CHAPTER 5 CUMULATIVE IMPACTS

5.0 INTRODUCTION

CEQ regulations implementing NEPA requires assessment of cumulative impacts of a Proposed Action (40 CFR Parts 1500-1508). A cumulative impact is an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR § 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR § 1508.7). The Army's NEPA regulations (32 CFR 651.51[a][1][ii]) also require that cumulative actions, those that have cumulatively significant impacts, be discussed in the same EIS. CEQ's guidance for considering cumulative effects states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant" (CEQ, 1997).

Section 5.1 presents the methodology used to evaluate cumulative impacts. Section 5.2 discusses other projects on Hawai'i Island that may have cumulative effects when combined with the impacts from the proposed projects within this document. Section 5.3 identifies and describes the cumulative impacts for each of the resource areas discussed in Chapters 3 and 4.

5.1 METHODOLOGY FOR CONSIDERING AND ANALYZING CUMULATIVE EFFECTS

This Programmatic EIS uses a variety of methods, resource specific, to assess the potential cumulative socioeconomic and environmental effects from implementing the proposed action at PTA, in relation to other projects within the ROI.

The Army first identified other projects and actions (military and public) that may be categorized as occurring in the past, present, and reasonably foreseeable future. The Army selected projects using a number of different methods; some of these include the following:

- Reviewing actions recently proposed by the military, with some or all of the proposed action potentially influencing Hawai'i Island (e.g., training the MV-22 Osprey at PTA, HAMET, developing training facilities at PTA by the Marine Corps);
- Identifying current training requirements by the Army, Navy and Marine Corps, and the Air Force at PTA (discussed in Chapter 1 of the Programmatic EIS);
- Proposing projects in this Programmatic EIS that extend beyond the five-year planning process (FYs 12-16). Greater detail of these projects is found in Appendix A;
- Reviewing projects recently proposed or implemented by public entities (e.g., implementation of the State Highways Modernization Plan, Saddle Road Realignment, and implementation of the 'Āina Mauna Legacy Program). The Army identified some of these projects early in the EIS planning process through internet research, and through public scoping in January 2011.

Cumulative impacts are generally best assessed by resource area (e.g., water resources, air quality, socioeconomic impacts), and impacts may arise from single or multiple actions, or may result in additive or interactive effects. Interactive effects may, in some cases, may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects; or they may be synergistic, where the net adverse cumulative effect is greater than the sum of the individual effects (CEQ, 1997). For individual

resources, the ROI for cumulative impacts is often larger than the ROI for direct and indirect impacts (identified in Chapter 3 of this Programmatic EIS within the sections covering each resource area). The factors considered in determining the significance of cumulative impacts are often the same as those presented in Chapter 4.

It should be noted that while the direct impacts of some individual projects (Table 5.2-1) were considered, there is very little quantitative data that was made available by project proponents for most projects listed in Table 5.2-1. An integral part of the cumulative impacts analysis involves determining whether impacts from the proposed projects would contribute to ongoing or foreseeable resource trends. The cumulative impacts analyses do not assess all expected environmental impacts from regional projects within the ROIs, but only those impacts resulting from both a project alternative and other past, present, and reasonably foreseeable future actions that influence a particular resource area. If a quantitative analysis cannot be formalized, the Army assesses qualitatively the potential cumulative impacts.

5.2 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE PROJECTS

Table 5.2-1 lists projects that the Army identified that, when considering the proposed action in this Programmatic EIS, could result in incremental impacts to a number of resource areas. The Army identified these projects through the review of recent NEPA documentation, identification of current training requirements by the military at PTA, long-term projects (through 2022 proposed in this Programmatic EIS), public scoping, and internet research.

Table 5.2-1 provides a title for each project; a location (e.g., municipality or island); project proponent or sponsor; a brief description of the project; and an estimated year of project completion, which was based upon available information.

The table is followed by more descriptive information on each listed project.

Table 5.2-1. Projects on Hawai‘i Island implemented in the Past, Present, and Reasonably Foreseeable Future

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Puainako Street Widening and Extension project	Hilo, Hawai‘i Island	Federal Highways Administration and Hawai‘i State Department of Transportation	Widens the 1.5-mile long section between Kilauea Avenue and Komohana Street, Puainako Street from two to four lanes and also accommodates dual sidewalks and bicycle lanes.	2004

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Outrigger Telescopes Project	Mauna Kea, Hawai‘i Island	NASA	NASA proposes to fund the construction and operation of six outrigger telescopes in the W. M. Keck Observatory site at the Mauna Kea Summit.	2006 (NASA funding withdrawn)
Undersea Warfare Exercise (USWEX)	Hawai‘i Island	Navy	Submarine Warfare Exercise proposed to be conducted by the U.S. Navy’s Carrier Strike Groups and Expeditionary Strike Groups while in transit from the west coast of the U.S. to the western Pacific Ocean.	2007
Deepening of the Kawaihae Deep Draft Harbor	Kawaihae Harbor, Hawai‘i Island	State of Hawai‘i	Deepen harbor to allow for increased drafts.	2008
Construct Mock Airfield	PTA, Hawai‘i Island	Navy	Proposed construction of a mock airfield at the PTA impact area; and install and operate technology to aid in simulated training exercises.	2010
Permanent Stationing of the 2/25th SBCT	Hawai’i Island	Army	Transformation of the 2/25th (L) BCT to a SBCT involving use of additional tactical vehicles, modification of training infrastructure at PTA, and acquisition of the KMA.	Ongoing
Development and Use of Military Training Facilities on PTA	PTA, Hawai‘i Island	USMC	Marine Corps Base, Hawai’i would develop training facilities at PTA including a MOUT facility; CLF range; enhancement of three forward operating base sites; and construct a live-fire grenade/shoot house facility.	Ongoing

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Draft Zero Waste Implementation Plan	Hawai'i Island	County of Hawai'i Department of Environmental Management, Solid Waste Division & Recycling Section	Initiative to reduce the county's ecological footprint and divert resources from the landfill for recovery and reuse.	Ongoing
Current Army use of PTA	Hawai'i Island	Army	Description of Army activities is found in Section 1.3.1.1	Ongoing
Current USMC use of PTA	Hawai'i Island	USMC	Description of USMC activities is found in Section 1.3.1.2	Ongoing
RIMPAC Exercises and current Navy use of PTA	Hawai'i Island	Navy, Joint Forces	Description of Navy activities is found in Section 1.3.1.3	Ongoing
Current Air Force use of PTA	Hawai'i Island	Air Force	Description of Air Force activities is found in Section 1.3.1.4	Ongoing
Six-year Highways Modernization Plan	Hawai'i Island	State of Hawai'i DOT	Highway Modernization Plan including 27 projects on the Big Land of Hawai'i to increase highway capacity, improve safety, replace bridges, stabilize rockfall and slope areas, protect shorelines and preserve pavement.	Announced 2009; ongoing
Hawai'i-Southern California Training and Testing (HSTT) EIS and OEIS	Hawai'i Island, Hawai'i Range Complex; select Navy pierside locations	Navy	EIS and Overseas EIS (OEIS) to evaluate the potential environment affects associated with military readiness training and research, development, testing, and evaluation (RDT&E) activities conducted within the HSTT study area.	Ongoing

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Training and Evaluation Activities in the Hawai‘i Range Complex (HRC)	Pacific Region	Navy	The Navy is currently conducting training, research, developing, testing, and evaluation activities in the HRC on new technologies including mid-frequency (MFA) and high-frequency (HFA) sonar.	Ongoing
Paving Mauna Kea Access Road	Hale Pohaku, Hawai‘i Island		Proposed paving of the remaining dirt portions of the Mauna Kea access road.	TBD
‘Āina Mauna Legacy Program	Hawai‘i Island	Department of Hawaiian Homelands (DHHL)	Homesteading program established to provide economic self-sufficiency of Native Hawaiians through the provision of land granted by the DHHL. This project would serve to preserve lands within the ‘Āina Mauna ecosystem, which is the upper region of the mountain lands that surround and include Mauna Kea.	TBD

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
HAMET	Hawai‘i Island	Army	The 25th ID CAB, stationed at WAAF, has requirements to train helicopter pilots and crews for high-altitude missions in preparation for deployment to Afghanistan, and to satisfy compulsory aviation training doctrine. The CAB needs to provide realistic flight training in a mountainous, high-altitude environment. The Army prepared NEPA documentation to address the potential impacts from training near PTA, at landing zones on Mauna Loa and Mauna Kea, and it reviews other alternatives. This action would add approximately 520 flight hours of training on Hawai‘i Island.	2011
Panoramic Survey Telescope & Rapid Response System (Pan-STARRS) – PS4 Telescope Suite	Area A, Hawai‘i Island	University of Hawai‘i’s Institute of Astronomy	Replace the existing UH 2.2 m telescope in Area A and consist of four 1.8 m telescopes within a single enclosure. It would enable remote and/or robotic operation.	2012 (Pending)
Basing of the MV-22 and H-1 Aircraft in Support of III Marine Expeditionary Force Elements in Hawai‘i	Oahu and Hawai’i	Navy, USMC	The Department of the Navy, USMC, is preparing an EIS for the basing and operation of MV-22 tiltrotor Osprey aircraft and H-1 Cobra and Huey attack helicopters in support of III Marine Expeditionary Force elements stationed in Hawai‘i.	2012

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Saddle Road Realignment	Hilo/Kona, Hawai‘i Island	Army	Project to straighten, repave and separate military training from motorists.	2012
Former Waikoloa Maneuver area and Nansay sites	Waikoloa, Hawai‘i Island	Army	MEC/UXO clearance on the 135,000-acre (54,633 ha) Former Waikoloa Maneuver area.	2015
Caltech Submillimeter Observatory Decommission	Area C of Mauna Kea, Hawai‘i Island	Caltech	Decommissioning and removal of Caltech Submillimeter Observatory.	2018
Range Maintenance Facility	PTA, Hawai‘i Island	Army	Proposed construction of an 18,100 ft^2 consolidated range maintenance complex on a previously developed site in a PTA cantonment.	2015
Packaged Sewer System	PTA Cantonment Area, Hawai‘i Island	Army	Proposed sewer system at PTA (dependent upon production well) to provide an advanced level of treatment of sewage along with a collection and discharge system for Cantonment Area effluent.	2017
Storm Drainage System	PTA Cantonment Area, Hawai‘i Island	Army	Proposed construction of a Cantonment Area-wide storm collection/drainage system that would depend upon the successful implementation of the PTA production well.	2017
Communications System	PTA, Hawai‘i Island	Army	Proposed construction of an installation-wide communication system at PTA.	2018
BAAF Runway Realignment	PTA Cantonment Area, Hawai‘i Island	Marine Corps	Proposed realignment and extension of the runway at Bradshaw Army Airfield, including construction of supporting infrastructure.	2018

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Rotary Wing Apron and Aircraft Maintenance Facility	PTA Cantonment Area, Hawai‘i Island	Marine Corps and Army	Proposed construction at BAAF to enhance PTA’s capability to provide air combat support and maintenance capability to aviation assets.	2018
MP Station	PTA Cantonment Area, Hawai‘i Island	Army	Proposed relocation of the MP station at PTA to near the installation main gate, to be compliant with military regulation.	2018
TISA	PTA Cantonment Area, Hawai‘i Island	Army	Proposed relocation of the existing TISA at PTA to the proposed industrial area of the installation. The mission of the TISA is to provide subsistence and order/supply support to dining facilities, Units undergoing field training exercises, contingency operations, charge sales, and other [mission] authorized activities.	2018
DFAC	PTA Cantonment Area, Hawai‘i Island	Army	Proposed relocation and construction of a DFAC at PTA that would effectively consolidate the three dining facilities located at the installation, and provide adequate capacity for the units and civilians that use those facilities.	2018

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Battalion Billets	PTA Cantonment Area, Hawai‘i Island	Army	Proposed construction of up to three, multi-story barracks, large enough to accommodate a battalion of Soldiers training at PTA. The first project would begin construction in 2019, the second in 2020, and the third in 2021.	2019
Fire Station	PTA Cantonment Area, Hawai‘i Island	Army	Proposed construction of a Fire Station at BAAF, to serve as a first response / emergency response facility and Aircraft Rescue Fire Fighting Fire Station.	2019
Physical Fitness Center	PTA Cantonment Area, Hawai‘i Island	Army	Proposed construction of a small physical fitness center of standard design, for up to a 1,000 person capacity.	2020
Multipurpose Storage Facility	PTA Cantonment Area, Hawai‘i Island	Marine Corps	Proposed construction of a permanent storage facility at PTA to gain efficiencies in meeting their semi-annual training requirements at the installation.	2020
DPW Maintenance Shop	PTA Cantonment Area, Hawai‘i Island	Army	Proposed construction of a maintenance shop within the Cantonment Area, to provide regular upkeep and repair of non-tactical vehicle and equipment assets that are used for the daily operations of PTA.	2022
DOL Base Yard	PTA Cantonment Area, Hawai‘i Island		Proposed construction of a Base Yard at the PTA Cantonment Area, which is analogous to a parking and storage area for military equipment and vehicles.	2022

Project Name	Project Location	Project Sponsor	Project Description	Project Completion (Yr.)
Urban Close Air Support (UCAS) Range	PTA, Hawai‘i Island	Marine Corps	Proposed construction of an UCAS range, located adjacent to the recently constructed Navy Mock Runway, in the southern portion of the PTA impact area to aid in training exercises for Marine aviators.	TBD

5.2.1 Project Descriptions

5.2.1.1 Puainako Street Widening and Extension

This project began in 1999 and concluded in 2004. The geographic scope of this project was a total 6-mile stretch of Puainako Street (State Hwy 2000) near Hilo on Hawai‘i Island. The original purpose was to widen the existing road to four lanes, and partially realign Puainako Street between Kilauea Avenue and Komohana Street; and to build sidewalk and bicycle lanes on both sides of the street. Puainak Street was also proposed to be extended with shoulders and bike lanes for 4.5 miles between Komohana Street and Saddle Road (State Hwy 200). This project was needed to improve arterial traffic flow by providing a direct link between the existing Puainako Street and the Saddle Road; and, to alleviate congested and unsafe traffic conditions at Puainako Street and Kaumana Drive. The project scope was subsequently modified. Only a portion of the road has multiple lanes, but with broad shoulders. Temporary impacts to traffic flow and air quality occurred from construction. The result was an overall beneficial impact to flow along some portions of Pauinako Street.

5.2.1.2 Outrigger Telescopes Project

This project would construct, install, and operate four, and possibly up to six Outrigger Telescopes at the W.M. Keck Observatory within the Mauna Kea Science Reserve on the summit of Mauna Kea on Hawai‘i Island. The project was approved on July 22, 2005 based on the Final EIS issued on February 2, 2005 and subsequent ROD. Construction is based upon the availability of funds that have not yet been issued.

5.2.1.3 Undersea Warfare Exercise

This is an Anti-Submarine Warfare (ASW) exercise conducted by the U.S. Navy’s Expeditionary Strike Groups (ESG) and Carrier Strike Groups (CSG) while in transit from the west coast off the U.S. to the Western Pacific Ocean. A Programmatic EA/Overseas EA (OEA) was prepared by the Navy, and a FNSI was issued on 24 January 2007. A Programmatic EA/OEA was issued by the Navy in October 2007.

ASW training conducted during an Undersea Warfare Exercise (USWEX) utilizes ships, submarines, aircraft, non-explosive exercise weapons, and other training systems and devices. Nearly all USWEX ASW training occurs in designated ASW areas which includes Acoustic Exposure Modeling Areas, SUA (W-194), the Air Traffic Control Assigned Airspace (ATCAA) of Lomo East and Pele which surround or

overlap portions of Hawai‘i Island; and also include Air-to-Ground STWEX at the PTA using live ammunition. Major factors to consider are airspace, air quality, and noise. Exercises using live ammunition at PTA are wholly contained within the impact area of the installation.

5.2.1.4 Deepening of the Kawaihae Deep Draft Harbor

This project was undertaken on Hawai‘i Island as a partnership between the USACE and Hawai‘i County, and State of Hawai‘i DoT Harbors Division. The project begun in 2003, and was completed in 2008. The geographic scope was the Kawaihae Harbor located on the west side of the island in the Kohala region. The harbor consists of an entrance channel, basin, and a “rubblemound” breakwater; and it provides maritime access for commerce and the military on the western side of the island. Growing demand for cargo to support the rapidly expanding economy drove the requirement for the turning basin to be dredged and deepened, resulting in a greater capability to accommodate cargo vessel traffic. An EIS reviewed a number of related impact studies (i.e., economic study, recreational resources, hazardous materials, disposal of dredged materials, cultural resources, impacts to flora and fauna and the marine environment, and sediment control). Adverse impacts of the greatest concern were associated with construction actions; specifically an increase in turbidity due to soil erosion (from on-shore activities), dredging, and driving piles into the harbor basin for piers. Several mitigation measures were employed to reduce the influence of siltation on the off shore coral reef and to avoid, to the extent practicable, impacts to the protected green sea turtle. Other significant impacts of concern included a permanent increase in noise from the upsurge in shipping vessel volume; and the introduction of non-native marine species from the ballast of foreign vessels. Land-based traffic volume surrounding the harbor also increased both in a temporary time period due to construction, and over the long-term to account for the transportation of shipping supplies.

5.2.1.5 Construct Mock Airfield

The Navy constructed an airfield mock-up at the PTA impact area; and install and operate a Mobile Electronic Warfare (EW) System, time sensitive targets, and Identify Friend or Foe (IFF) Radar.

