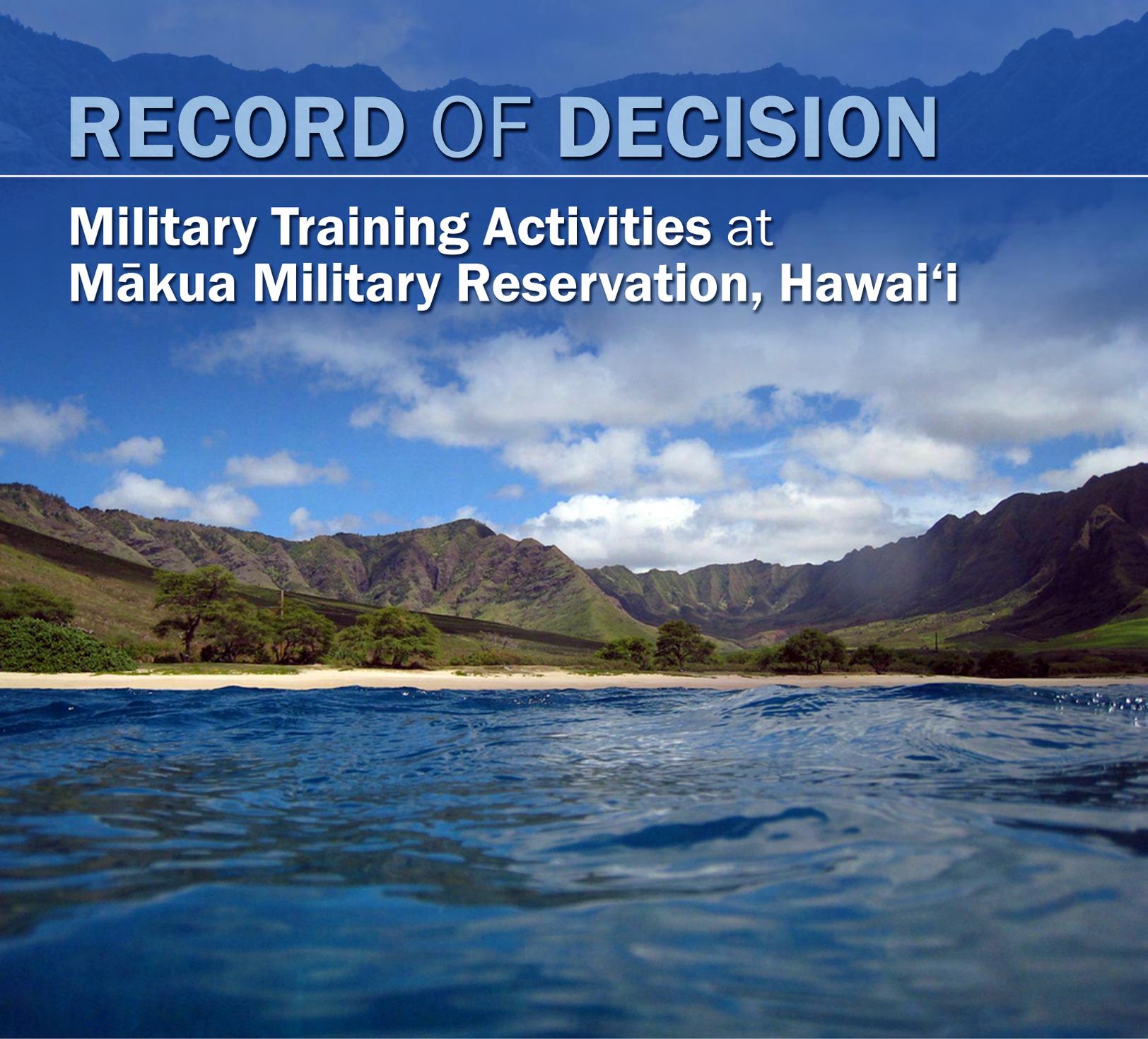


RECORD OF DECISION

Military Training Activities at Mākua Military Reservation, Hawai‘i



Prepared for:
U.S. Army Garrison, Hawai‘i



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U.S. Army Environmental Command

JULY 2009

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**Record of Decision for
Military Training Activities at
Mākuā Military Reservation, Hawai‘i**

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Acronym	Full Phrase
25 th ID	25 th Infantry Division
AAR	After Action Review
AR	Army Regulation
ARTEP	Army Training and Evaluation Program
AT	Anti-tank
ATI	Areas of Traditional Importance
CALFEX	Combined Arms Live-fire Exercise
BAX	Battle Area Complex
BMP	Best Management Practice
BO	Biological Opinion
CCAAC	Complex Company Combined-Arms Assault Course
CD	Compact Disk
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMETL	Core Mission Essential Task List
Convoy LFX	Convoy Live-fire Exercise
CS	Combat Support
CSS	Combat Service Support
CZMA	Coastal Zone Management Act
DA PAM	Department of the Army Pamphlet
DMETL	Directed Mission Essential Task List
DMPRC	Digital Multipurpose Range Complex
DOT	Department of Transportation
DPTM	Directorate of Plans, Training, and Mobilization
DPW	Directorate of Public Works
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
EOD	Explosive Ordnance Disposal
ESA	Endangered Species Act
FM	Department of the Army Field Manual
HE	High Explosive
IBCT	Infantry Brigade Combat Team
IED	Improvised Explosive Device
INRMP	Integrated Natural Resources Management Plan
IPBC	Infantry Platoon Battle Course
ITAM	Integrated Training Area Management

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Acronym	Full Phrase
IWFMP	Integrated Wildfire Management Plan
JRTC	Joint Readiness Training Center
LSV	Logistic Support Vessel
MBTA	Migratory Bird Treaty Act
MIP	Mākua Implementation Plan
MMPA	Marine Mammal Protection Act
MMR	Mākua Military Reservation
MOPM	Modular Packed Mine System
MPRC-L	Multipurpose Range Complex-Light
MRS	Marine Resources Study
MTP	Mission Training Plan
NDAA	National Defense Authorization Act
NGB	National Guard Bureau
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
NOAA	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
NTC	National Training Center
OB/OD	Open Burn/Open Detonation
ORAP	Operational Range Assessment Program
PA	Programmatic Agreement
PACOM	US Pacific Command
PTA	Pōhakuloa Training Area
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
ROI	Region of influence
SBCT	Stryker Brigade Combat Team
SBMR	Schofield Barracks Military Reservation
SDZ	Surface Danger Zones
SHPO	State Historic Preservation Officer
SMAW	Shoulder-launched multipurpose assault weapon
STRAC	Standards in Training Commission
T&E	Threatened and Endangered Species
TC	Training Circular
TOW	Tube-launched, Optically tracked, Wire-guided (missile)
UAV	Unmanned Aerial Vehicle

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Acronym	Full Phrase
USAG-HI	United States Army Garrison- Hawai'i
USAR	United States Army Reserve
USCENTCOM	United States Central Command
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps.
UXO	Unexploded Ordnance
VBIED	Vehicle Borne Improvised Explosive Device
VEC	Valued Environmental Component
WAAF	Wheeler Army Air Field

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Record of Decision for Military Training Activities at Mākua Military Reservation, Hawai‘i

DECISION SUMMARY

After a thorough review of the Final Environmental Impact Statement (EIS) for Military Activities at Mākua Military Reservation (MMR), Hawai‘i, I have decided to proceed with a variation of Alternative 2. This variation of Alternative 2 has less impact to the environment and to the community than Alternative 3, the Army’s preferred alternative in the Final EIS, and has less impact than Alternative 2, which was also analyzed in the Final EIS.

The action I have selected allows up to 32 combined-Arms live-fire exercises (CALFEX) and 150 convoy live-fire exercises (LFX) per training year at MMR; this decision includes the squad- and platoon-level LFXs that sequentially lead up to a CALFEX. The Army will not use MMR for live-fire training at night until all relevant fire suppression measures are met and approved in accordance with the US Fish and wildlife Service (USFWS) 2007 and 2008 Biological Opinions (BO).

I have elected to not use either C-Ridge or Ka’ena Point for training, due to the risk of wildfire, and the potential irreversible impacts from training to threatened and endangered (T&E) species.

The action does not include use of Javelin and inert, tube-launched, optically-tracked, wire-guided (TOW) missiles; anti-tank (AT-4) and 2.75-inch rockets, the shoulder-launched multipurpose assault weapon (SMAW), illumination munitions, and tracer ammunition at MMR. The selected action represents a proper balance for meeting the training requirements of the units of the 25th Infantry Division (25th ID) and other users, while ensuring the Army meets its responsibilities to preserve the land and resources at MMR, and continues to be a good neighbor to the community along the Wai’anae coast.

1.0 Background

The mission of Army units is to support the full spectrum of operations worldwide from waging the Nation’s wars to supporting peace and stability. While at home station it is critical that Army units retain or develop those skills necessary to deploy and execute their mission. This training includes combined arms teamwork and synchronization that is accomplished only through regular practice of combat missions. Live-fire exercises are essential to training, to the development of the Soldier’s situational awareness, improvement of the Soldiers’ ability to remain focused under duress, and is critical to the Soldiers’ ability to fight and win. The advantage of live-fire training is the ability to simulate, as closely as possible, an actual

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battlefield scenario. These simulated battle conditions best prepare the leaders, infantry Soldiers, and supporting combat support and combat service support teams for combat missions. Company-level units are generally the smallest units that exercise direct command and control of combined arms elements in the synchronized execution of actual combat operations.

Live-fire Training at MMR

MMR occupies 4,190 acres (1,696 hectares), 38 miles (61 kilometers) northwest of Honolulu, on the west shore of O‘ahu, near Ka‘ena Point, and is within the adjoining Mākua and Kahanahāiki Valleys. It is roughly bordered on the west by Farrington Highway and the Pacific Ocean and is surrounded on its north, south, and east sides by the Wai‘anae Mountains. Mākaha, the nearest township, is approximately 3 miles (5 kilometers) south.

The Army primarily trains at MMR within the Piliā‘au Range Complex Company Combined-Arms Assault Course (CCAAC), a 457-acre (185-hectare) training course in the southwestern portion of MMR. The CCAAC has historically been used for both live-fire and non live-fire maneuver training exercises. The historical primary use of the CCAAC has been for company-level CALFEXs by the Army’s 25th ID, which is based at Schofield Barracks Military Reservation (SBMR), approximately 10 miles (16 kilometers) southeast of MMR. Figure 1 on the next page illustrates the relative locations of MMR and SBMR on the island of O‘ahu.

CALFEX training, including the squad- and platoon-level LFXs that progressively lead to a CALFEX, and convoy LFXs at MMR historically have used the CCAAC, land north of the CCAAC, and land outside the firebreak roads comprising approximately 1,136 acres (460 hectares) of land. Additional acreage north of the CCAAC, and inside the north firebreak road have been used during training for parking, bivouac (encampment), ammunition storage, and equipment staging.

There are over 50 occurring or potentially occurring endangered plant and animal species in the MMR region of influence (ROI). In September 1998, the Army temporarily suspended training at MMR due to several wildfires that burned outside the south and north firebreak roads. The proximity of these species to potential fire hazards presents MMR with a significant challenge.

The Army conducted limited training at MMR after 1998 due to the risk of wildfire. An October 2001 judicial injunction further limited live-fire training at MMR from 2001 to 2004. The 25th ID has attempted to meet its CALFEX training requirements by sending its companies to other training locations such as the National Training Center (NTC), Fort Irwin, CA; at a training center in Thailand; and the Joint Readiness Training Center (JRTC), Fort Polk, LA.

Since 2004, the use of MMR has been limited to non live-fire training events that include aircraft lasing, unmanned aerial vehicle (UAV) training, blank ammunition training, engineer training, and using MMR as a staging base for ground or air movement-command and control elements for activities occurring elsewhere in Hawai‘i.

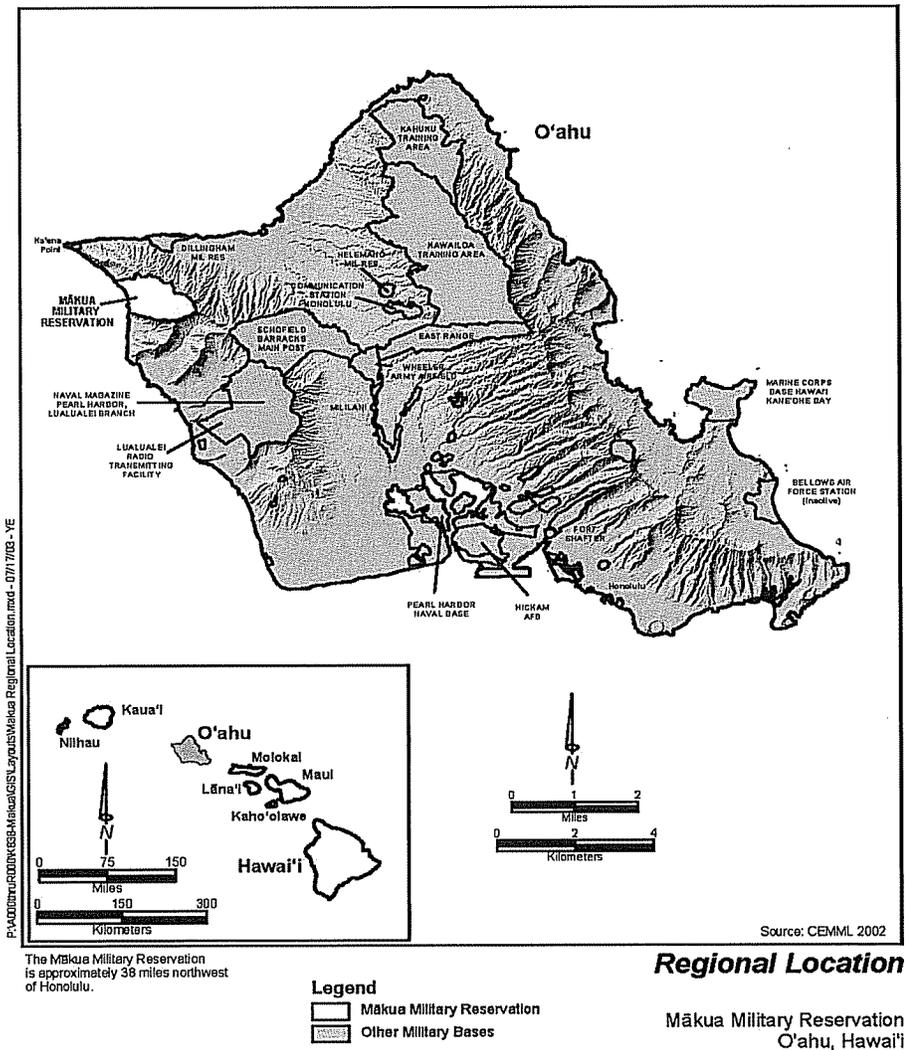


Figure 1. Map illustrating the relative locations of MMR and SBMR on the island of O'ahu

Combined Arms Live-fire Exercises (CALFEX)

As described in the Army Training and Evaluation Program (ARTEP) 7-8 Mission Training Plan (MTP) for Infantry units, DA Pamphlet (DA PAM) 350-38, Standards in Training Commission (STRAC) and the 25th ID annual training guidance, Infantry companies are required to conduct company-level CALFEX training annually. The CALFEX is the culmination of a training year in which Infantry squads have conducted live-fire exercises four times per year (recommended),

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and Infantry platoons have conducted LFX two times per year (recommended). This building-block approach adheres to the Army's progressive training doctrine, in which smaller units train individually and then collectively as part of a larger unit. In a CALFEX, leaders must coordinate and synchronize the fire and movement of individual Soldiers, squads, platoons within their company, and with their supporting combat elements. A company-level CALFEX provides invaluable training to an infantry commander, who learns the skills required to plan, coordinate, and execute integrated combined-arms combat operations supported by aviation, artillery, mortar, and combat engineer assets. A CALFEX is typically made up of several phases; these are planning, movement to the range/training area, preparation for dry fire, the live-fire exercise, and cleanup. An example CALFEX is explained briefly below. A more detailed description may be found in Chapter 2 of the Final EIS.

