

CHAPTER 2

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

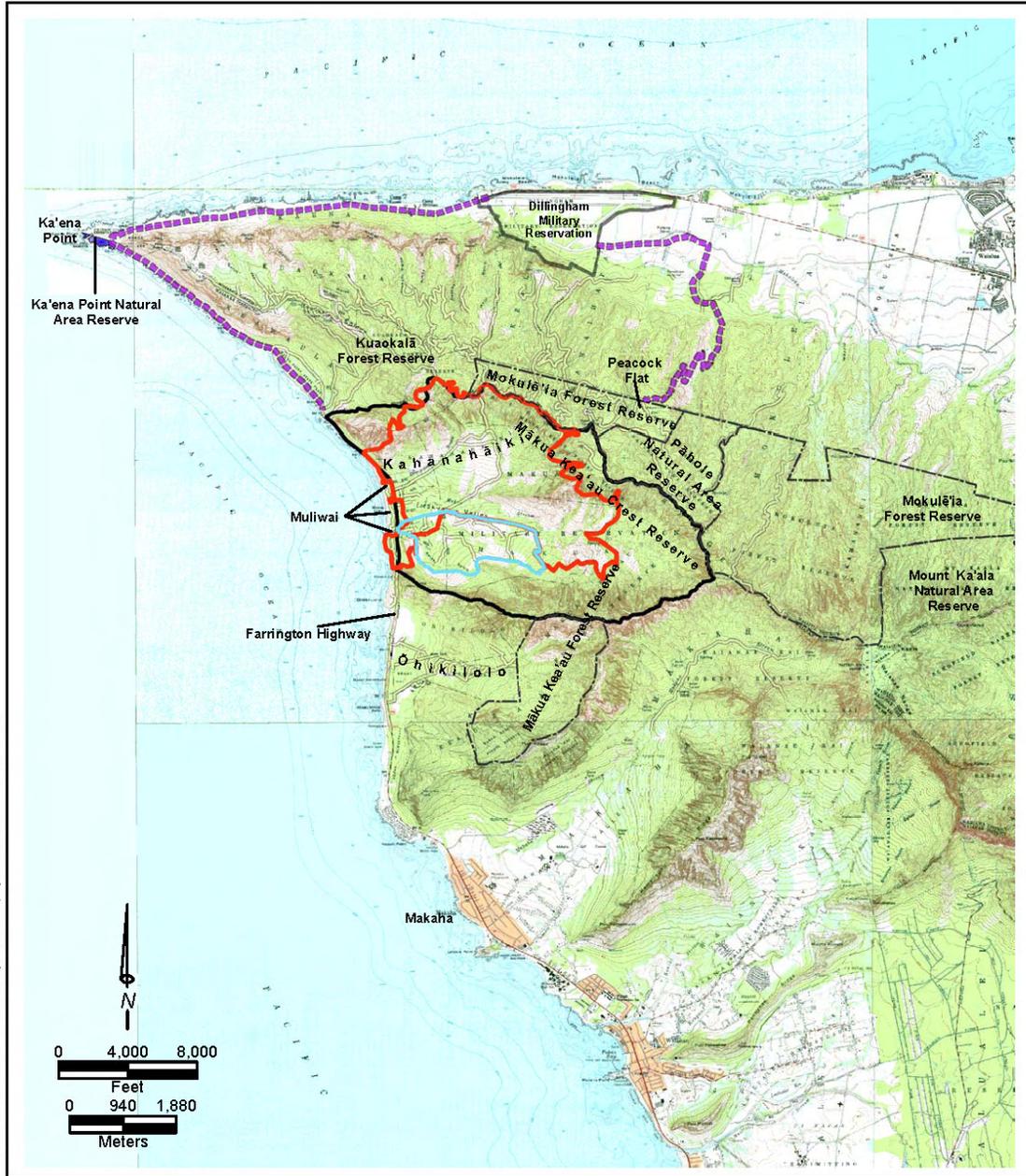
2.1 INTRODUCTION

The Proposed Action evaluated in this EIS is for the Army to conduct the necessary type, level, duration, and intensity of live-fire and other military training exercises, in particular company-level CALFEXs and convoy live-fire exercises (LFXs), for the combat units assigned to the 25th ID and for other military units to attain and maintain readiness for immediate deployment. This chapter identifies and describes the No Action Alternative (Section 2.3), the Proposed Action (Section 2.4), and alternatives to accomplish the Proposed Action (Section 2.4.6). Other alternatives considered but not carried forward for analysis are discussed in Section 2.5. The Army's preferred alternative is Alternative 3 (Section 2.4.6).

2.2A MĀKUA MILITARY RESERVATION

The Army trains at MMR primarily within the Pililā'au Range Complex CCAAC, which is a 457-acre (185-hectare) training course in the southwestern portion of MMR (Figure 2-1). The CCAAC is used for both live-fire and nonlive-fire maneuver training exercises. Vegetation is manicured in the approach corridor and is densely matted with nonnative grasses in other areas.

CALFEX training at MMR uses approximately 1,136 acres (460 hectares) of land, which includes the CCAAC, land north of the CCAAC, and acreage outside the firebreak roads for establishing SDZs (Figure 2-1). The



Mākua Military Reservation is approximately 1.5 miles south of Dillingham Military Reservation and 3 miles north of Makaha, the nearest community

Legend

-  Mākua Military Reservation
-  Company Combined-Arms Assault Course (CCAAC)
-  Trails
-  Roads
-  July 2003 Wildfire Boundary

Project Location

Mākua Military Reservation
O'ahu, Hawai'i

Figure 2-1

Figure 2-1 Project Location

training area north of the CCAAC, and inside the north firebreak road, includes areas used during training for parking, bivouac (encampment), ammunition storage, and staging. Artillery firing points are located within and outside of the CCAAC, but all ammunition is fired at targets within the CCAAC. The Army does not conduct training exercises on the nearby Mākua Beach.

The north and south firebreak roads border the training area; the south firebreak road borders the CCAAC, and the north firebreak road borders the northern portion of the training area (Figure 2-2). The Mokulē'ia Forest Reserve, Pāhole Natural Area Reserve, and the Mākua Kea'au Forest Reserve border the reservation's north, south, and southeastern boundaries (Figures 2-1 and 2-2).

Training exercises are staged throughout the CCAAC in eight areas that are referred to as objectives. These eight objectives are described in greater detail in Table 2-1. Five of the eight objectives—Deer, Fox, Coyote, Wolf, and Badger—are used for maneuver training at the CCAAC (Figure 2-2). Units are authorized to enter Objective Badger and set up fire support when attacking the final objective (Deer). Objective Deeds is used for support-by-fire and long-range (sniper) shooting. While Objectives Elk and Buffalo are closed for maneuver training due to the proximity of cultural resources, Objective Buffalo is used as a firing point (location that weapons are fired from). In addition to the established objectives, the Army can also create new objectives for training exercises. Any new objectives used by the Army would be located within the same corridor as the existing objectives in the CCAAC and be subject to environmental analysis.

This EIS analyzes use of MMR and PTA alternatives by all prospective range users, including other military services. Some of the SBCT training scenarios evaluated in this EIS include use of Stryker vehicles (up to five Strykers would operate primarily from stationary positions on existing roads, trails, and paved areas, the 120-millimeter (mm) high explosive (HE) mortar, and the 155mm HE howitzer. SBCT forces also may conduct squad and platoon dismounted maneuver live-fire or nonlive-fire training. SBCT forces would also conduct convoy LFXs.

A separate EIS was prepared to address the environmental impacts of the Army's decision to transform the 2nd Brigade of the 25th ID into an SBCT (US Army and USACE 2004) (Chapter 5, Cumulative Projects and Impacts). That EIS did not evaluate the use of MMR by SBCT forces. The EIS was completed in May 2004 and the ROD was signed on November 7, 2004. As a result of a legal dispute, the Army examined alternative locations to permanently station the SBCT through a supplemental EIS.

Table 2-1
Description of Typical MMR Training Objectives

Objective	Features	Use/Types of Training	Notes
Deer	<ul style="list-style-type: none"> • Approximately 300 feet (91 meters) of trench line about 5 feet (two meters) in depth and 4 feet (1.2 meters) wide • 10 bunkers or rooms where hand grenades are used to suppress the enemy • 17 target positions (“pop-up” targets) inside the trench leg • Nine target positions (berms) on the outside/center of the trench • Three target positions on the north/east corner for support by live-fire use • Final consolidation area on the east side of the trench has 48 positions • Four tunnels located west of the trench on the downhill slope • Protective area (cover) when bangalores are in use 	Final objective that units maneuver to. Obstacle breaching (using bangalore torpedoes), trench entering/clearing, and Military Operations on Urbanized Terrain (MOUT) are conducted.	Located in the central portion of Mākua Valley, this objective is a large and relatively topographically flat site. It is one of the most heavily used objectives.
Fox	<ul style="list-style-type: none"> • Eight targets (berms) 	<p>A secondary objective or an enemy observation point while en route to the final objective.</p> <p>An objective and breach point where demolition effect simulators can be initiated.</p>	Located in the gulch and parallel to the axis of Mākua Valley, and in the maneuver corridor west of Objective Deer.
Coyote	<ul style="list-style-type: none"> • 20 target positions (berms) • Two simulated tank positions 	A secondary objective used as an enemy opposing force. Attack by one of the platoons from the infantry company; the remainder of the company continues towards the maneuver corridor.	Located on a topographic “nose” that projects slightly into Mākua Valley.

**Table 2-1
Description of Typical MMR Training Objectives**

Objective	Features	Use/Types of Training	Notes
Wolf	<ul style="list-style-type: none"> 14 target positions. 	<p>Same as Coyote but generally for a smaller attack group (squad or team). Target area for support by fire positions (machine guns).</p>	Located on a small, low relief topographic “nose,” this objective is the most forward position used for training.
Deeds	<ul style="list-style-type: none"> Three target positions An area just east of Objective Deeds is used as a support by fire position — when the final objective is being attacked, either machine guns and/or mortars can be placed there 	Long range (sniper) shooting.	Located east of the service road in an area of high relief.
Badger	<ul style="list-style-type: none"> Five structures reinforced with tires (“tire forts”) 	<p>Formerly used as a MOUT training facility.</p> <p>Units are authorized to enter Objective Badger and set up support by fire when attacking the final objective. The back part of the objective is used as a firing point for the 60mm mortar. All firing is then directed away from cultural sites.</p>	<p>Due to deterioration, two of the structures have been taken away and the remaining three are a safety hazard to enter.</p> <p>The objective cannot be fired upon due to the close proximity of cultural resource sites.</p>
Elk	<ul style="list-style-type: none"> 15 target positions (berms) situated around five large tire structures (“tire forts”) 	Same as Objective Badger	<p>Located on a small topographic “nose” in the southern areas of MMR.</p> <p>Closed to training due to the number of cultural sites found on the objective.</p>

Table 2-1
Description of Typical MMR Training Objectives

Objective	Features	Use/Types of Training	Notes
Buffalo	<ul style="list-style-type: none"> • 10 target positions • Small trench system (no grenade bunkers) 	<p>Same as Objectives Wolf and Coyote but units could also set in a defensive line upon entering the objective.</p> <p>The objective is used as a firing point for the 81mm mortar.</p>	<p>Located just south of the service road on a rocky, rugged area associated with Kaiahi Gulch.</p> <p>Closed to maneuver training due to the proximity of cultural resource sites.</p> <p>The trenchline is also closed for safety reasons (deteriorated due to non-repair).</p>

The ROD for this FEIS was signed in April 2008 and selected the Proposed Action to transform the 2/25th in Hawai‘i.

The Army prepared a report pursuant to Section 343 of the National Defense Authorization Act for Fiscal Year 2007 (Public Law 109-364). As required, the report (herein referred to as “the Army’s Report to Congress”) provided the following with regard to Army live-fire ranges in the State of Hawai‘i (USARHAW and 25 ID(L) 2007b):

- An evaluation of the capacity of the existing live-fire ranges to meet the training requirements of the Army, including the training requirements of SBCTs;
- A description of any existing plan to modify or expand any range in Hawai‘i to meet anticipated live-fire training requirements;
- A description of the current live-fire restrictions at the Mākua Valley range and the effect of these restrictions on unit readiness; and
- Cost and schedule estimates for constructing new ranges or modifying existing ranges that are necessary to support future training requirements if restrictions on training at the Mākua Valley range remain in place.

With regard to the MMR training restrictions and their effect on unit readiness, the Army’s Report to Congress found that Hawai‘i units were unable to conduct company-level live-fire exercises in Hawai‘i and convoy LFXs on O‘ahu. It also found that pre-deployment training is not always feasible or available at other training facilities, which can result in less-prepared Soldiers being deployed into combat zones. The report stated that unavailability of MMR for live-fire training results in less-effective units, thereby jeopardizing Soldiers’ lives in combat.