The Mock Airfield provides realistic structural targets on simulated dense urban terrain at PTA to support carrier air wing with close air support and strike warfare training. Close air support in a dense urban environment is recognized as one of the most complex and challenging missions an aircrew will perform because it requires precision weapon delivery. Target systems are unpowered plastic decoys that provide a realistic visual signature for identifying, targeting, and engaging mobile land-based targets. Decoys are deployed on trailers and towed behind standard full sized trucks. The targets are set at established locations on the mock airfield. Typically, these decoys are removed from the range and returned to PTA cantonment area (or another developed area) nightly or upon completion of the event. The Navy sought a location within the impact area because the mock airfield and targets would be used in bombing training exercises (using inert bombs only).

The Navy additionally proposed Mobile EW System to support Strike Warfare and Electronic Combat training. EW training is essential to training friendly aircrews and surface systems operators to recognize threats in the radio frequency spectrum.

This system provides EW emissions in support of Strike Warfare and Electronic Combat training. EW training is essential to training friendly aircrews and surface systems operators to recognize threats in the radio frequency (RF) spectrum. For aircrews, EW training consists of flying within a known volume of airspace while shore-based EW assets illuminate the aircraft with preformatted surface-to-air missile (SAM), anti-aircraft artillery (AAA), and RF jamming signals to stimulate the onboard threat warning systems and cockpit displays.

Time sensitive targets represent visual, infrared, acoustic, and radar signatures to train with ground-to-ground and air-to-ground weapons that employ intelligent seekers (munitions).

The Navy's EA concluded that the proposed action would not have any unmitigable, significant direct, indirect, or cumulative adverse impacts on the environment. Impacts chiefly were related to temporary air quality impacts during the construction phase. No endangered or native species were present in the area and the terrain limited the number of native species.

5.2.1.6 Permanent Stationing of the 2/25th SBCT (projects influencing Hawai'i Island)

The Army has constructed, and continues to construct several projects at PTA to accommodate the SBCT (ROD issued in 2008). Projects analyzed include constructing a BAX, Anti-Armor Live-fire and Tracking Range, Ammunition Storage Area, Tactical Vehicle Wash Facility (completed), acquisition of the KMA (completed), Range Maintenance Facility (not completed), reorient and improve BAAF (not completed), install fixed tactical internet and Information Infrastructure Architecture at PTA and throughout Hawai'i Island (partially completed), and adding a Qualification Training Range (completed). These projects are fully detailed and supported by analysis in the 2004 SBCT Final EIS; and further examined in the 2008 Final Supplemental SBCT EIS. The BAX is still under construction at PTA. While the 2/25th SBCT is already permanently stationed in Hawai'i, some projects related to SBCT are unfulfilled and those requirements remain as ongoing or future activities.

5.2.1.7 Develop and Use Military Training Facilities on PTA

In March 2006, the 3rd Marines laid out a development concept to maximize the ground combat element use of PTA to support current and future training requirements. The USMC plan involved the creation of a training complex at PTA to support combined arms live-fire and maneuver training, urban warfare training, convoy live-fire training, and weapons training.

Facilities to meet current and future training requirements would be joint facilities, with shared cost and usage between MCB Hawai'i and Army units and other users. The USMC prepared a 2009 EA covering construction and operation of a MOUT facility, CLF range, building a live-fire grenade/shoot house, and enhancement of three FOB sites by developing modular perimeter walls and improving trail access.

5.2.1.8 Draft Zero Waste Implementation Plan

The County of Hawai'i Department of Environmental Management, Solid Waste Division & Recycling Section's Draft Zero Waste Implementation Plan is an ongoing effort to reduce the county's ecological footprint and divert resources from the landfill for recovery and reuse. The draft implementation plan was presented in March 2009 and includes a proposed 5-year timeline. The exact geographic scope is still under determination but is not limited to existing waste and landfill facilities and construction of recycle

and reuse facilities. The construction plans include re-design of landfill and transfer stations into Resource Recovery (RR) parks to divert waste.

5.2.1.9 Highways Modernization Plan

The Hawai‘i State DoT announced a Six-Year Highways Modernization Plan in January 2009. The geographic scope on Hawai‘i Island includes 27 projects including the widening of Kuakini Hwy from Henry Street to Kamehameha III Road, and Kawaihae Road Bypass from Waimea to Kawaihae. Each project was aimed at improving highway capacity as well as safety improvements on Keaau-Pahoa Road from Keaau to Pahoa. Other major projects involve adding a bridge on Hawai‘i Belt Road; bridge replacement over Hilea Stream; conduct rockfall and slope stabilization on Hawai‘i Belt Road; install rockfall protection at various sections of several roads on the island; and to add shoreline protection in east Hawai‘i and pavement preservation.

5.2.1.10 Navy HSTT

The Navy’s HSTT EIS and OEIS consisted of six scoping meetings conducted in 2010 to evaluate the potential environmental effects associated with maintaining military readiness training, and research, development, test and evaluation activities conducted in the HSTT study area. The study areas consist of the sea and airspace within the Hawai‘i Range Complex (extended to the International Dateline), select Navy pierside locations, and transit areas between the range complexes. The Navy proposes to conduct military readiness training and testing activities in the HSTT study area including the use of active sonar and explosives within the in-water areas of the existing Navy range complexes around the Hawaiian Islands, primarily in established operating and military warning areas.

5.2.1.11 Training and Evaluation Activities in the Hawai‘i Range Complex (HRC)

The Navy is currently conducting training, research, developing, testing, and evaluation activities in the HRC on new technologies including MFA and HFA sonar. Training activities associated with implementation of the HRC EIS Preferred Alternative are primarily conducted in the at-sea HRC area, the Pacific Missile Range Facility (PMRF), and the Naval Undersea Warfare Center Detachment Pacific ranges; but also include airstrike sorties to PTA, and amphibious landing training on DoD beaches.

The Preferred Alternative currently being implemented includes an increase in the tempo and frequency of naval training that has been continuously conducted in the HRC for the past 40 years, and an expansion of training capabilities to include aircraft landing and an increased number of Major Exercise activities. In addition, the Preferred Alternative proposed to expand the primary training locations listed above to include MCBH on Oahu.

Impacts resulting from implementation of the Preferred Alternative and occurring at PTA, as analyzed in the HRC EIS, have the potential to affect only the installation’s airspace, biological resources, cultural resources, health and safety parameters, and noise levels. Analysis of the Preferred Alternative determined that no short- or long-term impacts would result on air quality, hazardous materials, soils, land use, socioeconomics, transportation, utilities, or water resources. Training activities within this action include airstrike training, but no significant terrestrial training at PTA. Implementing this Preferred Alternative has required no expansion of current PTA airspace; no expansion of Navy use of Hilo airport;

no expansion of terrestrial training into previously non-operating, sensitive or designated areas; and has maintained compliance with PTA's existing health and safety plans and its hearing protection program.

The ROD supporting the Preferred Alternative for the HRC EIS was issued on 26 June, 2008. Training activities were sanctioned to begin immediately, however a revised ROD was issued on 26 February, 2009 limiting a portion of the at-sea training activities due to authorizations released by the National Marine Fisheries Service. The revised ROD does not restrain training activities associated with this action conducted at PTA.

5.2.1.12 Paving Mauna Kea Access Road

The road to the observatory is rough, unpaved, steep, and dangerous. The road surface would be paved to reduce dust and to protect the sensitive "eyes" of the telescopes; and improve vehicle safety.

5.2.1.13 ʻĀina Mauna Legacy Program

The DHHL proposes to homestead up to 56,200 acres (22,743 ha) of land located on the northeast slopes of Mauna Kea, known as the Humuʻula and Piʻihonua area. The Humuʻula parcel makes up about 49,100 acres (19,870 ha), and the Piʻihonua parcel makes up about 7,078 acres (2,864 ha) of land. According to the program Web site, vegetation of the area is largely non-native pasture grasses with koa/`ōhi`a forest found in the lower portions of Pi`ihonua, and in lands adjacent to the Hakalau Forest National Wildlife Refuge. Scattered koa and māmane are found over the northern portions of Humu`ula with scattered māmane found in the upper elevations, especially adjacent to the Mauna Kea Forest Reserve. The habitat there serves several threatened or endangered species, including the palila.

The program for the Humuʻula and Piʻihonua area has the multiple goals of ecosystem restoration, conserving wildlife habitat, reducing threats to the ecosystem, generation of revenue for reinvestment into property management, focus conservation management for the ʻĀina Mauna, and serve beneficiary needs (of Native Hawaiians). Land managers would implement a number of projects to further program goals, including:

- Recovering native forest through ungulate control, fencing, seed collection, site preparation and irrigation, access road maintenance and development.
- Incorporate a sustainable forestry program through plant propagation, decreasing fire hazards, planting, and seed orchard development.
- Develop facilities, including water catchment, photovoltaic system, wind generators, fog drip augmentation system, composting toilets, etc., to be managed by dedicated workers.
- Conduct invasive species control measures through clearing and mulching, controlled burns, hand and aerial spraying, and use of biological controls.
- Develop an administration base facility that includes living and dining space, office space, and laboratory space to promote full time land management and minimize traffic to- and from the property.
- Develop a well and groundwater distribution system to facilitate land restoration operations and domestic use, including consumption.

- Implement a timber planting and harvesting program over 10,000 acres (4,407 ha) to 15,000 acres (6,070 ha) that would dually work to eradicate non-native plant species.
- Construct fencing and roads to protect seed propagation.
- Construct 100 to 200 homesteads that would require site preparation (clearing and grubbing for home properties, install alternative energy systems, and construct unpaved access roads.
- Restore historic facilities (i.e., Sheep Station) and develop remote accommodations and commercial facilities to promote site management and eco-tourism.
- Conduct research on natural and cultural resources to promote resource preservation and management.

5.2.1.14 HAMET

In 2010, the Army prepared an EA that addresses high-altitude, mountainous environment training using LZs on Mauna Loa and Mauna Kea. The proposed training would offer aviators an opportunity to train for mission critical flight operations currently being conducted in Afghanistan. The CAB currently uses PTA to conduct approximately 4,500 aviation hours of training each training year. The proposed HAMET action would increase this training baseline as HAMET exercises are needed. Note that HAMET exercises are not regularly scheduled as other semi-annual doctrinal training requirements. Aviation assets conducting HAMETs would use the UH-60 Black Hawk and CH-47 Chinook aircraft All aircraft used in HAMET exercises would be unarmed (i.e., no pyrotechnic devices, ordnance, etc.). The EA reports that less than significant impacts would occur to air quality on ozone and from secondary air pollutants due to aircraft operation, and PM and fugitive dust from operations occurring near designated training areas. Some soil loss or impaction is anticipated to occur at LZs. The impact to water resources is unlikely due to the lack of surface water and approximate depth to groundwater; although, in the case of an oil spill some potential to groundwater resources could occur, but is highly unlikely. No threatened or endangered species habituate near LZs. HAMET training is not anticipated to adversely impact cultural resources proximally located to designated training areas. Finally, the results of noise sampling indicated that no long-term adverse impacts would occur as a result of training activities. The Army has identified several mitigation measures to implement when HAMET training occurs.

5.2.1.15 Pan-STARRS

The University of Hawai‘i’s Institute of Astronomy’s Pan-STARRS PS4 Telescope Suite is proposed to be constructed on the site of the University of Hawai‘i 2.2-meter telescope on Mauna Kea. The geographic scope of this project is to remove the current 2.2-meter telescope and its building and to construct PS4 (a suite of 4 telescopes) inside a smaller building that has reduced visibility and a design that blends into the background compared to the current facility. An EIS is ongoing.

5.2.1.16 Basing of the MV-22 and H-1 Aircraft in Support of III Marine Expeditionary Force Elements in Hawai‘i

The EIS will evaluate a proposal to introduce up to two Marine Medium Tiltrotor (VMM) squadrons with a total of 24 MV-22 aircraft, and one Marine Light Attack Helicopter (HMLA) squadron composed of 18 AH-1Z and 9 UH-1Y helicopters, construction of improvements to accommodate the new aviation

squadrons, improvements to training facilities in Hawai‘i used by the Marine Corps, and use of DoD training areas statewide. Stationing and infrastructure improvements to accommodate the new mission would occur primarily on Oahu. Proficiency training would occur at PTA.

The Navy completed scoping for the EIS in September 2010, and plans to release a Draft EIS for public comment in 2011.

5.2.1.17 Saddle Road Realignment

This is a long-term highway construction project that includes improvements and modifications to Saddle Road between the Hilo side and Kona side of Hawai‘i Island to improve safety and use, and promote commerce. Once complete, approximately 250 miles (402 kilometers) of road will be modernized to meet American Association State Highway and Transportation Officials standards. Saddle Road does not meet current design standards for roadways. It is the only road serving PTA and is subject to serious traffic congestion when military convoys are transporting ammunition or troops for training. It is also the only road serving the Mauna Kea astronomical observatory complex, Waiki‘i Ranch, Kilohana Girl Scout Camp, Mauna Kea State Recreation Area, and major hunting areas. An EIS was completed in the fall of 1999, and a Supplemental EIS was completed in 2010.

The project would upgrade and modernize Saddle Road as a two-lane highway that would meet design standards for rural arterials and provide adequate capacity to handle anticipated traffic volumes through 2014 and beyond. The roadway improvements would address five general types of needs: roadway deficiencies, conflicts with and hazards of military operations, capacity, safety, social demand, and economic development.

5.2.1.18 Former Waikoloa Maneuver Areas and Nansay Sites

The Army’s Former Waikoloa Maneuver Areas and Nansay Sites are situated on the northwest side of Hawai‘i Island, approximately 30 miles (48.3 kilometers) north of the city of Kailua-Kona in the South Kohala District. This area served as a maneuver and live-fire training area beginning in 1943 and was used as an artillery firing range. Live ordnance and MEC/UXO have been found previously in this area. Land use in the former maneuver area is mostly cattle ranching/grazing by the Parker Ranch, with urban-residential, commercial, and industrial land uses found proximal to Waimea (Kamuela) and the Waikoloa Village area.

5.2.1.19 Caltech Submillimeter Observatory (CSO) Decommission

The CSO decommission is scheduled to begin in 2016 with the return of the site to its natural state by 2018. The CSO is a facility for astronomical research and instrumentation development located near the summit of Mauna Kea that began operation in 1986. The decommissioning of the CSO is due to the construction of the next generation of radio telescope, the Cornell Caltech Atacama Telescope (CCAT) to be located in Chile.

5.2.1.20 Range Maintenance Facility

The Army proposes construction of a new building that would centralize range maintenance storage, communication, and equipment. Range control and maintenance operations are currently housed in eight

temporary buildings dispersed throughout the PTA cantonment area, leading to inefficiencies, excessive travel, reduced response times, and miscommunication between different range elements. Most of these facilities are Quonset huts, with characteristic curved roofs that render much of their interior space useless. Electrical and mechanical systems are antiquated and require excessive maintenance funding. The shop facilities lack adequate ventilation and operating sprinkler systems. As a health and safety issue, all welding must be conducted outside by order of the FD. Dispersal of maintenance activities has reduced the quality of service provided to range users due to inefficient split functions.

PTA does not have adequate facilities of this type to centralize range maintenance requirements and to meet existing mission requirements by ensuring Soldiers using PTA have access to ranges that can meet their training needs. Funding shortfalls over the years have limited maintenance and renovations in the range area, resulting in increased requirements to overcome existing backlogs. The need for these buildings is also centered on demands of the transformed forces and units for specific functions that support mission or equipment maintenance needs.

The facility would include administrative space for range maintenance, a carpentry shop, a welding shop, target and raw material storage, and parking for personally operated vehicles and other vehicles and equipment. Supporting facilities include potable water system, septic system, electric service and 150-kVA, three-phase transformer, paving, walks, parking, security fencing, information systems, and site improvements. Existing structures would be demolished and replaced by the proposed complex.

Power requirements to operate building systems and equipment would include single-phase, 250-amp service in the administrative space, three-phase/four-wire, 250-amp service in the carpentry shop, and three phase/four-wire, 400-amp service in the welding shop. A 150-kilovolt transformer would also be required. Air conditioning, estimated at 10 tons, would be provided for administrative space only. Mechanical ventilation would be provided in the warehouse and shop areas. Water would be connected to an existing line approximately 45.7 m (150 ft) north of the proposed site. Sewage would be collected and treated by a standard septic system, including septic tank and leach fields, to be located immediately to the west of the site.

5.2.1.21 Packaged Sewer System

The Army proposes to construct a sewer system at PTA to provide an advanced level of treatment of sewage along with a collection and discharge system for Cantonment Area effluent. This system may include a packaged system with lagoons that would have the capability to meet the effluent limitations identified in the installation NPDES permit. This project would provide the garrison with a greater capability to handle wastewater, to achieve efficiencies over the current processes. For example, wastewater resulting from use of the vehicle wash racks at PTA is entirely self-contained, non-discharging of waste water. All sediment used in the filtration process is collected and the water would be recycled continuously. The planned system would have a 100,000 gallon per day capacity.

Sewage facilities would comply with the Military Standard and UFC 3-240-07FA Sanitary and Industrial Wastewater Collection. This project would be dependent upon successful implementation of the PTA Production Well project.

5.2.1.22 Storm Drainage System

The purposes of this system would be to simply drain excess rain water from paved streets, parking areas, sidewalks, and roofs, and discharge water safely away from the main portion of the Cantonment Area. A re-designed Cantonment Area with new construction and move paved and covered areas, would require stormwater diversion from impervious surfaces to avoid pooling and damage to infrastructure.