1. **Planning.** In accordance with the US Army Garrison, Hawai'i (USAG-HI) and 25th ID Regulation 210-6, *Installation Ranges and Training Areas*, planning a typical training exercise begins at least eight weeks prior to the event. This phase can include a leader's reconnaissance of the range/training area in order to develop a maneuver and fire support plan; identify control measures and limits of advance; and Surface Danger Zones (SDZ) for all approved weapons systems. Weapons used in typical CALFEX training are found in Table 1 below.
2. **Movement to the range/training area.** For CALFEX training that historically has occurred at MMR, an Infantry company of approximately 150 Soldiers and supporting elements in approximately 30 military vehicles move from Schofield Barracks to the range/training area. While one Infantry company conducts a CALFEX at a time, as many as three companies (one battalion) may travel to the training area one time. Movements are scheduled to avoid peak commute times and school transit hours¹.

Units draw Ammunition from the ammunition storage point at Wheeler Army Airfield (WAAF), at the naval magazines at Lualualei, or at West Loch. Weather permitting, ammunition has been flown into the training area to avoid transporting it through the local community². All safety regulations are rigorously followed for the storing, packing, handling, and transportation of ammunition. Ammunition is stored at the ammunition supply points in the vicinity of the exercise and is guarded throughout the exercise.

3. **Preparation and Dry Fire (Days One and Two).** Once training units arrive at the respective range and bivouac in designated areas, Soldiers can prepare for- and rehearse live-fire exercises. This preparation will usually include individual Soldier, team, squad and platoon-level tasks. Popup targets, blank ammunition, and weapons effects simulators may be used on the range/training area during rehearsals. Unit leaders are briefed by the USAG-HI, Directorate of Plans, Training, and Mobilization (DPTM), Range Division, and from USAG-HI Directorate of Public Works (DPW) Environmental

¹ Travel may be in convoys or individual vehicles dispersed throughout the traffic flow. The bulk of the unit moves down public highways (including Interstate Highways H-1 and H-2) from Schofield Barracks and then up Farrington Highway, with participating artillery and engineering units following the same route. Aviation units fly out in helicopters at scheduled times prescribed in the training scenario.

² The Army airlifted all ammunition used for CALFEX training from 2001 to 2003.

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Division staff on the locations of T&E species and habitat, locations of known cultural resource sites, fire hazards, and fire prevention measures and procedures. If necessary, unit leaders modify the training scenario to reduce the risk of fire and other damage to the environment. Company and unit leaders also brief every Soldier in the unit on the importance of protecting endangered species and habitat and cultural sites and of preventing wildfires. Staffing protocol regarding fire suppression activities are accomplished in accordance with the USFWS BO (Appendix H-1 of the Final EIS).

4. **Live-Fire Exercise (Days Three and Four).** On days three and four, leaders and Soldiers conduct their squad- and platoon-level LFX in order to be proficient before moving on to the company-level exercise. During live-fire training, units attack and defeat a simulated enemy force and are also presented with tasks to overcome such as trench lines, bunkers, mine fields (simulated), and concertina-wire obstacles. Day three can include maneuver, Soldiers firing blank ammunition or live ammunition, and support by mortar fires. Day Four will include maneuver and Soldiers firing all approved weapons and ammunition. The live-fire exercise lasts several hours, depending upon the unit's proficiency and the satisfactory accomplishment of the training tasks. The Infantry Soldiers, squads and platoons move from an initial assembly area toward specific objectives. Simultaneously, some Soldiers/units maneuver towards the objectives and fire on targets while others are in overwatch positions and also engage targets. In combination with their individual- and crew-served weapons direct fire, the Soldiers/units are supported by mortar, field artillery, and helicopter fires. Combat engineer Soldiers/units remove and clear obstacles. Once the objectives have been seized, units consolidate and reorganize, and prepare for the next mission. The last step in a training event is the After Action Review (AAR) in which the leaders and Soldiers review the mission and identify areas for improvement.
5. **Combined live-fire exercise (CALFEX) (Day Four or Five).** Once proficient at the lower unit levels, the company will conduct a CALFEX. The movement of units from the assembly area to the objectives is similar to the previous days' training, but larger units and more Soldiers are involved in the training. Similar tasks, like breach obstacles and clearing bunkers and trench lines are accomplished. The CALFEX greatly increases the complexity of command, control and coordination of not only the Infantry Soldiers and units, but also the supporting combined arms – mortars, field artillery, engineers, and aviation units.
6. **Cleanup (Day Five).** Upon completion of the CALFEX, units remove any target equipment they may have provided, gather brass casings from spent rounds, remove litter, and otherwise make every effort to restore the range to its condition prior to their use. Explosive ordnance disposal (EOD) specialists destroy all identified unexploded ordnance (UXO). Ordnance normally is destroyed where it is found in the impact areas, whether it resulted from the training being conducted, or from earlier exercises. Rarely, due to unexpected occurrences, the EOD specialists are unavailable to dispose of UXO immediately after a training exercise. In those situations, UXO will be disposed of once the specialists are available and prior to use of the area for new training.

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Excess propellant charges from mortars and artillery is burned in a burn pan. Any ash generated from powder burn operations is removed from the burn pan and collected in a 55-gallon (208-liter) drum. When the drum is full, the ash is tested to determine if it meets US Environmental Protection Agency (USEPA) criteria as a hazardous waste. The ash is ultimately removed from the site and is disposed of in accordance with USEPA regulations. Unexpended ammunition is repackaged and returned to the ammunition supply point. When the cleanup is complete, the units load their equipment on their vehicles and return to SBMR.

In addition to the coordination and synchronization of Infantry Solder/unit fire and movement, the CALFEX can include other complex leader tasks such as planning and executing Army Aviation Operations, Artillery Support, and use of UAVs. These activities are briefly discussed below.

Airmobile. Aircraft travel to the training area using designated flight corridors and at designated altitudes in accordance with Army Regulation (AR) 95-1, Aviation Flight Regulations. Exceptions are made based on noise abatement, “fly neighborly” policies, or other safety considerations. Flight schedules are not provided to the community in advance.

In most cases, two CH-47 Chinook helicopters transport troops and equipment from Schofield Barracks to the training area.

There is also ongoing basic training of new pilots assigned to Hawai‘i, involving one or two flights per day familiarizing them with the terrain and training areas. OH58s or UH60s are used for this training.

Air Assault. When air assault is part of a CALFEX, Soldiers board helicopters (either six UH60s or two CH47s) and fly to the approved landing zone. The helicopters land one or two at a time, discharge their loads and fly off.

Aviation Support. A typical scenario includes three OH58 (Kiowa) attack helicopters. One helicopter is designated as an observation aircraft and the other two as attack helicopters firing .50-caliber and 7.62mm machine guns, in support of units on the ground. During the exercise, there is typically a ground rehearsal, a fly-by rehearsal, and then the actual close-air support firing exercise. Over the five-day CALFEX, there would be up to five helicopter approaches during the non live-fire day, and up to five approaches during each of the daytime and nighttime live-fire iterations. During the exercises, the helicopters typically depart the training area to rearm and refuel four times. During each live-fire exercise, helicopters hover as they wait to re-group after each firing pass. Aircrews direct all fire into the ordnance impact area and are in constant radio contact with Soldiers on the ground to ensure that the correct targets are engaged.

Artillery Support. Artillery (e.g., 155mm) is an integral part of combined-arms training. A typical exercise involves at least two gun sections, with four Soldiers per section. Artillery firing is directed at specific targets in the ordnance impact area.

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Unmanned Aerial Vehicles. UAVs are likened to remote controlled aircraft. The UAV allow unit commanders to observe the battle space that could not otherwise be seen or that presents a high risk to piloted aircraft.

Table 1. Weapons and Ammunition used during a typical CALFEX

Weapon	Ammunition or Charge
Small arms:	Ball bullets:
Rifles	5.56mm and 7.62mm
Pistols	9mm, .45-caliber, .38-caliber, .22-caliber
Machine guns	5.56mm, 7.62mm, .50-caliber, 40mm HE (High Explosive)/ TP (Training Practice round)
Shotguns	12 gauge shotgun (00)
Helicopter guns	7.62mm, .50-caliber
Tracer ammunition	5.56mm, 7.62mm, and .50-caliber
Short-range training ammunition (SRTA)	5.56mm and .50-caliber
Mortars and artillery	60mm HE and 60mm SRTA (mortar) 81mm HE and 81mm TP (mortar) 105mm HE (artillery) 120mm HE (mortar) 155mm HE (artillery) Artillery simulators
Anti-tank weapons	AT-4/M136 (84mm HE anti-tank rocket) Javelin 2.75-inch rocket
Shoulder-launched multipurpose assault weapon (SMAW)	Launcher assault rockets SMAW practice round
Inert TOW missile launcher	Inert TOW missile
Illumination munitions	81mm mortar, 105mm artillery, and 155mm artillery
Smoke grenades	Colored, hexachloroethane smoke, white smoke, and target acquisition smoke practice
Grenades	Fragmentation, offensive, practice, simulators
Demolitions	Limit 300-pound (136-kilogram) net explosive weight, including bangalore torpedoes
Mines	Claymore antipersonnel, inert antipersonnel (volcano delivery device or modular packed mine system [MOPM] delivered), anti-tank

Convoy Live-fire Exercises

Convoy live-fire training is required for all types of units including combat arms, combat support (CS), and combat service support (CSS). Units in convoy formations must be able to react to improvised explosive device (IED) attacks, sniper attacks, and other enemy small unit actions.

IEDs are the enemy's preferred asymmetric weapon against US forces deployed in Iraq and Afghanistan, among other locations. Asymmetric warfare is conflict in which a modern Army faces an opponent with more limited technological resources. IEDs account for over 50 percent of all US Coalition forces casualties in the US Central Command (USCENTCOM) area of

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responsibility. Unit AARs and lessons learned clearly identify the critical importance for all Army units to be tactically proficient in all tasks trained in convoy live-fire training.

Live-fire convoy training provides realistic training for convoy operations and an opportunity to employ direct limited point and area fires in support of tactical movements. Convoy live-fire training is designed to train units to react to enemy contact during tactical movement.

Convoy Live-Fire Training Description and Scenarios

Threats against a moving convoy may include, but are not limited to an ambush with obstacles that stop the convoy, (daytime or nighttime) accompanied by direct and indirect fires; an ambush without obstacles (daytime or nighttime) by direct- and indirect fires; snipers; mines (any type); IEDs/ VBIEDs (homemade explosive devices); human intervention (this may include a hostile or ambiguous crowd or individuals); suicide bombers/vehicles; and hostile aircraft.

Each squad or platoon will first conduct a convoy without firing weapons (dry-fire). This familiarizes Soldiers with the range and the safety procedures. After successfully completing the dry-firing, the squads and platoons may execute the blank ammunition iteration of the exercise. After successfully completing blank ammunition iterations, units are prepared to conduct the live-fire portion of the training exercise.

Convoys will be led by either an officer or non-commissioned officer. Vehicles will have communication and possess small arms mounted and Soldier-held weapons. As a convoy moves along the designated route it can be attacked either via simulated enemy fire, mine, or IED. The simulated enemy (pop-up) targets within existing SDZs will be engaged with mounted and dismounted small arms fire. In an ambush with obstacles, Soldiers may dismount their vehicles in order to seek cover and engage the enemy targets. In an ambush without obstacles, the convoy would continue moving and return defensive fire from the vehicles until reaching a safe distance.

An IED can be simulated to explode using an approved IED simulator device. This simulator replicates a large "boom" and gives off a small cloud of smoke. These devices produce no fire hazards. This scenario will cause the convoy to stop to create a defensive perimeter and return fire.

Convoy LFXs may also include aviation support.

Weapons and the approximate munitions expended per convoy LFX are included Table 2 below.