With regard to new or modified training ranges to replace MMR training capability, should MMR training restrictions remain in place, the Army’s Report to Congress evaluated the cost and schedule for undertaking four options. Following completion of the battle area complex (BAX), SBMR would not have sufficient acreage adjacent to the current impact area to construct a replacement training facility that could support company-level CALFEXs; accordingly, the cost and schedule for this option were not estimated. Other Army properties on O‘ahu do not have an ordnance impact area (a controlled area into which high explosive munitions are fired), do not have suitable land areas for creating an ordnance impact area, and do not support live-fire training. Consequently, the Army did not estimate the cost and schedule for constructing a replacement training

facility on other Army properties on O‘ahu. Acquiring new property on O‘ahu with sufficient acreage to support an ordnance impact area, maneuver area, and SDZs and using that property for live-fire training would present prohibitive public concerns, such as noise, safety, and land acquisition; therefore, the Army did not estimate the cost and schedule for constructing a replacement training facility on acquired O‘ahu land (USARHAW and 25 ID[L] 2007b). While the Army’s Report to Congress evaluated the construction of a much more elaborate training facility at PTA, the Army does not have an exact cost estimate for the construction of a company-level CALFEX facility at PTA.

2.2B PŌHAKULOA TRAINING AREA

The Army received several public comments in response to the original Draft EIS that a more thorough analysis of alternatives at PTA was needed. In response to this feedback, the Army decided to conduct a full operational analysis of PTA to determine if there were reasonable alternatives that could be considered as a replacement for MMR in the EIS. Section 2.5 includes a summary of this analysis.

PTA is located in the north central portion of the Island of Hawai‘i (Figure 2-3) just to the west of Humu‘ula Saddle, or plateau, formed by Mauna Loa and Mauna Kea. PTA is about a 1-hour drive 36 miles (58 kilometers) from the eastern shore city of Hilo, and about 1.5 hours from the western shore city of Kailua-Kona 50 miles (80 kilometers). The town of Waimea is 25 miles (40 kilometers) from PTA. A third volcanic mountain range, Hualalai, lies to the west but does not affect the topography of PTA.

PTA was established as a multi-functional training facility in 1956 for the US Army Western Command and other Pacific Command units. The installation encompasses approximately 132,000 acres (53,419 hectares) with a central impact area of approximately 51,000 acres (20,638 hectares). Total acreage includes the recently acquired Ke‘āmuku Maneuver Area, or Ke‘āmuku Parcel.

PTA supports training for a variety of services, including the Army, Army National Guard, Navy, Marine Corps, Air Force, Special Operations Forces, and allied armed forces from the Pacific region. Transportation of military personnel and cargo to PTA involves use of several alternative land, sea, and air routes that employ commercial and military transportation systems (Sato 1996). PTA includes Bradshaw Army Airfield (BAAF), which is directly west of the cantonment area and includes a 90- by 4,750-foot (27.4- by 1,448-meter) paved runway.

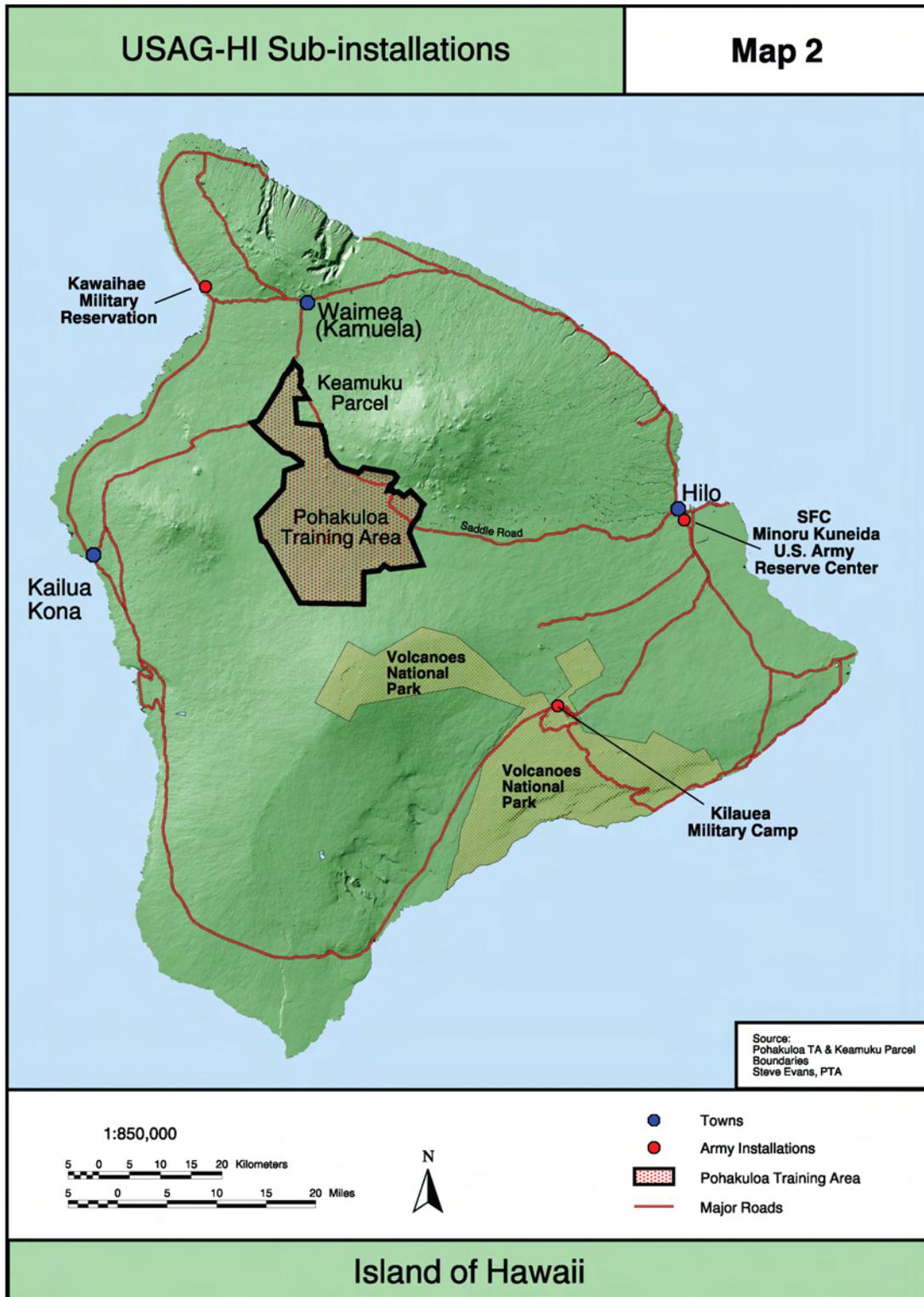


Figure 2-3 USAG-HI Sub-Installations

Much of the land surrounding PTA is designated as a conservation district, which includes both state- and privately owned land. Grazing is the major use of the surrounding conservation district. The Bishop Estate borders PTA on the southwest, Parker Ranch forms the northwestern border with PTA, Hawaiian Homelands are to the east of PTA, and the remainder of adjoining lands belongs to the State of Hawai'i. Besides grazing, public recreation is an important land use on neighboring lands.

The primary mission of PTA is to operate and maintain a safe, modernized, major training area for USAG-HI, Army, Pacific, and other US Pacific Command military units. PTA is a primary tactical training area for conducting military Mission Essential Task List training and contributes to the Army's training mission by providing resources and facilities for active and reserve component units that train on the installation each year. PTA assets are geared towards maneuver unit live-fire, maneuver training, and artillery live-fire. The largest live-fire range and training complex belonging to USAG-HI is located on PTA.

The ordnance impact area consists of approximately 51,000 acres (20,648 hectares) and extends from central PTA to the southern boundary. This area allows for firing all types of tactical weapons currently in the USAG-HI inventory. Approximately 56,661 acres (22,940 hectares) are suitable for maneuvers.

PTA supports all types of live-fire training and can support large-scale (battalion or larger) maneuver training under uniquely realistic conditions, although the terrain limits training in certain areas (Nakata Planning Group, LLC 2002a, 2002b). Ranges at PTA are as follows (Sato 1996): Infantry Squad Battle Course/Squad Defense Range; Combat Pistol Qualification Course; Rifle Grenade Range; Rifle Range; Hand Grenade Range; Hand Grenade Qualification Course; Rifle Zero Range; Multi-purpose Machine Gun/Sniper Range; Demolition Range; Infantry Platoon Battle Course; Multi-purpose Anti Armor Range; Grenade Machine Gun Range; Direct Fire Range; Helicopter Gunnery; Bombing Range; Forward Area Arming and Refueling Point; Forward Area Refueling Point; Drop Zone; Confidence Course; Mortar Firing Positions; and Artillery Firing Positions. Units are scheduled to conduct training at PTA annually, using an automated system known as Range Facility Management Support System (RFMSS). PTA provides the space for infantry and associated support units to conduct force-on-force maneuvers. Under this maneuver, live bullets are not fired, and blanks are used in rifles and small caliber automatic weapons, along with Multiple Integrated Laser Engagement System (MILES) equipment. Seven types of weapon systems are generally

used at PTA (Sato 1996): small arms, antitank weapons, mortars, field artillery, air defense artillery, explosives, and rockets.

The Army considered eight separate alternatives at PTA for conducting CALFEX training, but only one met operational requirements. A summary of the screening analysis used to determine the feasible alternatives is included in Section 2.5 (Alternatives Considered but Eliminated).

The Twin Pu‘u location was found to be the only operationally feasible PTA alternative for consideration as a replacement range for the MMR. Although there are very challenging issues to overcome with respect to terrain, construction, and operation of a range in this area, the Twin Pu‘u alternative has the least significant operational challenges. A comprehensive environmental analysis of the Twin Pu‘u location is carried forward throughout the remainder of this EIS. Figures 2-4 and 2-5 include a map of this alternative range, while Photograph 2-1 provides a photograph of the area.

Description of the Twin Pu‘u CALFEX Alternative at Pōhakuloa Training Area

There are currently no established ranges at the Twin Pu‘u location, thus this alternative requires the construction of a new range. The proposed range would begin at the southern edge of the Leilani Pu‘u and extend southeast approximately 14,764 feet (4,500 meters). The range maneuver area would be fan shaped, with an average width of approximately 3,281 feet (1,000 meters). The total maneuver area is approximately 988 acres (400 hectares). Since the range boundaries are located entirely in the existing impact area, unexploded ordnance (UXO) removal would have to take place prior to range construction.

The terrain is relatively flat and consists mainly of pāhoehoe type lava flows. The surface is quite rough and covered primarily by invasive fountain grass. There are widespread cavities, surface seams, and pockets; thus extensive land conditioning would be required before the terrain would be suitable for dismounted maneuver.

Associated range infrastructure would be sited to the north of and adjacent to the maneuver area. This would include a bivouac area, parking lot, ammo storage facility, covered mess, latrines, range control tower, and covered facility for training preparation and after action review.

