DoN 2010b). PMRF has a continuing feral animal-trapping program to protect the albatross as well as the wedge-tailed shearwater and other birds on-base.

Non-native bird species on Kaua'i are usually common field and urban birds such as the zebra dove, Japanese white-eye, ring-necked pheasant, northern cardinal, northern mockingbird, and house finch (DoN 2010b). In recent years, the primary predation documented in wedge-tailed shearwater colonies has been from barn owls (*Tyto alba*), which were introduced to the Hawaiian Islands. A total of 101 barn owls have been culled at Barking Sands since 2005 to reduce deleterious effects to indigenous species (DoN 2010b).

3.6.1.3.5 Sensitive Habitat

Critical Habitat

In 2008, USFWS designated critical habitat for the endangered lau 'ehu (*Panicum niihauense*) at Polihale State Park, north of PMRF, and in beach areas of PMRF (Figure 3.6-1). Although this plant is not found at PMRF, the USFWS has determined that land at PMRF in dune areas along the southern portion of the range contains primary constituents necessary for the recovery of lau 'ehu. The USFWS designated these areas as unoccupied critical habitat since there are not enough other areas outside the base that contain the elements to achieve the USFWS' goal of 8 to 10 recovered lau 'ehu populations (DoN 2010b).

Coral Reefs

PMRF nearshore waters were surveyed for coral reefs and other marine resources in 2000 and 2007 to provide information for the INRMPs dated October 2001 and November 2010. Offshore of the runway proposed for UAS use, living corals are more sparsely distributed than off Nohili Point to the north. Nohili Point contains more coral cover than anywhere else in the study area, yet still ranges from only 32 to 39 percent of bottom cover. The most abundant coral species are lobe coral, rose or cauliflower coral, and ringed rice coral. Macroinvertebrates in this area include the rock oyster, cone shells, sea urchins, and sea cucumbers (DoN 2010b). Continual wave action appears to limit coral growth on the reef platforms, and corals in the Mana Point area occur predominantly as flat encrustations on the flat bottom. The breaking, scouring, and abrading action caused by waves on corals yields high mortality and corals in wave-exposed areas die as fast as they can be replaced (DoN 2010b). Solitary colonies of *Porites lobata* and *Pocillopora* spp. are the most abundant species in the Mana Point Sector (DoN 2012a).

Essential Fish Habitat

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat has been designated within Kaua'i's Exclusive Economic Zone, the 200-mile (322-kilometer) boundary around the island. Essential Fish Habitat includes those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 [United States Code] USC 1802). These waters include aquatic areas and their associated physical, chemical, and biological properties used by fish, and may include areas historically used by fish (DoN 2010b). Areas designated as Essential Fish Habitat contain habitat essential to the long-term survival and health of our nation's fisheries. These areas off PMRF sustain a large variety of shallow-water (0 to 328 feet [0 to 100 meters]) bottomfish, deep-water (328 to 1,312 feet [100 to 400 meters]) species, marketable pelagic species (down to 3,280 feet [1,000 meters]), and crustaceans (DoN 2010b).

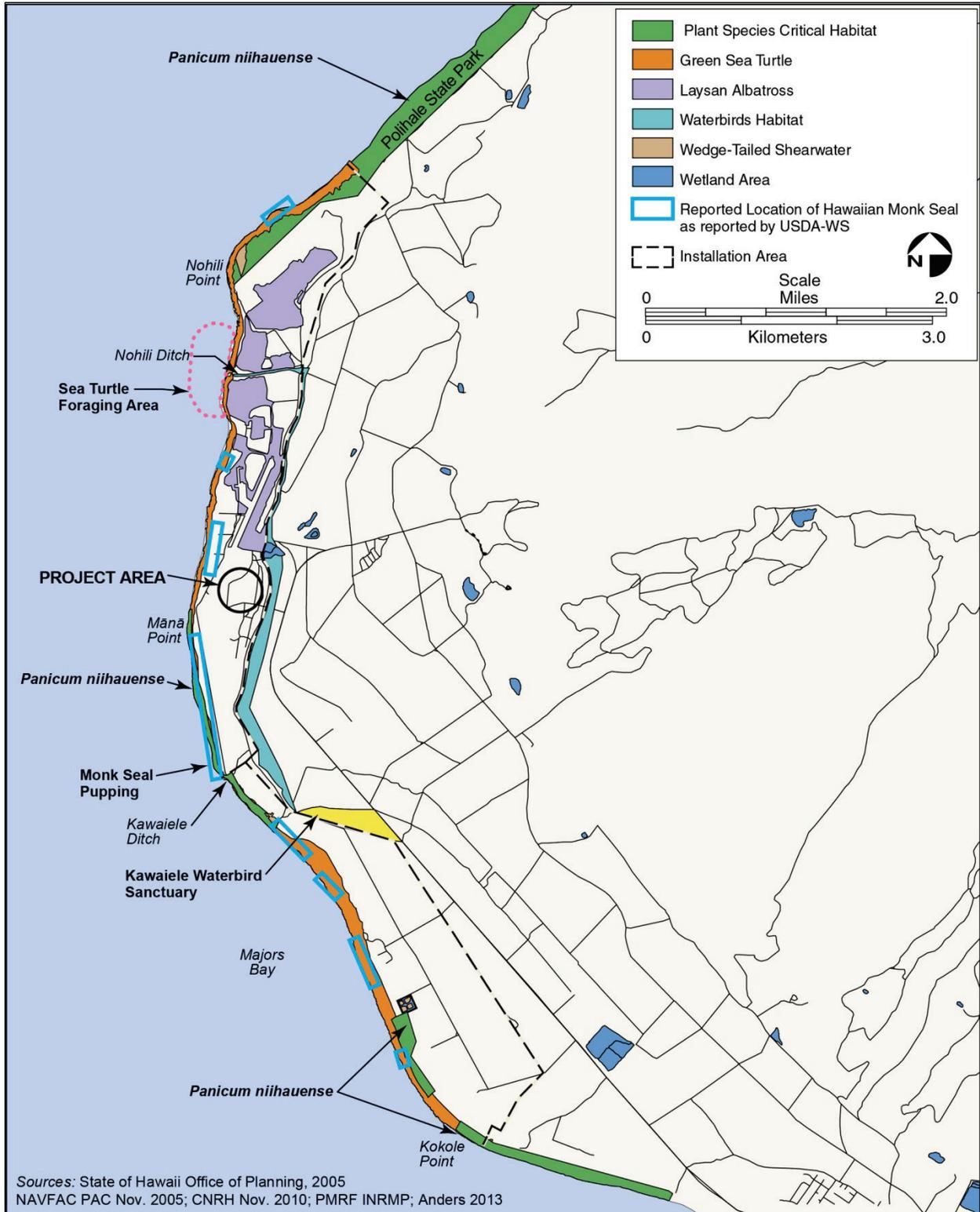


Figure 3.6-1. PMRF Critical Habitat

3.6.1.4 PTA

3.6.1.4.1 Terrestrial Flora

PTA is considered a subalpine tropical dryland ecosystem (CEMML 2009). A total of 313 vascular plant taxa from 75 families and 203 genera have been identified at PTA (U.S. Army 2010b). Most taxa are forbs (42 percent), followed by grasses and grass-like plants (18 percent) and shrubs (16 percent). Approximately 40 percent of plants found at PTA are indigenous or endemic, and about 60 percent are non-native species.

Thirty-three distinct plant communities have been described at PTA. Ground cover ranges from little to no plant cover (barren lava) to treelands, shrublands, grasslands, and species-rich kipuka, which are vegetated areas that persisted in the midst of lava following volcanic eruptions. Barren lava covers 25 percent of the installation. Lichens, such as lava lichen (*Stereocaulon vulcani*), and ferns, such as cliffbrake (*Pelaea ternifolia*), are the first colonizers of these flows, although fountain grass is beginning to invade these barren areas (DoN 2012a). There are four types of *Metrosideros* treeland, ranging from sparse to mixed intermediate. The dominant canopy vegetation in these areas is generally ohia. There are three types of *Dodonaea* shrubland: open, dense, and mixed. The 'a'ali'i (*Dodonaea vissa*) is the dominant plant in each community, along with other native species, including ilima (*Sida fallax*), aheahea, and naio. Pūkiawe (*Leptephylla tameiameiae*) occurs either as a mixed shrubland community or as a component of *Leptephylla-Dodonaea* shrubland. *Chamaesyce* treeland is generally found hosting native species 'Akoko (a species of concern), ilima, aheahea, and 'a'ali'i. *Chenopodium* shrubland and hardstem lovegrass grassland are similar communities with different dominant species. The remainder of the native natural communities is a combination of *Chamaesyce*, *Myoporum*, and *Sophora* species, with divisions based on the density of species.

Most of the native habitat observed in and around the activity areas on-base has been disturbed by military operations or ungulate browsing. These disturbances have greatly reduced the potential of these areas to support native plant and wildlife species. Furthermore, PTA has been under severe drought conditions for several years, leaving much of the vegetation (and potential habitat) either dead or severely stressed (DoN 2012b).

3.6.1.4.2 Terrestrial Fauna

Thirty-seven avian species have been recorded at PTA, 20 of which do not receive ESA or MBTA protection because they are either game birds or non-migratory.

Ten of the non-native species are game birds. The PTA Natural Resources staff conducts avian surveys of forest populations. The Hawaiian 'amakihi (*Hemignathus virens virens*; native) is the most frequently documented species during these surveys, averaging 26 percent of the sightings from 2003 to 2005, followed by the Japanese white-eye (*Zosterops japonicus*; non-game, non-native, 19 percent), Erckel's Francolin (*Francolinus erckelli*, non-native, game bird, 11 percent), and house finch (*Carpodacus mexicanus*; non-native, non-game, migratory bird, 10 percent) (U.S. Army 2010a).

3.6.1.4.3 Threatened and Endangered Species and MBTA-Protected Birds

Fifteen endemic plant species at PTA are listed as endangered, one is listed as threatened, and two are candidate endangered species (DoN 2012b). Listed plants are carefully monitored and many acres of land harboring sensitive plants are kept fenced, which provides protection from feral ungulates and human activities (CEMML 2009).

Five bird species recorded to occur at PTA are ESA-listed species (endangered), and another eight are protected under the MBTA. Rare and endangered bird surveys are continuing as per two USFWS Biological Opinions (USFWS 2003, DoN 2012a) and as part of the installation's ecosystem management program. Information gathered is utilized to determine and guide management strategies for enhancing habitats and populations. Species currently monitored include the Hawaiian 'elepaio (*Chasiempis sandwichensis sandwichensis*), Hawaiian hawk ('io) (*Buteo solitarius*), nēnē, and the Hawaiian dark-rumped petrel (U.S. Army 2010b).

Other MBTA-protected species of note seen in recent surveys include apapane (*Himatione sanguine*), Hawai'i amakihi (*Hemignathus virens*), house finch, northern cardinal, northern mockingbird, skylark (*Alauda arvensis*), and Pacific golden-plover.

The ESA-listed endangered Hawaiian hoary bat is known to occur at PTA. Surveys for the Hawaiian hoary bat conducted at the installation began in 2007 and include using echolocation to detect bats. Based on limited available information, Hawaiian hoary bats are present in low numbers throughout PTA year-round. Bat activity is apparently greatest from September to December (post-lactation period), and least from January to March (pre-pregnancy period) with a minor peak in May and June during the breeding season. The year-round presence of bats and the availability of suitable roosting habitat indicate that bats are likely breeding, foraging, and possibly roosting at PTA (DoN 2012a).

3.6.1.4.4 Invasive Species

Eight plant, seven ant, one weevil, and nine mammal species have been identified as invasive within the boundaries of PTA (U.S. Army 2010b). These species directly or indirectly affect native species and their persistence, and/or interfere with the military mission. The natural resources staff controls invasive and noxious weeds that include fountain grass (*Pennisetum setaceum*), fireweed (*Senecio madagascarensis*), banana poka (*Passiflora mollissima*), and Russian thistle (*Salsola kali*). In recent years, fountain grass has become an increasing part of the landscape, especially in disturbed sites (e.g., along roads and covering trails).

Feral pigs, along with rat species, mongoose (*Herpestes auropunctatus*), mouse (*Mus domesticus*), domestic cattle (*Bos taurus*), domestic horse (*Equus caballus*), feral dogs, and feral cats are considered nuisance species and harmful to the persistence of many native species (DoN 2008).

3.6.1.4.5 Sensitive Habitat

Critical Habitat

Two areas within PTA boundaries north of Saddle Road are designated as critical habitat for palila (*Loxioides bailleui*), an endangered finch. The critical habitat is composed of mamane

(*Sophora chrysophylla*) and naio (*Myoporum sandwicense*) forests which play an essential role in the survival of this endangered species. No documented populations of palila occur in critical habitat on the installation, but there could be incidental presence because these birds are found on adjacent state lands (DoN 2012a, U.S. Army 2010b).

3.6.2 Potential Impacts

3.6.2.1 Proposed Action

3.6.2.1.1 MCB Hawaii Kaneohe Bay

Basing

Basing of VMU-3 at MCB Hawaii Kaneohe Bay would include demolition, renovation, and construction on buildings and previously disturbed surfaces within the project area, which do not provide high-quality habitat for native or naturalized flora. Demolition, renovation, and construction would not occur in the vicinity of ESA-listed or other protected species, endemic seagrass found offshore, or sensitive habitats, including coral reefs. Undeveloped areas within the project area would either be paved or planted with landscape-type plant material for easy maintenance. Indirect effects could result from surface water runoff. These impacts would be minimized or avoided with the use of established BMPs. Based on the distance of the project site to the ocean, native seagrass found offshore would not be affected by surface water runoff during construction or operations. Implementation of BMPs to avoid or minimize stormwater runoff would further reduce potential impacts on seagrass (Section 3.5, *Water Resources*). No significant impact on biological resources would be expected to occur and no mitigation is proposed.

Proposed construction and renovation activities would occur mainly within currently developed areas within the airfield flightline. Existing invasive species management programs would be implemented in coordination with facilities pest control within the project area if necessary. No significant impacts on biological resources as a result of invasive species would be expected to occur and no mitigation is proposed.

Training

Proposed training activities would include up to 480 annual UAS landing and takeoff operations from the existing paved airfield within the FAA-designated Class D airspace above MCB Hawaii Kaneohe Bay, which would result in approximately a 0.1 dB change in noise level (DNL) from existing conditions (Section 3.3.2). Proposed UAS training is not expected to adversely affect any listed or protected species in and around the airfield. In addition, many of these species are already exposed to, and likely habituated to, military flight training activities. No significant impacts on biological resources would be expected to occur and no mitigation is proposed.

3.6.2.1.2 WAAF

The project area where construction would occur is located within the existing flightline at WAAF. The portion of the project site in which construction would occur does not provide valuable habitat for listed and/or protected species and is maintained to discourage wildlife presence because it is near the runway. No significant impacts on biological resources would be expected to occur and no mitigation is proposed.

There are no listed species and few protected birds present at WAAF. Proposed UAS flight training activities would take place in the context of current military training operations at WAAF and would result in minimal increases in noise. The RQ-7B and RQ-21A are 10 and 17 decibels (dB) quieter, respectively, than the quietest manned aircraft operating at WAAF, and UAS training is conducted primarily at high altitudes. Proposed training is not expected to adversely affect any listed or protected species in and around the airfield. In addition, many of these species are already exposed to, and likely habituated to, military flight training activities. No significant impacts on biological resources would be expected to occur and no mitigation is proposed.

3.6.2.1.3 PMRF

No significant impacts on biological resources would be expected to occur as a result of minor improvements to the runway shoulder and the addition of UAS arresting gear, and no mitigation is proposed.

Even with several listed and protected species using areas in and around PMRF, UAS training from the existing paved airfield at PMRF is not expected to adversely affect these species since they are already exposed to, and likely habituated to, military training activities. Natural resources management programs are currently in place to protect ESA-listed and MBTA-protected species at PMRF, and increases in overflights and noise would be consistent with existing airfield operations. No significant impacts on biological resources would be expected to occur and no mitigation is proposed.

3.6.2.1.4 PTA

No facility upgrades would be needed at PTA to support the intermittent VMU-3 UAS training. The Proposed Action would utilize existing facilities at Cooper Airstrip, which is currently used exclusively for UAS operations, to support training activities. Species in close proximity to the airfield are currently exposed to, and likely habituated to, military training in the area. Natural resources management programs that are currently in place through the PTA INRMP to protect listed and other sensitive species would be applied to the Proposed Action as necessary. In addition, training operations would follow measures as required by regulations and SOPs to avoid impacts on ESA-listed and MBTA-protected species. No significant impacts on biological resources would be expected to occur and no mitigation is proposed.

3.6.2.2 *No-Action Alternative*

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and no construction or renovation activities associated with basing and training of VMU-3 would occur. Baseline conditions for biological resources as described in Section 3.6.1, *Affected Environment*, would be expected to continue.

3.7 POPULATION AND HOUSING

3.7.1 Affected Environment

3.7.1.1 MCB Hawaii Kaneohe Bay

The Proposed Action would relocate VMU-3 squadron personnel, including the addition of approximately 480 persons to O'ahu, Hawai'i in 2014. Housing for personnel and dependents would be provided on-base at MCB Hawaii Kaneohe Bay, at other Navy/Marine Corps housing areas on the island of O'ahu, or within the local community as needed and available. Housing at MCB Hawaii Kaneohe Bay consists of military family housing as well as bachelor housing.

Population and housing characteristics were evaluated in the areas anticipated to absorb the relocated population. The 2010 U.S. Census population and housing data for the State of Hawai'i, Honolulu County and related Census Designated Places (CDP) are shown in Table 3.7-1.

	Population	Persons Under 5 Years	Persons Under 18 Years	Housing Units	Occupied Housing Units	Available Housing Units	% Available Housing Units
State of Hawai'i	1,360,301	6.4%	22.2%	516,394	445,513	70,881	13.7%
Honolulu County	953,207	6.5%	22.0%	336,011	307,248	28,763	8.6%
Kaneohe Station CDP	9,517	13.8%	25.7%	2,275	2,089	186	8.2%
Kaneohe CDP	34,597	5.8%	20.8%	11,496	11,006	490	4.3%
Kailua CDP	38,635	5.4%	20.5%	13,517	12,877	640	4.7%
Pearl City CDP	47,698	5.8%	19.3%	14,604	14,159	445	3.0%
Urban Honolulu CDP	337,256	4.9%	17.4%	143,602	127,727	15,875	11.1%

Key: CDP=Census Designated Place
Sources: Census 2010a, Census 2010b

As of the 2010 Census, the resident population of MCB Hawaii Kaneohe Bay (identified in Table 3.7-1 as Kaneohe Station CDP) was 9,517. Percentages of school aged, or near school aged, children were higher than county and related CDP averages. As reported by base housing staff in December 2010, on-base housing accommodates 3,398 bachelor personnel and 2,216 families. By the end of 2014, the number of family housing units at MCB Hawaii Kaneohe Bay is expected to reach 2,592 (DoN 2012a). Off-base housing availability in 2010 ranged from approximately 3 to 11 percent in related CDPs and more than 9 percent county-wide (Table 3.7-1).

3.7.1.2 WAAF, PMRF, and PTA

Under the Proposed Action, there would be no personnel based at WAAF, PMRF, or PTA. Therefore, baseline population and housing data for these installations are not provided here.

3.7.2 Potential Impacts

The VMU-3 relocation has the potential to affect the receiving community, particularly through the increased demand for housing and public facilities. This section evaluates how the proposed relocation would affect or contribute to changes in population and housing.

Adverse environmental impacts would result only if an action caused sudden and significant population changes in the receiving areas. A significant impact to housing would occur if the number of available on- and off-base homes were insufficient to meet the need of the action, straining housing availability and increasing home rental or sales prices in the off-base housing market. Such a strain would only occur if the total demand for off-base housing exceeded the level of natural vacancies within the market area.

As shown in Table 3.7-2, housing vacancy in 2010 ranged from approximately 3 to 11 percent in related CDPs, and more than 9 percent county-wide (Census 2010b).

	2010 Population	2020 Population	Change	Annual Rate of Change	2010 Housing Units	2020 Housing Units	Change	Annual Rate of Change
Honolulu County	911,841	969,467	57,626	0.6%	340,906	372,256	31,350	0.9%
Kailua	39,953	40,451	-93	0.1%	39,953	40,451	1,800	0.1%
Kaneohe	38,765	38,672	498	0.0%	37,237	39,037	498	0.5%
Total			405	0.1%			2,298	0.3%

Key: CDP=Census Designated Place
Source: DoN 2012a. MV-22/H-1 EIS, from Honolulu Department of Planning and Permitting socio-economic projections; the areas identified as Kaneohe and Kailua are larger than the CPDs discussed earlier.

3.7.2.1 Proposed Action

3.7.2.1.1 MCB Hawaii Kaneohe Bay

The proposed VMU-3 squadron relocation would add approximately 480 residents to Honolulu County. Based on population projections documented in the MV-22/H-1 EIS, City and County of Honolulu population is projected to increase by approximately 58,000 people from 2010 to 2020. While the MV-22/H-1 addition would amount to approximately 2.3 percent of the forecasted population increase, the VMU-3 relocation amounts to an additional 0.8 percent.

The MV-22/H1 EIS documented the percentage of Marines currently living off-base as determined by home address, the most prevalent areas including: Kailua (33 percent), Kaneohe (22 percent), and Urban Honolulu (20 percent), which extends from Hawaii Kai to Fort Shafter. More than half of the Marines currently living off-base chose to live in Kailua or Kaneohe. Table 3.7-2 shows that population in Kailua and Kaneohe is projected to increase only slightly from 2010 to 2020 (0.1%/year), and is expected to be outpaced by home construction (0.3%), which could result in increased housing vacancy rates.

Based on the estimated number of dependents (202) of active duty military personnel (274) associated with the Proposed Action, it is assumed that approximately 72 enlisted personnel would be bachelors relocating to MCB Hawaii Kaneohe Bay without dependents. Programmed MILCON projects, planned to be executed between the years 2014 to 2017 at MCB Hawaii Kaneohe Bay, are expected to accommodate the VMU-3 bachelor enlisted personnel.

Based on the assumption that 72 VMU-3 bachelors would be accommodated in these facilities, it is estimated that approximately 202 active duty personnel would require housing. Housing for these personnel and dependents would be provided on-base at MCB Hawaii Kaneohe Bay, at other Navy/Marine Corps housing areas on the island of O'ahu, or within the local community as

needed and available. Table 3.7-1 indicates that housing units were available at MCB Hawaii Kaneohe Bay in 2010.

As shown in Table 3.7-1, the total number of homes in each of the possible receiving areas exceeds the estimated 202 housing units needed. Possible impacts on housing availability in any single neighborhood would be further reduced if neighborhood selection follows the current Marine off-base housing distribution of 33 percent in Kailua, 22 percent in Kaneohe, 20 percent in Urban Honolulu, and the remaining 25 percent in other areas. No significant impacts on population or housing would be expected to occur and no mitigation is proposed.

3.7.2.1.2 WAAF, PMRF, and PTA

Under the Proposed Action, there would be no personnel based at WAAF, PMRF, or PTA. During regularly scheduled training periods at WAAF, up to 65 of the Marines who would operate the UAS would commute daily via personal or official vehicles from MCB Hawaii Kaneohe Bay. Training deployments at PMRF and PTA would consist of approximately 75 personnel on a temporary basis only. No impacts on population or housing would occur and no mitigation is proposed.

3.7.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i, so there would be no related population or housing impacts.

3.8 EDUCATION

3.8.1 Affected Environment

3.8.1.1 MCB Hawaii Kaneohe Bay

School-aged dependents of MCB Hawaii Kaneohe Bay personnel use public and private educational facilities across Honolulu County. It is estimated that 67 of the 202 dependents (33 percent) are children (based on the general formula for estimating the number of dependents of married Marines used by the MCB Hawaii Kaneohe Bay Family Housing Department: 1.5 dependents/married Marine) (USN 2011). Based on the personnel distribution described in Section 3.7, *Population and Housing*, which showed that 55 percent of Marines currently residing on O'ahu selected housing in the Kailua and Kaneohe area, it is expected that the majority of student population relocated to O'ahu with the VMU-3 squadron would enroll in either the Kalaeo or Castle Public School complexes. Schools in the Pearl City Public School complex, serving the Pearl City area, were also reviewed to account for a portion of the remaining population residing in Urban Honolulu. A summary of the public and private schools in the related area is provided in Table 3.8-1.

Table 3.8-1. Schools in Related Areas, Grades K-12

School Type	Kalaheo Public Schools complex	Castle Public Schools complex	Pearl City Public Schools complex	Kāne'ohe Area Private Schools	Pearl City Area Private Schools
Elementary	Mōkapu Elementary 'Aikahi Elementary Kailua Elementary Kainalu Elementary Hakipu'u Learning Center (Public Charter)	Ahuimanu Heeia Kahaluu Kaneohe Puohala Kapunahala Ben Parker Waiahole	Kanoelani Elementary Lehua Elementary Manana Elementary Momilani Elementary Palisades Elementary Pearl City Elementary Pearl City Highlands Elementary Waiiau Elementary	Le Jardin Academy (PK-12) Cost. Anthony Parish School (PK-8) Cost John Vianney (PK-8) Cost. Anne's Model Schools (1-8) Trinity Christian (PK-10) Cost. Mark Lutheran (K-8) Koolau Baptist Academy (K-12)	Our Lady of Good Counsel School (PK-8) The Children's House (PK-6)
Intermediate	Kailua Intermediate	King	Highlands Intermediate		
High	Kalaheo High	Castle	Pearl City High		

Key: PK=Pre-kindergarten
Source: HDOE 2012

The Kalaheo complex serves Kaneohe Bay and adjacent areas. On average, student enrollment in this complex is down 19 percent since 2000 (Figure 3.8-1). The only school that has experienced enrollment increase in this period is Mōkapu Elementary, which is up one percent. It is the only on-base school at MCB Hawaii Kaneohe Bay. Approximately 89 percent of the enrolled students are military dependents. Enrollment at Kailua Intermediate is down 26 percent and enrollment at Kalaheo High is down 19 percent since 2000.

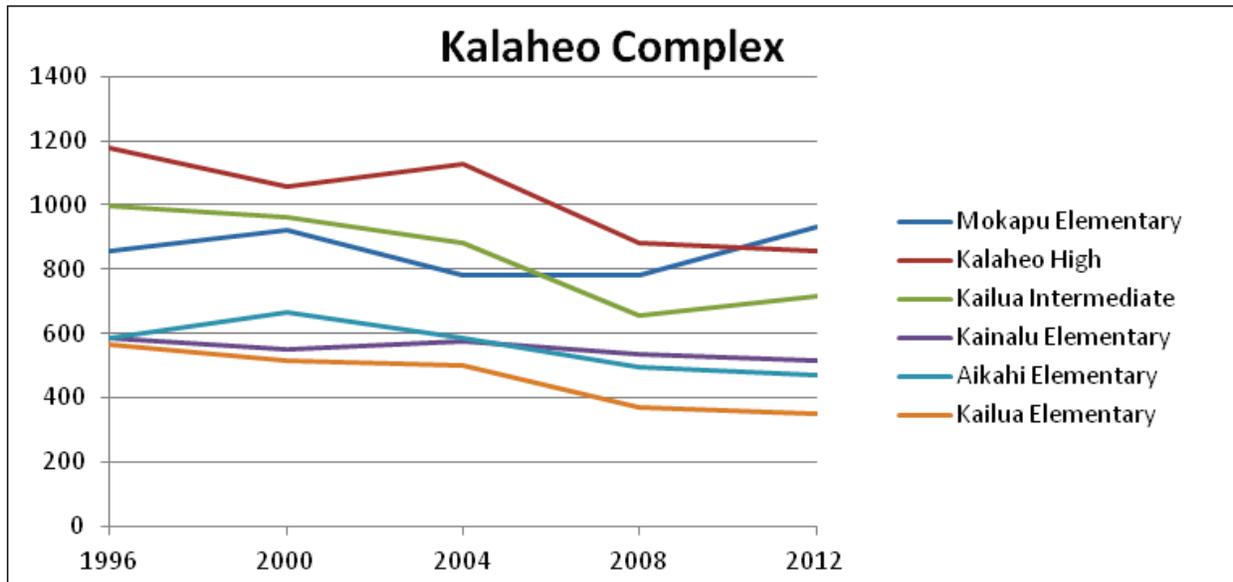


Figure 3.8-1. Kalaheo Public Schools Complex Enrollment Trends from 1996 to 2012

The Castle complex serves the greater Kaneohe area, and would likely absorb some of the school-aged dependents related to the VMU-3 relocation. On average, student enrollment in this complex is down 24 percent since 2000 (Figure 3.8-2). Two schools have experienced increased enrollment in this period: Kaneohe Elementary, up 11 percent, and Kahaluu Elementary, up 20 percent. Enrollment at King Intermediate is down 39 percent and enrollment at Castle High is down 34 percent since 2000.

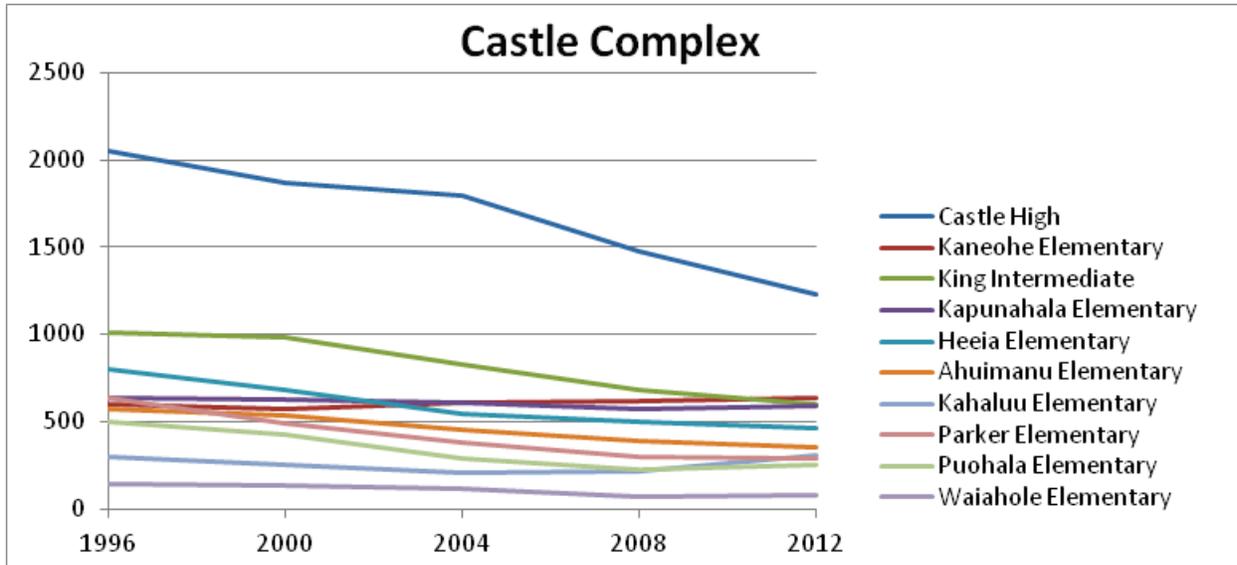


Figure 3.8-2. Castle Public Schools Complex Enrollment Trends from 1996 to 2012

The Pearl City complex serves the Pearl City area, including MCB Hawaii Kaneohe Bay’s Manana Family Housing Area. On average, student enrollment in this complex is down four percent since 2000 (Figure 3.8-3). Four schools have experienced increased enrollment in this period: Pearl City Highlands Elementary, up 13 percent, Palisades Elementary, also up 13 percent, Momilani Elementary, up two percent, and Lehua Elementary, up less than one percent. Enrollment at Highlands Intermediate is down 13 percent and enrollment at Pearl City High is down 16 percent since 2000.

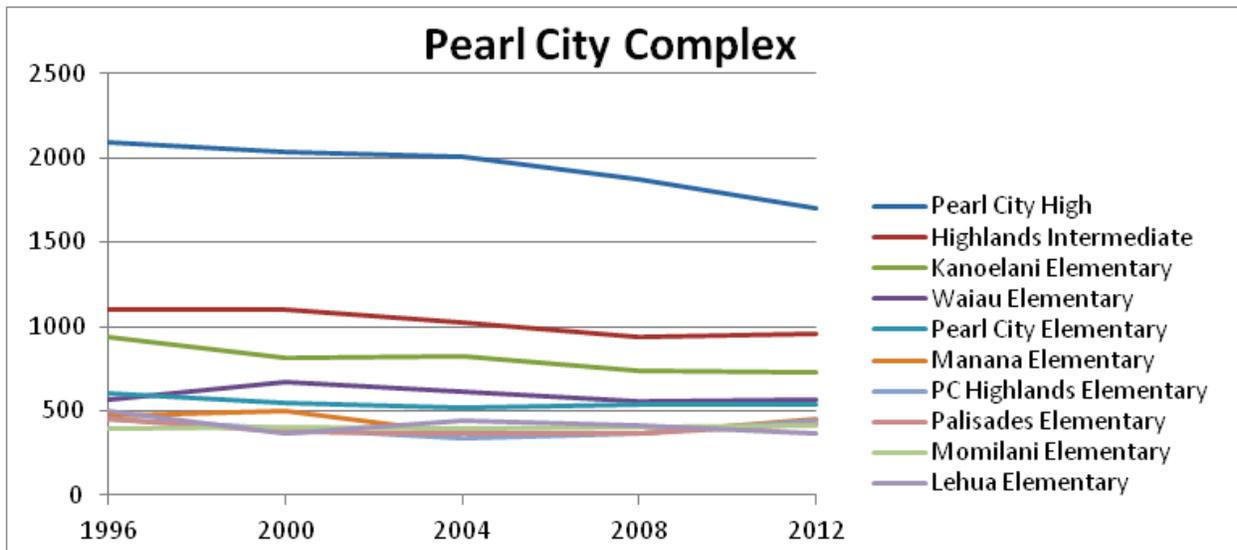


Figure 3.8-3. Pearl City Public Schools Complex Enrollment Trends from 1996 to 2012

Based on Hawaii State Department of Education (DOE) records, four schools in these complexes were over ideal capacity during the 2012 school year: Kanoelani Elementary, Manana Elementary, Mōkapu Elementary, and Momilani Elementary. All other schools are operating near or below capacity (as low as 37 percent of capacity) with a general downward trend in

enrollment. As shown in Table 3.8-2, all currently-over-capacity schools are operating below previous peak enrollment levels.

School	2012 Enrollment	2010-12 Change	Capacity	Percent Capacity	Peak Enrollment (Year)	Change: Peak to Current Enrollment	Projected 2016 Enrollment	2012-16 Change
Kanoelani ES	729	-2%	713	102%	1054 (1995)	325	757	4%
Manana ES	454	9%	400	114%	502 (1999)	48	481	6%
Mōkapu ES	932	21%	862	108%	970 (1999)	38	879	6%
Momilani ES	415	0%	302	137%	426 (2011)	11	415	0%

Capacity figures are based on an ideal number of students per classroom, and vary between the school's educational level and special needs considerations. Capacity estimates are determined on an individual school basis and are flexible, based on how the school addresses enrollment fluctuations and the school's determination on acceptable class sizes. Individual schools coordinate with DOE when physical capacity increases are deemed necessary.

3.8.1.2 WAAF, PMRF, and PTA

Under the Proposed Action, there would be no personnel based at WAAF, PMRF, or PTA. Therefore, baseline education data for these installations are not provided here.

3.8.2 Potential Impacts

Impacts on the Kalaheo, Castle, or Pearl City Public School complexes would depend on the actual number and age of dependents relocated with the VMU-3 squadron, residency choices made by those relocating, and their personal school choices. A significant impact, such as a sudden and drastic increase in enrollment, would be one that exceeded the public school complex's enrollment capacity and forced classroom sizes above limits established by DOE.

3.8.2.1 Proposed Action

3.8.2.1.1 MCB Hawaii Kaneohe Bay

The Proposed Action includes the relocation of 274 military personnel, approximately three contract personnel, and approximately 202 dependents to MCB Hawaii Kaneohe Bay. For the purposes of this report, it is estimated that 67, or 33 percent, of the 202 dependents are non-spousal dependents, including school-aged children (rationale provided in Section 3.7.2.1.1). For this analysis, it is assumed that all of these children are, or will, become school-aged.

Existing family housing at MCB Hawaii Kaneohe Bay may be available to VMU-3 personnel, but no new housing construction is planned for VMU-3 personnel. Based on consultation with the Mōkapu Elementary Vice Principal, enrollment is currently heavy at the K, 1, and 2 grades, but the number of incoming students is expected to decrease. Although ideal capacity of this school is in the mid-800 student range, they are comfortable operating up to the mid-900 range. Once in the mid-900 range, Mōkapu Elementary administration would likely begin turning down geographical exception applicants to balance enrollment. If a sudden increase in on-base families and elementary aged students occurred that pushed enrollment beyond the mid-900 range, the

school would address the increase with portable classrooms until an assessment of future growth needs could be conducted. Enrollment increases at Mōkapu Elementary, beyond the mid-900 student range, due to VMU-3 relocation are not expected.

VMU-3 personnel requiring family housing that prefer to live off-base in the Kailua or Kaneohe areas would need to look for schools in the area. As shown in Tables 3.8-1 and 3.8-2 and Figure 3.8-2, several schools exist in the Kalaheo and Castle complexes that can accommodate enrollment increases.

MCB Hawaii Kaneohe Bay's Manana housing area is primarily served by Pearl City Elementary, Highlands Intermediate, and Pearl City High. Enrollment is down or stable and well below capacity at each of these schools. These schools could easily accommodate enrollment increases if VMU-3 families with school-aged children relocate to this housing area. With the exception of Manana and Momilani elementary schools, other Pearl City complex schools could also accommodate enrollment increases if VMU-3 families relocate to the Pearl City area.

Over a five year period, the direct increases to the Kalaheo, Castle, and Pearl City Public School complexes would be small relative to annual enrollment ranges (e.g., the difference between the highest [502] and lowest [364] enrollments at Mōkapu Elementary over the last 15 years is 138 students). No significant impacts on schools would be expected to occur and no mitigation is proposed.

3.8.2.1.2 WAAF, PMRF, and PTA

Under the Proposed Action, there would be no personnel based at WAAF, PMRF, or PTA. Significant impacts on schools and school enrollment due to the Proposed Action would not be expected to occur there.

3.8.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and the Kalaheo, Castle, and Pearl City Public School complexes would experience no related enrollment changes. No related impacts on schools would occur and no mitigation is proposed.

3.9 LAND USE

3.9.1 Affected Environment

3.9.1.1 MCB Hawaii Kaneohe Bay

3.9.1.1.1 Surrounding Off-Base Land Use

MCB Hawaii Kaneohe Bay is situated on Mōkapu Peninsula on O'ahu and is geographically separated from the population centers of Kailua and Kāne'ohe. Areas of undeveloped land, as well as Kailua and Kāne'ohe Bays, serve as buffers between the base and these communities. Land use in the vicinity of MCB Hawaii Kaneohe Bay includes primarily low-density residential and open space/preserve. Commercial-center and some medium-density residential use is located at Kailua town and along Kamehameha Highway in Kāne'ohe. Other nearby land use includes agriculture, parks, golf courses, and institutional facilities such as Windward Community

College and the University of Hawai'i Institute of Marine Biology on Coconut Island in Kāneʻohe Bay.

3.9.1.1.2 On-Base Land Use

MCB Hawaii Kaneohe Bay is a multiple-use facility owned in fee by the U.S. Government and designed to fit the needs of the USMC. The base has various land use designations to address and minimize conflicts among those needs. Current land use designations include Operational, Training, Maintenance, Supply and Storage, Medical and Dental, Administration, Family Housing, Troup Housing, Community Facilities, Recreation, Open Space, Utilities and Landfill, and Constrained Open Space.

The built environment at MCB Hawaii Kaneohe Bay is characterized by base operations facilities (administrative, training, and industrial uses), low- and medium-density housing, and community support facilities (commercial, recreation, administrative, and industrial use). The major land use at MCB Hawaii Kaneohe Bay is the Marine Corps Air Station (MCAS), which includes a runway complex and related aircraft operation and maintenance facilities, located in the western and southern portion of the base. The eastern portion of the base is dominated by Marine Corps ground-forces operations. Quarters for military personnel are located near both of these primary work areas. The central portion of the base is used for administrative and community support. Family housing occupies the north-central and northeastern portions of the base.

The existing use and land use designation, as well as proposed future use and land use designation, are provided in Table 3.9-1. Building 373 is located within a designated maintenance area and currently serves the 3D Radio Battalion. The building was originally configured to support a Marine Wing Support Squadron that was sustained at the base until the late 1990s. Portions of the building are still used as an aircraft supply warehouse by MALS-24, a unit of MAG-24. Land use surrounding Building 373 includes the airfield, which is designated for Operational land use, to the west. Aboveground Storage Tanks (ASTs), containing jet and motor fuel, lie immediately to the northeast and southeast of the building. Land designated as “supply/storage” borders the site to the north.