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Table 2. Expected Convoy Live-Fire Weapons and Munitions Usage

Weapon System	Rounds Per Convoy LFX1	Total Rounds Per 100 Convoy LFXs (Alt 1)	Total Rounds Per 200 Convoy LFXs (Alts 2-3)
Small Arms			
M2 (.50 Cal) machine gun	500	50,000	100,000
M4/M4A1 (5.56 mm machine gun)	400	40,000	80,000
M248 / M240 (7.62 mm) machine gun	600	60,000	120,000
M249 (5.56 mm) Squad Auto Weapon	600	60,000	120,000
MK-19 (40 mm HE machine gun)	100	10,000	20,000
Weapons Fired From Helicopters			
50 Cal machine gun	200	20,000	40,000
2.75-inch training rockets	3	300	600

¹The ammunition expenditures presented in this table represent a typical convoy live-fire exercise. The actual expenditures for a convoy live-fire exercise would fluctuate and could be either higher or lower than the numbers in this table.

2.0 Purpose and Need

2.1 Purpose of the Proposed Action

The Army's Proposed Action is to conduct the necessary type, level, duration, and intensity of live-fire and other military training exercises, in particular company-level CALFEXs and Convoy LFXs, for the combat units assigned to the 25th ID and for other military units to attain and maintain the combat readiness of those units. The purpose of the Proposed Action is to enable the military in Hawai'i to achieve and maintain readiness for immediate deployment. Providing the best and most realistic training for the types of threats the Army expects to encounter during combat operations ensures that the military's leaders and Soldiers are prepared for the full spectrum of operations faced in combat. These operations include offensive, defensive, stability, and support operations.

2.2 Need for the Proposed Action

There is currently a shortfall of collective training range capacity in Hawai'i. The Proposed Action is needed because there are no existing training areas on O'ahu, outside of MMR, that are currently configured and available to support a company-level CALFEX. The Army needs a ready and available force that is able to conduct combined-arms live-fire training within the shortened home station periods that result from accelerated deployments associated with overseas combat activities in Iraq and Afghanistan. This Proposed Action provides opportunities to conduct realistic, integrated training prior to deployment.

In addition to CALFEX training, the 25th ID needs the range capacity to accommodate platoon convoy LFXs with no impact on any other ranges. Lessons learned in combat have demonstrated the need for all Army units to be proficient in all the individual and collective tasks associated with convoy live-fire training. The more frequent and realistic this convoy live-fire training is at home station, the more prepared Soldiers are to survive and win on the modern battlefield.

Army units use two different but complementary task lists to develop their training strategies, training plans, and training events. One is called the Core Mission Essential Task List (CMETL) and it includes tasks the unit must be proficient in so it can accomplish its worldwide full spectrum operations whenever required. The other is called the Directed Mission Essential Task List (DMETL) and it includes tasks the unit expects it must accomplish in its next deployment into combat operations, specifically Iraq or Afghanistan. Given the current time an Army unit spends at home station (O'ahu) between deployments and the requirement to recover, reorganize and re-equip the unit must focus on training its DMETL tasks.

Up to this point a CALFEX has not been a DMETL task, although a change in mission, enemy situation and/or operational environment in Iraq or Afghanistan could cause unit leadership to select a CALFEX as a DMETL task. Once Army units reduce their frequency of deployments to Iraq and Afghanistan, are given a new mission by Army leadership, or return to training for full spectrum operations, the units will again be required to train on CMETL tasks, including CALFEXs.

Operations and lessons learned in Iraq or Afghanistan, specifically in counter-insurgency, irregular warfare, and stability operations have made convoy live-fire an essential training task and DMETL requirement. Small units of Soldiers must train to respond in a live-fire environment to attacks on convoys to include training their reaction to IEDs. This convoy live-fire requirement will continue for many years, and Army units in Hawai'i will need the range/maneuver area to support this training.

The necessary criteria to support military training at this level are range capacity; range design; quality of life; and time and cost. These criteria are described in greater detail below.

CALFEX and Convoy LFX Training and Range Requirements

Given the present number and types of units stationed in Hawai'i that require use of Army live-fire ranges, Hawai'i needs the range capacity to support thirty-two (32) company-level

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CALFEXs annually. Ten of these are companies of the 3/25th Infantry Brigade Combat Team (IBCT) (nine Infantry companies and one Engineer company). Thirteen of these are Stryker Brigade Combat Team (SBCT) companies. The SBCT has similar dismounted training requirements as light infantry, to include the requirement for CALFEX training at the company level; however, the SBCT has increased live-fire training requirements for mounted operations. In addition, the Army needs to be prepared to host nine US Marine Corps (USMC) companies.

Hawai'i also needs the range capacity to support a minimum of 150 convoy LFXs. 143 represents the minimum number of convoy LFXs required for units of the 25th ID, National Guard Bureau (NGB), US Army Reserve (USAR), and combat aviation units that are represented in the fiscal year 2007 National Defense Authorization Act (NDAA) study to report on capability of live-fire ranges in the State of Hawai'i. There is also the possibility for added convoy LFX requirements for units not currently garrisoned in Hawai'i, or are recently garrisoned in Hawai'i. These added unit requirements result from the September 2008 decision to station Army units in the Pacific region (Record of Decision for Army Growth and Force Structure Realignment to Support Operations in the Pacific).

Range Capacity

Units stationed on O'ahu require access to live-fire ranges and maneuver land with capacity to meet doctrinal standards³ for sequential (Soldier, crew, squad, platoon, and company levels) live-fire tasks.

The CALFEX is the culmination of a training year in which units have conducted requisite live-fire exercises. Therefore, to meet company-level CALFEX requirements, a range must have the capacity to integrate the movement and live-fire of Soldiers with, at a minimum, aviation assets, artillery, mortar, and engineering activities (e.g., demolition).

The requirements for a convoy live-fire range must include the capacity to train convoys comprised of five to twenty vehicles travelling at intervals of 25-100 meters. It should have roads of such a length that it will appear as a surprise to Soldiers where the ambush or IED attack will occur. It must also have live-fire capacity including targets with associated SDZs.

To meet the combined-arms training requirements of the 25th ID, and other range users, the required range facilities must also be available to support air assault exercises, sniper training, demolition training, and to act as a staging base for ground and air movement of Soldiers.

Ranges that are of sufficient size at SBMR and Pōhakuloa Training Area (PTA) to support these exercises do not have the sufficient capacity to meet the minimum CALFEX requirements (including convoy live-fire and squad and platoon LFXs) of units of the 25th ID, USAR components, NGB, and other users. This is because these ranges have overlapping SDZs and training must cease at adjacent ranges when one range is in use.

³ Doctrinal requirements for units of the 25th ID are set forth in AR 350-1, Army Training and Leader Development; TC 7-9, Infantry Live-Fire Training; DA PAM 350-38, Standards in Weapons Training; TC 25-8, Training Ranges; USARPAC Live Fire Guidance; and the unit's CMETL/DMETL.

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Prior to the live-fire restrictions agreed to in settlement agreements, MMR had the capacity to meet the requirements of- and was used as the primary range for- company-level CALFEXs and convoy live-fire training in Hawai'i. MMR also has the capability to support requisite squad and platoon LFXs.

Range Design

CALFEX. There is no standard range design to accommodate a CALFEX. The recommended range for a CALFEX is a Digital Multipurpose Range Complex (DMPRC). The Army does not have a range of this configuration in Hawai'i. Other ranges that could support CALFEX training include an Infantry Platoon Battle Course (IPBC), MPRC-L (light), and a Battle Area Complex (BAX).

To successfully support combined-arms training required by units stationed in Hawai'i, the range must be not only of the appropriate size- but also must be configured in a manner that would support the movement and live-fire of Soldiers with aviation assets/support, artillery and mortar fire, and engineering activities. In addition, a range would need to have an existing impact area sufficient to support the munitions listed in Tables 1 and 2.

There are no ranges in Hawai'i, outside of MMR, that are currently configured to support a CALFEX. The Army is constructing a BAX at Schofield Barracks to support company gunnery and training, and qualification requirements of the weapons systems included as part of the SBCT. The primary use of the BAX would be for SBCT mounted training exercises using the Stryker vehicle. While the BAX range may also be capable of supporting dismounted infantry CALFEXs, these would be modified CALFEXs, without the full integration of units and weapons. Range modifications that would be implemented to support SBCT training requirements would result in less priority given to dismounted exercises for other non-SBCT units, including dismounted CALFEXs, therefore non-SBCT CALFEXs at the Schofield Barracks BAX would be extremely limited.

The Army is also constructing a BAX at PTA to support SBCT training. The PTA BAX would be capable of conducting modified CALFEX training with extensive ground softening work to accommodate Soldiers maneuvering on foot. The PTA BAX would also experience throughput (the ability to accommodate required training) conflicts if the Army were to utilize the PTA BAX to perform even the minimally required number of CALFEXs for units stationed in Hawai'i.

Convoy Live-fire Range. The Army is in the process of finalizing a minimum design standard for convoy live-fire ranges. The targets of a convoy live-fire range may be presented individually, or as part of a tactical array in an open or urban environment; and the complex is designed to engage and defeat vehicle and Infantry targets from multiple firing points as part of an entry control point. The convoy live-fire route should be long enough or be designed such that leaders and Soldiers cannot anticipate the attack. It must also be large enough to include targets for direct-fire engagements and their associated SDZs.

The USMC is currently constructing a Convoy LFX range at PTA. This range will be available for the Army to use while on PTA to conduct other collective training exercises.

Quality of Life

Preserving Soldier and Family quality of life and the all-volunteer force are two of the Army's highest priorities. The Army strives to maintain the highest quality of life for Soldiers by establishing deployment predictability and balancing the time Soldiers are deployed away from home station against mission requirements. The Army also has as its goal that Soldiers spend two years at home station between one-year deployments, and that while at home station they maximize the time spent with family while meeting training and readiness requirements. Currently the Army is short of its intended goal, and Infantry Soldiers are spending one and a half years at home station between deployments, causing a substantial negative impact upon their quality of life.

Conducting CALFEX's and convoy LFXs close to home stationing would enable the Army to help meet its goals of balancing quality of life and time spent with families, with the requirements of training and combat readiness.

Time and Cost

Range assets must be available for access by all O'ahu-stationed units to meet their annual training requirements and to achieve combat readiness status before they deploy. The time and cost of transporting units to a training area must not have a major impact on the overall training levels for a unit. Each unit has limited amounts of time and financial resources to achieve its training requirements. The time and cost of transport cannot be so excessive that it compromises the unit's ability to meet all mission essential tasks and readiness requirements.

3.0 Proposed Action and Alternatives

3.1 Proposed Action

The Proposed Action is to provide realistic company-level CALFEXs and convoy live-fire training in close proximity to the home-station for the units assigned to the 25th ID and all progressive live-fire training events preceding the company-level exercise.

The Army developed for the decision maker's consideration a No Action alternative and four alternatives to accomplish the Proposed Action. The No Action alternative and alternatives 1-3 pertain to MMR. Alternative 4 examines the use of PTA on the island of Hawai'i. The Army also considered other alternatives that ultimately were not carried forward for analysis. These are identified as Alternatives Considered but Eliminated, and are found in Section 2.5 of the Final EIS.

Each action alternative (Alternatives 1-4) includes other types of training that could be conducted, in addition to the company-level CALFEXs and convoy LFXs. Examples of other training activities include squad and platoon live-fire exercises, demolitions training, sniper training, non live-fire maneuver exercises, force-on-force exercises using simulated weapons systems, and staging for ground or air movement of troops. These other types of training are described in greater detail in Section 2.4.4 of the Final EIS.

3.2 Alternatives

The EIS analyzes the No Action Alternative and four alternatives to accomplish the Proposed Action, which are described in detail in Section 2.4.6 of the final EIS:

- No Action Alternative (No Live-Fire Military Training at MMR);
- Alternative 1, MMR (Reduced Capacity Use with Some Weapons Restrictions);
- Alternative 2, MMR (Full Capacity Use with Some Weapons Restrictions);
- Alternative 3, MMR (Full Capacity Use with Fewer Weapons Restrictions); and
- Alternative 4, PTA (Full Capacity Use with Fewer Weapons Restrictions).

Alternative 3 was the Army's preferred alternative in the EIS.

The No Action Alternative is the environmentally preferred alternative.

The EIS analyzes the use of these MMR and PTA range alternatives by all prospective range users, including other military services. In the past, the Army, USMC, US Navy, US Coast Guard, US Army Reserve, and Hawai'i Army National Guard have trained at MMR and PTA. These military units would be limited to a company-level CALFEX or convoy LFX as the maximum levels of training and all other services would follow the same training constraints as Army units.

3.2.1 No Action Alternative

Under this alternative, there would be no live-fire military training at MMR. The current level of management at MMR is designed to enable the Army to resume training should that decision be reached. If that possibility were eliminated, a reduced level of management would be required. This reduced level of management would be possible because the chances of fire would be greatly reduced. This alternative is not considered to be a reasonable alternative as it would not meet either the purpose or need for undertaking the Proposed Action. This alternative is the environmentally preferred alternative, and serves as an environmental baseline against which other action alternatives can be evaluated.

The use of MMR would be limited to the non live-fire training that is currently authorized involving primarily aviation lasing and unmanned aerial vehicle (UAV) training. To a lesser extent, training occasionally would involve using MMR as a staging base for ground or air movement command and control elements, blank ammunition training, and engineer training. These activities are described briefly below:

Under the No Action Alternative, the 25th ID would be unable to meet its company CALFEX and most convoy LFX requirements in Hawai'i. These would have to be conducted at other training installations outside of Hawai'i. The No Action Alternative, while not considered a reasonable alternative, was analyzed in the EIS, and served the Army as an environmental baseline against which other action alternatives were evaluated.

3.2.2 Live-fire Alternatives (Alternatives 1-4)

CALFEX Training

CALFEXs are conducted at the platoon or company-level. CALFEXs are defined by the integration of different arms, such as infantry, aviation, artillery, engineers, and others, to achieve a combined effect on the enemy greater than if each weapon system were used individually. Table 1 presents the small arms and other weapons that could be used during a typical CALFEX; as the Army continues to evolve, newer weapon systems could be substituted for similar weapons listed in the table. Weapons used by other military units training at MMR or PTA would be substantially similar to those used by the Army.