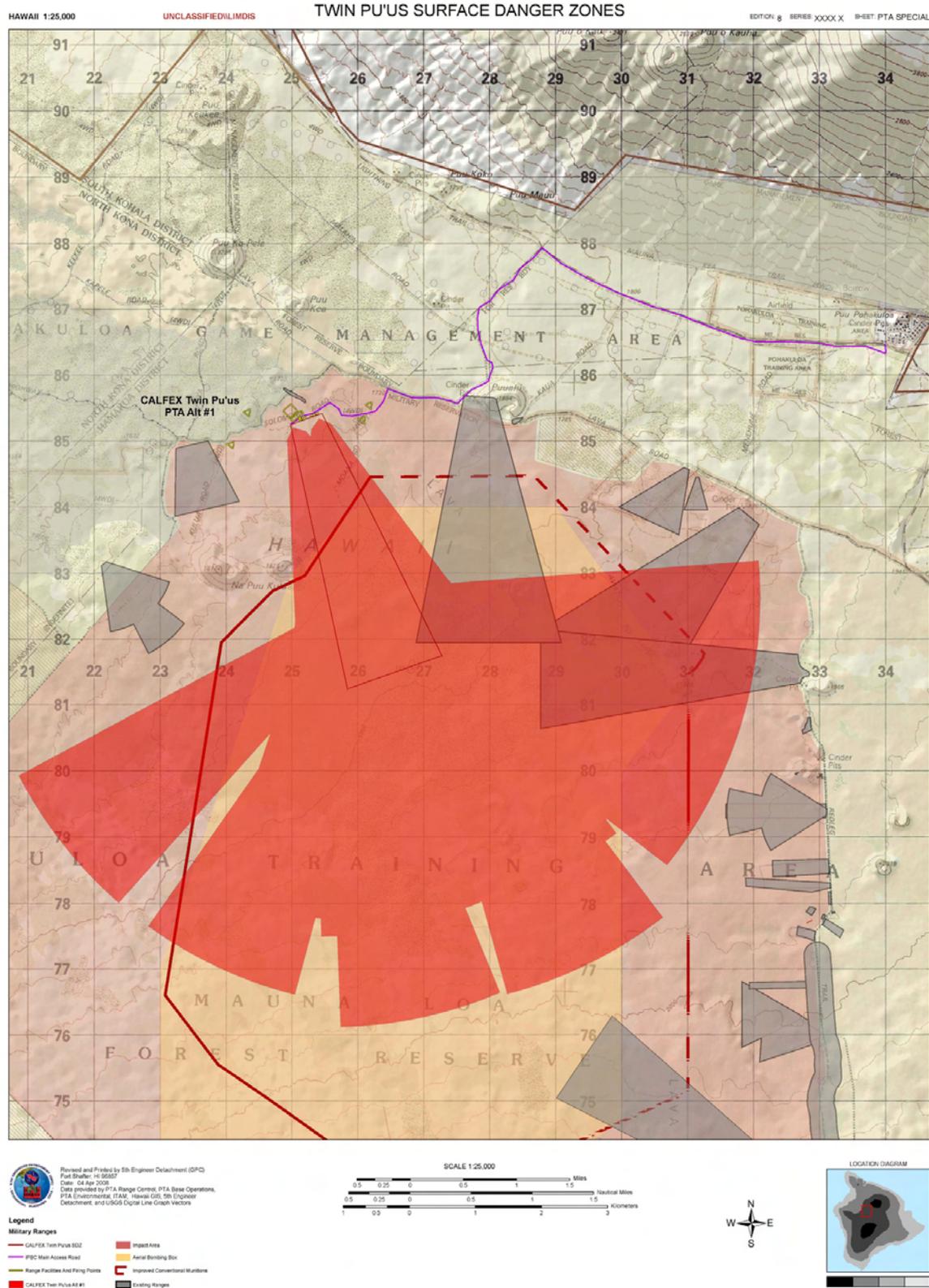


Figure 2-4 Broad View of Twin Pu'u Location



Figure 2-5 Close Shot of Twin Pu‘u Location with Associated Range Infrastructure



Photograph 2-1 Twin Pu‘u Photograph

Two artillery firing positions would be located to the east and west of the northern range boundary, but all ammunition would be fired at objectives within the existing impact area. There are also two sniper firing positions outside of the maneuver area that would also be used to fire upon objectives in the impact area.

Training exercises would be staged across the entire range with at least eight objectives dispersed throughout the maneuver area. Primary features would include moving and stationary armor and infantry targets, trench obstacles, landing zones, machine gun bunkers, and an assault/defend house.

This EIS analyzes the use of this location by all prospective range users, including other military services. SBCT dismounted training at this alternative would be substantially similar to the dismounted CALFEXs described later in this chapter.

2.3 NO ACTION ALTERNATIVE

Because the Proposed Action analyzed in this EIS is for the Army 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 at MMR, if no action were taken, then 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. However, this alternative is the environmentally preferred alternative.

Maintaining the fuel breaks would be the only maintenance activities conducted. Activities at the installation would be limited to security patrols to check the condition of fences and to identify any signs of unauthorized access. Army maintenance and stewardship programs listed in Section 2.4.5 and in Chapter 3 would continue at a minimal level due to the absence of military live-fire training at MMR. Reduced management could result in adverse effects to species, allowing for the more rapid spread of invasive species, increased fuel loads and increased potential for wildfire from non-military ignition sources. Access to cultural sites would be provided in accordance with the Ukanipō *Heiau* Programmatic Agreement (PA) and the access protocols developed by the garrison in consultation with Native Hawaiian stakeholders. The Army would consult with the USFWS, the Hawai‘i SHPO, and Native Hawaiian organizations to ensure that the Army’s maintenance and stewardship requirements fulfill applicable statutory obligations regarding natural and cultural resources. Consultation with these agencies and stakeholders would identify appropriate management measures. At this time, the Army expects that management would be similar to other agency actions in similar unused areas, such as Lualualei, and would involve such actions as monitoring plant populations.

Under this alternative, the 25th ID would be unable to meet its CALFEX and convoy LFX requirements in Hawai‘i. CALFEXs and convoy LFXs would have to be conducted at other training installations outside of Hawai‘i. Reliance on installations in the continental US (CONUS) or in foreign nations would be insufficient to meet the full CALFEX and convoy live-fire requirements of the 25th ID.

The analysis of No Action in this EIS assesses the environmental impacts on resources that would result from a cessation of live-fire training at

MMR. The No Action Alternative would result in a reduced level of management from the current level at MMR because the Army would have no expectation of resuming live-fire training activities at the range. The No Action Alternative, while not considered a reasonable alternative, must be analyzed in the EIS and will serve as an environmental baseline against which other action alternatives can be evaluated.

2.4 PROPOSED ACTION

The Army has developed alternatives to accomplish its Proposed Action. This section describes the alternatives evaluated in this EIS and is organized as follows:

- Introduction (Section 2.4.1);
- Maneuver Live-Fire Training (Section 2.4.2);
- Combined Live-Fire/Maneuver Training (Section 2.4.3);
- Other Types of Training (Sniper, Demolitions, and Staging Base for Ground or Air Movement) (Section 2.4.4);
- Current Institutional Programs (Section 2.4.5); and
- Alternatives to Accomplish the Proposed Action (Section 2.4.6).

2.4.1 Introduction

The Proposed Action evaluated in this EIS is for the Army 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 maintain the combat readiness of those units. The company-level CALFEX is the maximum level of training proposed at MMR. In addition, squad- and platoon-level live-fire exercises would be conducted. The components of each alternative described in this EIS reflect the Army's current weapon systems and training requirements; as such, they are subject to change as those weapon systems and training requirements continue to evolve. The Army would prepare additional environmental impact analyses for evolving weapons that could increase the potential for adverse environmental impacts. The existing institutional programs listed in Section 2.4.5 and discussed in greater detail in Chapter 3 would be implemented for any live-fire training conducted at MMR.

While this EIS evaluates the effects of all weapons systems contemplated for use at MMR, commitments made during ESA Section 7 consultation with the USFWS and in the resultant 2007 BO require that certain

weapons and munitions be used only after conditions for their use are achieved.

This EIS analyzes the following four alternatives to accomplish the Proposed Action, which are described in detail in Section 2.4.6:

- Alternative 1, Mākua Military Reservation (Reduced Capacity Use with Some Weapons Restrictions);
- Alternative 2, Mākua Military Reservation (Full Capacity Use with Some Weapons Restrictions);
- Alternative 3, Mākua Military Reservation (Full Capacity Use with Fewer Weapons Restrictions); and
- Alternative 4, Pōhakuloa Training Area (Full Capacity Use with Fewer Weapons Restrictions).

The original Draft EIS fully analyzed Alternatives 1 through 3. Alternative 4 was added in response to public comments regarding the need to consider the use of PTA as an alternative to MMR. Alternative 3 is the Army's preferred alternative.

For each of the alternatives, impacts were analyzed assuming that the range would be used for 242 training days per year, but fewer training days are expected to be used due to the limitations on live-fire training. Under Alternative 1 (Reduced Capacity Use with Some Weapons Restrictions), the Army would use MMR at a reduced capacity and would conduct a limited number of company-level CALFEXs, 19 to 28 per training year. Under Alternatives 2, 3, and 4, the Army would maximize usage and would conduct up to 50 company-level CALFEXs per training year. While this level of training may exceed the actual number of CALFEXs conducted each year, this level of use is analyzed in this EIS to ensure that there is adequate training capacity for all military units in Hawai'i to achieve combat readiness.

To minimize the potential for wildfires, CALFEXs and other live-fire training would only be conducted during "green" or "yellow" fire danger ratings and other conditions specified in the 2007 BO. These conditions are described in Section 3.14, and the 2007 BO included as Appendix H-1. Live-fire training would be suspended when the conditions reach the "red" fire danger rating.

For all four alternatives, weapons systems would be similar to those used under past training conditions at MMR. In addition, the use of tracer ammunition is included under Alternative 2 (Full Capacity Use with Some

Weapons Restrictions). Alternative 3 (Full Capacity Use with Fewer Weapons Restrictions) and Alternative 4 (Full Capacity Use with Fewer Weapons Restrictions), Pōhakuloa Training Area, also include use of tracer ammunition, inert, tube-launched, optically tracked, wire-guided (TOW) missiles, 2.75-caliber training rockets, and illumination munitions. Also under Alternative 3, the use of additional land for training within MMR is analyzed. These alternatives are described in greater detail in Section 2.4.6.

The four weapons systems that distinguish the alternatives from each other are described below:

- Tracer ammunition is used to illuminate a shooter's line of fire at night or during the day, depending on the type of tracer used. Within the rear end of the projectile is a compound that ignites as it exits the barrel and burns at a rate and distance that allows the shooter to see the path of the projectile. Tracers are used primarily in machine gun and rifle applications, where every fourth or fifth round is a tracer. Tracers would be used on the M240B machine gun and the M4 and M16 rifles. Tracer ammunition would be used only during a "green" fire danger rating, which, most often is between November and March during the evenings and early mornings. Tracers would be used under Alternatives 2, 3, and 4.
- Inert TOW missiles are used primarily in antitank warfare to engage and destroy enemy armored vehicles and other targets, such as field fortifications, from ranges up to 12,303 feet (3,750 meters). The weapon system can be launched from a tripod or a high mobility multi-purpose wheeled vehicle (HMMWV). After firing the missile, the gunner must keep the crosshairs of the sight centered on the target to ensure a hit (Federation of American Scientists 2000a). Inert TOW missiles would be used under Alternatives 3 and 4.
- The 2.75-caliber rocket is used primarily from ranges up to 21,320 feet (6,500 meters). This rocket is fired at targets from a helicopter in a downward flight path. The training round that would be used contains a small charge that creates an explosive flash and smoke. An estimated 28 rockets would be fired during each CALFEX iteration. The 2.75-caliber rocket would be used under Alternatives 3 and 4.
- Illumination munitions are used primarily at night as a source of light to illuminate targets and battle positions. They are fired from artillery and mortar systems. Illumination munitions were removed from the scope of ESA Section 7 consultation because of their

increased fire risk. The environmental impacts of these illumination munitions are still addressed in the EIS, but separate ESA Section 7 consultation would be required prior to their resumed use at MMR. The use of PTA would also require ESA Section 7 consultation and might result in similar restrictions. Illumination munitions would continue to be used at PTA in accordance with the IWFMP and the SOPs associated with the fire danger rating at the time of training. Illumination munitions would be used under Alternatives 3 and 4.

While these alternatives include training designed primarily for companies of Soldiers, they could also accommodate training by squads and platoons. The number of Soldiers in each of these elements is summarized in Table 2-2.

Table 2-2
General Combat Structure of Army Units for MMR

Element	Number of Soldiers
Squad	5-10
Platoon	20-40
Company	80-150
Battalion	240-600

Each alternative includes other types of training that could be conducted, in addition to the company-level CALFEXs and convoy LFX. Examples of other training activities include squad and platoon live-fire exercises, demolitions training, sniper training, nonlive-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.

Training at MMR would be conducted primarily on the 812 acres (329 hectares) situated inside the north and south firebreak roads, with the exception of a trail over the north-central ridgeline used during troop marches from Dillingham Military Reservation (DMR) to MMR, hereinafter called the Kuaokalā Trail, and the Ka'ena Point Trail (Figure 2-2). The Kuaokalā Trail would be used once a month by a company of Soldiers. Troop marches around Ka'ena Point using the state road and the Farrington Highway entrance to MMR would be conducted twice a month, each time by a company of Soldiers. Training activities at Ka'ena Point Trail were removed from the scope of ESA Section 7 consultation. The environmental impacts of marches around Ka'ena Point are still addressed

in the EIS, but separate ESA Section 7 consultation and coordination with the State of Hawai‘i would be required prior to conducting such exercises. The CCAAC would be used for live-fire maneuver training exercises and nonlive-fire maneuver exercises. The training area north of the CCAAC would be used for bivouac areas (described in the paragraphs below), support for CALFEX training, support for squad, section, and platoon maneuver training, artillery firing points, sniper training, and other nonmaneuver training. Areas outside the firebreak roads would be used to establish the required SDZs. Support activities would include conducting reconnaissance of activities at the CCAAC and approach of objectives on the CCAAC by additional troops. Artillery firing points are those locations considered optimal for firing weapons into the ordnance impact area.

Bivouac training consists of setting up camp for rest, resupply, refit, maintenance, and support. Bivouac sites vary, depending on unit size and mission. Depending on unit size, bivouac sites can contain areas for vehicle and weapons maintenance and parking, general supply, munitions supply, medical service, helicopter landing zones, and vehicle off-loading. A bivouac site consists of a series of tents and temporary structures covered with camouflage nets housing the unit. Bivouac is normally done in level or gently rolling areas that provide vehicle and aircraft access. Open fires are not allowed during bivouac. Munitions used in bivouac typically consist of grenade and artillery simulators and blank ammunition. These weapons are used to defend against an attack.

Live-fire training follows the Army standard training methodology in FM 7-10. The individual Soldier qualifies with an assigned weapon and then progresses through squad-, platoon-, and company-level live-fire exercises. Live-fire training entails an individual Soldier, a crew of a weapon system, or a collective unit firing at targets from a range facility. Live-fire exercises may incorporate free maneuver within the established safety zones of a range.