The stormwater system design, which is yet undetermined, would depend upon the final planned design of the Cantonment Area with new construction. A Cantonment Area-wide system would require extensive clearing, grubbing and trenching, and grading of soils to run piping underground to reach existing and newly planned facilities.

5.2.1.23 Communication System (Installation Wide)

The system would use, to the extent possible, existing utility poles to run fiber optic cabling throughout the Cantonment Area, and to some portions of the Range Area. A satellite dish would also be installed at a location within the Cantonment Area. The Range Area may be supported by telecommunication towers. This plan is still in the early development phase. Limited additional information is available.

The installation currently has dedicated telephone lines, but digital or cellular communication is not reliable. This project would improve communication throughout the installation, and the technology capability (to support some digital capability) at some locations in the Range Area.

To the extent practicable, telecommunication lines would be run along existing poles. New poles could also be built to support additional lines. The Army may either trench or bore in the Cantonment Area to run subsurface telecommunication lines. Boring is generally identified as being more costly than trenching, but inflicts less damage to the ground surface, and lines can be run several meters below grade to avoid buried artifacts near the soil surface. The Army may, if needed, construct communication towers that may require grading, fencing, foundation (concrete slab), and an on-site generator. If towers are necessary, the Army would comply with all FCC regulations, and USFWS regulations governing the migratory birds.

5.2.1.24 BAAF Realignment

BAAF is used for deploying, redeploying, and resupplying all military units training on Hawai‘i Island. The airfield has one runway that is 1,128 m (3,700 ft) long from east to west, with a total of 335.3 m (1,100 ft) of overruns. The airfield’s relatively high elevation of 1,890 m (6,200 ft) above mean sea level impedes aircraft performance and limits the weight of cargo aircraft can safely carry. The airfield operates under substandard conditions due to a relatively short runway, limitations imposed by mountainous terrain, presence of man-made obstructions to the east, winds from the east that increase throughout the day, and maximum tailwind landing restrictions for the C-130 (15 knots) aircraft impede mission accomplishment. Current operations are limited to VFR and approaches and departures only from the west. The pavement is deteriorated in many areas and is structurally inadequate for C-130 loading operations.

The Marine Corps proposes to construct a 1,707 m (5,600 ft) long full strength paved runway with 91.4 m (300 ft) long full strength paved overruns on each end. Total length of full strength pavement would be

1,890 m (6,200 ft) long. The runway would be 30.5 m (100 ft) wide with 7.6 m (25 ft) wide paved shoulders, and realigned by a minimum of 5 percent, possibly to the south, to avoid conflicts and limitations posed by Cantonment Area construction.

Supporting facilities will include site preparation (clear/grubbing, excavation, grading, and storm drainage), a mobile asphalt concrete batching plant, water supply source, and extension of the primary electrical service line from the base camp.

5.2.1.25 Rotary Wing Apron and Aircraft Maintenance Facility

BAAF currently serves 18 UH-60 Black Hawks/ OH-58 Kiowa helicopter aprons, 8 CH-47 Chinook / CH-53 Sikorsky helicopter aprons, and limited C-130 operations. Based upon current authorized units in Hawai‘i, BAAF has the potential to serve up to 32 AH-64 Apache/ UH-60/ OH-58 Aprons for one Assault or Cav Aviation battalion, 8 CH-47/ CH-53 aprons for Army General Support Aviation Battalion (GSAB) and Marine Corps requirements, and 2 MV-22 Osprey aprons as a Marine Corps/ Navy requirement. The Army and Marine Corps further proposes to construct a 45.1 sq. m (48,540 sf) aircraft maintenance facility to support added aviation maintenance requirements.

Existing aircraft aprons and maintenance facilities at BAAF are aged and to not meet current requirements for the CAB to utilize the airfield fully at PTA. Construction of a new maintenance facility includes maintenance shops and offices, parts and tool storage, aviation operations, and all support equipment and facilities, administrative operations, aviation operations area, a hazardous materials storage facility, information systems, fire protection and alarm systems, and EMCS connection.

5.2.1.26 Military Police Station

MP stations are the physical structures required at all Army installations that, along with manpower and operational procedures, are used to restrict access to the installation. Prior to realignment of Saddle Road, Section II to north of the PTA Cantonment Area, the Highway ran through the Cantonment Area, and the former access gate and MP station were co-located at that point. Since Section II of Saddle Road has been realigned, the Army constructed only a new access gate. The MP Station exists at its original location. The Provost Marshal’s Law and Order Purview, Chapter 1 of FM 19-10, requires that the MP Station be as near as possible to a point on the installation that provides effective direction and centralized control of all MP operational elements. For PTA, that point is determined to be co-located with the access gate to provide control over admittance to the installation, provide effective force protection measures and safety for those who work at PTA, and to act as an information center for visitors to PTA.

The project would include parking, lighting, information systems, fire protection and alarm systems, Intrusion Detection System (IDS), and EMCS, curbs and gutters, storm drainage, landscaping and signage.

5.2.1.27 TISA

The mission of the TISA is to provide Subsistence support to dining facilities, units undergoing field training exercises, contingency operations, and other [mission] authorized activities. For example, the TISA would provide stockage/storage for a unit’s basic subsistence provisions when training in the field at PTA. The Army proposes to relocate the existing TISA to the PTA industrial area, to make room for

Battalion Barracks. The PTA industrial area would be used to consolidate similar facility types and better organize the installation Cantonment Area to facilitate more efficient use and operation of the installation.

The existing TISA is dispersed throughout modified Quonset Huts that are old and rapidly degrading, and do not offer adequate storage capacity to accommodate mission activities at PTA.

There are three standard facility design sizes for the TISA; these are small 4,358 sq. m (46,914 sf) gross area, medium 5,540 sq. m (59,627 sf) gross area, and large 8,317 sq. m (89,519 sf) gross area. The appropriate baseline size for a project will form the basis from which the total storage gross sq. area requirement is determined. The Army is still in the planning process for improvements to the Cantonment Area and will determine the appropriate sized facility in a future, tiered NEPA document.

5.2.1.28 DFAC

The current capacity of the existing dining facilities at PTA is as follows: Bldg. T-185/186 (100 individuals), T-190 (40 individuals), and T-270 (40 individuals). TI 800-01 requires that maximum effort will be directed in planning enlisted personnel dining facilities toward the consolidation and modernization of existing permanent facilities, and the replacement of existing temporary facilities with permanent consolidated facilities, when appropriate. At this point, the Army proposes construction of a DFAC with a capacity of up to 2,600 Soldiers and would be up to 5,203 sq. m (56,000 sf) in area.

PTA needs to consolidate facilities throughout the installation to make room for Cantonment Area-wide improvements, and specifically to make room for the proposed battalion billets.

The project would include food preparation and cooking areas, entrance/control area, serving, dining, dishwashing, pot wash, administration, locker area, waste disposal, receiving and loading dock, cold and dry storage, information systems, fire protection and alarm systems, IDS, and EMCS, connection. Design features would include utilities and connections, lighting, paving, parking, walks, curbs and gutters, storm drainage, information systems, landscaping and signage, and heating and air conditioning.

5.2.1.29 Battalion Billets

Billets house unaccompanied enlisted personnel and authorized civilians who are conducting training at a location other than assigned home station (such as RC Soldiers at annual training sites, and AC Soldiers training away from home station).

The proposed billets, or CMUs, would be constructed as funding permits, or as space becomes available in the Cantonment Area over time, to replace currently used Quonset Huts.

PTA needs adequate barracks to accommodate military units deployed to PTA for training. Adequate housing is a significant quality of life issue for all Soldiers. At PTA there is a critical shortfall in temporary housing. This shortfall has developed as a result of inadequate funding over many years. Soldiers deployed to PTA currently use dilapidated Quonset Huts as temporary stay facilities, when not training in the field. Quonset Huts do not meet basic quality of life requirements as discussed in Chapter 2, and do not meet the installation's energy goals as defined in Section 3.16. The rehabilitation of Quonset Huts is not economically feasible, and could never be accomplished in a way to meet Army standards.

Each billet would be approximately 6.1 m (20 ft) wide by 30.5 m (100 ft) long, or about 186 sq. m (2,000 sf) in area; and would accommodate up to 40 Soldiers per CMU. When construction is complete, the Army anticipates up to 37 billets at PTA.

5.2.1.30 Fire Station

The standard Army Fire Station is an emergency respondent facility that supports the needs of Soldiers and civilians during fire and medical emergency situations. By co-locating the Fire Station with BAAF, the facility would also serve to protect military flight-lines. PTA's existing fire station is too small, does not have adequate storage space, and cannot currently meet the mission requirements of the firefighters that man and operate the station. In its current location, the fire station at PTA cannot sufficiently meet its crash rescue mission for protecting the flight line.

Site planning must include criteria to provide sufficient response time; provide adequate site space to accommodate the firefighting vehicular turning radii; provide personnel parking, visitor parking, delivery vehicles; and meet storage requirements for firefighting equipment. The planned facility would be approximately (1,533 gross sq. m (16,500 gross sf) in size. The facility would also be constructed with adequate lighting, storm water drainage, heating and air conditioning, toilet, information systems, fire protection and alarm systems, IDS, and EMCS connection.

5.2.1.31 Physical Fitness Center

Physical fitness is the cornerstone of Soldier readiness. The Army emphasizes the importance of a high level of physical fitness capability for the occupational tasks that Soldiers are required to perform in training and in combat. Physical Fitness Centers are required by the Army to promote the strength and fitness of Soldiers. These facilities also boost morale and support Army core values. There is currently no physical fitness center at PTA. Activity functions include cardiovascular, and free-weight equipment, exercise areas, and a gymnasium and structured activity module/area.

The proposed facility, by Army design standards, is considered an extra small facility offering capacity for 251 to 1,000 individuals, and would be 2,580 gross sq. m (27,771 gross sf) in size. Supporting requirements are laundry, parking, curbs, lighting, toilet, and heating and air conditioning.

5.2.1.32 Multipurpose Storage Facility

Each time a Marine Corps unit deploys to PTA for training they are required to transport all of the equipment they plan on using during training, and then redeploy it back to the home station. The purpose of this facility would be to gain efficiencies in cost and time for transporting unit equipment to PTA. The Marine Corps has a need to reduce transportation costs and reduce their reliance on carriers.

This project is still in the planning phase, but includes construction of a 2,323 sq. m (25,000 sf) permanent facility capable of storing enough equipment for a company.

5.2.1.33 DPW Maintenance Shop

Current DPW maintenance facilities at PTA do not provide adequate storage or work bays to serve sustainment maintenance and repair functions for DPW vehicles and equipment.

The DPW Maintenance Shop would be located in the industrial area of the installation, to be co-located with the DOL Base Yard and tactical vehicle maintenance shop. Planners have not yet selected a design size for this facility. The facility would be constructed with parking, lighting, storm water drainage, heating and air conditioning, toilet, information systems, fire protection and alarm systems, IDS, and EMCS connection.

5.2.1.34 DOL Base Yard

The Base Yard would consist of an open storage area, storage building, and storage shed. The open storage area would be similar to a parking area, suitable for the storage of material and equipment that does not require any protection from the elements. These structures are generally improved or semi-improved areas that do not provided any cover or protection from weather. A storage building is enclosed with roof, side and end walls, and possibly includes loading docks and material handling equipment. A storage shed is a roofed structure that is not fully enclosed, and is used for storing material that requires maximum ventilation, or material that does not require complete protection from the weather.

PTA does not have adequate storage to support the training mission at the installation. Currently, units that deploy to PTA to conduct semi-annual training must transport all equipment to- and from the installation. A DOL Base Yard would provide some infrastructure at PTA to support long-term storage of unit equipment.

The Army has a need to reduce the costs of deploying to PTA for training, and to reduce the time it takes to ready and prepare units to deploy to the installation to conduct their higher-level echelon FSO METL tasks.

The DOL Base Yard would be sized to meet mission requirements and available land area. The Army has not yet determined a suitable size. The storage areas are generally graded, drained and surfaced with concrete, asphalt or other material in order to stabilize the supporting ground. The storage areas are usually fenced-in for security purposes with a single entry/exit point. The fences are normally 1.8 m (6 ft) to 2.4 m (8 ft) high, and the fence may be topped with three strands of barbed/concertina wire. Perimeter and interior lighting (light poles 6.1 m [20 ft] high) would be installed according to the size of the storage area and the materials and equipment stored there.

5.2.1.35 UCAS Range

This proposed range would be used to train Marine aviators in conducting precision support fire to ground-based troops, simulating combat in an urban environment. CAS tasks challenge aviators to acquire and engage enemy ground targets, and integrate air and ground combat maneuvers in close proximity to friendly forces. Ground forces have increasingly relied on airpower integration to be successful in Iraq and Afghanistan.

The UCAS would employ use of unimproved roads capable of supporting tank and heavy wheeled vehicle traffic. Roads would be approximately (6 m) 20 ft in width to support tactical vehicle movement throughout the range. The site would require erosion control, stormwater permits, and management plans to support environmental compliance and minimize damage to the range from weather when combined

with ground maneuvers. The selected range area may require ground softening, grading, construction of firing pads / firing points, and placement of several shipping containers (sea/land storage units) to simulate buildings. Each container would be approximately 2.4 m (8 ft) wide x 2.4 m (8 ft) high and 6 m (20 ft) long, stacked adjacent to and on top of each other, from one to five levels high. The selected site would further require EOD support for the survey and clearance of MEC/UXO to facilitate a safe construction and operation area.

The range would incorporate targets, to include hard wired and remote controlled systems that are programmable (e.g., SITs, SATs, MITs, MATs, and full size replica targets of armor vehicles and infantry). Targets systems would be protected from damage by live-fire using dirt berms, steel or concrete coffins, and use steel plates to withstand .50 cal projectiles. Target emplacements include the following: 25 SITs, 25 SIT door targets, 50 SIT window targets, 10 SATs, 8 MITs, 8 MATs, 10 full size replica armor vehicle targets, and 50 full size replica infantry targets.

5.3 CUMULATIVE IMPACTS AND SUMMARY TABLE

Table 5.3-1. Summary of Potential Cumulative Impacts

Valued Environmental Resources Considered	Modernize Infrastructure, Ranges, and Cantonment Area at PTA	Other Projects Outside PTA Boundaries	No Action
Land Use/ Recreation	⊙	⊗	○
Airspace	○	○	○
Visual Resources	⊙	⊙	○
Air Quality	⊙⊘	⊙⊘	○
Noise	⊙⊘	⊗	○
Transportation/ Traffic	⊙	⊙⊘	○
Water Resources	⊙⊘+	⊙⊘	○
Geology/Soils	⊙⊘	⊘ ⊗	○
Biological Resources	⊙⊘⊗+	⊙⊘	○
Cultural Resources	⊗	⊗	○
HM/HW	⊙⊘	⊘	○
Depleted Uranium	○	○	○
Socioeconomics/ Env Justice	○+	⊙+	○
Public Services/ Utilities	⊙	⊙	⊙
Wildfires	⊙⊘⊗+	⊘⊗	○
Sustainability	⊙	⊙+	○

LEGEND
⊗ = Significant impact
⊘ = Significant impact mitigable to less than significant
⊙ = Less than significant impact
○ = No impact
+ = Beneficial impact

Resource Areas

5.3.1 Land Use and Recreation

This section discusses cumulative effects on land use and recreation. Existing land uses or designated land uses, such as those in general plans or in Federal or State resource planning documents, comprise land use. Recreational resources are those areas that are designated as recreation areas or areas where people seek out and gather for recreation either in urban settings, open spaces or other natural areas.

For the evaluation of cumulative impacts relative to land use and recreation, the ROI spans the Hawai‘i Island. Land use policy in Hawai‘i is developed at the both the State and local level; however, land use planning and regulations are made at the county level. In this section, cumulative land use impacts have been assessed at the island-wide level but are discussed relative to similar or surrounding areas where appropriate.

Cumulative impacts for land use were assessed based on the existing land use trends in Hawai‘i. These trends provide the context for determining whether the projects would contribute to adverse trends occurring in the ROI. The impacts of the proposed projects added to the past, present, and reasonably foreseeable future project impacts to determine if the incremental impacts of all the projects would contribute to the historical or existing trends in land use and recreation. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis.

Cumulative Impacts to Land Use

Significant Impact – Projects proposed outside PTA boundaries on Hawai‘i Island include various construction, demolition, and alteration projects; military training exercises/tests; and MEC/UXO clearance activities. Development on Hawai‘i Island has resulted in an ongoing loss of agricultural land. The cumulative impacts as a result of the other projects in the ROI, but located outside PTA boundaries, could be significant. However, acreage from the proposed projects, such as the realignment or construction of streets or development activities on Hawai‘i Island, are not presently known. Future land use analyses should address the cumulative impacts from these projects.

Less than Significant – Basic land use would not be changed at PTA under any of the proposed projects. Land acquisition at PTA would not be required for the projects identified in Table 5-1. The areas considered for range modernization or new ranges would continue to be used for ongoing military training operations with no expansion of current impact areas at PTA.

Cumulative Impacts to Recreation

Less than Significant – The cumulative impacts on the access to natural resources management and recreation resources would not change from the current conditions. Cumulative impacts on Hawai‘i Island relative to hunting would be the same as current conditions. Individually, the proposed actions would not result in significant impacts on natural resources management and recreational lands. Cumulative impacts on recreational land use and natural resource management would not be significant. There would be less than significant impacts due to potential impacts caused by proposed and planned training and related activities that may produce increased fire danger.