Facility	Existing Use	Future Use under the Proposed Action
Hangar 102	Hangar	Renovate hangar for storage, organizational vehicle parking, and administrative use.
Building 191	Storage building	Aviation gasoline (AVGAS) drum storage
Building 373	Building 373	Renovate Building 373 for an Automotive Organizational Shop, a Vehicle Holding Shed, a Grease Rack, new Vehicle Wash-Platform
Facility 5026	concrete pad	General storage shed and open storage area
New 3D Radio Battalion Facility	undeveloped	New 3D Radio Battalion facility will be constructed as part of a MILCON analyzed under the Grow the Force EA (USN 2011) and is not part of the Proposed Action.
Key: AVGAS=Aviation gasoline; FY=Fiscal Year; MILCON=Military Construction		

Hangar 102 is a maintenance hangar and aviation supply facility located within the flightline. Building 191 is a 185 square foot stand-alone storage building with an enclosed, vented, and secured flammable storage area located in the northeast corner of Hangar 102. Facility 5026 is an

84 foot by 34 foot (25.6 meters by 10.3 meter) concrete pad located near the northeast corner of Hangar 102.

3.9.1.2 WAAF

3.9.1.2.1 Surrounding Off-Base Land Use

Land use bordering WAAF is a mixture of urban, military, and agriculture. The town of Wahiawa is to the north, the town of Mililani is to the east-southeast, and SBMR is to the northwest. Forested land surrounds the southeastern boundary of WAAF, with land formerly used for pineapple production located just beyond this wooded area to the south and east. Kamehameha Highway forms the eastern perimeter of WAAF, and Kunia Road delineates WAAF from SBMR at its northwest perimeter. The Leileihua Golf Course is across Kamehameha Highway and Interstate H-2 (Veterans' Memorial Freeway) to the east.

3.9.1.2.2 On-Base Land Use

WAAF is located 21 miles northwest of Honolulu. Current land use at the airfield includes operations, training, maintenance, supply storage, medical/dental, administration, family housing, troop housing, community/personnel facilities, outdoor recreation, and open buffer zones. The project site is located southwest of the runway on the flight line in an area designated for airfield and open buffer zone land use. The project site is adjacent to Facility X-1138, which houses the Army UAS RQ-7B Unit.

3.9.1.3 PMRF

3.9.1.3.1 Surrounding Off-base Land Use

PMRF is located on the west side of Kaua'i and is surrounded primarily by agricultural and conservation lands. Current land use adjacent to PMRF includes recreation (Polihale State Park) to the north, agricultural (former sugar cane fields) to the east, and conservation (Kekaha Landfill) to the south. The Pacific Ocean, which is used for naval training and recreational activities, is located to the west of PMRF.

3.9.1.3.2 On-Base Land Use

PMRF is divided into three zones: North, Central, and South. The North Zone is used for rocket launches and associated support activities, administration, and services. The Central Zone contains air operations, administration, supply, base services, range operations, ordnance maintenance, and fuel/supply. The South Zone contains housing, personnel support, recreational, communications, and rocket launch facilities. The Proposed Action site is located in the Central zone, northeast of the runway on the flight line in an area designated for airfield land use.

3.9.1.4 PTA

3.9.1.4.1 Surrounding Off-Base Land Use

PTA is located in the north-central portion of the island of Hawai'i, just to the west of the plateau formed by Mauna Loa and Mauna Kea volcanoes. Hawai'i County has nine districts: Puna, South Hilo, North Hilo, Hāmākua, North Kohala, South Kohala, North Kona, South Kona, and Ka'u (County of Hawai'i 2013). PTA is located primarily within the Hāmākua district, as well as

relatively small portions of the South Kohala and North Kona districts. Approximately 60 percent of the Hāmākua district is classified as a conservation district. PTA is surrounded mainly by state-designated conservation and private land (Bishop Estate, Parker Ranch, and Waiki'i Ranch). Land use in the area includes cattle grazing, game management, forest reserves, scientific research, and undeveloped land. Land located to the northwest of PTA is agricultural and is primarily used for cattle grazing. The land also provides limited hunting opportunities for big game species and game birds. Land to the north of PTA includes the Ka'ōhe Game Management Area, Mauna Kea State Park, and Mauna Kea Forest. Land to the east and south is included in the Mauna Loa Forest Reserve. Land to the west is owned by Kamehameha Schools. While not adjacent to the PTA boundary, which extends to a maximum elevation of approximately 8,000 feet, the Mauna Kea Science Reserve, starting at about the 12,000-foot elevation level, and host to the world's largest astronomical observatory, with 13 working telescopes near the summit of Mauna Kea, is located about four miles to the northwest of, and approximately 4,000 feet above the nearest point of the PTA boundary (Figure 2.4-13).

3.9.1.4.2 On-Base Land Use

Land use at PTA includes the cantonment area (facility administration offices, troop billeting, and support services facilities), BAAF, maneuver training areas, drop zones, live-fire training ranges, artillery firing points, an ordnance impact area, and areas unsuitable for maneuver activities. The Proposed Action would be located at Cooper Airstrip, which is currently used exclusively for UAS operations.

3.9.2 Potential Impacts

Project actions could have a potentially significant adverse environmental impact if they conflict with surrounding land use or the base master/development plan.

3.9.2.1 Proposed Action

3.9.2.1.1 MCB Hawaii Kaneohe Bay

Basing

Table 3.9-1 shows the existing and future land use within the project area. The Proposed Action would renovate or demolish existing facilities and construct new facilities at already developed sites to accommodate the same or similar use. Facility construction would be designed and sited to be compatible with the existing base master plan and airfield safety guidelines. The Proposed Action would not represent a change in existing land use designations and would not conflict with surrounding land use or the base master plan. No significant impacts on land use would be expected to occur and no mitigation is proposed.

The Proposed Action is located on federal land and is excluded from the state (Hawai'i) coastal zone under the Coastal Zone Management Act (CZMA). However, CZMA requires federal agencies to conduct their planning, management, development, and regulatory activities in a manner consistent with the State's CZM program.

By letter dated 9 June 2009, the Department of Business, Economic Development and Tourism concurred with DoN's (Navy Region Hawaii) proposed modifications to the list of Navy/Marine Corps De Minimis Activities Under CZMA (Appendix F). Modifications included expansion of

coverage to MCB Hawaii Kaneohe Bay. The facility modifications of the Proposed Action fall within Items 1 and 2 on the De Minimis Activity List. Provided that the Proposed Action complies with the items listed under "Mitigation/Conditions," no significant direct or indirect impacts on the coastal zone are expected. The relevant mitigation/conditions are as follows:

- (1) All activities will occur on DoD property.
- (3) Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- (6) No project-related materials will be stockpiled in the water.
- (8) Adjacent marine/aquatic environments will be protected from contamination by project-related activities.
- (9) Fueling of project-related vehicles and equipment will take place away from the water. A contingency plan will be established to control accidental petroleum releases during project construction.
- (10) All fill material will be protected from erosion as soon as practicable.
- (11) All exposed soil will be protected from erosion and stabilized as soon as practicable.
- (13) No species or habitats protected under ESA will be affected by the Proposed Action.
- (14) NEPA EA process will be completed.
- (15) The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
- (16) State CZM office notified on use of De Minimis List for an EA.

Training

The proposed UAS flight operations described in Section 2.4.3 would be conducted within the FAA-designated Class D airspace of MCB Hawaii Kaneohe Bay. Safety guidelines, and existing airfield management and land use plans would be updated as needed to address RQ-21A operations. No significant impacts on land use would be expected to occur and no mitigation is proposed.

3.9.2.1.2 WAAF

Facility construction to support the Proposed Action would be designed and sited to be compatible with the existing base master plan and airfield safety guidelines. The Proposed Action would not represent a change in existing land use designations within the airfield. No significant impacts on land use would be expected to occur and no mitigation is proposed.

Established SUA footprints would not be expanded with implementation of the Proposed Action. Under the Proposed Action, VMU-3 would utilize existing airspace within R-3109 and R-3110 for training activities approximately two weeks per month, with an approved COA to transition from WAAF to these SUAs. Airspace training operations would be consistent with existing airspace operations and would comply with the established range and land use management plans. Furthermore, safety guidelines, existing range management, and land use plans would be updated as needed to address RQ-21A operations. The proposed change in aircraft operation at WAAF and within the R-3109 and R-3110 may result in a small increase in noise levels from existing conditions, but this would remain consistent with land use compatibility guidelines. No significant impacts on land use would be expected to occur as a result of proposed airspace operations and no mitigation is proposed.

3.9.2.1.3 PMRF

No changes to existing land use or land use designations would occur from the proposed minor runway improvements and periodic flight training. No significant impacts on land use would be expected from the Proposed Action and no mitigation is proposed.

Established SUA footprints would not be expanded with implementation of the Proposed Action, which would utilize existing airspace within R-3101, and to a lesser extent, R-3107 and the Warning Areas around Kaua'i, for training activities. Airspace training operations would be consistent with existing airspace operations and would comply with the established range and land use management plans. Furthermore, safety guidelines, and existing range management and land use plans would be updated as needed to address RQ-21A operations. The proposed training of the VMU-3 aircraft may result in a small increase in noise levels from existing conditions, but this would remain consistent with land use compatibility guidelines. No significant impacts on land use would be expected to occur as a result of proposed airspace operations and no mitigation is proposed.

3.9.2.1.4 PTA

The Proposed Action would utilize existing facilities at PTA and Cooper Airstrip to support VMU-3 UAS flight training. The Proposed Action would not represent a change in existing land use or land use designations at PTA. No significant impacts on land use would be expected to occur and no mitigation is proposed.

Established SUA footprints would not be expanded with implementation of the Proposed Action. The Proposed Action is anticipated to utilize existing airspace within R-3103 for training activities. Airspace training operations would be consistent with existing airspace operations and would comply with the established range and land use management plans. Furthermore, safety guidelines and existing range management and land use plans would be updated to address RQ-21A operations. The proposed increase in aircraft operations at PTA and within the R-3103 due to training activities may result in a small increase in noise levels from existing conditions, but this would remain consistent with land use compatibility guidelines. No significant impacts on land use would be expected to occur as a result of proposed airspace operations and no mitigation is proposed.

3.9.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and no construction or renovation activities associated with basing and training of VMU-3 would occur. Baseline conditions for land use as described in Section 3.9.1, *Affected Environment*, would be expected to continue.

3.10 CULTURAL RESOURCES

Cultural resources are archaeological, architectural, and traditional cultural properties that reflect our heritage and are considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. Federal regulations define historic properties to include prehistoric and historic sites, buildings, structures, districts, or objects listed or eligible for listing in the National Register of Historic Places (NRHP), as well as artifacts, records, and remains related to such properties (National Historic Preservation Act [NHPA], as amended [16 USC 470 *et seq.*]).

Additionally, cultural resources are protected under the Archaeological Resources Protection Act (ARPA) (16 USC 470aa-470mm; Public Law 96-95 and amendments) and the Native American Graves Protection and Repatriation Act (NAGPRA) (Public Law 101-601; 25 USC 3001-3013). The procedures for complying with Section 106 of NHPA, which directs federal agencies to take into account the effect of a federal undertaking on a historic property, are outlined in the Advisory Council on Historic Preservation's regulations, *Protection of Historic Properties* (36 CFR Part 800). NHPA and associated Section 106 implementing regulations also include provisions for Native Hawaiian consultation regarding cultural significance of potential religious and sacred properties and artifacts (16 USC 470a [a][6][A] and [B]).

3.10.1 Definition of the Area of Potential Effects or Region of Influence

Under Section 106 of NHPA, federal agencies "must review the effects of an undertaking within the area of potential effects, defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)). The ROI for cultural resources is equivalent to the Area of Potential Effect (APE) under Section 106 of NHPA.

3.10.2 Affected Environment

3.10.2.1 MCB Hawaii Kaneohe Bay

The cultural resources ROI for the Proposed Action consists of the locations where actions associated with the Proposed Action would occur, including areas of potential ground disturbance, construction, staging, building modifications, and areas within the viewshed of these activities (Figures 2.4-1, 2.4-4, and 2.4-5). The ROI includes Hangar 102 and vicinity (including Building 191 and Facility 5026) and the proposed VMU complex (including Building 373).

Sand, presumably mined from the Mōkapu Dunes, was used as construction fill during initial base development and up until the late 1950s. This source for fill material sometimes contained human burials, so NAGPRA Cultural Items, including human remains, may be encountered, mixed with sand fill in utility trenches and under building foundations constructed prior to

the 1960s. For this reason, archaeological monitoring is conducted in areas with sand fill. Sand fill has been found in utility trenches in the vicinity of Building 373 at the proposed VMU-3 complex.

There are numerous documented historic properties at MCB Hawaii Kaneohe Bay, including the Mōkapu Peninsula Fishpond complex (eligible for listing in the NRHP) and the Mōkapu Burial Area (listed in the NRHP). Neither of these resources is within the ROI for the Proposed Action. The Kaneohe Naval Air Station (NAS) National Historic Landmark (NHL) is within the viewshed of the Proposed Action.

Buildings and structures at MCB Hawaii Kaneohe Bay are designated as: listed in the NRHP; determined eligible for listing, as determined by previous studies; or not eligible. There are 195 buildings on the base that were built before 1952 and have been listed, or determined to be eligible for listing in the NRHP due to their association with the 7 December 1941 Japanese attack, which marked the start of U.S. involvement in World War II (DoN 2013b). Of these, Hangar 101 (located south of the airfield), the parking apron, and the adjacent seaplane ramps extending into Kāneʻohe Bay, are listed in the NRHP, and together are classified as the Kaneohe NAS NHL. Three NRHP-eligible historic districts are also located at MCB Hawaii Kaneohe Bay. The Aviation District encompasses the NHL and Hangars 102, 103, 104, and 105 to the east of Hangar 101. The Administration District and the Hilltop Officers' Housing District are outside the ROI for the Proposed Action. There are also three NRHP-eligible Cold War-era buildings, none of which is within the ROI for the Proposed Action.

Three buildings and a concrete pad would be re-used or/and renovated under the Proposed Action. Building 373, constructed in 1943, and Facility 5026, an existing concrete pad with steel framing, have been determined not eligible for listing in the NRHP (USMC 2011). Hangar 102, a Maintenance Hangar/Marine Aviation Logistics Squadron Aviation Supply Building constructed in 1941 and Building 191, Aircraft Ready Fuel Storage, constructed in 1943, have been determined eligible for listing in the NRHP. Both are within the proposed Aviation Historic District.

3.10.2.2 WAAF

The cultural resources ROI at WAAF consists of the area proposed for construction of the 4,000 square foot (371.6 square meter) operational storage space adjacent to the current U.S. Army UAS facility on the flight line (Figures 2.4-6 and 2.4-7).

Cultural resources previously identified at WAAF include archaeological resources, built environment resources, and an NHL District associated with World War II history and the Japanese attack on Oʻahu on 7 December 1941. Five historic archaeological sites have been identified on the installation; one is considered eligible for the NRHP (USACE 2004). One resource of potential traditional religious and cultural importance to Native Hawaiians has been identified at WAAF, but is not within the project ROI (USACE 2011, Rasmussen 2013).

There are 273 buildings built before 1953 that have been evaluated for eligibility; of these, two were recommended as not eligible and 271 were recommended as eligible. Two of those recommended as eligible have been demolished. The period of significance for the installation has been identified as 1925–1949 (NPS 2014). Wheeler Field NHL District includes 242 eligible

buildings and one archaeological site. The NRHP-eligible properties include most of the 1932 cantonment area of the base as well as the area where the hangars are located and the original airfield. A high degree of ground disturbance within WAAF boundaries, including along the flight line, has left little undisturbed land or preserved archaeological sites (USACE 2011).

3.10.2.3 PMRF

The cultural resources ROI at PMRF consists of the portions of the runway shoulder where proposed improvements would include paving or the installation of matting and the installation of an anchoring system for UAS arresting gear.

Large portions of PMRF have received a systematic surface survey for archaeological resources. Although many of the cultural materials identified at PMRF could also be considered traditional resources, including the Kawaiele Ditch, no traditional or archaeological resources are known to be within the ROI (DoN 2012a). Inadvertent discoveries of human remains are recorded in both the coastal and back beach areas of the installation, all of which have been handled in accordance with installation-specific guidance. Several architectural evaluations have been conducted for PMRF. The evaluations included pre-military facilities and features, as well as World War II and Cold War-era resources. Numerous buildings and structures were recommended eligible for inclusion in the NRHP, but none are within the ROI.

3.10.2.4 PTA

The ROI for cultural resources at PTA consists of the existing facility configuration at PTA and the area around Cooper Airstrip. No construction or building alterations at PTA are included in the Proposed Action.

Survey of PTA has documented over 550 archaeological sites, including both prehistoric and historic Native Hawaiian sites and historic military structures. An inventory of cave and lava tube systems within PTA recorded cultural resources at the cave entrances and within the underground system; some sites include burials (USAEC 2013). PTA has established archaeologically sensitive areas (USAEC 2013). One site is listed in the NRHP (the Bobcat Trail Habitation Cave, Site 50-10-30-5004).

The U.S. Army Garrison-Hawaii (USAG-HI) Directorate of Public Works Building Environmental staff conducted a survey and condition assessment of the 138 structures at PTA that have turned or are approaching 50 years of age.

3.10.3 Potential Impacts

Impact analysis for cultural resources focuses on assessing whether the Proposed Action has the potential to affect cultural resources that are eligible for listing in the NRHP or that have traditional significance for Native Hawaiian groups. For this EA, impact analysis for cultural resources focuses on, but is not limited to, guidelines and standards set forth in NHPA Section 106's implementing regulations (36 CFR 800). Project actions would be considered to have significant impacts under Section 106 of the NHPA if: 1) they adversely affect the integrity of a historic property's location, design, setting, materials, workmanship, feeling, or association; or 2) result in the physical destruction, damage or alteration of visual, audible, or atmospheric elements that are defining characteristics of the property or its setting. Impacts can be direct or

indirect. Indirect effects are often the result of a notable increase in population that is attributable to the planned action at an installation. If the action damaged or resulted in restricted access to a sacred site, it could be an impact under American Indian Religious Freedom Act (AIRFA), and if the project disturbed human remains or items of cultural patrimony it could be an impact under NAGPRA.

3.10.3.1 Proposed Action

3.10.3.1.1 MCB Hawaii Kaneohe Bay

Basing

No significant impacts on archaeological resources would be expected to occur at MCB Hawaii Kaneohe Bay. Although impacts on archaeological resources could be caused by land-disturbing activities associated with demolition, construction, or renovation, there are no known archaeological resources in the vicinity of Hangar 102 or Building 373. Furthermore, project locations are all areas that have been disturbed previously by initial base construction, and none are located within the boundaries of known archaeological sites.

As with any construction activity that involves ground disturbance, there exists the potential to uncover previously unidentified subsurface resources. Inadvertent discovery of human remains is possible in the sandy fill material used circa 1940s in utility trenches located within the project area. Archaeological monitoring would be conducted during excavation, including in areas that contain coralline beach sand, such as old utility trenches and below concrete slabs. With implementation of these BMPs, significant impacts on archaeological resources or human remains would not occur.

Resources of traditional religious and cultural importance to Native Hawaiians known to exist at MCB Hawaii Kaneohe Bay are located well outside the APE of the proposed project (DoN 2013b). No significant impacts on traditional cultural resources would be expected to occur and no mitigation is proposed.

Building 373 and Facility 5026 have been determined not eligible for the NRHP. Hangar 102 and Building 191 are eligible for listing in the NRHP; both are located within MCB Hawaii Kaneohe Bay's NRHP-eligible Aviation Historic District and adjacent to the Kaneohe Bay NAS NHL. No modifications or renovations are proposed for Building 191. Interior renovations to the office spaces of Hangar 102 would follow the Secretary of Interior's Standards and not adversely affect the hangar. The two-stop passenger/freight combination elevator that would be installed in Hangar 102 would penetrate the roof of the building, constituting an adverse effect to this historic property.

Training

MCB Hawaii Kaneohe Bay is an active airfield and the small increase in flight activities that would occur under the Proposed Action would have no significant impacts on cultural resources (archaeological, traditional, or architectural). The increase in personnel at the installation resulting from the Proposed Action would not be great enough to lead to indirect impacts on historic properties, or other cultural resources. No significant impacts on cultural resources would be expected to occur as a result of training and no mitigation is proposed.

In compliance with Section 106 of NHPA, USMC has consulted with the Hawai'i SHPO, the National Trust for Historic Preservation, the Advisory Council on Historic Preservation (ACHP), the Historic Hawai'i Foundation, and Native Hawaiian Organizations, which resulted in an executed Memorandum of Agreement (MOA) between MCB Hawaii Kaneohe Bay and the Hawai'i SHPO that commits the USMC to measures that mitigate the adverse effect to Hangar 102 (Appendix E).

3.10.3.1.2 WAAF

Construction of a new facility that is approximately 50 feet x 80 feet (15.2 meters x 24.4 meters) is planned to provide UAS training equipment storage and work space to support UAS operations. The location of the proposed structure is adjacent to existing airfield paving that has been subject to construction-related ground disturbance and is considered to have low sensitivity for the presence of archaeological resources. The likelihood of encountering archaeological sites is considered low. No archaeological resources or resources of traditional religious and cultural importance to Native Hawaiians are known to occur within the ROI at WAAF.

No existing architectural resources would be modified under the Proposed Action. There would be no effect on the NHL's viewshed due to the distance of the proposed construction from the NHL. The same is true for other NRHP-eligible architectural resources located at WAAF. Furthermore, the proposed construction would be adjacent to existing structures of a similar scale. No significant impacts on archeological, cultural, or historic resources would be expected to occur at WAAF and no mitigation is proposed.

Training

WAAF is an active airfield and the small increase in flight activities that would occur under the Proposed Action would have no impact on cultural resources. The number of additional personnel required to staff the training operations is not large enough to lead to direct or indirect impacts on historic properties. No significant impacts on cultural resources at WAAF would be expected to occur, and no mitigation is proposed.

In compliance with Section 106 of NHPA, the USMC, on behalf of USAG-HI, has completed consultation with the Hawai'i SHPO who concurred with the USMC's determination of no historic properties affected at WAAF (Appendix E).

3.10.3.1.3 PMRF

Runway improvement activities would occur within a low sensitivity area for encountering archaeological sites and/or deposits. No archaeological sites or deposits are located in this area, which was previously disturbed during initial development of the airfield. The anticipated addition of VMU aircraft flight training two times a year, for a period of three weeks each time would not change the visual environment at the airfield. No significant impacts on cultural resources would be expected to occur as a result of construction and training activities at PMRF and no mitigation is proposed.

Pursuant to the stipulations in the Programmatic Agreement among the Commander Navy Region Hawaii, The Advisory Council on Historic Preservation and the Hawai'i SHPO regarding Navy undertakings in Hawai'i (as amended 2012), NAVFAC Pacific has determined that the Proposed Action does not require further Section 106 review under the NHPA (Appendix E).

3.10.3.1.4 PTA

PTA is an active training area and no facility upgrades would be needed at PTA to support VMU-3 UAS training. No significant impacts on cultural resources would be expected to occur due to the small increase in flight activities in existing SUA. No mitigation is proposed.

3.10.3.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawaii, and no construction or renovation activities associated with basing and training of VMU-3 would occur. Baseline conditions for cultural resources as described in Section 3.10.1, *Affected Environment*, would be expected to continue.

3.10.4 Mitigation Measures

In compliance with Section 106 of NHPA, USMC has consulted in accordance with 36 CFR 800, which resulted in the executed MOA described above. If the Proposed Action is implemented, MCB Hawaii Kaneohe Bay would proceed with the proposed renovation of its existing facilities and construction of a new facility at WAAF in accordance with the stipulations contained in the MOA to mitigate impacts on historic properties (see Appendix E). Archaeological monitoring would be conducted for all ground-disturbing activities in areas at MCB Hawaii Kaneohe Bay that may contain buried archaeological deposits and in areas containing sand fill, such as during the proposed ground disturbing activities at the Building 373 complex, since sand fill has been found in utility trenches in this area.

In the event of an inadvertent discovery, MCB Hawaii Kaneohe Bay would follow standard cultural resources practices dictated by NHPA and DoD guidance. These include, but are not limited to, provisions for immediate stoppage of land-disturbing work, protecting the resource from damage or loss, contacting the base Cultural Resources Manager, and complying with Section 106 of NHPA.

The Proposed Action would be consistent with management actions prescribed for each installation. Each management action focuses on protecting and preserving all installation cultural resources while reducing conflicts between cultural resources management and the military mission. If cultural resources are identified within the potential areas of impact, the USMC would continue to work with various stakeholders, including the Hawaii SHPO, to develop appropriate mitigation measures to avoid impacts on cultural resources.

3.11 TRAFFIC AND CIRCULATION

Traffic analysis was conducted to assess potential impacts and mitigation measures for the proposed VMU-3 relocation to MCB Hawaii Kaneohe Bay. The traffic analysis undertaken for the 2012 *Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawaii (MV-22/H-1 EIS)* serves as the basis for the VMU-3

relocation impacts analysis (DoN 2012a). The MV-22/H-1 EIS traffic analysis (completed in September 2011) assessed the impacts of increased vehicular traffic on entrance gates, within the base, and on roadways surrounding the base. That study identified several traffic improvements required to provide adequate service at critical locations on the base. Changes to traffic conditions resulting from the relocation of VMU-3 to MCB Hawaii Kaneohe Bay, in addition to those assessed for the MV-22/H-1 EIS, were considered in this traffic analysis update (Appendix G).

3.11.1 Affected Environment

3.11.1.1 MCB Hawaii Kaneohe Bay

For the purposes of the traffic analysis, it was assumed that the proposed VMU-3 relocation would add fewer than 500 persons on the base, representing a 2 percent increase in the population of the base (estimate includes an anticipated increase in Marine Corps Community Services (MCCS) employment to support the higher population). While there will be on-base bachelor housing to accommodate approximately 36 percent of the VMU-3 personnel, many personnel and dependents would commute from off-base housing to their work sites or to use base facilities. The impacts of these additional persons on the access gates, on base roads, and roads surrounding the base were analyzed.

3.11.1.2 WAAF, PMRF, and PTA

Traffic impact analysis was not conducted for WAAF, PMRF, or PTA. Significant traffic impacts from periodic squadron training events at WAAF, PMRF, and PTA are not expected.

3.11.2 Potential Impacts

3.11.2.1 MCB Hawaii Kaneohe Bay

The increased on-base activity from squadron relocation would result in increased traffic volume. Analyses were conducted assuming an increase in peak-hour traffic volume in proportion to the increase in base population. Combined traffic volume through the H-3 and Mōkapu gates is projected to increase by 4.3 percent. This increase was applied to the traffic volume used in the MV-22/H-1 EIS analysis.

The increase in two-way traffic volume on roadways outside of the base were previously identified (for the MV-22/H-1 EIS) to be at most 153 vehicles per hour on the H-3 Freeway and 120 vehicles per hour on Mōkapu Road, just outside the Mōkapu gate; these increases were not considered significant. The addition of VMU-3 would increase projected peak hour volume on H-3 by 55 vehicles per hour (from 1,250 to 1,305) and 30 vehicles per hour on Mōkapu Road (from 685 to 715); in both cases, this volume would remain well below the capacities of these facilities (4,000 and 2,000 respectively). The project traffic impact on other roadways outside of the base would continue to be fewer than 100 vehicles per hour during the peak hour and the MV-22/H-1 EIS conclusion that the impact would not be significant is still valid.

At the MCB Hawaii Kaneohe Bay gates, 55 additional vehicles per hour at the H-3 Gate and 30 at the Mōkapu Gate are anticipated. Quicker processing of the identification checks by the gate-guards was identified in the MV-22/H-1 EIS as a needed mitigation measure to

accommodate the traffic increase, decrease delay, and limit queue lengths. The MV-22/H-1 EIS recommended that an evaluation of gate procedures be conducted with notes that the existing practice of tandem checking of vehicle passes could start earlier and continue longer and possibly be increased so that three cars per lane can be checked simultaneously. This recommendation still stands and is further emphasized with the anticipated increases associated with proposed VMU-3 basing. Table 1 of Appendix G presents the results of the traffic counts undertaken in the 2011, MV-22/H-1 EIS traffic increase estimates, and the estimated traffic increase analysis done for the VMU-3 relocation.

As discussed in the MV-22/H-1 EIS assessment (DoN 2012a), peak traffic conditions entering the gates can be expected to occur for a longer period during the morning peak period because some drivers may arrive earlier to avoid the increasing congestion and delay that would be incurred while entering the gates. Table 2 of Appendix G illustrates this effect by using the Volume/Capacity (V/C) ratio through the H-3 Gate. Using a gate capacity of 1,200 vehicles per hour, the V/C ratios suggest congested conditions during periods when the ratio exceeds 0.95. Based on vehicle counts taken for the MV-22/H-1 EIS, peak gate congestion occurs from 0630 to 0700. With the projected increase in demand at the H-3 gate, congested conditions could be expected to begin before 0600 (a similar situation is already occurring at Joint Base Pearl Harbor-Hickam, with congested conditions occurring as early as 0530).

At the time the MV-22/H-1 EIS traffic analysis was conducted, there were two signalized intersections on the base; they were found to operate at acceptable Levels of Service (LOS) (overall intersection LOS "D" or better) during three peak hours. Greatest delay and highest utilization occurred at the intersection of G Street and Third Street during the PM peak hour, and at the intersection of Mōkapu Road and Harris Avenue during the AM peak-hour. Reevaluation of these intersections with increased traffic from the VMU-3 relocation and some changes in signal timing would result in increased delay, but acceptable conditions would still be attained (Table 3 of Appendix G).

Analyses were also conducted under the MV-22/H-1 EIS for peak-hour conditions at seven signalized intersections (including the intersection of G Street, Mōkapu Road, and Lawrence Road, where a traffic signal system was placed in a flashing mode in late-2010, thereby converting it to operate as an all-way-stop-controlled intersection). At three of these intersections, mitigation measures were identified in the EIS to improve conditions to acceptable (Level of Service "D" or better) during each peak hour (recommendations shown in Table 3.11-1 through Table 3.11-3).

The re-evaluation of the worst peak hour at each of the seven intersections showed that acceptable conditions would continue with the additional traffic that would be expected with the proposed addition of VMU-3 (Table 4 of Appendix G).

Table 3.11-1. Roadway Improvements for Existing Conditions	
1.	Upgrade traffic signal system at intersection of G Street and Third Street by adding pedestrian signal heads and push buttons for south crosswalk, adding vehicular detectors on Third Street approaches, and retiming signal operation with an actuated east-west (Third Street) phase [MV-22/H-1 EIS Figure 6]
2.	Modify the lane use on the westbound Mōkapu Road approach to the intersection with G Street and Lawrence Road, by having the through traffic movement share the right lane instead of the left lane [MV-22/H-1 EIS Figure 7]
3.	Channelize the intersection of Second Street and E Street by providing a new approach from Second Street that is perpendicular to the main flow of traffic and farther away from the E Street intersection with Third Street, to improve the driver's sight line and to increase opportunities to enter traffic [MV-22/H-1 EIS Figure 8]
4.	Restripe parking stalls and reverse the flow in the parking lot between Building 213 and E Street to eliminate the existing exit at the intersection of E Street and Third Street [MV-22/H-1 EIS Figure 8]
5.	Restripe Mōkapu Road from G Street to Harris Avenue from the existing two lanes of traffic in each direction to one lane of traffic in each direction with a median lane that will be available for left turns, and at selected locations, for pedestrian refuge [MV-22/H-1 EIS Figure 10]
6.	Convert the lane assignments at the intersection of Mōkapu Road and Harris Avenue to improve the distribution of traffic and modify traffic signal operations [MV-22/H-1 EIS Figure 11]
7.	Reconfigure the intersection of Third Street and Selden Street [MV-22/H-1 EIS Figure 12]
8.	Convert the existing two-way stop at the intersection of Craig Avenue and Selden Street to an all-way stop control [MV-22/H-1 EIS Figure 16]
Note: Per the existing conditions at the time of the MV-22/H-1 EIS traffic analysis (September 2011)	

Table 3.11-2. Roadway Improvements to Support GTF	
1.	Monitor and adjust signal timing as needed at the two existing signalized intersections
2.	Add left turn lanes on Selden Street at the intersection with Craig Avenue [MV-22/H-1 EIS Figure 16]

Table 3.11-3. Roadway Improvements to Mitigate MV-22/H-1 EIS Project Impacts	
1.	Monitor and adjust signal timing as needed at the two existing signalized intersections; add a fourth phase to the traffic signal at the intersection of Third Street and G Street to convert a portion of the Third Street phase to allow unopposed westbound traffic
2.	Widen the west leg (Mōkapu Road) of the intersection to add a second eastbound lane [MV-22/H-1 EIS Figure 20]
3.	Restripe the southbound approach on Craig Avenue to provide a separate right turn lane.
4.	Widen the southbound Reed Road approach to Mōkapu Road to mitigate the anticipated very long delays at the stop sign [MV-22/H-1 EIS Figure 21]

The traffic signals at the intersection of G Street, Mōkapu Road, and Lawrence Road were reactivated in late-2012. While vehicular traffic was adequately served by the flashing mode, pedestrians had difficulties determining when a safe crossing could be made. With the signals activated, there is a clear indication of when pedestrians can cross. Conditions were determined to be worst in the Midday peak hour; a comparison of levels of service with the signals in use is shown in Table 5 of Appendix G.

The additional loading resulting from the relocation of VMU-3 to MCB Hawaii Kaneohe Bay would not be expected to have a significant impact on traffic beyond that identified in the MV-22/H-1 EIS traffic analysis.

3.11.2.2 WAAF, PMRF, and PTA

Traffic impact analysis was not conducted for WAAF, PMRF, or PTA. Significant traffic impacts from periodic squadron training events at WAAF, PMRF, and PTA are not expected. Under the Proposed Action, traffic impacts are limited to MCB Hawaii Kaneohe Bay.

3.11.2.3 No-Action Alternative

Under the No-Action alternative, status quo would be maintained and the improvements recommended in the traffic analysis done for the MV-22/H-1 EIS would improve roadway and gate conditions to acceptable levels of service.

3.11.3 Mitigation

Mitigation measures proposed in the MV-22/H-1 EIS included roadway improvements to mitigate existing traffic problems, measures to support personnel increases associated with the Grow the Force initiative, and to mitigate impacts related to the MV-22/H-1 relocation.

Traffic engineering improvements to address undesirable existing traffic conditions (listed in order of traffic need priority) are shown in Table 3.11-1. Additional improvements necessary to adequately serve the changes in traffic demands that are expected with full implementation of the Grow the Force initiative are shown in Table 3.11-2. Improvements identified to address the traffic impacts associated with base population increases described in the V-22/H-1 EIS are shown in Table 3.11-3.

Based on consultation with MCB Hawaii Facilities Maintenance Division, all MV-22/H-1 EIS traffic improvement recommendations are currently being submitted for fiscal year (FY) 2016 consideration. No mitigation, beyond that previously proposed in the MV-22/H-1 EIS and currently being pursued, is needed or proposed.

3.12 UTILITIES, INFRASTRUCTURE, AND SOLID WASTE

3.12.1 Affected Environment

3.12.1.1 MCB Hawaii Kaneohe Bay

3.12.1.1.1 Water

There are no potable (drinking) water wells at MCB Hawaii Kaneohe Bay; potable water is purchased from the City and County of Honolulu Board of Water Supply. The Board of Water Supply has the capacity to provide an estimated maximum demand of three million gallons per day (MGD); however, MCB Hawaii Kaneohe Bay is not obligated to use, nor is it restricted to this amount. MCB Hawaii Kaneohe Bay's water distribution system consists of lines that are owned and maintained by the USMC. In FY 2010, the most recent data available, total water consumption at MCB Hawaii Kaneohe Bay was 457 million gallons and the average daily use was 1.25 MGD (MCB Hawaii Kaneohe Bay 2010).

3.12.1.1.2 Wastewater

Wastewater at MCB Hawaii Kaneohe Bay is treated at the installation's Water Reclamation Facility (WRF). The WRF has the following design capacity: 2.0 MGD for average daily influent flow; 3.0 MGD for maximum daily influent flow; and 5.0 MGD for peak influent flow. In 2013, the average influent flow was approximately 1.1 MGD. The average influent flow has been decreasing due to recent infrastructure improvements to reduce infiltration and inflow rates (Larson 2013). The WRF provides secondary treated effluent that is pumped to the City and County of Honolulu's Kailua Wastewater Treatment Plant for ocean disposal via the plant's Mōkapu Outfall (USN 2011). Future programmed improvements to the WRF (e.g., installation of a new disinfection system) would allow treated effluent to be reused at MCB Hawaii Kaneohe Bay after meeting R-2 requirements, which restrict the uses and applications for secondary treated water that has been oxidized and disinfected.

3.12.1.1.3 Electricity

The MCB Hawaii Kaneohe Bay electrical distribution system receives power from Hawaiian Electric company. At Hawaiian Electric company's Mōkapu Substation, located near the H-3/Main Gate, power is transformed from 46 kilovolts (kV) to 11.5 kV and distributed along the base's electrical distribution system. The MCB Hawaii Kaneohe Bay electrical distribution system consists of a main incoming switching station, three downstream switching stations (Substations 1, 2, and 3), and feeder lines. The existing percent loading on the various feeders that serve the three substations ranges up to 87.7 percent (USN 2011).

3.12.1.1.4 Solid Waste

Most solid waste produced at MCB Hawaii Kaneohe Bay is disposed of at the MCB Hawaii Kaneohe Bay sanitary landfill, which is located on the southern slope of Ulupa'u Crater. Hazardous and regulated waste is not accepted at the MCB Hawaii Kaneohe Bay sanitary landfill. The MCB Hawaii Kaneohe Bay sanitary landfill has a maximum estimated capacity of 1,204,000 cubic yards and an estimated remaining capacity of 671,900 cubic yards (i.e., projected remaining life of 46 years). During the reporting period July 2011 through June 2012, MCB Hawaii Kaneohe Bay generated approximately 6,658 tons of solid waste: approximately 3,510 tons was recycled on-base, and approximately 3,148 tons was disposed of at the MCB Hawaii Kaneohe Bay sanitary landfill. The average solid waste disposal rate was approximately six tons per day (MCB Hawaii Kaneohe Bay 2012). MCB Hawaii Kaneohe Bay currently participates in a recycling program and diverts as much solid waste as possible from the landfill. An on-base recycling center that accepts all recyclable and reusable materials is located in Building 132.

Solid waste produced from the family housing areas and construction projects is collected by a commercial contractor and disposed of at the City and County of Honolulu's H-Power Plant, or at the Waimanalo Gulch Landfill when the H-Power Plant is not operating. The H-Power Plant can process (i.e., incinerate for energy) more than 3,000 tons of municipal solid waste per day (H-Power 2011).

3.12.1.2 WAAF

3.12.1.2.1 Water

WAAF derives its water supply from groundwater that is pumped from deep wells and sent to a treatment plant before distribution to users. For emergency purposes, the water supply and distribution system at WAAF is also connected to the City and County of Honolulu's Board of Water Supply system. The water system at WAAF consists of approximately 20 miles of pipelines, valves, meters, and fire hydrants. The water system also provides potable water to SBMR Main Post, East Range, Helemano Military Reservation, and the Naval Computer and Telecommunications Area Master Station, Wahiawa. The water supply at WAAF provides sufficient capacity for current mission and mission support requirements, based on the average daily demand. However, it does not support requirements at peak conditions. During FY09, peak domestic demand (approximately 6.86 MGD) exceeded capacity by approximately five percent (0.29 MGD) (U.S. Army 2011a).

3.12.1.2.2 Wastewater

Wastewater generated at WAAF is transported to the Schofield Barracks Wastewater Treatment Plant, located near the west end of WAAF. The Army privatized the wastewater system, including the treatment plant and collection systems; the wastewater system is owned and operated by AQUA Engineering. The wastewater system provides services to WAAF, SBMR, Camp Stover, Kunia Military Reservation, Leilehua Golf Course, and Helemano Military Reservation. The wastewater treatment plant has a design flow capacity of 4.2 MGD, a maximum design flow capacity of 10 MGD, and a design peak flow capacity of 15 MGD. It is permitted to treat 3.2 MGD (U.S. Army 2011a).

The wastewater system at WAAF consists of approximately 14 miles of collection lines and seven pump stations. WAAF's wastewater system provides sufficient capacity to support current mission support requirements. The system is currently operating at 45 percent capacity (1.91 MGD) (U.S. Army 2011a).

3.12.1.2.3 Electricity

The WAAF electrical distribution system receives power from Hawaiian Electric Company via a 46 kV circuit that originates at the Wahiawa substation. At the WAAF substation, power is transformed to 12.47 kV and distributed along underground and overhead feeder lines to the onsite distribution system. WAAF has two other 12.47 kV circuits that are used in case of an emergency. The electrical capacity at WAAF is 10 megavolt-amperes. Current peak demand is 7.66 megavolt-amperes, which is approximately 76 percent of capacity (U.S. Army 2011a).