The requirement for live-fire training varies depending on individual and unit mission, weapons assigned, and ammunition available. Each Soldier must demonstrate proficiency on the assigned weapon system once or twice per year. Unit commanders must ensure that live-fire training meets readiness standards. Weapons proficiency, or qualification, is scored and recorded for each individual or crew and is reported collectively by unit.

Live-fire training includes basic weapons marksmanship ranges, grenade training, urban/village assault and entrenched enemy training, small unit live-fire and maneuvers, artillery and mortar firing, infantry demolition training, and use of mines and bangalore torpedoes (10-foot [3-meter]

tubes packed with explosives). The field expedient bangalore (brashier) has also been used as an alternative to the bangalore torpedo.

MOUT training occurs on Objective Deer and provides troops with the opportunity to train in a realistic urban environment (e.g., using bunkers and other man-made structures) and to experience as much realistic stress as possible. MOUT training may include limited use of short-range training ammunition (SRTA, also known as blue-tip ammunition), which uses a plastic ballistic projectile. Although SRTA is classified as live-fire training in accordance with AR 385-63, the maximum range of this ammunition is only 300 to 700 yards (274 to 640 meters), depending on the caliber used. SRTA may be used for each of the four alternatives in conjunction with other live-fire ammunition. Its use is analyzed in this EIS.

SDZs are designed for each military range and training event, in accordance with DA PAM 385-64, *Ammunition and Explosives Safety Standards*. SDZs ensure a proper buffer zone to the range and ordnance impact area and prevent accidental injury and exposure to live weapons outside the designated training area. Prior to training, specific firing points (i.e., firing locations) are designated for the firing of most munitions, including claymore mines and artillery. The company provides the range office with the training scenario in accordance with the USAG-HI and 25th ID Regulation 210-6, *Installation Ranges and Training Areas* (USARHAW and 25th ID[L] 1999) and a range-specific SOP. The Range Office builds an SDZ to fit the training scenario and gives the unit a safety card. The safety card specifies the right and left firing limits for mortars as well as the minimum and maximum range for firing to ensure that the mortar falls within the ordnance impact area (Figure 2-2). The MMR and PTA alternatives provide sufficient acreage for establishing the SDZs for larger weapon systems such as the 120mm HE mortar.

CALFEXs conducted at MMR would not include dropping bombs from aircraft, use of tracked armored vehicles, or training on Mākua Beach. Should these activities be proposed in the future, the appropriate level of NEPA analysis would be prepared. None of these activities are reasonably foreseeable.

Vehicles and aircraft that would be used during training include the following:

- HMMWVs, used on existing roads (approximately six vehicles);
- 2.5-ton (2.3-metric-ton) or 5-ton (4.5-metric-ton) cargo trucks (two);

- UH-60 Blackhawk helicopters (up to six);
- OH-58D Kiowa Warrior helicopters (up to three);
- CH-47 Chinook helicopters (two);
- Strykers (up to five);
- Any wheeled vehicle in the Army inventory; and
- Unmanned aerial vehicles (UAVs).

The Stryker is a wheeled vehicle, with a 350-horsepower engine and a weight of 19 to 20 tons (17 to 18 metric tons). Up to five Strykers would operate primarily from stationary positions on existing roads, trails, and paved areas. Live weapons firing would not occur any further east than objective Deer. There would be no off-road use of Strykers. Stationary Strykers would be used to fire MK 19 (40mm), 7.62mm, and .50-caliber machine guns and 120mm mortars from existing trails toward range targets in the ordnance impact area. The Stryker incorporates an advanced targeting system that gives its weapons improved accuracy and reduces the potential for off-target rounds. Strykers also would be used as command and control vehicles. SBCT forces could conduct six to nine company-level dismounted CALFEXs per year¹. These specific restrictions were developed for MMR only and do not generally apply to other SBCT training activities at PTA.

Although Marine Corps units have used tracked vehicles as transportation to MMR in the past, no tracked combat vehicles would be used in the training area.

The ranges at MMR and PTA would be made available to other military units for training. In the past, the Army, Marine Corps, Navy, Air Force, Coast Guard, Army Reserve, and Hawai'i Army National Guard have trained at MMR and PTA. The ranges would also be available to Soldiers assigned to the 8th Theater Support Command. It is likely that forces from other countries hosted by the 25th ID as part of the US Pacific Command Theater Security Cooperation Plan would use these training resources from time to time. These military units would be limited to a company-level CALFEX as the maximum level of training and would be required to adhere to the same range-specific training constraints as the 25th ID and USAG-HI. Additionally, these units would adhere to 25th ID and USAG-HI policies regarding transport of ammunition to and from these ranges (see Section 2.4.3).

¹ The required annual CALFEX for the SBCT companies are normally conducted in a mounted form at a BAX and not at MMR.

2.4.2 Maneuver Live-Fire Training

Maneuver live-fire exercises occur at various levels; their range would extend from squad- to company-level. Squad live-fire exercises would use small arms (MK 19, M60, M16, M4, M249, M240B, and M203), with the support of company mortars (60mm). They also may involve the use of demolition and hand grenades (M67). Platoon live-fire exercises would resemble a CALFEX and may be supported by company and battalion mortars, as well as battalion artillery. The focus of the live-fire training for both squad and platoons is likely to follow the battle drills listed below and specified in FM 7-8:

- Platoon attack;
- Squad attack;
- React to contact;
- Break contact;
- React to ambush;
- Knock out bunkers;
- Enter building/clear room;
- Enter/clear a trench; and
- Conduct initial breach of a mined wire obstacle.

All of these battle tasks are building blocks and components of company-level CALFEXs.

Live-fire exercises require several phases of training. The ultimate goal of each live-fire exercise, regardless of unit size, is to execute the exercise at night, under limited visibility. A unit conducting a live-fire exercise would initially rehearse its action by conducting a dry walk-through with no ammunition (first phase). It would then conduct a full-speed exercise using blank ammunition (second phase). Providing this is done to standard, the unit then would execute a daytime live-fire exercise (third phase). In general, after a unit has successfully completed daytime live-fire exercises, it would conduct a nighttime blank fire rehearsal (fourth phase), before finally culminating in a nighttime live-fire exercise (fifth phase). While this describes a five-day scenario, the Army can compress the schedule in various ways. Units do not currently conduct nighttime live-fire exercises at MMR due to fire-fighting capability issues; however, nighttime live-fire exercises are essential in ensuring that units are combat ready.

2.4.3 Combined Live-Fire/Maneuver 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. A typical company-level CALFEX would include a maneuver ground force of dismounts with small arms weapons (M4, M16A1/A2, M249 SAW, M240B machine gun, M203 grenade launcher). Table 2-3 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. Units conducting a typical CALFEX would be supported by indirect fire and aviation units. Indirect fire support would include the company and battalion mortars (two 60mm mortars, two 81mm mortars, and the 120mm mortar), as well as the platoon 105mm artillery (three howitzers); 155mm howitzers would be used interchangeably with the 105mm weapons. Aviation fire is normally provided by a platoon of OH-58D Kiowa Warriors (i.e., up to three helicopters). CALFEXs follow a variety of tactical operations, as described in FM 7-8 and FM 7-10. These exercises may be offensive or defensive, but they generally use the same types of weapons and munitions.

Example CALFEX

The most common CALFEX is attacking a strong point, which can be anything from forces defending a built-up area to forces defending from a trench line.

The following paragraphs describe a typical five-day course of events, during which one company uses the training areas. While a CALFEX is generally conducted over a five-day period, the Army can compress this schedule in various ways. The CALFEX described is of a unit attacking an opposing force defending itself from a trench line, the most common form of a CALFEX. For a CALFEX, the infantry company is augmented at a minimum by a combat engineer squad and is supported by at least battalion mortars and direct support artillery, as described above. When available, attack and assault lift aviation, primarily helicopters, participate in the exercise.

Planning for the Exercise

In accordance with the 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. The unit commander provides a detailed written plan of the exercise scenario, which includes the following:

- A maneuver and fire support plan;

**Table 2-3
Weapons and Ammunition Analyzed for Use at MMR and PTA**

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 target practice (TP)
Shotguns	12 gauge shotgun (00)
Helicopter guns	7.62mm, .50-caliber
Tracer ammunition	5.56mm, 7.62mm, and .50-caliber
Green ammunition	5.56mm and 7.62mm*
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-caliber rocket*
Shoulder-launched multipurpose assault weapon (SMAW)	Launcher assault rockets SMAW practice round
Inert TOW missile launcher	Inert TOW missile blast effect simulator
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

Notes:

*With the exception of the green ammunition, 120mm mortar, 155mm artillery, 2.75-caliber rockets, and the Javelin, weapons listed in Table 2-3 have either been used in the past or are used currently for training at MMR. The Javelin would be phased in to replace the previously used Dragon, a similar weapon system.

While the EIS evaluates use of ammunition as presented in this table, certain types of ammunition could only be used following further ESA Section 7 consultation with USFWS.

Weapons used by other military units training at MMR would be substantially similar to those Army weapons listed in this table.

- Weapons, ammunition, and targets to be used;
- Control measures and means of communication;
- Limits of advance; and
- SDZs for all weapons systems.

The unit commander also provides a risk assessment for the exercise. The risk assessment provides analysis of safety threats to Soldiers in combat situations. The unit commander's superiors (the battalion and brigade commander—a lieutenant colonel and colonel, respectively) and the division commander's range safety supervisors and range officer must approve the exercise plan.

Movement to Mākuā Military Reservation

Moving an infantry company to MMR typically involves a maximum of 150 Soldiers and supporting elements, which depart SBMR with up to 30 military vehicles. While a maximum of one company conducts a single training exercise at MMR, as many as three companies (one battalion) may be transported to MMR at one time. Movements are scheduled to avoid peak commute times and school transit hours. 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 SBMR 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.

The unit ammunition section from the battalion support platoon draws ammunition to be used for the exercise at the ammunition storage point at Wheeler Army Airfield (WAAF), at the naval magazines at Lualualei, or at West Loch, where ammunition types for military units in Hawai'i are stored in specially designed facilities. Section leaders sign for the exact quantities of ammunition issued, and any unused ammunition is accounted for and returned at the end of the exercise.

When possible (i.e., weather permitting), ammunition is flown into MMR to avoid transporting it through the local community. The Army airlifted all ammunition used for CALFEX training from 2001 to 2003.

Vehicles used to transport ammunition must pass a rigorous safety inspection before they are allowed to enter any ammunition storage facility. All personnel involved in transporting ammunition are trained in accordance with Army, federal, and state standards and are certified to transport hazardous materials. Artillery and mortar ammunition are packed separately from ignition fuses to preclude accidental detonations. In addition, all ammunition is stored in specialized packing materials

designed to withstand an impact 15 times greater than the force of gravity, further minimizing the risk of accidental explosion. All vehicles used in moving ammunition are powered by diesel fuel or JP-8 (kerosene), fuels that are much less volatile than gasoline.

If ground transport of ammunition is required, the ammunition is transported with a front and back escort at a maximum speed of 45 miles (72 kilometers) per hour, in accordance with all State of Hawai'i Department of Transportation (DOT) rules and regulations for the transport of explosive materials (Husemann 2003c). Vehicles transporting explosives, grenades, mines, artillery rounds, anti-tank rounds, and mortar rounds avoid using Farrington Highway from 5:00 AM to 7:00 PM. Vehicles transporting other munitions and ordnance on Farrington Highway avoid using the highway during peak traffic hours and at times when children are traveling to and from school (5:30 AM to 8:30 AM and 12:30 PM to 6:30 PM). These restrictions combine to substantially reduce the risk of vehicle accidents involving ammunition transport vehicles and public exposure to potential accidental explosion of munitions should a vehicle accident ever occur.

Movement to Pōhakuloa Training Area

Moving an infantry company to PTA typically involves a maximum of 150 Soldiers and supporting elements, which depart SBMR with up to 30 military vehicles. While a maximum of one company would conduct a single training exercise at PTA, as many as three companies (one battalion) may be transported to PTA at one time.

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). Due to combining of training requirements, it is expected that there would be no net increase in transportation requirements from O'ahu to PTA.

Inter-Island Transportation. Units would deploy equipment to PTA from O'ahu to Kawaihae Deep Draft Harbor. Deployment requires both barges and logistic support vessels (LSVs). Once the BAX is completed at PTA to support the SBCT, the expected annual vessel traffic for deployment to PTA would be approximately four barge and 66 LSV round-trips. Troops would continue to be transported primarily via

commercial aircraft, with a small percentage moving by military aircraft and marine vessel transportation.

Kawaihae Harbor to Pōhakuloa Training Area Cantonment Area.

Once unloaded at Kawaihae Harbor, troops and equipment would be transported via convoys of Trucks and/or Strykers on state and county two-lane roads to PTA. Convoys would include no more than 30 vehicles at a time. If multiple convoys are required, they would be spaced out in 15-minute intervals. A convoy first travels on Kawaihae-Waimea Road and then on Māmalahoa Highway and onto Saddle Road or on Kawaihae-Waimea Road to Queen Ka‘ahumanu Highway to Waikoloa Road to Māmalohoa Highway and onto Saddle Road.