Convoy Live-fire Training

Convoy LFXs have become an important pre-deployment training requirement based on lessons learned in Iraq and Afghanistan. Live-fire convoy training provides realistic training for convoy operations and an opportunity to employ direct and limited point and area fires in support of tactical movements. Convoy live-fire training is designed to train units to react to enemy contact during tactical movement. This training is required for all types of units including combat arms, CS and CSS. Units in a convoy formation must be able to react to attacks on convoys. Table 2 presents the weapons that could be used during a typical convoy LFX.

Weapons systems generally would include rifles, pistols, machine guns, helicopter guns, mortars, artillery, anti-tank weapons, rockets, and mines. The use of tracer ammunition is included in Alternative 2. Alternatives 3 and 4 involve the use of tracer ammunition, inert TOW missiles, 2.75-inch rockets, and illumination munitions. Alternative 3 also includes training on C-Ridge (the ridge between the north and south lobes of the training area).

While the Final EIS evaluates the effects of all weapons systems contemplated for use at MMR, commitments made during Endangered Species Act (ESA) Section 7 consultation with the USFWS and in the resultant 2007 BO and 2008 amendment to the BO require that certain weapons and munitions be used only after conditions for their use are achieved. In addition, training at Ka'ena Point and C-Ridge and the use of illumination munitions were not covered in the MMR ESA Section 7 consultations. Due to the potential need to use these sites and munitions in the future, however, the Army assessed the environmental impacts associated with these actions.

Table 3 below compares each live-fire alternative for the number of training days and training area required, number and type of live-fire events proposed and evaluated, and for the type of munitions proposed.

A description of each live-fire alternative follows this section.

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Table 3. Comparison of Alternatives to Achieve the Proposed Action

	Alternative 1 MMR	Alternative 2 MMR	Alternative 3 MMR	Alternative 4 PTA
Number of training days	242	242	242	242
Size of training area	1,136 acres (459.7 hectares)	1,136 acres (459.7 hectares)	1,136 acres (459.7 hectares) plus the use of C-Ridge (the ridge between the north and south lobes of the training area)	988 acres (400 hectares) for maneuver plus approximately 10,000 acres (4,047 hectares) for SDZ
Number of annual company- level CALFEXs	10 to 19	Up to 50	Up to 50	Up to 50
Number of Convoy LFXs	100	200	200	NA ¹
Weapons systems	Weapons and munitions listed in Table 2-3 and 2-4 of the Final EIS	Weapons and munitions listed in Table 2-3 and 2-4 of the Final EIS	Weapons and munitions listed in Table 2-3 and 2-4 of the Final EIS	Weapons and munitions listed in Table 2-3 and 2-4 of the Final EIS
Use of live ammunition	Yes	Yes	Yes	Yes
Tracer ammunition	No	Yes	Yes	Yes
Inert TOW missiles, 2.75- inch rockets, and illumination munitions	No	No	Yes	Yes
Squad, section, and platoon maneuvers	Yes	Yes	Yes	Yes
Demolitions training	Yes	Yes	Yes	Yes
Sniper training	Yes	Yes	Yes	Yes
Bivouac	Yes	Yes	Yes	Yes
Staging base (ground or air movement)	Yes	Yes	Yes	Yes
Air assault	Yes	Yes	Yes	Yes
Stryker	Yes	Yes	Yes	Yes
UAVs	Yes	Yes	Yes	Yes

¹ Units deploying to PTA for major exercises are already able to conduct Convoy LFX at PTA. For these units, the number of Convoy LFXs at PTA would not increase under the proposed action.

3.2.2.1 Alternative 1

This alternative involves conducting 10 to 19 company-level CALFEXs and up to 100 convoy LFXs at MMR during a 242-day training year⁴. Convoy LFXs may be conducted either in conjunction with or independently of CALFEX training. The Army would train its units at a reduced range capacity on an approved live-fire assault course. Implementing this alternative

⁴ Includes the progressive live-fire training events preceding the company-level exercise.

would allow military units to conduct nighttime, as well as daytime, training exercises. However, nighttime training would not occur until after fire suppression issues have been finalized by the Army and approved by the USFWS. Over a typical training year, the Army would conduct other types of training, in addition to CALFEXs and convoy LFXs, this would include the squad- and platoon-level LFXs that sequentially lead up to a CALFEX. Activities associated with target emplacements, training aids and objectives, fire treatment and fuel management measures would also occur at MMR in accordance with the 2007 and 2008 USFWS BOs and Section 106 Cultural Resources Programmatic Agreement.

3.2.2.2 Alternative 2

This alternative involves conducting up to 50 company-level CALFEXs up to 200 convoy LFXs during a 242-day training year at MMR. This would include squad- and platoon-level LFXs. Under this alternative, the Army would train its units at a full range capacity on an approved live-fire assault course. Implementing this alternative would allow military units to conduct nighttime, as well as daytime, training exercises. Over a typical training year, it is anticipated that the Army would likely conduct fewer than 50 company-level CALFEXs with some training days dedicated to other types of training. However, analysis of up to 50 company-level CALFEXs identifies environmental impacts from the maximum contemplated use of MMR, with some weapons restrictions. This alternative would involve the use of tracer ammunition facilitating nighttime training. All infantry forces of the US military must be trained and ready for daytime and nighttime live-fire combat and maneuvers. The use of tracers is invaluable in showing the trajectory of bullets and verifying the accuracy of aim at night (fire restrictions similar to Alternative 1 would apply). Convoy LFXs may be conducted either in conjunction with or independently of CALFEX training.

3.2.2.3 Alternative 3

This alternative involves conducting up to 50 company-level CALFEXs and up to 200 convoy LFXs over a 242-day training year at MMR. This would include squad- and platoon-level LFXs. In addition to tracer ammunition, live-fire training would include the use of inert TOW missiles, 2.75-inch rockets, and illumination munitions. Alternative 3 is identified in the Final EIS as the Army's preferred alternative.

This alternative would allow the Army to train its units with maximum realistic training using critical weapons systems on an approved live-fire assault course. Implementing this alternative would allow military units to conduct nighttime and daytime training exercises more effectively.

Alternative 3 also analyzes the impacts from training on C-Ridge, the ridge located between the north and south lobes of the training area. Training at C-ridge would include live-fire support, non-live-fire support, and sniper training. The area is too exposed for the use of artillery.

Convoy LFXs may be conducted either in conjunction with or independently of CALFEX training.

3.2.2.4 Alternative 4

This alternative represents the same weapons and intensity usage as Alternative 3. It provides for a maximum use capacity at PTA including conducting up to 50 company-level CALFEXs over a 242-day training year. The weapons and ammunition proposed for use by the Army are listed in Tables 1 and 2, and would incorporate the use of tracers, inert TOW missiles, 2.75-inch rockets, and illumination munitions.

This alternative would allow the Army to train its units with maximum realistic training with critical weapons systems on an approved live-fire assault course. Both daytime and nighttime training exercises would be conducted under this alternative. This alternative would be subject to future ESA and cultural resources consultations and National Environmental Policy Act (NEPA) documentation and analysis, which may add restrictions and mitigation actions similar to those at MMR. Convoy live-fire training would occur at a future USMC convoy LFX range when the complex is available for use.

3.2.3 Alternatives Considered but Eliminated

To be evaluated in detail in this EIS, alternatives had to meet the purpose and need for the Proposed Action. Alternatives that do not advance the purpose and need are not considered reasonable alternatives. The Army developed four screening criteria based on the purpose and need: 1) range capacity, 2) range design, 3) quality of life, and 4) time and cost. To be carried forward for full evaluation, an alternative must meet all four screening criteria. A full description of these criteria is included in Section 2.5 of the Final EIS. This section discusses the reasons the Army considered but eliminated other identified alternatives.

The alternatives considered but eliminated from detailed evaluation include:

1. Conduct CALFEXs at Seven Potential Locations of PTA;
2. Conduct Training at a Replacement Training Facility at Another Army Installation on O'ahu;
3. Conduct Training at a Site in the Continental United States;
4. Conduct Training at a Site Outside of the United States;
5. Acquire Property on O'ahu and Conduct Training at a New Training Facility; and
6. Move Stationary Ranges to MMR and Conduct CALFEXs and convoy Live-Fire at SBMR.

These alternatives have been eliminated because they do not meet the purpose and need or certain screening criteria and eliminated them from further review in this EIS. Table 4 provides a summary of the alternatives considered, but eliminated, as well as the analysis of each against the four screening criteria.

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Table 4. Summary of Alternatives Considered but Eliminated

	Seven Potential Range Locations on PTA	O'ahu Installations	CONUS Installations	Installations Outside the United States	Acquire Land on O'ahu for New Training Facility	Move Stationary Ranges to MMR and Train at SBMR
Screening Criterion 1: Range Capacity	Does not meet this criterion.	Does not meet this criterion.	Does not fully meet this criterion.	Does not fully meet this criterion.	Does not fully meet this criterion.	Does not meet this criterion.
Screening Criterion 2: Range Design	Does not meet this criterion.	Does not fully meet this criterion.	Meets this criterion.	Meets this criterion.	Does not fully meet this criterion.	Does not meet this criterion.
Screening Criterion 3: Quality of Life	Meets this criterion.	Meets this criterion.	Does not meet this criterion.	Does not meet this criterion.	Meets this criterion.	Meets this criterion.
Screening Criterion 4: Time and Cost	Meets this criterion.	Does not fully meet this criterion.	Does not meet this criterion.	Does not meet this criterion.	Does not meet this criterion.	Does not fully meet this criterion.

3.3 Public Involvement

Through public involvement, the Army determined the range of issues and those significant issues to be addressed in the EIS. Public involvement also allowed for full and fair discussion of significant environmental impacts. By providing a means for open communication between the Army and the public, the procedural aspects of NEPA promote better decision-making. Persons who were known to have a potential interest in the Proposed Action were notified and invited to participate in the environmental impact analysis process.

The 25th ID and USAG-HI reached out to numerous organizations to gather input on the NEPA process. Civic organizations consulted included Rotary International, chambers of commerce, the Military Affairs Committee, veterans groups, retired military members, state and city government officials, Members of Congress, and neighborhood boards. Native Hawaiian and Pacific Islander groups also have been encouraged to participate in the NEPA process.

Council on Environmental Quality (CEQ) regulations and 32 CFR Part 651 are the resources that guide public participation opportunities. The Army's public participation outreach includes issuing in the *Federal Register* a notice of intent (NOI) to prepare an EIS, a public scoping process, providing public review periods for the Draft EIS and Supplemental Draft EIS, and publication of the Final EIS, accompanied by a 30-day mandatory waiting period before a

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Record of Decision (ROD) is issued. The Notice of Availability (NOA) for this ROD will be published in the *Federal Register*.

The NOI was published in the *Federal Register* on March 20, 2002, and notices were published in the major newspapers on O'ahu announcing the time and location of two public scoping meetings that were held to solicit public input and to obtain comments on the scope of the EIS. The dates for public notifications and the publications in which they were published, information on scoping meeting locations, and a summary of the major concerns expressed during the scoping process is found in Section 1.6 of the Final EIS.

Subsequently, the Army prepared a Draft EIS. For public review of the Draft EIS, the USEPA published a NOA in the *Federal Register* on July 22, 2005, and the Army published a notice of availability in the *Federal Register* on August 3, 2005. The Army also issued a press release on the availability of the Draft EIS on July 22, 2005 and on July 23, 2005.

The Army provided a public comment period for the Draft EIS of 60 days (from July 22 to September 21, 2005), then extended it an additional 15 days to October 6, 2005. Extension of the comment period was published by the USEPA in a September 16, 2005, *Federal Register* notice.

Three public comment meetings were held on the island of O'ahu on August 23, 25, and 27, 2005. Seventy-one individuals or persons representing organizations provided oral comments for the Army's consideration. The Army also received written comments on the Draft EIS from approximately 38 individuals, organizations, and government agencies in the form of e-mails and written letters. The public comments, and the Army's responses to them, are included in Appendix K of the Final EIS⁵.

The Draft EIS was also made available for a second 60-day public comment period, from February 2 to April 3, 2007. The review period for technical experts retained on behalf of Mālama Mākua was extended an additional 16 days, to April 19, 2007. During this time, the Army received oral comments from 10 individuals or persons representing organizations. Two individuals also provided written comments on the Draft EIS. The public comments, and the Army's responses to them, are included in Appendix K of the Final EIS.

The Army made several changes to the Draft EIS in response to public comments, including the evaluation of an additional training alternative at PTA. The Army therefore published the EIS again as a supplemental draft to seek public comment on September 22, 2008. CEQ regulations provide for a minimum 45-day public comment period following publication of the Supplemental Draft EIS. The 45-day comment period ended on November 3, 2008, with four public meetings held on the islands of O'ahu and Hawai'i in early October 2008.

During the meetings, the public was provided the opportunity to make oral and written comments on the EIS. In addition, individuals and representatives of private organizations and

⁵ Appendix K was not printed with the Final EIS, rather, Appendix K may be found online at the Army's Web site established for the EIS: <http://www.garrison.hawaii.army.mil/makuaeis>

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government agencies submitted written comments to the Army without attending the public meetings.

The Army published a Marine Resources Study (MRS) on January 14, 2009, and thereafter initiated a 60-day public review and comment period. On February 11, 2009, the Army held a public meeting at Nanaikapono Elementary School. Approximately 30 attendees were present at that meeting and 14 speakers addressed the audience. The entire meeting was recorded. The Army also provided for a Native Hawaiian translator, one court recorder that transcribed the meeting, a second court recorder to take private testimony, and a Facilitator. The Army also made available copies of the MRS for the public, and prepared posters summarizing the study for the public to view. The video and transcripts of this meeting are included as part of the administrative record for this EIS. In addition, the transcripts of that meeting, and responses to comments on the study, are available as an appendix to the 2009 MRS. The MRS is found as Appendix G-8 of the Final EIS⁶.

Other opportunities for public input and involvement are listed in Section 1.6 of the Final EIS, and include efforts conducted in support of identification and access of cultural sites; sampling and analysis plans and studies for the field investigations at MMR; and a proposal for the Army to conduct prescribed burns at MMR.