5.3.2 Airspace

The ROI for cumulative impacts related to airspace would be the same as described under Existing Environment, Section 3.1. Factors considered in determining the cumulative effect to airspace in relation to the projects identified in Table 5.2-1. Because of the well-developed nature of the national airspace system and air traffic control with its many rules and regulations, procedures, and limitations, airspace is not particularly vulnerable to adverse, incremental, cumulative effects.

Since 2000, civilian general aviation traffic at Hilo International Airport has dropped by 41% from 32,908 operations to 13,466 operations in 2008. Kona International Airport has seen an increase in GA traffic with 47,021 operations in 2000 and 70,064 operations in 2008 (County of Hawai‘i data book, 2009). However, military flight activity on Hawai‘i Island has dropped by 75 percent since 1994 (Andera, 2003; Dohmen, 2004).

Modernization of PTA includes the proposed development of an UAV facility, realignment of the rotary wing apron at the BAAF, and an UCAS range on PTA. For these future projects, the required FAA consultation and review process for airspace use would eliminate the possibility of direct adverse impacts on airspace use. All aircraft operations at the BAAF would continue to be subject to air traffic control clearances and instructions. Should the proposed BAAF rotary wing upgrade, UAV flights or UCAS range occur, operations would be conducted in accordance with FAA procedures piloted or remotely operated aircraft. Any UAV flights primarily would be contained within restricted areas or warning areas, but may operate outside of restricted areas so long as the aircraft remain in positive control (when its position is determined by direct radar observation).

In addition to the modernization projects at PTA, several planned projects involve helicopter stationing or training activities such as the Army’s HAMET action, the USMC’s plan to introduce helicopter squadrons on the Hawai‘i Island, and a possible UCAS range at PTA. The Army’s 2011 EA for the HAMET describes the proposed action to train 260 experienced 25th CAB helicopter aviators for mountainous, high-altitude flights to meet requirements for 25th CAB aircrews to complete high-altitude training before deploying to the theater. HAMET operations would require the USAG-HI to conduct operations from Kahului Airport, a civilian facility with permissions and extensive coordination with airfield management prior to the co-use of civilian facilities. Pilots conducting HAMET flights would follow standard FAA procedures for flights conducted in and out of controlled airspace. The overall volume of flights that HAMET would contribute (3%) would be small compared to current commercial and recreational air traffic and pilots could be redirected temporarily through FAA air traffic control. In addition, Army helicopters would use the Island Traffic Advisory Frequency when outside of PTA and while conducting HAMET operations. This Island Traffic Advisory Frequency is the same radio frequency that all the civilian airplanes, tour helicopter companies, and military helicopters use to de-conflict air traffic and communicate (U.S. Army, 2011).

The USMC is preparing an EIS to evaluate the introduction of up to two Marine Medium Tiltrotor (VMM) squadrons (total of 24 MV-22 aircraft) and one Marine Light Attack Helicopter squadron (18 AH-1Z and 9 UH-1Y helicopters) with construction of improvements to accommodate the new aviation squadrons, improvements to USMC training facilities in Hawai‘i, and use of DoD training areas statewide. Proficiency training would occur at PTA, whereas, stationing and infrastructure improvements to accommodate the new mission would occur primarily on Oahu. Military aircraft would continue to be

flown in accordance with FAA regulations and within recommended altitudes established by the FAA, the State of Hawai‘i, and restricted airspace (R-3103) over PTA.

Cumulative Impacts to Airspace

No Impact – Military pilots operating outside SUA would follow these regulations, minimizing the potential for adverse cumulative airspace use impacts. The required scheduling process for SUA by the military would eliminate the potential for adverse cumulative impacts. There would be minimal impacts to airspace associated with activities at PTA or Hawai‘i Island. Flights in support of training activities would not reduce the amount of navigable airspace in the ROI. Additionally, no other projects in the PTA airspace ROI have been identified to have a potential for additive cumulative impacts on controlled or uncontrolled airspace, SUA, military training routes, en route airways, or airfields. The proposed actions would have no cumulative impact on airspace.

5.3.3 Visual Resources

Visual resources are usually defined as the visual quality or character of an area, consisting of both the landscape features and the social environment from which they are viewed. The landscape features that define an area of high visual quality may be natural (e.g., mountain views) or manmade (e.g., city skyline).

For the evaluation of cumulative impacts relative to visual resources, the cumulative ROI for visual resources encompasses PTA and all areas within line-of-sight of PTA. Factors considered in determining significance of cumulative impacts on visual resources include the extent or degree to which these impacts would do the following:

- Introduce physical features that are substantially out of character with adjacent developed areas;
- Alter a site so that a sensitive viewing point or vista is obstructed or adversely affected, or if the scale or degree of change appears as a substantial, obvious, or disharmonious modification of the overall view; and
- Be inconsistent with the visual resource policies of the County of Hawai‘i General Plan (County of Hawai‘i 2005).

Major projects that have or could impact visual resources within the cumulative ROI include the Saddle Road Realignment and the proposed HAMET training.

For the Saddle Road Realignment, the State and County of Hawai‘i assessed in 2010 that improved sections of Saddle Road are, and would be more visually compatible with the surrounding environment than was originally assessed in the 1999 Final EIS. The realignment has also opened more scenic vistas for motorists to enjoy when travelling along the road. The State and County of Hawai‘i further are implementing mitigation measures to insure no adverse effects to the Saddle region would occur as a result of that realignment. Some of these mitigation measures include blending final cut and fill slopes along the road with the surrounding landscape; applying rock slope surface treatment at cuts (in the terrain where new road is laid) to provide a natural appearance; build-in natural-appearing guardrails where needed; and create gradual transition areas in places where trees and shrubs are to be cleared.

For the HAMET action, the Army assessed 16 representative viewpoints based on what were considered sensitive to cultural practitioners, sight seers, and residents. The Army conducted a spatial analysis in order to determine the potential that sightseers or cultural practitioners at these locations could observe helicopter training. The Army determined through analysis that HAMET flights would be unlikely to obstruct the view of natural beauty sites within the Hāmakua and North Hilo planning districts. In addition, those sites were not accessed by large amounts of people. The proposed flights and related impacts, such as air quality, would be intermittent in nature, lasting only the duration of the action. Finally, this area is not identified as an area of high scenic quality.

Cumulative Impacts to Visual Resources

Less than Significant – Construction projects proposed, when considered with cumulative projects, would be generally consistent with visual resource polices. Many of the projects and activities in the PTA ROI would be obscured by vegetation or terrain or at such a distance as to be indiscernible. The areas within PTA are not identified as being of "high scenic quality" (i.e., designated scenic corridors or locations) and are not readily accessible to, or used by, large numbers of people. Projects constructed in or proposed for the viewshed areas surrounding PTA would not introduce new physical features that are visually substantially out of character, or obstruct or adversely alter and sensitive viewing points or vistas.

It is generally accepted that the most significant view plane is from the sea looking towards Mauna Kea. Given that the PTA Cantonment Area cannot be seen from the base of Mauna Kea, it is unlikely that construction projects, including municipal projects, would have a significant impact to the visual character of the ROI.

5.3.4 Air Quality

This section discusses cumulative effects on air quality including emissions of pollutants and the resulting pollutant concentrations in ambient air.

As discussed in section 3.4.1, the ROI for air quality issues depends on the pollutant and emissions sources being considered. Secondary pollutants such as ozone are those that are formed through chemical reactions in the atmosphere from precursor pollutants and have the potential to reach island-wide. The ROI for a primary pollutant such as PM is generally much smaller, reaching areas within a few miles from the emissions source. Impacts from both secondary and primary pollutants can vary depending on the rate of emissions from a source, the elevation of the source, the type of pollutant, and the meteorological conditions that limit its dispersion and dilution during transport away from the emissions source.

Cumulative air quality impacts would occur when multiple emissions sources affect the same geographic areas simultaneously such as when projects overlap or there are consecutive projects that prolong the air quality impacts to a given area when they occur over an extended period of time. The major emission sources associated with the modernization projects at PTA include secondary pollutant ozone precursors (VOC and NOx) and directly emitted PM from construction activities, vehicle traffic and troop training exercises. Emissions of other pollutants are expected to be insignificant and would not negatively impact air quality conditions. Overall the projected effects of the Proposed Action on air quality are expected to

be minor, and their regional influence is anticipated to be localized so that incremental effects on the ROI will also be minimal.

Historical Cumulative Effects

Air pollution levels in Hawai‘i have been historically low due to the small size and isolated location of the islands. The NAAQS for ozone have not been exceeded in Hawai‘i in the past decade, despite the cumulative emissions from vehicle traffic, aircraft operations, agricultural operations, commercial and industrial facility operations, and construction projects throughout the islands. In fact, almost all of the monitoring data collected in recent years for the area shows that all of the ambient air quality levels remain well below the values of the relevant State and NAAQS. Training conducted by the Army in the past has resulted in short-term, minor, and localized effects on air quality with little to no measureable effects on air quality from these past actions (USAEC, 2009b).

PTA is situated between three volcanoes on the Hawai‘i Island. Volcanic activity generates gaseous emissions of sulfur dioxide (SO_2), as well as other gases including hydrogen sulfide, hydrogen chloride, hydrogen fluoride, and trace metals like mercury, which reacts with sunlight, oxygen, dust particles, and water in the air to form VOG. VOG creates a haze which obscures visibility and contributes to development of acid rain.

Hawai‘i is currently considered an attainment area for PM-10. Nonetheless, Hawai‘i Island, and land adjacent to PTA have experienced occasional events in which dust impacts have had an adverse effect on air quality in the region. The soil at PTA is fine, volcanic ash which is particularly prone to wind erosion and dust generation. Furthermore the land at PTA is sparsely vegetated and susceptible to fugitive dust generation from construction activities, training exercises, off-road vehicle travel, and wind erosion.

Cumulative Impacts to Air Quality

Significant Impacts Mitigable to Less than Significant - Several of the proposed modernization/construction projects at or in close proximity to PTA are predicted to at least partially overlap in their construction timeframes.

PM emissions are generated in conjunction with construction activities, vehicle traffic from vehicle convoys, construction vehicles, POVs, as well as vehicle maneuver training on unpaved gravel or dirt roads inside the installation and on off-road trails. Other sources of fugitive dust may occur from wind erosion in areas with sparse vegetation and exposed soils as well as from military helicopter flight operations and fixed wing aircraft operating at BAAF. Ordnance firing and detonations may also generate PM emissions during live-fire training exercises.

Spatial separation among these various construction projects would minimize or eliminate cumulative PM-10 effects from these projects with overlapping construction timeframes. The impacts from fugitive dust from construction vehicle activity on unpaved roads would also be significantly reduced through mitigation programs.

Recommended Mitigation 1 – The Army could, as necessary and in accordance with existing installation policy, apply dust control palliative products on unpaved military vehicle trails/roads where construction activities would occur.

Recommended Mitigation 2 - Construction contractors would also be required to comply with the provisions of Hawai'i Administrative Rules, Sec. 11-60.1-33 on Fugitive Dust as part of the requirements of their construction contracts. Implementing these measures would avoid exceeding the PM-10 standards and any impacts to visibility.

Two long-term road construction projects that are currently ongoing include the Federal Highway Administration's Six-year Highway Modernization Plan to increase highway capacity and improve safety on Hawai'i Island, and the Army's Saddle Road Realignment project that will straighten, repave, and separate military traffic from motorists. These road construction projects could create short-term impacts to CO due to the interruption of normal traffic flow. As a result of the high traffic volumes and reduced speeds, vehicles will also be increasing fuel burn and other criteria pollutant emissions such as NOx and VOC which are precursors to ozone. Temporary, localized impacts to air quality would also be anticipated during construction from the generation of fugitive dust and the emissions from construction equipment and vehicles. Impacts to PM-10 during the construction phase could be mitigated through employing standard BMPs similar to those identified above.

Less than Significant - Emissions from construction projects, vehicle travel, aircraft operations, wind erosion, troop maneuver exercises, and weapons use in the air quality ROI are expected to generate minor increases in air pollutants.

Aircraft flight operations, maneuver, and live-fire training conducted by troops at PTA and vehicle travel on un-paved roads and off-road areas, will be a recurring activity that contributes to fugitive dust. Additional training activities may reduce vegetative cover in some of the range areas which could result in increased susceptibility to dust generation from vehicle travel. Live-fire and maneuver training can disturb soils and vegetation through activities such as dismounted movements, vehicle travel, and trenching and digging. Fugitive dust emissions would also be generated from helicopter landing areas and training events where helicopter crews hover aircraft over ranges during live-fire exercises. The removal of protective vegetation and continuous aircraft/vehicle use in these areas increases the potential for wind erosion of disturbed soils and, as a result, increase the generation of fugitive dust. Fugitive dust generated by training and associated vehicle activity would be widely dispersed due to the winds in the area and would not be expected to result in exceedances of fugitive dust standards outside of the range. The cumulative air quality effects from these other sources of PM-10 are expected to be below the General Conformity *de minimis* levels and therefore less than significant.

Construction equipment, aircraft operation, and vehicle traffic and are also important sources of secondary pollutant ozone precursor emissions. From a cumulative perspective, modernization projects at PTA would do little to alter overall vehicle and aircraft traffic. The proposed actions will involve the temporary use of heavy equipment that would generate short-term exhaust emissions from the operation of construction vehicles during the building period. Motor vehicle traffic from troop maneuver training and POVs traveling from the existing range areas to newly modernized range areas would also generate a slight increase in vehicle exhaust emissions. This would be due to the additional travel distance required to drive to the proposed range locations. Even though vehicle related emissions would slightly increase, cumulative emissions of ozone precursors would be minimal, these emissions would be temporary and would have too small of a net increase in ozone precursor emissions to have a measurable effect on ozone

levels. Consequently vehicle traffic and construction equipment cumulative air quality impacts from secondary pollutants would be less than significant.

The potential exists for aircraft flight activity to increase in the future as other modernization projects at PTA are completed and come on-line. UAV flight activity is expected to be minimal and have little effect on ambient pollutant concentrations. In addition, modernizing the range infrastructure will not result in additional helicopter activity at PTA. Therefore, cumulative impacts of emissions from future increased aircraft operations are considered less than significant.

The Army is also implementing several projects at PTA that will serve to accommodate the future permanent stationing of the 2/25th SBCT. This includes adding tactical armored vehicles and support vehicles to the training inventory used at PTA. The construction of new facilities and support infrastructure as well as improvements to existing structures will provide necessary training required for an SBCT.

The 3rd Marines have also proposed a plan to further develop joint training facilities at PTA and create additional joint training complexes at PTA to support live-fire and maneuver training, urban warfare, convoy live-fire training, and weapons training requirements. As a result, emissions from the 2/25th (and other Army unit) tactical vehicles and other Marine Corps tactical vehicles, in addition to heavy construction equipment would occur. However it's expected that the emissions from the military vehicle engines, temporary use of construction equipment and the fugitive dust generated during construction activities would not be generated in sufficient quantity to have meaningful effects on ambient air quality conditions or negatively affect the attainment status of the project area. Consequently, the increase in emissions from activities associated with the permanent stationing of the 2/25th SBCT and use of military training facilities by the 3rd Marines would have a less than significant impact on air quality.

The Army's 25th CAB has proposed to implement high-altitude mountainous environment training). The Marine Corps is also proposing a new mission to provide proficiency training of pilots in the MV-22 tiltrotor Osprey aircraft and H-1 Cobra and Huey attack helicopters at the proposed UCAS range, and other ranges as they are available (e.g., IPBC), in support of III Marine Expeditionary Force elements stationed in Hawai‘i. Emission sources associated with these projects may include military helicopter engines and fugitive dust from helicopter landings and take-offs. Localized fugitive dust can be generated by wind effects on exposed soils and unpaved roads, and dust would be expected from these aviation training operations. It is expected that the emissions from military helicopter use from HAMET and MV-22 and H-1 aircraft proficiency training at PTA would have a less than significant impact on air quality conditions due to the limited number of missions. It is expected that emissions from other UAV flight activity and military helicopter use at PTA associated with the modernization of the ranges would also be minimal. These activities would have little effect on ambient pollutant concentrations and would not contribute to cumulatively significant impacts to existing air quality.

An MEC/UXO clearance project on the former Waikoloa Maneuver site and Nansay live-fire training sites could have impacts on air quality if open burning/open detonation is used as a treatment approach to dispose of the materials. Open burning in the ambient air or in a receptacle does not provide for control of combustion of gaseous or particulate emissions and they are emitted directly in to the air. A project by Caltech is also scheduled to decommission and remove a Submillimeter Observatory from near the summit of Mauna Kea beginning in 2016. The project has the potential to generate emissions associated

with the use of heavy equipment and fugitive dust from demolition activities that would return the site to its natural state. The MEC/UXO removal and observatory decommissioning projects would be expected to have none to less than significant impacts on air quality conditions due to their distance from PTA and elevation of the site at Mauna Kea that could limit the dispersion and dilution of pollutants during transport away from the emissions source.

As a result of historical air quality conditions on the island, overall cumulative air quality impacts from construction equipment, aircraft operation, and vehicle traffic associated with the proposed action, in combination with emissions from other DoD and Non-DoD projects, and the continuing emissions from other emissions sources in the ROI are not expected to violate any state or NAAQS. Therefore the proposed Actions, when considered in combination with other past, present, and reasonably foreseeable future actions, would not be cumulatively significant to impact existing air quality conditions.