A new PTA Trail is scheduled to be constructed as a result of the SBCT use of PTA. The environmental impacts of the new PTA Trail are covered in the Stryker EIS and SEIS. The trail is expected to be operational no earlier than 2010. At that time, the PTA Trail will be the primary route for convoys traveling between the Kawaihae Harbor and PTA. The PTA Trail would replace a seldom used military vehicle trail that parallels Saddle Road. The current military vehicle trail passes through grazing lands and fields. The proposed road would consist of a 24-foot- (7-meter-) wide gravel road and a 3-foot- (1-meter-) wide shoulder on either side of the road. It would run approximately 27 miles (43 kilometers), connecting Kawaihae Harbor to PTA. Work would include grading, paving, improving drainage, installing culverts at stream crossings and guardrails at drop-offs, and building storm drainage structures. Road grades steeper than 10 percent would be paved with asphalt or concrete.

Per command guidance, USAG-HI convoys normally maintain a gap of at least 30 minutes between serials (a group of military vehicles moving together), and 330 feet (100 meters) between vehicles on highways and 25 to 50 feet (7.5 to 15 meters) while in town traffic. Per state regulation, military convoys are normally restricted from operating on state highways between 6:00 AM and 8:30 AM and between 3:00 PM to 6:00 PM during the normal work week. This is to avoid peak traffic hours and to reduce the risk of accidents. In addition, convoys and ammunition movements normally are not authorized to pass through a school zone when students are in transit; that is, when school zone lights are flashing Monday through Friday. Movements on Saturday, Sunday, and holidays are by special request only.

Pōhakuloa Training Area Cantonment to Twin Pu‘u CALFEX Range.

Convoys would travel approximately 7 miles (11.3 kilometers) entirely within the boundaries of the installation to the range area utilizing existing

roads and or trails. Beginning at the cantonment area, they would travel in convoys northwest on Saddle Road; southwest on Ahi Road; east on Lava Road; and southwest on Solomon Road.

Preparation and Dry Fire

Training units arrive at the respective range and bivouac in designated areas. Their ammunition is stored at the ammunition supply points in the vicinity of the exercise and is guarded throughout the exercise. Soldiers subsist on packaged meals-ready-to-eat or on delivered hot foods, and they use portable toilets. Planning and instruction generally lasts two days. Unit personnel practice their exercise without live-fire and conduct other tasks associated with preparing for the actual live-fire exercise. Popup targets and blast simulators are sometimes placed in the training area to replicate enemy contact.

Company leaders (Captains, Lieutenants, and Sergeants) receive briefings from the US Army Garrison, Hawai'i (USAG-HI), Directorate of Plans, Training, and Mobilization (DPTM), Range Division and from USAG-HI Directorate of Public Works (DPW) Environmental Division staff on the locations of threatened and endangered species and habitat, locations of known cultural resource sites, fire hazards, and fire prevention measures and procedures. Where necessary, the scenario is modified to reduce the risk of fire and other damage to the environment. The unit leaders then brief every Soldier in the unit on the importance of protecting endangered species and habitat and cultural sites and of preventing wildfires.

Twenty Soldiers from the unit are designated as firefighters and remain on standby during CALFEXs, and in the event of a fire they assist the five permanent professionally trained firefighters who are on-site during all CALFEXs. A helicopter dedicated to firefighting is always present on the range during live-fire exercises at MMR, with an additional helicopter at WAAF available for backup and additional support. Safeguards contained within the IWFMP (Section 2.4.5) are designed to reduce the likelihood of fires. Fires contained within the firebreak road that circumscribes the actual training site do not imperil any threatened or endangered species and habitat.

Smoking may be permitted only in the administrative bivouac site or other designated areas. In the event of a fire at any location, training is stopped immediately and the unit takes all appropriate actions to put out the fire.

Live-Fire Exercise

On days three and four, unit personnel conduct their actual training exercise. On day three, only blank ammunition is fired, and mortars and

artillery are aligned, calibrated, and fired. Training exercises conducted on both days typically last approximately three hours and begin at dawn. The company generally moves with 3 platoons of approximately 30 to 40 Soldiers (or 9 squads of 5 to 10 Soldiers, plus personnel operating machine guns and support personnel) toward the objectives. Soldiers in the lead platoon fire their rifles and machine guns at the objective or target. The mortar section fires 60mm mortars at the objective, while the lead platoon moves toward it. When the lead platoon makes contact with the objective, the platoon leader moves squads to a position of advantage and, by spreading out Soldiers to ensure they can hit every target, gains fire superiority over the “enemy.”

In an operation called fire and maneuver, the platoon leader advances the lead squad, while the squad behind observes the area and provides fire cover for other maneuvering units. The platoon continues to fire and maneuver across the objective until there are no more targets to shoot. The platoon leader consolidates the troops, reorganizes by determining the number of Soldiers wounded and the amount of ammunition remaining, and organizes the forces to defend the land just taken. The unit is on the first objective, with another objective in front of it. The company commander may elect to continue moving the first platoon forward or to hold the lead platoon and bring another platoon forward.

Most exercises present advancing platoons with the problem of trench lines, mine fields (simulated), and concertina-wire obstacles. Confronted with these situations, platoons must practice the skills required to enter and clear a trench line, conduct a company deliberate attack, conduct a platoon and squad attack, knock out a bunker, and conduct an initial breach of a mine field/obstacle. Some simulated minefields would be cleared with the aid of engineers attached to the company. Bangalore torpedoes may be used to blast routes through such locations. A simulated minefield and a concertina-wire obstacle usually protect the bunker entrance. The company commander would order the engineer squad to reduce the obstacle with a bangalore torpedo designed to focus the blast in a cutting line that explodes mines, cuts wire, and allows Soldiers to walk over the site. Several bangalore torpedoes may be combined to clear a wider path.

After the minefield and wire obstacle have been cleared, the Soldiers run through the breach to the trench complex. Two Soldiers roll into the trench and fire down its length to engage any enemy present. The squads and platoon follow, and as each lead Soldier comes to a turn in the trench line, other Soldiers provide shield. The unit Soldiers continue down the trench to the first bunker or room, where four-person fire teams clear the bunkers

with fragmentation hand grenades. The lead Soldier guards the opposite approach, and the remaining three Soldiers position themselves close to the door in a “stack.” The lead Soldier tosses a grenade in, and the three Soldiers rush the room following detonation, pointing their rifles at different prearranged locations in the bunker, covering any “enemy” remaining. Soldiers continue clearing the trench in this manner.

Upon seizing their objectives, units must prepare for any counterattack. A company commander may direct the emplacement of claymore mines (small, command-detonated antipersonnel mines) in front of the unit. If artillery is employed in the scenario, the company commander may distribute its fire in advance of an attack or direct its fire toward a target to suppress counterattack. The commander may also direct the company’s anti-armor section to position its missile launchers to prevent any enemy tanks from overrunning the just-taken objective (e.g., the trench line). Once the enemy counterattacks and is repelled by the company, the exercise is over.

Part of the value of MMR and PTA to the Army and other military units is its capability to support a number of variations to the basic company-level exercise, such as those described below.

- **Air assault.** When air assault is part of a CALFEX, Soldiers board helicopters (either six UH60s or two CH47s) at SBMR and fly to the approved landing zone north of the range control buildings. The helicopters land one or two at a time, discharge their loads and fly off. Some vehicles and equipment may be rigged for external transport beneath the helicopters (a practice known as sling-loading), allowing the aircraft to transport both the Soldiers and their equipment to a given location at the same time. Sling loads are not generally carried over populated areas.
- **Aviation support.** A typical scenario includes three attack helicopters—one designated as an observation aircraft and the other two as attack helicopters—flying to MMR and PTA and firing .50-caliber and 7.62mm machine guns and 2.75-caliber rockets in support of troops on the ground. Aircrews direct all fire into the ordnance impact area (Figure 2-2) and are in constant radio contact with Soldiers on the ground to ensure that the correct targets are engaged.
- **Artillery support.** Artillery, in this case weapons no larger than 155mm, is an integral part of combined-arms training. A typical exercise involves at least two gun sections, with four Soldiers per section. Firing is conducted from a point at the valley’s western edge at targets within the southern firebreak road. In some

scenarios, gun sections may be transported by UH-60 Blackhawk helicopters, with the guns sling-loaded below the helicopters and flown forward into the CCAAC. Such a scenario also includes up to six HMMWVs and two five-ton trucks to haul ammunition. All ordnance fired at MMR is aimed to fall within the south firebreak road.

- **Unmanned aerial vehicle.** The UAV can be likened to a large radio controlled model airplane. The UAV would allow tactical commanders a view into heavily protected battle space that could not be penetrated by other intelligence assets or that presents a high risk to piloted aircraft. The aircraft weighs approximately 325 pounds (147 kilograms), has a wingspan of 13 feet (4 meters), and measures 11 feet (3.4 meters) from nose to tail. It is a remote-controlled, gas-powered vehicle. The UAVs would take off from MMR or would be flown in from WAAF before a CALFEX to obtain pictures for reconnaissance and photo observation. The UAV would be used for up to nine hours each week, either during training exercises or independently.

Aircraft Maneuvers

There are two primary corridors or flight patterns between WAAF and MMR used by helicopters participating in exercises at MMR: 1) due north from WAAF to the east of Hale‘iwa, a left turn over Waialua Bay paralleling the north coast of O‘ahu to off Ka‘ena Point, and then south to MMR and the restricted area complex; 2) due west from WAAF over the Kolekole Pass Highway and then straight to MMR (see Figure 3-4). When weather conditions prevent use of the primary flight corridors, a third corridor is used; from WAAF, the helicopters fly due south over Kunia Road to ‘Ewa Beach, then north along the coast to MMR.

Altitudes flown are 2,100 feet (640 meters) above ground level (AGL), except over the water where the helicopters fly at a 300-foot (91-meter) minimum altitude above the ocean. Over land, helicopter traffic pattern altitudes, in accordance with AR 95-1, Aviation Flight Regulations, are at least 700 feet (213 meters) AGL, but may be set at different altitudes based on noise abatement, “fly neighborly” policies, or other safety considerations. Flight schedules are not provided to the community in advance.

When transiting the north shore off DMR and around Ka‘ena Point, helicopters fly 1 or 2 nautical miles (2 to 4 kilometers) offshore; if they are flying into Dillingham Airfield to stop before an exercise, or to stop at the Forward Area Rearm and Refuel Points (FARRP), they would typically fly at 1,000 to 1,500 feet (305 to 457 meters) offshore (Fancher 2003a).

During these flights, the aircraft altitude would be 700 feet (213 meters) both day and night when flying without aids and 300 feet (91 meters) when using night vision goggles. 1,000 feet above within ½ mile (800 meters of shore) for marine mammals. The Dillingham FARRP is south of the runway in the “Boondocks” training area close to the northern boundary of the R-3110 B & C restricted area (Fancher 2003a).

During CALFEXs, OH58 (Kiowas) and UH60 (Blackhawks) are used. The exercise typically involves two or three OH58s (two for firing and one for command and control) and one helicopter for standby with a water bucket in case of a wildfire, with one exercise in the morning and one in the afternoon. During the exercise, there is typically a ground rehearsal, a fly-by rehearsal, and then the actual close-air support firing exercise with the regular .50-caliber M-2 rounds. Over the five-day CALFEX, there would be up to five helicopter approaches during the nonlive-fire day and up to five approaches during each of the daytime and nighttime live-fire iterations. In addition, two CH-47 Chinook helicopters would transport troops and equipment from SBMR to MMR.

During the exercises, the helicopters would depart MMR and rearm and refuel at the FARRPs located at DMR and at SBMR just off the Kolekole Pass Highway, approximately 5 miles (8 kilometers) west of WAAF. On average, each helicopter flies to the FARRP four times during each exercise.

On the way to MMR for a live-fire exercise, the helicopters typically stop to pick up ammunition at either the DMR FARRP, or at the Kolekole Pass Highway FARRP. They would then proceed to MMR, participate in the exercise, and fly back to one of the FARRPs to rearm and refuel. Fuel and ammunition temporarily stored at the FARRPs for the duration of the exercises is brought in by truck from the fuel depot and permanent ammunition storage areas (Andera 2003a).

During each live-fire exercise conducted at MMR, the helicopters hover as they wait to re-group after each firing pass. The hover point is usually behind the ridge at the southern boundary of the R-3110 A & B restricted area (Figure 3-4) just east of Farrington Highway, where they can hover for 30 to 45 minutes at a time, typically. The command and control helicopter typically flies orbits (to conserve fuel) over the ocean at 300 to 400 feet (91 to 122 meters) above sea level. Its distance from shore ranges from about 0.25 mile (0.4 kilometer) to 0.5 mile (0.8 kilometer), and at times 1 mile (1.6 kilometer) offshore. The pilots watch for marine mammals and avoid them when spotted.