The NOA for the Final EIS was published in the Federal Register on June 5, 2009, which commences a 30-day waiting period (32 CFR Part 651.45(i)) during which time a decision will be considered. The Army issued press releases to newspapers in Hawai'i on June 3, 2009, informing the public of the Final EIS release. The Army also mailed notices of the Final EIS publication to more than 300 Federal and State stakeholders, interested parties, Native Hawaiian groups and organizations, and Elected Officials. Hard copies and compact disks (CDs) containing the EIS were made available at the following libraries on the islands of O'ahu and Hawai'i: Hawai'i State Library, 478 South King Street, Honolulu; Wahiawa Public Library, 820 California Avenue, Wahiawa; Wai'anae Public Library, 85-625 Farrington Highway, Wai'anae; Pearl City Public Library, 1138 Waimano Home Road, Pearl City; Hilo Public Library, 300 Waiānuenu Avenue, Hilo; Kailua-Kona Public Library, 75-138 Hualālai Road, Kailua-Kona; and the Thelma Parker Memorial Public and School Library, 67-1209 Māmalahoa Hwy. Kamuela.

Individuals and organizations are invited to access information concerning the EIS at <http://www.garrison.hawaii.army.mil/makuaeis>.

⁶ This MRS supplemented a study that was released for public review and comment in February 2007. The Army completed the 2009 study to address new requirements of a legal settlement agreement (Jan 2007). The 2007 study, including public comments and responses by the Army, is found as part of the Supplemental Draft EIS.

3.3.1 Comments Received During the Final EIS Waiting Period

During the 30-day waiting period following publishing the Final EIS, the Army received comments from the State of Hawai'i Department of Health, the State of Hawai'i Department of Transportation (DOT), the USEPA Region IX, and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), that require further consideration or clarification in the ROD. Other comments received are forwarded to the USAG-HI Directorate of Public Works for their consideration, and are included in the administrative record for this project.

The State of Hawai'i Department of Health pointed out that intermittent streams are considered state waters under Hawai'i Administrative Rules, Chapter 11-54. The Army had assumed otherwise in its initial response to comments, pp. K-39 to K-40. I took this information into account in making the decision.

The State of Hawai'i DOT notified the Army of concerns regarding convoy travel between SBMR and MMR, and the transport of ammunition on State facilities. Their concerns were incorporated into the Army's analysis of potential impacts, and I have decided to adopt their requests as mitigations for the selected alternative (see Section 4.2 Mitigation Measures).

The USEPA reissued some of their prior concerns raised in the Draft EIS and Supplemental Draft EIS. By selecting the Alternative 2 variation, I feel the impacts to soils and water at MMR, and the impacts resulting from wildfires at MMR will be reduced, and therefore addresses the USEPA's concerns as they relate to Alternative 3 in the Final EIS (indicated as the Army's preferred alternative).

The USEPA also commented on the results of the MRS (Appendix G-8 in the Final EIS), and the potential risk to area residents who rely on the Mākua muliwai and nearshore areas for subsistence. I have decided to adopt a long-term monitoring program to help detect potential on-site, as well as off-site transport of contamination. This scope of, and protocol for, this program will be made available for a 60-day public comment period.

The USEPA recommended that the Army select Alternative 4 PTA or Alternative 1 MMR, both evaluated in the Final EIS. I have considered these alternatives, and balanced my decision on the comments supplied by our Federal and State partners and the community, and the mission requirements of the 25th ID. In the end, I did not feel Alternatives 1 or 4 fully met the need for the proposed action. My rationale for selecting the Alternative 2 variation is found in Section 4.1 of this ROD.

The USEPA urged the Army to commit to a remediation program for the former open burn/open detonation (OB/OD) area of MMR, and to remove "hot spots" in areas where contaminants exceed preliminary remediation goals, specifically Objective Elk and the Mākua Stream Firing Area. The USEPA further requested of the Army to increase the level of post-training cleanup activities. The OB/OD area is the only area of Mākua with sufficient explosive concentrations to allow for remedial efforts. Levels of contamination at both Elk and Mākua Stream Firing Area are not widespread enough to justify a hot spot removal or remediation project. The OB/OD area

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is, however, in Resource Conservation and Recovery Act (RCRA) deferred closure with EPA, meaning that as long as it is in the middle of an active range there is an exemption from clean-up. Management of the closure of the OB/OD area has been turned over to the State of Hawai'i Department of Health; this is further explained in a May 18, 2007 letter from the USEPA. Lastly, the Army conducts a thorough cleanup of the range area following training activities. This is fully detailed in Section 2.4.3 of the Final EIS. UXO is also cleared if it becomes known following rain storms or other events which would expose it or wash it to the surface. Additionally, UXO clearance is incorporated into construction projects such as widening the firebreak road network at MMR.

Finally, the USEPA recommended that the Army include in the ROD all mitigation measures identified in the Final EIS including additional helicopters related to fire suppression mitigations in Chapter 4.14 of the Final EIS. I have decided to adopt these wildfire mitigations as noted in Section 4.2 of this ROD.

The NOAA NMFS notified the Army of its concerns about the potential impacts on coral reef communities as a result of Army live-fire training. The first concern raised dealt with excessive sediment loading as a principal threat to corals and to other marine species. The Army addressed soil erosion and sedimentation in Section 3.8 and 4.8 of the Final EIS. I have decided to adopt several mitigation measures to reduce the effects of soil erosion on- and off- the installation. These are found in Section 4.2 of the ROD and include reseeding slopes and planting vegetation buffers on MMR; reducing the potential for wildfires to ignite, thus protecting soils from increased weathering and erosion; and adoption of a phytoremediation pilot study that would decrease the risk of substances migrating from the OB/OD.

The NMFS also noted that the Army did not adequately characterize the marine biological community, the coral reef habitat in particular, during surveys off Mākua beach, and therefore was prevented from conducting a comprehensive analysis of the impacts to marine species. The NMFS also raised concern that the impacts to corals were not considered in the cumulative impacts section of the Final EIS, and were not considered in the EIS section on other related analyses. The MRS at Section 2.4 discusses a preliminary shellfish survey undertaken to identify species that inhabit the muliwai and nearshore areas off Mākua Beach. Although corals were not specifically counted in that survey, their presence was discussed in the MRS. Section 1.1 of that study indicates that corals were observed in relatively small communities, not dense enough to obscure even the underlying surface. The Final EIS on page 3-193 to 3-194 also characterizes the coral community; it provides information on where corals are located near Mākua beach and where they are not, and it lists the reef fish that most commonly inhabit the corals in this area. Section 5.3.9 discusses the potential cumulative impacts from sedimentation and chemical substance transport to marine resources. Section 5.3.7 also discusses the potential for chemical substance transport to the marine environment, and that this issue is of significant concern to the Army.

The NMFS supported the Army's mitigation plan to develop a long-term monitoring program, and requested more information on that program. The Army is currently in the process of preparing its proposed long-term monitoring plan, and will shortly have that plan ready for

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public comment. I forwarded the letter from NMFS to the USAG-HI DPW and Environmental Division for their action and consideration.

The NMFS further offered an additional mitigation for the Army to consider, and I have added more discussion in Table 10, which is found in Section 4.2 of this ROD.

Finally, the NMFS indicated that the waters off Mākua beach are designated Essential Fish Habitat (EFH) from shoreline to 50 fathoms (approximately 91 meters or 300 feet) under the Coral Reef Ecosystem Fishery Management Plans; and they further indicated that the Army did not adequately address the potential adverse impacts of the Army's proposed action to the Mākua nearshore environment (contained within EFH), and consequently, the NMFS could not provide adequate conservation recommendations to minimize such adverse impacts. During preparation of the Final EIS, the Army considered and analyzed the impacts to Mākua nearshore fish and benthic communities in both Section 4.8 of the EIS, and in preparing the MRS as a supporting study of the EIS. In addition, in accordance with 50 CFR § 600.920, and with proposed NMFS guidance, the Army fulfilled its responsibilities under NEPA by notifying the Service of the availability of the Draft EIS and Supplemental Draft EIS. The NMFS was afforded opportunity to provide comments on the issue raised here. The Army's notification also indicated that significant adverse impacts were anticipated due to soil erosion and from munitions use to areas on- and off MMR. The Army further provided the NMFS a CD containing the Supplemental Draft EIS for its review and comment. I encourage the Service to work with the Army in preparing the long-term monitoring plan, to foster full cooperation of both Federal departments, while helping the Army to conduct a full evaluation of the risk from live-fire training at MMR to the marine ecosystem and to the local community.

3.4 Environmental Consequences

This section provides a summary of the overall potential environmental impacts for each of the alternatives described in Chapter 2 of the Final EIS. Each section in Chapter 4 of the Final EIS includes a discussion of impact methodology and factors used to determine the significance of direct and indirect impacts (40 CFR 1508.8) as well as proposed mitigation where appropriate. Cumulative impacts are presented in Chapter 5 of the Final EIS.

Pursuant to the CEQ regulations, factors considered for determining significance of impacts have been established for each resource and are presented for each resource section. If any project activity would exceed one of those factors, the impact is considered significant.

Impacts are defined in the following categories:

- Significant impact;
- Significant impact mitigable to less than significant;
- Less than significant impact;
- No impact; and
- Beneficial impact.

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Table 5 below provides a comparative summary of the potential impacts of implementing each alternative for meeting the Proposed Action. Table 6 exhibits the composite impact (direct and indirect impacts) for each valued environmental component (VEC) resulting from implementation of each alternative.

The composite impact incorporates the impacts from the four activity groups that were analyzed (Range Capacity, Range Design, Quality of Life, Time and Cost). To summarize these impacts comparatively, the highest impact level to each VEC that would be realized from any of the four activity groups in any of the impacted areas is used as the single impact rating for each of the alternatives. There may be both adverse and beneficial impacts within a single resource category. Where there are both adverse and beneficial impacts, both are listed on the tables and in the text.

Table 5. Summary of Potential Impacts

Impact Issues	No Action Alternative	Alternative 1 MMR (Reduced Capacity Use with Some Weapons Restrictions)	Alternative 2 MMR (Full Capacity Use with Some Weapons Restrictions)	Alternative 3 MMR (Full Capacity Use with Fewer Weapons Restrictions)	Alternative 4 PTA (Full Capacity Use with Fewer Weapons Restrictions)
Land Use and Recreation	○	⊗	⊗	⊗	○
Airspace	○	○	○	○	○
Visual Resources	○	○	○	○	○
Air Quality	○	○	○	○	⊗
Noise	○	⊗	⊗	⊗	○
Traffic and Transportation	○	⊗	⊗	⊗	○
Water Resources	○	⊗	⊗	⊗	○
Geology and Soils	⊗	⊗	⊗	⊗	○
Biological Resources	⊗	⊗	⊗	⊗	⊗
Cultural Resources	⊗	⊗	⊗	⊗	⊗
Hazardous Materials and Waste	○	○	○	○	⊗
Socioeconomics & Environmental Justice	○	⊗	⊗	⊗	○+
Public Services and Utilities	○	○	○	○	○
Wildfires	⊗	⊗	⊗	⊗	⊗

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Table 5. Summary of Potential Impacts

Impact Issues	No Action Alternative	Alternative 1 MMR (Reduced Capacity Use with Some Weapons Restrictions)	Alternative 2 MMR (Full Capacity Use with Some Weapons Restrictions)	Alternative 3 MMR (Full Capacity Use with Fewer Weapons Restrictions)	Alternative 4 PTA (Full Capacity Use with Fewer Weapons Restrictions)
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LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ⊖ = Less than significant impact
- = No impact
- + = Beneficial impact

In addition to the direct and indirect effects the Army assessed for meeting the purpose of the proposed action, it also conducted an assessment of cumulative impacts when looking at this action in terms of past, present, and reasonably foreseeable proposals in the region. The impact assessment below incorporates the impacts when viewed in the context of proposals and actions which have already occurred, or may occur in the future.

Table 6. Summary of Potential Cumulative Impacts

Impact Issues	No Action Alternative	Alternative 1 MMR (Reduced Capacity Use With Some Weapons Restrictions)	Alternative 2 MMR (Full Capacity Use With Some Weapons Restrictions)	Alternative 3 MMR (Full Capacity Use With Fewer Weapons Restrictions)	Alternative 4 PTA (Full Capacity Use with Fewer Weapons Restrictions)
Land use and recreation	⊖	⊗	⊗	⊗	⊖
Airspace	○	○	○	○	○
Visual resources	⊖	⊖	⊖	⊖	⊖
Air quality	⊖	⊖	⊖	⊖	⊙
Noise	⊖	⊗	⊗	⊗	⊖
Traffic and transportation	⊖	⊙	⊙	⊙	⊖
Water resources	⊗	⊗	⊗	⊗	⊖
Geology and soils	⊗	⊗	⊗	⊗	⊗
Biological resources	⊗	⊗	⊗	⊗	⊗
Cultural resources	⊗	⊗	⊗	⊗	⊗
Hazardous materials and waste	⊖	⊙	⊙	⊙	⊙
Socioeconomics and environmental justice	⊖+	⊗	⊗	⊗	⊖+
Public services and	⊖	⊖	⊖	⊖	⊖

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Table 6. Summary of Potential Cumulative Impacts

Impact Issues	No Action Alternative	Alternative 1 MMR (Reduced Capacity Use With Some Weapons Restrictions)	Alternative 2 MMR (Full Capacity Use With Some Weapons Restrictions)	Alternative 3 MMR (Full Capacity Use With Fewer Weapons Restrictions)	Alternative 4 PTA (Full Capacity Use with Fewer Weapons Restrictions)
utilities					
Wildfires	⊗	⊗	⊗	⊗	⊗

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ◉ = Less than significant impact
- = No impact
- ⊕ = Beneficial impact

4.0 Decision

After a thorough review of the Final EIS for Military Activities at MMR, Hawai‘i, I have decided to proceed with a variation of Alternative 2. This variation of Alternative 2 has less impact to the environment and to the community than Alternative 3, the Army’s preferred alternative in the Final EIS, and has less impact than Alternative 2, which was also analyzed in the Final EIS.

The action I have selected allows up to 32 CALFEXs and 150 convoy LFXs per training year at MMR; this decision includes the squad- and platoon-level LFXs that sequentially lead up to a CALFEX. The Army will not use MMR for live-fire training at night until all relevant fire suppression measures are met and approved in accordance with the USFWS 2007 and 2008 BO.