5.3.5 Noise

Determining the cumulative noise impacts of spatially related projects, such as those listed in Table 5-1, creates a unique challenge. Due to the complexity of calculating noise impacts, modeling is typically used to create contours that present the location and amount of noise impact, based on the selected metric. Normally, modeling is completed during the environmental review of an individual project and metrics are selected based on best practices for noise analysis (e.g., DNL for measuring human annoyance). Many of the projects being considered in the cumulative impacts analysis are in the early planning stages, with few details available to accurately provide a quantitative analysis of the cumulative noise impacts. Therefore, this section presents a qualitative discussion of the relevant projects from Table 5-1 with the potential for cumulative noise impacts. It should be noted that each future project would undergo a NEPA review with more detailed information on specific noise impacts.

The ROI for cumulative noise impacts depends on the intensity of noise generation. For most common noise sources, the ROI is limited to areas within 0.5 mile (1 km) of the noise source. High intensity noise sources, such as ordnance detonations, may have an ROI extending several miles from the noise source. Generally, this area includes PTA and its adjacent environs. Therefore, the ROI for cumulative noise impacts is identical in scope to the ROI used to discuss PTA noise impacts in Chapters 3.5 and 4.5 of this document.

Several planned projects identified in Table 5-1 at PTA involve helicopter stationing or training activities such as the Army's HAMET action, the proposed UCAS range, and the USMC's plan to introduce helicopter squadrons on the Hawai‘i Island. The Army's 2011 EA for the HAMET describes the proposed action to train 260 experienced 25th CAB helicopter aviators for mountainous, high-altitude flights to meet requirements for 25th CAB aircrews to complete high-altitude training before deploying to the theater. HAMET operations would require the USAG-HI to conduct operations from Kahului Airport, a civilian facility with permissions and extensive coordination with airfield management prior to the co-use of civilian facilities. Pilots conducting HAMET flights would follow standard FAA procedures for flights conducted in and out of controlled airspace. The overall volume of flights that HAMET would contribute (3%) would be small compared to current commercial and recreational air traffic and pilots could be redirected temporarily through FAA air traffic control.

The USMC is preparing an EIS to evaluate the introduction of up to two squadrons (total of 24 MV-22 aircraft) and one Marine Light Attack Helicopter squadron (18 AH-1Z and 9 UH-1Y helicopters). Proficiency training would occur at PTA, whereas, stationing and infrastructure improvements to accommodate the new mission would occur primarily on Oahu. Military aircraft would continue to be flown in accordance with FAA regulations and within recommended altitudes established by the FAA, the State of Hawai‘i, and restricted airspace (R-3103) over PTA.

Only a limited amount of detail is available regarding the noise impacts for the majority of the projects identified in Table 5-1 at PTA and for surrounding land uses. Based on the review of the proposed and planned projects, several have the potential to create noise impacts. Additional data would be needed (such as noise models and contour maps) in order to compute the sum of all noise levels and assess the spatial relationships of noise impacts. Further analysis completed in these project-specific environmental reviews should be used to determine whether the cumulative impact exceeds established significance thresholds, particularly for aircraft and live fire operations (whereas construction activities and maneuver operations are less likely to result in significant cumulative impacts). For example, while it is not currently possible to determine whether HAMET and USMC MV-22 training at PTA could be significant when added to the existing operations levels at PTA, future noise analyses should address the cumulative noise impacts using modeling data from each of these projects. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis.

Cumulative Impacts to Noise

Live-fire training is the dominant source of noise at PTA. Under existing noise conditions for small arms fire, Noise Zone III is fully contained on the installation. Noise Zone II is mostly contained within the installation boundary with the exception of one portion, southeast of the Cantonment Area (extending from firing points northeast of the impact area) (Figure 3.5-2). Noise Zone II in this area extends into designated forest reserve land, but the level of noise is considered acceptable for the area (U.S. Army, 2010). No incompatible land uses exist on or off the installation within the Noise Zone II noise contours. Under existing conditions for large caliber weapons fire, Noise Zone III contours are contained mostly on the installation with the exception of several small areas north of the installation, extending up to 200 m (656 ft) into forest reserve land. Noise Zone II contours also extend into forest reserve land at that same location. After conducting modeling, the Army determined that there are no incompatible land uses on or off the installation within Noise Zones II and III noise contours from large caliber weapons firing (U.S. Army, 2010).

Noise Zone II from the proposed IPBC of the IPBA in the Western Range Area extends into areas outside if the impact area where there have been historically documented occurrences for the Hawaiian Hoary Bat, Hawaiian Hawk, and the nene. Direct impacts from live-fire noise to these species are addressed in Section 4.9. No other noise contours from live-fire training extend to the Western Range Area (see existing noise contours (Figure 3.5-2). No new noise contours would extend off the installation boundary as a result of operating the IPBC.

Noise producing activities at PTA that are unassociated with modernization projects include military live-fire training, and military aircraft maneuvers or nonlive-fire operations. Civilian sources of noise include traffic from Saddle Road, which does not considerably contribute to noise conditions at or outside the installation.

Less than Significant Impacts to Significant Impacts Mitigable to Less than Significant - Noise generated from construction is generally considered temporary. Construction noise proposed heard at the Cantonment Area from proposed PTA modernization projects, however, may persist over an approximate ten year time period. It is possible that persistent construction-related noise over this extended timeframe could result in an overall incompatible land use in the Cantonment Area. If multiple construction projects would not occur simultaneously (more of a real world scenario given a lack of DoD funding resources), it is more likely that construction noise would remain as an annoyance to Military and civilian employees working in the Cantonment Area.

Recommended Mitigation – Mitigation measures to be considered for construction activities may include, but not limited to, restricting construction activities by time of day to avoid persistent noise exposure, using different equipment or construction methods to limit noise exposure, temporary relocation of PTA personnel to offices/buildings located farther away from construction activities and/or offices facing away from construction areas, and performing periodic noise measurements to determine construction noise levels as compared to background noise levels.

Less than Significant – Planned new live-fire ranges, potentially sited in the north, west, and south PTA impact area may require the Army to model and adjust existing noise contours, depending on the location, training type and duration, and weapons system type proposed for use at those ranges. Opening up new areas of the PTA impact area particularly, could modify the Zone II contour specifically. The Army would conduct the appropriate level of noise analysis in subsequent modernization projects to determine the cumulative impact of those actions when coupled with existing noise conditions. It should be noted that no new training mission or weapons system is identified as part of the Army's proposed modernization list; and therefore, without modeling, the Army presently anticipates less than significant noise impacts from those actions.

The proposed HAMET project includes helicopter operations at PTA with landings and takeoffs at the BAAF. The HAMET EA (2010a) states that the noise impacts from helicopter operations would be less than significant. Specifically, the project "would likely result in Zone II noise contours in the immediate vicinity of training flight paths and either below or within Zone I noise contours surrounding the training flight paths" which is compatible with the surrounding land uses (U.S. Army, 2011). In addition, conservation measures to reduce helicopter noise impacts would include maintaining a minimum altitude of 610 m (2,000 ft) during flights.

The USMC prepared a 2009 EA covering construction and operation at PTA of a MOUT facility, CLF range, and a live-fire grenade/shoot house with the enhancement of three FOB sites. The EA stated that noise impacts due to the construction activities would not be significant. Furthermore, the noise impacts due to additional live fire operations would be periodic in nature and the impacts would not be significant.

The Navy's proposed mock airfield and associated targets at PTA would provide realistic training opportunities that include carrier air wing strike warfare, mobile EW, time sensitive targets, and IFF radar. The Navy proposed the use of inert bombs in the area of the mock airfield; the noise generated from inert munitions items are generally much lower what is generated from the standard munition item upon detonation.

5.3.6 Transportation and Traffic

Factors the Army considered in determining whether a significant impact to traffic/transportation could occur in relation to projects in Table 5.2-1, include the extent to which the Proposed Action would result in increased traffic in the ROI, and disrupt traffic circulation patterns, and/or cause safety hazards. For the purposes of this analysis, significant effects could occur if traffic flow is degraded to a LOS of E as described in Table 5.3-2 and discussed in the following text.

Table 5.3-2. LOS and Volume Capacity

LOS	Volume/Capacity Ratio	Description
A	Less than 60%	Free-flow operation
B	60% to less than 70%	Reasonably free-flow
C	70% to less than 80%	Flow at or near free-flow speed
D	80% to less than 90%	Borderline unstable
E	90% to less than 100%	Operation at capacity
F	100% or Greater	Breakdown

The County of Hawai‘i and State of Hawai‘i (2010) approximated the ADT on Saddle Road to be 1,400 vehicles per day, and further projected that daily traffic would triple to 4,058 by 2013 resulting from road improvements. After completing realignment of Section I, the State and County of Hawai‘i project that total traffic volumes could rise to over 5,000 by 2020 and 8,125 by 2034 (approximately 6,500 vehicles (80 percent) would utilize the realigned section, and 1,625 vehicles (20 percent) would use the old Saddle Road through Waiki‘i. Portions of Saddle Road currently operate at a LOS of E (passing is unsafe, and the road operates at 90 to less than 100 percent capacity). After improvements are complete, Saddle Road would operate at LOS B (60 to less than 70 percent capacity, reasonably free-flow speed). It should be noted that even with the proposed improvements, the Saddle Road LOS near KMA would remain at a rating of C (70 to less than 80 percent, near free-flow speed) as late as the design year 2034 County of Hawai‘i, State of Hawai‘i, 2010).

The Saddle Road realignment would improve the LOS because current deficiencies would be corrected to incorporate newer design standards. These higher standards will improve sight distances and provide sufficient lane widths and shoulders, and would result in higher operating speeds.

Traffic throughout Hawai‘i Island has increased steadily over the last decade for a number of reasons including, but not limited to, the following factors:

- Population increase (As reported by the Census Bureau 2009 data, the population has grown from 120,317 in 1990 to 172,370 in 2009). This accounts for a growth rate that more than doubles average State growth rate. Hawai‘i Island makes up approximately 13.5% of the total State population.
- Relative steady increase in tourism to the island (the Hawai‘i Department of Business, Economic Development & Tourism (2011) conducted a long-term visitor analysis beginning in 2000 and

forecasting out to 2014 that, even accounting for the 2008 economic downturn, projects an overall steady increase tourism into the foreseeable future[93]).

- Increase in demand for consumer goods from outside of Hawai‘i Island commensurate with growth in population and tourism, and resulting in more trucks and delivery vehicles travelling on Hawai‘i County roadways.
- Implementation of the Hawai‘i Long Term Transportation Plan and roadway improvements as discussed in Section 3.6, resulting in temporary traffic congestion, but having an overall long-term benefit to traffic flow.

For the purposes of this cumulative impacts analysis, the ROI for both the IPBA and the programmatic projects (Chapter 2, Table 2.1-1) is Saddle Road. Actions proposed in the Programmatic EIS do not involve increasing training deployments to PTA. Therefore, the impacts to traffic from transporting Soldiers and equipment to PTA to conduct their semi-annual training would be the same as were analyzed in the Final EIS for the Permanent Stationing of the 2/25th SBCT. In addition, it is infeasible to determine at this time where construction-related traffic for the IPBA would originate on Hawai‘i Island. Primary impacts would occur to traffic on Saddle Road.

Construction traffic on Saddle Road resulting from PTA modernization would include, but not limited to, construction worker POVs, dump trucks, water trucks, and haulers (e.g., flatbeds, stretch trailers, and lowboys) hauling bulldozers, excavators, cranes (for some construction), and other construction equipment. Construction equipment would account for on-site construction activities, including site clearing, grading, foundation excavation, and ground softening, for example.

The proposed action consists of 35 projects to be implemented over a ten year time period with varying levels of construction ranging from 6 months and requiring relatively light equipment, to 24 months and requiring heavier equipment. Traffic associated with modernization construction is expected to remain constant over this time, thereby inflating the ADT on Saddle Road, likely slightly above the projections provided by the State and County of Hawai‘i.

The Army further considers other projects that may increase short- or long-term daily traffic along Saddle Road. Troop drawdown in Iraq coupled with increased dwell time at the home station (discussed in Chapter 1) is expected to bring semi-annual training deployments to PTA at- or approaching average historic training levels (pre- early 2000s). As discussed previously, the baseline for semi-annual training deployments to PTA has been analyzed in prior NEPA documentation. At the time of the 2008 analyses, portions of Saddle road had just begun realignment, but the segment near the Cantonment Area had not been completed. The benefits from Saddle Road realignment to north of the Cantonment Area have since mitigated much of the safety concern (commuter traffic encountering military convoy or construction traffic) near the Cantonment Area at Section II. Furthermore, the 2004 Stryker Transformation NEPA documentation fully analyzed the impacts that SBCT deployments would incur to Saddle Road traffic. That document also proposed the creation and use of a PTA Tank Trail that would aid in mitigating significant impacts from unit movement from Kawaihae Harbor to PTA. The PTA Tank Trail has since been cancelled. The 2004 SBCT provided traffic analysis from added SBCT movements and those impacts to traffic conditions on Saddle Road. That analysis focused on the traffic conditions expected

[93] http://hawaii.gov/dbedt/info/visitor-stats/tourismforecast/

while the PTA trail would have been under construction. The 2004 EIS assessed pre-PTA trail conditions to be "Less than Significant".

Similarly, troop movements to PTA would continue to increase temporarily, and then decrease again due to Joint training activities (e.g., RIMPAC) that occur every two to three years. These increases would be nominal (having minor almost imperceptible impacts) because much of the training at PTA would be aviation maneuvers, only some command and control, or exercise planning-related vehicle traffic may occur along Saddle Road to access the installation.

At this time, it is unclear if the Marines consider proposing range construction for facilities associated with the MV-22 Osprey and H-1 aircraft. If new ranges supporting these aircraft are required, construction-related traffic would be temporary.

Non-military traffic on Saddle Road is also anticipated to increase temporarily with improvements proposed to telescopes on Mauna Kea. More steady increases in non-construction civilian traffic would occur as more visitors access recreational areas nearby PTA.

In summary, the cumulative ADT on Saddle Road is anticipated to increase substantially over the next ten years for the following reasons:

- Rise in population growth resulting in greater use of roadways County-wide.
- Rise in consumer demand resulting in greater use of roadways County-wide.
- Rise in visitor and tourism resulting in greater use of roadways County-wide.
- Near continual construction at PTA.
- Return to the baseline of training at PTA due to increased dwell time at the home station and drawdown of troops from overseas engagement.

Cumulative impacts along Saddle Road must be reviewed in two parts, these are impacts to sections that have already been realigned or may complete realignment in the near future (i.e., Section II, and portions of Section III); and impacts to sections that have not yet been realigned (i.e., Section I and IV, and portions of Section III).

Cumulative Impacts to Realigned Sections

Less than Significant - The Saddle Road Realignment Project is designed to improve the LOS along the entire roadway from E to B, including accommodating projections on traffic increases out to the year 2034 (up to 8,125 vehicles daily). Current traffic projections through the ten year period covered in this EIS were modeled by the State and County of Hawai‘i to be at approximately 5,000 daily. It is feasible to assume that construction-related daily traffic would increase to above State and County projections through 2023, but would be far below the 2034 projections. The improvements from Saddle Road Realignment would easily handle PTA construction-related traffic over the next ten years. Construction-related traffic would not reduce the LOS on completed sections to above B. Therefore, the long-term cumulative traffic impacts are rated at Less than Significant.

Cumulative Impacts to Saddle Road Sections not yet Realigned

Significant Impact Mitigable to Less than Significant – Without modeling, it is feasible to assume that construction-related traffic along unfinished sections of Saddle Road, chiefly Section I and near the KMA, would further degrade traffic conditions, and possibly reduce the LOS from E to F. These impacts could be mitigated through implementing a traffic control plan, issuing press releases, and ensuring construction contracts include limitations on equipment deployments to PTA.

Recommended Mitigation 1 - The Army should work with the State and County of Hawai‘i to prepare a traffic control plan that outlines steps to minimize congestion and maintain access to adjacent properties during construction, and also to maintain access to areas of Saddle Road that serve recreation, including hunting units.

Recommended Mitigation 2 – The Army could consider limiting heavy equipment construction traffic to non-peak commute times to minimize conflicts with other users of Saddle Road, and minimize safety hazards posed by passenger cars encountering heavy equipment.

Recommended Mitigation 3 - Prepare regular Media Releases advising the public when major construction traffic could occur, primarily during phases of construction start-up when heavy equipment would travel to PTA for site clearing, ground softening, etc., and publish the estimated initiation dates and times.

5.3.7 Water Resources

Cumulative impacts on water resources include water supply, surface water quality, groundwater quality, and flooding. The ROI is the same as described in Section 3.7, and includes the region within the installation boundaries or easements where the projects would be implemented, the watershed downstream of the installation boundaries (for surface water impacts), or the aquifer(s) down gradient of the installation boundaries (for groundwater impacts). The ROI of the projects outside the boundaries of PTA vary in size and are not be well defined. In general, the cumulative impact assessment is intended to be descriptive rather than quantitative.

There are no surface streams, lakes, or other bodies of water within PTA boundaries due to low rainfall, porous soils, and lava substrates. Intermittent stream channels quickly dry after rainfall stops. Rainfall is the main source of water that sustains plants and animals in the dryland habitat of PTA. Limited data on surface water quality are available for the PTA watersheds.

There are several intermittent streams that drain surface water off the southwestern flank of Mauna Kea and lie within the same drainage area as PTA. Popo’s Gulch is the closest stream to PTA boundaries. Popo’s Gulch converges with ‘Auwaiakeakua Gulch to drain surface water toward the Waikoloa community to the west of PTA. There are three intermittent streams located within two miles (3.2 km) of the Cantonment Area (Waikahalulu Gulch, Pōhakuloa Gulch, and an unnamed gulch, which collect runoff from the southern flank of Mauna Kea) (U.S. Army and USACE, 2008a). One perennial stream occurs downstream of PTA, the Waikoloa Stream, which heads towards the Kohala Mountains, runs north parallel to State Highway 19, and discharges into Kawaihae Bay through the Waiulaula Gulch (State of Hawai‘i, 2002b).