Typically, air assault exercises are conducted less frequently than CALFEXs. 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. About 45 percent of this training is conducted at night. Total flight hours have dropped about 75 percent since 1994, primarily from the cessation of training in 1998 and restrictions on training frequency per the Settlement Agreement. Inclement weather (ceiling visibility and wind turbulence) affects flying about 25 percent of the time (Andera 2003b).

Pōhakuloa Training Area Flight Corridors

There are no formal, published military training routes in the PTA airspace, however, the R-3103 restricted area is heavily used for helicopter training exercises. The PTA airspace includes uncontrolled Class G airspace, which extends from the surface to a ceiling of 1,200 feet (366 meters), and controlled Class E airspace, which is airspace above 1,200 feet (366 meters). BAAF is surrounded by Class D airspace extending from the surface to a ceiling of 8,700 feet (2,652 meters).

Between O'ahu and the Island of Hawai'i, helicopters would fly at least 1,000 feet (305 meters) above sea level. The Aviation Brigade of the 25th ID has local flying rules SOPs that include a 1,000-foot (305-meter) vertical limit over whales and, more recently, over monk seals and dolphins when sighted. These procedures have already been communicated to all units flying in Hawai'i and have been formally incorporated into the local flying rules. For reasons discussed in Section 2.4.3, there would be no change in helicopter activity expected if Alternative 4 were selected.

Cleanup

On day five and sometimes at the end of day four, 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 UXO. Ordnance normally is destroyed where it is found, whether it resulted from the training being conducted or from earlier exercises; no known unexploded rounds are left in place at the conclusion of a training exercise.

These procedures ensure that training would not increase the amount of UXO on the site and may reduce it, if possible. Sometimes, due to unexpected occurrences, the EOD specialists are not available to dispose of UXO immediately after a training exercise. In this case, UXO would be disposed of once the specialists are available and prior to use of the area

for new training. 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 EPA criteria as a hazardous waste. The ash is ultimately removed from the site and is disposed of in accordance with EPA regulations. Unexpended ammunition is repackaged and returned to the ammunition supply point from which it was drawn.

When the cleanup is complete, the units load their equipment on their vehicles and return to SBMR via the same route described above, again avoiding peak traffic hours to the extent possible. Army personnel also conduct surveys of archaeological/cultural resources to determine if they have been disturbed.

Example Convoy Live-Fire Exercises

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, combat support (CS) and combat service support (CSS). Units in a convoy formation must be able to react to IEDs attacks on convoys. IEDs are the enemy's preferred asymmetric weapon against US forces while deployed in a hostile environment. Asymmetric warfare is conflict in which a modern Army faces not another modern Army, but an opponent with more limited technological resources.

Convoy Live-Fire Training Description and Scenarios

Threats against a moving convoy may include, but are not limited to, the following:

- 1) Blocked Ambush (Daytime or Nighttime) with direct and indirect fires.
- 2) Unblocked Ambush (Daytime or Nighttime) with direct and indirect fires.
- 3) Snipers
- 4) Mines (any type)
- 5) IEDs/VBIEDs: Homemade explosive devices (can be found any time, anywhere).
- 6) Human intervention: This may include a crowd or individuals of a hostile or desperate nature looking for food, etc.

- 7) Suicide bombers: May include one person, many people, or a vehicle.
- 8) Hostile aircraft

In keeping with the crawl/walk/run concept, each squad or platoon will first conduct a dry-fire iteration. The purpose is to familiarize soldiers with the range and the safety procedures for conducting a convoy LFX. After successfully completing the dry-firing, the squads and platoons may execute a Multiple Integrated Laser Engagement System (MILES)/blank fire iteration. The soldiers wear MILES gear and are armed with blank ammunition only. The opposing forces (OPFOR) will also wear MILES gear and will be armed with blank ammunition. Hits and near misses are recorded by the observers/controllers (O/Cs) moving with each vehicle in the serial. After successfully completing the MILES/blank-fire iterations, the units are prepared to conduct the live fire portion.

A convoy live-fire range must have the capacity to train convoys comprised of 5 to 20 vehicles travelling at intervals of 82 to 328 feet (25 to 100 meters). Due to limited training space to accommodate convoy LFXs on O'ahu, a typical training scenario will have normally five to six vehicles. 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 surface danger zones.

Convoys will be lead by either an officer or non-commissioned officer. Vehicles will have communications and possess small arms mounted and Soldier-held weapons. Vehicles will start down an existing road or trail and will be attacked either via simulated enemy fire, mine, or IED. At a pre-arranged signal, the leader in the convoy pushes a button on an electronic remote control box that sends a signal to a bank of target lifters that are positioned very close to the road that the vehicles are traveling on. The lifters spring up, bringing silhouette targets with them that look like enemy soldiers holding rifles. This can be accompanied with a signal to a pneumatic machine gun, a simulator that produces the sound of an enemy machine gun being fired towards Army Soldiers.

Also, an IED can be simulated to explode with an approved air compressed IED simulator. This simulator replicates a large "boom" and gives off a small cloud of smoke. These devices produce no fire hazards. A blocked ambush scenario will cause the convoy to stop and create a defensive perimeter and return fire.

Return fire will be at designated targets that serve as “enemy” forces within existing SDZs for vehicle mounted and dismounted small arms fire. Several of the dismounted soldiers may engage in an offensive scenario by advancing towards the enemy in order to neutralize the threat. The “enemy” will be existing targets downrange, but within approved SDZs. An unblocked ambush scenario would dictate that the convoy continue through the area, and return defensive fire from the vehicles until reaching a safe distance. Once the counter-ambush is over, the leaders exit the area.

Weapons and Munitions Use

Weapons and the approximate munitions expended per convoy LFX are included Table 2-4.

**Table 2-4
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	10,000
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-caliber training rockets	3	300	600

¹ The 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.

Location and Design

A convoy live fire range must have roadways that simulate conditions experienced by tactical convoys. A typical convoy live fire course will

have an Entry control point with several objectives consisting of stationary and moving targets with facades to replicate urban areas that the enemy will normally attack from. SDZs will always be established for all target arrays and facades throughout the course.

At MMR, the typical convoy live-fire training scenario for Alternatives 1 through 3 would begin in the vicinity of the range control tower and proceed primarily on South Firebreak Road, replicating transport to a village or logistics support location. Vehicles would not leave the existing roadway either before or after engaging existing targets. Furthermore, the convoy LFXs would utilize the existing SDZs that have been established for Army CALFEX training at MMR. Flight corridors for support helicopters would be similar to the description provided for aircraft maneuvers (Section 2.4.3).

For Alternative 4, convoy LFXs would be performed at existing facilities at PTA along the Redleg Trail on the East side of the installation. Ultimately, the Army could use the USMC convoy live-fire range proposed for PTA if that project is approved.

Frequency

Convoy LFXs last four to five hours. Normally, two or more convoy LFXs could be conducted per day. Although the Army requires the capacity to conduct these exercises at night, they are subject to the restrictions on night fire that resulted from ESA consultation. The minimum number of convoy LFXs for Hawai'i-based units would be 100 per year. However, the Army analyzed an optimum capacity of 200 per year because the maximum use analysis would allow units to conduct two convoy LFXs per year. It should be noted, as described in chapter one, that as units' requirements for CALFEXs increase, their requirements for convoy LFXs go down. In any event, the combination of convoy LFXs and CALFEXs would not exceed 242 days per year at MMR.

2.4.4 Other Types of Training

The following training exercises would be conducted independently or in conjunction with a CALFEX.

Air Assault

The 25th ID would use these range alternatives as a possible air assault objective. The components of the air assault are similar to the CALFEX, the primary exception being that artillery and troops would be brought in by air, moments before the attack begins, to practice the element of surprise. The objective would be suppressed with aviation fire (.50-caliber), and troops would be airlifted into the valley in close proximity to the objective. Actions on the objective might include conducting a breach

(use of a bangalore torpedo), then entering and clearing a trench. The actual objective may vary but is not likely to require any other weaponry.

Sniper Training

Due to the limitation of sniper ranges on SBMR, The CALFEX ranges at MMR and PTA are likely places to support static sniper firing. In general, this includes using a M24 sniper rifle firing a 7.62mm round at targets up to 3,281 feet (1,000 meters) away. The M107 heavy sniper rifle that fires .50-caliber ammunition also can be used. Snipers would frequently participate in CALFEXs.

Demolitions Training

Demolitions training would take place at the ordnance impact area and could include a range of activities, such as the following:

- Use of low levels of explosives to destroy such materials as steel and wooden structures.
- Use of explosives to gain entry to buildings.
- Placement and detonation of shape charges at the ordnance impact area. Shape charges are composed of C4 plastic and would be used as 15-pound (6.8-kilogram) charges (up to 80 times a year) and 40-pound (18-kilogram) charges (up to 36 times a year). The shape charge would create a narrow hole in the ordnance impact area.
- Detonation of cratering charges at the ordnance impact area following the detonation of the shape charge. The M039 cratering charge, filled with ammonium nitrate, is placed within the hole created by the shape charge. The typical maximum amount of ammonium nitrate that would be used at any one time would be up to 150 pounds (68 kilograms), and possibly up to 300 pounds (136 kilograms). Training using cratering charges would occur up to twice a month (24 times a year).

Staging Base for Ground or Air Movement

The MMR and PTA range alternatives can also be used as a staging base for ground or air movement. Army training is normally conducted in a dispersed or distributed fashion to better reflect fighting over a large battlefield with extended distances between organizations.

Ground Movement

The range alternatives would be used as a staging base for ground movement (FM 21-18). An infantry Soldier's primary means of mobility is by foot, and all infantry units train heavily on foot movements while carrying heavy loads. Military units would use these range alternatives as a

staging base to begin foot movements and to provide a final destination. The unit size conducting foot movements can range anywhere from platoons to battalions.

Air Movement

These range alternatives can serve as a possible pickup zone for air assault operations conducted at other training areas (FM 90-4). The size of the units would be platoons and companies. Air assaults, depending on the size, can include moving not only troops, but also artillery pieces and vehicles.

2.4.5 Current Institutional Programs

Institutional programs are good stewardship plans and programs that could affect, protect, and manage the biological, physical, and socioeconomic environment at USAG-HI installations. Several management programs have been developed to address the sustainability of specific resources. The programs that are currently established and operating at USAG-HI are range management, ITAM, Wildland Fire Management Program (WFMP), and environmental management programs. These programs would continue as part of the Proposed Action alternatives. Under No Action, the programs would continue at a minimal level, if at all, due to the absence of training at MMR.

Range Management

The Range and Training Land Program (RTLTP) is the program under which the Army conducts range operations and maintenance on lands where Soldiers train in the field. The RTLTP provides a military-centered framework for land management since USAG-HI lands are primarily classified for military use. The Range Division implements the RTLTP, operates firing ranges, and regulates use of training and ordnance impact areas. In addition, Range Division regulates access to training areas and ranges.

The key RTLTP planning device is an installation range development plan, which defines the range and training land requirements. This plan is incorporated into the USAG-HI Real Property Master Plan, the Integrated Natural Resources Management Plan (INRMP), and the Integrated Cultural Resources Management Plan (ICRMP). These efforts, together with the ITAM work plan described below, produce a sound approach for consistent and proactive management of training land while balancing mission, infrastructure, and environmental stewardship.

Integrated Training Area Management

The ITAM program is the Army's formal strategy for ensuring the sustainable use of training and testing lands. The intent of the ITAM program is to systematically provide uniform training land management capability across USAG-HI and to ensure that the carrying capacity of the training lands is maintained over time. The Army manages its lands to minimize loss of training capabilities in order to support current and future training and mission requirements. The integration of stewardship principles into training land and conservation management practices ensures that the Army's lands remain viable to support future training and mission requirements. ITAM integrates elements of operational, environmental, master planning, and other programs that identify and assess land use alternatives.

The ITAM program also supports sound natural and cultural resources management practices and stewardship of its land assets, while sustaining land attributes conducive to supporting training, testing, and other installation missions. These management requirements are as follows:

- Integrate training requirements with training land management;
- Conduct annual monitoring and analysis of resources and ranges;
- Conduct repair and maintenance of training land;
- Enhance mobility, maneuverability, access, and availability in training areas; and
- Train Soldiers in sustainable range awareness to minimize training land damage.

These requirements are applicable at all training areas.

The following ITAM programs are being implemented:

- Combat trail maintenance, including drainage and erosion control repair;
- Culvert maintenance, embankment repair, hydroseeding of drainage swales;
- Installation of energy dissipaters in swales, sedimentation and detention basins, and erosion control blankets; and
- Archaeological site capping, which includes the use of sandbags to protect sites, and installation of concertina fencing.