I have elected to not use either C-Ridge or Ka’ena Point for training, due to the risk of wildfire, and the potential irreversible impacts from training to T&E species.

The action does not include use of Javelin and inert TOW missiles; AT-4 and 2.75-inch rockets, the SMAW, illumination munitions, and tracer ammunition at MMR. The selected action represents a proper balance for meeting the training requirements of the units of the 25th ID and other users, while ensuring the Army meets its responsibilities to preserve the land and resources at MMR, and continues to be a good neighbor to the community along the Wai’anae coast.

4.1 Rationale for the Decision

It is essential for units stationed in Hawai'i to have the proper level and type of training prior to deploying to combat missions overseas. Allowing up to 32 CALFEXs and 150 convoy LFXs permits the 25th ID and other users of MMR the flexibility to choose the right level of training required for their units during recovery operations and prior to deployment.

Based on this guidance, units of the 25th ID require a minimum of 23 CALFEXs annually. Ten (10) of these are companies of the 3/25th IBCT. Thirteen of these are SBCT companies. SBCT companies need a suitable mounted maneuver facility in order to conduct a CALFEX to standard, and therefore, could not conduct mounted CALFEX training at MMR. However, they are permitted to conduct dismounted training at MMR providing the Stryker vehicles (up to five) remain at designated firing points. The SBCT units (13 in total) would primarily train with Stryker vehicles (mounted exercises) at either the Schofield Barracks or PTA BAX, upon completion of these complexes, to meet their tactical live-fire operational requirement. In addition, the Army will be prepared to host nine (9) USMC companies conducting CALFEXs at MMR.

My decision is to permit any combination of 32 CALFEXs in a year at MMR. This means that companies of the 3/25th, 2/25th, and USMC may conduct more than their minimum CALFEX training requirements at MMR, to ensure the right level of training is accomplished during unit recovery operations and prior to deployment; however, no more than 32 CALFEXs may be conducted at MMR in any given year. Units of the 3/25th will also be permitted to conduct non-standard (dismounted) CALFEXs at SBMR and at PTA once the BAXs at those locations are complete, and if those ranges are available to support the additional throughput. Similarly, SBCT units will also be permitted to conduct their annual CALFEX training to standard at SBMR and PTA once the BAXs at those locations are complete.

My decision to permit up to 32 CALFEXs of any combination at MMR shall not influence the ability of CALFEXs (standard or non-standard) to be conducted at SBMR and PTA.

My decision is also to allow up to 150 convoy LFXs per training year at MMR. As defined in Section 2.2 of this ROD, the minimum required number of convoy LFXs per training year is 150. 143 of these represent the minimum requirements for units of the 25th ID, NGB, US Army Reserve, and combat aviation units presently established in Hawai'i. These are units represented in the fiscal year 2007 NDAA study to report on capability of live-fire ranges in the State of Hawai'i. Additional flexibility must be given for units not currently garrisoned in Hawai'i, or are recently garrisoned in Hawai'i under the September 2008 decision to station Army units in the Pacific region (Record of Decision for Army Growth and Force Structure Realignment to Support Operations in the Pacific). Therefore, in order to provide these units the necessary flexibility to meet their minimum convoy LFX training requirements, I have decided to allow up to 150 convoy LFXs per training year at MMR.

Units of the 25th ID and other users of the range at MMR must be permitted to meet, at minimum, their DMETL convoy live-fire training requirements in order to be prepared for combat missions prior to deployment. The range at MMR is close to home stationing, allowing units to travel to a range on O'ahu that is configured for convoy LFXs, complete their required

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training, and travel back to home station in one day. Permitting convoy LFXs at MMR eliminates the need for units of the 25th ID to complete multiple deployments to other ranges in Hawai'i in order to meet their minimal convoy LFX training requirements.

The USMC is constructing a convoy LFX range at PTA. This range will be available for the Army to use, and will provide some flexibility in training throughput for Army units deploying to PTA to conduct collective training exercises. The use of MMR will not influence the need to conduct convoy LFXs at other locations in Hawai'i, as required to be prepared for missions overseas.

MMR is the only facility in the State of Hawai'i with the capacity to support company-level CALFEXs. The topography of MMR with steep valley walls enclosing the range area on three sides, and MMR's relative isolation from population centers provides the necessary buffer areas that successfully facilitate maneuver live-fire training up to the company-level. Mākua is also an essential home station facility necessary to maintain training readiness of O'ahu-based units. Primary benefits of Mākua's proximity to Schofield Barracks include reduced travel time⁷ and transportation cost savings, and reduced time away from families for units preparing for deployments.

Rationale for eliminating the use of Tracer Ammunition

The use of tracer ammunition is invaluable in demonstrating the trajectory of bullets and verifying the accuracy of aim so that Soldiers may train to proficiency and be successful in combat. Nevertheless, the most common cause of wildfires at MMR has historically been from tracer ammunition⁸. It is incumbent upon the Army to plan sensibly the use of MMR, to maximize use of the range for training, and concurrently to enact measures to reduce the Army's training impact on the land. By eliminating tracer ammunition from live-fire training exercises at MMR, I have sought that proper balance of training and responsible resource management.

Rationale for eliminating the use of C-Ridge and Ka'ena Point

The use of C-Ridge and Ka'ena Point were also evaluated in the Final EIS. I have elected to not use these locations for training due to the following reasons.

The Hawai'i Natural Area Reserves System is managing Ka'ena Point for the recovery of the native vegetation and bird life. There are a number of endangered plants found at Ka'ena Point and critical habitat for six listed plants has been designated within Ka'ena Point. In addition, the Laysan albatross, a bird of conservation concern, and the wedgetailed shearwater, both Migratory Bird Treaty Act (MBTA) -protected species, would be adversely affected by increased use of Ka'ena Point Trail for military marches. Therefore, due to the sensitivity of this area to the proposed military training, USAG-HI excluded this area from training.

C-ridge is highly prone to wildfires. Wildfire ignition on C-ridge threatens the Kahanahaiki Management Unit, a T&E species management area. To train on C-Ridge presents an unnecessary risk to natural habitat and T&E species in that area.

⁷ The convoy travel time from SBMR to MMR is generally under two hours. Units may travel to MMR, complete convoy live-fire training, and return to SBMR in approximately one day.

⁸ Tracer ammunition has been the result of approximately 49 percent of wildfires at MMR.

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Finally, the selection of an Alternative 2 variation reduces the intensity of impacts from live-fire and maneuver training on the environment, below what was evaluated as Alternative 2 in the Final EIS (Full capacity use with some weapons restrictions), and below Alternative 3 (Full capacity use with fewer weapons restrictions)-the Army's Preferred Alternative. The primary difference in impacts between the Alternatives result from fewer CALFEXs and convoy LFXs performed at MMR, and from eliminating munitions that would otherwise cause greater levels of noise and increase the risk of igniting a wildfire at the installation. Nevertheless, the overall impacts from implementing the Alternative 2 variation will not be substantially different than Alternative 2 evaluated in the Final EIS. Therefore, the Army conducted a full analysis of the potential impacts from implementing the Alternative 2 variation.

Table 7 discusses a brief summary of the potential impacts associated with the Alternative 2 variation, as they relate to Alternative 2 in the Final EIS (Full capacity use with some weapons restrictions), and Alternative 3 (Full capacity use with fewer weapons restrictions).

Table 7. Evaluation of Potential Impacts Associated with the Alternative 2 Variation

Impact Issues	Alternative 2 *Variation MMR	Summary of Anticipated Impacts Comparison of Alternative 2 Variation against: Alternative 2 (Full capacity use with some weapons restrictions) Alternative 3 (Full capacity use with fewer weapons restrictions)
Land use and recreation	⊗	Impacts would be the same as those described under Alternative 2. Impacts would be the same as Alternative 3, except there would be slightly less of an impact on recreational resources at Mākua Beach due to the elimination of use of additional HE weapons.
Airspace	○	Impacts would be the same as those described under Alternative 2 and 3. There would be no reduction in the amount of navigable airspace, no assignment of new or modified special use airspace, and no change to existing or planned military training routes.
Visual resources	⊙	Impacts would be the same as Alternative 2 and 3, except elimination of the use of tracer ammunition and some HE munitions would reduce the chance of fires that would otherwise detract from scenic views available to the public.
Air quality	⊙	Impacts would be the same as Alternative 2 and 3, except air emissions from vehicles and munitions/weapons firing would be slightly reduced.
Noise	⊗	Impacts would be the same as Alternative 2 and 3, except fewer munitions fired will result in slightly less of an impact to users of Mākua Beach.
Traffic and transportation	⊙	Impacts would be the same as Alternative 2 and 3, except fewer convoys may travel between SBMR and MMR through the Waianae coast community.
Water resources	⊙	Impacts on surface water quality would be reduced from significant impacts mitigable to less than significant. Elimination of tracer ammunition and some HE munitions would reduce the chance of fires that would otherwise result in the erosion of soils. In addition, fewer vehicles and Soldiers maneuvering on foot would reduce vegetation loss and thus impact to soils.
Geology and soils	⊗	Impacts would be the same as Alternative 2 and 3, except the potential for wildfires to occur would be slightly decreased by eliminating tracer ammunition and some other HE munitions, thus reducing vegetation and soil loss. By eliminating some munitions from use at MMR, smaller amounts of explosive materials would contaminate soils.

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Table 7. Evaluation of Potential Impacts Associated with the Alternative 2 Variation

Impact Issues	Alternative 2 *Variation MMR	Summary of Anticipated Impacts Comparison of Alternative 2 Variation against: Alternative 2 (Full capacity use with some weapons restrictions) Alternative 3 (Full capacity use with fewer weapons restrictions)
Biological resources	⊗	Impacts would be the same as Alternative 2 and 3, except the potential for wildfires to occur would be slightly decreased by eliminating tracer ammunition and some other HE munitions, thus reducing impacts to sensitive plant and animal species.
Cultural resources	⊗	Impacts would be the same as Alternative 2 and 3, except a reduction in CALFEX training would slightly reduce the risk of accidental damage to cultural resources.
Hazardous materials and waste	⊙	Impacts would be the same as Alternative 2 and 3, except there would be a slight decrease in hazardous material and waste resulting from a reduction in the use of munitions items.
Socioeconomics and environmental justice	⊗	Impacts would be the same as Alternative 2 and 3, except less convoy travel would decrease the risk of accident along Farrington Highway. Flying some munitions items to MMR for training rather than transporting them along Farrington Highway would decrease the risk (of accidental explosion) to the residents of the Waianae coast.
Public services and utilities	⊙	Impacts would be similar.
Wildfires	⊗	Impacts would be the same as Alternative 2 and 3, except by eliminating the use of tracer ammunition (and some HE munitions) the risk of wildfire ignition would be reduced. In addition, the Army has adopted, or will adopt, a number of mitigations that would assist in wildfire suppression. These are discussed in Section 4.2 Mitigation measures.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

Rationale for not selecting the No Action Alternative

Under this alternative, there would be no live-fire military training at MMR. The use of MMR would be limited primarily to aviation lasing and UAV training. To a lesser extent, training occasionally would involve using MMR as a staging base for ground or air movement command and control elements, blank ammunition training, and engineer training. The No Action Alternative is the environmentally preferred alternative because the higher level of impact to the environment, including from air emissions and noise from live-fire training activities would not occur.

Under this alternative, units of the 25th ID would be unable to meet their company-level CALFEX and most convoy LFX requirements in Hawai'i. These would have to be conducted at other training installations outside of Hawai'i. Units of the 25th ID have been stationed in

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Hawai'i to support national security goals and objectives, and to meet the objectives outlined in the Quadrennial Defense Review and the Army Campaign Plan. The US Pacific Command (PACOM) must be prepared to handle contingencies involving a number of potential conflict scenarios including foreign nation aggression, and deterring nuclear advancement and terrorist insurgency. For units stationed in Hawai'i to perform these duties successfully, range assets must be available within a geographic distance that allows each unit to deploy its Soldiers and equipment to and from range locations to complete essential live-fire tasks within established timeframes. The time and cost of transporting units to a training area must not have a major impact on the overall training levels for a unit. Each unit has a limited amount of time and cost resources to achieve training requirements. Therefore, range assets outside of Hawai'i would compromise the unit's ability to meet all mission essential tasks and readiness requirements.

The No Action alternative is also the least favorable alternative for T&E species conservation. The Army is currently implementing conservation measures in accordance with the USFWS 2007 and supplemental 2008 BO that are beneficial to the listed species within the action area of the preferred alternative. Had the No Action Alternative been selected, the Army would reinitiate consultation with the USFWS based on the fact that potential mission impacts on listed species would be greatly minimized. There would be no need to continue with current conservation efforts, such as offsite species stabilization, if no live-fire training were to occur at the installation. Offsite conservation has been essential for reducing impacts to listed species from fire, ungulates, invasive plant species and other threats, and to help stabilize populations of listed species. Cessation of conservation efforts required to support live-fire training at MMR, would have significant adverse impacts on numerous listed species for the reasons listed above.

Rationale for not selecting the Army's Preferred Alternative (Alternative 3)

I have selected the Alternative 2 variation over the Army's preferred alternative for the following reasons.

The Army understands that use of MMR may have significant and irreversible affects to the environment and to the native Hawaiians who perpetuate their cultural tradition on lands of MMR. We must practically, and to the extent possible, balance the needs of the native Hawaiian people and the critical training requirements of the Army, while continuing to manage the land and its resources responsibly.

- 50 CALFEXs exceeds the projected annual CALFEX requirements for units of the 25th ID stationed in Hawai'i, and for units of other military services that intend to use MMR to train. Hawai'i needs the range capacity to support a minimum of 32 company-level CALFEXs annually.
- 200 convoy LFXs exceeds the projected annual convoy LFX requirements for units of the 25th ID, US Army Reserve, and Army National Guard that are stationed in Hawai'i. The minimum annual platoon-level convoy LFX requirement for these units is 143. Additional convoy LFXs may be required for units that have recently been garrisoned in Hawai'i, or are known to be garrisoned in Hawai'i in the future.
- Alternative 3 evaluates the use of inert tracked TOW missiles, 2.75-inch rockets, and illumination munitions. The EIS also analyzed the use of AT-4 rockets and the SMAW.