3.12.1.2.4 Solid Waste

Non-recyclable solid waste produced at WAAF is collected by a private company and transported to the City and County of Honolulu's H-Power Plant or the Waimanalo Gulch Landfill when the H-Power Plant is not operating. The Army diverts approximately 90 percent of its solid waste to the H-Power Plant; only a small portion of solid waste goes to the Waimanalo Gulch Landfill.

3.12.1.3 PMRF

3.12.1.3.1 Water

Water is supplied to PMRF by the State Department of Land and Natural Resources (DLNR) and the Kaua'i Department of Water. The DLNR water supply originates at the Mana well (located approximately 1,000 feet south of the Kamokala Ridge magazines) and is pumped to PMRF and stored in two water tanks near the Main Hangar, one with a 420,000-gallon capacity and one of 100,000-gallon capacity. This water source serves the central and northern portions of the base. In 2006, PMRF's DLNR-supplied water consumption was 78.5 million gallons (U.S. Army 2010a). The maximum delivery capacity of water from the state is 0.32 MGD.

Water supplied from the Kaua'i Department of Water originates at Kekaha Waipa'o Valley Well, Pau'a Valley Well, Shaft 12, and Waimea wells A and B (U.S. Army 2010a). This water is stored in two 126,000-gallon tanks at Kokole Point. In 2006, PMRF's consumption of water from the Kaua'i County Department of Water was 10.8 million gallons.

3.12.1.3.2 Wastewater

The wastewater system at PMRF consists of two domestic sewage treatment facilities, leach fields, septic tanks, and a collection system. A treatment plant, located south of the Main Gate, treats approximately 8,000 gallons per day (GPD), or 2.7 percent of its 30,000 GPD design capacity. An oxidation pond, located on the southern end of the base, received 20,000 to 25,000 GPD of its 54,000 GPD design capacity (USASMDC 2002). Both facilities discharge their effluent into leach fields. PMRF also has more than 20 septic tanks/leach field systems and cesspools that serve individual buildings in the northern part of the base (USASMDC 2002).

3.12.1.3.3 Electricity

The PMRF electrical distribution system receives power from Kaua'i Island Utility Cooperative (KIUC). Power to PMRF/Main Base and the northern complex area is supplied via a 57 kV/69 kV transmission line between KIUC's Mana Substation and Kekaha switchyard. This transmission line has a capacity of 7.6 megawatts (MW) at 95 percent power factor; the current peak load is 2.5 MW (U.S. Army 2010a). A 12.47 kV feeder circuit system owned by KIUC supplies primary power to the base's southern area; this circuit has a capacity of 4.3 MW at 95 percent power factor (U.S. Army 2010a). In the event of a power outage, PMRF provides additional power with its own plant, utilizing commercial power as a backup. The PMRF power plant contains two 600-kilowatt and three 300-kilowatt generator units (USASMDC 2002).

3.12.1.3.4 Solid Waste

Solid waste generated at PMRF is disposed of at Kaua'i County's Kekaha Landfill. The Kekaha Landfill averages 230 tons per day and 88,000 tons per year. The landfill is close to its maximum capacity; however, the county is currently in the planning phases for expansion of the existing facility. In FY06, PMRF generated approximately 530.6 tons of solid waste that was disposed of in the landfill and approximately 252.3 tons were recycled (U.S. Army 2010a). PMRF maintains a recycling program, and green waste is collected and reused for composting on the base (USASMDC 2002).

3.12.1.4 PTA

3.12.1.4.1 Water

Water is supplied to PTA from Hawai'i County wells, primarily the Waimea well, to the cantonment area via 5,000-gallon-capacity tankers. Water is then transported to two pump stations that distribute water to two 670,000-gallon distribution reservoirs where the water is treated and then distributed to three 10,000-gallon reservoirs. Water is used to support PTA, BAAF, and fire reserves. Water consumption at PTA ranges from 10,000 GPD (minimal troop activity) to 70,000 GPD (full training capacity). If PTA's water demand cannot be accommodated by the Waimea well, additional water can be provided by the City of Hilo (USAEC 2009).

3.12.1.4.2 Wastewater

The wastewater system at PTA consists of septic tanks and/or underground injection wells. All wastewater is handled onsite in accordance with DOH-Safe Drinking Water Branch, Underground Injection control permit UH-2609. Injectant (treated fluid) is limited to septic tank-treated domestic wastewater from five separate septic tank wastewater treatment systems. Under this permit, PTA staff is required to conduct daily monitoring, quarterly sampling, periodic inspections, and annual status reporting.

3.12.1.4.3 Electricity

Electrical power for PTA is provided to the main base substation by a Hawaiian Electric Light company-owned substation, located adjacent to the northeast fence of the cantonment areas. At the substation, the 69 kV transmission line is transformed to 12.47 kV and distributed through a radial distribution system via a 2,500-kilovolt-ampere transformer. PTA owns, operates, and maintains the electrical distribution system, which consists of metering equipment, nine transformers, 20 miles of overhead feeder lines, and 755 poles. PTA's current electricity usage is approximately 1,718,400 kilowatt-hours per year, and electricity consumption has increased steadily in recent years (USAEC 2013).

3.12.1.4.4 Solid Waste

Solid waste produced at PTA is disposed of at the South Hilo Sanitary Landfill or West Hawaii Sanitary Landfill in Pu'uana'hulu. In 2010, PTA generated an average of approximately three tons of solid waste per day, or approximately 1,100 tons per year (USAEC 2013). PTA currently participates in a recycling program that has an overall goal of diverting solid waste from landfills and reducing waste streams.

3.12.2 Potential Impacts

3.12.2.1 Proposed Action

3.12.2.1.1 MCB Hawaii Kaneohe Bay

Basing

The analysis assumes that all of the approximately 480 personnel and dependents would reside on base, which would have the greatest possible impacts on the utilities, infrastructure, and solid waste systems at MCB Hawaii Kaneohe Bay.

Renovation, demolition, and construction activities would involve the disconnection of utility services to the building to be demolished and removal of utility infrastructure within the existing Building 373 compound. Demolition of utility lines and infrastructure would be planned so that services remain uninterrupted for adjacent tenants/buildings. Furthermore, disconnection of utility services in the Building 373 compound would not affect the function or capacity of the MCB Hawaii Kaneohe Bay utility distribution systems.

Water

The Proposed Action would include construction of additional water distribution lines that would connect directly to existing infrastructure at MCB Hawaii Kaneohe Bay. Based on the per capita guidelines contained in UFC-3-230-19N, *Water Supply Systems*, the Proposed Action could result in an estimated 0.08 MGD increase in the average daily demand for potable water. This would represent a 4 percent increase over the FY08 average daily use of 1.81 MGD. However, to achieve a LEED Silver rating, sustainable design features that reduce inefficiencies and waste, including overall water consumption, would be incorporated into the Proposed Action. Actual water consumption is likely to be lower than the per capita estimate. The proposed water system improvements would be adequate to accommodate the additional personnel and dependents required to support proposed operations. Implementation of the Proposed Action would not have a significant impact on water system utilities and no mitigation is proposed.

Wastewater

The Proposed Action would include construction of additional wastewater mains that would connect directly to existing infrastructure at MCB Hawaii Kaneohe Bay. The proposed additional personnel could result in an estimated influent flow increase of 38,320 GPD (based on 80 Gallons Per Capita Demand [GPCD] for residents). This increase would result in a total estimated average influent flow of 1.138 MGD, which would be well below the 75 percent threshold of the WRF's 2.0 MGD capacity, at which time plans to increase the treatment plant's capacity would be initiated (Larson 2013). To achieve a LEED Silver rating, conservation and sustainable design features, including water-conserving plumbing fixtures, would be incorporated into the Proposed Action. Actual wastewater flow would likely be lower than the per capita estimate. The proposed wastewater system improvements would be adequate to accommodate the additional personnel and dependents proposed for relocation. Implementation of the Proposed Action would not have a significant impact on wastewater system utilities and no mitigation is proposed.

Electricity

Demands for electricity are anticipated to increase slightly as a result of the proposed additional personnel. The Proposed Action would include construction of electrical distribution system improvements that would connect directly to existing infrastructure at MCB Hawaii Kaneohe Bay. The additional demands on electricity are not anticipated to exceed the operational capacity of the Hawaiian Electric Company's Mōkapu Substation because this facility has adequate transformer capacity to support planned future growth at MCB Hawaii Kaneohe Bay (USMC 2011). No significant impacts on electrical system utilities would be expected to occur and no mitigation is proposed.

Solid Waste

Demands for solid waste disposal are anticipated to increase slightly as a result of the proposed additional personnel. Proposed activities would generate debris that would be disposed of in compliance with MCB Hawaii Kaneohe Bay's recycling program, ensuring that eligible items are recycled. Most unrecyclable materials would be disposed of at the MCB Hawaii Kaneohe Bay sanitary landfill. There is a total remaining volume of 671,900 cubic yards (CY) (46 years at current solid waste disposal rate) within the base sanitary landfill. This is sufficient capacity to accommodate the volume of solid waste expected to be generated by the Proposed Action (Larson 2013). Furthermore, the amount of solid waste generated by the Proposed Action would be reduced by the base's continuing recycling efforts. No significant impacts on solid waste disposal utilities would be expected to occur and no mitigation is proposed.

Training

The proposed UAS training activities would not increase demands on utilities (i.e., water, wastewater, electricity, or solid waste) such that existing capacity would be inadequate. No significant impacts on utilities, infrastructure, or solid waste would be expected to occur and no mitigation is proposed.

3.12.2.1.2 WAAF

Existing WAAF utility infrastructure (i.e., water, wastewater, electricity and solid waste) would be adequate to accommodate the additional operator, maintenance, and support personnel required for proposed VMU-3 UAS operations at WAAF and the new facility to support operational and equipment storage space for VMU-3 detachment. No significant impacts on utilities, infrastructure, or solid waste would be expected to occur and no mitigation is proposed.

3.12.2.1.3 PMRF

Construction activities associated with the proposed runway improvements (paving or matting and installation of permanent holes for anchoring gear) would result in a negligible increase in demands on solid waste disposal. No additional utilities (water, wastewater, and/or electricity) would be affected by the proposed runway improvements.

Proposed training activities at PMRF are anticipated to be infrequent and would not increase demands on utilities (i.e., water, wastewater, electricity, or solid waste) such that existing capacity would be inadequate. No significant impacts on utilities, infrastructure, and solid waste would be expected to occur and no mitigation is proposed.

3.12.2.1.4 PTA

No facility upgrades would be needed at PTA to support the proposed VMU-3 UAS training. Proposed training activities at PTA are anticipated to be infrequent, and would not increase demands on utilities (i.e., water, wastewater, electricity, or solid waste) such that existing capacity would be inadequate. No significant impacts on utilities, infrastructure, or solid waste would be expected to occur and no mitigation is proposed.

3.12.2.2 No-Action Alternative

Under the No-Action Alternative, VMU-3 would not relocate to Hawai'i and construction of military basing and training support facilities, utilities, and site improvements would not occur. Existing conditions would be expected to remain as described in Section 3.12.1, *Affected Environment*.

3.13 HAZARDOUS MATERIALS AND WASTE

Hazardous materials and hazardous waste are substances that have hazardous physical and chemical properties and/or high toxicity. They are called hazardous materials before and during their use, and they become hazardous wastes when they are no longer needed. Other issues related to this topic are Installation Restoration Program (IRP) sites, asbestos-containing materials, lead-based paint, ASTs, and Underground Storage Tanks (USTs).

Hazardous materials listed under the comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA) are defined as any substances that, due to quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment.

Hazardous wastes listed under the Resource Conservation and Recovery Act (RCRA) are defined as any solid, liquid, or contained gaseous or semisolid waste, or any combination of wastes that pose a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Other federal regulations that apply to hazardous materials/waste include the Toxic Substances Control Act, Community Environmental Response Facilitation Act, Federal Facilities Compliance Act, Hazardous Materials Transportation Act, Pollution Prevention Act, EO 12088, Federal Compliance with Pollution Control Standards, and EO 12856, Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements.

3.13.1 Affected Environment

3.13.1.1 MCB Hawaii Kaneohe Bay

Hazardous materials at MCB Hawaii Kaneohe Bay are managed in accordance with regulations that are intended to minimize hazards to public health and damage to the environment. Hazardous materials are also managed to minimize the generation of hazardous waste. At MCB Hawaii Kaneohe Bay, these materials primarily consist of aviation fuel, ground vehicle fuel, lubricants, hydraulic fluids, antifreeze, degreasers, and solvents, chemical batteries, cleaning materials, and paint-related materials.

MCB Hawaii Kaneohe Bay has developed a Hazardous Waste Management Plan (HWMP) describing the responsibilities, requirements, and procedures for handling, accumulating, turning in, and removing hazardous waste and regulated non-hazardous waste generated on the base (USN 2011). The HWMP specifies procedures and protocol for waste management at the unit level and at the Base Hazardous Waste Accumulation Site. MCB Hawaii Kaneohe Bay neither stores nor transports any hazardous waste and the base accumulates hazardous waste for no longer than 90 days. Hazardous waste transportation and disposal are currently the responsibility

of the Defense Reutilization and Marketing Office–Hawaii. Training is provided to base personnel, on a quarterly basis, on how to follow and implement the HWMP. Hazardous materials (new or in-use products) are properly stored in various locations at MCB Hawaii Kaneohe Bay, including in storage tanks, flammable storage lockers, shelves, and materials storage warehouses. Excess hazardous materials are returned to the Hazardous Materials Minimization (HAZMIN) Center where they are screened for use by other units to prevent them from being wasted.

MCB Hawaii Kaneohe Bay conducts an IRP that manages sites where remediation or other efforts are being undertaken due to the release of hazardous materials or petroleum products (USN 2011). Handling and disposal of hazardous materials at MCB Hawaii Kaneohe Bay is regulated by policies set forth by USEPA and DOH. The IRP at MCB Hawaii Kaneohe Bay has been in effect since the Initial Assessment Study was completed in 1983. According to the Environmental Cleanup Program Sites Status Update, July 2011, there are currently 22 IRP sites at MCB Hawaii Kaneohe Bay (DoN 2012a). Procedures are in place for any work needing to be done at these IRP sites.

The Building 373 compound is located close to former UST sites, the Fuel Farm, and presently, a few ASTs. Just northeast of the facility is AST 1253 (site IR-21), which holds Jet Propellant Grade 5 (JP-5). In 1987, Navy personnel discovered that JP-5 had leaked from AST 1253 into the subsurface soil. A 1988 investigation found that an estimated 60,000 gallons of JP-5 had contaminated the subsurface soil, and that it had migrated southwest approximately 315 feet from the center of AST 1253, with a thickness ranging up to 71 inches at its thickest (DoN 2013c). Another investigation conducted in 2012 revealed that the product plume had migrated approximately 520 feet to the southwest and the product thickness ranged up to approximately 0.49 foot on the surface of the groundwater (DoN 2013c). Although the extent of the free-phase product is not expected to increase, the estimated extent of contamination encroaches upon the Building 373 compound proposed to be paved as a feature of VMU-3 relocation to MCB Hawaii Kaneohe Bay (DoN 2013c). The Navy has proposed a Conditional No Further Action status for AST 1253 (site IR-21), with continuation of long-term management activities and monitoring for the presence and thickness of free-phase petroleum product. The monitoring results will be used to evaluate the free-phase JP-5 product plume for continued biodegradation and potential lateral migration.

Site IR-16 is located at the southwest corner of Building 373 (USN 2011). It is known that approximately 5 gallons of sulfuric acid electrolyte were disposed of directly into the ground near the battery shop in this vicinity (NEESA 1984). Due to the calcareous nature of the soils in the area, it was expected that the acids would have quickly been neutralized and the small quantities of metals they contained would have been adsorbed onto clay particles in the soil. Therefore, no confirmation study was proposed for site IR-16 at the time of its initial register. Additional site sampling of IR-16 performed by NAVFAC Hawaii in FY13 did not find significant levels of contamination and the site was designated for No Further Action (NAVFAC Pacific 2013).

Site IR-12 is located to the east of Building 373. This site is described as a “Fuel Farm Sludge Disposal Area” located approximately 175 feet east of the footprint of the proposed new vehicle wash rack. The Remedial Investigation Report completed in April 2013 recommends No Further Action for the Former Sludge Disposal Area (USMC 2013b).

There are no known hazardous material or IRP sites in the vicinity of Hangar 102.

There are five active USTs and 77 ASTs at MCB Hawaii Kaneohe Bay. Two of the five active USTs are located near the airfield. One is a diesel tank for the emergency generator at the old control tower, and the other is an oil/water separator for used oil, located at the fixed-wing range facility (DoN 2012a). The USEPA has issued regulations requiring a Spill Prevention, Control and Countermeasure (SPCC) plan for non-transportation-related, oil product-storing facilities that could possibly discharge oil in harmful quantities to navigable waters of the U.S. MCB Hawaii Kaneohe Bay is subject to these requirements based on its AST oil capacity.

3.13.1.2 WAAF

Hazardous materials at WAAF are managed in accordance with AR 200-1, *Environmental Protection and Enhancement* (December 2007) for the purpose of minimizing hazards to public health and damage to the environment. Hazardous materials are also managed to minimize the generation of hazardous waste. At WAAF, these materials primarily consist of aviation fuel, ground vehicle fuel, lubricants, hydraulic fluids, antifreeze, degreasers, and solvents, chemical batteries, cleaning materials, and paint-related materials.

WAAF maintains site-specific Spill Prevention, Control, and Countermeasure Plans (SPCCPs) to regulate the storage and use of petroleum products, and pollution prevention plans to regulate the storage and use of hazardous materials. The hazardous materials and wastes used and generated by non-Army tenants at WAAF are the responsibility of the generator and it is the generator's responsibility to ensure that contract means are in place for their management (Akasaki 2013).

WAAF conducts an IRP for identifying, evaluating, and remediating contaminated sites on federal land under DoD control. Through its IRP, the Army evaluates and cleans up sites where hazardous materials and wastes have been spilled or released into the environment. There are no IRP sites within the footprint of the area proposed for construction of the VMU-3 facility at WAAF (U.S. Army 2011a).

There are eight ASTs at WAAF (U.S. Army 2011a); none are inside the footprint of the area proposed for construction of the VMU-3 facility at WAAF.

3.13.1.3 PMRF

PMRF manages hazardous materials through the Navy's Consolidated Hazardous Materials Reutilization and Inventory Management Program (CHMRIMP). CHMRIMP mandates procedures to control, track, and reduce the varieties and quantities of hazardous materials in use at facilities (USASMDC 2010). The CHMRIMP established HAZMIN Centers as the inventory controllers for Navy facilities. All departments, tenant commands, and work centers must order hazardous materials from these centers, where all such transactions are recorded and tracked. Hazardous materials at PMRF are managed by the operations and maintenance contractor

through CHMRIMP. Hazardous materials (other than fuels) managed through the CHMRIMP are stored in Building 338 (USASMDC 2010). Typical materials used at PMRF and stored at Building 338 include cleaning agents, solvents, and lubricating oils. PMRF has management plans for oil and hazardous materials outlined in the *PMRF SPCC Plan* and the installation's *Spill Contingency Plan* (USASMDC 2010).

PMRF conducts an IRP for identifying, evaluating, and remediating contaminated sites on federal land under DoD control. There are 19 IRP sites on the installation, eight of which have been granted "no further action" status by the DOH (USASMDC 2010).

There are 16 USTs and 7 ASTs at PMRF (USASMDC 2010); none are within the footprint of the project area.

3.13.1.4 PTA

PTA manages hazardous materials and regulated waste through the Installation HWMP, which specifies plans and procedures for handling, storing, and disposing of hazardous materials and hazardous waste on USAG-HI bases. In addition, guidance and procedures on storage of petroleum, oil, and lubricants (POLs), spill prevention, and spill plans at USAG-HI bases are regulated by the USAG-HI SPCC plan. PTA has its own guidance and procedures regarding a spill plan, storage and use of POLs, refueling procedures, and the usage of spill kits.

3.13.2 Potential Impacts

3.13.2.1 Proposed Action

3.13.2.1.1 MCB Hawaii Kaneohe Bay

Basing

Facility renovation and construction methods would limit, to the extent possible, the use of hazardous materials. Petroleum products and other hazardous materials (e.g., paints and solvents) would be used during construction and renovation activities. These materials would be stored in proper containers, employing secondary containment as necessary to prevent and limit accidental spills. All spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste, would be reported and mitigated.

Groundwater level in the vicinity of Building 373 is approximately 12 feet below ground surface (USN 2011). Repaving the parking area, construction of the new Vehicle Wash-Platform, and renovations to buildings within the proposed VMU-3 complex would not require excavations down to groundwater, where contact with free product from site IR-21 may result. The current product plume boundary has been entered into the Naval Installation Restoration Information System, allowing MCB Hawaii personnel to effectively manage sites requiring land use controls; remediation measures may be needed based on sampling results and information gathered during future site investigations.

In addition to known IRP sites, there is the possibility that undocumented contaminated soils from past fuel spills may be present beneath portions of the base. Any potential impacts associated with unknown contamination would be mitigated through worker awareness and safety training.

Proper removal, handling, transport, and disposal of hazardous materials from the premises of buildings that contain lead-based paint and asbestos-containing materials would be conducted by qualified professionals, in compliance with all applicable state and federal health, safety, and environmental regulations. In accordance with HAR 11-501, *Asbestos Requirements*, DOH would be notified of any demolition or renovation work involving asbestos, as appropriate. BMPs would be employed during demolition or renovation work to prevent and/or minimize the release of hazardous materials, and to protect workers. This would minimize the risk of persons on-base being exposed to health hazards associated with hazardous materials.

In the long term, any hazardous materials used or stored during VMU-3 relocation-related operations would continue to be handled and managed in accordance with established protocol. This includes barcoding and tracking of material by the base's Hazard Minimization Center, waste-screening, and disposal of hazardous waste at the base's Hazardous Waste 90-day accumulation site. Hazardous waste is not allowed in base dumpsters or in the base landfill.

Training

Building 191 would be used for the storage of the approximately 350 gallons of 100-Octane low-lead fuel that would be used per month for VMU-3 flight training operations. The storage, handling, and use of fuel would be managed in accordance with the installation's HWMP, SPCC plan, and associated policy and procedures.

With implementation of the environmental control measures described above and compliance with existing regulations and procedures, no significant impacts related to hazardous materials or waste would be expected to occur and no mitigation is proposed.

3.13.2.1.2 WAAF

Proposed VMU-3 basing and training at WAAF would require the construction of a facility approximately 50 feet by 80 feet (15.2 meters by 24.4 meters), and paved parking for 20 POVs. The facility would be constructed utilizing construction methods that would limit, to the extent possible, the use of hazardous materials. Petroleum products and other hazardous materials (e.g., paints and solvents) would be used during construction activities. These materials would be stored in proper containers, employing secondary containment as necessary to prevent and limit accidental spills. Spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported and mitigated.

There are no IRP sites in the vicinity of project area (U.S. Army 2011a). However, there is the possibility that undocumented contaminated soils from past fuel spills may be present beneath portions of the base. Potential impacts associated with unknown contamination would be mitigated through worker awareness and safety training.

In the long-term, any hazardous materials used or stored during VMU-3 operations would continue to be handled and managed in accordance with established protocol. Hazardous waste is not allowed in base dumpsters or in the base landfill. VMU-3 would ensure that contract means are in place for the management of its hazardous materials and wastes generated by its training operations at WAAF (Akasaki 2013).

With implementation of the environmental control measures described above and in compliance with existing regulations and procedures, no significant impacts related to hazardous materials or waste would be expected to occur and no mitigation is proposed.

3.13.2.1.3 PMRF

The airfield improvements for the Proposed Action would be performed utilizing construction methods that would limit, to the extent possible, the use of hazardous materials. Petroleum products and other hazardous materials (e.g., paints and solvents) would be used during construction activities. These materials would be stored in proper containers, employing secondary containment as necessary to prevent and limit accidental spills. Spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported and mitigated. The existing hazardous materials/waste programs for PMRF would handle the needs of the Proposed Action.

Some limited ground disturbance would occur during the runway improvements and the installation of the arresting gear holes. There are no IRP sites in the project area or vicinity and it is unlikely that these activities would encounter contaminated soil. However, there is the remote possibility that undocumented contaminated soils from past fuel spills may be present beneath portions of the base. Potential impacts associated with unknown contamination discovered within the project area would be mitigated through worker awareness and safety training.

In the long term, any hazardous materials used or stored during VMU-3 operations would continue to be handled and managed in accordance with established protocol. The RQ-7B uses motor gasoline (MOGAS) and the RQ-21A uses aviation gasoline (AVGAS). PMRF does not currently provide AVGAS to airfield users. Existing procedures and plans would be updated as needed to reflect the particular needs of the VMU-3 systems. The types of hazardous materials used and hazardous waste generated would be managed in accordance with existing PMRF procedures, which conform to federal and State of Hawai'i requirements.

With implementation of the environmental control measures described above and in compliance with existing regulations and procedures, no significant impacts related to hazardous materials or waste would be expected to occur and no mitigation is proposed.

3.13.2.1.4 PTA

Any hazardous materials used or stored during VMU-3 periodic training operations would continue to be handled and managed in accordance with established protocol. The types of hazardous materials used, and hazardous waste generated, would be managed in accordance with existing PTA procedures, which conform to federal and State of Hawai'i requirements.

With implementation of existing regulations and procedures, no significant impacts related to hazardous materials or waste would be expected to occur and no mitigation is proposed.

3.13.2.2 No-Action Alternative

Under the No-Action Alternative, VMU 3 would not relocate to Hawai'i and no construction or renovation activities associated with basing and training of the squadron would occur. Baseline conditions for hazardous materials and waste as described in Section 3.13.1, *Affected Environment*, would be expected to continue.

3.14 CUMULATIVE IMPACTS

Cumulative impacts are the result of two or more individual effects that, when considered together, compound or increase the overall impact. Cumulative impacts can arise from the individual effects of a single action or from the combined effects of past, present and/or future actions. Cumulative impacts can result from individually minor actions that collectively amount to significant actions over time.

The projects listed in Table 3.14-1 through Table 3.14-3 were considered in conducting the cumulative impact analysis. Table 3.14-1 lists cumulative projects at MCB Hawaii Kaneohe Bay and Table 3.14-2 lists cumulative projects at WAAF. Table 3.14-3 lists non-military projects in the project vicinity. Capital improvement projects at MCB Hawaii Kaneohe Bay make up the majority of projects, while some projects are planned for WAAF and SBMR. Projects listed in these tables are planned to be constructed concurrent with, or shortly after, the VMU-3 projects encompassed by the Proposed Action. For the purposes of this EA, the timeframe of current and/or reasonably foreseeable projects extends from 2013 to 2016. Many of the capital improvement projects at MCB Hawaii Kaneohe Bay would accommodate the basing of the MV-22 Osprey, the Marine Light Attack Helicopter (HMLA), the P-8A Multi-Mission Maritime Aircraft, their supporting units, and other aviation-related improvements. The U.S. Navy completed an EIS in 2008 for the introduction of the P-8A Multi-Mission Maritime Aircraft into the Navy fleet and is currently preparing a Supplemental EIS (DoN 2013d). The USMC completed an EIS for projects that support the basing of MV-22 and HMLA aircraft at MCB Hawaii Kaneohe Bay in 2012. The Defense Policy Review Initiative (DPRI) would relocate some U.S. Marines and dependents from Okinawa to O'ahu, projected for the years between 2019 and 2026. The projects associated with DPRI are part of the USMC long-term planning horizon, but, at this time, are not sufficiently detailed for in-depth analysis to be included within the cumulative impacts analysis.

In addition, environmental analysis documents have been, or are being, completed for the listed State- or City-sponsored projects located within the nearby civilian community.

Table 3.14-1. Projects at MCB Hawaii Kaneohe Bay

Title	Description	Fund Year
Naval Aviation Vision 2032	Replace the P-3C and SH-60 based at Marine Corps Base (MCB) Hawaii Kaneohe Bay with P-8A and MH-60R.	2010
FY2012 Aviation Plan (AV Plan)	The U.S. Marine Corps Fiscal Year (FY)12 Marine AvPlan (USMC 2011) delineates the Marine Corps' overall strategy and schedule for equipment upgrades, potential movement of units, and fielding of new aviation capabilities across the Marine Corps; future plans for all Marine Corps aircraft and squadrons to be based at MCB Hawaii Kaneohe Bay include the future relocation of a Marine Unmanned Aerial Vehicle (VMU) squadron to the State of Hawai'i.	2011
Grow the Force (GTF)	GTF initiatives that have already been implemented at MCB Hawaii Kaneohe Bay are the introduction of an additional artillery battery (Echo Battery, 2D Battalion, 12th Marines [2/12 Marines]) and a radio company (Bravo Company, 3D Radio Battalion). The aviation ground support squadron (MWSD, MAG 24) arrival would be phased from FY12 and beyond. Construct adequate living, working, and training facilities or renovate existing facilities.	complete in 2011
Bachelor Enlisted Quarters (BEQ)	Construct BEQ at MCBH Kaneohe Bay to meet current demands.	2011 (continuing)
Waterfront Operations Center	Construct new facility to replace the Waterfront Operations existing deteriorated facilities.	2011 (continuing)
Force Realignment Initiatives	Reduce the overall size of the Marine Corps from 202,000 to 182,100 by FY18. The impacts of this reduction in force for MCB Hawaii Kaneohe Bay appear to be minimal. The current proposal would involve relocating Marines to several locations, including MCB Hawaii Kaneohe Bay, although there has been no final decision regarding the number of Marines who would be based in Hawai'i, the type of units, or the timing of that basing.	2012
Marine Corps Air Station (MCAS) Operations complex	Consolidate MCAS command operations facility to include passenger air terminal, cargo terminal, weather office, command spaces, and Aircraft Rescue and Firefighting Command Center.	2012 (continuing)
Hawaii Public/Private Venture (PPV) Housing Program	MCB Hawaii Kaneohe Bay entered into a PPV to privatize a portion of family housing on O'ahu through year 2054 under the Military Housing Privatization Initiative.	Continuing
Power Plant at MCB Hawaii Kaneohe Bay	The development of an Enhanced Use Lease is underway by Naval Facilities Engineering Command (NAVFAC) Hawaii for a biodiesel-fueled power plant sized up to 60 megawatts at MCB Hawaii Kaneohe Bay.	Continuing
MV-22 Hangar	Provide hangar to support one new MV-22 Squadron to be based in Hawai'i.	2013
Aircraft Staging Area	Construct aircraft parking apron for one MV-22 squadron.	2013
Marina Pier and Wave Attenuator	Construct new docks, floating wave attenuator, boat rinse area with improved drainage, fuel pump and fuel dock; relocated moorings.	2013
Auto Skills Center	Demolish Buildings 1267, 1307, and 1672 and renovate Building 3097; construct new exterior bays and support facility.	2013
MV-22 Aircraft Parking Apron and Infrastructure for Second Marine Medium Tilt-Rotor Squadron (VMM) Squadron	Construct aircraft parking apron for a second MV-22 squadron, including relocation of Mōkapu Road and demolition of facilities on site.	2014
MV-22 Hangar for Second VMM Squadron	Construct a hangar for a second MV-22 squadron	2014
Marine Aviation Logistics Squadron (MALS) Aircraft Maintenance Expansion	Renovate and expand the MALS maintenance facilities including the Ground Support Equipment (GSE) compound.	2014

Table 3.14-1. Projects at MCB Hawaii Kaneohe Bay (Continued)

Title	Description	Fund Year
Mission Support Facility (Aviation Trainer Systems)	Construct a new Simulator Center to accommodate new aviation simulators in support of the MV-22, Helicopter Marine Light Attack (HMLA), and Marine Heavy Helicopter squadrons.	2014
Helicopter Marine Light Attack (HMLA) Hangar Renovation	Renovate Hangar 101 for HMLA and construct additional shop/admin space to meet Basic Facility Requirement (BFR).	2014
Armory Addition	Construct new armory to address deficiency identified by 3D Marine Regiment and to address requirements for the additional firing battery added to 1/12 resulting from Ground Task Force (GTF). This project could be downsized pending Force Structure Review Group (FSRG) results.	2014
3d Radio Battalion (BN) Complex	Construct facilities to support GTF Marines added to 3d Radio Battalion.	2014
Wiki Wiki Marine Mart	Construct new Marine Mart and food vendor spaces to replace existing facilities in Building 1090.	2014
BEQ (Aviation Support)	Construct a new 208-bed BEQ and parking structure to support new Aviation Squadrons and Marine Wing Support Squadron (MWSS). This is the first phase of construction.	2015
VMU, Marine Wing Support Detachment (MWSD), and CH-53E Upgrades	Relocate 3rd Radio Motor Pool out of the Building 373 compound. Construct pavement and wash racks to support VMU and MWSD. Upgrade and reconfigure various buildings and install a five-ton crane for CH-53E in Hangar 102; create a Secure Compartmentalized Information Facility (SCIF) and install Optimized-Organizational Maintenance Activity (OOMA) infrastructure for VMU support.	2015
Electrical Distribution, Airfield Lighting and Repairs and Improvements	Relocate Airfield Vault and upgrade airfield lighting controls, including infrastructure. Upgrade and repair electrical utility system.	2015
Klipper Recreational Villas	Construct new villas; relocate maintenance facility.	2015 (Unprogrammed)
MAG-24 Armory Expansion	Expand armory to meet the needs of HMLA, MWSS, VMU, and MV-22.	2016+ (Unprogrammed)
MV-22 Environmental Impact Statement (EIS) Traffic Mitigation	Traffic improvements to various areas on base to mitigate traffic per the MV-22/HMLA EIS.	2016+ (Unprogrammed)
Marine Aircraft Group (MAG)-24 Headquarters Building	Construct a new MAG-24 Headquarters and multi-story parking structure to accommodate existing and anticipated new aviation squadrons.	2016 (Unprogrammed)
Artillery Battery Complex	Construct new vehicle maintenance facility, gun storage facility, renovate existing gun storage facility, and provide office spaces to replace trailers and tension fabric structures currently used by 1/12.	2016 (Unprogrammed)
Landing Helicopter Dock (LHD) Pad Conversion and MV-22 Landing Zone Improvements	Landing zone improvements at various locations to accommodate MV-22.	2016 (Unprogrammed)
Marine Corps Community Services (MCCS) Self Storage	Construct storage facilities to replace facilities that have to be demolished as a result of the Military Construction (MILCON) for a second MV-22 Hangar.	2016 (Unprogrammed)
Regimental Consolidated Communication/Electrical Facility	Consolidated Communication/Electrical Shop for 3rd Marines and 1/12 BN.	2016 (Unprogrammed)
Wastewater Treatment Plant (WWTP) Redundancy and Electrical Upgrade	Upgrade the base WWTP to provide redundant treatment systems.	2016 (Unprogrammed)
Multi-Purpose Training Complex	Construct facility to support individual and small-unit training using simulators. Includes classrooms, an auditorium, and a training pool.	2016 (Unprogrammed)

Table 3.14-1. Projects at MCB Hawaii Kaneohe Bay (Continued)

Title	Description	Fund Year
Addition to Hill-Top Self-Storage	Construct addition to Hill Top Self-Storage	2016 (Unprogrammed)
Airfield Security Fencing	Fencing and gates to provide entry control to the airfield and associated functional areas.	2017+ (Unprogrammed)
Bachelor Enlisted Quarters (BEQ) (Aviation Support)	Construct a new 200-bed BEQ to support new Aviation Squadrons and MWSS. This is the second phase of construction.	2017+ (Unprogrammed)
MV-22/Helicopter Marine Light Attack (HMLA) Warehouse and Marine Aviation Logistics Squadron-24 (MALS-24) Headquarters	Construct new warehouse for MV-22/HMLA and consolidate MALS-24 Headquarters offices with their storage function. Construct replacement warehouses demolished as part of construction of aircraft parking apron for a second MV-22 squadron.	2017+ (Unprogrammed)
Introduction of the P-8A Multi-Mission Maritime Aircraft (MMA) into the U.S. Navy Fleet	Dual-siting of the P-8A. For MCB Hawaii Kaneohe Bay, the proposed dual-siting would result in the new assignment of two rotating P-8A MMA detachments, the elimination of permanently assigned P-3C aircraft and personnel, and a reduced facility footprint.	Draft Supplemental EIS released in September 2013
Defense Policy Review Initiative (DPRI)	This action, if taken, would include the relocation of personnel and dependents from Okinawa to O'ahu projected for the years between 2019 and 2026.	Unprogrammed

Table 3.14-2. Projects at WAAF/SBMR

Title	Description	Fund Year
Regional Satellite Communication (SATCOM) Support Center	Substandard building is scheduled for demolition at Wheeler Army Airfield (WAAF). Construct satellite communications planning facility, including administrative, work, and training space and equipment storage.	2010
Upgrade Air Support Operations Center (ASOC) Complex	Renovate and reconfigure Buildings 203 and 204, construct storage facilities, resurface motor pool pavement, add vehicle parking, and conduct site work at WAAF.	2010
Combat Aviation Brigade (CAB) Complex Phase 1	Construct modern replacement facilities for the US Army 25th Infantry Division CAB. Phase 1 will construct the site infrastructure to provide adequate capacity to meet demand from the CAB Complex. This phase of construction includes electrical, water, sanitary sewer, storm drainage, and communications.	2010
Whole Barracks Renewal (WBR) Quad D 450/451	Renovate/modernize to provide unaccompanied enlisted personnel housing to meet current Department of the Army WBR standards.	2011
Construct New Barracks	Construct a barracks at Schofield Barracks for approximately 228 persons, with private vehicle parking, on a site bounded by Heard, Foot, Flagler, and Waianae. This would help alleviate shortage of barracks spaces that meet current housing standards.	2011
Training Support Center	Construct a training support center with parking lot near training areas at South Range at Schofield Barracks Military Reservation (SBMR) for using simulations equipment and to provide weather protection for training equipment, which is subject to rapid deterioration if left exposed to the weather.	2011
Central Vehicle Wash Facility	Construct a centralized vehicle wash facility near training areas at Lyman and Trimble Roads at SBMR to eventually replace inefficient and inferior individual motor pool wash racks. Facility will include a tank to use recycled water.	2012
WBR Quad B. Buildings 156/157/158	Renovate buildings to meet Department of the Army standards. The project includes modernization of the unaccompanied enlisted personnel housing, central plant, and primary utilities for the quad.	2013

Table 3.14-3. Non-DoD Actions

Title	Description	Fund Year
Transit Project	The largest project on O'ahu is the city's planned construction of an elevated rail system between Kapolei on the Ewa plain and Ala Moana Shopping Center in urban Honolulu. Two segments and several stations are under design, and other phases are scheduled to follow. Although the rail alignment is not located near MCB Hawaii Kaneohe Bay or any of the training areas, the magnitude of the project is such that it would affect the capacity of construction contractors and the availability of construction labor island-wide and possibly statewide.	In planning phase
Other City and County of Honolulu Projects	The City of Honolulu has embarked on extensive improvements to its sewage infrastructure. Wastewater treatment plants at Sand Island and Honouliuli must be upgraded to bring them into compliance with the Federal Clean Water Act. It is estimated that these projects could cost more than \$1 billion (ENS 2009). The City is also planning improvements to its Windward O'ahu wastewater facilities, including sewer lines and the Kailua Wastewater Treatment Plant that serves MCB Hawaii Kaneohe Bay. Another major City project is the planned expansion to the Honolulu Program of Waste Energy Recovery (H-POWER) waste-to-energy facility, which would increase its capacity by approximately 50 percent.	Continuing
Renewable Energy Initiatives	Hawaiian Electric company is participating in an agreement between the State of Hawai'i and the Department of Energy (DoE) "to decrease energy demand and accelerate use of renewable, indigenous energy resources in Hawai'i in residential, industrial, utility, and transportation end-use sectors, so that renewable energy resources will be sufficient to meet 70 percent of Hawai'i's energy demand by 2030." Hawaiian Electric company's renewable energy efforts include generating electricity from renewable power (biofuels, wind, solar, ocean energy, biomass, geothermal, seawater air conditioning), sponsoring the largest solar water heating program in the nation, supporting net energy metering, conducting integrated resource planning, installing solar electric system in schools, and increasing energy conservation and efficiency. A major initiative currently being planned is the Hawai'i Interisland Renewable Energy Program. The State of Hawai'i, in operation with DoE, is preparing a Programmatic EIS for the Hawai'i Interisland Renewable Energy Program, which proposes development of an undersea cable system connecting possible wind farms on one or more islands in Maui County to the island of O'ahu (HCEI 2010).	In planning phase
Saddle Road Realignment and Improvement Project	Saddle Road, linking the east and west sides of the island of Hawaii, provides vehicular access to Pohakuloa Training Area (PTA). Construction of major improvements is in progress.	Continuing

3.14.1 Airspace

The Proposed Action would not result in significant cumulative impacts on airspace. No additions or modifications would be required for the existing Class D/E airspace or SUA structure to support the proposed UAS operations. Any COA that may be required for UAS operations outside of the SUA would require FAA approval. Regular training and intermittent exercise activities would have minimal effects on other operations currently conducted within existing Class D/E airspace or SUA. The addition of the relatively small number of RQ-7B and RQ-21A UAS operations at MCB Hawaii Kaneohe Bay, WAAF, PMRF, PTA, and the associated training airspace units would not be expected to have any measurable effect on overall airspace management or use. There would be no substantial cumulative effect on airspace management or use from the VMU-3 relocation in conjunction with past, present, or reasonably foreseeable projects.