Wildland Fire Management Program

The Army has an IWFMP. The IWFMP outlines specific guidance, procedures, and protocols in the prevention and suppression of wildfires on all USAG-HI training lands with wildland fuels. Its goal is to convey the methods and protocols necessary to minimize fire frequency, severity, and size, while allowing military units to maintain a high level of combat readiness. It defines responsibilities of all offices, departments, and agencies involved, and describes fire presuppression and suppression actions to be taken on strategic as well as tactical bases. The IWFMP is discussed in Section 3.14, Wildfires. Before night training at MMR is conducted, helicopters would have to be authorized to be used for fighting night fires. In support of the most recent ESA Section 7 consultation on live-fire training at MMR, the Army, with the assistance of the USFWS, has been updating its IWFMP to incorporate new and/or additional measures that would minimize the risk of resource damage due to training-related wildland fires.

Environmental Management Programs

USAG-HI manages two major environmental programs: natural resources management and cultural resources management. The natural resources management program is focused on protecting endangered species. The cultural resources management program is focused on monitoring and protecting cultural resources according to federal statutes and regulations and Army regulations and guidance.

The cultural resources management program at USAG-HI has a staff that includes a cultural resources manager, two archaeologists, one architectural historian, and 14 contract cultural resource specialists. Managing the resources includes the following tasks:

- Maintaining a cultural site database, including Geographic Information System mapping;
- Conducting field survey and site evaluation, location, verification, and monitoring before, during, and after training activities;
- Ensuring site preservation;
- Conducting Native Hawaiian consultation; and
- Coordinating with other regulatory agencies.

Conservation actions provide stewardship to rare species and cultural resources and are described in greater detail under the appropriate resource section of Chapter 3, Affected Environment.

The cultural resources team also coordinates and facilitates public outreach actions that include site tours and public education and forming cultural advisory groups on O‘ahu and the Island of Hawai‘i. Cultural resource programs are discussed in greater detail in Section 3.10.

The natural resources management program at USAG-HI has a staff that includes a natural resources manager, two biologists, and over 70 contract natural resource specialists. Managing the resources includes the following tasks:

- Monitoring threatened and endangered species;
- Implementing invasive species control programs, including fencing, rat control, and weed control;
- Restoring/improving habitat for threatened and endangered species;
- Preparing and implementing the INRMP;
- Implementing the MIP;
- Conducting floral and faunal surveys;
- Conducting consultation with the USFWS and NOAA Fisheries;
- Coordinating with other regulatory agencies; and
- Researching new control methods for threats to endangered species.

Army Compatible Use Buffers

Since 2003, the Military Services have been authorized to enter into cooperative agreements for the purpose of managing incompatible land uses in the vicinity of installations. The Army has been using this authority to establish Army Compatible Use Buffers (ACUBs) in the areas surrounding installations. These buffers have the benefits of helping the Army achieve its training requirements as well as its land stewardship objectives by establishing conservation space in ways that support mission-related activities and that could benefit the conservation of listed species and critical habitat.

The areas purchased on O‘ahu to date include Waimea Valley, Moanalua Valley, and Pupukea Paumalu. The Army may continue to provide funds to support the ACUB program and conserve additional significant natural and cultural resources.

2.4.6 Alternatives to Accomplish the Proposed Action

This EIS evaluates the following four alternatives to accomplish the Proposed Action:

- Alternative 1 (Reduced Capacity Use with Some Weapons Restrictions);
- Alternative 2 (Full Capacity Use with Some Weapons Restrictions);
- Alternative 3 (Full Capacity Use with Fewer Weapons Restrictions); and
- Alternative 4, (Full Capacity Use with Fewer Weapons Restrictions), Pōhakuloa Training Area.

Table 2-5 summarizes training activities and weapons that would be used under each of the alternatives. This EIS analyzes the following major points for each alternative, which are summarized below:

- 242 days of training for all alternatives.
- Weapon systems and munitions proposed for use at MMR (Table 2-3). While the 120mm HE mortar would be used by the SBCT at MMR, it would also be used in the future by other military units.
- Use of tracer ammunition in Alternatives 2, 3 and 4. All infantry forces of the US military must be trained and ready for daytime and nighttime live-fire and maneuvers. The use of tracers is invaluable in showing the trajectory of bullets and verifying the accuracy of aim at night. Tracers would be used in accordance with ESA Section 7 consultation. Night live-fire would occur only when helicopters are authorized to fly.
- Convoy LFX.
- Use of inert TOW missiles, 2.75-caliber rockets, and illumination munitions for Alternatives 3 and 4.
- Use of aircraft and vehicles listed below for training (and their approximate numbers), including use of the Stryker by SBCT:
 - HMMWV (six);
 - 2.5-ton (2.3-metric-ton) or 5-ton (4.5-metric-ton) cargo trucks (two);
 - UH-60 Blackhawk helicopters (six);
 - OH-58D Kiowa Warrior helicopters (three);
 - CH-47 Chinook helicopters (two);
 - Strykers (up to five); and
 - UAVs.

Table 2-5
Comparison of Alternatives to Achieve the Proposed Action

	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)
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 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	19 to 28	Up to 50	Up to 50	Up to 50
Number of Convoy LFXs	100	200	200	NA ²
Weapons systems	Weapons and munitions listed in Table 2-3 and 2-6	Weapons and munitions listed in Table 2-3 and 2-6	Weapons and munitions listed in Table 2-3 and 2-6	Weapons and munitions listed in Table 2-3 and 2-6
Use of live ammunition	Yes	Yes	Yes	Yes
Tracer ammunition ¹	No	Yes	Yes	Yes
Inert TOW missiles, 2.75-caliber 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

¹Tracer ammunition would be used only during a “green” fire danger rating. The “green” rating occurs most often from November to March, during the evenings, and the early mornings. The 25th ID night fire training techniques would be implemented in accordance with the IWFMP (MMR-relevant excerpts of the IWFMP are presented in Appendix J).

² 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. For units deploying to the CENTCOM area of operations that would not normally train at PTA, convoy LFXs would probably be conducted somewhere other than Hawai‘i, such as Kuwait, or the National Training Center in California (assuming that MMR is not available).

Other types of training at these MMR or PTA alternatives include squad, section, and platoon maneuver live-fire, demolitions and sniper training, troop marches, and use of the range as a staging base for air assault.

Alternative 1 includes the least number of CALFEXs, 19 to 28, and does not include tracer use. Alternative 2 includes 50 CALFEXs and the use of tracers. Alternatives 3 and 4 include 50 CALFEXs, the use of tracers, inert TOW missiles, 2.75-caliber rockets, and illumination munitions. Alternative 3 also includes training on the ridge located between the north and south lobes of the training area (Figure 2-2). Training on this ridge would have to be the subject of additional ESA Section 7 consultation.

The only weapons used in these alternatives that can produce UXO are the grenades, demolition materials, mortars, rockets, and artillery. The quantities of ammunition used depend on the training activity and scenario being conducted.

All current environmental programs would continue for the four alternatives, including natural and cultural resource management, wildland fire management, and other programs, as described in Section 2.5.5 and Chapter 3 of this EIS.

A factor in common for all four action alternatives is that all elements, prior to adoption, would be subject to the requirement for consultation with the USFWS required under ESA Section 7. Although these alternatives are set out in this EIS to include all activities necessary to accomplish the required military training, some of those activities have either not yet been the subject of consultation or have been authorized with significant restrictions. For instance, Alternatives 2 and 3 include the use of tracer ammunition at MMR. Under the 2007 BO for MMR, tracer ammunition can only be used under certain plant moisture conditions and once the Army has completed certain fire suppression projects and species stabilization efforts. The 2007 BO also limits the use of any live ammunition at night for MMR because of limitations in helicopter fire-fighting capability.

A somewhat different situation exists with respect to illumination munitions at MMR. Because of their propensity to start fires, they were not made part of the action that was the subject of the 2007 BO for MMR. Use of illumination munitions would have to be the subject of additional consultation with the USFWS.

Training activities at Ka'ena Point trail and on the ridge located between the north and south lobes of the training area were removed from the scope of ESA Section 7 consultation. The environmental impacts of marches around Ka'ena Point are still addressed in the EIS, but separate ESA

Section 7 consultation and coordination with the State of Hawai‘i would be required prior to conducting such exercises. The environmental impacts of training on the ridge located between the north and south lobes of the training area are still addressed in the EIS, but separate ESA Section 7 consultation would also be required prior to conducting such exercises.

The key point is that the action alternatives present the methods by which the Army can meet the purpose and need of the Proposed Action. Many elements of the alternatives, however, would have to be phased in over time. The success of species stabilization efforts, the further development of fire-fighting techniques, and the development of new scientific information about endangered species, are all factors in determining when the alternatives could be fully implemented by the Army. The requirements of the 2007 BO for MMR are further discussed in Section 3.9.2. If selected, the PTA alternative would also require additional ESA consultations prior to construction and operation.

Alternative 1 (Reduced Capacity Use With Some Weapons Restrictions)

This alternative involves conducting 19 to 28 company-level CALFEXs at MMR during a 242-day training year (Table 2-5). The weapons and ammunition analyzed for use by the Army at MMR are listed in Table 2-3. This alternative does not incorporate the use of tracers, inert TOW missiles, 2.75-caliber rockets, or illumination munitions. Under this alternative, the Army would train its units at a reduced range capacity on an approved live-fire assault course. The proposed CALFEX training under Alternative 1 would be like the CALFEX training described in the SEA (dated May 2001) and conducted over the past few years under the Settlement Agreement.

This alternative also involves conducting up to 100 convoy LFXs. Section 2.4.3 describes the weapons analyzed for use by the Army at MMR and the approximate munitions expended per convoy LFX. These exercises may be conducted either in conjunction with or independently of CALFEX training.

Implementing this alternative would allow military units to conduct nighttime, as well as daytime, training exercises. Over a typical 242-day training year, the Army is expected to conduct other types of training, in addition to the 19 to 28 company-level CALFEXs.

While records of ordnance used in the past were not routinely retained, the Army is now required by DoD Directive 4715.11 to maintain records of all ordnance expended at MMR, as well as at all other installations worldwide. Table 2-6 presents the estimated quantities of ammunition to be used by the Army for 19 and 28 company-level CALFEXs.

Table 2-6
Estimate of Annual Munitions Expended for Daytime and Nighttime CALFEXs

Weapons System ¹	One Daytime and Nighttime CALFEX	Expected Annual Ammunition Expenditures ²		
		19 CALFEXs ³	28 CALFEXs ³	50 CALFEXs ^{3,4}
M24 sniper weapon (7.62mm rifle)	17	323	476	850
9mm pistol	0	0	0	0
M249 Squad Automatic Weapon (SAW) (5.56mm machine gun)	6,120	116,280	171,360	306,000
M16A2 ⁵ (5.56mm rifle)	20,196	383,724	565,488	1,009,800
M4/M4A1 (5.56mm machine gun)	4,692	89,148	131,376	234,600
M240B (7.62mm machine gun)	2,040	38,760	57,120	102,000
M2 (.50-caliber machine gun)	170	3,230	4,760	8,500
MK 19 (40mm machine gun)	68	1,292	1,904	3,400
M203 (40mm grenade launcher)	388	7,372	10,864	19,400
Kiowa helicopter with .50- caliber machine gun	1,360	25,840	38,080	68,000
60mm mortar (inert)	46	874	1,288	2,300
60mm HE mortar	37	703	1,036	1,850
81mm HE mortar	49	931	1,372	2,450
Illumination munitions for the 81mm HE mortar	22	0	0	1,100
M119, 105mm HE howitzer ⁶	121	968	1,331	2,420
Illumination munitions for the 105mm howitzer ⁶	Not applicable	0	0	360
120mm HE mortar ⁷	49	931	1,372	2,450
155mm HE howitzer ⁶	324	3,564	5,508	9,720
Illumination munitions for the 155mm howitzer ⁶	Not applicable	0	0	540
Javelin	2	38	56	100
AT-4/M136, 84mm anti- tank rockets	3	57	84	150
Inert TOW missiles	2	0	0	100
2.75-caliber rockets	56	0	0	2,800
Fragmentation grenades	34	646	952	1,700

Table 2-6
Estimate of Annual Munitions Expended for Daytime and Nighttime CALFEXs

Weapons System ¹	One Daytime and Nighttime CALFEX	Expected Annual Ammunition Expenditures ²		
		19 CALFEXs ³	28 CALFEXs ³	50 CALFEXs ^{3,4}
Smoke grenades	12	228	336	600
Engineer support with Bangalore torpedo	3	57	84	150
M18A1/A2 Claymore mine	9	171	252	450
2 lbs. C4	3	57	84	150
Shape charge, 40 lbs. C4	Not applicable	36	53	95
Shape charge, 15 lbs. C4	Not applicable	80	118	211
Cratering charges	Not applicable	24	35	63

¹While the EIS evaluates use of ammunition as presented in this table, certain types of ammunition could only be used following further ESA Section 7 consultation with USFWS.

²The ammunition expenditures presented in this table represent a typical company-level CALFEX. The actual expenditures for an individual CALFEX or training year would fluctuate and could be either higher or lower than the numbers in this table. Also, for an individual CALFEX, additional rounds of a smaller caliber mortar or artillery weapon may be substituted for the estimated rounds of a larger weapon; the total number of rounds for the smaller weapon would not exceed the combined estimated rounds for both weapons. For example, additional rounds of the 60mm HE mortar could be fired if the 81mm HE mortar is not used during a given exercise, but the total number of 60mm rounds fired during that exercise would not exceed 86 (49 + 37).