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Decidedly, these munitions increase the risk of wildfire at MMR. The Army would be required to make a number of costly investments over a period of not less than 25 years to re-consult with USFWS on the use of these munitions. These investments may not, in the end, yield conditions at MMR favorable for use of these weapons systems.

- The use of the MK-19 High Explosive munition item was evaluated in the EIS. Continued use of this dud-producing round would require considerable time and funding investments from the Army to be able to maintain the existing targetry and range facilities. This item will not be used, rather, the MK-19 training practice round will be used for training in its place. The training practice round is not a HE munition will have less impacts to training infrastructure at MMR.

Rationale for not selecting Alternative 4 (PTA)

I have selected the use of MMR over Alternative 4, PTA, because implementation of Alternative 4 would prove too costly a training investment for the Army to consider long-term; it would reduce Soldier readiness, may reduce the overall training capability at PTA due to range requirements associated with T&E species and Cultural Resources, and it would reduce greatly the quality of life of the Soldiers and their Families.

- The cost to the Army for deploying units to train for extended periods of time at PTA, combined with the cost for constructing the associated CALFEX range and infrastructure, would be exorbitant. Use of the twin Pu'u area would not only require range construction, but would require significant PTA cantonment area upgrades. The best estimate currently available is that the Twin Pu'u range would cost about \$71 million. Associated cantonment area improvements could cost as much as \$200 million. Currently, there are no formal cost estimates for these projects. In the end, the implementation of Alternative 4 would divert much needed resources from 25th ID mission requirements, and from other basic living, training, and infrastructure requirements for units and Soldiers' Families stationed in Hawai'i.
- For the Army to have a ready and available force, Soldiers must have access to ranges and training areas that are close to their home station. Soldiers stationed in Hawai'i must be able to achieve and maintain readiness for immediate deployment. This means ensuring Soldiers are able to meet both their individual training requirements, and meet CMETL and DMETL requirements prior to deployment to Afghanistan or Iraq. Deployments of units to PTA require a combination of transportation methods for Soldiers and equipment, including barges, logistic support vessels (LSVs), and commercial and military aircraft. The distance for a vessel to travel between O'ahu and Hawai'i is greater than 200 miles and takes time to accomplish the deployment and re-deployment back to home station. It is unlikely that a company would travel to PTA solely to conduct a CALFEX or convoy LFX. In most cases, the excessive time and costs associated with moving equipment would lead to combining of various training requirements, and a longer stay at PTA. A typical battalion deployment to PTA is approximately 30 days. For three line companies to conduct CALFEX training, it is estimated that an additional 12 to 15 days would be required (for a total of 42 to 45 days per battalion rotation to PTA). Under the PTA alternative, the time it would take for units stationed on O'ahu to deploy and train at PTA (42 to 45 days) would prevent those units from meeting much of their training requirements in a given training year.

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- The large footprint of a planned CALFEX range at PTA would diminish the overall training capacity for the planned BAX and other ranges located adjacent to the preferred CALFEX range location at PTA. This is due to an overlap of the SDZs of the planned range with the adjacent training areas. If the CALFEX range were to be used, safety measures would limit activity on the neighboring training areas.
- The projected Section 7 ESA and Section 106 Cultural Resources consultations that would be required for use of a new CALFEX range at PTA may result in training restrictions beyond those which would make training at PTA a favorable alternative. The addition of a CALFEX range at the PTA Twin Pu'u location would increase the use of larger caliber munitions in an area where there are currently no established ranges, thus requiring the construction of a new range, and the need for prescribed burns to remove invasive fountain grass and facilitate the clearance of UXO. Wildfires caused by prescribed burns or by training pose a threat to sensitive plants and animals adjacent to the proposed range footprint. Training may also damage archeological sites, as could UXO clearance activities to ready the range area for use. Finally, the amount of time for the Army to complete required NEPA documentation, prior to when range construction could begin, may be extensive, and would continue to contribute to a shortfall in valuable collective training in Hawai'i.
- Preserving Soldier and Family quality of life is one of the Army's highest priorities. The Army strives to maintain the highest possible quality of life for the Soldiers who serve by balancing the timeframes for which Soldiers are deployed away from home station against mission requirements. In a typical Army unit, approximately 50-55% of Soldiers are married. A 4,000-person Brigade, for example, may be accompanied by more than 2000 spouses and 1,500 children. Conducting additional collective training requirements at PTA would extend the amount of time required for units of the 25th ID to be away from their Families and their home station to 42 to 45 days per deployment to PTA. The lack of home-based live-fire training capability has an impact on Soldiers' morale as more time is spent away from their Families, which is not quantifiable in Unit Status Reports; however, reduced time with family is clearly identified as reason for Soldiers not re-enlisting during exit interviews. In addition, the high costs required for construction of a CALFEX range and supporting cantonment area infrastructure at PTA would divert resources from basic living and infrastructure requirements for units and Soldiers' Families stationed in O'ahu. The Army is committed to providing the highest quality of life that can be attained for the Soldiers and their Families, who have endured multiple deployments supporting the wars in Iraq and Afghanistan.

4.2 Mitigation Measures

Mitigation actions are anticipated to reduce, avoid, or compensate for most significant and adverse effects. Mitigation measures are identified as Regulatory and Administrative mitigations, additional adopted mitigations that will help reduce the significance of certain environmental impacts or may be part of the installation's best management practices (BMPs), and mitigations that the Army has considered but decided would not be implemented.

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Regulatory and Administrative Mitigations. Regulatory and administrative mitigations (Table 8), are required in compliance with federal environmental laws and regulations, and prior settlement agreements; and may also be part of existing standard operating procedures and existing Army programs (such as the Army's Integrated Training Area Management (ITAM) program).

Additional Mitigations and BMPs. Additional mitigations (Table 9), which are proposed by the Army, other agencies, or the public may include BMPs that are not required by law, but may be a combination of proposed programs and current institutional programs that the Army has decided will further assist in reducing the level of impacts from training on affected resources, while simultaneously providing a benefit to those resources.

Mitigations Considered but Not Adopted. Consistent with 32 CFR Part 651, I have presented in Table 10 the mitigation measures that I have decided not to implement, and the reasons why the Army will not employ these measures.

Mitigation monitoring and enforcement plans will be fully developed and implemented by the Hawai'i State Historic Preservation Division. Monitoring plans that are required by the Section 7 and the Section 106 process shall be completed in accordance with consultations that occurred with the USFWS and the State Historic Preservation Officer (SHPO). Monitoring plans for mitigations that are not a part of those consultations, but have been adopted as part of this NEPA process, shall define the goal and objective of all mitigations, and shall include milestones for status reports, monitoring time-frames, and measureable thresholds indicating success to ensure that the developed mitigation plans meet their goals and objectives. The mitigation effectiveness-monitoring program will be consistent with the guidance at 32 CFR Part 651, Appendix C.

Except as indicated below, all practicable mitigation measures to avoid or minimize environmental harm have been adopted. Mitigation measures are summarized below, and are described in greater detail in Chapter 4 of the Final EIS.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
Water Resources				
1	Soil erosion effects on surface water quality	USAG-HI would continue to evaluate and implement land management practices to reduce erosion impacts. Practices for soil erosion include reseeded slopes or planting vegetation buffers, redirecting run-on and runoff, and avoiding damaged areas.	Army ITAM Program	Implementation of this mitigation could reduce significant impacts on water quality from live-fire training to less than significant by minimizing erosion and thus minimize soil and sediment transport to surface water bodies.
2	Chemical contaminant effects on surface water quality	A monitoring program will be developed to monitor potential off-site contamination. Continuance of monitoring that was previously associated with the Army's Operational Range Assessment Program (ORAP).	January 2007 Settlement Agreement	Implementation of this mitigation will help detect potential on-site, as well as off-site transport of, constituents in order for the Army to evaluate risk
Traffic and Transportation				
3	Convoy and ammunition transportation consistency with state regulations and policies	Mitigation measures include limiting convoys containing oversize or overweight vehicles to two vehicles. The Army will coordinate with the Hawai'i DOT to establish the number of allowable vehicles in each convoy.	State of Hawai'i Department of Transportation (DOT) rules and regulations for the transport of explosive materials	Implementation of this mitigation could reduce significant impacts to less than significant by avoiding traffic hazards.
4	Convoy and ammunition transportation consistency with state regulations and policies	Mitigation measures include providing 48-hour advance written notice to police and fire departments of the transport of ammunition.	State of Hawai'i DOT rules and regulations for the transport of explosive materials	Implementation of this mitigation could reduce significant impacts to less than significant by aiding response to potential accidents during ammunition transportation.
5	Convoy and ammunition transportation consistent with settlement agreements	The Army shall transport explosives, grenades, mines, artillery rounds, anti-tank rounds, and mortar rounds to MMR by airlift, provided such airlift is available and weather permits. When airlift is unavailable or weather does not permit, the Army shall transport these munitions and ordnance to MMR by way of Farrington	October 2001 Settlement Agreement	Implementation of this mitigation could reduce harm to the public by decreasing the safety risks from potential accidents during ammunition transportation.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
Geology and Soils				
6	Soil Erosion	<p>Highway avoiding the hours of 5:00 a.m. to 7:00 p.m. Transport all other munitions and ordnance by way of Farrington Highway to avoid peak traffic hours and times when children are traveling to or from school (5:30 a.m. to 8:30 a.m. and from 12:30 p.m. to 6:30 p.m.).</p> <p>Mitigation measures include obtaining a permit from the state prior to using trails within state-owned lands. The state would issue the permit only if it determined that the trail was in good condition. The state would maintain the trail to prevent significant erosion and would improve the trail to address any effects from erosion.</p>	State of Hawai'i	Implementation of this mitigation could reduce significant impacts on soils from trail marches by ensuring that the trails are kept in good condition.
Biological Resources				
7	Impacts on sensitive terrestrial species and habitat resulting from the spread of nonnative species	<p>Mitigation measures include instructing Soldiers to clean boots and equipment directly prior to marches to eliminate nonnative species.</p> <p>Integrated Natural Resources Management Plan (INRMP) activities will continue to be implemented. The Army will implement the MIP to control, minimize, and mitigate the spread and impact of nonnative species.</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could reduce the overall impacts on the ecosystem resulting from the spread of nonnative species. This mitigation is not anticipated to reduce the level of significance.
8	Impacts from fire on sensitive terrestrial species and sensitive habitat	<p>Mitigation measures include re-vegetation of critical habitat affected by fires, especially along edges of critical habitat to ensure no net loss of habitat or species.</p> <p>The Army will replace the 5,577 feet (1,700 meters) of fencing that burned in the 2003</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could minimize significant impacts by minimizing fire damage and protecting and restoring native vegetation.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
9	Disturbance to marine wildlife from aircraft	<p>Mākua fire. Replacing this fencing, which had been constructed to keep out feral pigs and goats, will reduce impacts on native plants.</p> <p>The INRMP, MIP, and the Integrated Wildfire Management Plan (IWFMP) will be implemented. Stewardship actions may include controlling feral mammals, selected weeds, predators, insect pests, and diseases and managing habitat. The Army will also monitor for introduced species and eradicate any newly introduced ones. The Army will implement the IWFMP to control, minimize, and mitigate the risk and impact of fire.</p> <p>Mitigation measures include emphasizing to all personnel that the mobile nature of marine wildlife mandates constant observation vigilance; limiting low-altitude flying for aircraft over areas likely to harbor marine mammals and performing a pass-by flight before training; avoiding flying over seals when present on Mākua Beach; limiting low flying when visibility is limited; using night vision goggles and thermal scanning during nighttime flights; maintaining a 1,000-foot (300-meter) separation from observed humpback whales; developing and implementing a comprehensive reporting and monitoring program; and continuing informal consultation with NOAA Fisheries.</p> <p>The Army will continue to use a command and control aircraft to observe the water for signs of marine mammals and will continue to follow</p>	Section 7 ESA Consultation Marine Mammal Protection Act (MMPA)	Implementation of this mitigation could reduce impacts and levels that could be considered as harassment levels on marine species.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
		standard operating procedures, such as the local flying rules, to protect marine wildlife when the animals are observed by pilots.		
10	Impacts on marine wildlife and coral ecosystems from runoff	As indicated in Regulatory and Administrative Mitigation #2.	January 2007 Settlement Agreement	Implementation of this mitigation will help detect potential on-site, as well as off-site transport of, constituents in order for the Army to evaluate risk
11	<p>Disturbance to marine wildlife from ground training</p> <p>Mitigation measures include emphasizing to all personnel that the mobile nature of marine wildlife mandates constant observation vigilance; alter training operations when necessary; and continuing informal consultation with NOAA Fisheries.</p> <p>The consultation with NMFS, the Army committed to doing the following:</p> <ul style="list-style-type: none"> - Conducting overflights of the beach before training operations begin to search for monk seals on the beach; - Alter training operations if a seal is hauled out by prohibiting direct beach overflights and limiting munitions use to avoid affecting the animal. These training restrictions will also be implemented immediately if a seal is observed during training event. The training will be altered to allow the animal to voluntarily leave the beach. <p>As required per consultation with NOAA Fisheries, the Army plans to complete a hydrophonic noise study in Mākua Bay during the first full CALFEX exercise to validate the</p>	<p>Section 7 ESA Consultations</p> <p>Coastal Zone Management Act (CZMA)</p> <p>MMPA</p>	<p>Implementation of this mitigation could reduce impacts on marine species. This will provide direct quantitative noise levels generated by the exercise and provide additional data to more accurately assess impacts. The Army has committed to reviewing these noise levels and to reinitiating consultation with NOAA Fisheries should the noise levels exceed the local NOAA Fisheries standards or levels that would exceed MMPA or ESA harassment standards.</p>	