Similar to surface water quality, groundwater occurrence and quality on the Hawai‘i Island and more specifically at PTA have not been well studied. It is believed that groundwater beneath PTA is at great depths.

Among the trends considered within this cumulative impacts analysis for water resources in Hawai‘i are increases in demand for potable water, due to an increasing population and expansion of urban and residential areas, and an accompanying increase in sources of pollution. In the past, demand for water for agriculture spurred the development of a network of tunnels, pipelines, and canals to transfer water from areas of abundance (usually in mountainous areas with high level water) to the major agricultural areas. This did not come without consequences in the form of lowered water levels in the high level aquifers. Potable water has also been supplied through drilling wells to tap abundant groundwater resources. Drilling and pumping water are expensive, and over pumping can lower groundwater levels, causing salt water intrusion in coastal areas. To prevent overdrawing groundwater resources, the State of Hawai‘i has attempted to estimate the long-term sustainable yield of the major aquifers and to issue permits for groundwater extraction so as not to exceed the sustainable yield.

Groundwater quality has been affected by industrial chemical releases and by septic systems, as well as by pollutants infiltrating urban runoff. These pollutants can threaten available water supplies requiring expensive treatment to make usable water. Similarly, urban expansion and industrial and agricultural development have impacted surface water quality. Nutrients, sediment, toxic chemicals, and debris from nonpoint sources collected by runoff in streams are eventually discharged to lakes, estuaries or the ocean. These pollutants can adversely affect aquatic species or the aesthetic qualities that make Hawai‘i a desirable place to live. The State of Hawai‘i has increasingly addressed efforts at reducing and preventing this type of pollution, through monitoring, setting water quality goals, and permitting and through public education and information campaigns. These trends are expected to continue.

Cumulative Impacts to Water Resources

Significant Impact Mitigable to Less than Significant – The proposed modernization projects in the Cantonment Area as well as the projects listed in Table 5-1 would have a significant cumulative impact on the water resources not only of PTA but the surrounding areas of PTA; however, these cumulative impacts are mitigable. Projects that modify the pervious balance of infiltration would be required to restore that balance through the compliance of Section 438 of EISA, thereby protecting the watersheds, water table, and water quality of the Hawai‘i Island from any adverse cumulative impacts.

Runoff from these projects has the potential for significant adverse impacts to the water quality surrounding PTA. Proposed projects may require a NPDES permit to mitigate potential impacts to the water supply “downstream” of PTA, also known as non-point source pollution. NPDES permitting requires an approved BMP plan (such as an erosion and sediment control plan with the HDOH-CWB) that would discuss pollution prevention measures that must be implemented during construction activities with continuous monitoring. In particular, weekly inspection(s) during and after a rain event are requirements of all NPDES permitted projects. The implementation of BMPs identified in the NPDES permits these projects would be required to obtain would mitigate these impacts to less than significant. To avoid significant adverse cumulative impacts to water quality not only of PTA but Hawai‘i Island, the projects must meet all city, county and State regulation requirements, such as HDOH, SDWB and WWB.

Construction projects generally result in soil disturbance and expose soils to erosion. Several of the projects identified in Table 5-1 involve ground disturbance. Those projects with ground disturbing activities of more than one acre 1 acre (0.4 ha) of land would be required to comply with stringent stormwater pollution prevention requirements, including use of BMPs identified prior to construction in stormwater pollution prevention plans, to minimize potential impacts on surface water quality from soil erosion and sediment loading.

As with the impacts of sediment loading, the effects of chemical contaminant loading could also contribute to cumulative impacts on water quality. However, implementing construction BMPs for stormwater would also address the potential for contaminant transport. Complying with regulatory requirements by implementing Phase 2 stormwater management regulations would ensure that the contributions of sediments and pollutants from the projects would be kept at a minimum. In most cases, complying with these regulations is expected to improve surface water quality compared to current conditions and to keep potential cumulative impacts from exceeding significant levels. Monitoring and the requirement to define and document progress toward meeting pollutant reduction goals would help to ensure that water quality is not degraded further.

Recommended Mitigation: Compliance with city, county, and State regulation requirements and BMPs to protect watersheds and water quality on Hawai‘i Island. Examples of pollution prevention construction BMPs may include:

- Stabilized construction entrances to provide and reduce vehicle tracking of sediments.
- Erosion and Sediment Control Inspections and Maintenance Practices; all control measures would be inspected once each week and following a rain event to ensure effectiveness.
- Built-up sediment would be removed from silt fences when it has reached one-third the height of the fence and or on a bi-weekly basis.

Less than Significant – Water resources impacts are considered less than significant because of the lack of permanent surface water resources and the great depth to the groundwater at PTA, implementation of construction BMPs, adherence to spill prevention and response procedures, and facility designs to account for flooding and runoff potentials. The Army would evaluate the need for and appropriately obtain permits under Section 404 of the CWA to minimize any dredge or fill impacts, as appropriate.

The Army continues to address potential groundwater contaminants resulting from past practices. Infiltrating surface water containing nonpoint source pollutants is not likely to have a significant impact on groundwater quality because the pollutants are typically highly dilute and tend to be adsorbed or biodegraded during infiltration through soils. Spills and other accidental releases may occur infrequently and could have more significant local impacts on groundwater quality. Their occurrence cannot be predicted, but SOPs have been established (i.e., training spill response personnel and those who handle or manage hazardous materials or wastes, provide spill response equipment and supplies, reduce the use of hazardous chemicals and other waste minimization procedures, and use engineering controls (such as secondary containment) to reduce the potential for releases) to reduce the potential and impacts of accidental spills and releases. If spills occur at PTA, the extent of the spill is expected to be fully investigated and characterized and then remediated, in compliance with regulatory requirements. The projects are not expected to significantly increase the cumulative potential for spills that could affect

groundwater quality. Because implementation of SOPs would address containment and remediation of spills, nonpoint source pollutants are not likely to interact with or accelerate any decreases in groundwater quality due to septic tank or industrial releases. There would be no impact to the groundwater supply at PTA because the drinking water is trucked in from areas with abundant freshwater.

Construction projects involving paving, new facilities, and other impermeable surfaces can increase flooding potential by reducing the retention time of runoff and concentrating runoff at selected discharge points, rather than dispersing it over a wide area. The proposed projects are not expected to contribute significantly to an increase in the potential for flooding at PTA or surrounding areas. Impacts from construction projects would not be expected to significantly decrease the amount of stormwater runoff retained by soils in the high-intensity short-duration storms that cause most flooding in Hawaiian watersheds. It is anticipated that each construction project would be designed to accommodate the additional runoff. Phase 2 stormwater management regulations would require MS4s, including Federal facilities, to control runoff in new developments and prevent impacts such as flooding or high stream flows that could increase erosion.

Beneficial Impact -- There could be additional training and new facilities at PTA, with increasing demand for potable water. One proposed modernization project is the test and use of a deep water production well. The deep water production well would provide an adequate water supply to PTA. Use of a production well would provide efficiencies in lieu of trucking water daily to the installation; the deep water well would also support modernization efforts such as the construction and operation of multi-story buildings in the Cantonment Area. A test well would be drilled beginning at a depth of 457.2 m (1,500 ft) beneath the installation to help determine the existence of water (if present), in what quantity, and for water samples to determine water quality. Plans for both the test well and larger deep water production well are in progress. As there are no potable water sources at PTA, if water was found under the installation, it would be a beneficial impact to the area.

5.3.8 Geology and Soils

The PTA ROI for geology and soils includes all areas in which project-related activities may occur, including the General Range Area and the corridors of the military vehicle roads. These projects may contribute to cumulative impacts from soil erosion. The major historic influence on soil erosion in the ROI is the disturbance of soils, slope modifications, changes to drainage features, and loss or disturbance of vegetation due to agricultural conversion, military activities, fires, roads, and development. As soil disturbance can change the soil profile of an area and expose soils directly to rain and runoff, this can increase the potential for soil erosion. Although it is difficult to quantify historic soil loss, many of the lower slopes of Hawai‘i island have experienced vegetation removal and subsequent increased soil erosion rates. Soil erosion and deposition are naturally occurring phenomena in any landscape. Adverse impacts, such as loss of productive topsoil, loss of fragile soils supporting unique plants or endangered habitats, impacts to water quality, and down slope soil movement, may result when erosion rates are accelerated by human or natural disturbances.

In recent years, soil erosion and/or soil loss has been reduced through better management of agricultural lands, stormwater controls on urbanized lands, revegetation of disturbed lands, and an understanding of

the importance of vegetative cover within an area. Notwithstanding, activities that disturb or remove vegetative cover are planned to or will occur in the reasonably foreseeable future, which will continue to result in greater soil erosion and loss than without these activities. Areas with well developed (deep) soils would likely be revegetated and stabilized, however, areas with newly formed soils or shallow soil profiles may not be able to recover from soil erosion or soil loss impacts.

Large construction projects, such as those listed in Table 5-1, are examples of potential soil-disturbing activities that can contribute to soil erosion. These projects, combined with other smaller projects, contribute to the cumulative loss of soils. However, to date, there are increasingly strict regulations at the Federal, State, and often local, level that require implementation of BMPs to reduce the potential for soil erosion from construction sites to protect water resources. The use of BMPs, and other management plans, has the indirect effect of reducing soil erosion at the source. Similar practices can be applied to all ground-disturbing activities, as awareness of the effects of soil erosion on downstream resources increases, and the forward trend in soil erosion is expected to be a continued decrease in erosion from human activities. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis.

The potential for soil erosion or soil loss within the ROI would increase with different land use activities or the level of disturbance planned for at PTA. In areas where soils are thin and fragile, the effects of soil loss may be irreversible. Impacts on water quality from these planned projects and other reasonably foreseeable projects can be mitigated with stormwater management and runoff controls (see Section 4.7). However, areas of intensive use or development cannot maintain a persistent vegetative cover because of the nature of the proposed use.

Cumulative Impacts to Geology and Soils

Significant Impact - Projects proposed outside PTA boundaries on Hawai‘i Island include various construction, demolition, and alteration projects; military training exercises/tests; and MEC/UXO clearance activities. These projects could increase the amount of vegetation cleared, thereby an increase in soil erosion may be experienced. The cumulative impacts to geology and soils from these projects could result in significant impacts, depending on the extent of ground disturbance.

Significant Impact Mitigable to Less than Significant – The construction of facilities, ranges, and infrastructure may increase the potential for soil erosion and vegetation cleared. Proposed projects in the Cantonment Area would require some ground disturbance from construction-related activities. Site clearing and grading for construction of proposed new facilities or infrastructure would expose soils to enhanced erosion by water or wind. However, this impact would be expected to be less than significant because the activities would be constructed on relatively level land using standard erosion control practices and the construction impacts would be temporary. Additionally, much of the proposed construction activities in the Cantonment Area would replace existing facilities or infrastructure; therefore, soils in these areas have already been permanently altered by prior activities. The Army would develop and implement management plans at PTA to address measures such as, but not limited to, restrictions on vegetation and soil monitoring, and buffer zones to minimize dust emissions in populated areas such as the Cantonment Area.

Additional Soldiers may utilize PTA for training exercises, such as the proposed USMC helicopter training and SBCT. Ground training impacts would be contained within the PTA impact area and could create dust or soil erosion in some areas; these effects are expected to be locally significant. The Army would develop and implement a management plan for PTA to address measures such as, but not limited to, restrictions on the timing or type of training during high risk conditions, vegetation and soil monitoring, and buffer zones to minimize dust emissions. However, at the regional level, the effects are not expected to be significant, compared to natural erosion rates.

Recommended Mitigation 1 – The Army would develop and implement an Erosion and Sediment Control Management Plan to minimize dust emissions.

Recommended Mitigation 2 – The Army would continue to implement land rehabilitation projects, as needed, within the LRAM program.

Less than Significant - Although exposure to chemical contaminants in soils from construction activities, particularly in the General Range Area could occur, the risk from exposure to contaminated soils would be low. Even though the construction of proposed or new ranges and facilities would require the conversion of a portion of the range impact area, Soldiers would be exposed to contaminated soils in a limited capacity for a period of days or weeks. The level of chemical compounds present would be below their respective industrial PRGs. Considered together, the potential duration of exposure to the chemical concentrations on the training ranges would represent a low risk to personnel. Airborne pathways (such as windblown contaminated dust) would not be a migration pathway that soils contaminated with munitions constituents would reach receptors outside the Range Area. Therefore, no significant exposures to chemical contaminants related to munitions constituents in soils would be expected.

Future training activities at PTA could include dismounted maneuver training, with vehicle use generally limited to existing trails or roads. Military units using PTA involve mounted, dismounted, and aviation maneuver training. Maneuvers that occur off-road result in soil erosion, soil compaction, and soil loss. In areas of PTA where soils are thin and fragile, the effects of soil loss are irreversible and the impacts from mounted maneuvers in these areas are considered to be significant. Impacts on water quality by proposed projects or activities may be mitigated with stormwater management and runoff practices (see Section 4.7). Maintaining a persistent vegetative cover in areas of intensive use or development is not possible because of the nature of the proposed training. Proposed maneuver training could contribute to significant soil loss and compaction at PTA, and mitigation measures would substantially reduce impacts.

Proposed road or trail construction at PTA could cause soil loss, however the impact would be less than significant. Road or trail construction activities would occur on previously disturbed areas. There would be potential dust and surface runoff erosion from use of roads at PTA. The impacts would not be considered to be significant relative to long term soil loss or erosion because the porosity of soils there coupled with a general lack of gulches or surface water would highly localize sedimentation from runoff erosion.

Seismic or volcanic eruption hazards could result in a natural disaster that influences areas at or surrounding PTA. However, the Army is expected to have internal capacity to evacuate its personnel and to support civilian emergency response efforts in a seismic or volcanic emergency. The presence of

trained personnel and equipment resources at PTA would reduce the potential impacts of a natural disaster to the civilian population in the region.

5.3.9 Biological Resources

Cumulative impacts for biological resources were assessed by analyzing factors that could impact resources cumulatively for past, on-going, or future projects by analyzing several factors, such as overall abundance of a particular resource, amount of the resource impacted, and state or federal status of the resource. The ROI used in this analysis includes PTA and Hawai‘i Island.

Impacts were assessed based on the resource in question. A species or ecosystem with regional or local significance would result in more significant impacts than a species more geographically abundant and prevalent. Impacts that could alter or destroy high quality to moderate quality habitat, affect populations or increase undesirable nonnative species would be considered significant. Impacts to other resources more abundant and geographically prevalent, such as non-sensitive wildlife and vegetation, could range from less than significant to mitigable to less than significant.

Future projects identified in Table 5-1 were reviewed to determine potential cumulative impacts to biological resources found within and outside the boundaries of PTA. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis. Several modernization projects are planned within the Cantonment Area, including construction of barracks and other support facilities, installation of a sewer system, and airfield upgrades. In addition, multiple modernization projects are planned within the General Range Area at PTA such as the operation of training ranges, support facilities, and the IPBA. These projects include an ammunition storage building, Tactical Vehicle Wash Facility, Battle Area Complex, Mock Airfield, Marine Corps Development and Use of Military Training Facilities on PTA Multipurpose Range Complex Installation Information Infrastructure Architecture (I3A). The USMC is preparing an EIS to evaluate the introduction of new troops in support of several helicopter squadrons with proficiency training occurring at PTA. Additional Soldiers training within the General Range Area at PTA may occur under the SBCT Transformation. Furthermore, there are numerous projects planned or proposed on Hawai‘i Island outside of PTA’s boundaries, including roadway extensions/pavements, construction of telescopes and observatories, landfill alteration, construction of facilities, submarine warfare exercises, harbor extension, service weapons tests, and MEC/UXO clearance.

Wildlife, Vegetation, Listed Species and Critical Habitat

Significant Impact – The construction of facilities, ranges, and infrastructure may increase the amount of vegetation cleared and potentially disturb habitats. Listed species and their habitats have been observed within the Range Area (Section 3.9). Population numbers and structure, genetic variability, and other demographic factors for these species could have large, short-term declines, with long-term population numbers significantly depressed. Some of these listed species have only been found at PTA. Loss of habitat might also affect the viability of at least some native species. Mitigation measures, such as following BOs, implementation plans, and various guidelines would reduce impacts, but overall resulting impacts would remain significant.

Projects proposed outside PTA boundaries on Hawai‘i Island include various construction, demolition, and alteration projects; military training exercises/tests; and MEC/UXO clearance activities. These projects could increase the amount of vegetation cleared, potentially disturb or take listed species and their habitat, may alter or disturb sensitive ecosystems, potentially introduce and spread invasive species, and may disturb native wildlife. The cumulative impacts to biological resources from these projects could result in significant impacts, depending on the extent of disturbance to listed species or ecosystems. Some listed species and their habitats are geographically found only on the Islands of Hawai‘i. Population numbers and structure, genetic variability, and other demographic factors for these species could have large, short-term declines with long-term population numbers significantly depressed. Furthermore, the possible spread of invasive plants could increase the potential of habitat loss, which could also impact sensitive ecosystems. Loss of habitat might also affect the viability of at least some native species. Mitigation measures would reduce impacts, but not to less than significant.

The Army has entered into an ESA Section 7 formal consultation with the USFWS for the proposed IPBA at PTA. The Army would abide by all the terms and conditions and the conservation measures identified in the resulting BO.