3.14.2 Greenhouse Gas (GHG) Emissions and Climate Change

GHGs are gases that trap heat in the atmosphere by absorbing infrared radiation. Without this natural greenhouse effect, the average surface temperature of the Earth would be about 61 degrees Fahrenheit (15.6 degrees Celsius) colder (USGCRP 2009). Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce environmental, economic, and social consequences across the globe.

GHG emissions occur from natural processes and human activities. Water vapor is the most important and abundant GHG in the atmosphere. However, human activities produce only a very small amount of the total atmospheric water vapor. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). The main source of GHGs from human activities is the combustion of fossil fuels, such as crude oil and coal. Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride.

Each GHG is assigned a Global Warming Potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO₂, which has a value of one. For example, CH₄ has a GWP of 21, which means that it has a global warming effect 21 times greater than CO₂ on an equal-mass basis (IPCC 2007). To simplify GHG analyses, total GHG emissions from a source are often expressed as a CO_{2e}. The CO_{2e} is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While CH₄ and N₂O have much higher GWPs than CO₂, CO₂ is emitted in such higher quantities that it is the overwhelming contributor to CO_{2e} from both natural processes and human activities.

Recent observed changes due to global warming include rising temperatures, shrinking glaciers and sea ice, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges. International, national, and state organizations independently confirm these findings (IPCC 2007, USGCRP 2009, and HDOP 2011). In Hawai'i, observations show that climate change has increased air temperatures, decreased rainfall and stream flows, increased rainfall intensity, increased sea level and sea surface temperatures, and increased ocean acidification (Fletcher 2010).

Federal agencies on a national scale address emissions of GHGs by reporting and meeting reductions mandated in federal laws, EOs, and agency policies. The most recent of these are EO 13423, EO 13514, and the *USEPA Final Mandatory Reporting of Greenhouse Gases Rule*.

Several states have promulgated laws as a means of reducing statewide levels of GHG emissions. In June 2007, the Governor of Hawai'i signed the Global Warming Solutions Act, which established a mandate to define GHG emissions in Hawai'i and to develop measures that would significantly reduce these emissions. The objective of the act is to reduce statewide GHG emissions to 1990 levels by 2020.

With the implementation of federal laws, EOs, and agency goals (such as Sail the Great Green Fleet), DoD, DoN, and USMC actively reduce energy use intensity and GHG emissions. The

types of projects currently in operation include energy conservation programs, implementation of LEED[®] Silver standards on new construction, thermal and photovoltaic solar systems, geothermal power plants, wind generators, and development of biofuels. DoN and USMC continue to promote and install new renewable energy projects.

On 18 February 2010, CEQ proposed for the first time, draft guidance on how federal agencies should evaluate the effects of climate change and GHG emissions for NEPA documentation (CEQ 2010). CEQ does not propose a reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment. In the analysis of the direct effects of a proposed action, CEQ proposes that it would be appropriate to 1) quantify cumulative emissions over the life of the project, 2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives, and 3) qualitatively discuss the link between such GHG emissions and climate change. CEQ is expected to issue its final guidance in the near future.

The potential effects of proposed GHG emissions are, by nature, global and cumulative impacts, since individual sources of GHGs are not large enough to have an appreciable effect on climate change. The impact of proposed GHG emissions to climate change is discussed in the context of cumulative impacts.

Scientific evidence indicates a correlation between increasing global temperatures/climate change over the past century and human-induced levels of GHGs. These environmental changes are predicted to have negative environmental, economic, and social consequences around the globe. Past, current, and future global GHG emissions are cumulatively significant.

Proposed basing and training activities would produce GHG emissions due to the use of fossil fuel-fired sources. These GHG emissions would combine with existing and future global GHG emission levels, but would produce immeasurable contributions to global climate change. As a result, GHGs from proposed basing and training activities would not produce significant cumulative impacts on global climate change.

GHG emissions result from both natural processes and human activities. GHGs trap heat in the atmosphere and re-radiate some of that heat downward. Common GHG emissions include CO₂, CH₄, and N₂O. The natural greenhouse effect regulates Earth's temperature; however, this natural process is being intensified by human activity, primarily the combustion of fossil fuels and deforestation. Due to the global nature of GHG emissions, individual projects are not likely to have an appreciable effect on climate change, though they could contribute to cumulative impacts. In compliance with various federal laws, EOs, and DoD mandates, each Proposed Action project would utilize sustainable design, including reducing energy consumption and reducing GHG emissions by incorporating LEED[®]-rated design principles. As a result, the Proposed Action could contribute to cumulative effects on GHG emissions, but this would be minimized through sustainable design and practices.

3.14.3 Air Quality

The ROI for project cumulative effects on air quality is all of the Hawaiian Islands for criteria pollutants. However, the highest project criteria pollutant impacts would occur in proximity to the operational locations of proposed sources. Approved or pending actions within the project

region that would potentially contribute to project impacts were considered in the air quality cumulative analysis.

Due to the ventilating effects of the prevailing tradewinds and the absence of substantial sources of air emissions, the Hawaiian Islands attain all national and state ambient air quality standards.

Due to the mobile and intermittent nature of most construction equipment, proposed construction emissions would not combine with existing and future cumulative emissions to the point that they would exceed an ambient air quality standard at any location. As a result, proposed construction would produce less than significant cumulative air quality impacts.

Proposed basing and training operations would result in minor increases to ambient pollutant concentrations within the project region. Emissions from proposed basing and training operations would not combine with existing and future cumulative emissions to the point that they would exceed an ambient air quality standard at any location. While the Proposed Action would result in an increase in on-base personnel and associated vehicular activity (both on-base and between MCB Hawaii Kaneohe Bay and WAAF), it would be a marginal increase above existing conditions. Long-term air quality impacts from mobile sources (i.e., vehicle movements) associated with the Proposed Action is expected to be insignificant due to the relatively low traffic volume within MCB Hawaii Kaneohe Bay. Proposed basing and training operations would produce less than significant cumulative air quality impacts.

3.14.4 Noise

The Proposed Action would not result in cumulative significant noise impacts. Construction-related noise impacts would be temporary and short-term. During operation, any human and vehicular traffic noise associated with the facilities is expected to be minimal and confined to the immediate vicinity of each project area. Existing-conditions noise levels in this analysis reflect completion of previously analyzed actions such as the phased basing of MV-22 and H-1 aircraft at MCB Hawaii Kaneohe Bay. RQ-7B and RQ-21A UAS noise levels are substantially less than the noise levels generated by the manned aircraft types operating within the proposed airspace. The addition of RQ-7B and RQ-21A UAS operations at MCB Hawaii Kaneohe Bay, WAAF, PMRF, PTA, and the associated training airspace units would not be expected to have any measurable effect on overall noise levels. There would be no substantial cumulative effect on installation or airspace noise from the VMU-3 relocation in conjunction with past, present, or reasonably foreseeable projects.

3.14.5 Topography and Soils

No significant cumulative impacts on topography or soils are expected to result from the Proposed Action. During the construction phase, land disturbing activities could result in soil loss from erosion and sedimentation, particularly during heavy rain. However, application of construction site BMPs would minimize the potential for soil loss. It is expected that all construction projects would similarly implement standard construction site BMPs and adhere to NPDES permit conditions so that there would be no significant cumulative impacts on soils.

3.14.6 Water Resources

The Proposed Action would not result in any cumulative adverse impacts on groundwater, drainage/flooding, or water quality at MCB Hawaii Kaneohe Bay or WAAF. It is expected that each individual project of the Proposed Action would incorporate design features to control drainage and runoff within project limits so that no significant adverse impacts on surface water or water quality are expected. Similar to the Proposed Action, it is expected that each individual project listed in Table 3.14-1 and Table 3.14-2 would also incorporate features to minimize and filter surface runoff so that no cumulative impacts on water resources would be anticipated. The groundwater underlying MCB Hawaii Kaneohe Bay is not a source of potable water, and at WAAF, the Storm Water Pollution Prevention Plan (SWPPP) and other project measures to manage potential runoff would be designed to prevent further degradation of the Kaukonahua and Waikele watersheds and Waikele Stream.

Proposed Action projects would incorporate site design strategies and features that minimize and filter runoff and implementation is not expected to result in any cumulative adverse impacts on jurisdictional wetlands. Implementation of BMPs and provisions of CWA would minimize the potential for adverse effects on jurisdictional wetlands for any planned construction project, whether the Proposed Action or any project listed in Table 3.14-1 or Table 3.14-2

3.14.7 Biological Resources

The Proposed Action is not expected to result in any significant impacts on flora or fauna at MCB Hawaii Kaneohe Bay, WAAF, PMRF, PTA, or within any of the SUA. The Proposed Action project areas at MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA are already developed with a managed landscape. The various project sites do not provide habitat for any threatened or endangered faunal species. The Proposed Action is not expected to contribute to any cumulative adverse impacts on flora or fauna

3.14.8 Population, Housing, and Education

The geographic scope of the cumulative population impact analysis includes MCB Hawaii Kaneohe Bay, the adjacent communities of Kailua and Kaneohe, MCB Hawaii Kaneohe Bay's Manana Housing area, and the Urban Honolulu area. Impacts are based on personnel relocation in relation to housing unit availability and school capacity

Possible cumulative population impacts were considered regarding past, present and reasonably foreseeable future actions. Planned MILCON projects at MCB Hawaii Kaneohe Bay were reviewed in addition to recent documents prepared for such actions, including the Final MV-22/H-1 EIS, the Marine Aviation Plan, the Final Environmental Assessment for the Grow the Force Initiative, and the Final MCB Hawaii Kaneohe Bay Plus-Up Development Plan (August 2012).

The most substantial planned military activity in the area is the basing of the MV-22/H-1 squadrons documented in the MV-22/H-1 EIS. The MV-22/H-1 EIS assesses socioeconomic factors, including actions that potentially affect base population, the surrounding region of influence, and all of O'ahu and serves as the basis for the VMU-3 cumulative population impacts analysis. Cumulative impact analysis presented in that EIS, which considered regional military

actions as well as non-DoD actions, assessed population increases on O'ahu from 2010 to 2020, and noted that the MV-22/H-1 basing would amount to 2.7 percent of this increase. Based on the MV-22/H-1 analysis, the new population with the VMU-3 Proposed Action would amount to an additional 0.8 percent of the population increase forecast for the City from 2010 to 2020, or a 0.05% increase to 2010 O'ahu population. Consequently, no sudden increase in population is anticipated.

Given the existing personnel housing distribution (33 percent Kailua, 22 percent Kaneohe, 20 percent Urban Honolulu, and the remaining 25 percent distributed in communities throughout O'ahu), it is not expected that any more than 22 students would relocate to one school complex, and it is unlikely that those students would be in the same school and grade or school level. Even if that situation were to occur, the vast majority of schools in potential housing areas can easily accommodate the additional enrollment that would result from the cumulative population increase.

VMU-3 relocation would result in minimal impacts on housing and public services, largely because relocated personnel would be dispersed to several communities, but also due to the general lack of population increase and projected increase in housing availability in the areas of analysis. Significant cumulative adverse impacts are not expected to result from the anticipated population increase.

3.14.9 Land Use

Basing projects and UAS training operations of the Proposed Action are consistent with the land use designations contained in the MCB Hawaii Kaneohe Bay, WAAF, PMRF, and PTA base master plans. The Proposed Action is not expected to result in cumulative impacts on existing and surrounding land use.

3.14.10 Cultural Resources

The Proposed Action would have no adverse effects on historic properties at WAAF, PMRF, or PTA. The Proposed Action would have an adverse effect on NRHP-eligible Hangar 102 at MCB Hawaii Kaneohe Bay, which would be mitigated through the NHPA MOA executed between MCB Hawaii and the SHPO. If the Proposed Action is implemented, MCB Hawaii Kaneohe Bay would proceed with the proposed renovation of its existing facilities and construction of a new facility at WAAF in accordance with the stipulations contained in the NHPA MOA to mitigate impacts on historic properties (Appendix E). No archaeological sites or deposits are located in the remainder of the project areas for the Proposed Action. Monitoring of ground-disturbing activities would avoid significant effects on archaeological resources or human remains. Due to the non-renewable nature of historic properties, the adverse impact on Hangar 102, when combined with past, present and reasonably foreseeable actions, would contribute to cumulative adverse impacts on cultural resources at MCB Hawaii Kaneohe Bay, and possibly overall Marine Corps facilities in Hawai'i.

3.14.11 Traffic and Circulation

Based on the improvements recommended in the MV-22/H-1 EIS, the increased vehicular activity associated with the Proposed Action of VMU-3 relocation would not result in significant cumulative impacts on traffic and circulation at MCB Hawaii Kaneohe Bay entrance gates, within the base, or on roadways surrounding the base.

A review of projected base loading at MCB Hawaii Kaneohe Bay shows an approximately 20 percent increase in base population from 2006 through FY18. Base loading increases are associated with the Grow the Force initiative, the Marine Aviation Plan, and changes to Navy units stationed at MCB Hawaii Kaneohe Bay. Marine Air-Ground Task Force units that are projected to increase through the FY18 timeframe include:

- 3D Radio Battalion
- 3d Regiment
- 1/12 Artillery Battalion
- 21st Dental company
- Marine Aircraft Group-24 (MAG-24)
- Marine Wing Support Detachment (MWSD)
- MCB Hawaii Supporting Establishment

Approximately one third of the base loading change associated with these unit increases is comprised by the initiatives covered in the MV-22/ H-1 EIS, a part of the MAG-24 increase. MAG-24 includes Navy and Marine Corps units and is impacted by Navy plan-related changes.

Changes to Navy units stationed at MCB Hawaii Kaneohe Bay also include the replacement of the P-3C aircraft with P-8A Multi-Mission Maritime Aircraft for maritime patrol missions, and the replacement of SH-60 with MH-60R helicopter squadrons as part of force structure changes to the Helicopter Master Plan. The extent of the P-8 replacement is not yet confirmed, but is expected to result in a decrease in base loading. The MH-60 replacement is not expected to alter base loading. Recent and planned MCB Hawaii Kaneohe Bay MILCON projects are shown in Table 3.14-1.

Based on the traffic improvements recommended in the MV-22/H-1 EIS that are programmed to be completed in FY16, the increased vehicular activity associated with the Proposed Action for the VMU-3 relocation would not result in significant cumulative impacts on traffic or circulation at MCB Hawaii Kaneohe Bay entrance gates, within the base, or on roadways surrounding the base.

Additional analyses as future relocations or personnel increases are confirmed will be required to ensure roadway capacity is adequate and traffic management is providing acceptable levels of service.

3.14.12 Hazardous Materials and Waste

The Proposed Action is not expected to result in any impacts as a result of hazardous materials or waste and would not contribute to any cumulative impacts.

3.14.13 Summary of Environmental Impacts

Under the Proposed Action and the No-Action Alternative, this EA concludes that no significant adverse environmental impacts are expected as a result of implementing the Proposed Action. Table 3.14-4 summarizes the potential impacts that could result from the alternatives evaluated.

Table 3.14-4. Comparison of Alternatives		
Environmental Resource	Proposed Action	No-Action
Airspace	Basing: No Impact Training: No Significant Impact	No Impact
Greenhouse Gas (GHG) Emissions	Basing: No Significant Impact Training: No Significant Impact	No Impact
Air Quality	Basing: Short-term, temporary impacts during construction. Training: No significant impact due to Unmanned Aircraft System (UAS) operations.	No Impact
Noise Environment	Basing: Short-term, temporary impacts during construction. Training: No significant impact due to UAS operations.	No Impact
Topography and Soils	Basing: Short-term, temporary impacts during construction Training: No significant impact	No Impact
Water Resources (Groundwater, Surface Water Drainage, Wetlands)	Basing: No significant impact Training: No significant impact due to UAS operations	No Impact
Biological Resources	Basing: No significant Impact Training: No significant impact due to UAS operations	No Impact
Population, Housing, and Education	Basing: Addition of approximately 480 persons would increase total base and O'ahu population by less than 1 percent. This increase is not expected to have significant adverse effects on population, housing, or education. Training: No significant impact due to UAS operations	No Impact
Land Use	Basing: No significant Impact Training: No significant impact due to UAS operations	No Impact
Cultural Resources	Basing: No significant Impact Training: No significant impact due to UAS operations	No Impact
Traffic and Circulation	Basing: Short-term, temporary impacts during construction. Some on-base Level of Service (LOS) degradation for minor movements; however, the overall LOS for public roadway approaches to MCB Hawaii Kaneohe Bay, on-base intersections, and project driveways are expected to remain at acceptable levels. Training: Same as for Basing	No Impact
Utilities, Infrastructure, Solid Waste	Basing: Slight increase in demand for services; however, demand is not anticipated to reach or exceed the operational capacities of the existing facilities and planned upgrades. Training: Same as for Basing	No Impact
Hazardous Materials and Waste	Basing: No significant Impact Training: No significant impact due to UAS operations	No Impact

In general, most expected impacts resulting from the Proposed Action would be construction-related and temporary. Adherence to standard construction BMPs would minimize potential construction-related impacts.

Potential long-term resource impacts on drainage and surrounding land use could result from implementing the Proposed Action. The increased base population is being met with the proposed MILCON projects to accommodate housing, training, and operational needs. The addition of impermeable surfaces within the project areas could potentially increase the rate and volume of stormwater runoff. However, LID design features would be incorporated into each of the proposed projects to mitigate drainage issues that may be encountered due to this increase.

Environmental impacts of the No-Action Alternative, VMU-3 remaining at Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, California, have been evaluated in the Grow the Force EA for MCAGCC Twentynine Palms (USN 2011), and are not evaluated further in this EA. Table 3.14-5 summarizes, for each environmental factor, the protective measures incorporated as part of the Proposed Action that would minimize any potential impacts.

Environmental Factor	Project Feature
Airspace	Coordination with the Federal Aviation Administration (FAA) for Certificate of Authorization (COA) to operate Unmanned Aircraft System (UAS) in controlled airspace.
Climate	None required.
Air Quality	Best Management Practices (BMPs) for dust control measures; dust screens, frequent watering of exposed soils; landscaping of bare earth.
Noise Environment	Use of properly muffled construction equipment, adherence to all applicable noise regulations.
Topography and Soils	BMP erosion and sedimentation control measures during construction (e.g., berms, cut-off ditches, silt fences, vegetative ground cover, and soil stabilization).
Water Resources (Groundwater, Surface Water, Drainage, Wetlands)	<ul style="list-style-type: none"> • BMP sediment control measures (e.g., silt fences, storm drain inlet protection, sediment traps) and site grading. • Incorporate Low Impact Development (LID) features into project design, such as bioswales, below grade detention devices and addition of drainage infrastructure at undeveloped sites.
Biological Resources	None required.
Population, Housing, and Education	None required.
Land Use	None required.
Cultural Resources	<ul style="list-style-type: none"> • Execution of an MOA in consultation between USMC and the SHPO to resolve adverse effects on Hangar 102 at MCB Hawaii Kaneohe Bay. • If warranted, development of an Archaeological Monitoring Plan and site monitoring during construction by a professional archaeologist.
Traffic and Circulation	Traffic Management Plan, detouring, flagging operations, and construction scheduling to minimize temporary traffic inconveniences.
Utilities, Infrastructure, and Solid Waste	Implement recommended electrical system upgrades.
Hazardous Materials and Waste	Adherence to all applicable regulations during removal and transport of any hazardous materials or waste.

3.15 SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The Proposed Action to relocate VMU-3 to MCB Hawaii Kaneohe Bay and the renovation/re-use of facilities precludes use of these sites for other potential uses in the short term. The additional personnel and aircraft would not significantly impact the long-term productivity of the land, water, or air. Aircraft have been regularly based at MCB Hawaii Kaneohe Bay, and trained in regional airspace for many decades. The military training that occurs in the airspace is consistent with existing operations. The long-term productivity of the environment at MCB Hawaii Kaneohe Bay is already compromised to some extent by the existing built environment, and it is not expected to be significantly altered, either negatively or positively, by the Proposed Action or other reasonably foreseeable actions.

3.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long term. An example of an irreversible commitment is the mining of ore. Once the ore is mined it can never be replaced. Irretrievable commitments are those that are lost for a period of time. The development of a highway through a timber-producing forest would represent an irretrievable loss of the timber while the highway is present.

The use of raw materials for construction and renovation of buildings, structures, and facilities at MCB Hawaii Kaneohe Bay, WAAF, and PMRF, as well as the use of fuels to power construction vehicles and equipment, and UAS operations, represents the irreversible and irretrievable commitment of those resources that would result from implementing the Proposed Action. However, the additional impact due to the Proposed Action would be insignificant overall.

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APPENDIX A
FEDERAL POLICIES AND EXECUTIVE ORDERS

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX A FEDERAL POLICIES AND EXECUTIVE ORDERS	A-1
A.1 Federal Policies	A-1
A.1.1 National Environmental Policy Act (NEPA).....	A-1
A.1.2 Historic Sites Act of 1935.....	A-1
A.1.3 National Historic Preservation Act (NHPA).....	A-1
A.1.4 The American Indian Religious Freedom Act (AIRFA)	A-1
A.1.5 The Native American Graves Protection and Repatriation Act (NAGPRA).....	A-2
A.1.6 Archaeological Resources Protection Act of 1979.....	A-2
A.1.7 Navy Cultural Resources Program	A-2
A.1.8 Coastal Zone Management Act (CZMA).....	A-2
A.1.9 Endangered Species Act (ESA).....	A-2
A.1.10 Clean Air Act (CAA)	A-3
A.1.11 Clean Water Act (CWA).....	A-3
A.1.12 Sikes Act	A-3
A.1.13 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).....	A-4
A.1.14 Resource Conservation and Recovery Act.....	A-4
A.1.15 Toxic Substances Control Act.....	A-4
A.1.16 Energy Policy Act.....	A-4
A.1.17 Energy Independence and Security Act	A-4
A.1.18 Other Regulatory Requirements	A-5
A.2 Executive Orders	A-5
A.2.1 Executive Order 11990 – Protection of Wetlands.....	A-5
A.2.2 Executive Order 12898 – Environmental Justice in Minority Populations and Low-Income Populations.....	A-5
A.2.3 Executive Order 13045 – Environmental Health Risks and Safety Risks to Children.....	A-5
A.2.4 Executive Order 13423 – Strengthening Federal Environmental, Energy, and Transportation Management.....	A-5
A.2.5 Executive Order 13186 – Protection of Migratory Birds	A-6

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The Proposed Action is consistent with the Federal laws, regulations, and Executive Orders (EO) described below.

A.1 Federal Policies

A.1.1 National Environmental Policy Act (NEPA)

NEPA of 1969 (42 United States Code [USC] Section [§]4321 *et seq.*) as amended, requires federal agencies to prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS) for federal actions that have the potential to significantly affect the quality of the human environment, including both natural and cultural resources. This EA has been prepared pursuant to the NEPA as implemented by the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), the Department of the Navy Procedures for Implementing NEPA (32 CFR §775), and Marine Corps Order (MCO) P5090.2A.

A.1.2 Historic Sites Act of 1935

The Historic Sites Act of 1935 (16 USC §§461 -467) establishes as a national policy the preservation of historic resources, including sites and buildings. This Act led to the establishment of the National Historic Landmark (NHL) program and the National Park Service (NPS) Historic American Building Survey/Historic American Engineering Records program that establishes standards for architectural and engineering documentation.

A.1.3 National Historic Preservation Act (NHPA)

NHPA of 1966, as amended (16 USC §470) established a national policy for the preservation of historic properties as well as the National Register of Historic Places (NRHP), Advisory Council on Historic Preservation (ACHP), and State Historic Preservation Officers (SHPOs).

Section 106 of the NHPA requires federal agencies having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking to take into account the effects of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP. Federal agencies shall also afford the ACHP a reasonable opportunity to comment on such undertakings.

Section 110 of NHPA requires federal agencies to use (to the maximum extent feasible) historic properties available to the agency, have appropriate records made of historic properties prior to substantial alteration or demolition, undertake (to the maximum extent possible) planning and actions to minimize harm to a NHL, and afford the ACHP the opportunity to comment on proposed undertakings that may have an adverse effect on a NHL. Section 110 also states that where a Section 106 Memorandum of Agreement (MOA) has been executed, such MOA shall govern the undertaking and all of its parts.

A.1.4 The American Indian Religious Freedom Act (AIRFA)

AIRFA (42 USC §1996) established federal policy to protect and preserve the rights of Native Americans to believe, express, and exercise their traditional religions, including providing access to sacred sites.

A.1.5 The Native American Graves Protection and Repatriation Act (NAGPRA)

NAGPRA (25 USC §§3001-3013) requires consultation with the appropriate (if any) Indian tribe or Native Hawaiian organization prior to excavation or removal of human remains and certain objects of cultural importance.

A.1.6 Archaeological Resources Protection Act of 1979

ARPA provides for the protection of archaeological resources (including sites) located on federally fee-owned lands against looting and/or vandalism by requiring that persons who excavate archaeological resources or sites on federal lands or Indian land (1) have appropriate professional qualifications, and (2) be issued permits by the land-managing agency. A person who disturbs an archaeological resource without a permit may face civil and/criminal penalties. Other provisions of ARPA foster increased cooperation and exchange of information. The ARPA of 1979 states that no person may excavate, remove, damage, or otherwise alter or deface any archaeological resource located on federally-owned land, or Native American lands without a permit issued by the land-managing agency for that action.

A.1.7 Navy Cultural Resources Program

Secretary of the Navy Instruction (SECNAVINST) 4000.35A, Cultural Resources Program establishes guidelines for managing and protecting cultural resources on property affected by Navy operations in the U.S. and U.S. territories and possessions.

A.1.8 Coastal Zone Management Act (CZMA)

The U.S. Congress noted in CZMA of 1972 (16 USC §1451 *et seq.*) a national interest in the effective management, beneficial use, protection and development of the coastal zone. While areas under the control of the federal government are by definition excluded from the state's coastal zone, federal agency activities within or outside the zone that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner consistent (to the maximum extent practicable) with the enforceable policies of an approved state Coastal Zone Management (CZM) program. If the federal agency proponent determines that an effect on coastal resources is reasonably foreseeable, a consistency determination is submitted to the state of Hawai'i's CZM Program. In 2009, the Navy and the Hawai'i CZM Program developed an updated list of de minimis activities which are expected to have insignificant direct or indirect coastal effects and are not subject to further review by the Hawai'i CZM Program.

A.1.9 Endangered Species Act (ESA)

ESA of 1973 (16 USC §§1531–1544, as amended) established measures for the protection of plant and animal species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects of their proposed actions through a set of defined procedures, which can include the preparation of a Biological Assessment and can require formal consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Act.

The *MCB Hawaii Integrated Natural Resources Management Plan (INRMP)* (DoN 2011) provides guidance for the management and conservation of natural resources within the Navy's area of responsibility and ensures compliance with regulatory and planning processes such as those required by the ESA. As a matter of policy, the INRMP gives top priority to actions that protect species listed as threatened or endangered under ESA.

A.1.10 Clean Air Act (CAA)

The primary goal of CAA of 1963 (42 USC §7401-7671q *et seq.*) is to encourage or otherwise promote reasonable federal, state, and local government actions for pollution prevention. The purpose of the CAA is to protect and enhance the quality of the nation's air resources to promote public health and welfare. The CAA defines the United States Environmental Protection Agency's (USEPA's) responsibilities for protecting and improving the nation's air quality and requires the USEPA to regulate emissions of toxic air pollutants. In accordance with the CAA, the USEPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP). Asbestos is a pollutant regulated under NESHAP.

The state of Hawai'i Department of Health (DOH), Indoor and Radiological Health (IRH) Branch maintains an Asbestos Program developed in cooperation with the USEPA. Owners of buildings and/or their contractors are required to notify applicable state and local agencies prior to all demolitions or renovations of facilities where asbestos material will be disturbed.

A.1.11 Clean Water Act (CWA)

CWA of 1972 (33 USC §1251 *et seq.*) is the primary federal law that protects the nation's waters including lakes, rivers and coastal areas. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters. Section 401 of the CWA requires that a Water Quality Certification (WQC) be obtained from the state (or territory) for actions that require a federal permit to conduct an activity, construction, or operation that may result in discharge to navigable waters of the U.S. The state of Hawai'i DOH, Clean Water Branch (CWB) issues the WQC for Hawai'i waters. Section 402 of the CWA requires National Pollutant Discharge Elimination System (NPDES) permit coverage for point source discharges to waters of the U.S. This includes discharges of stormwater associated with construction activities. Permit coverage is required for construction activities that disturb a land area of one acre (0.4 hectare [ha]) or more or activities that disturb less than one acre (0.4 ha) of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one acre of land and that have a discharge stormwater from the construction site to waters of the U.S. The DOH-CWB issues the NPDES for Hawai'i waters.

A.1.12 Sikes Act

The SAIA seeks to promote effectual planning and coordination of conservation and rehabilitation efforts for wildlife, fish, and game on military land. It provides for cooperation by the U.S. Department of the Interior and DoD with state agencies in planning, developing, and maintaining fish and wildlife resources on military reservations throughout the U.S.

A.1.13 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA of 1980 was enacted to address the problems of hazardous waste (including hazardous substances) found at inactive or abandoned sites and facilities or problems resulting from spills that require emergency response. Releases of "extremely hazardous substances" at inactive and/or abandoned sites and facilities are regulated by CERCLA. In addition, CERCLA Section 103 addresses the reporting of releases of hazardous substances. Hazardous wastes are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that either exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or are listed as a hazardous waste in 40 CFR Part 261. CERCLA (also known as the Superfund) provides broad federal authority to the USEPA to clean up releases or threatened releases of hazardous substances that may endanger public health or the environment.

A.1.14 Resource Conservation and Recovery Act

Hazardous wastes are regulated under RCRA of 1976. RCRA places controls on the generation, transportation, treatment, storage, and disposal of hazardous waste, as well establishing a framework for the management of non-hazardous waste. It sets forth statutory authorities and the liability for owners and operators of facilities that fail to comply with the statutory and regulatory requirements.

A.1.15 Toxic Substances Control Act

TSCA of 1976 authorized the EPA to secure information on all new and existing chemical substances as well as to control any of the substances that were determined to cause unreasonable risk to public health or the environment. This act includes the regulation of polychlorinated biphenyl (PCB) products. Later additions to the act by Congress included Asbestos, Lead, and Radon regulations.

A.1.16 Energy Policy Act

The Energy Policy Act of 2005, Section 109, directs new federal buildings to be designed 30 percent below American Society of Heating, Refrigerating, and Air Conditioning Engineers standards and calls for application of sustainable design principals.

A.1.17 Energy Independence and Security Act

The 2007 Energy Independence and Security Act calls for reduction in energy intensity for federal facilities and conservation of energy. Section 438 of the act (P.L. 110-140) requires that any development or redevelopment project involving a Federal facility with a footprint exceeding 5,000 square feet use site planning, design, construction, and maintenance strategies to maintain or restore the predevelopment hydrology of the property with regard to temperature, rate, volume, and duration of flow. Compliance with this requirement can be met through the implementation of low-impact development technologies.

A.1.18 Other Regulatory Requirements

Other federal regulations that apply to hazardous materials/waste include the Community Environmental Response Facilitation Act; Federal Facilities Compliance Act; Hazardous Materials Transportation Act; Pollution Prevention Act; EO 12088, Federal Compliance with Pollution Control Standards; and EO 12856, Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements.

A.2 Executive Orders

A.2.1 Executive Order 11990 – Protection of Wetlands

EO 11990 necessitates that federal agencies implement measures that prevent the degradation of wetlands, and that construction in a wetland be the last option if no other practical alternatives can be taken. None of the Proposed Action sites is located in a wetland, although wetland areas exist within approximately 700 feet (213 meters) and 2,800 feet (8533 meters) of the two project areas.

A.2.2 Executive Order 12898 – Environmental Justice in Minority Populations and Low-Income Populations

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address disproportionately high and adverse effects on the health and the environment of minority and low-income populations resulting from federal programs, policies, and activities. A presidential memorandum that accompanied EO 12898 specified that Federal agencies “shall analyze the environmental effects, including human health, economic, and social effects of federal actions, including effects on minority communities, when such analysis is required by the National Environmental Policy Act (NEPA), 42 USC Section 4321 *et seq.* The memorandum further stated 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.”

A.2.3 Executive Order 13045 – Environmental Health Risks and Safety Risks to Children

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was issued on 20 April 1997. EO 13045 requires that federal agencies make it a priority to identify and assess environmental health and safety risks that may disproportionately affect children. It also requires that agencies ensure that their policies, programs, activities, and standards address such risks.

A.2.4 Executive Order 13423 – Strengthening Federal Environmental, Energy, and Transportation Management

EO 13423, dated 24 January 2007, consolidates and strengthens five EOs and two memorandums of understanding and establishes new and updated goals, practices, and reporting requirements for environmental, energy, and transportation performance and accountability. EO 13423 requires federal agencies to lead by example in advancing the nation’s energy security and environmental performance by meeting specific goals to reduce the following: Greenhouse Gas (GHG) emissions, energy consumption per square foot of facility, the use of petroleum in

facilities and vehicles, the use of chemicals and toxic materials, and water consumption. It also requires that agencies increase alternative fuel consumption, allow use of renewable energy where possible, expand purchases of environmentally sound goods and services, and construct or renovate buildings in accordance with sustainability strategies.

A.2.5 Executive Order 13186 – Protection of Migratory Birds

EO 13186 was issued to assist federal agencies with their efforts to comply with the MBTA (16 USC 703-711). It should be noted that the EO does not constitute any legal authorization that in any way supersedes the requirements outlined in the MBTA. The EO directs federal agencies undertaking actions that have, or are likely to have, a measurable adverse impact on migratory bird populations to develop and implement a memorandum of agreement with the USFWS addressing the conservation of these populations.

APPENDIX B
INTERAGENCY COMMUNICATION

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX B INTERAGENCY COMMUNICATION	B-1
B.1 Memorandum for Commanding Officer, Marine Corps Base Hawaii	B-1
B.2 Memorandum for Facilities Department, Marine Corps Base Hawaii	B-3

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B.1 Memorandum for Commanding Officer, Marine Corps Base HawaiiREPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND, PACIFIC REGION
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
851 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5000

IMPC-HAW-ZA

22 APR 2013

MEMORANDUM FOR Commanding Officer, Marine Corps Base Hawaii (LF), Box 63002, Kaneohe Bay, HI 96863-3002

SUBJECT: Request for Basing of Unmanned Aerial Vehicle (UAV) Squadron at Wheeler Army Airfield (WAAF)/Schofield Barracks (SB)

1. Reference Letter 11000 LF/016-13j, dated 5 Feb 13, SAB.
2. The Directorate of Public Works (DPW), US Army Garrison – Hawaii, wishes to inform you that:
 - a. The requirement for a United States Marine Corps (USMC) non-permanent 50ft x 80ft facility, in the vicinity of WAAF, is approved, but will need to be funded and constructed by the USMC to support requirements for Unmanned Air System (UAS) operations, maintenance and storage.
 - b. The total basing requirements for the USMC UAV Squadron is disapproved at this time. There are no existing facilities (operations/maintenance/hangar) or other available land at WAAF or SB, which can be reallocated to support these requirements.
3. The Marines should commit to funding and constructing a temporary facility on the designated site on WAAF with an end state Military Construction (MILCON) Project for a permanent structure (same site) before beginning any type of UAS operations, because there are no existing facilities available for co-sharing.
4. Marine's training will be coordinated with and thru the Garrison Airfield Operations and 25th Division's Combat Aviation Brigade (CAB) to preclude scheduling conflicts. The 25th CAB should have priority for air time.
5. Saturation of aircraft on WAAF and its impact on Aircrew Training Programs of the 25th CAB, 2nd Striker Brigade Combat Team (SBCT) and 3rd Brigade Combat Team (BCT) UAS platoons, and Hawaii National Guard UAS will increase which will further impact the limited airspace for UAS operations.
6. Current construction projects in the vicinity of WAAF has limited aviation training area on the airfield (hover work, slope training, maintenance, etc.) further contributing to aircraft congestion within the airfield and controlled movement areas. In addition, aircraft congestion already hinders daily training operations within the established

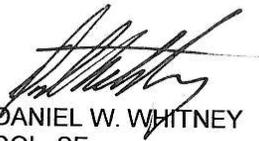
IMPC-HAW-ZA

SUBJECT: Request for Basing of Unmanned Aerial Vehicle (UAV) Squadron at
Wheeler Army Airfield (WAAF)/Schofield Barracks (SB)

traffic patterns over WAAF and the Visual Flight Rules (VFR) reporting points in the
Class D airspace.

7. Our point of contact is Mr. Mark Mitsunaga, Master Planner, Master Planning
Division, Directorate of Public Works, Tel. (808) 656-6511 or e-mail:
mark.m.mitsunaga.civ@mail.mil

Encl
as



DANIEL W. WHITNEY
COL, SF
Commanding

CF:
25th CAB
DPTMS
DPW ENV Div
DPW Planning Div (Real Estate)

B.2 Memorandum for Facilities Department, Marine Corps Base Hawaii



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND, PACIFIC REGION
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
851 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5000

IMPC-HAW-ZA

22 APR 2013

MEMORANDUM FOR Director, Facilities Department, Marine Corps Base Hawaii (LF),
Box 63002, Kaneohe Bay, Hawaii 96862-3002

SUBJECT: Request Use of Army Real Estate to Support United States Marine Corps
(USMC) Training Requirements in Hawaii.

1. Reference Letter 11000 LEPE/140-12j, dated 29 Oct 12, SAB.
2. We wish to inform you that your request for concurrence to begin analysis of various referenced actions is approved.
3. Please be advised that each of your actions must be properly coordinated with and through this Command before a decision or final outcome is reached for those actions.
4. Assistance will be provided, in every way possible and on a case by case basis, based on workload and priorities.
5. Our point of contact is Mr. Mark Mitsunaga, Phone: (808) 656-6511 or e-mail: mark.m.mitsunaga.civ@mail.mil.


DANIEL W. WHITNEY
COL, SF
Commanding

CF:
PTA CDR
25th DIV
DPTMS
DPW ENV
DPW Planning - Real Estate

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APPENDIX C
AIRSPACE MANAGEMENT

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX C AIRSPACE MANAGEMENT.....	C-1
C.1 National Airspace System Description	C-1
C.2 Airspace Definitions	C-1
C.3 Certificate of Waiver or Authorization (COA).....	C-4
C.3.1 2012-WSA-10.....	C-5
C.3.2 2012-WSA-47.....	C-23

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C.1 National Airspace System Description

The nation's airspace is designed and managed by the Federal Aviation Administration (FAA) in a manner that strives to meet both the individual and common needs of all military, commercial, and general aviation interests. In general, all navigable airspace is categorized as either regulatory or nonregulatory. Within those two categories are four types of airspace: Controlled, Special Use, Uncontrolled, and Other. Airspace is further defined in terms of classifications according to the operating and flight rules that apply to each airspace area. The manner in which airspace is classified is dependent on (1) the complexity or density of aircraft operations within an airspace area; (2) the nature of those operations; (3) the level of safety required; and (4) national and public interest. Airspace management discussions reference these types/classifications, where appropriate, as they relate to the proposed VMU-3 relocation. (FAA 2008)

Table 3.1-1 provides basic definitions of the more common aeronautical terms used throughout the airspace management sections.

Controlled airspace is airspace of defined dimensions within which ATC services are provided to Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) flights in accordance with the airspace classification (FAA 2011). Controlled airspace is categorized into five separate classes: Classes A through E. These classes identify airspace that is controlled, airspace supporting airport operations, and designated airways affording en route transit from place-to-place. The classes also dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace class. Military aircrews fly under FAA rules when not training in SUA. Uncontrolled airspace (designated as Class G airspace) has no specific prohibitions associated with its use. Figure C.1-1 illustrates the different types of airspace designations.