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
		noise model. The study will allow the Army to collect empirical data for analysis of noise levels above and below the water surface. Monitoring data are to be collected at two locations offshore of Mākua Beach in marine mammal habitat areas, and at one beach location that also serves as marine mammal and sea turtle habitat.		
Cultural Resources				
12	Impacts on Areas of Traditional Importance (ATI)	Mitigation measures include Army monitoring of cultural resources, clearing of vegetation from resources, and documenting and repairing any damage.	National Historic Preservation Act Section 106 Cultural Resources Responsibilities Programmatic Agreement (PA) between US Army Garrison Hawai'i and the Hawai'i State Historic Preservation Officer	Implementation of this mitigation could reduce impacts on ATI by continuing to manage and monitor cultural resources.
13	Impacts on ATI	Mitigation measures include avoidance training, site protective measures, relocating any targets or training activities that could disturb or damage known cultural resources, and conducting inspections following training to ensure that resources were not harmed. And surveying and evaluating the additional area used for training. The Army will continue to avoid all recorded cultural resources during training, and align firing points and paths to avoid shooting over cultural resources. The Army will implement the requirements of the recently agreed upon PA for	National Historic Preservation Act Section 106 Cultural Resources Responsibilities PA between US Army Garrison Hawai'i and the Hawai'i State Historic Preservation Officer	Implementation of this mitigation could reduce impacts on ATI by continuing to manage and monitor cultural resources.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
		training.		
14	Impacts on archeological resources	Mitigation measures include relocating any targets or training activities that could disturb or damage known cultural resources, aligning firing points and paths to avoid shooting over cultural resources, conducting inspections following training to ensure that resources were not harmed. In addition, communication between the cultural resource and fire managers will continue in order to develop acceptable strategies for fire containment and control and protection of cultural resources. Mitigations measures also include surveying and evaluating the additional area used for training. The Army will continue to avoid all recorded cultural resources during training, and align firing points and paths to avoid shooting over cultural resources. The Army will implement the requirements of the recently agreed upon PA for training.	National Historic Preservation Act Section 106 Cultural Resources Responsibilities PA between US Army Garrison Hawai'i and the Hawai'i State Historic Preservation Officer	Implementation of this mitigation could reduce impacts on archeological sites
15	Access to ATI and archeological sites	The Army will continue to provide cultural access to ATI and archeological resources, in accordance with the Ukanipō Heiau programmatic agreement	National Historic Preservation Act Ukanipō Heiau programmatic agreement	Implementation of this mitigation could reduce impacts on access by facilitating access to additional ATI and archeological sites for use by Native Hawaiian cultural practitioners.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
Wildfires				
16	Wildfire Ignition	<p>Mitigation measures include enforcing fire-related procedures and policies and taking disciplinary action when they are violated. The Army will update the IWFMP to address nighttime training and fire suppression.</p> <p>The Army will provide a dedicated fire manager at MMR to implement the IWFMP. Additional data sections will be added to the fire incident report. USAG-HI will continue to inform troops before training about methods for preventing and responding to wildfires. The Army will implement the wildland fire prevention and suppression measures contained within the 2007 MMR BO.</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could reduce the overall impact from fire potential and increasing the likelihood of containing fires that may occur.
17	Wildfire Ignition	<p>Mitigation measures include increasing staff to assist the program manager of the IWFMP. For example, a contracted or full-time 5-man strike team that is wildland fire trained and red carded that could be used to respond to fires and assist daily in managing other pre-fire suppression areas of the program.</p> <p>Fire fighting infrastructure improvements will include installing an additional larger capacity (60,000-gallon) water storage tank and upgrading the existing water distribution system to increase flow capacity from the city's water meter to support the new storage tank, fire hydrant, or overhead filling systems.</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could reduce the overall impact from fire potential and increasing the likelihood of containing fires that may occur.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
18	Wildfire Ignition	<p>A water distribution line could be installed to the upper dip pond to improve water resupply capability.</p> <p>The Army will implement the wildland fire prevention and suppression measures contained within the 2007 and 2008 Biological Opinions.</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could reduce the overall impact from fire potential and increasing the likelihood of containing fires that may occur.
19	Wildfire Ignition	<p>Mitigation measures include increasing the number of available helicopters on site and on standby to ensure enough resources are available to respond to fires that may occur from concurrent training activities. The helicopter requirements are outlined in the 2007 BO and are dependent upon weather conditions.</p> <p>Other mitigation measures include using ITAM-related geographic information systems to monitor the effectiveness of wildfire management activities and assigning appropriate personnel and equipment to water resources for responding to a wildfire.</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could reduce the overall impact from fire potential and increasing the likelihood of containing fires that may occur.
20	Wildfire Ignition	<p>Mitigation measures include cutting, and performing annual maintenance, on- an additional 60 meter wide fuels management area on the inside of the south firebreak road. There is currently a 10 meter fuels management area associated with the existing fire break system. This would add an additional 50 meters of fuel break to that area.</p> <p>Mitigation measures include cutting and maintaining the area surrounding the mortar firing point located in the north firebreak road.</p>	Section 7 ESA Consultations (Biological Opinion)	Implementation of this mitigation could reduce the overall impact from fire potential and increasing the likelihood of containing fires.

Table 8. Regulatory/ Administrative Mitigation

#	Direct Effect	Regulatory/ Administrative Mitigation	Regulatory/ Administrative Driver	Benefit of Mitigation
		<p>Mitigation measures include maintaining the grass cutting contract for the area currently being mowed at MMR pursuant to the requirements in the 2007 and 2008 BOs.</p> <p>Mitigation measures include controlling the grass in an additional 20 meter buffer, beyond what the Natural Resource Staff is already controlling, around the three endangered plant locations on Lower Ohikilolo Ridge as specified in the 2007 and 2008 BOs.</p>		

Table 9. Additional Mitigation - Best Management Practices

#	Direct Effect	Additional Mitigation - Best Management Practices	Benefit of Mitigation
Land Use and Recreation			
1	Impacts on recreational resources due to training (Mākua Beach)	Mitigation measures include notifying the public of planned CALFEXs and other training exercises involving aircraft operations by posting a Web site notice and publishing newspaper notices at least one week in advance of those activities.	The impact could be reduced by allowing the public to plan recreational activities around the hours that the Army conduct CALFEXs and other exercises involving aircraft operations.
2	Impacts on recreational resources due to training in the Mokulē'ia Forest Reserve and Wai'anae Kai Forest Preserve	Mitigation measures will include notifying the Mokulē'ia Forest Reserve and Wai'anae Kai Forest Preserve users regarding live-fire training by posting a Web site notice and publishing newspaper notices at least one week in advance of those activities.	The less than significant effect could be reduced by allowing the public to plan recreational activities around the hours that the Army conduct CALFEXs and other exercises involving aircraft operations.
Water Resources			
3	Chemical contaminant effects on surface water quality	Mitigation measures include conducting remedial actions at the OB/OD area. These actions could include soil removal and phytoremediation.	Implementation of a pilot study could reduce impacts on water quality by decreasing the risk of chemical contamination. This mitigation would be enacted strictly as a pilot study. Implementation of this mitigation is subject only to the availability of funding. If it is determined that adequate funding is not available to support this mitigation, the Army may cancel indefinitely this program.
Geology and Soils			
4	Soil erosion	Mitigation measures include implementation of post-wildfire erosion control measures that may include native plant reseeding and selective planting of burned areas or engineering controls to redirect or control runoff.	Implementation of this mitigation could reduce overall significance of impacts from live-fire training by reducing the amount of post-wildfire erosion impacts to surface water.

Table 9. Additional Mitigation - Best Management Practices

#	Direct Effect	Additional Mitigation - Best Management Practices	Benefit of Mitigation
5	Soil Erosion	Mitigation measures include preparing and implementing an erosion control plan. This plan will include provisions for periodic monitoring, methods for identifying erosion problems, and management practices for addressing erosion problems.	Implementation of this mitigation is subject only to the availability of funding. If it is determined that adequate funding is not available to support this mitigation, the Army may cancel indefinitely this program. Implementation of this mitigation could reduce significant impacts on training area soils by ensuring that erosion problems are identified and addressed. This is a current practice of the US Army Garrison Hawai'i. Implementation of this mitigation requires continued compliance with the standing erosion control plan, and includes periodic updates to that plan as necessary.
Water Resources			
6	Flooding	Mitigation measures include preparing a flood contingency plan to identify and address potential hazards associated with training activities and permanent facilities; developing a flood alert procedure along with evacuation procedures for materials and equipment staged in the bivouac area; and modifying hazardous materials storage procedures to address risks from flooding.	Implementation of this mitigation could reduce the overall significance of impacts from flooding by decreasing the risk of property and equipment damage staged in the bivouac area at Mākua Military Reservation.
Biological Resources			
7	Impacts from fire on sensitive terrestrial species and sensitive habitat	Mitigation measures include installing a new radio repeater within range of Mākua Valley to facilitate communications between Mākua, Army Natural Resource Staff, wildland firefighters, and cooperators stationed outside Mākua Valley.	Implementation of this mitigation could minimize impacts by minimizing fire threat and protecting native vegetation by facilitating faster response to wildfires at Mākua Valley. Conservation recommendation identified by USFWS in the 2007 MMR Biological Opinion.

Table 9. Additional Mitigation - Best Management Practices

#	Direct Effect	Additional Mitigation - Best Management Practices	Benefit of Mitigation
8	Impacts on sensitive terrestrial species and habitat resulting from the spread of nonnative species	<p>Mitigation measures include aggressively pursuing acquisition and transfer of title to a public or private conservation organization, of the Puulu to Ala 'ihe 'ihe Gulch and Haili to Kawaiu areas to better ensure access for long-term Army stabilization actions for <i>Hibiscus brackenridgei</i>.</p> <p>Conservation recommendation identified by USFWS in the 2008 MMR supplemental Biological Opinion.</p>	Implementation of this mitigation could promote conservation of listed plant species.

Mitigations Considered but Not Adopted

Consistent with 32 CFR Part 651, I have also presented here the mitigation measures that I have decided not to implement, and the reasons why the Army will not employ those measures.

Table 10. Mitigations Considered but Not Adopted

#	Direct Effect	Additional Mitigation - Best Management Practices	Explanation for Removal of Consideration
Biological Resources			
1	Impacts from fire on sensitive terrestrial species and sensitive habitat	<p>Mitigation measures include adding GPS locations of every individual plant to USAG-HI's GIS database to facilitate reintroduction and fire suppression planning.</p> <p>Implementation of this mitigation could minimize significant impacts by minimizing fire damage and protecting native vegetation by allowing for better planning.</p> <p>Conservation recommendation identified by USFWS in the 2007 MMR Biological Opinion.</p>	<p>The Army has a comprehensive data base containing known locations of the majority of individuals of each plant species requiring management. This information is adequate to support fire suppression planning and the reintroduction of those species. It is not practicable to expend valuable staff and monetary resources on an effort that will yield little practical information.</p>
2	Impacts from fire on sensitive terrestrial species and sensitive habitat	<p>Mitigation measures include establishing protocols for hydro-mulching or other large-scale native plant seeding to be used in native habitat restoration efforts.</p> <p>Implementation of this mitigation could minimize impacts of fire and promote native vegetation.</p> <p>Conservation recommendation identified by USFWS in the 2007 MMR Biological Opinion.</p>	<p>There is currently no technology available to accomplish this measure anywhere in Hawai'i and the Garrison cannot expend resources to fund research that may take many years to accomplish and may still yield a technology that could not be validated for use. Therefore, this measure is not practicable.</p>
3	Disturbance to sensitive terrestrial species and habitat from ground training	<p>Mitigation measures include the Army limiting marches at Ka'ena Point during the Laysan albatross breeding season (November to July) to at most one march per month and conducting monitoring at the beginning of the wedge-tailed shearwater breeding season (April to June) to determine whether burrows are present along the trail. Additional measures would be taken pending results of monitoring and</p>	<p>Ka'ena Point is no longer considered for use by the Army in conducting road marches at MMR.</p>

Table 10. Mitigations Considered but Not Adopted

#	Direct Effect	Additional Mitigation - Best Management Practices	Explanation for Removal of Consideration
		consultation with USFWS and the State Department of Land and Natural Resources.	
4	NOAA NMFS Proposed Mitigation	Mitigation measures include suspending training operations at MMR during heavy rain periods to reduce the potential for excessive contamination or sedimentation impacts to coral reef communities.	Rain and wet conditions at MMR help to facilitate training by increasing the fuel moisture content of vegetation, and reducing the potential for wildfires to ignite during live-fire training exercises. The adoption of this proposed mitigation would further limit training at MMR, and therefore would reduce the readiness of the Soldier to be prepared for deployment to combat operations in Afghanistan, Iraq, and elsewhere. Therefore, this measure is not practicable.

5.0 Point of Contact

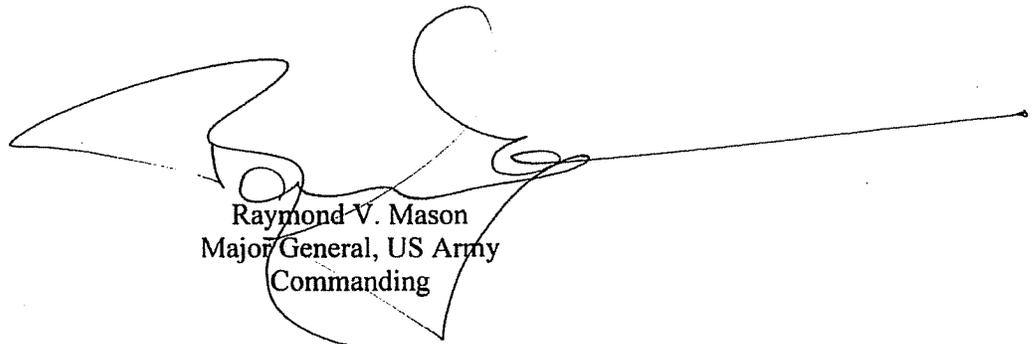
If you have any questions or wish to obtain additional information on this document, please contact the U.S. Army Garrison, Hawai'i, available by phone at (808)-656-3152, or by facsimile at (808) 656-3162 during normal business hours Monday through Friday 9 a.m. to 5 p.m. Hawai'i Standard Time. To contact U.S. Army Garrison, Hawai'i by email, please address your messages to usaghipaomakuaeis@hawaii.army.mil.

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Dated: JUL 16 2009