Less than Significant – Facilities construction within the PTA Cantonment Area may increase the amount of vegetation cleared, potentially disturbing habitats. Although a few listed avian species or the Hawaiian hoary bat may fly over the Cantonment Area, proposed construction projects would occur in previously disturbed areas that offer with little or no habitat for listed species to habituate. Additional Soldiers may utilize PTA for training exercises, such as the proposed USMC aviation training and SBCT training. Much of the training at PTA would constitute a nominal increase as it would be aviation maneuvers, some command and control, or training (exercise) activities. The limited increase in aviation activity would likely result in a less than significant cumulative impact on listed species and wildlife. Ground training impacts would be contained within the PTA impact area in designated ranges, thereby avoiding habitat for listed species. However, ground training could introduce noise into the terrestrial environment and increase erosion, vehicle disturbance, and foot trampling. Ground training activities that could create dust or soil erosion could settle on listed plant species and possibly inhibit photosynthesis or cause other damage to plants. The PTA INRMP, PIP, and measures identified in previous ESA Section 7 consultations adequately minimize and/or mitigate the potential impact of dust or soil erosion that may occur from ground training at PTA. The loss of habitat and listed species within the impact area have been mitigated and/or minimized through these NEPA and ESA consultations. Cumulative impacts to biological resources from training activities would likely result in less than significant impacts. However, impacts would not be expected to result in large, short-term declines having long-term population numbers significantly depressed, as Soldiers would utilize existing training areas.

Military readiness activities are exempt from take of migratory birds under the MBTA, unless the Army determines that such take may have a significant adverse impact on a population of migratory bird species. A number of birds are known to occur at PTA, but the numbers of native migratory birds in the area have not been assessed. However, it is not anticipated that ground training activities at PTA would take many birds, especially not to the degree of significant impact on a population level.

Beneficial Impact – Table 5.2-1 lists several implementation plans proposed for PTA, including Implementation of the Integrated Wildfire Management Plan and the PTA Implementation Plan.

Cumulative impacts of implementing these plans would likely result in a positive impact to biological resources, as these plans have mitigation measures, best management practices, and guidelines to reduce military training impacts to biological resources, as well as restore/improve biological resources.

Invasive Species

Significant Impact Mitigable to Less than Significant – The construction of facilities, ranges, and infrastructure may possibly introduce and spread invasive species. The possible spread of invasive plants could increase the potential of habitat loss, which could also impact sensitive ecosystems. Loss of habitat might also affect the viability of at least some native species. Disturbance from these activities would leave surrounding habitats vulnerable to the spread of nonnative species (including the potential introduction of nonnative species that do not presently occur on PTA) that can outcompete native species. The potential to spread invasive plants may occur; however, control measures would be continued (e.g., vehicle washing requirements, invasive plant management guidance, and a weed control program) to minimize the establishment of non-native species. Considering the historic, ongoing, and reasonably foreseeable future actions, although mitigation measures would be implemented, the overall cumulative impact from the spread of invasive (nonnative) species from the proposed action and those listed in Table 5.2-1 would be significant. Mitigation measures, such as following BOs, implementation plans, and various guidelines would reduce impacts, but not to less than significant.

The Army has entered into an ESA Section 7 formal consultation with the USFWS for the proposed IPBA at PTA. The Army would abide by all the terms and conditions and the conservation measures identified in the resulting BO.

Recommended Mitigation – Consider implementing the following mitigation measures to minimize the spread of invasive species from construction-related activities:

- Educate construction contractors about the need to wear weed-free clothes and maintain weed-free vehicles when accessing the construction site.
- Educate Soldiers and civilians that use PTA facilities and roads on the importance of cleaning vehicles, equipment, and field gear.
- Prepare a one-page insert for construction contract bids that inform bidders of invasive species BMP requirements.
- Inspect and wash all military vehicles at wash rack facilities prior to leaving the installation to minimize the spread of weeds (e.g., fountain grass), and animals (i.e., invertebrates).
- Implement invasive animal control programs to include protocols for the removal of introduced animals.

5.3.10 Cultural Resources

This section discusses the cumulative impacts for cultural resources. The cumulative ROI for cultural resources is the Hawai‘i Island. While the most directly connected resources to those at PTA are within the surrounding communities, archaeological sites throughout the island would be affected by the continued development and military training included in the cumulative projects.

Many factors were considered for this cumulative analysis, including public comments for this project and the projects listed above. Most of the public comments related to access to traditional areas and the potential destruction of cultural sites and landscapes from training. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis.

Historical Cumulative Effects

Residential, commercial, and military development throughout the State of Hawai‘i has destroyed or damaged many cultural resource sites, but Hawai‘i’s rich history produced a dense collection of historic properties, many of which are as yet undiscovered. Past cumulative effects on cultural resources have resulted from Euro-American settlement and over 50 years of military activity at PTA. Significant impacts on cultural resources can include destruction of the properties or elements of the resource that qualify it for inclusion on the NRHP. Other impacts can occur from changing the setting and character of the resource. For places important for traditional reasons, significant impacts can include reducing or eliminating public access to these areas, altering the landscape or setting, or destroying or altering the natural setting by prescribed burns.

Prior to military use, ranching and cattle altered much of the indigenous vegetation in the 1800s, causing the destruction or alteration of many of the prehistoric and historic period archaeological sites in the valley due to cattle trampling and landscape alteration. It is likely that early military use of PTA, prior to cultural resource legislation and current management efforts may have resulted in the loss, destruction or alteration of numerous cultural sites from training activities. Because access to PTA has been restricted for over 50 years, it is difficult to find community members with specific knowledge of the historic use of these areas[94]. This loss of knowledge is an additional effect of the prolonged military use of these areas.

Significant Impact – Construction projects on Hawai‘i Island could result in significant cumulative impacts on cultural resources. Previous public comments indicate that there are significant Native Hawaiian resources in the area around Kawaihae Harbor, including an underwater heiau; the harbor deepening and the new highway from Waimea to Kawaihae Harbor could significantly affect these resources. Construction of new facilities at PTA could have significant impacts on cultural resources, depending on its location.

At PTA, the Army is currently consulting with the SHPD and other interested parties on the loss of cultural resources in the impact area (mainly excavated pits) for the proposed IPBA within the impact area. For the proposed projects identified in Table 5.2-1, cultural resources surveys would be conducted as part of the required site-specific NEPA documentation. However, if numerous cultural resources (i.e., excavated pits) are found at other newly proposed ranges such as the AGR, or during road / trail construction, there could be an overall loss of cultural resources.

In recent years, the loss of cultural resources at PTA has been greatly reduced through implementation of avoidance measures, an understanding of the importance of cultural resources in the area, and education

[94] The oral history interviews cited earlier in Chapter 3.10 is evidence of some of the remaining memory of historic use and tradition. The oral history interviews cited earlier indicated that memory at least of trapping birds for feather collection persisted into the late 20th century. Loss of knowledge of use of the PTA area has also resulted from changing lifeways and shifts in population/residential patterns.

of Soldiers training in the General Range Area. The Army is developing an ICRMP for all its installations in the State, including PTA. This plan would provide an inventory of cultural resources on Army properties and would provide management protocols for Army activities in order to protect and preserve cultural resources and comply with Federal laws and regulations regarding cultural resources.

Although each of the projects identified would be consulted on under federal or state historic preservation laws and regulations, as appropriate, with accompanying agreement documents as needed, the cumulative impact on cultural resources on Hawai‘i Island could be significant because cultural resources could be damaged or destroyed. These impacts could be limited to a greater or lesser extent, depending on the ability of project proponents to avoid or mitigate the damage.

Mitigation for these cumulative impacts would be to avoid archaeological sites and other cultural resources, to prohibit demolition of significant historic buildings and structures, to reuse these properties following the Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*, and to treat historic and prehistoric archaeological resources appropriately, should such resources be uncovered. In addition, historic properties would be documented before being destroyed, in accordance with Department of Interior standards and Section 106 of the NHPA. The Army intends to work with range planners and the Corps of Engineers during the range design process to ensure avoidance measures are taken into consideration when locating firing points, targetry, and maneuver areas on the ranges. The Army would also develop a monitoring program for eligible sites and TCPs to observe for long-term impacts and corrective measures. Continuing education and awareness of Soldiers training at PTA would be conducted using in-briefing materials to ensure units using proposed new ranges can identify sites and take avoidance measures during training.

Given the damage or destruction of cultural resources from the cumulative impact of the projects identified in Table 5.2-1, these activities could accelerate the trend of damage to cultural resources in Hawai‘i. Although specific actions for the proposed activities on PTA can be mitigated on a case-by-case basis, the overall effect of continued development throughout Hawai‘i would result in substantial alteration and restriction of native use of traditional areas and the potential destruction of numerous archaeological sites.

The Army continues to work with the SHPD to incorporate historic preservation goals, which are outlined in the State's Historic Preservation Plan found on the SHPD Web site[95] (State of Hawai‘i, 2001). Each goal, as stated below, further has objectives that the State and its cooperating partners (including the Army) integrate into its planning practices:

- Promote effective land use planning that incorporates historic preservation concerns.
- Promote sensitive historic preservation, community revitalization and economic revitalization.
- Increase recognition and improve management of Hawai‘i's historic resources.
- Increase public knowledge of Hawai‘i's historic properties and the benefits of historic preservation.

[95] http://state.hi.us/dlnr/hpd/hpgreeting.htm

USAG-HI has committed to preserving some historic properties under its control at PTA, and is actively protecting those sites through fencing. The Army recognizes that cultural resources at PTA are not entirely representative of the rest of Hawai‘i Island because the Pōhakuloa was “culturally outside” of the areas that were the focus of most Hawaiian habitation and subsistence activities.

5.3.11 Hazardous Materials and Hazardous Waste

The discussion of the cumulative effects of HM/HW requires a detailed look at the properties of the ROI in which the cumulative projects are taking place. The effects of HM/HW are most commonly localized and limited to the boundaries of the project ROI. Due to the localized nature of these environmental effects, most would be classified as either a less than significant impact or significant impact mitigable to less than significant depending on the control measures in place and environmental characteristics of the ROI. The cumulative effects of HM/HW become a concern due to continued deposition over time and/or the existence of a transport mechanism such as an airway, waterway, or groundwater at many locations throughout the U.S.. The effects of extensive accumulation and/or rapid transport and dispersion of contamination could result in a significant impact.

Due to the localized nature of HM/HW effects and the characteristics of PTA, the ROI impacted by the cumulative effects of HM/HW is limited to the boundaries of PTA. The lack of surface or groundwater greatly reduces the probability of contaminant migration in both the Cantonment Area and Range Areas. The conclusions of an ORAP assessment of PTA conducted in 2010 (discussed in detail in Section 3.8) found that migration pathways that contaminants would use to leave the range area do not exist at PTA. As a result, contaminants are generally confined to the range areas and within the impact area at PTA.

The regional project list found in Table 5.2-1 includes projects that have, or would occur within the boundaries of PTA, and those which do not. As a result of the information discussed in the previous paragraph, projects that do not occur within the boundaries of PTA, or directly adjacent to, are not discussed as contributing to the cumulative effects of HM/HW in this section. The effects of HW/HM for projects outside of the PTA boundary would be limited to their respective transport (migration) mechanisms and ROI.

Cumulative Impacts to Hazardous Materials/Hazardous Waste

Significant Impact Mitigable to Less than Significant – Some of the future projects proposed by other Military Services involve training the MV-22 Osprey and Cobra Attack Squadron, and Navy bombing exercises (e.g., at the mock airfield) at PTA. Both live and inert munitions would be used during training exercises under these actions. While these actions would increase the amount of MEC/UXO generated at PTA, both would involve firing into the impact area, which is a restricted access area, thereby resulting in less than significant impacts to human health and safety. Significant impacts to human health as a result of reclaiming future impact area to create training area (such as what is proposed for the IPBA). Installation personnel and contractors surveying the impact area for natural resources, cultural resources, and MEC/UXO would be accompanied by experts trained in MEC/UXO identification, to minimize dangerous contact with dudded munitions items. MEC/UXO found would be GPS tagged so that those areas could be cleared safely prior to construction. There is a chance that construction workers conducting ground clearing and build-up of the new range would encounter MEC/UXO not found during

initial surveys. As a mitigation measure, the Army would ensure all construction workers on the range (and Soldiers using the range once completed) would be educated on how to identify MEC/UXO and learn the proper protocols if MEC/UXO is found. Through the continuance of education and training programs, and implementing safety protocols within the range area, significant impacts to worker and Soldier safety may be mitigable to less than significant.

MEC/UXO found in the Range Area (outside the impact area) would present significant hazards to Soldier and site-worker safety. Through continued survey of new or previously used areas, and through survey of training areas at the completion of live-fire exercises involving dudded munitions, MEC/UXO could be properly disposed of, thereby reducing potentially significant impacts to human health.

Less than Significant - The construction and operation of PTA projects would increase the amount of HM stored at PTA, and increase (by a currently undetermined amount) of HW generated and stored on the installation; however, the introduction of new maintenance facilities would be an improvement on the current facilities by which waste is temporarily maintained prior to disposal. There would be no change in procedure for handling and managing waste.

Construction of new facilities in the Cantonment area would generate small amounts of hazardous waste and require controlled amounts of hazardous materials. Should demolition of existing structures be required, building materials such as asbestos and LBP found during previous surveys of the Cantonment Area would be disposed of properly by licensed personnel. No asbestos or LBP would be used in the construction of new facilities. Controlled amounts of POLs would be required to fuel and maintain construction equipment working within the cantonment area. The implementation of installation BMPs, SPCCPs, and continued implementation of the IHWMP would minimize POL and hazardous waste contamination during construction.

The operation of the newly constructed facilities will add to the current HM/HW generation and storage baseline at PTA. The addition of several maintenance facilities may require the use of OWS (if a water source, distribution, and stormwater control system is in place) would aid in the control and containment of effluent POLs from the facilities. These OWS will be properly maintained and inspected through the use of BMPs, education programs, and the USAG-HI ECO.

Range Area construction would also generate small amounts of hazardous waste (e.g., POLs). New ranges would require an increase in herbicide and/or pesticide materials that may, over time, require an increase in the storage space at environmental or DPW facilities in the Cantonment Area. The implementation of BMPs, SPCCPs, and continued implementation of the IHWMP would minimize the impacts from hazardous material and waste production, storage, handling, and disposal.

5.3.12 Depleted Uranium

Factors the Army considered in determining whether a significant impact could occur were determined based upon the risk that receptors would be exposed to DU exceeding the acceptable risk range that the USEPA considers safe (10^{-6} to 10^{-4} millirems/yr.).

The ROI for DU contamination extends to the boundaries of PTA, and not beyond. Since the Army ceased using DU at PTA in the 1960s, no additional DU-containing munitions have been used at the installation. Therefore, no additional DU accumulation has occurred at PTA beyond the 1960s.

Cumulative effects of DU may be reviewed as the cumulative, long-term exposure to DU at PTA. This is addressed in the section on DU exposure, below.

The public surrounding PTA has raised also concern that DU contamination at the installation contributes to background levels of radiation, and presents a substantial safety concern. This concern is addressed in the section on background levels of radiation, below.

Cumulative Impacts to DU Exposure

Less than Significant - Studies conducted by the Army through 2005 consistently indicate that the health risks associated with DU exposures are low. Based on data presented in a Baseline Health Risk Assessment for Residual DU at PTA (CABRERA, 2010), the maximum doses or exposure risks that receptors at PTA may experience are well below that of USEPA acceptable risk range[96]. These conclusions are based upon conservative estimates of long-term potential exposure to DU at the installation. That study also found that no exposure pathways exist for receptors outside of PTA's boundaries (including nearby residents or those using recreational areas close to the installation).

None of the projects reviewed in Table 5.2-1 involve the use or handling of DU. The chance that aerosolized particles in areas adjacent to where modernization projects would occur, would become re-suspended from construction activities in any quantities that could pose an unnecessary health risk would be less than significant.

Cumulative Impacts to Background Levels of Radiation

No Impact - Background levels of radiation have increased worldwide from those before the 1900s primarily due to atmospheric weapons testing. The U.S. DoE reports that "Following the explosion of the Chernobyl plant in Ukraine in 1986, air monitoring in the U.S. also picked up trace amounts of radioactive particles, less than one thousandth of the estimated annual dose from natural sources for a typical person." (EPA Radiation Protection Web site, 2011)[97] Ongoing monitoring of radiation by the EPA has further detected miniscule quantities of iodine isotopes and other radioactive particles (that pose no health risk) in the U.S. since the April 2011 Fukushima nuclear plant disaster in Japan.

Current Army activities at PTA are not increasing these levels. AR 385-63 *Range Safety* prohibits the use of DU ammunition for training worldwide, a policy that has been in effect for over 20 years; and, DU containing munitions has not been used at PTA since the 1960s. The Army considered background levels of radiation when it prepared the PTA Baseline Health Risk Assessment for Residual DU. USEPA (1996) reported that "Background levels of radiation are ubiquitous (existing or being everywhere), and at levels that exceed typical risk targets; therefore, natural variability may preclude the ability to quantify small incremental risks due to contamination.[98]" The Army assessed that no adverse human health

[96] Receptors are defined as current/future maintenance workers, future construction workers/remediation workers, future adult cultural monitor/trespasser/visitor, future site worker, and current/future Soldier.