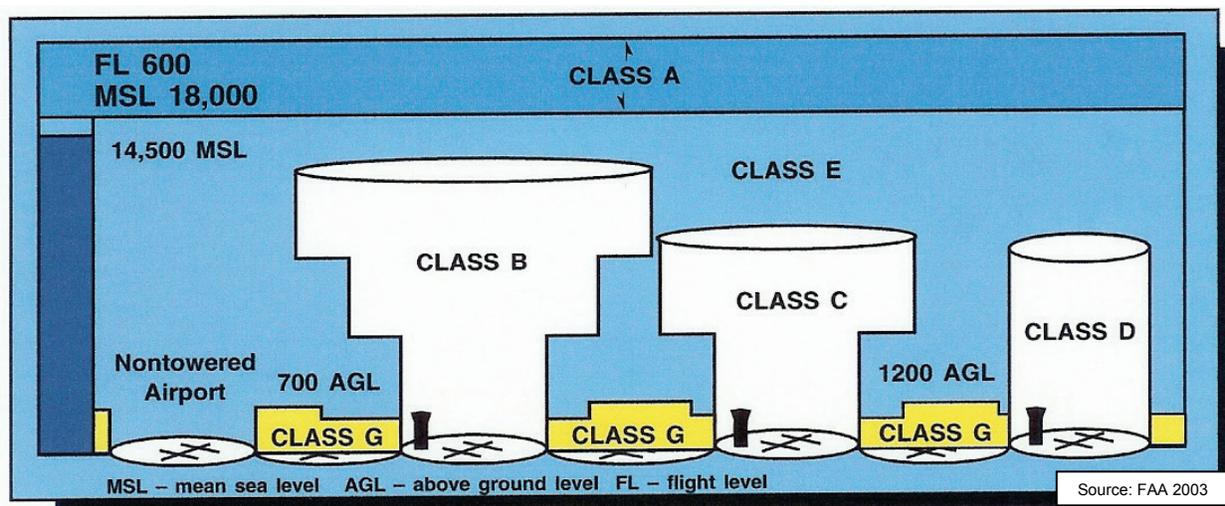


Figure C.1-1. Airspace Designations

C.2 Airspace Definitions

Class A airspace, generally, is that airspace from 18,000 feet MSL up to, and including, Flight Level (FL) 600. Unless otherwise authorized, all aircraft must operate IFR within Class A airspace.

Class B airspace, generally, is that airspace from the surface to 10,000 feet MSL around the nation's busiest airports. The actual configuration of Class B airspace is individually tailored and consists of a

surface area and two or more layers, and is designed to contain all published instrument procedures (FAA 2008).

Class C airspace, generally, is that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the actual configuration of Class C airspace is individually tailored, it usually consists of a surface area with a 5 nautical mile (NM) radius, and an outer circle with a 10 NM radius that extends from 1,200 feet to 4,000 feet above the airport elevation (FAA 2008).

Class D airspace, generally, is that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be designated as Class D or Class E airspace (FAA 2008).

Class E airspace is controlled airspace that is not Class A, B, C, or D. The floor of Class E airspace is generally 700 feet above ground level (AGL). There are areas where Class E airspace begins at either the surface or 700 feet AGL that are used to transition to/from the terminal or en route environment (around non-towered airports). These areas are designated by VFR sectional charts. In most areas of the U.S., Class E airspace extends from 1,200 feet AGL up to, but not including, 18,000 feet MSL, the lower limit of Class A airspace. No ATC clearance or radio communication is required for VFR flight in Class E airspace. VFR visibility requirements below 10,000 feet MSL are 3 statute miles visibility and cloud clearance of 500 feet below, 1,000 feet above, and 2,000 horizontal. Above 10,000 feet MSL the requirement is 5 statute miles visibility, and cloud clearance of 1,000 feet below, 1,000 feet above, and 1 mile laterally (FAA 2008). There are seven types of Class E airspace:

Surface Area Designated for an Airport - When so designated, this type of Class E airspace will be configured to contain all instrument procedures.

Extension to a Surface Area - These are Class E airspace areas that serve as extensions to Class B, C, and D surface areas designated for an airport. This airspace provides controlled airspace to contain standard instrument approach procedures without imposing a communications requirement on pilots operating under VFR.

Airspace Used for Transition - These are Class E airspace areas beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment.

En Route Domestic Airspace Areas - These areas are Class E airspace areas that extend upward from a specified altitude to provide controlled airspace where there is a requirement for IFR en route air traffic control services, but where the Federal Airway system is inadequate.

Federal Airways - Federal Airways (Victor Airways) are Class E airspace areas, and, unless otherwise specified, extend upward from 1,200 feet to, but not including, 18,000 feet MSL.

Other - Unless designated at a lower altitude, Class E airspace begins at 14,500 feet MSL to, but not including, 18,000 feet MSL overlying a) the 48 contiguous states, including the waters within 12 miles from the coast of the 48 contiguous states; b) the District of Columbia; c) Alaska, including the waters within 12 miles from the coast of Alaska, and that airspace above FL600; d) excluding the Alaska peninsula west of 160°00'00" west longitude, and the airspace below 1,500 feet above the surface of the earth unless specifically so designated.

Offshore/Control Airspace Areas. This includes airspace areas beyond 12 NM from the coast of the U.S., wherein air traffic control services are provided (FAA 2011).

Airspace that has not been designated as Class A, B, C, D, or E airspace is Uncontrolled Airspace (Class G). Class G airspace generally underlies Class E airspace with vertical limits up to 700 feet AGL, 1,200 feet AGL, or 14,500 feet AGL, whichever applies. Cloud clearance and visibility requirements differ by altitude and day versus night.

FAA has charted and published Special Use Airspace (SUA) for military and other governmental activities. SUA is designated airspace within which flight activities require confinement of participating aircraft or place operating limitations on non-participating aircraft. Military Operations Areas (MOA), Restricted Areas, Controlled Firing Areas, and Warning Areas are examples of SUA. Other airspace consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), Low Altitude Tactical Navigation (LATN) areas and Aerial Refueling Tracks. This category also includes Air Traffic Control Assigned Airspace (ATCAA).

Management of SUA considers how airspace is designated, used, and administered to best accommodate the individual and common needs of commercial aviation, general aviation, the military, resource management agencies, and others. The FAA considers multiple and sometimes competing demands for aviation airspace in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System can best be structured to accommodate all user requirements. Airspace currently used for military training activities in Alaska includes the types of airspace defined below:

Military Operations Area (MOA) - MOAs are established to separate or segregate certain non-hazardous military activities from IFR aircraft traffic and to identify VFR aircraft traffic where these military activities are conducted. A MOA is SUA of defined vertical and lateral limits established outside Class A airspace to separate and segregate certain non-hazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted (FAA 2011). MOAs are considered “joint use” airspace whereas non-participating aircraft operating under VFR are permitted to enter a MOA, even when the MOA is active for military use. Aircraft operating under IFR must remain clear of an active MOA unless approved by the responsible ATC. If an IFR aircraft is approved to transit a MOA that part of the MOA is effectively made not active for military training during the IFR aircraft transit.

ATCAA - An ATCAA is airspace of defined vertical and lateral limits, assigned by Air Traffic Control for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace and other IFR air traffic (FAA 2011). When not required for other needs, an ATCAA is airspace authorized for military use by the managing Air Route Traffic Control Center (ARTCC). ATCAAs are in Class A airspace and are frequently structured and used to extend the horizontal and/or vertical boundaries of MOAs. ATCAAs can extend from Flight Level (FL)180 to FL600 or higher.

Restricted Area - Restricted Areas are designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. A Restricted Area is airspace designated under 14 Code of Federal Regulations (CFR) Part 73, within which the flight of aircraft is subject to restriction. Most restricted areas are designated “joint-use” and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency (FAA 2011).

Military Training Routes (MTRs) - MTRs are flight corridors developed and used by the DoD to practice high-speed, low-altitude flight, generally below 10,000 feet MSL. Specifically, MTRs are airspace of defined vertical and lateral dimensions established for the conduct of military flight training at airspeeds in excess of 250 Knots Indicated Airspeed (KIAS).

Warning Areas - A warning area is airspace of defined dimensions, extending from three nautical miles outward from the coast of the United States that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning areas is to warn non-participating pilots of the potential danger. A warning area may be located over domestic or international waters or both.

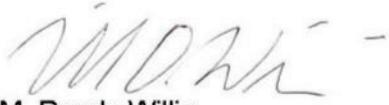
Controlled Firing Areas (CFAs) - A controlled firing area is established to contain activities, which if not conducted in a controlled environment, would be hazardous to nonparticipating aircraft.

Low Altitude Tactical Navigation (LATN) Areas - Airspace outside a MOA used by aircraft such as the A-10 and C-130 for low altitude training that can safely operate at speeds of 250 knots/287 mph, or less. At these speeds, these aircraft are capable of safely merging with general aviation traffic. Military aircraft engaged in this type of exercise, like all other aircraft, are required to comply with federal aviation regulations to see and avoid other aircraft and obstacles. FAA and USAF regulations also require aircraft utilizing the LATN area to avoid airfields, towns, noise sensitive areas and wilderness areas by prescribed vertical and/or horizontal distances.

C.3 Certificate of Waiver or Authorization (COA)

Following is a COA that was issued by the FAA to the USMC for RQ-11B Raven Unmanned Aircraft System (UAS) operations at Marine Base Hawaii, Kaneohe Bay, Hawaii, and Marine Corps Training Facility, Bellows, Hawaii. This COA reflects those provisions and requirements that would be included in a COA for the Shadow and Integrator UASs.

C.3.1 2012-WSA-10

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION	
CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO United States Marine Corps	
Attn: AC/S G-3 PO Box 63002 Kaneohe Bay, HI 96863-3002	
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Operation of the RQ-11B Raven Unmanned Aircraft System (UAS) in Class D airspace when the tower is operational and Class E airspace when the tower is closed at West Field on Marine Base Hawaii, Kaneohe Bay, HI, and Class G airspace at the Marine Corps Training Facility, Bellows, HI. All operations will be conducted at or below 400' Above Ground Level (AGL) under the jurisdiction of the Honolulu Control Facility (HCF).	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE N/A	
STANDARD PROVISIONS	
1. A copy of the application made for this certificate shall be attached and become a part hereof. 2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations. 3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein. 4. This certificate is nontransferable.	
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.	
SPECIAL PROVISIONS	
Special Provisions are set forth and attached.	
This certificate 2012-WSA-10 is effective from May 8, 2012 to November 3, 2012, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.	
BY DIRECTION OF THE ADMINISTRATOR	
<u>FAA Headquarters, AJV-13</u> <small>(Region)</small>	 <u>M. Randy Willis</u> <small>(Signature)</small>
<u>May 7, 2012</u> <small>(Date)</small>	<u>Acting Manager, Unmanned Aircraft Systems</u> <small>(Title)</small>

FAA Form 7711-1 (7-74)

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 2 of 18

COA Number: 2012-WSA-10

Issued To: United States Marine Corps, referred herein as the "proponent"

Address: Attn: AC/S G-3
PO Box 63002
Kaneohe Bay, HI 96863-3002

Activity: Operation of the RQ-11B Raven Unmanned Aircraft System (UAS) in Class D airspace when the tower is operational and Class E airspace when the tower is closed at West Field on Marine Base Hawaii, Kaneohe Bay, HI, and Class G airspace at the Marine Corps Training Facility, Bellows, HI. All operations will be conducted at or below 400' Above Ground Level (AGL) under the jurisdiction of the Honolulu Control Facility (HCF).

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of training flights.

Dates of Use: This Certificate of Authorization is valid from May 8, 2012 through November 3, 2012. If an updated Airworthiness Certificate is received prior to expiration, this COA will be extended to May 7, 2013. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 business days prior to the requested effective date.

Public Aircraft

1. A public aircraft operation is determined by statute, 49 USC §40102(a)(41) and §40125. All public aircraft flights conducted under a COA must comply with the terms of the statute.
2. All flights must be conducted per the declarations submitted on COA on-line.

STANDARD PROVISIONS

A. General.

The review of this activity is based upon current understanding of UAS operations and their impact in the NAS. This COA will not be considered a precedent for future operations. (As changes in or understanding of the UAS industry occur, limitations and conditions for operations will be adjusted.)

All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.

A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are being conducted.

This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive written notice of cancellation.

During the time this COA is approved and active, a site safety evaluation/visit will be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA.

B. Airworthiness Certification.

The unmanned aircraft must be shown to be airworthy to conduct flight operations in the NAS. The United States Marine Corps has made its own determination that the RQ-11B unmanned aircraft is airworthy. The RQ-11B must be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in this COA application.

1. A configuration control program must be in place for hardware or and/software changes made to the UAS to ensure continued airworthiness. If a new or revised Airworthiness Release is generated as a result of changes in the hardware or software affecting the operating characteristics of the UAS, no further flight is authorized until the UAPO has reviewed these changes and determined whether new safety mitigations are required.
2. The RQ-11B must be operated in strict compliance with all provisions and conditions contained within the spectrum analysis assigned and authorized for use within the defined operations area.
3. All items contained in the application for equipment frequency allocation must be adhered to, including the assigned frequencies and antenna equipment characteristics. A ground operational check to verify the control station can communicate with the aircraft (frequency integration check) must be conducted prior to the launch of the

unmanned aircraft to ensure any electromagnetic interference does not adversely affect control of the aircraft.

4. The use of a Traffic Collision Avoidance System (TCAS) in any mode while operating an unmanned aircraft is prohibited.

C. Operations.

1. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
 - a. In any defined operating area,
 - b. From a single control station, and
 - c. By one pilot at a time.
2. A Pilot-in-Command (PIC) is the person who has final authority and responsibility for the operation and safety of flight, has been designated as PIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight. The responsibility and authority of the PIC as described by 14 CFR 91.3, Responsibility and Authority of the Pilot-in-Command, apply to the unmanned aircraft PIC. The PIC position may rotate duties as necessary with equally qualified pilots. The individual designated as PIC may change during flight. Note: The PIC can only be the PIC for one aircraft at a time. For Optionally Piloted Aircraft (OPA), PIC must meet UAS guidance requirements for training, pilot licensing, and medical requirements when operating OPA as a UAS.
3. The PIC must conduct a pre-takeoff briefing as applicable prior to each launch. The briefing should include but is not limited to the
 - a. Contents of the COA,
 - b. Altitudes to be flown,
 - c. Mission overview including handoff procedures,
 - d. Frequencies to be used,
 - e. Flight time, including reserve fuel requirements,
 - f. Contingency procedures to include lost link, divert, and flight termination, and
 - g. Hazards unique to the flight being flown.

Note: Flightcrew Member (UAS). In addition to the flightcrew members identified in 14 CFR part 1, Definitions and Abbreviations, an Unmanned Aircraft System flightcrew member includes pilots, sensor/payload operators, and visual observers but may include other persons as appropriate or required to ensure safe operation of the aircraft.

4. All operations will be conducted in compliance with Title 14 CFR Part 91. Special attention should be given to:
 - a. § 91.3 Responsibility and authority of the pilot in command.
 - b. § 91.13 Careless or reckless operation.

- c. § 91.17 Alcohol or drugs.
 - d. § 91.103 Preflight Actions
 - e. § 91.111 Operating near other aircraft.
 - f. § 91.113 Right-of-way rules: Except water operations.
 - g. § 91.115 Right-of-way rules: Water operations.
 - h. § 91.119 Minimum safe altitudes: General
 - i. § 91.123 Compliance with ATC clearances and instructions.
 - j. § 91.133 Restricted and prohibited areas
 - k. § 91.137 Temporary flight restrictions in the vicinity of disaster/hazard areas
 - l. § 91.145 Management of aircraft operations in the vicinity of aerial demonstrations and major sporting events
 - m. § 91.151 Fuel requirements for flight in VFR conditions
 - n. § 91.155 Basic VFR weather minimums.
 - o. § 91.159 VFR cruising altitude or flight level.
 - p. § 91.209 Aircraft Lights.
 - q. § 91.213 Inoperative instruments and equipment
 - r. § 91.215 ATC transponder and altitude reporting equipment and use.
 - s. Appendix D to Part 91—Airports/Locations: Special Operating Restrictions
5. Unless otherwise authorized as a special provision, all operations must be conducted in visual meteorological conditions (VMC) during daylight hours in compliance with Title 14 of the Code of Federal Regulations (CFR) part 91 §91.155 and the following:
6. Special Visual Flight Rules (VFR) operations are not authorized.
- a. VFR cloud clearances specified in 14 CFR part 91 §91.155, must be maintained, except in Class G airspace where Class E airspace visibility requirements must be applied, but not less than 3 statute miles (SM) flight visibility and 1000' ceiling.
 - b. Flights conducted under Instrument Flight Rules (IFR) in Class A airspace shall remain clear of clouds. **NOTE: Deviations from IFR clearance necessary to comply with this provision must have prior ATC approval**
 - c. Chase aircraft must maintain 5 NM flight visibility.
7. Night operations are prohibited unless otherwise authorized as a special provision.
8. Operations (including lost link procedures) must not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.

D. Air Traffic Control (ATC) Communications.

1. The pilot and/or PIC will maintain direct, two-way communication with ATC and have the ability to maneuver the unmanned aircraft in response to ATC instructions, unless addressed in the Special Provision Section.

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 6 of 18

- a. When required, ATC will assign a radio frequency for air traffic control during flight. The use of land-line and/or cellular telephones is prohibited as the primary means for in-flight communication with ATC.
2. The PIC must not accept an ATC clearance requiring the use of visual separation, sequencing, or visual approach.
3. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft must not loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.
4. For flights operating on an IFR clearance at or above 18,000 feet mean sea level (MSL), the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDS, and/or waypoints is provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.
5. If equipped, the unmanned aircraft must operate with
 - a. An operational mode 3/A transponder with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk
 - b. Position/navigation and anti-collision lights on at all times during flight unless stipulated in the special provisions or the proponent has a specific exemption from 14 CFR Part 91.209.
6. Operations that use a Global Positioning System (GPS) for navigation must check Receiver Autonomous Integrity Monitoring (RAIM) notices prior to flight operations. Flight into a GPS test area or degraded RAIM is prohibited for those aircraft that use GPS as their sole means for navigation.

E. Safety of Flight.

1. The proponent or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.
2. ATC must be immediately notified in the event of any emergency, loss and subsequent restoration of command link, loss of PIC or observer visual contact, or any other malfunction or occurrence that would impact safety or operations.
3. Sterile Cockpit Procedures.
 - a. Critical phases of flight include all ground operations involving
 - (1) Taxi (movement of an aircraft under its own power on the surface of an airport)
 - (2) Take-off and landing (launch or recovery)
 - (3) All other flight operations in which safety or mission accomplishment might be compromised by distractions.
 - b. No crewmember may perform any duties during a critical phase of flight not required for the safe operation of the aircraft.

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 7 of 18

- c. No crewmember may engage in, nor may any PIC permit, any activity during a critical phase of flight which could
 - (1) Distract any crewmember from the performance of his/her duties or
 - (2) Interfere in any way with the proper conduct of those duties.
 - d. The pilot and/or the PIC must not engage in any activity not directly related to the operation of the aircraft. Activities include, but are not limited to, operating UAS sensors or other payload systems.
 - e. The use of cell phones or other electronic devices is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with Air Traffic Control.
4. See-and-Avoid.

Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations. Adherence to 14 CFR part 91 §91.111, §91.113 and §91.115, is required.

- a. The proponent and/or delegated representatives is responsible at all times for collision avoidance with all aviation activities and the safety of persons or property on the surface with respect to the UAS.
- b. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft at all times.
- c. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the pilot flying.
- d. UA operations will only be conducted within Reduced Vertical Separation Minimum (RVSM) altitudes, when appropriately equipped or having received a clearance under an FAA deviation. NOTE: UA operations should not plan on receiving an Enroute clearance in RVSM altitudes, without being RVSM equipped.
- e. Visual observers must be used at all times except in Class A, airspace, active Restricted Areas, and Warning areas designated for aviation activities.
 - (1) The observers may either be ground-based or in a chase plane.
 - (2) If the chase aircraft is operating more than 100 feet above/below and/or more than ½ NM laterally of the unmanned aircraft, the chase aircraft PIC will advise the controlling ATC facility.
- f. The PIC is responsible to ensure the visual observers are;
 - (1) Able to see the aircraft and the surrounding airspace throughout the entire flight, and
 - (2) Able to determine the UA's altitude, flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to

- (a) Comply with CFR 91.111, 91.113 and 91.115, and
 - (b) Prevent the UA from creating a collision hazard.
5. Observers must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.
 6. Pilots and observers must not perform crew duties for more than one unmanned aircraft at a time.
 7. A PIC may rotate duties as necessary to fulfill operational requirements; a PIC must be designated at all times.
 8. Pilots flying chase aircraft must not concurrently perform observer or UA pilot duties.
 9. Pilot and observers must not assume concurrent duties as both pilot and observer.
 10. The required number of ground observers will be in place during flight operations.
 11. The use of multiple successive observers (daisy chaining) is prohibited unless otherwise authorized as a special provision.
 12. The dropping or spraying of aircraft stores, or carrying of hazardous materials (including ordnance) outside of active Restricted, Prohibited, or Warning Areas approved for aviation activities is prohibited unless specifically authorized as a special provision.

F. Crewmember Requirements.

1. All crewmembers associated with the operation of the unmanned aircraft, including chase operations, must be qualified or must be receiving formal training under the direct supervision of a qualified instructor, who has at all times, responsibility for the operation of the unmanned aircraft.
2. Pilots and observers must have an understanding of, and comply with, Title 14 Code of Federal Regulations, and/or agency directives and regulations, applicable to the airspace where the unmanned aircraft will operate.
3. Pilots, supplemental pilots, and observers must maintain a current second class (or higher) airman medical certificate that has been issued under 14 CFR part 67, or an FAA accepted agency equivalent based on the application.
4. At a minimum, the use of alcohol and/or drugs in violation of 14 CFR part 91 §91.17 applies to UA pilots and observers
5. At a minimum, observers must receive training on rules and responsibilities described in 14 CFR part 91 §91.111, §91.113 and §91.115, regarding cloud clearance, flight visibility, and the pilot controller glossary, including standard ATC phraseology and communication.
6. Recent Pilot Experience (Currency). The proponent must provide documentation, upon request, showing the pilot/supplemental pilot/PIC maintains an appropriate level of recent pilot experience in either the UAS being operated or in a certified simulator. At a minimum, he/she must conduct three takeoffs (launch) and three landings (recovery) in the specific UAS within the previous 90 days (excluding pilots who do not conduct

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 9 of 18

launch/recovery during normal/emergency operations). If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating requirements.

7. A PIC and/or supplemental pilot have the ability to assume the duties of an *internal* or an *external* UAS pilot at any point during the flight.
8. A PIC may be augmented by supplemental pilots.
9. PIC Ratings.

Rating requirements for the UAS PIC depend on the type of operation conducted. The requirement for the PIC to hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61, and is predicated on various factors including the location of the planned operations, mission profile, size of the unmanned aircraft, and whether or not the operation is conducted within or beyond visual line-of-sight.

- a. The PIC must hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61.under all operations:
 - (1) Approved for flight in Class A, B, C, D, E, and G (more than 400 feet above ground level (AGL)) airspace
 - (2) Conducted under IFR (FAA instrument rating required, or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61.
 - (3) Approved for night operations
 - (4) Conducted at or within 5 NM of a joint use or public airfields.
 - (5) Requiring a chase aircraft
 - (6) At any time the FAA has determined the need based on the UAS characteristics, mission profile, or other operational parameters.
- b. Operations without a pilot certificate may be allowed when **all** of the following conditions are met:
 - (1) The PIC has successfully completed, at a minimum, FAA private pilot ground instruction and passed the written examination, or the FAA accepted agency equivalent, based on the application. Airman Test reports are valid for the 24-calendar month period preceding the month the exam was completed, at which time the instruction and written examination must be repeated.
 - (2) Operations are during daylight hours.
 - (3) The operation is conducted in a sparsely populated location.
 - (4) The operation is conducted from a privately owned airfield, military installation, or off-airport location.
 - (5) Operations are approved and conducted solely within visual line-of-sight in Class G airspace.
 - (6) Visual line-of-sight operations are conducted at an altitude of no more than 400 feet AGL in class G airspace at all times.

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 10 of 18

- c. The FAA requires specific aircraft category and class ratings in manned aircraft depending on the UAS seeking approval and the characteristics of its flight controls interface.

10. PIC Recent Flight Experience (Currency).

- a. For those operations that require a certificated pilot or FAA accepted agency equivalent, based on the application, the PIC must have flight reviews and if the pilot conducts takeoff, launch, landing or recovery maintain recent pilot experience in manned aircraft per 14 CFR §§ 61.56, Flight Review.
- b. For operations approved for night or IFR through special provisions, the PIC must maintain minimum recent pilot experience per § 61.57 Recent Flight Experience: Pilot in Command, as applicable.

11. Supplemental Pilot Ratings.

Supplemental pilots must have, at a minimum, successfully completed private pilot ground school and passed the written test or the FAA accepted agency equivalent, based on the application. The ground school written test results are valid for two years from the date of completion, at which time the instruction and written examination must be repeated. If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating, currency, medical, and training requirements listed in this document.

12. Ancillary personnel such as systems operators or mission specialists must be thoroughly familiar with and possess operational experience of the equipment being used. If the systems being used are for observation and detection of other aircraft for collision avoidance purposes, personnel must be thoroughly trained on collision avoidance procedures and techniques and have direct communication with the UAS pilot, observer, and other crewmembers.

G. Notice to Airmen (NOTAM).

1. A distance (D) NOTAM must be issued when unmanned aircraft operations are being conducted. This requirement may be accomplished
 - a. Through the proponent's local base operations or NOTAM issuing authority, or
 - b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation, unless otherwise authorized as a special provision. The issuing agency will require the:
 - (1) Name and address of the pilot filing the NOTAM request
 - (2) Location, altitude, or operating area
 - (3) Time and nature of the activity.
2. For proponents filing their NOTAM with the Department of Defense: The requirement to file with an Automated Flight Service Station (AFSS) is in addition to any local procedures/requirements for filing through the Defense Internet NOTAM Service (DINS).

H. Data Reporting.

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. This requirement includes COA operations within Special Use airspace. NOTE: Negative (zero flights) reports are required.
2. The proponent must submit the following information through *UAS COA On-Line* on a monthly basis:
 - a. The number of flights conducted under this COA. (A flight during which any portion is conducted in the NAS must be counted only once, regardless of how many times it may enter and leave Special Use airspace between takeoff and landing)
 - b. Aircraft operational hours per flight
 - c. Ground control station operational hours in support of each flight, to include Launch and Recovery Element (LRE) operations
 - d. Pilot duty time per flight
 - e. Equipment malfunctions (hardware/software) affecting either the aircraft or ground control station
 - f. Deviations from ATC instructions and/or Letters of Agreement/Procedures
 - g. Operational/coordination issues
 - h. The number and duration of lost link events (control, vehicle performance and health monitoring, or communications) per aircraft per flight.

I. Incident/Accident/Mishap Reporting.

Immediately after an incident or accident, and before additional flight under this COA, the proponent must provide initial notification of the following to the FAA via the *UAS COA On-Line* forms (Incident/Accident):

1. All accidents/mishaps involving UAS operations where any of the following occurs:
 - a. Fatal injury, where the operation of a UAS results in a death occurring within 30 days of the accident/mishap
 - b. Serious injury, where the operation of a UAS results in a hospitalization of more than 48 hours, the fracture of any bone (except for simple fractures of fingers, toes, or nose), severe hemorrhage or tissue damage, internal injuries, or second or third-degree burns
 - c. Total unmanned aircraft loss
 - d. Substantial damage to the unmanned aircraft system where there is damage to the airframe, powerplant, or onboard systems that must be repaired prior to further flight
 - e. Damage to property, other than the unmanned aircraft.
2. Any incident/mishap that results in an unsafe/abnormal operation including but not limited to

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 12 of 18

- a. A malfunction or failure of the unmanned aircraft's on-board flight control system (including navigation)
 - b. A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)
 - c. A powerplant failure or malfunction
 - d. An in-flight fire
 - e. An aircraft collision
 - f. Any in-flight failure of the unmanned aircraft's electrical system requiring use of alternate or emergency power to complete the flight
 - g. A deviation from any provision contained in the COA
 - h. A deviation from an ATC clearance and/or Letter(s) of Agreement/Procedures
 - i. A lost control link event resulting in
 - (1) Fly-away, or
 - (2) Execution of a pre-planned/unplanned lost link procedure.
3. Initial reports must contain the information identified in the *COA On-Line* Accident/Incident Report.
 4. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations. Such reports must be limited to factual information only where privileged safety or law enforcement information is included in the final report.
 5. Public-use agencies other than those which are part of the Department of Defense are advised that the above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR part 830 §830.5.
 6. This COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.

FLIGHT STANDARDS SPECIAL PROVISIONS

J. Contingency Planning

1. **Point Identification.** The proponent must submit contingency plans that address emergency recovery or flight termination of the unmanned aircraft (UA) in the event of unrecoverable system failure. These procedures will normally include Lost Link Points (LLP), Divert/Contingency Points (DCP) and Flight Termination Points (FTP) for each operation. LLPs and DCPs must be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart (or similar format). FTPs or other accepted contingency planning measures must also be submitted in latitude/longitude (Lat/Long) format along with a graphic representation

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 13 of 18

plotted on an aviation sectional chart, or other graphic representation acceptable to the FAA. The FAA accepts the LLPs, DCPs, FTP's, and other contingency planning measures submitted by the proponent, but does not approve them. When conditions preclude the use of FTPs, the proponent must submit other contingency planning options for consideration and approval. At least one LLP, DCP, and FTP (or an acceptable alternative contingency planning measure) is required for each operation. The proponent must furnish this data with the initial COA application. Any subsequent changes or modifications to this data must be provided to AJV-13 for review and consideration no later than 30 days prior to proposed flight operations.

2. **Risk Mitigation Plans.** For all operations, the proponent must develop detailed plans to mitigate the risk of collision with other aircraft and the risk posed to persons and property on the ground in the event the UAS encounters a lost link, needs to divert, or the flight needs to be terminated. The proponent must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDS, and congested areas. In the event of a contingency divert or flight termination, the use of a chase aircraft is preferred when the UAS is operated outside of Restricted or Warning Areas. If time permits, the proponent should make every attempt to utilize a chase aircraft to monitor the aircraft to a DCP or to the FTP. In the event of a contingency divert or flight termination, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

- a. **LLP Procedures.**

- (1) LLPs are defined as a point, or sequence of points where the aircraft will proceed and hold at a specified altitude, for a specified period of time, in the event the command and control link to the aircraft is lost. The aircraft will autonomously hold, or loiter, at the LLP until the communication link with the aircraft is restored or the specified time elapses. If the time period elapses, the aircraft may autoland, proceed to another LLP in an attempt to regain the communication link, or proceed to an FTP for flight termination. LLPs may be used as FTPs. In this case, the aircraft may loiter at the LLP/FTP until link is re-established or fuel exhaustion occurs.
- (2) For areas where multiple or concurrent UAS operations are authorized in the same operational area, a segregation plan must be in place in the event of a simultaneous lost link scenario. The segregation plan may include altitude offsets and horizontal separation by using independent LLPs whenever possible.

- b. **DCP Procedures.**

- (1) A DCP is defined as an alternate landing/recovery site to be used in the event of an abnormal condition that requires a precautionary landing. Each DCP must incorporate the means of communication with ATC throughout the descent and landing (unless otherwise specified in the Special Provisions) as well as a plan for ground operations and securing/parking the aircraft on the ground. This includes the availability of ground control stations capable of

2012-WSA-10 FAA FORM 7711-1 UAS COA Attachment Page 14 of 18

launch/recovery, communication equipment, and an adequate power source to operate all required equipment.

- (2) For local operations, the DCP specified will normally be the airport/facility used for launch and recovery; however, the proponent may specify additional DCPs as alternates.
- (3) For transit and/or mission operations that are being conducted in Class A airspace or Class E airspace above flight level (FL) 600, DCPs will be identified during the flight to be no further than one hour of flight time at any given time, taking into consideration altitude, winds, fuel consumption, and other factors. If it is not possible to define DCPs along the entire flight plan route, the proponent must identify qualified FTPs along the entire route and be prepared to execute flight termination at one of the specified FTPs if a return to base (RTB) is not possible.
- (4) It is preferred that specified DCPs are non-joint use military airfields, other government-owned airfields, or private-use airfields. However, the proponent may designate any suitable airfield for review and consideration.

c. Flight Termination Procedures.

- (1) Flight termination is the intentional and deliberate process of performing controlled flight into terrain (CFIT). Flight termination must be executed in the event that all contingencies have been exhausted and further flight of the aircraft cannot be safely achieved or other potential hazards exist that require immediate discontinuation of flight. FTPs or alternative contingency planning measures must be located within power off glide distance of the aircraft during all phases of flight and must be submitted for review and acceptance. The proponent must ensure sufficient FTPs or other contingency plan measures are defined to accommodate flight termination at any given point along the route of flight. The location of these points is based on the assumption of an unrecoverable system failure and must take into consideration altitude, winds, and other factors.
- (2) Unless otherwise authorized, FTPs must be located in sparsely populated areas. Except for on- or near-airport operations, FTPs will be located no closer than five nautical miles from any airport, heliport, airfield, NAVAID, airway, populated area, major roadway, oil rig, power plant, or any other infrastructure. For offshore locations, the proponent must refer to appropriate United States Coast Guard (USCG) charts and other publications to avoid maritime obstructions, shipping lanes, and other hazards. Populated areas are defined as those areas depicted in yellow on a VFR sectional chart or as determined from other sources.
 - (a) It is preferred that flight termination occurs in Restricted or Warning Areas, government-owned land, or offshore locations that are restricted from routine civil use. However, the proponent may designate any suitable location for review and consideration.

- (b) The proponent is required to survey all designated areas prior to their use as an FTP. All FTPs will be reviewed for suitability on a routine and periodic basis, not to exceed six months. The proponent assumes full risk and all liability associated with the selection and use of any designated FTP.
- (c) It is desirable that the proponent receive prior permission from the land owner or using agency prior to the use of this area as an FTP. The proponent should clearly communicate the purpose and intent of the FTP.
- (d) For each FTP, plans must incorporate the means of communication with ATC throughout the descent as well as a plan for retrieval/recovery of the aircraft.
- (e) Contingency planning must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDS, and congested areas to the maximum extent possible.
- (f) In the event of a contingency divert or flight termination, if time permits, the use of a chase aircraft is preferred when the UA is operated outside of Restricted or Warning Areas.
- (g) In the event of a contingency divert or flight termination or other approved contingency measures, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

K. Night Operations are not authorized.

AIR TRAFFIC CONTROL PROVISIONS

A. Coordination Requirements.

Proponent will notify Kaneohe Base Operations at 808-257-2121 at least 24 hours prior to operations to allow time to publish the NOTAM.

If Kaneohe is closed at start of and/or end of UAS operations, Unmanned Aircraft PIC will contact HCF at (808) 840-6201.

When Kaneohe Approach Control is open, Bellows Field is part of their airspace. HCF does not talk to aircraft in Kaneohe's airspace. Therefore, the UAS operator should call Kaneohe Approach at 808-257-0294 to advise of activity.

When Kaneohe Approach Control is closed, but Kaneohe Tower is open, their approach control airspace goes to HCF. UAS operator should call HCF at 808-684-6201 for Bellows. However, if the activity will occur at the Kaneohe airport, the UAS operator should call Kaneohe Base Operations at 808-257-2121.

When both Kaneohe Tower and Approach Control is closed, then the UAS operator needs to call HCF at (808) 840-6201 to advise of start and termination.

B. Communication Requirements.

For unmanned aircraft operations at Bellows airfield, PIC must monitor frequency 120.7 for civil aircraft traffic in vicinity of Bellows. Tour helicopters and seaplane operators also monitor and make calls on 120.7, which will give UAS PIC a heads up to air traffic in area.

C. Procedural Requirements.

There will be no mixing of civil manned and unmanned aircraft in the area.

D. Emergency/Contingency Procedures.

Lost Link: definition

In the event of a lost link, the UAS pilot will immediately notify Honolulu Control Facility at 808-840-6201, state pilot intentions, and comply with the following provisions:

The UAS will return to the landing site or be commanded to make an immediate landing within Marine Corps Facility property.

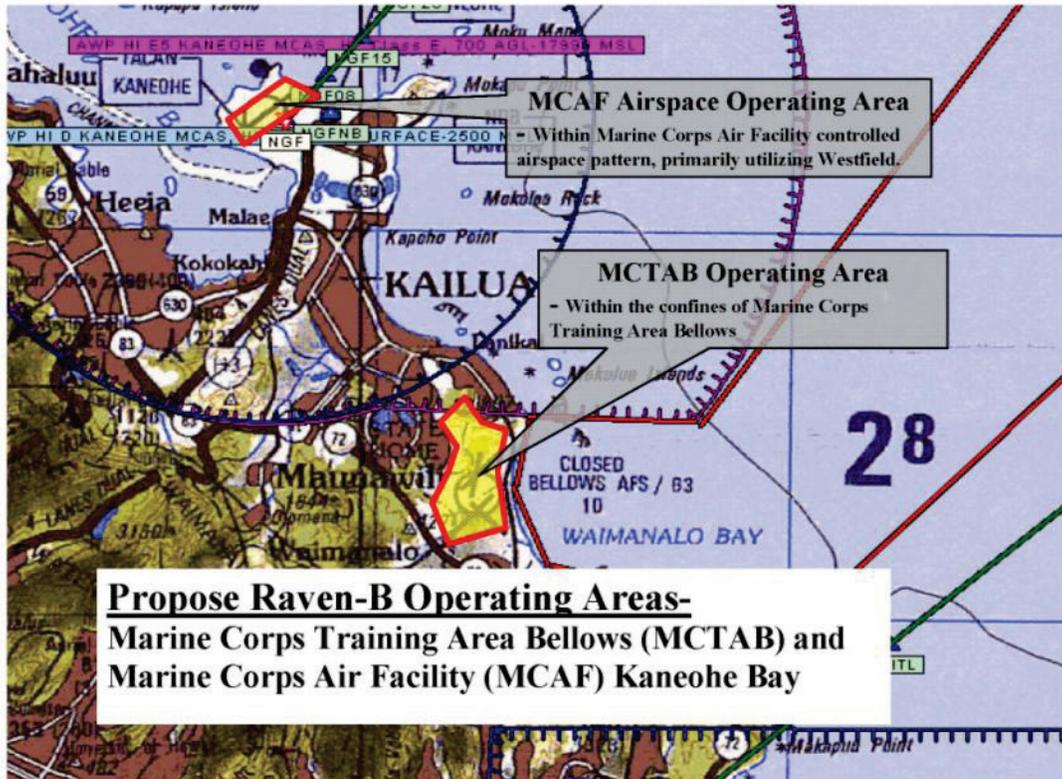
The unmanned aircraft lost link mission will not transit or orbit over populated areas.

Lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.

Lost link orbit points shall not coincide with the centerline of Victor airways.

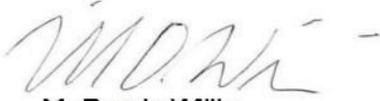
AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the United States Marine Corps to resolve the matter. This COA does not authorize flight within Special Use airspace without approval from the using agency. The United States Marine Corps is hereby authorized to operate the RQ-11B Unmanned Aircraft System in the operations area depicted in the Activity section of this attachment.



C.3.2 2012-WSA-47

This COA was issued by the FAA to the U.S. Army Garrison, Hawaii for operations of the Shadow at Wheeler AAF. This COA reflects those provisions and requirements that would be included in a separate COA for the USMC-proposed Shadow operations.

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION	
CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO Department of the Army	
Headquarters United States Army Garrison Hawaii Schofield Barracks, HI 96857	
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Operation of the Shadow, Unmanned Aircraft System (UAS) in Class D airspace at or below 2,500' Above Ground Level (AGL) under the jurisdiction of Wheeler Army Airfield Air Traffic Control Tower.	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE N/A	
STANDARD PROVISIONS	
1. A copy of the application made for this certificate shall be attached and become a part hereof. 2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations. 3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein. 4. This certificate is nontransferable.	
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.	
SPECIAL PROVISIONS	
Special Provisions are set forth and attached.	
This certificate 2012-WSA-47 is effective from July 31, 2012 to July 30, 2014, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.	
BY DIRECTION OF THE ADMINISTRATOR	
<u>FAA Headquarters, AJV-115</u> <small>(Region)</small>	 M. Randy Willis <small>(Signature)</small>
<u>July 24, 2012</u> <small>(Date)</small>	<u>Acting Air Traffic Manager, UAS Integration Office</u> <small>(Title)</small>

FAA Form 7711-1 (7-74)

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 2 of 20

COA Number: 2012-WSA-47

Issued To: Department of the Army, referred herein as the "proponent"

Address: Headquarters
United States Army Garrison Hawaii
Schofield Barracks, HI 96857

Activity: Operation of the Shadow, Unmanned Aircraft System (UAS) in Class D airspace at or below 2,500' Above Ground Level (AGL) under the jurisdiction of Wheeler Army Airfield Air Traffic Control Tower.

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of training flights.

Dates of Use: This COA is valid from July 31, 2012 through July 30, 2014. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 business days prior to the requested effective date.

Public Aircraft

1. A public aircraft operation is determined by statute, 49 USC §40102(a)(41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statute.
3. All flights must be conducted per the declarations submitted on COA on-line.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 3 of 20

STANDARD PROVISIONS**A. General.**

The review of this activity is based upon current understanding of UAS operations and their impact in the NAS. This COA will not be considered a precedent for future operations. (As changes in or understanding of the UAS industry occur, limitations and conditions for operations will be adjusted.)

All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.

A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are being conducted.

This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive written notice of cancellation.

During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA. Note: This section does not pertain to agencies that have other existing agreements in place with the FAA.

B. Airworthiness Certification.

The unmanned aircraft must be shown to be airworthy to conduct flight operations in the NAS. The Department of the Army has made its own determination that the Shadow unmanned aircraft is airworthy. The Shadow must be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in the COA application.