[97] http://www.epa.gov/radiation/docs/readytorespond/520-1-91-027-pg2.html

[98] Natural variability means uncertainties that stem from inherent randomness or unpredictability in the natural world, but may be characterized through monitoring or other programs of observation. In the case of DU at PTA, the Army determined that accounting for background radiation in modeling would diminish the model's ability to quantify health risks.

impacts are likely to occur as a result of exposure to the uranium present in the soil at PTA. The Army, as a result, assesses no cumulative impacts to human health from the actions proposed in this Programmatic EIS coupled with background radiation, and past, present, or reasonably foreseeable future actions. For many of the proposed modernization projects, the duration of construction would be very short. Workers would not meet the maximum exposure limits or dosing limits of Uranium.

5.3.13 Socioeconomics and Environmental Justice

The main data points used to describe the prevailing socioeconomic conditions in the area that comprise the ROI include population demographics; economic data such as regional employment, housing, and income; access schools and emergency services; and environmental justice and protection of children (per EOs 12898 and 13045, respectively). The socioeconomic analysis discusses the potential impacts of the proposed projects on the economy and sociological environments within the ROI for PTA. PTA is located in Hawai‘i County, which serves as the ROI. Hawai‘i County covers the entire island; PTA is primarily contained within the Pā‘auhau-Pa‘auilo CCD, as well as small portions of the North Kona, South Kohala, and North Hilo CCDs.

The cumulative impact analysis considered the net effects of the cumulative projects on the socioeconomic conditions within the ROI. Factors considered in determining significant impact on socioeconomics include the extent or degree to which the implementation of a project would adversely affect the unemployment rate; change total income, business volume or any social, economic, physical, environmental or health conditions in such a way as to disproportionately affect any particular low-income or minority group; or disproportionately endanger children in areas on or near the project site. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis.

Historical Cumulative Effects

Past actions in the ROI affecting socioeconomic conditions include establishing and operating Army installations on Hawai‘i Island and constructing and operating training ranges at PTA. Other past actions affecting socioeconomic conditions include private actions, such as developing residential communities or commercial areas (e.g., restaurants, hotels, and resorts). These past actions stimulated the local economy, generating beneficial economic impacts on ROI employment, income, and business volume. Some of these impacts, such as construction projects, are short-term in nature and are now removed in time from present economic conditions. However, other past actions can continue and have positive impacts on the local economy.

Cumulative Impacts to Socioeconomics and Environmental Justice

Less than Significant – Projects proposed outside PTA boundaries on Hawai‘i Island include various construction, demolition, and alteration projects. Cumulatively, there would be less than significant impacts on the protection of children as a number of projects may be located fairly close to nearby populations (particularly children), but construction areas are typically taped-off from public access and include signage to warn of safety hazards. There could be risks, although minor, inherent to increased

project construction and activities. To minimize impacts, applicable safety regulations and procedures would be followed.

No Impact – There would be no impacts on population, housing, schools, and environmental justice from the projects proposed at PTA. New staff added to PTA would be minimal (less than five people). This increase in staff and subsequent would have minimal effect on the ROI economy. Other projects identified in Table 5-1 are not expected to increase ROI population. Furthermore, population projections through 2020 generated by the State of Hawai‘i indicate continued slow growth in Hawai‘i County, as well as in the State of Hawai‘i (DBEDT, 2000, 2003). Projections for residential population growth, including and excluding Armed Forces, indicate a decrease in growth rates throughout the forecast period. For example, the projections indicate the annual population growth decreases from a rate of one percent from 2000 to 2005 to 0.9 percent from 2005 to 2020 (DBEDT, 2000, 2003).

No adverse cumulative effects on the protection of children would be expected. Noise sources associated with construction projects occurring in the ROI would not result in a significant change from current conditions. Proposed PTA construction projects would occur within the Cantonment Area or in areas that would be off-limits to the general public. Restricted areas would continue to be posted with signs, enclosed by a fence or stationed with guards. Risks to the general public would be minimized by strictly adhering to applicable safety regulations and procedures.

Beneficial Impact – Beneficial cumulative impacts on the PTA ROI economy would be expected from several of these projects as there would be increased employment, income, and business volume, especially resulting from modernization projects, range construction, and training at PTA and construction projects on Hawai‘i island (such as the various roadway and highway improvements and deepening of Kawaihae Harbor). The economic benefits would mainly last for the duration of the construction periods and thus would be temporary in nature and less than significant. Construction projects would occur over a ten-year or more timeframe, lessening the potential shortages and price increases for certain high demand goods and services.

5.3.14 Public Services and Utilities

Public services consist of police, fire, and emergency medical services. Public utilities include water, sewer, solid waste management, stormwater drainage, electrical, and telephone services. These public services and utilities are owned and operated by various county, Federal, and private organizations. The ROI encompasses a geographic area in which a public service or utility used at PTA is indirectly or directly affected by a military project. Potential impacts caused by the projects identified in Table 5.2-1 could directly or indirectly affect the agencies responsible for providing public services or utilities to the community. Therefore, cumulative ROI for water, electrical, solid waste management, and telephone services is Hawai‘i Island. Changes in demands for these services may adversely influence the public service’s ability to provide capacity to the island community.

Much of the land directly surrounding PTA is designated as a conservation district, including both State and privately-owned land. Grazing is the primary use of the surrounding conservation district. The demand for utilities and public services, per capita use, across the larger Hawai‘i Island has grown along with the general population.

The cumulative impact analysis considered the net effects of the proposed action and projects listed on Table 5.2-1 on the capability of local public service and utility providers to meet the cumulative demand for service. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis. In addition to population increases, per capita use has increased for utilities such as water, electricity, and fuel. Public services have seen a similar linear increase following the population trends. Meeting fuel demands, for vehicles and to generate electricity, is a challenge since all fuel sources must be shipped to the island. Other services such as waste disposal are limited by availability of land. With the increased demand for public services and utilities, the public and private sectors in Hawai‘i have been working to reduce energy demand. Between 1980 and 1995, growth in energy use lagged far behind population growth. Alternative energy sources and increased conservation measures have reduced per capita energy demand. Wastewater in Hawai‘i is treated by wastewater treatment plants and by UIC (Juvik, 1998, 2002).

In addition, modern military ranges often demand more energy due to use of automated targetry. To reduce this demand, the Army seeks opportunities to use alternative energy sources, such as solar power, when feasible, to control targetry. Range operations facilities still demand energy from the common grid.

Cumulative Impacts to Public Services and Utilities

Less than Significant – Cumulative impacts on public services would be expected to be less than significant. The military's presence at PTA ensures that Federal police, fire, and emergency management presence would continue. The Army would continue to have MP appropriately staffed for any increases in Soldiers to address crime issues on base. In addition, no significant increases in demand for these services for other projects in the ROI would be expected. Proposed modernization of emergency services at PTA, such as the MP station and fire station, could improve emergency services at PTA and in the region.

All wastewater at PTA is handled through septic tanks and/or underground injection wells (see 3.14.1.2). Since wastewater is treated internally at PTA, it would not contribute to any island trends regarding increased demand for treatment facilities. There would be no significant cumulative impacts on wastewater and stormwater.

Cumulative construction activities by the military at PTA and regional construction projects on the Island, such as highway construction, would place an increased demand on the solid waste disposal system from construction/demolition debris. When viewed regionally, modernization of PTA over the next 10 years is not anticipated to have a significant impact on the capacity of the West Hawai‘i Landfill. While construction and demolition activities would be anticipated to contribute to demand, the overall demand on capacity would be less than significant due to programs that the landfill is presently implementing to mitigate regional capacity issues (e.g., metal recycling).

The contribution of the proposed construction activities to stormwater runoff impacts would be minimized to less than significant levels by implementing standard construction practices as grading and installing curbs, drains, and gutters. Construction of new facilities at PTA in combination with other construction projects, such as the Saddle Road realignment, would increase impervious surfaces, would contribute incrementally to increased impervious surfaces and increased runoff. However, each construction project would be designed to accommodate additional runoff and facilities on PTA would be

designed to comply with stormwater management regulations to control runoff. There would be no significant cumulative impacts on solid waste management.

The cumulative impacts on utilities such as electrical, sewer, and telephone services would be less than significant. Electricity demand would be expected to increase as a result of cumulative construction projects and could place an additional demand on utility systems. While construction of new barracks or buildings at PTA would likely result in more energy-efficient buildings as the projects would use modern, energy efficient materials and would comply with EO 13123. Proposed modernization of utility infrastructure, such as the electrical upgrade and packaged sewer system, could improve public services and utilities at PTA and in the region.

5.3.15 Wildfires

The projects featured in Table 5.2-1 include past, current, and future projects occurring within PTA boundaries, as well as outside of PTA. Wildfires within PTA have the potential to burn outside of the PTA boundaries and wildfires on Hawai‘i Island have the potential to enter PTA. In the event of a wildfire, regional air quality can be affected, entire plant and animal communities can be damaged, cultural resources can be destroyed, and major losses in vegetation can occur. Due to these factors, the ROI was determined to be Hawai‘i Island, to include PTA.

In the past, a few large wildfires were responsible for 97 percent of the fire damage at PTA between 1987 and 1999. Current projects occurring within PTA remain an ignition concern, as numerous small fires have been recorded since live-fire exercises began at PTA. However, the greatest concern lies with ignition of wildfires off-post. Non-Army projects with potential fire-producing activities (such as road construction and development), coupled with the fact that 91 percent of all acres burned on PTA were caused by lightning, arson, or carelessly discarded cigarettes off Army lands, are outside of Army control. The Army cannot mitigate for all potential scenarios. Since July of 1990, a total of 7,700 acres (3,116 ha) within PTA were burned as a result of fires ignited outside of the PTA boundaries. For this reason, projects occurring outside of the PTA boundary must be considered when addressing the cumulative impacts of these projects, particularly non-Army projects.

Potential direct impacts from wildfires include damage to biological and cultural resources and impairment of air quality. Examples of potential indirect impacts from wildfires include increased soil erosion rates due to removal of vegetation from the land and reduced water quality from water running over land cleared by fire. Wildfires could occur from the ignition and spread of a wildfire, either from training activities or the re-ignition of a fire thought to be extinguished. Because it is possible for many fires to affect a relatively limited area (resulting in limited impacts) or for a wildfire to affect a large area (resulting in many impacts), the frequency of wildfires is not used as a means for assessing the impacts of wildfires. Instead, the potential for wildfire ignition is used as the criterion for assessing wildfire impacts. Wildfires are considered significant if there is a high probability of increasing the frequency and intensity of the fires, especially in sensitive ecological areas.

Cumulative Impacts to Wildfires

Significant Impact – Past, present, and future training activities that involve live-fire training at PTA would have the potential to cause wildfires due to the weapons fired, detonation of munitions, use of welding torches, vehicle engines, and other training-related activities. These activities could result in wildfires, which could impact listed species and their habitats, cultural resources, and air quality. Furthermore, live-fire training could destroy habitat for wildlife or increase incidental mortality to wildlife from potential increases in wildfire, vegetation removal, soil erosion, and water run-off. Cumulative impacts to wildfire potential would be considered significant based on the extent of live-fire training activities proposed and the presence of sensitive ecological resources located in the general range area. Firefighting infrastructure and SOPs would reduce impacts, but not to less than significant.

Projects proposed outside PTA boundaries on Hawai‘i Island include various construction, demolition, and alteration projects; military training exercises/tests; and MEC/UXO clearance activities. These projects could increase the amount of vegetation cleared, potentially disturb or take listed species and their habitat, may alter or disturb sensitive ecosystems, potentially introduce and spread invasive species, and may disturb native wildlife. These activities would likely have similar cumulative impacts as those discussed for the modernization projects. In addition, wildfires could potentially impact sensitive ecological resources found only on Hawai‘i Island with limited firefighting infrastructure in place or lack of fire management guidance to reduce impacts. Therefore, cumulative impacts to wildfire potential would be considered significant.

Significant Impact Mitigable to Less than Significant – The projects listed in Table 5.2-1 include the construction of several ranges, facilities, and infrastructure within the PTA General Range Area. Modernization projects would involve site clearing and grading for construction projects, with possible ignition sources from construction vehicles and machinery, as well as potential introduction of invasive species. Invasive species and ignition sources have the potential to cause wildfires. Cumulative impacts to wildfire potential would be considered significant to mitigable to less than significant based on established firefighting SOPs to mitigate and prevent wildfires, existing firefighting infrastructure in the area, and guidelines to reduce the introduction and spread of invasive plants.

Maneuver training could create ignition sources and introduce invasive species and other weeds, which could cause the potential of wildfires to occur. Cumulative impacts to wildfire potential from increased training activities would result in significant to mitigable to less than significant impacts as the IWFMP would be followed and SOPs would be implemented to reduce introduction and spread of invasive species.

Less than Significant – Table 5.2-1 lists several planned and future modernization projects that would occur within the Cantonment Area. These projects would require some ground disturbance from construction-related activities, which as mentioned in the Section 5.3.9, could introduce invasive species. The spread of invasive plants or noxious weeds increases the potential of wildfires occurring. In addition, possible ignition sources, such as catalytic converters and sparks associated with construction vehicles and machinery, have the potential to cause wildfires. The most significant impact of training to migratory birds would be the ignition and spread of fire that would alter or destroy preferred habitats. Wildfires can have impacts to listed species, cultural resources, air quality, vegetation, and wildlife. Cumulative impacts to wildfire potential would be considered less than significant based on the overall lack of

vegetation present in the Cantonment Area and the presence of firefighting infrastructure (firebreaks and dip tanks) in place.

Military readiness activities are exempt from take of migratory birds under the MBTA, unless the Army determines that such take may have a significant adverse impact on a population of migratory bird species. A number of birds are known to occur at PTA, but the numbers of native migratory birds in the area have not been assessed. However, it is not anticipated that ground training activities at PTA would take many birds, specifically not to the degree of significant impact on a population level.

Beneficial Impact – Table 5.2-1 lists several implementation plans proposed for PTA, including Implementation of the Integrated Wildfire Management Plan and the PTA Implementation Plan. Cumulative impacts of implementing these plans would likely result in a positive impact to wildfire potential, as these plans have mitigation measures, best management practices, and guidelines to reduce military training impacts to wildfire potential.

5.3.16 Sustainability

The factors to be considered in evaluating cumulative effects on Sustainability include: energy and water use; waste production; fuel consumption and GHG emissions.

Energy consumption consists of fuel used to create electricity at PTA and purchased electricity or thermal energy produced outside PTA. PTA also purchases and burns propane fuel for various on-site activities. At this time PTA does not have its own water source on the installation, so water consumption consists of water purchased or provided outside the installation and delivered to PTA. Waste production is a result of Soldier activities and support provide to Soldiers and training units. GHG emissions are primarily a result of electricity and fuel and gasoline consumption.

Given the discussion above, the ROI for the cumulative effects of all four Sustainability factors contains Hawai‘i Island. Because project-specific data are not available for all cumulative projects, the cumulative analysis was conducted on a qualitative basis. The USAG-HI has developed Strategic Sustainability Action Plan Goals for several of these factors. The applicable goals are: reduce per capita potable water consumption; maintain utility consumption per square foot at or below current usage and reduce solid waste disposal.

Cumulative Impacts to Sustainability

Less than Significant - The ten-year construction timeframe for projects proposed in this EIS could adversely impact fuel consumption and GHG emissions (construction equipment) and solid waste production (construction materials). The addition of permanent facilities could potentially adversely impact energy (electricity) and water consumption, however, the implementation of sustainable facility design features and energy-saving technologies that are incorporated into standard design features for most projects can mitigate a portion of these impacts. Additionally, if the completion of a potable water source/well and water distribution system is successful then the requirement to procure potable water off PTA will be diminished, thereby reducing transportation costs in trucking water to PTA, and alleviating demand on a public water supply.

The temporary construction phase for water distribution, sewer and storm drainage systems would likewise impact fuel consumption and GHG emissions (construction equipment) and solid waste production (construction materials).

Military training by the Army Marines, Navy and Air Force at PTA impacts all four sustainability factors. Fuel is consumed by tactical wheeled vehicles and aviation platforms, and electricity is consumed within the support facilities are used by training units while at PTA. The tactical vehicles and aviation platforms also produce GHG emissions while operating. Units and Soldiers require a constant supply of potable water for drinking, cooking, personal hygiene and other activities. Training units and Soldiers produce solid waste, primarily packing materials and consumable/ expendable supply items, while at PTA. Modification and construction of training facilities by the Army and Marines will increase the impact on energy, GHG emissions and solid waste during the temporary construction/modification phases. Transformation of the Army's 2/25th BCT from a "light" or BCT to a Stryker equipped BCT increased the number of tactical vehicles training at PTA and thus fuel consumption and GHG emissions. The Marine's proposed stationing of MV-22 Osprey aircraft and H-1 helicopters on Oahu and Hawai'i, and the proposed HAMET activities for the 25th CAB near PTA could intermittently impact GHG emissions on and off PTA.

Beneficial Impact - The main impacts on sustainability on Hawai'i Island outside PTA would result from the State of Hawai'i DOT Six-Year Highway Modernization Plan (2009-2017) and the Saddle Road Realignment. The construction activities is support of both projects would impact fuel consumption and GHG emissions from construction equipment operations and solid waste production as from the construction itself and construction materials. These impacts could feasibly be off-set by the resulting benefits, post-construction. The modernization of the highways should improve traffic flow and possibly reduce fuel consumption and GHG emissions. After completion of the Saddle Road Realignment a decrease in fuel consumption and GHG emissions is anticipated as traffic will use the shorter and safer Saddle Road route to cross the island instead of the longer perimeter route.

The packaged sewer system proposed for PTA is estimated to also have a beneficial impact (across all Cantonment Area proposed projects) on waste management disposal, which is otherwise trucked off the installation and properly disposed of by a qualified contractor.