1. A configuration control program must be in place for hardware and/or software changes made to the UAS to ensure continued airworthiness. If a new or revised Airworthiness Release is generated as a result of changes in the hardware or software affecting the operating characteristics of the UAS, notify the UAS Integration Office of the changes as soon as practical.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 4 of 20

- a. Software and hardware changes should be documented as part of the normal maintenance procedures. Software changes to the aircraft and control station as well as hardware system changes are classified as major changes unless the agency has a formal process, accepted by the FAA. These changes should be provided to the UAS Integration office in summary form at the time of incorporation.
 - b. Major modifications or changes, performed under the COA, or other authorizations that could potentially affect the safe operation of the system must be documented and provided to the FAA in the form of a new AWR, unless the agency has a formal process, accepted by the FAA.
 - c. All previously flight proven systems to include payloads, may be installed or removed as required, and that activity recorded in the unmanned aircraft and ground control stations logbooks by persons authorized to conduct UAS maintenance. Describe any payload equipment configurations in the UAS logbook that will result in a weight and balance change, electrical loads, and or flight dynamics, unless the agency has a formal process, accepted by the FAA.
 - d. For unmanned aircraft system discrepancies, a record entry should be made by an appropriately rated person to document the finding in the logbook. No flights may be conducted following major changes, modifications or new installations unless the party responsible for certifying airworthiness has determined the system is safe to operate in the NAS and a new AWR is generated, unless the agency has a formal process, accepted by the FAA. The successful completion of these tests must be recorded in the appropriate logbook, unless the agency has a formal process, accepted by the FAA.
2. The Shadow must be operated in strict compliance with all provisions and conditions contained within the spectrum analysis assigned and authorized for use within the defined operations area.
 3. All items contained in the application for equipment frequency allocation must be adhered to, including the assigned frequencies and antenna equipment characteristics. A ground operational check to verify the control station can communicate with the aircraft (frequency integration check) must be conducted prior to the launch of the unmanned aircraft to ensure any electromagnetic interference does not adversely affect control of the aircraft.
 4. The use of a Traffic Collision Avoidance System (TCAS) in any mode while operating an unmanned aircraft is prohibited.

C. Operations.

1. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
 - a. In any defined operating area,

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 5 of 20

- b. From a single control station, and
 - c. By one pilot at a time.
2. A Pilot-in-Command (PIC) is the person who has final authority and responsibility for the operation and safety of flight, has been designated as PIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight. The responsibility and authority of the PIC as described by 14 CFR 91.3, Responsibility and Authority of the Pilot-in-Command, apply to the unmanned aircraft PIC. The PIC position may rotate duties as necessary with equally qualified pilots. The individual designated as PIC may change during flight. **Note:** The PIC can only be the PIC for one aircraft at a time. For Optionally Piloted Aircraft (OPA), PIC must meet UAS guidance requirements for training, pilot licensing, and medical requirements when operating OPA as a UAS.
 3. The PIC must conduct a pre-takeoff briefing as applicable prior to each launch. The briefing should include but is not limited to the
 - a. Contents of the COA,
 - b. Altitudes to be flown,
 - c. Mission overview including handoff procedures,
 - d. Frequencies to be used,
 - e. Flight time, including reserve fuel requirements,
 - f. Contingency procedures to include lost link, divert, and flight termination, and
 - g. Hazards unique to the flight being flown.

Note: Flight Crew Member (UAS). In addition to the flight crew members identified in 14 CFR Part 1, Definitions and Abbreviations, an Unmanned Aircraft System flight crew members include pilots, sensor/payload operators, and visual observers and may include other persons as appropriate or required to ensure safe operation of the aircraft.

4. All operations will be conducted in compliance with Title 14 CFR Part 91. Special attention should be given to:
 - a. § 91.3 Responsibility and authority of the pilot in command
 - b. § 91.13 Careless or reckless operation
 - c. § 91.17 Alcohol or drugs
 - d. § 91.103 Preflight Actions
 - e. § 91.111 Operating near other aircraft.
 - f. § 91.113 Right-of-way rules: Except water operations
 - g. § 91.115 Right-of-way rules: Water operations
 - h. § 91.119 Minimum safe altitudes: General
 - i. § 91.123 Compliance with ATC clearances and instructions.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 6 of 20

- j. § 91.133 Restricted and prohibited areas
 - k. § 91.137 Temporary flight restrictions in the vicinity of disaster/hazard areas
 - l. § 91.145 Management of aircraft operations in the vicinity of aerial demonstrations and major sporting events
 - m. § 91.151 Fuel requirements for flight in VFR conditions
 - n. § 91.155 Basic VFR weather minimums
 - o. § 91.159 VFR cruising altitude or flight level
 - p. § 91.209 Aircraft Lights
 - q. § 91.213 Inoperative instruments and equipment
 - r. § 91.215 ATC transponder and altitude reporting equipment and use
 - s. Appendix D to Part 91—Airports/Locations: Special Operating Restrictions
5. Unless otherwise authorized as a special provision, all operations must be conducted in visual meteorological conditions (VMC) during daylight hours in compliance with Title 14 of the Code of Federal Regulations (CFR) Part 91 §91.155 and the following:
6. Special Visual Flight Rules (VFR) operations are not authorized.
- a. VFR cloud clearances specified in 14 CFR Part 91 §91.155, must be maintained, except in Class G airspace where Class E airspace visibility requirements must be applied, but not less than 3 statute miles (SM) flight visibility and 1000' ceiling.
 - b. Flights conducted under Instrument Flight Rules (IFR) in Class A airspace shall remain clear of clouds. NOTE: Deviations from IFR clearance necessary to comply with this provision must have prior ATC approval.
 - c. Chase aircraft must maintain 5 NM flight visibility.
7. Night operations are prohibited unless otherwise authorized as a special provision.
8. Operations (including lost link procedures) must not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.

D. Air Traffic Control (ATC) Communications.

- 1. The pilot and/or PIC will maintain direct, two-way communication with ATC and have the ability to maneuver the unmanned aircraft in response to ATC instructions, unless addressed in the Special Provision Section.
 - a. When required, ATC will assign a radio frequency for air traffic control during flight. The use of land-line and/or cellular telephones is prohibited as the primary means for in-flight communication with ATC.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 7 of 20

2. The PIC must not accept an ATC clearance requiring the use of visual separation, sequencing, or visual approach.
3. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft must not loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.
4. For flights operating on an IFR clearance at or above 18,000 feet mean sea level (MSL), the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDs, and/or waypoints is provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.
5. If equipped, the unmanned aircraft must operate with
 - a. An operational mode 3/A transponder with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk
 - b. Position/navigation and anti-collision lights on at all times during flight unless stipulated in the special provisions or the proponent has a specific exemption from 14 CFR Part 91.209.
6. Operations that use a Global Positioning System (GPS) for navigation must check Receiver Autonomous Integrity Monitoring (RAIM) notices prior to flight operations. Flight into a GPS test area or degraded RAIM is prohibited for those aircraft that use GPS as their sole means for navigation.

E. Safety of Flight.

1. The proponent or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.
2. ATC must be immediately notified in the event of any emergency, loss and subsequent restoration of command link, loss of PIC or observer visual contact, or any other malfunction or occurrence that would impact safety or operations.
3. Sterile Cockpit Procedures.
 - a. Critical phases of flight include all ground operations involving
 - (1) Taxi (movement of an aircraft under its own power on the surface of an airport)
 - (2) Take-off and landing (launch or recovery)
 - (3) All other flight operations in which safety or mission accomplishment might be compromised by distractions
 - b. No crewmember may perform any duties during a critical phase of flight not required for the safe operation of the aircraft.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 8 of 20

- c. No crewmember may engage in, nor may any PIC permit, any activity during a critical phase of flight which could
 - (1) Distract any crewmember from the performance of his/her duties or
 - (2) Interfere in any way with the proper conduct of those duties.
 - d. The pilot and/or the PIC must not engage in any activity not directly related to the operation of the aircraft. Activities include, but are not limited to, operating UAS sensors or other payload systems.
 - e. The use of cell phones or other electronic devices is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with Air Traffic Control.
4. See-and-Avoid.
- Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations. Adherence to 14 CFR Part 91 §91.111, §91.113 and §91.115, is required.
- a. The proponent and/or delegated representatives are responsible at all times for collision avoidance with all aviation activities and the safety of persons or property on the surface with respect to the UAS.
 - b. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft at all times.
 - c. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the PIC.
 - d. UA operations will only be conducted within Reduced Vertical Separation Minimum (RVSM) altitudes, when appropriately equipped or having received a clearance under an FAA deviation. **NOTE:** UA operations should not plan on an en-route clearance in RVSM altitudes, without being RVSM equipped.
 - e. Visual observers must be used at all times except in Class A, airspace, active Restricted Areas, and Warning areas designated for aviation activities.
 - (1) Observers may either be ground-based or in a chase plane.
 - (2) If the chase aircraft is operating more than 100 feet above/below and/or more than ½ NM laterally of the unmanned aircraft, the chase aircraft PIC will advise the controlling ATC facility.
 - f. The PIC is responsible to ensure visual observers are;
 - (1) Able to see the aircraft and the surrounding airspace throughout the entire flight, and

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 9 of 20

- (2) Able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:
 - (a) Comply with CFR Parts 91.111, 91.113 and 91.115, and
 - (b) Prevent the UA from creating a collision hazard.
5. Observers must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.
6. A PIC may rotate duties as necessary to fulfill operational requirements; a PIC must be designated at all times.
7. Pilots flying chase aircraft must not concurrently perform observer or UA pilot duties.
8. Pilot and observers must not assume concurrent duties as both pilot and observer.
9. The required number of ground observers will be in place during flight operations.
10. The use of multiple successive observers (daisy chaining) is prohibited unless otherwise authorized as a special provision.
11. The dropping or spraying of aircraft stores, or carrying of hazardous materials (including ordnance) outside of active Restricted, Prohibited, or Warning Areas approved for aviation activities is prohibited unless specifically authorized as a special provision.

F. Crewmember Requirements.

1. All crewmembers associated with the operation of the unmanned aircraft, including chase operations, must be qualified or must be receiving formal training under the direct supervision of a qualified instructor, who has at all times, responsibility for the operation of the unmanned aircraft.
2. Pilots and observers must have an understanding of, and comply with, Title 14 Code of Federal Regulations, and/or agency directives and regulations, applicable to the airspace where the unmanned aircraft will operate.
3. Pilots, supplemental pilots, and observers must maintain a current second class (or higher) airman medical certificate that has been issued under 14 CFR Part 67, or an FAA accepted agency equivalent based on the application.
4. At a minimum, the use of alcohol and/or drugs in violation of 14 CFR Part 91 §91.17 applies to UA pilots and observers.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 10 of 20

5. At a minimum, observers must receive training on rules and responsibilities described in 14 CFR Part 91 §91.111, §91.113 and §91.115, regarding cloud clearance, flight visibility, and the pilot controller glossary, including standard ATC phraseology and communication.
6. Recent Pilot Experience (Currency). The proponent must provide documentation, upon request, showing the pilot/supplemental pilot/PIC maintains an appropriate level of recent pilot experience in either the UAS being operated or in a certified simulator. At a minimum, he/she must conduct three takeoffs (launch) and three landings (recovery) in the specific UAS within the previous 90 days (excluding pilots who do not conduct launch/recovery during normal/emergency operations). If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating requirements.
7. A PIC and/or supplemental pilot have the ability to assume the duties of an internal or an external UAS pilot at any point during the flight.
8. A PIC may be augmented by supplemental pilots.
9. PIC Ratings.
Rating requirements for the UAS PIC depend on the type of operation conducted. The requirement for the PIC to hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application of 14 CFR Part 61, is predicated on various factors including the location of the planned operations, mission profile, size of the unmanned aircraft, and whether or not the operation is conducted within or beyond visual line-of-sight.
 - a. The PIC must hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61, under all operations:
 - (1) Approved for flight in Class A, B, C, D, E, and G (more than 400 feet above ground level (AGL)) airspace
 - (2) Conducted under IFR (FAA instrument rating required, or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61
 - (3) Approved for night operations
 - (4) Conducted at or within 5 NM of a joint use or public airfields
 - (5) Requiring a chase aircraft
 - (6) At any time the FAA has determined the need based on the UAS characteristics, mission profile, or other operational parameters
 - b. Operations without a pilot certificate may be allowed when all of the following conditions are met:
 - (1) The PIC has successfully completed, at a minimum, FAA private pilot ground instruction and passed the written examination, or the FAA accepted agency equivalent, based on the application. Airman Test reports are valid for the 24-

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 11 of 20

calendar month period preceding the month the exam was completed, at which time the instruction and written examination must be repeated.

- (2) Operations are during daylight hours.
 - (3) The operation is conducted in a sparsely populated location.
 - (4) The operation is conducted from a privately owned airfield, military installation, or off-airport location.
 - (5) Operations are approved and conducted solely within visual line-of-sight in Class G airspace.
 - (6) Visual line-of-sight operations are conducted at an altitude of no more than 400 feet Above Ground Level (AGL) in class G airspace at all times.
- c. The FAA may require specific aircraft category and class ratings in manned aircraft depending on the UAS seeking approval and the characteristics of its flight controls interface.

10. PIC Recent Flight Experience (Currency).

- a. For those operations that require a certificated pilot or FAA accepted agency equivalent, based on the application, the PIC must have flight reviews 14 CFR Part 61.56, and if the pilot conducts takeoff, launch, landing or recovery the PIC must maintain recent pilot experience in manned aircraft per 14 CFR Part 61.57,; Recent Flight Experience: Pilot in Command. .
- b. For operations approved for night or IFR through special provisions, the PIC must maintain minimum recent pilot experience per 14 CFR Part 61.57, Recent Flight Experience: Pilot in Command, as applicable.

11. Supplemental Pilot Ratings.

- a. Supplemental pilots must have, at a minimum, successfully completed private pilot ground school and passed the written test or the FAA accepted agency equivalent, based on the application. The ground school written test results are valid for two years from the date of completion, at which time the instruction and written examination must be repeated. If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating, currency, medical, and training requirements listed in this document.

12. Ancillary personnel such as systems operators or mission specialists must be thoroughly familiar with and possess operational experience of the equipment being used. If the systems being used are for observation and detection of other aircraft for collision avoidance purposes, personnel must be thoroughly trained on collision avoidance procedures and techniques and have direct communication with the UAS pilot, observer, and other crewmembers.

13. The Agency will ensure that Crew Resource Management (CRM) training is current for all crew members before flying operational or training missions. The CRM program

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 12 of 20

must consist of initial training, as well as CRM recurrent training during every recurrent training cycle, not to exceed a 12 month interval between initial training and recurrent training or between subsequent recurrent training sessions.

G. Notice to Airmen (NOTAM).

1. A distance (D) NOTAM must be issued when unmanned aircraft operations are being conducted. This requirement may be accomplished
 - a. Through the proponent's local base operations or NOTAM issuing authority, or
 - b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation, unless otherwise authorized as a special provision. The issuing agency will require the:
 - (1) Name and address of the pilot filing the NOTAM request
 - (2) Location, altitude, or operating area
 - (3) Time and nature of the activity.
2. For proponents filing their NOTAM with the Department of Defense: The requirement to file with an Automated Flight Service Station (AFSS) is in addition to any local procedures/requirements for filing through the Defense Internet NOTAM Service (DINS).

H. Data Reporting.

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. This requirement includes COA operations within Special Use airspace. NOTE: Negative (zero flights) reports are required.
2. The proponent must submit the following information through UAS COA On-Line on a monthly basis:
 - a. The number of flights conducted under this COA. (A flight during which any portion is conducted in the NAS must be counted only once, regardless of how many times it may enter and leave Special Use airspace between takeoff and landing)
 - b. Aircraft operational hours per flight
 - c. Ground control station operational hours in support of each flight, to include Launch and Recovery Element (LRE) operations
 - d. Pilot duty time per flight
 - e. Equipment malfunctions (hardware/software) affecting either the aircraft or ground control station
 - f. Deviations from ATC instructions and/or Letters of Agreement/Procedures
 - g. Operational/coordination issues

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 13 of 20

- h. The number and duration of lost link events (control, vehicle performance and health monitoring, or communications) per aircraft per flight.

I. Incident/Accident/Mishap Reporting.

Immediately after an incident or accident, and before additional flight under this COA, the proponent must provide initial notification of the following to the FAA via the UAS COA On-Line forms (Incident/Accident).

1. All accidents/mishaps involving UAS operations where any of the following occurs:
 - a. Fatal injury, where the operation of a UAS results in a death occurring within 30 days of the accident/mishap
 - b. Serious injury, where the operation of a UAS results in a hospitalization of more than 48 hours, the fracture of any bone (except for simple fractures of fingers, toes, or nose), severe hemorrhage or tissue damage, internal injuries, or second or third-degree burns
 - c. Total unmanned aircraft loss
 - d. Substantial damage to the unmanned aircraft system where there is damage to the airframe, power plant, or onboard systems that must be repaired prior to further flight
 - e. Damage to property, other than the unmanned aircraft.
2. Any incident/mishap that results in an unsafe/abnormal operation including but not limited to
 - a. A malfunction or failure of the unmanned aircraft's on-board flight control system (including navigation)
 - b. A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)
 - c. A power plant failure or malfunction
 - d. An in-flight fire
 - e. An aircraft collision
 - f. Any in-flight failure of the unmanned aircraft's electrical system requiring use of alternate or emergency power to complete the flight
 - g. A deviation from any provision contained in the COA
 - h. A deviation from an ATC clearance and/or Letter(s) of Agreement/Procedures
 - i. A lost control link event resulting in
 - (1) Fly-away, or
 - (2) Execution of a pre-planned/unplanned lost link procedure.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 14 of 20

3. Initial reports must contain the information identified in the COA On-Line Accident/Incident Report.
4. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations. Such reports must be limited to factual information only where privileged safety or law enforcement information is included in the final report.
5. Public-use agencies other than those which are part of the Department of Defense are advised that the above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR Part 830 §830.5.
6. This COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.

FLIGHT STANDARDS SPECIAL PROVISIONS

A. Contingency Planning

1. **Point Identification.** The proponent must submit contingency plans that address emergency recovery or flight termination of the unmanned aircraft (UA) in the event of unrecoverable system failure. These procedures will normally include Lost Link Points (LLP), Divert/Contingency Points (DCP) and Flight Termination Points (FTP) for each operation. LLPs and DCPs must be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart (or similar format). FTPs or other accepted contingency planning measures must also be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart, or other graphic representation acceptable to the FAA. The FAA accepts the LLPs, DCPs, FTPs, and other contingency planning measures, submitted by the proponent but does not approve them. When conditions preclude the use of FTPs, the proponent must submit other contingency planning options for consideration and approval. At least one LLP, DCP, and FTP (or an acceptable alternative contingency planning measure) is required for each operation. The proponent must furnish this data with the initial COA application. Any subsequent changes or modifications to this data must be provided to AJV-13 for review and consideration no later than 30 days prior to proposed flight operations.
2. **Risk Mitigation Plans.** For all operations, the proponent must develop detailed plans to mitigate the risk of collision with other aircraft and the risk posed to persons and property on the ground in the event the UAS encounters a lost link, needs to divert, or the flight needs to be terminated. The proponent must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDs, and congested areas. In the event of a contingency divert or flight termination, the use of a chase aircraft is preferred when the UAS is operated

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 15 of 20

outside of Restricted or Warning Areas. If time permits, the proponent should make every attempt to utilize a chase aircraft to monitor the aircraft to a DCP or to the FTP. In the event of a contingency divert or flight termination, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

a. LLP Procedures.

- (1) LLPs are defined as a point, or sequence of points where the aircraft will proceed and hold at a specified altitude, for a specified period of time, in the event the command and control link to the aircraft is lost. The aircraft will autonomously hold, or loiter, at the LLP until the communication link with the aircraft is restored or the specified time elapses. If the time period elapses, the aircraft may autoland, proceed to another LLP in an attempt to regain the communication link, or proceed to an FTP for flight termination. LLPs may be used as FTPs. In this case, the aircraft may loiter at the LLP/FTP until link is re-established or fuel exhaustion occurs.
- (2) For areas where multiple or concurrent UAS operations are authorized in the same operational area, a segregation plan must be in place in the event of a simultaneous lost link scenario. The segregation plan may include altitude offsets and horizontal separation by using independent LLPs whenever possible.

b. DCP Procedures.

- (1) A DCP is defined as an alternate landing/recovery site to be used in the event of an abnormal condition that requires a precautionary landing. Each DCP must incorporate the means of communication with ATC throughout the descent and landing (unless otherwise specified in the Special Provisions) as well as a plan for ground operations and securing/parking the aircraft on the ground. This includes the availability of ground control stations capable of launch/recovery, communication equipment, and an adequate power source to operate all required equipment.
- (2) For local operations, the DCP specified will normally be the airport/facility used for launch and recovery; however, the proponent may specify additional DCPs as alternates.
- (3) For transit and/or mission operations that are being conducted in Class A airspace or Class E airspace above flight level (FL)-600, DCPs will be identified during the flight to be no further than one hour of flight time at any given time, taking into consideration altitude, winds, fuel consumption, and other factors. If it is not possible to define DCPs along the entire flight plan route, the proponent must identify qualified FTPs along the entire route and be prepared to execute flight termination at one of the specified FTPs if a return to base (RTB) is not possible.
- (4) It is preferred that specified DCPs are non-joint use military airfields, other government-owned airfields, or private-use airfields. However, the proponent may designate any suitable airfield for review and consideration.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 16 of 20

c. Flight Termination Procedures.

- (1) Flight termination is the intentional and deliberate process of performing controlled flight into terrain (CFIT). Flight termination must be executed in the event that all contingencies have been exhausted and further flight of the aircraft cannot be safely achieved or other potential hazards exist that require immediate discontinuation of flight. FTPs or alternative contingency planning measures must be located within power off glide distance of the aircraft during all phases of flight and must be submitted for review and acceptance. The proponent must ensure sufficient FTPs or other contingency plan measures are defined to accommodate flight termination at any given point along the route of flight. The location of these points is based on the assumption of an unrecoverable system failure and must take into consideration altitude, winds, and other factors.
- (2) Unless otherwise authorized, FTPs must be located in sparsely populated areas. Except for on- or near-airport operations, FTPs will be located no closer than five nautical miles from any airport, heliport, airfield, NAVAID, airway, populated area, major roadway, oil rig, power plant, or any other infrastructure. For offshore locations, the proponent must refer to appropriate United States Coast Guard (USCG) charts and other publications to avoid maritime obstructions, shipping lanes, and other hazards. Populated areas are defined as those areas depicted in yellow on a VFR sectional chart or as determined from other sources.
 - (a) It is preferred that flight termination occurs in Restricted or Warning Areas, government-owned land, or offshore locations that are restricted from routine civil use. However, the proponent may designate any suitable location for review and consideration.
 - (b) The proponent is required to survey all designated areas prior to their use as an FTP. All FTPs will be reviewed for suitability on a routine and periodic basis, not to exceed six months. The proponent assumes full risk and all liability associated with the selection and use of any designated FTP.
 - (c) It is desirable that the proponent receive prior permission from the land owner or using agency prior to the use of this area as an FTP. The proponent should clearly communicate the purpose and intent of the FTP.
 - (d) For each FTP, plans must incorporate the means of communication with ATC throughout the descent as well as a plan for retrieval/recovery of the aircraft.
 - (e) Contingency planning must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDs, and congested areas to the maximum extent possible.
 - (f) In the event of a contingency divert or flight termination, if time permits, the use of a chase aircraft is preferred when the UA is operated outside of Restricted or Warning Areas.
 - (g) In the event of a contingency divert or flight termination or other approved contingency measures, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 17 of 20

B. Night Operation Limitations.

Night operations are authorized. The following measures are considered adequate to ensure an acceptable level of safety for UAS night operations.

UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (Note: this is equal to approximately 30 minutes after sunset until 30 minutes before sunrise).

1. For Class D - UAS launch and recovery operations will take place wholly within Class D airspace while the ATC tower is open and the Class D active.
2. For Class D - The mixing of civil manned and unmanned traffic within Class D airspace during launch and recovery operations is prohibited.
3. All classes of airspace - External pilots and UAS ground observer(s) must be in place 30 minutes prior to night operations to ensure dark adaptation.
4. All classes of airspace - Ground observers will undergo additional training on the lighting configuration of the UAS to ensure proper recognition during flight at night.
5. For Class D - In addition to the ground observers, ATCT will monitor the Digital Bright Radar Indicator Tower Equipment (DBRITE) display, if available, as a supplement to ensure no traffic is approaching the controlled airspace without making the required radio contact. Additionally, information from the DBRITE will be used to help reduce possible night time optical illusions. If the DBRITE is not operational, night operations will not be authorized.
6. The use of night vision devices (NVD) to improve night vision is allowed. However, due to the limitations of the NVD, and additional observer without NVD shall be stationed directly next to any observer using NVD. The additional observer shall keep the UAS in sight and scan for other traffic outside the NVD observer's field of view.
7. The UA shall operate navigation and strobe lights for all nighttime operations while in the Wheeler Class D airspace. Nighttime operations are not allowed if the UAS lights are inoperable.
8. The mixing of civil manned and unmanned aircraft within the Wheeler traffic pattern is prohibited.

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

Page 18 of 20

AIR TRAFFIC CONTROL SPECIAL PROVISIONS

A. Coordination Requirements.

There are no special coordination requirements.

B. Communication Requirements.

The use of cell phones or other telephonic communication is restricted to the operational control of the UAS and any required communication with ATC.

C. Procedural Requirements.

1. There will be no mixing of civil manned and unmanned aircraft in the Wheeler Class D airspace.
2. If transponder or altitude encoding failure occurs during flight, PIC will coordinate with Wheeler ATCT for immediate recovery and landing in accordance with Shadow Recovery Procedures.
3. Operations shall remain within the confines of the Wheeler Class D airspace area when transiting to/from adjacent restricted airspace.

D. Emergency/Contingency Procedures.

Lost Link:

In the event of a lost link, the UAS pilot will immediately notify Wheeler ATCT at 808-656-1062, state pilot intentions, and comply with the following provisions:

The UAS shall fly via a predetermined route to a waypoint located at (N 21° 30' 22.8" W 158° 05' 30.2") within R-3109. If the re-establishment of link is not accomplished, the air vehicle will remain in loiter until a flight termination command is autonomously executed by the UAS operator and the parachute is deployed.

The unmanned aircraft lost link mission will not transit or orbit over populated areas.

Lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.

If lost link occurs within a restricted or warning area, or the lost link procedure above takes the UA into the restricted or warning area – the aircraft will not exit the restricted or warning areas until the link is re-established.

Lost link orbit points shall not coincide with the centerline of Victor airways.

Lost Communications:

In the event of lost radio communications with ground observers or Wheeler ATCT, contact will be made via telephone to coordinate recovery of the UAS to return to base via pre-established coordinates to Wheeler Army Airfield.

Emergency Procedures:

Version 2.1: June 2012

FAA FORM 7711-1 UAS COA Attachment
2012-WSA-47 COA

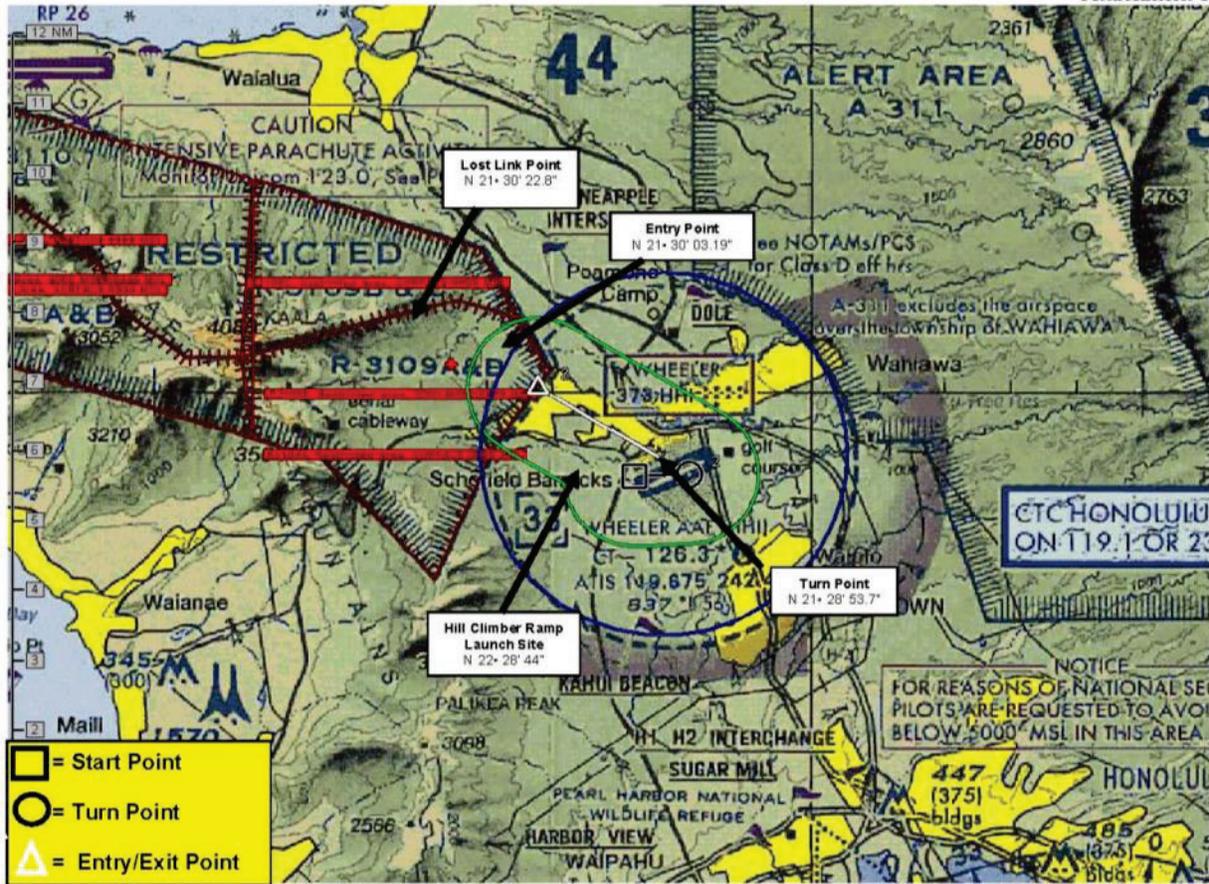
Page 19 of 20

All in-flight emergencies will be handled in accordance with the B Company, 3rd BSTB UAS Platoon Pre-Accident Plan and the Wheeler Army Airfield Local Flying Rules. In the event of an emergency, both Wheeler ATC and Flight Operations will be contacted immediately. If the emergency occurs within the restricted airspace the UAS will remain within the restricted area until the emergency is terminated. Activation of crash and rescue personnel will be determined by ATC on a case by case basis. In the event of an emergency involving manned aircraft, UAS launch and recovery will not be authorized until the emergency is terminated and further UAS operations are approved by ATC. Manned aircraft emergencies will have precedence over unmanned aircraft emergencies.

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the Department of the Army to resolve the matter. This COA does not authorize flight within Special Use airspace without approval from the using agency. The Department of the Army is hereby authorized to operate the Shadow Unmanned Aircraft System in the operations area depicted in the Activity section of this attachment.

Version 2.1: June 2012



Version 2.1: June 2012

APPENDIX D
BIOLOGICAL RESOURCES – SPECIES LISTS

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX D BIOLOGICAL RESOURCES – SPECIES LISTS	D-1
Table D-1. ESA-Listed Threatened and Endangered Species Observed at MCB Hawaii Kaneohe Bay and Surrounding Waters in the 500-yard Offshore Security Buffer Zone	D-1
Table D-2. MBTA-Listed Bird Species at MCB Hawaii Kaneohe Bay	D-1
Table D-3. ESA-Listed Threatened and Endangered Faunal Species at PMRF	D-3
Table D-4. MBTA-Listed Bird Species Observed at PMRF	D-4

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Table D-1. ESA-Listed Threatened and Endangered Species Observed at MCB Hawaii Kaneohe Bay and Surrounding Waters in the 500-yard Offshore Security Buffer Zone			
Scientific Name	Common Name	Hawaiian Name	Regulatory Status
Birds			
<i>Anas syvilliana</i>	Hawaiian duck	Koloa moali	E
<i>Fulica americana alai</i>	Hawaiian coot	Alae keokeo	E
<i>Gallinula chloropus sandvicensis</i>	Hawaiian gallinule, common moorhen	Alae ula	E
<i>Himantopus mexicanus knudseni</i>	Hawaiian stilt	Aeo	E
<i>Puffinus auricularis newelli</i>	Newell's/Townsend's shearwater	Ao	T
Plants			
<i>Sesbania tomentosa</i>	Ohai or O'ahu riverhemp	Ohai	E
<i>Hibiscus arnottianus</i>	Native white hibiscus	Koki'o ke'oke'o	E
<i>Hibiscus brackenridgei</i>	Native yellow hibiscus (state flower)	Ma'o hau hele	E
Marine Mammals and Turtles			
<i>Monachus schauinslandi</i>	Hawaiian monk seal	Ilio holo I ka uaua	E
<i>Physeter catodon</i>	Sperm whale		E
<i>Megaptera novaeangliae</i>	Humpback whale	Kohola	E
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	Ea	E
<i>Chelonia mydas</i>	Green sea turtle	Honu	T
<i>Lepidochelys olivacea</i>	Olive Ridley sea turtle		T
Key: T=federally-listed as threatened, E=federally-listed as endangered			
Source: DoN 2011, 2012b			

Table D-2. MBTA-Listed Bird Species at MCB Hawaii Kaneohe Bay			
Scientific Name	Common Name	Hawaiian Name	Origin
Waterbirds			
<i>Anas platyrhynchos</i>	Mallard		Introduced
<i>Anas syvilliana</i>	Hawaiian duck	Koloa moali	Endemic
<i>Ardea herodias</i>	Great blue heron		Visitor
<i>Bubulcus ibis</i>	Cattle egret		Introduced
<i>Calidris alpina</i>	Dunlin		Visitor
<i>Egretta caerulea</i>	Little blue heron		Visitor
<i>Egretta thula</i>	Snowy egret		Visitor
<i>Fulica alai</i>	Hawaiian coot	Alae keokeo	Endemic
<i>Gallinula chloropus sandvicensis</i>	Hawaiian gallinule, common moorhen	Alae ula	Endemic
<i>Himantopus mexicanus knudseni</i>	Hawaiian stilt	Ae o	Endemic
<i>Nyctirax nyctirax hoactli</i>	Black-crowned night heron	Aukuu	Indigenous
Seabirds			
<i>Anous minutes melanogenys</i>	Black noddy	Noio	Endemic
<i>Anous stolidus pileatus</i>	Brown noddy	Noio koha	Indigenous
<i>Fregata minor palmerstoni</i>	Great frigatebird	Iwa	Indigenous
<i>Gygis alba</i>	White tern	Manu-o-ku	Indigenous
<i>Phaethon lepturus</i>	White-tailed tropicbird	Koae kea	Indigenous
<i>Phaethon rubricauda</i>	Red-tailed tropicbird	Koae ula	Indigenous
<i>Phoebastria immutabilis</i> (<i>Diomedea immutabilis</i>)	Laysan albatross	Moli	Indigenous
<i>Puffinus pacificus chlororhynchus</i>	Wedge-tailed shearwater	Uau kani	Indigenous
<i>Puffinus auricularis newelli</i>	Newell's/Townsend's shearwater	Ao	Indigenous

Table D-2. MBTA-Listed Bird Species at MCB Hawaii Kaneohe Bay (Continued)			
Scientific Name	Common Name	Hawaiian Name	Origin
<i>Sterna fuscata</i>	Sooty tern	Ewaewa	Indigenous
<i>Sula dactylatra</i>	Masked booby	'A	Indigenous
<i>Sula leugaster</i>	Brown booby	'A	Indigenous
<i>Sula sula rubripes</i>	Red-footed booby	'A	Indigenous
Land Birds			
<i>Alauda arvensis</i>	Skylark		Introduced
<i>Asio flammeus sandwichensis</i>	Short-eared owl	Pueo	Endemic
<i>Cardinalis cardinalis</i>	Northern cardinal		Introduced
<i>Carpodacus mexicanus</i>	House finch		Introduced
<i>Mimus polyglottos</i>	Northern mockingbird		Introduced
<i>Tyto alba</i>	common barn owl		Introduced
Migratory Birds			
<i>Anas acuta</i>	Northern pintail	Koloa mapu	Migratory
<i>Anas americana</i>	American wigeon		Migratory
<i>Anas clypeata</i>	Northern shoveler	Koloa moha	Migratory
<i>Anas crecca</i>	Green-winged teal		Migratory
<i>Arenaria interpres</i>	Ruddy turnstone	Akekeke	Indigenous/ Migratory
<i>Aythya affinis</i>	Lesser scaup		Migratory
<i>Aythya marila</i>	Greater scaup		Migratory
<i>Branta bernicla</i>	Brant		Migratory
<i>Branta bernicla nigricans</i>	Black brant		Migratory
<i>Branta canadensis</i>	Canada goose		Migratory
<i>Bucephala albeola</i>	Bufflehead		Migratory
<i>Calidris alba</i>	Sanderling	Hunakai	Indigenous/ Migratory
<i>Calidris alpina</i>	Dunlin		Migratory
<i>Catoptrophorus semipalmatus</i>	Willet		Migratory
<i>Charadrius semipalmatus</i>	Semipalmated plover		Migratory
<i>Chlidonias niger</i>	Black tern		Migratory
<i>Fal peregrines</i>	Peregrine falcon		Migratory
<i>Gallinago gallinago</i>	common snipe		Migratory
<i>Heteroscelus incanus</i>	Wandering tattler	Ullii	Indigenous/ Migratory
<i>Larus atricilla</i>	Laughing gull		Migratory
<i>Larus delawarensis</i>	Ring-billed gull		Migratory
<i>Larus pipixcan</i>	Franklin's gull		Migratory
<i>Limnodromus spp.</i>	Dowitcher		Migratory
<i>Limnodromus slopaceus</i>	Long-billed dowitcher		Migratory
<i>Lophodytes cucullatus</i>	Hooded merganser		Migratory
<i>Numenius phaeopus</i>	Whimbrel		Migratory
<i>Numenius tahitiensis</i>	Bristle-thighed curlew	Kioea	Migratory
<i>Pandion haliaetus</i>	Osprey		Migratory
<i>Phalaropus fulicarius</i>	Red phalarope		Migratory
<i>Plegadis chihi</i>	White-faced Ibis		Migratory
<i>Pluvialis fulva</i>	Pacific golden plover	Kolea	Indigenous/ Migratory
<i>Pluvialis squatarola</i>	Black-bellied plover		Migratory
<i>Sterna antillarum</i>	Least tern		Migratory
<i>Sterna bergii</i>	Great crested tern		Migratory

Table D-2. MBTA-Listed Bird Species at MCB Hawaii Kaneohe Bay (Continued)

Scientific Name	Common Name	Hawaiian Name	Origin
<i>Sterna caspia</i>	Caspian tern		Migratory
<i>Sterna fuscata</i>	Sooty tern	Ewaewa	Migratory
<i>Sterna hirundo</i>	common tern		Migratory
<i>Tringa flavipes</i>	Lesser yellowlegs		Migratory
<i>Tringa melanoleuca</i>	Greater yellowlegs		Migratory

Source: DoN 2011, 2012b

Table D-3. ESA-Listed Threatened and Endangered Faunal Species at PMRF

Scientific Name	Common Name (Hawaiian Name) [Regulatory Status] ^{1, 2}	Comments
<i>Anas syvilliana</i>	Hawaiian duck (Koloa moali) [E]	The Hawaiian duck has been observed in drainage ditches and ponds on the base.
<i>Gallinula chloropus sandvicensis</i>	Hawaiian common moorhen [E]	The moorhen has been observed in drainage ditches and ponds on the base. It nests on Kaua'i year-round.
<i>Fulica alai</i>	Hawaiian coot [E]	The Hawaiian coot has been observed in drainage ditches and ponds on the base. It nests on Kaua'i year-round.
<i>Himantopus mexicanus knudseni</i>	Hawaiian black-necked stilt [E]	The Hawaiian stilt has been observed in drainage ditches and ponds on the base. It nests on Kaua'i year-round.
<i>Branta sandvicensis</i>	Hawaiian goose (nēnē) [E]	An active nēnē nest was found at PMRF in November 2009, less than a mile from the south end of the active runway. Other adult nēnē (~20) were also observed in this area. USDA Wildlife Services has worked with the Navy to haze nēnē from the runway area and to attempt to relocate nesting nēnē and goslings to decrease bird air strike hazard.
<i>Puffinus auricularis newelli</i>	Newell's shearwater [T]	This bird nests from April to November in the interior mountains of Kaua'i. Fledglings leave their nests at night in October and November and head for open ocean. They may become temporarily blinded by lights when flying near developed areas, and collide with trees and structures.
<i>Phoebastria albatrus</i>	Short-tailed albatross [E]	
<i>Pterodroma phaeopygia sandwichensis</i>	Hawaiian dark-rumped petrel [E]	The Hawaiian dark-rumped petrel arrives in February and may traverse PMRF from its nesting grounds to the sea.
<i>Lasiurus cinereus</i>	Hawaiian hoary bat [E]	Hawaiian hoary bats have been observed foraging around the sewage treatment ponds, just offshore of the northern PMRF main base and at Polihale State Park north of the base.
<i>Monachus schauinslandi</i>	Hawaiian monk seal [E]	From 2000 to 2006, 1 to 4 Monk seal births occurred on the Kauai beaches, some of which occurred at PMRF.
<i>Megaptera novaeangliae</i>	Humpback whale [E]	Humpback whales have been observed offshore waters during the winter season.
<i>Chelonia mydas</i>	Green sea turtle [T]	Green sea turtles are regularly observed basking on-shore in the vicinity of Nohili Ditch. Up to three sea turtle nests have been documented on the beach near PMRF each year from 2010 to 2012 (Anders 2013).
<i>Eretmochelys imbricate</i>	Hawksbill turtle [E]	

Notes:

¹. E = federally listed as endangered; T = federally listed as threatened; C = federal candidate for listing as threatened or endangered.

². All federally listed species under ESA are also the state of Hawaii-listed species.

Key: ESA=Endangered Species Act of 1973, PMRF=Pacific Missile Range Facility, USDA=U.S. Department of Agriculture

Sources: HHFP 2010, NMFS/NOAA 2007, DoN 2010, DoN 2013

Table D-4. MBTA-Listed Bird Species Observed at PMRF

Scientific Name	Common Name	Hawaiian Name	Comments
<i>Phoebastria immutabilis</i>	Laysan albatross	Moli	The Laysan albatross is a native seabird species, with more than 90% of the world population nesting in the Hawaiian archipelago. This species attempts to nest next to the runway and in the KTF area of PMRF, and birds are relocated from these areas to prevent BASH.
<i>Phoebastria nigripes</i>	Black-footed albatross	Not available	The black-footed albatross is a State of Hawai'i-listed threatened as well as an MBTA-protected native seabird. Black-footed albatrosses have been observed loafing near the runway at PMRF; however, there has been no Record of breeding at the installation. In 2009, the USFWS reopened the public information solicitation period on an October 9, 2007, 90-day finding on a petition to list the black-footed albatross as threatened or endangered under the ESA. The petition is still under review.
<i>Sula leugaster</i>	Brown booby	'A	The brown booby is a native seabird that has been observed foraging off shore at PMRF. It most often forages in large, mixed species flocks associated with schools of large predatory fishes that drive prey species to the surface. No nesting has occurred on PMRF.
<i>Puffinus pacificus</i>	Wedge-tailed shearwater	Uaukani	Wedge-tailed shearwaters are native pelagic seabirds. There are two breeding colonies located at PMRF, one near the beach cottages and one in the Nohili dunes area. Wedge-tailed shearwaters breed from February through November. They are ground-nesting birds.
<i>Nyctirax nyctirax</i>	Black-crowned night heron	Aukuu	The black-crowned night heron is a native, medium-sized heron. The species has been observed in the ditches and oxidation ponds at PMRF.
<i>Bubulcus ibis</i>	Cattle egret	Not available	The cattle egret is a small, white egret often found in pastures and roadsides. Cattle egrets are found on all grassy areas on PMRF.
<i>Pluvialis fulva</i>	Pacific golden plover	Kolea	Pacific golden plovers are commonly observed at PMRF between the months of August and April. These birds prefer well-tended grounds, such as lawns and other grassy areas, which allow them to find food more easily and to be on the look-out for predators.
<i>Pluvialis squatarola</i>	Black-bellied plover	Not available	The black-bellied plover is a large shorebird of coastal beaches. The species has been observed at the beach at PMRF. On its wintering grounds, it roosts in dense flocks but spreads out over sandy and muddy flats to forage as the tide recedes. Although generally a coastal bird, it also forages successfully
<i>Heteroscelus incanus</i>	Wandering tattler	Uili	The wandering tattler winters in the Hawaiian Islands. Adults arrive from July to August and juveniles from September to November. They have been observed at the beach at PMRF.
<i>Arenaria interpres</i>	Ruddy turnstone	Not available	The ruddy turnstone is a small, calico-colored shorebird that winters on the shorelines of the main Hawaiian Islands. While in Hawaii, they are almost exclusively coastal and forage mostly along stony or rocky shorelines with abundant seaweed and commonly on sandy shorelines and in mudflats and river deltas. They have been observed at the beach at PMRF.
<p>Key: BASH=Bird/Wildlife-Aircraft Strike Hazard, ESA=Endangered Species Act of 1973, KTF=Kauai Test Facility, MBTA=Migratory Bird Treaty Act, PMRF=Pacific Missile Range Facility, USFWS=United States Fish and Wildlife Service Source: HHFP 2010</p>			

APPENDIX E
NATIONAL HISTORIC PRESERVATION ACT
SECTION 106 CORRESPONDENCE

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX E NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CORRESPONDENCE.....	E-1
E.1 Marine Corps Base Hawaii Kaneohe Bay and Wheeler Army Airfield	E-1
E.2 Pacific Missile Range Facility.....	E-31

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E.1 Marine Corps Base Hawaii Kaneohe Bay and Wheeler Army Airfield

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEHOE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/140-13
November 4, 2013

CERTIFIED MAIL NO.: 7010 1870 0002 7901 2906

Mr. William Aila
State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

RE: Section 106 Review: Relocation of Marine Unmanned Aircraft System Squadron Three to Hawaii, aboard Marine Corps Base Hawaii Kaneohe Bay, District Ko'olaupoko, Ahupua'a of Kane'ohe, Oahu, Ahupua'a of Waimea, TMK 1-4-4-08:001 and aboard Wheeler Army Airfield, District of Wahiawa, Ahupu'a of Waianae Uka, TMK 1-7-7-01.

Dear Mr. Aila:

Marine Corps Base (MCB) Hawaii is consulting with your office in compliance with Section 106 of the National Historic Preservation Act regarding the proposed undertaking that includes relocating the existing Marine Unmanned Aircraft System Squadron Three (VMU-3) from Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California, to the State of Hawaii, and conducting training activities within existing training ranges in the region. This letter initiates our Section 106 consultation for this project.

Project Description

The purpose of relocating VMU-3 to Hawaii is to ensure that the III Marine Expeditionary Force (MEF) operational commander is supported by a balanced, geographically co-located Marine Air Ground Task Force (MAGTF) in Hawaii, in order to carry out legally-mandated responsibilities and maintain the highest state of readiness. Currently, III MEF is the only MEF in the USMC that lacks Group 3 unmanned aircraft systems (UAS) aerial reconnaissance capability. The proposed undertaking enhances III MEF's ability to sufficiently man, train, and equip Marines to meet any future crisis or conflict. Additionally, the proposed undertaking would allow III MEF units based in Hawaii to more completely train as they fight; as a single unit combining the four elements of a MAGTF: Command Element (CE), Ground Combat Element (GCE), Air Combat Element (ACE), and Logistics Combat Element (LCE).

Group 3 UAS (e.g., RQ-7B Shadow and RQ-21A Integrator unmanned aircraft) weigh an average of 400 pounds (the Integrator weighs under 150 pounds), with a 14-16-foot wingspan and a typical 100-pound payload (up to several hundred pounds possible) of sensors, and have a gross takeoff weight of between 56 and 1,320 pounds. They are catapult-launched, have a range of about 75 nautical miles, a normal operating altitude below 18,000 feet above mean sea level (MSL), and have a maximum airspeed of less than 250 Knots Indicated Air Speed (KIAS). The RQ-7 requires a short landing strip for recovery, whereas the RQ-21 utilizes a recovery system known as Skyhook, which uses a hook on the end of the wingtip to catch a line hanging from a 30 to 50-foot pole. Group 3 UAS are powered by small propeller engines.

5090
LE/140-13
November 4, 2013

The proposed undertaking includes the use of three RQ-7B systems and nine RQ-21A systems (12 RQ-7B and 45 RQ-21A unmanned aircraft), for a total of 57 unmanned aircraft. Regularly-scheduled squadron training (i.e. UAS flying) activities are proposed within controlled and/or special-use airspace at Wheeler Army Airfield (WAAF)/Makua Valley and, to a lesser and limited extent, at MCB Hawaii Kaneohe Bay. Less-frequent training evolutions (two to four times per year) are proposed at Pacific Missile Range Facility (PMRF) on Kauai and at Pohakuloa Training Area (PTA) on the island of Hawaii. Construction would be needed to support VMU-3 at MCB Hawaii and WAAF, Wahiawa, on the island of Oahu. No new facilities are proposed for PMRF or PTA.

Proposed Undertaking at MCB Hawaii

The proposed undertaking at MCB Hawaii includes relocating the personnel from VMU-3 into existing facilities on Mokapu Peninsula, including Hangar 102, and Buildings 191, 373, 4054, and Facility 5026 [Enclosures 1 to 4]. Some of these facilities will require renovations and modifications.

Hangar 102 is located south of First Street, between Hangars 101 and 103. Renovations to Hangar 102 include installation of an elevator, creation of a Sensitive Compartmented Information Facility (SCIF), upgrades to the communication infrastructure to support maintenance of the UAS, and possibly partitions within the currently defined office spaces.

An elevator is proposed for the eastern portion of Hangar 102. It is needed for contract employees and possibly a family readiness officer at the Hangar, which legally requires Americans with Disabilities Act (ADA) access to meet the needs of civilians with potential ADA access requirements. This eastern portion of the hangar was constructed immediately following the Japanese attack of 7 December 1941. Although the elevator would be located within the hangar, a portion of the elevator would penetrate the roof and the floor of the hangar. Preliminary drawings suggest that the penetration would be approximately 2 to 3 feet above the roof and about 6 feet below the ground [Enclosure 2], similar to the proposed elevator in Hangar 101 that underwent Section 106 consultation as part of the Programmatic Agreement for the Hawaii Basing of the MV-22 and H-1 aircraft.

In addition, a Sensitive Compartmented Information Facility (SCIF) would be installed on the ground floor of the hangar in existing street side (north) office space. A SCIF consists of a secure room or vault for holding sensitive material.

Upgrades to the communication infrastructure are also proposed in Hangar 102. The communication infrastructure includes the computer network system and will not affect the appearance of the hangar. The network system is currently in place and existing wiring and connections would be utilized. No new penetrations are anticipated for the upgrades.

The existing office spaces may be partitioned into smaller spaces or cubicles for privacy. These cubicles are removable if space requirements change.

5090
LE/140-13
November 4, 2013

Building 191 is located on the northeast side of Hangar 102 on the south side of First Street. Building 191, a 185 square foot stand-alone building, has been identified as a viable Aviation Gasoline (AVGAS) drum storage location. This facility provides an enclosed, vented and secured flammable storage building with cement flooring, and is conveniently located next to Hangar 102.

Building 373 is located east of B Street, between Third Street and Sixth Street. Building 373 would be used by VMU-3 as an Automotive Organizational Shop. Modifications to the interior of Building 373 would include renovations of office space, restrooms, and storage space. The existing vehicle wash-platform would be demolished and a new vehicle wash-platform would be constructed. The driveway and parking area on the south side of Building 373 would be slightly expanded, which consists of removing the existing asphalt, grading the area, and then repaving the driveway and parking area.

Facility 5026, located near the northeast (street) side of Hangar 102, consists of a poured concrete pad about 34 by 84 ft in size. VMU-3 would use the concrete pad as general storage. The western end of Facility 5026 has existing steel framing. The project proposes to provide roofing and sheathing for partial protection of equipment. The remainder of the concrete pad would be used as open storage.

Proposed Undertaking at Wheeler Army Airfield

The proposed undertaking at WAAF includes construction of a VMU-3 training detachment facility or erection of a pre-engineered maintenance facility and an associated parking area for 20 vehicles [Enclosures 5 to 8]. The training detachment facility would provide a working space for approximately 65 operators, maintainers and support personnel needed to support VMU-3 UAS detachment operations at WAAF, as well as space for storage of equipment. The structure would be 50 by 80 feet wide by 16 feet high (4,000 square feet). A parking area for 20 vehicles would be located adjacent to the storage facility. The parking area would be approximately 16,146 square feet. The new facility would employ basic design compatibility elements to blend in with the installation architecture. Design drawings will be submitted to your office for review and comment.

IDENTIFICATION OF HISTORIC PROPERTY

Mokapu Peninsula, MCB Hawaii

MCB Hawaii Background

MCB Hawaii is composed of eight installations under the jurisdiction of the Commanding Officer of MCB Hawaii, including MCB Hawaii Kaneohe Bay, located on Mokapu Peninsula in the district of Ko'olaupoko. MCB Hawaii Kaneohe Bay encompasses 2,951 acres on the windward side of Oahu.

Traditionally, life on Mokapu likely revolved around a cycle of agriculture and fishing. Initially people may have lived in all areas of the peninsula for short periods while collecting resources or tending fields. Archaeological evidence suggests that people lived on or came to Mokapu Peninsula for at least 500 to 800 years before Western Contact. By the 15th

5090
LE/140-13
November 4, 2013

or 16th century, the Hawaiians had constructed a complex of fishponds along the southern coast of the peninsula, which included Nu'upia Pond, Halekou Pond, and Kaluapuhi Pond. Nu'upia may have been divided into three sections called 'Ekahi, 'Elua, and 'Ekolu. Traditionally the production from fishponds was for the support of the ruling chiefs.

By the mid-19th century, the Catholic Church was established on the western side of the peninsula. It was dedicated to St. Catherine. However, by the second half of the century, the population on the peninsula had declined and the church closed. At this same time, much of the peninsula was included in the holdings for the Kaneohe Sugar Company, who leased it for cattle ranching. It became part of the Kaneohe Ranch in 1894. The cattle denuded much of the vegetation on the peninsula.

During the 1930s, the western side of Mokapu Peninsula was subdivided for development of summer homes in the area called 'Pali Kilo.' At this same time, the Army began development of Fort Kuwaaoho on the east side of the peninsula. During World War II the fort was renamed Fort Hase.

With the onset of World War II, the Hepburn Board recommended the peninsula for development of a seaplane base to support the Pearl Harbor Fleet. The installation was officially commissioned as Kaneohe Naval Air Station on 15 February 1941. By late 1941, there were about 150 facilities on the air station. The Japanese attack on 7 December 1941 focused on destroying the aircraft, which resulted in substantial damage to the hangars. Hangar 101, the five seaplane ramps, and the parking apron were designated as part of the National Historic Landmark in 1987 (National Historic Landmark Number 87001299) due to the direct impacts these facilities endured during the December 7th attack.

World War II was officially over on 2 September 1945 when the Japanese signed surrender documents on the USS *Missouri*. Three years after the war was over, Kaneohe Bay Naval Air Station was decommissioned and the Navy made the land available for lease.

As the Cold War began, the United States found itself involved in the ensuing Korean War. Since the lands formerly used by the Navy were available, the Marine Corps acquired the property and commissioned Marine Corps Air Station (MCAS) Kaneohe in 1952.

As part of a general effort by the U.S. military to reduce and streamline its existing forces after the Cold War ended in 1991, the Marine Corps in 1994 reorganized all of its installations and landholdings in Hawaii under a single command, Marine Corps Base (MCB) Hawaii, headquartered on Mokapu Peninsula.

As mentioned above, the proposed Action at MCB Hawaii includes relocating the personnel from VMU-3 into existing facilities on Mokapu Peninsula, including Hangar 102, and Buildings 191, 373, 4054, and Facility 5026.

Hangar 102 has been determined eligible for listing in the National Register of Historic Places (NRHP). The hangar was initially constructed in 1939 and was one quarter its current size. It was the first hangar constructed south of First Street. By 1941, Hangars 101 (on the east side of

5090
LE/140-13
November 4, 2013

Hangar 102), 103 and 104 (on the west side of Hangar 102) were either nearing completion or completed. The aircraft within these hangars (PBYS) were the focus of the Japanese attack on 7 December 1941. During the attack, the hangars were heavily damaged by enemy fire. Following the attack, the hangars were rebuilt. When they were rebuilt, the size of Hangar 102 was increased about four times its original size, to the same as the other hangars (240 feet wide, 372 feet long, and 51 feet high).

Hangar 102 now consists of a large, two-story, rectangular building with a low, sloping gabled roof. The hangar has tall, rectangular elements at each corner. During World War II, a steel shed roof addition was added to the north and south end of the hangar between the tall rectangular forms. The hangar walls are constructed of steel with corrugated siding. Originally the siding was cement asbestos; however, it has been replaced with steel siding that has a similar corrugation pattern. The low slope gable roof is constructed of steel trusses with metal roofing. Originally the hangar had two roof monitors to allow light into the large hangar space; however, these have been replaced by skylights. Large sliding doors are located on each side of the hangar. They are manually opened and closed. While many of the steel windows in the doors still exist, nearly all of them have been painted over or covered from the exterior. Historically, there was a continuous band of steel windows around the hangar; some of these original windows are still in place within the interior of Hangar 102.

Building 191 has been determined eligible for listing in the NRHP. It is located on the northeast side of Hangar 102. It was constructed in 1943 for flammable storage. It consists of a rectangular concrete structure on a concrete slab. It has a flat roof with a slight overhang and two steel vented doors. No modifications or renovations are necessary to Building 191.

Building 373 has been determined not eligible for listing in the NRHP. The proposed modifications for this building include demolition and reconstruction of the vehicle wash-platform. In addition, the parking area and driveway would be expanded and repaved. This area was previously graded during initial construction of the base when this building was built. During previous projects at Building 373 that included ground-disturbing activities, no archaeological sites or deposits were discovered. Thus, due to these former extensive construction activities, no archaeological sites or deposits are anticipated to be encountered during the proposed undertaking. It is probable, however, that sand fill is present within this area as dune sand was often used as padding for concrete foundations of buildings that were built in the decades during and immediately following WWII. Sand fill may contain NAGPRA cultural items.

Facility 5026 was constructed in 2003 as a concrete pad with utilities and is not eligible for listing in the NRHP. The roofing and sheathing will be attached to existing framing and could be removed. No other alterations are necessary at Facility 5026.

Wheeler Army Airfield

WAAF Background

WAAF is part of the United States Army Garrison - Hawaii (USAG-HI) located in the district of Wahiawa on the island of O'ahu. It encompasses

5090
LE/140-13
November 4, 2013

1,369.9 acres adjacent to Schofield Barracks. WAAF is a United States Army post.

Traditionally Wahiawa is believed to have had a sizable population (Handy and Handy (1972:465). This is based on the numerous agricultural terraces in the area. In the 1800s, Wahiawa became one of the prime sources of sandalwood that Kamehameha was harvesting for trade. Archaeological surveys around the proposed action at WAAF did not uncover evidence of archaeological sites or deposits (Tomonari-Tuggle 1994; McElroy 2009). This area was previously disturbed during construction activities. The closest traditional Hawaiian archaeological site consists of the displaced remains of a boundary marker/heiau with the name Maunauna. This site, designated as Site 07-6759, is about 750 m away. A remnant portion of the OR&L railroad, listed as Site 08-6872 is also nearby. This project will not be affecting the remnants of the railway.

Initial clearing of a flying field was begun in 1922 by a detachment of 20 enlisted men from Luke Field, Ford Island. They erected two canvas hangers and began construction of housing. The installation was constructed in a Garden City type pattern with loops and ample green spaces to provide a pleasing appearance. The field was named Wheeler Field on 11 November 1922 in honor of Major Sheldon H. Wheeler, former commander of Luke Field, who died in a crash in 1921. Wheeler Field was the site of several major historic aviation events, including the first nonstop Mainland to Hawaii flight in 1927, the first trans-Pacific flight from the US to Austria in 1928, and the first Hawaii to Mainland solo flight in 1935 by Amelia Earhart. On 7 December 1941, Wheeler Army Airfield was one of the primary targets of the Japanese. Most of the planes on the ground were destroyed. Twelve pilots were able to get their P-36 Hawk and P-40 Warhawk aircraft in the air and engaged in enemy dogfights. On 28 May 1987, the National Park Service designated Wheeler Field as a National Historic Landmark (NHL). The NHL nomination form focuses on the associations of Wheeler Field with pioneering aviation events and with the events of 7 December 1941. The NHL includes the hangars, adjacent ramps, and a few other buildings that survived the Japanese attack. The proposed VMU-3 training detachment facility is not located within the NHL.

In 2010, the Army Garrison formally incorporated the housing areas and other administrative buildings that exemplify the use of leading concepts of urban design in the 1930s and a distinctive style to Army buildings known as "Garden City." The Army received concurrence from the Hawaii State Historic Preservation Division that the additional district area is eligible for listing in the National Register of Historic Places.

The proposed VMU-3 training detachment facility is about 500 m from the NHL. The eligible district area is located on the far side of the NHL. The small size of the proposed facility and the distance from the NHL and proposed district area indicates that the proposed facility will be visually unobtrusive.

AREA OF POTENTIAL EFFECT

The area of potential effect (APE) for the relocation of VMU-3 to Hawaii at MCB Hawaii has been determined to include the footprint of the proposed undertakings (described above) for the VMU-3 relocation in Hawaii as well as

5090
LE/140-13
November 4, 2013

the flight training areas, which would be limited to the controlled airspace within the training ranges.

DETERMINATION OF AFFECT

MCB Hawaii has determined that, pursuant to the Section 106 Implementing Regulations at 36 CFR 800.5(d)(2), the proposed undertaking would result in an adverse effect to historic properties. The proposed undertaking, as shown above, includes a variety of projects proposed for different properties on different installations. Therefore, in addition to the aforementioned adverse effect determination, MCB Hawaii has also considered the effects of the individual proposed projects upon relevant historic properties per installation. Specifically, the relocation of VMU-3 to Hawaii would result in the following:

- an adverse effect to Hangar 102 (MCB Hawaii),
- no adverse effect to Building 191 (MCB Hawaii), in accordance with the Section 106 Implementing Regulations at 36 CFR 800.5(b),
- no historic properties affected in the vicinity of Buildings 373 and 5026 (MCB Hawaii), in accordance with the Section 106 Implementing Regulations at 36 CFR 800.4(d)(1),
- and no historic properties affected at Wheeler Army Airfield, also in accordance with the Section 106 Implementing Regulations at 36 CFR 800.4(d)(1).

Renovations to Hangar 102 include installation of an elevator. The elevator would likely penetrate the roof, which would adversely affect the building. Renovations to the office spaces and installation of the SCIF and upgrades to the communication structure would follow the Secretary of Interior's Standards and not adversely affect the hangar. Archaeological monitoring would occur during all ground-disturbing activities associated with installation of the elevator.

There would be no adverse effect to Building 191. This structure would be used for fuel storage without modifications or renovations. It was originally constructed in 1943 as oxygen storage and as such would provide an excellent storage space.

As stated above, Buildings 373 and 5026 are not eligible for NRHP listing and thus by definition are not historic properties. Archaeological monitoring would occur during all ground-disturbing activities associated with Building 373, since there is the possibility of finding NAGPRA cultural items in the sand fill material located around and below Building 373. Thus, the ground-disturbing activities associated with Building 373 would result in no historic properties affected. No ground disturbance would occur associated with the interior alterations of Building 5026.

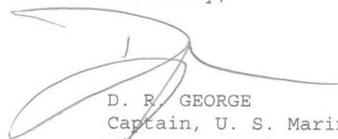
No historic properties would be affected at WAAF. The proposed undertaking is located about 500 m from the NHL and, due to the small size of the proposed facility, it will be visually unobtrusive. In addition, this

5090
LE/140-13
November 4, 2013

area was previously disturbed and no archaeological sites or deposits are anticipated (Tomonari-Tuggle 1994; McElroy 2009).

We request your review of and concurrence in our determinations of effect and the APE stated above within 30 days of receipt of this letter. MCB Hawaii is simultaneously consulting with other consulting parties, including Native Hawaiian organizations (NHO) [Enclosure 10], in accordance with the Section 106 Implementing Regulations at 36 CFR 800.6(a), and we are notifying the Advisory Council on Historic Preservation (hereinafter Council) of our adverse effect determination in order to determine Council participation in this consultation pursuant to the Section 106 Implementing Regulations at 36 CFR 800.6(a)(1). Finally, in accordance with the Section 106 Implementing Regulations at 36 CFR 800.6(b) and (c), MCB Hawaii wishes to develop a Memorandum of Agreement with your office and the aforementioned consulting parties that would document ways to avoid, minimize, and mitigate the adverse effects described above. The initial meeting with all consulting parties will be held on 20 November 2013 at the Environmental Department at 9:00 am to begin the dialogue regarding the proposed undertaking, the effect determinations, and ways to mitigate adverse effects. If you would like to attend, please contact the MCB Hawaii Cultural Resources Management (CRM) staff to access the base or receive call-in information. If you know of others that would be interested in participating, please have them contact the MCB Hawaii CRMs in writing. Should you or your staff have any questions or concerns please contact the MCB Hawaii CRM staff, Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil or Coral Rasmussen at 257-7134 or via email at coral.rasmussen@usmc.mil.

Sincerely,



D. R. GEORGE
Captain, U. S. Marine Corps
Director, Environmental Compliance and
Protection Department
By direction of the Commanding Officer

5090
LE/140-13
November 4, 2013

Enclosures:

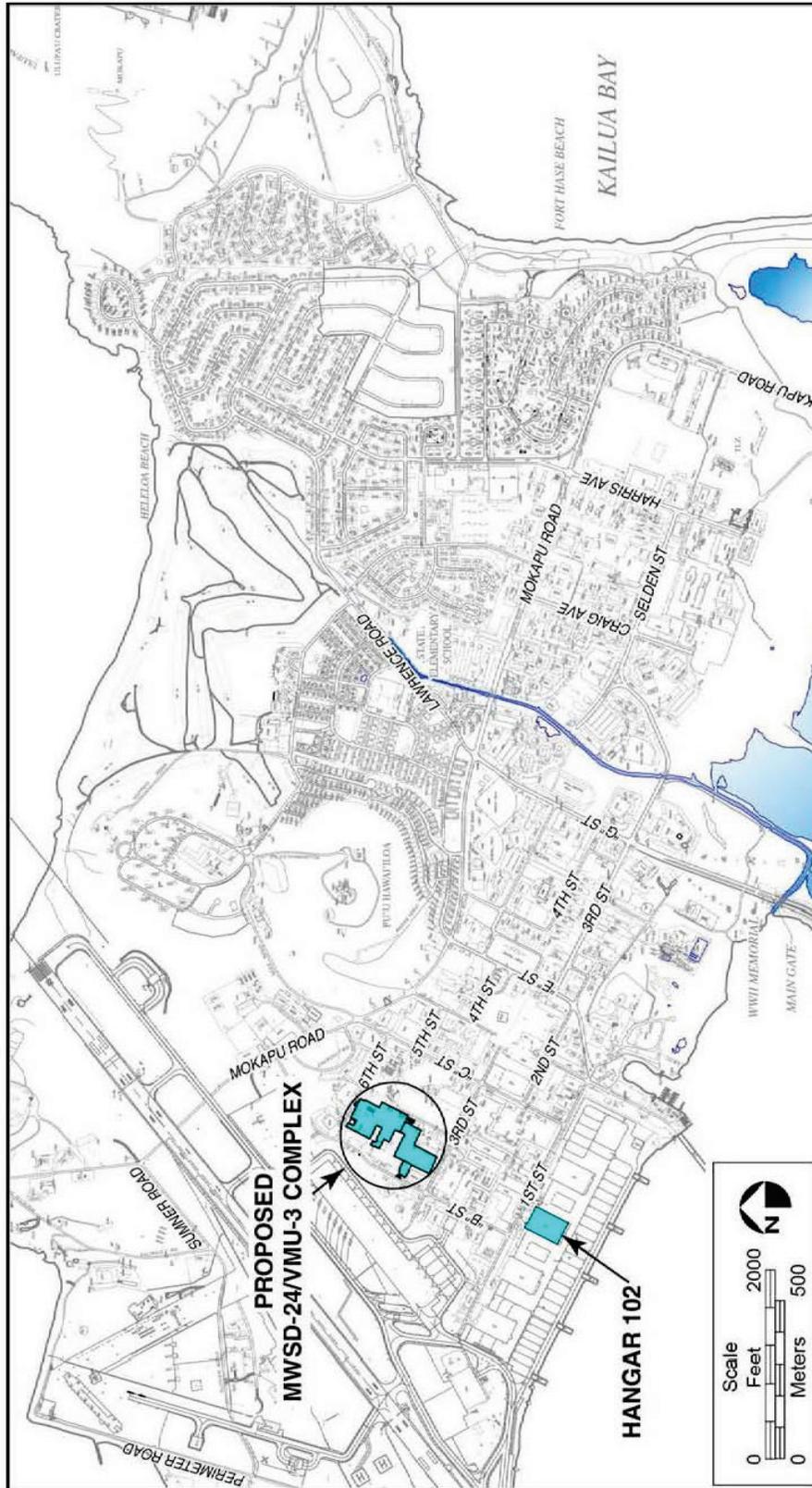
- (1) Proposed construction areas for Alternatives 1 and 2 aboard MCB Hawaii.
- (2) Elevations of Hangar 102 showing proposed elevator that would penetrate the roof.
- (3) Location of Facility 373 and existing parking area proposed for expansion aboard MCB Hawaii.
- (4) Location of Facility 373 and parking area proposed for expansion aboard MCB Hawaii.
- (5) Location of proposed VMU-3 training detachment facility aboard Wheeler Army Airfield.
- (6) Aerial view of Wheeler Army Airfield showing the proposed site for the VMU-3 training detachment facility.
- (7) Proposed Maintenance Facility layout;
- (8) Location of historic bomb craters and battle damage at Wheeler Army Airfield. This area forms part of the NHL and is not located near the proposed VMU-3 training detachment facility.
- (9) Wheeler Army Airfield Historic District, incorporating the National Historic Landmark and the National Register eligible district.
- (10) List of Consulting Parties.

References:

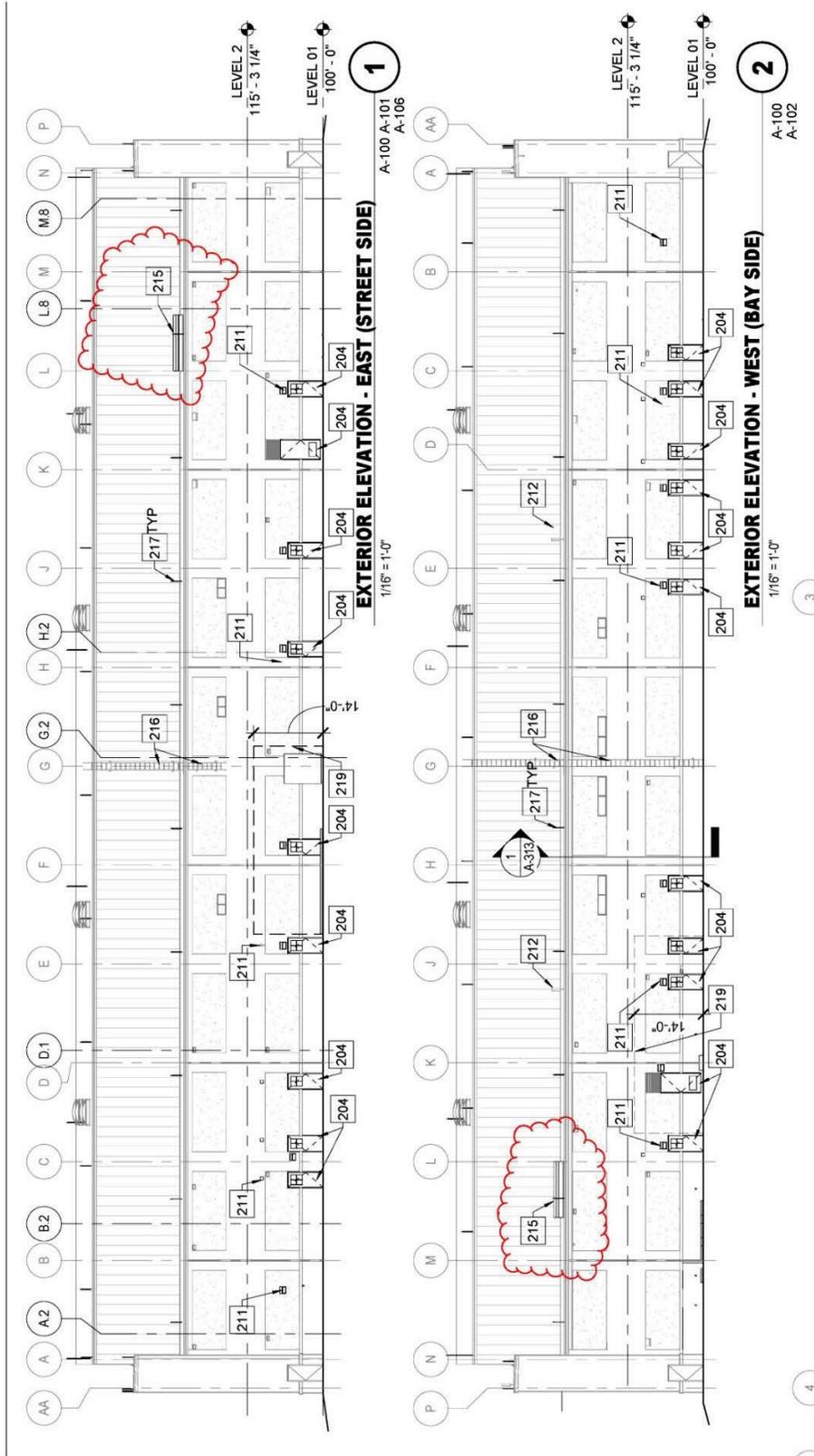
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- Environmental Compliance and Protection Department Marine Corps Base Hawaii
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2005 *Archaeological Monitoring of Cart Path Improvements Within Mōkapu Burial Area and Sand Dune Deposits Associated with the Klipper Golf Course, MCBH Kaneohe Bay, Island of O'ahu, Hawai'i*. Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawai'i. Pacific Consulting Services, Inc., Honolulu.

5090
LE/140-13
November 4, 2013

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2010 *Archaeological Survey and Testing at Former Marine Aircraft Control Squadron (MACS) II Facility, Marine Corps Base Hawaii, Kaneohe Bay, O'ahu, Hawai'i.* Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific. International Archaeological Research Institute Inc., Honolulu.
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1996 *Archaeological Monitoring and Data Recovery for Negation of Adverse Effect of KB-038M, Replace Potable Water Mains, and Site 50-80-11-4933, Marine Corps Base Hawaii.* Prepared for Department of the Navy, Pacific Division, Pearl Harbor, Hawaii. Ogden Environmental and Energy Services Co., Inc., Honolulu.
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Enclosure 1. Proposed construction areas for Alternatives 1 and 2 aboard MCB Hawaii.



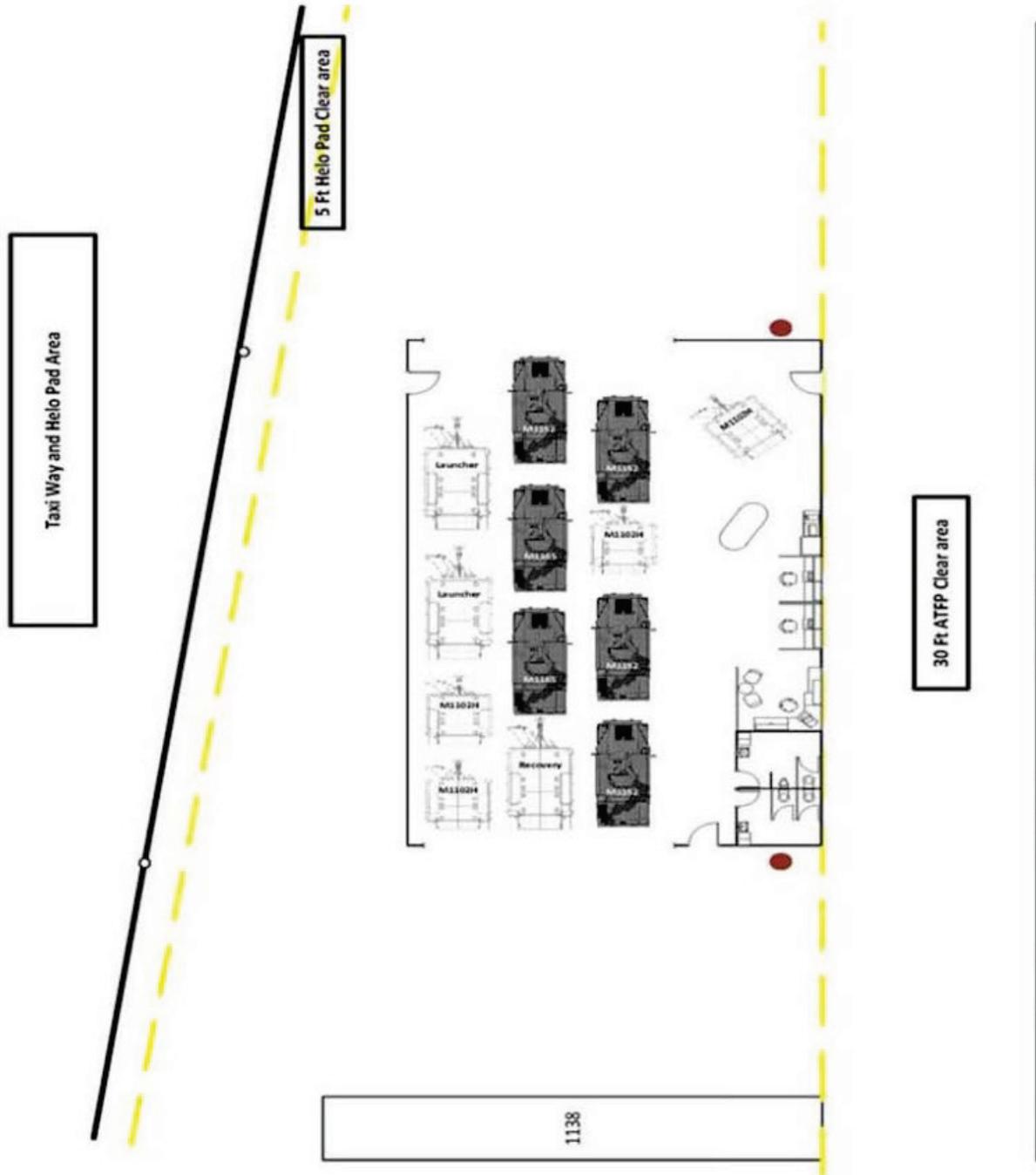
Enclosure 2. Elevations of Hangar 102 showing proposed elevator that would penetrate the roof.



Enclosure 5. Location of proposed VMU-3 training detachment facility aboard Wheeler Army Airfield.



Enclosure 6. Aerial view of Wheeler Army Airfield showing the proposed site for the VMU-3 training detachment facility.





**WWII Bomb Craters and Battle Damage
WAAF, Oahu**

Scale 1:3,500
Projection: UTM
Zone: 4 North
Datum: NAD 83
2005 Aerial Photo



Enclosure 8. Location of historic bomb craters and battle damage at Wheeler Army Airfield. This area forms part of the NHL and is not located near the proposed VMU-3 training detachment facility.



Enclosure 9. Wheeler Army Airfield Historic District, incorporating the National Historic Landmark and the National Register eligible district confirmed by the State Historic Preservation Division (courtesy of USAG-HI). Note the location of the proposed VMU-3 facility.

Enclosure 10
Consulting Parties

Copy to:

Mr. John Fowler; Advisory Council on Historic Preservation
Ms. Kauli Maukele; Aloha First
Ms. Cari Kreshak, National Park Service
Ms. Elaine Jackson-Retondo, National Park Service
Ms. Ah Lan Diamond; Diamond 'Ohana
Ms. Nalani Olds; Olds 'Ohana
Ms. Donna Ann Camvel; Paoa Kea Lono 'Ohana
Dr. Kamana'opono Crabbe; Office of Hawaiian Affairs
Ms. Kuulei Laughlin; Hawaiian Civic Club of Waimanalo
Ms. Kiersten Faulkner; Historic Hawaii Foundation
Mr. Edward Ayau; Hui Malama I Na Kupuna O Hawai'i Nei
Mr. Charles Maxwell Sr.; Hui Malama I Na Kupuna O Hawai'i Nei
Mr. Eric Enos' Ka'ala Farms Cultural Education Center
Mr. Henry Hopfe; Kahu Kahakai, Ko'a Mana
Mr. Glen Kila; Kahu Kahakai, Ko'a Mana
Mr. Clarence DeLude; Kahu Kulāiwi, Ko'a Mana
Mr. Alike Poe Silva; Kahu Kulāiwi, Ko'a Mana
Ms. Nau Kamalii; Boyd 'Ohana
Ms. Terrilee Napua Kekoolani Raymond; Kekoolani 'Ohana
Mr. Cy Harris; Kekumano 'Ohana
Ms. Emalia Keohokalole, Keohokalole 'Ohana
Ms. Terrilee Napua Kekoolani Raymond; Kekoolani 'Ohana
Mr. Fred Dodge; Malama Mauka
Mr. Sparky Rodrigues; Malama Makua
Ms. Leandra Wai; Malama Mauka
Ms. Cathleen Mattoon; Koolauloa Hawaiian Civic Club
Ms. Keona Mark
Ms. Clara Sweets Matthews; Ka Lahui Hawaii
Ms. Elaine Jackson-Retondo; National Park Service
Ms. Mahealani Cypher; O'ahu Council Hawaiian Civic Clubs
Chair; Oahu Island Burial Council
Dr. Kamanaopono Crabbe; Office of Hawaiian Affairs
Ms. Delilah Ortiz; Ortiz 'Ohana
Mr. Richard Papa
Ms. Ella Paguyo; Paguyo 'Ohana
Ms. Kaleo Paik
Ms. Regina Makai; Pu'uhonua O Waimanalo Neighborhood Board
Mrs. Leimaile Quitevis
Ms. Chasmin Sokoloski; Prince Kuhio Hawaiian CC
Ms. Keahaulani Souza
Mr. Clive Cabral; Temple of Lono
Ms. Kelley L. Uyeoka
Mr. Tom Lenchanko; Wah 'Olelo'Aha Kukaniloko
Mr. Rocky Naeoloe; Waianae Military Civilian Advisory Council
Mr. Wilson Kekoa Ho; Waimanalo Neighborhood Board
Mr. Harry Wasson



Preserving America's Heritage

November 26, 2013

Captain D. R. George
Director, Environmental Compliance and Protection
Department
U.S. Marine Corps
Marine Corps Base Hawaii
Box 63002
Kaneohe Bay, HI 96863-3002

**Ref: *Proposed Relocation of Marine Unmanned Aircraft System Squadron Three to Hawaii
MCB HI Kaneohe Bay, Hawaii***

Dear Captain George:

On November 18, 2013, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the adverse effects of the referenced undertaking on properties listed on and eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800) does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or another party, we may reconsider this decision. Additionally, should circumstances change, and you determine that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR 800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Hawaii State Historic Preservation Officer (SHPO) and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the Agreement and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with your notification of adverse effect. If you have any questions or require further assistance, please contact Kelly Fanizzo at 202-606-8507, or via email at kfanizzo@achp.gov.

Sincerely,

Raymond V. Wallace
Historic Preservation Technician
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUIHHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

WILLIAM J. AHLA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCES MANAGEMENT

ESTHER KIA'A'INA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOARD AND BOAT ADMINISTRATION
DIRECTOR OF CORAL REEF
COMMISSIONER OF WATER RESOURCE MANAGEMENT
TERRESTRIAL AND COASTAL LANDS
COMMISSIONER OF WATER RESOURCES DEVELOPMENT
DIRECTOR
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSIONER
LAND
STATE PARKS

DATE: December 20, 2013 **LOG:** 2013.6302
DOC: 1312MB16

TO: D.R. George
Captain, U.S. Marine Corps
Director, Environmental Compliance and Protection Department
Box 63002
Kaneohe Bay, Hawaii 96863-3002

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Consultation**
Project: Installation of Unmanned Aircraft System Squadron 3 to Hawaii
Owner Name: U.S Marine Corps
Address: MCB Kaneohe Bay and Wheeler Army Airfield
Tax Map Key: (1) 4-4-08:011, (1) 7-7-01

Date Received by SHPD: November 8, 2013

Description of Project/Undertaking: Proposed project consists of the relocation of the Marine Unmanned Aircraft System Squadron Three to Hawaii. Alterations at Kaneohe MCB include installation of elevator, information facility, communication infrastructure upgrade, and installation of partitions at Hangar 102; use of Building 191 as gasoline storage; and a demolition and grading for a new carwash platform at Building 373. A new structure and associated parking will be constructed at Wheeler Army Airfield.

Area of Potential Effect (APE): Parcels

Eligibility: Hangar 102 and Buildings 191 and 373 have been identified as potentially eligible for the National Register of Historic Places.

Documentation Received: Correspondence from the US Marine Corps dated November 4, 2013.

SHPD Determination: SHPD concurs with the determination of *No Adverse Effect* for Buildings 191 and 373 with the understanding that an archaeological monitor will be present during all ground disturbing activity in the vicinity of Building 373. Furthermore SHPD concurs with the determination of *Adverse Effect* for the proposed work in Hangar 102 with the understanding that the US Marine Corps will develop a Memorandum of Understanding with the relevant consulting parties to address appropriate mitigation which should include documentation such as Historic American Building Survey.

Any questions should be addressed to Megan Borthwick, SHPD Architectural Historian at Anna.M.Borthwick@hawaii.gov

Mahalo for the opportunity to comment.

Angie Westfall
Architecture Branch Chief, Hawaii Historic Preservation Division

MCON Project P-861

DECEMBER 2013

**MEMORANDUM OF AGREEMENT (MOA)
BETWEEN
MARINE CORPS BASE (MCB) HAWAII,
AND THE
HAWAII STATE HISTORIC PRESERVATION OFFICER (SHPO)
REGARDING
THE RESOLUTION OF ADVERSE EFFECTS TO HANGAR 102,
MARINE CORPS BASE HAWAII**

WHEREAS, Marine Corps Base (MCB) Hawaii proposes to install a two-stop passenger/freight combination elevator inside Hangar 102 (hereafter referred to as the "Undertaking"); and

WHEREAS, Hangar 102 was determined eligible for listing in the National Register of Historic Places (NRHP) on 29 April 2011 and is a contributing structure to the NRHP-eligible World War II Resources of US Naval Air Station Kaneohe Bay Aviation District; and

WHEREAS, MCB Hawaii, in consultation with the Hawaii State Historic Preservation Officer (SHPO), has established the Undertaking's area of potential effects (APE), defined at 36 CFR § 800.16(d) as Hangar 102 and the immediately adjacent area which defines the viewshed; and

WHEREAS, MCB Hawaii has consulted with the Hawaii SHPO in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470 (NHPA), its implementing regulations (36 CFR Part 800.6(b)(1)) to determine that the proposed Undertaking will have an adverse effect on Hangar 102; and

WHEREAS, MCB Hawaii has contacted the Advisory Council on Historic Preservation (the Council) concerning the proposed undertaking and the Council declined participation on 26 November 2013. An executed copy of this agreement will be filed with the Council pursuant to 36 C.F.R. § 800.6(b)(1)(iv);

WHEREAS, MCB Hawaii has contacted Historic Hawaii Foundation (HHF) concerning the proposed undertaking and HHF declined to participate in the consultation on 20 November 2013.

WHEREAS, Native Hawaiian Organizations (NHOs) affiliated with Mokapu Peninsula (location of MCB Hawaii Kaneohe Bay) were consulted for the proposed undertaking and MCB Hawaii received no responses to the proposed undertaking.

WHEREAS, there are no archaeological resources eligible for the National Register of Historic Places within the APE; and

WHEREAS, MCB Hawaii has consulted with the Hawaii State Historic Preservation Officer (SHPO) to resolve the adverse effects on historic properties; and

NOW THEREFORE: MCB Hawaii and the Hawaii SHPO agree that, upon filing of this Agreement with the Council, and upon MCB Hawaii's decision to proceed with the Undertaking, MCB Hawaii shall ensure that the

MCON Project P-861

DECEMBER 2013

following stipulations are carried out in order to take into account the effects of this Undertaking on historic properties.

STIPULATIONS

MCB Hawaii shall ensure that the following stipulations are implemented as part of the Undertaking:

I. DOCUMENTATION

Prior to any construction and/or demolition, HABS photo documentation shall be conducted. The level of HABS will be determined by the National Park Service (NPS). The HABS report shall be carried out by or under the direction of an architectural historian or historical architect who meets the professional qualifications for Architectural Historian or Historical Architect under the Secretary of the Interior's Historic Preservation Professional Qualification Standards (Federal Register Vol. 62, No. 119, pp. 33713-33714, 33719, 1997). HABS documentation shall include:

- A. Current (high resolution-digital) photographs of the principal exterior views of the property; and key interior view of extant features map;
- B. Location map;
- C. Information on the date of construction and functions of the property;
- D. Written contextual history of the hangars; and
- E. Original plans that depict the hangar features and function.

II. DESIGN GUIDELINES

A. The new elevator in Hangar 102 shall be designed and executed in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for preserving, rehabilitating, restoring and reconstructing historic buildings.

1) Character defining features of Hangar 102 that will be altered include:

- a. Penetration of the low slope gable roof by the elevator; and
- b. Penetration of the concrete floor by the elevator shaft; and
- c. Insertion of the elevator into the large interior open space at the southeast side of the hangar.

2) Character defining features of Hangar 102 that will not be altered include:

MCON Project P-861

DECEMBER 2013

- a. Corrugated metal siding; and
- b. Large sliding hangar doors; and
- c. Tall rectangular form at each corner of the hangar; and
- d. Historic door openings and pipe railing along mezzanine; and
- e. Exposed steel truss framing on the interior.

B. PROJECT EXECUTION

1. The NPS will review and comment on a 95% non-archival submittal of the HABS prior to submitting 100% documentation.
2. No physical alteration of Hangar 102 will take place prior to the acceptance of 100% HABS documentation by the NPS.
3. The terms of this MOA will expire within 10 years if the project is not executed.

III. RESOLVING OBJECTIONS

- A. Should a Signatory or Concurring Party to this MOA object in writing to MCB Hawaii regarding how the proposed Undertaking is carried out or the manner in which the terms of this MOA are carried out, MCB Hawaii shall consult with the objecting party to resolve the objection. If MCB Hawaii determines that the objection cannot be resolved, MCB Hawaii shall forward all documentation relevant to the dispute to the ACHP, including MCB Hawaii's proposed response to the objection. Within forty-five (45) days after receipt of all pertinent documentation, the ACHP will:
 1. Advise MCB Hawaii that it concurs with MCB Hawaii's proposed response, whereupon MCB Hawaii shall respond to the objection accordingly; or
 2. Provide MCB Hawaii with recommendations pursuant to 36 CFR § 800.2(b)(2), which MCB Hawaii shall take into account in reaching a final decision regarding the dispute; or
 3. Notify MCB Hawaii that it shall comment pursuant to 36 CFR § 800.7(c) and proceed to comment on the subject in dispute.
- B. Should the ACHP not exercise one of the above options within forty-five (45) days after receipt of all pertinent documentation, MCB Hawaii may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, MCB Hawaii shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the

MCON Project P-861

DECEMBER 2013

MOA, and provide them and the ACHP with a copy of such written response.

- C. MCB Hawaii's responsibility to carry out all actions under this MOA that are not the subject of the objection shall remain unchanged.

IV. AMENDMENTS AND TERMINATION

Only the Signatories (SHPO and MCB Hawaii) may propose to amend or terminate this MOA. Upon a proposal to amend this MOA, MCB Hawaii shall initiate consultation to consider such an amendment. This MOA may be amended when such an amendment is agreed to in writing by all Signatories. The amendment shall be effective on the date that a copy signed by all of the Signatories is filed with the ACHP.

If any Signatory to this MOA determines that its terms will not, or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment. If within thirty (30) days an amendment cannot be reached, any Signatory may terminate the MOA upon written notification to the other Signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, MCB Hawaii must either (a) execute a new MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. MCB Hawaii shall notify the Signatories as to the course of action it will pursue.

V. DURATION

This MOA shall terminate at the completion of the Undertaking or when all the Mitigation Measures listed in Stipulation I are completed (whichever occurs first); or if terminated pursuant to Stipulation IV. MCB Hawaii shall provide written updates to signatories and concurring parties every two years until the MOA has expired or has been terminated.

VI. ANTI-DEFICIENCY

The MCB Hawaii's obligations under this MOA are subject to the availability of appropriated funds, and the stipulations of this MOA are subject to the provisions of the Anti-Deficiency Act. MCB Hawaii shall make reasonable and good faith efforts to secure the necessary funds to implement this MOA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the MCB Hawaii's ability to implement the stipulations of this agreement, MCB Hawaii shall consult in accordance with the amendment and terminations procedures found at Stipulations IV of this MOA.

Execution of this MOA by MCB Hawaii and the SHPO and implementation of its terms evidence that MCB Hawaii has afforded the ACHP an opportunity to comment and taken into account the effects of this Undertaking on historic properties.

MCON Project P-861

DECEMBER 2013

SIGNATORIES:

MARINE CORPS BASE HAWAII, KANEOHE

Brian Annichiarico, Colonel, United States Marine Corps
COMMANDING OFFICER, MCB HAWAII

By: 

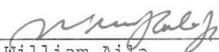
Date: 12-17-2013

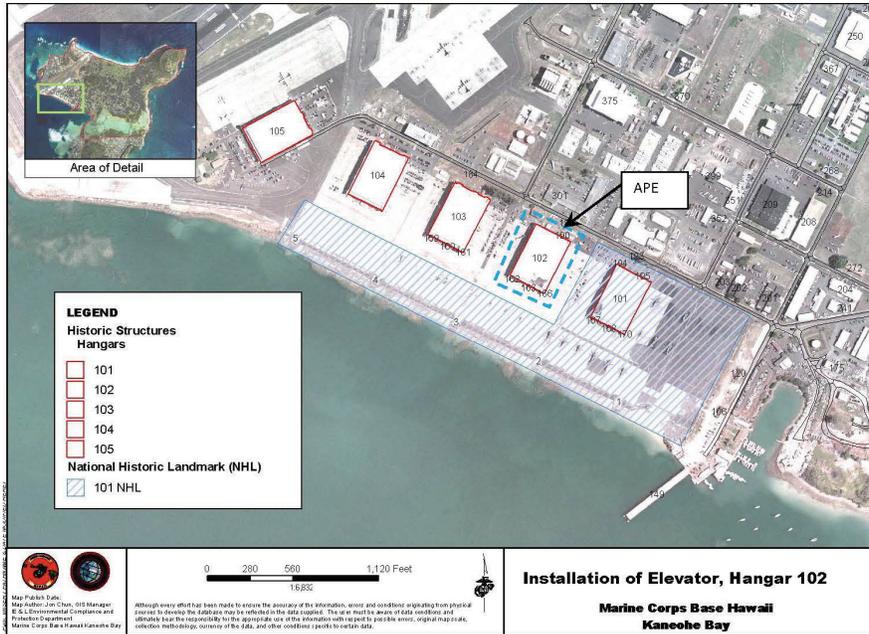
MCON Project P-861

DECEMBER 2013

STATE HISTORIC PRESERVATION OFFICER

William Aila
HAWAII STATE HISTORIC PRESERVATION OFFICER

By:  Date: 1/27/14
William Aila
Chairman, Department of Land and Natural Resources



Enclosure 1. Location of Hangar 102, showing Area of Potential Effect.

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E.2 Pacific Missile Range Facility

PROGRAMMATIC AGREEMENT RECORD

DATE: September 11, 2013
 PROJECT TITLE: VMU UAS
 PROJECT LOCATION: PMRF
 REVIEWED BY: Dr. Eric West
 ACTIVITY/CODE: NAVFAC PAC, EV23
 TELEPHONE: 472-1415



PROJECT DESCRIPTION:

This project proposes to relocate the existing VMU squadron (VMU-3) from Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California, to the state of Hawaii, and to conduct training activities within existing training ranges in the region, including the Pacific Missile Range Facility (PMRF). The III Marine Expeditionary Force (MEF) is the only MEF in the USMC that lacks Group 3 unmanned aircraft systems (UAS) aerial reconnaissance capability. Group 3 UAS (e.g., RQ-7B Shadow and RQ-21A Integrator unmanned aircraft) weigh an average of 400 pounds (the Integrator weighs under 150 pounds), with a 14-16-foot wingspan and a typical 100-pound payload (up to several hundred pounds possible) of sensors, and have a gross takeoff weight of between 56 and 1,320 pounds. They are catapult-launched, have a range of about 75 nautical miles, a normal operating altitude below 18,000 feet above mean sea level (MSL), and have a maximum airspeed of less than 250 Knots Indicated Air Speed (KIAS). Group 3 UAS are powered by small propeller engines. The proposed action includes the use of three RQ-7B systems and nine RQ-21A systems (12 RQ-7B and 45 RQ-21A unmanned aircraft), for a total of 57 unmanned aircraft. Construction will be needed to support the VMU-3 at PMRF, and the Area of Potential Effect (APE) consists of a minimum 50 by 710-foot section of the runway shoulder through paving or use of matting and installing approximately 36 permanent holes for anchoring the RQ-7B arresting gear components used during UAS recovery (landing). Enclosures 1 and 2 show the APE.

ARCHAEOLOGICAL MANAGEMENT AREAS:

Area:	<input type="text" value="Low"/>	Any National Register [eligible] sites present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A
		Will this Undertaking affect this site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DETERMINATION

According to the Integrated Cultural Resources Management Plan (ICRMP 2012), the Area of Potential Effect (APE) for this proposed action is located within a low sensitivity area for encountering archaeological sites and/or deposits (Enclosure 3.). This area was previously disturbed during initial development of the airfield and no archaeological sites or deposits are located in this area. Enclosure 4 shows the runway construction. Considering the information presented on this form, pursuant to the Standard Operating Procedures detailed in the 2012 PMRF ICRMP, and as stipulated in the PA among the Commander Navy Region Hawaii, The Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy undertakings in Hawaii (as amended 2012), the proposed undertaking does not require further Section 106 review under the National Historic Preservation Act. This memorandum is to be retained as administrative record of this finding.

[Check all that apply.]

Stipulation IX(A)(1)
The undertaking does not have the potential to cause effects to listed, contributing, or eligible historic properties (specifically archaeological sites/objects/traditional cultural places) as noted above.

Stipulation IX(A)(2)
The undertaking is listed in Appendix A.

I.B.3: Ground disturbing activities that occur outside archaeologically sensitive areas indicated on ICRMP maps.

PROGRAMMATIC AGREEMENT RECORD

REVIEWER SIGNATURE:

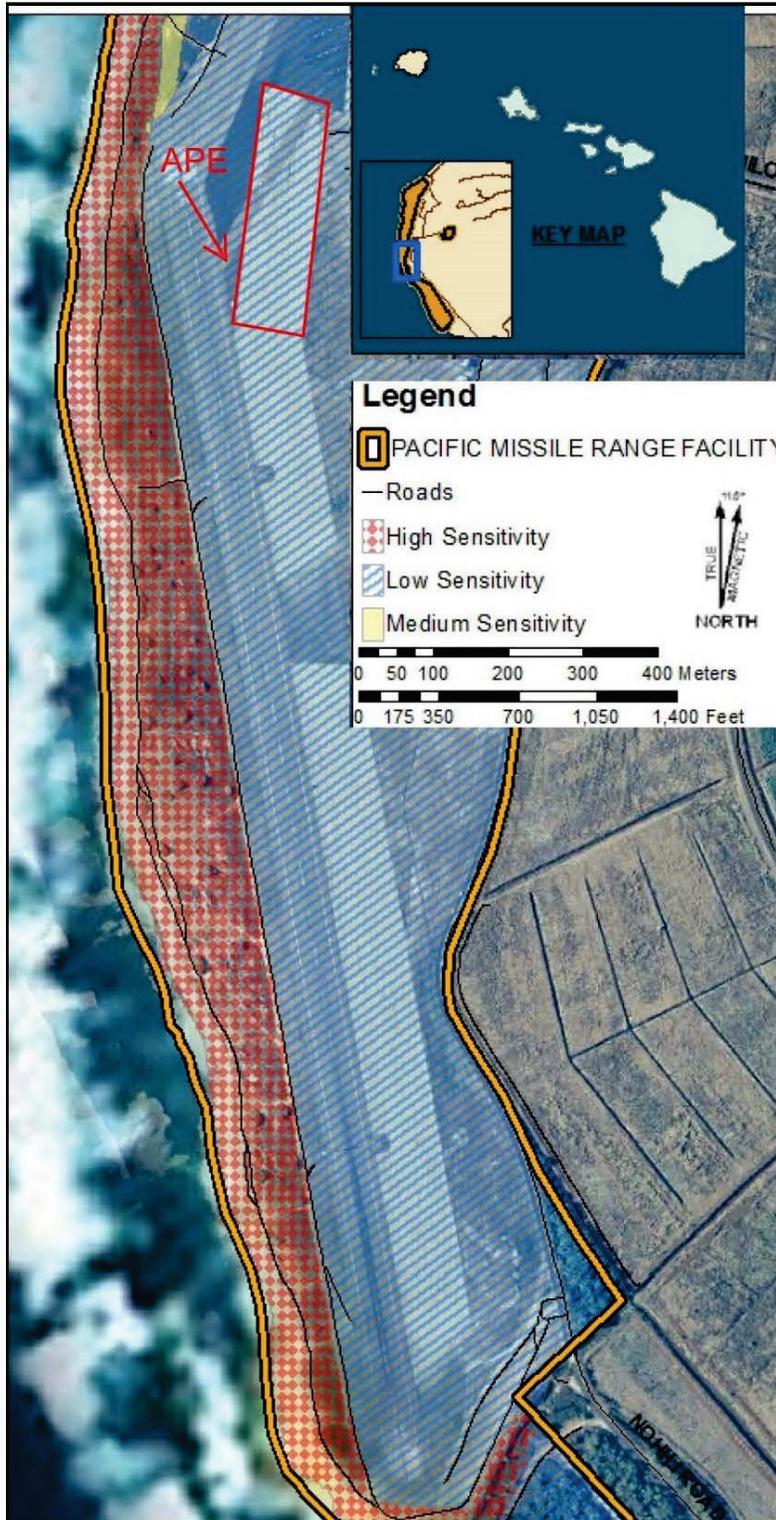
ERIC W. WEST, Ph.D.
Supervisory Archaeologist, NAVFAC Pacific



Enclosure 1. Proposed runway improvements at Pacific Missile Range Facility, indicated as launch area.



Enclosure 2. Detail of PMRF Runway shoulder proposed for improvements.



Enclosure 3. PMRF Barking Sands Sensitivity Areas.



Enclosure 4. Construction of initial runway, circa 1942 (Photograph courtesy Rick Rogers, archivist, Hawaiian Airlines and Kauai Historical Society).

APPENDIX F
NAVY/MARINE CORPS *DE MINIMIS* ACTIVITIES UNDER CZMA

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX F NAVY/MARINE CORPS <i>DE MINIMIS</i> ACTIVITIES UNDER CZMA.....	F-1

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DEPARTMENT OF THE NAVY

COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR, HAWAII 96860-51015090
Ser N4/ 04163
01 JUN 2009

CERTIFIED MAIL NO. 7007 2560 0002 0326 9580

Mr. Abbey Mayer
Office of Planning
Department of Business, Economic
Development and Tourism
P. O. Box 2359
Honolulu HI 96804

Dear Mr. Mayer:

SUBJECT: REQUEST FOR CONCURRENCE WITH MODIFICATIONS TO THE DEPARTMENT
OF THE NAVY DE MINIMIS ACTIVITIES UNDER THE COASTAL ZONE
MANAGEMENT ACT (CZMA)

This letter is to request your concurrence with the attached list of Navy/Marine Corps de minimis activities under the CZMA. The attached de minimis list will amend the current de minimis list which was established on April 2, 2007. The new de minimis list will include the Marine Corps, and will cover areas in the Pearl Harbor Naval complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station Pacific, Pacific Missile Range Facility on Kauai, Kaneohe Marine Corps Base Hawaii, Camp Smith and all associated installations/facilities/equipment located outside of those Navy/Marine Corps properties.

The Navy and Marine Corps have determined that the listed Proposed Actions have insignificant direct or indirect (cumulative and secondary) coastal effects and should therefore be categorized as de minimis in accordance with the Department of Commerce, National Oceanic and Atmospheric Administration, CZMA Federal Consistency Regulations 15 CFR part 930.33 (3). With the corresponding mitigation and conditions applied, these actions would be exempt from a negative determination or a consistency determination from the State of Hawaii.

Should you have any questions, please contact Mr. Brian Yamada at 472-1449, by facsimile transmission at 474-5419, or by email at brian.yamada@navy.mil.

Sincerely,

A handwritten signature in cursive script, reading "E. J. D'Andrea".

E. J. D'ANDREA
Lieutenant Commander, CEC, U. S. Navy
Assistant Regional Engineer
By direction of the
Commander

Enclosure: 1.Navy De minimis Activities Under CZMA

<p align="center">Navy/Marine Corps De Minimis Activities Under CZMA</p> <p>*covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF), Kaneohe Marine Corps Base Hawaii, Camp Smith, and all associated installations/facilities/equipment located outside of these Navy/Marine Corps properties</p>			
No.	Proposed Action	Description	Mitigation / Conditions
1	New Construction	Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.	1, 3, 6, 8, 9, 10, 11, 13, 14, 16
2	Utility Line Activities	Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.	1, 10, 11, 12, 14, 16
3	Repair and Maintenance	Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.	12, 14, 16
4	Aids to Navigation	Includes buoys, beacons, signs, etc. placed within Navy/Marine Corps controlled coasts and navigable waters as guides to mark safe water.	2, 5, 14, 16
5	Structures in Fleeing and Anchorage Areas	The installation of structures, buoys, floats and other devices placed within anchorage or fleeing areas to facilitate moorage of vessels within Navy/Marine Corps controlled property.	2, 5, 14, 16
6	Oil Spill and Hazardous Waste Cleanup	Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy/Marine Corps controlled property.	1, 8, 14, 16
7	Maintenance Dredging	Excavation and removal of accumulated sediment for maintenance to previously authorized depths.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
8	New Dredging	Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy/Marine Corps controlled property. This does not include dredging or degradation through coral reefs.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
9	Scientific Measuring Devices	The installation of devices which record scientific data (staff gages, tide gages, water recording devices, water quality testing and improvement devices and similar structures) on Navy/Marine Corps controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.	1, 2, 14, 16
10	Studies and Data Collection and Survey Activities	Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.	2, 3, 6, 8, 9, 11, 12, 13, 14, 16
11	Demolition	Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.	1, 11, 12, 14, 16
12	Military Testing and Training	Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.	9, 13, 14, 15, 16
13	Real Estate/Property Transfer	Real estate acquisitions or outleases of land involving new ingranits/outgrants and/or 50 acres or more where existing land use will change.	14, 16

ENCLOSURE(/)

14	Mission Changes	Mission changes, base closures/relocations/consolidations, and deployments that would cause long term population increases or decreases in affected areas.	14, 16
15	Limitation of Access to Property	Permanent closure or limitation of access to any areas that were open previously to public use, such as roads or recreational purposes (provided the access is not required by established agreements with State of Hawaii, private industry, etc.)	14, 16
16	Environmental Management Activities	Environmental management activities within Navy/Marine Corps controlled areas including, but not limited to, activities such as vegetation and mangrove removal, ditch clearing, sediment removal, invasive species removal, construction related to protecting endangered species and wildlife, and actions prescribed by the Integrated Natural Resources Management Plan (INRMP)	2, 13, 14, 16
17	Towers	Installation, operation, and maintenance of towers (such as communication towers, cellular phone antennas, wind-energy towers) within Navy/Marine Corps controlled areas.	1, 2, 6, 8, 9, 12, 13, 14, 16
18	Alternative Energy Research	Installation, operation, replacement, and removal of alternative energy research structures/equipment taking place within Navy/Marine Corps controlled areas.	1, 2, 3, 5, 6, 12, 13, 14, 16
19	Army Corps Nation Wide Permits	Work subject to an Army Corps of Engineers Nationwide permit (which are applicable to Hawaii)	16

Project Mitigation / General Conditions

- 1) Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.
- 2) If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.
- 3) Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- 4) Dredging/filling in the marine/aquatic environment shall be scheduled to avoid coral spawning and recruitment periods.
- 5) All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
- 6) No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
- 7) All debris removed from the marine/aquatic environment shall be disposed of at an upland site or EPA approved ocean disposal site, and Best Management Practices shall be followed.
- 8) No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.
- 9) Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
- 10) Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
- 11) Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).
- 12) Section 106, of the National Historic Preservation Act (NHPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.
- 13) Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.
- 14) The National Environmental Policy Act (NEPA) review process will be completed.
- 15) The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
- 16) Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA). Notification can be sent via email: to jNakagaw@dbedt.hawaii.gov



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBIE SETH MAYER
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Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12644

July 9, 2009

Lieutenant Commander E. J. D'Andrea
Assistant Regional Engineer
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Attention: Mr. Brian Yamada

Dear Lt. Commander D'Andrea:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency
Concurrence with Modifications to the Department of the Navy De Minimis
Activities in Hawaii under the Coastal Zone Management Act (CZMA)

The Hawaii CZM Program has completed the federal consistency review of the proposed modifications to the list of Department of the Navy de minimis activities under the CZMA, including changes to various activity categories, adding new activity categories, and expanding the coverage to Marine Corps Base Hawaii Kaneohe Bay and Camp Smith. The CZM Program conducted a thorough review of the request and a public notice of the CZM review was published in the State of Hawaii Office of Environmental Quality Control's publication, *The Environmental Notice*, on June 23, 2009. The public was provided an opportunity to participate in the review through July 7, 2009. There were no public comments received.

We concur that the activities identified on the modified list entitled, "Navy/Marine Corps De Minimis Activities Under CZMA" are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects, and should not be subject to further review by the Hawaii CZM Program on the basis and condition that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions."

The Hawaii CZM Program reserves the right to review, amend, suspend, and/or revoke the "Navy/Marine Corps De Minimis Activities Under CZMA" list whenever it finds that a listed activity or activities will have reasonably foreseeable coastal effects. CZM consistency

Lieutenant Commander E. J. D'Andrea
Page 2
July 9, 2009

concurrence does not convey approval with any other regulations administered by any State or County agency.

Modifying and expanding the list of Navy de minimis activities under the CZMA was a cooperative effort between our Office and Mr. Brian Yamada from the Department of the Navy, who interned with the Hawaii CZM Program in September 2008. We appreciate the efforts of Mr. Yamada in working with our CZM staff. The de minimis activities list will result in more efficient compliance with CZMA federal consistency requirements for both the Navy and the Hawaii CZM Program.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,



Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch (w/ copy of de minimis list)
Ms. Rebecca Hommon, Region Counsel, Navy Region Hawaii

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APPENDIX G
TRAFFIC IMPACT ASSESSMENT REPORT

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
APPENDIX G TRAFFIC IMPACT ASSESSMENT REPORT	G-1

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Traffic Impacts Assessment of
Relocation of VMU-3 to
MCB Hawaii Kaneohe Bay
Kaneohe, Hawaii

Prepared by:
Julian Ng Inc.
P.O. Box 816
Kaneohe, HI 96744

June 2013

VMU-3 Traffic Impacts Assessment

Traffic Impacts of Relocation of VMU-3 to MCBH Kaneohe Bay

Traffic analysis was conducted to assess potential impacts and mitigation measures for the proposed VMU-3 relocation to MCB Hawaii – Kaneohe Bay. The traffic analysis undertaken for the 2012 Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawaii (MV-22/H-1 EIS) serves as the basis for the VMU-3 relocation impacts analysis.¹ The MV-22/H-1 EIS traffic analysis (completed in September, 2011) assessed the impacts of increased vehicular activity on entrance gates, within the base, and on roadways surrounding the base. That study identified several traffic improvements required to provide adequate service at critical locations on the base. Changes to traffic conditions resulting from the relocation of VMU-3 to MCB Hawaii Kaneohe Bay, in addition to those assessed for the MV-22/H-1 EIS, were considered in this traffic analysis update.

The proposed relocation of USMC Unmanned Aircraft System Squadron 3 (VMU-3) to the Marine Base Hawaii Kaneohe Bay could add approximately 500 persons on the base, representing a 2% increase in the population of the base. A recent traffic study¹ analyzed peak hour conditions and identified several traffic improvements that were required to provide adequate service at critical locations on the base. This report considers the changes to traffic conditions resulting from the relocation of VMU-3 to MCBH Kaneohe Bay.

The proposed VMU-3 facility on the base will include the relocation of several existing users of the site to other already-developed areas of the base. The increased activity on the base is expected to result in increased traffic volumes and analyses were done assuming an increase in peak hour traffic volumes in proportion to the increase in base population.

De facto population increases from 19,323 to 19,734, a 2.1% increase. While there will be an increase in on-base housing, many personnel and dependents would commute from off-base housing to their work sites or to use base facilities. Traffic volumes through the gates are projected to increase by 4.3%. These increases were applied to the traffic volumes used in the analyses.

The increase in traffic volumes on roadways outside of the base were previously identified (for the Aviation Plan) to be at most 153 vehicles per hour on the H-3 Freeway and 120 vehicles per hour on Mokapu Road just outside the gate; these increases were not considered significant. The addition of VMU-3 will increase the projected peak hour volumes to 1,305 vehicles per hour on H-3 (from 1,250) and 715 vehicles per hour on Mokapu Road (from 685); in both cases, these volumes will remain well below the capacities (4,000 and 2,000 respectively). The project traffic impact to other roadways outside of the base will continue to be less than 100 vehicles per hour during the highest hour and the previous conclusion that the impact would not be significant is still valid.

¹ Julian Ng Incorporated, *Traffic Impact Report, Environmental Impact Statement for the Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawaii (MV-22/H-1 EIS)*, 15 September 2011

VMU-3 Traffic Impacts Assessment

At the gates, quicker processing of the identification checks were identified as a needed mitigation to accommodate the increased traffic demand, decrease delay, and limit queue lengths. This recommendation does not change. Table 1 shows the results of the analyses.

Table 1 – Queuing at Gates

Parameter	H-3 Gate			Mokapu Gate		
	V	AD	Q	V	AD	Q
Existing (2011)	1,050	106	40	600	42	13
Aviation Plan ^{***}	1,250	99	45	685	21	9
With VMU-3 ^{**}	1,305	121	53	715	24	10

Note: * assumed 10% improvement in service time at gates (all others existing)
V = volume in vehicles per hour
AD = average delay in seconds
Q = Design queue in number of vehicles

Peak traffic conditions entering the gates can be expected to occur for a longer period of time during the morning peak period, as some drivers may arrive earlier to avoid the increasing congestion and delay that would be incurred while entering through the gates. Table 2 illustrates this effect by using the v/c (volume/capacity) ratio through the H-3 Gate. Using a gate capacity of 1,200 vehicles per hour, the v/c ratios suggest congested conditions during periods when the ratio exceeds 0.95. With the projected increase in demand through the gate with increased activity and personnel entering from off-base, congested conditions at the gate could be expected to begin before 0600, as some of the excess demand that occurs between 0630 and 0730 would need to enter earlier (a similar situation is already occurring at Joint Base Pearl Harbor Hickam, as congested conditions occur as early as 0530).

Table 2 – Peak Period at Entry, H-3 Gate

Time interval	2010 counts *		2018 with VMU-3	
	volume	v/c ratio	demand	v/c ratio
0600-0630	467	0.78	526	0.88
0630-0700	539	0.90	607	1.01
0700-0730	608	1.01	685	1.14
0730-0800	381	0.64	429	0.72

* from manual counts taken September 9, 2010 (MV-22/H-1 EIS)

At the time the previous traffic study was done, two intersections on the base were operating as signalized intersections; they were found to operate at acceptable conditions (overall intersection Level of Service, or LOS, "D" or better) during three peak hours. Greatest delay and highest utilization occurred at the intersection of G Street and Third Street during the PM Peak Hour, and at the intersection of Mokapu Road and Harris Avenue during the AM Peak Hour. Reevaluation of these intersections with increased traffic from the VMU-3 relocation with some changes in signal timing results in increased delay, but acceptable conditions will still be attained (Table 3).

VMU-3 Traffic Impacts Assessment

Table 3 – Conditions at Signalized Intersections

	Aviation Plan			With VMU-3		
	V/C	AD	LOS	V/C	AD	LOS
G Street and Third Street (PM Peak Hour)						
Southbound G Street	0.90	54.6	D	0.88	51.1	D
Northbound G Street	0.74	49.1	D	0.79	53.0	D
Westbound Third Street	0.95	53.6	D	0.92	48.2	D
Eastbound Third Street	0.54	32.2	C	0.79	53.6	D
Overall Intersection	0.90	49.4	D	0.90	51.0	D
Mokapu Road and Harris Avenue (AM Peak Hour)						
Southbound Harris Avenue	0.75	30.3	C	0.83	37.8	D
Northbound Harris Avenue	0.86	54.3	D	0.80	48.1	D
Westbound Mokapu Road	0.93	53.7	D	0.85	48.5	D
Eastbound Mokapu Road	0.76	42.2	D	0.70	42.0	D
Overall Intersection	0.82	42.7	D	0.83	43.1	D
V/C = utilization or volume/capacity ratio AD = average delay per vehicle (seconds) LOS = Level of Service						

Analyses were also done for peak hour conditions at seven unsignalized intersections (including the intersection of G Street, Mokapu Road, and Lawrence Road, where a traffic signal system was placed in a flashing mode in late-2010, thereby converting it to operate as an all-way stop-controlled intersection). At three of these intersections, mitigation measures were identified to improve conditions with the Aviation Plan to acceptable (Level of Service “D” or better) during each peak hour. The reevaluation of the worst peak hour at each of the seven intersections showed that acceptable conditions would continue with the additional traffic that is expected with the addition of VMU-3 (Table 4).

The traffic signals at the intersection of G Street, Mokapu Road, and Lawrence Road were reactivated in late-2012. While vehicular traffic was adequately served by the flashing mode, pedestrian wishing to cross had difficulties determining when a safe crossing could be made; with the signals activated, there is a clear indication of when pedestrians can cross. Conditions were determined to be worst in the Midday peak hour; a comparison of levels of service with the signals in use is shown in Table 5.

Conclusion

The additional loading resulting from the relocation of VMU-3 at MCBH Kaneohe Bay, while increasing traffic demand slightly, will not have any significant effect to traffic conditions than those previously identified.

VMU-3 Traffic Impacts Assessment

Table 4 – Conditions at Unsignalized Intersections

	Aviation Plan			With VMU-3		
	V/C	AD	LOS	V/C	AD	LOS
Third Street at E Street (AM Peak Hour)						
E Street southbound left turn	0.06	7.6	A	0.06	7.6	A
Third Street westbound right turn	0.27	10.1	B	0.28	10.1	B
Third Street westbound left turn/thru	0.73	25.1	D	0.77	28.4	D
E Street northbound left turn	0.00	7.4	A	0.00	7.5	A
Relocated Second Street at First Street (PM Peak Hour)						
Second Street southbound approach	0.65	30.1	D	0.68	32.5	D
First Street eastbound left turn	0.00	7.7	A	0.00	7.7	A
Craig Avenue at Mokapu Road (AM Peak Hour)						
Mokapu Road westbound left turn	0.21	9.8	A	0.21	9.8	A
Craig Avenue northbound approach	0.68	32.5	D	0.70	34.3	D
Third Street at Selden Street (MID Peak Hour)						
Selden Street westbound left turn	0.32	8.4	A	0.32	8.5	A
Third Street northbound approach	0.49	16.4	C	0.51	16.6	C
Selden Street eastbound right turn	0.11	11.9	B	0.11	12.0	B
C Street and Reed Road at Mokapu Road (MID Peak Hour)						
Reed Road southbound approach	0.65	34.2	D	0.65	34.7	D
Mokapu Road westbound left turn	0.05	7.7	A	0.05	7.7	A
Mokapu Road eastbound left turn	0.03	8.2	A	0.03	8.2	A
C Street northbound approach	0.34	18.7	C	0.38	18.9	C
G Street, Lawrence Road, and Mokapu Road {All-way Stop} (MID Peak Hour)						
Southbound Lawrence Road	0.36	15.9	C	0.36	16.0	C
Westbound Mokapu Road	0.87	34.5	D	0.87	34.3	D
Eastbound Mokapu Road	0.74	27.4	D	0.75	28.5	D
Northbound G Street	0.62	19.3	C	0.64	19.9	C
Overall Intersection	--	27.0	D	--	27.3	D
Craig Avenue and Selden Street {All-way Stop} (MID Peak Hour)						
Southbound Craig Street	0.43	14.5	B	0.44	14.7	B
Westbound Selden Street	0.82	33.6	D	0.83	34.4	D
Eastbound Selden Street	0.58	18.7	C	0.60	19.3	C
Northbound Craig Street	0.36	14.9	B	0.36	15.0	C
Overall Intersection	--	22.0	C	--	22.4	C
V/C = utilization or volume/capacity ratio AD = average delay per vehicle (seconds) LOS = Level of Service						

VMU-3 Traffic Impacts Assessment

**Table 5 – Conditions at Signalized Intersection of
G Street, Lawrence Road, and Mokapu Road**

	Aviation Plan			With VMU-3		
	V/C	AD	LOS	V/C	AD	LOS
MID Peak Hour						
Southbound G Street	0.59	50.4	D	0.59	50.4	D
Northbound G Street	0.58	49.7	D	0.61	50.5	D
Westbound Third Street	0.87	46.0	D	0.88	46.8	D
Eastbound Third Street	0.81	46.6	D	0.82	47.2	D
Overall Intersection	0.76	47.2	D	0.77	47.9	D
<small>V/C = utilization or volume/capacity ratio AD = average delay per vehicle (seconds) LOS = Level of Service</small>						