³Each company-level CALFEX includes both a daytime and nighttime iteration. Estimate of munitions is based on actual training data.

⁴Some expected ammunition levels jump from 0 for 19 and 28 CALFEXs to a much higher number for 50 CALFEXs. This is due to greater intensity and weapons flexibility associated with Alternative 3, which includes up to 50 annual CALFEXs.

⁵Some of the M16A2 rounds are SRTA rounds.

⁶For CALFEXs at MMR, the 155mm howitzer and the 105mm howitzer are interchangeable weapons. Both weapons would not be used during the same CALFEX. The number of rounds presented for 19, 28, and 50 CALFEXs is the estimated number of rounds to be expended during a training year.

⁷While the 120mm HE mortar is planned for future use at MMR, no allocations for the weapon have been made.

Alternative 2 (Full Capacity Use with Some Weapons Restrictions)

This alternative represents a maximum use capacity of MMR and involves conducting up to 50 company-level CALFEXs during a 242-day training year (Table 2-5). The weapons and ammunition proposed for use by the Army at MMR are listed in Table 2-3.

Alternative 2 includes use of tracers but does not include the use of inert TOW missiles, 2.75-caliber rockets, or illumination munitions. The burnout time of the tracers is 2,624 feet (800 meters) for 5.56mm, 3,280 feet (1,000 meters) for 7.62mm, and 7,216 feet (2,200 meters) for .50-caliber.

Under this alternative, the Army would train its units at a full range capacity on an approved live-fire assault course. 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 convoy live-fire and other types of training, as described in the Proposed Action. Analysis of up to 50 company-level CALFEXs, however, provides a worst case scenario of environmental impacts with some weapons restrictions. Table 2-6 presents the estimated quantities of ammunition to be used by the Army for 50 company-level CALFEXs; however, the use of inert TOW missiles, 2.75-caliber rockets, and illumination munitions is not included as part of Alternative 2. Both daytime and nighttime training would be conducted under this alternative.

This alternative also involves conducting up to 200 convoy LFXs. Section 2.4.3 describes the weapons analyzed for use by the Army at MMR and the approximate munitions expended per convoy LFX. These exercises may be conducted either in conjunction with or independently of CALFEX training.

Alternative 3 (Full Capacity Use with Fewer Weapons Restrictions)

This is the Army's preferred alternative. This alternative represents a maximum use capacity of MMR and involves 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 Table 2-3. Additionally, live-fire training proposed under Alternative 3 would use tracers, inert TOW missiles, 2.75-caliber rockets, and illumination munitions.

While training would make use of inert TOW missiles, propellants would still be required for launching the weapons. The quantities of ammunition used depend on the training exercise and scenario being conducted. Estimates of munitions to be expended under Alternative 3 are provided in Table 2-6. Inert TOW missiles, 2.75-caliber rockets, and illumination munitions create a greater risk of wildfire.

This alternative, would allow the Army to train its units with maximum realistic training with critical weapons systems on a live-fire assault course. Both daytime and nighttime training exercises would be conducted under this alternative.

This alternative also involves conducting up to 200 convoy LFXs. Section 2.4.3 describes the weapons analyzed for use by the Army at MMR and the approximate munitions expended per convoy LFX. These exercises may

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

Alternative 4 (Full Capacity Use with Fewer Weapons Restrictions), Pōhakuloa Training Area

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 Table 2-3. Live-fire training proposed under Alternative 4 would use tracers, inert TOW missiles, 2.75-caliber rockets, and illumination munitions.

While training would make use of inert TOW missiles, propellants would still be required for launching the weapons. The quantities of ammunition used would depend on the training exercise and scenario being conducted. Estimates of munitions to be expended under Alternative 4 are provided in Table 2-6.

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. Both daytime and nighttime training exercises would be conducted under this alternative. This alternative would be subject to future ESA consultation, which may add restrictions and mitigation actions similar to those at MMR.

Convoy live-fire training would occur along Redleg Trail or at the USMC convoy live-fire range if approved.

2.4.7 Scope of Training

All of the training events and tactical scenarios described in Section 2.4, Proposed Action, are general descriptions that illustrate the routine military training events to be conducted at either an MMR or PTA alternative. These descriptions were not intended to prescribe the precise way in which the training events would be executed, thereby restricting the military's use of an alternative to the described training events or tactical scenarios. Instead, there may be deviations from the description when the live-fire or nonlive-fire training event is actually planned and executed. The environmental impacts identified, analyzed, discussed, and mitigated in this EIS are based on five parameters² that have been described in the

² The military training parameters set forth in the EIS are consistent with the Proposed Actions that formed the basis for the formal Section 7 consultations with USFWS and comply with any restrictions established by USFWS in its BOs and Supplemental BOs covering military training at MMR. The Army is continuing to consult with USFWS on weapons and training activities not addressed during previous Section 7 consultations.

document: (1) delineation of the land areas that will be used by military units; (2) specification of the general military use(s) for these delineated land areas (e.g., maneuver areas, ordnance impact areas, bivouac areas, tactical march areas, and administrative areas); (3) enumeration of the types of weapon systems that may be used (either during a company-level CALFEX or convoy LFX); (4) quantification of the ammunition/munitions expenditures by type and approximate number of rounds that may be fired during a company-level CALFEX or convoy LFX (depends on the action alternative); and, (5) quantification of the number of company-level CALFEXs and convoy LFXs per year. Within the bounds of these five training parameters, the military services are free to plan and execute training events and tactical scenarios. Specifically, training events or tactical scenarios with less environmental impact than a company-level CALFEX may be planned and executed without restriction, as long as they do not go beyond the five parameters or other limitations that are reflected in the ROD.

There was no intent to restrict training events or tactical scenarios to the specific ammunition expenditures per company-level CALFEX depicted in Table 2-6. The intent was to provide ammunition estimates by type and amount, which are generally high, to use as assumptions in the analysis ensuring that concrete environmental impacts could be estimated. During a particular training event, certain weapons systems may not be used at all or other systems may be substituted. For example, during a particular live-fire training event, 105mm howitzers may be substituted for 155mm howitzers, or different types of mortar rounds (60mm, 81mm, or 120mm) may be used in varying quantities or not at all. This variability occurs because the tactical scheme for gunfire and maneuver may vary greatly from one training event to the next or the organic weapon systems for units may differ. Over the course of a year, some company-level CALFEXs may expend more ammunition by type than reflected in Table 2-6; others may expend much less ammunition by type. However, the overall parameter for the alternative selected would not be exceeded. For example, if the Army selected Alternative 2 or 3, there would not be more than 306,000 rounds of 5.56mm ammunition fired from a M249 SAW during a given training year. This EIS also includes routine training events and tactical scenarios for military elements smaller than companies, such as platoons and squads (see Table 2-2). To identify and describe the highest level of environmental impact, the environmental impact analysis in this EIS focuses on a company-level CALFEX as the highest level of training.

Routine military training activities at MMR may change over a period of time as tactics, military weaponry, and training doctrine change. In the future, if the military must change any of the five parameters, the

appropriate level of NEPA analysis will be prepared before the parameter is exceeded. For example, if the military intends to introduce a new weapons system or new type of ammunition to MMR, the appropriate level of NEPA analysis will be prepared.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED

This EIS carries forward for evaluation a range of alternatives considered to be reasonable. In determining whether or not an alternative was reasonable, each identified alternative was evaluated against the stated purpose and need in Sections 1.2 and 1.3. The basic need for 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. To evaluate all proposed alternatives and to determine which of those could meet this need, and thus be carried forward for full evaluation, the following screening criteria were developed:

- **Range Capacity.** Units stationed on O‘ahu require access to a set of live-fire ranges and maneuver lands with capacity to meet doctrinal standards for sequential live-fire tasks. This is to maintain combat readiness at the Soldier, crew, squad, platoon, and company levels. Sufficient capacity would ensure that each unit of the 25th ID could engage annually in sequential live-fire tasks that meet the doctrinal requirements for live-fire exercises set forth in the following:
 - AR 350-1, *Army Training and Leader Development*;
 - Training Circular (TC) 7-9, *Infantry Live-Fire Training*;
 - Department of the Army Pamphlet 350-38, *Standards in Weapons Training*;
 - TC 25-8, *Training Ranges*;
 - The US Army Pacific Command’s Live Fire Guidance; and
 - The unit’s related Mission Essential Task List (METL).

In particular, at the company level, each unit must be able to perform an annual CALFEX that integrates the movement and live fire of infantry Soldiers with, at a minimum, aviation assets, artillery, mortar, and engineering activities (e.g., demolition). In addition, range facilities must be available to support air assault exercises, sniper training, demolition training, and convoy LFX

and to act as a staging base for ground and air movement of Soldiers (see Section 2.5.4). Live-fire training must be able to be conducted on ranges with SDZs that do not result in the closure of training areas needed for maneuver of units. A range also would have to be available when and where it would not interfere with the training requirements of other military units.

The Army has not yet finalized a minimum design capacity for convoy live-fire ranges. Over the past few years, Army trainers have developed various modifications to existing ranges in order to provide adequate convoy live-fire training exercises for Soldiers deploying to Iraq and Afghanistan. This decision assumes that the USMC range is not available, since it is the subject of a yet-to-be completed NEPA analysis.

- **Range Design.** Based on MMR training capabilities, a live-fire maneuver range for an infantry unit must be substantially similar to either an Infantry Platoon Battle Course (IPBC) or MPRC-L, and of sufficient acreage to accommodate the SDZs for use of the specified munitions, as required by DA PAM 385-64, *Ammunition and Explosive Safety Standards*. This would require a minimum of 1,136 acres (460 hectares). The range must be configured in a manner that would support a CALFEX and smaller unit live-fire exercises described in Sections 2.5.1 through 2.5.3, as well as the additional training activities set forth in Section 2.5.4. In addition, a range would need to have an existing impact area sufficient to support the live-fire munitions contemplated for use at MMR. A range would need to be configured (e.g., course and targets) in a manner that would lend itself to achieving the offensive and defensive objectives for a company-level CALFEX and convoy LFX.

The Army has not yet finalized a standard design for convoy live-fire ranges.

- **Quality of Life.** A reasonable alternative should ensure that Soldiers are not separated from their families for unreasonable periods of time. Quality of life for Soldiers and their families is critical to retaining experienced Soldiers. This is especially so when world events require many Soldiers to deploy overseas for over a year at a time. The Army is transforming and a major goal of the Army Campaign Plan is to improve unit and family stability, to reduce the stress of deployment, to minimize personnel turbulence,

and to provide deeper roots in the community and opportunities for Soldiers to spend longer periods at the same installation.

- **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. This means that sufficient ranges must be available within a geographic distance that allows each unit to deploy its Soldiers logistically and equipment to and from range locations to complete essential live-fire tasks within established timeframes. Construction of a range complex necessary to support live-fire tasks for the combat readiness of home-stationed units would not be reasonable in the absence of Congressional appropriations, Headquarters Department of the Army approval, and a plan for the expeditious design and construction. Any construction should avoid or minimize to the greatest extent practicable disturbing sensitive natural and cultural resources. 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. 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.

To be carried forward for full evaluation, an alternative must meet all four screening criteria. The Army applied those criteria to the following ten alternatives to identify a range of reasonable alternatives to accomplish the Proposed Action:

- (1) MMR Reduced Capacity Use, with Some Weapons Restrictions;
- (2) MMR Full Capacity Use, with Some Weapons Restrictions;
- (3) MMR Full Capacity Use, with Fewer Restrictions;
- (4) Conduct CALFEXs at the Twin Pu‘u Location of PTA on the Island of Hawai‘i;
- (5) Conduct CALFEXs at Seven Potential Locations of PTA;
- (6) Conduct Training at a Replacement Training Facility at Another Army Installation on O‘ahu.;
- (7) Conduct Training at a Site in the Continental United States;
- (8) Conduct Training at a Site Outside of the United States; and
- (9) Acquire Property on O‘ahu and Conduct Training at a New Training Facility.

(10) Move Stationary Ranges to MMR and Conduct CALFEXs and Convoy Live Fire at SBMR.

After conducting its evaluation, the Army determined that the first four alternatives satisfied the need criteria; these alternatives are evaluated in the EIS and are described in Section 2.4.6. The Army determined that the other six alternatives did not satisfy the need criteria and eliminated them from further review in this EIS. Table 2-7 and the remaining subsections provide a discussion of the analysis of those six alternatives considered but eliminated from further consideration. As noted, in addition to four live-fire action alternatives, the Army considered options for conducting live-fire training at other Army installation locations other than MMR or PTA:

- O‘ahu other than MMR;
- The CONUS; and
- An installation outside the US.

Additional information on the available training areas at USAG-HI’s installations is presented in Appendix C.

Table 2-7
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.

2.5.1 Seven Potential Range Locations on PTA

The Army received several public comments in response to the original Draft EIS that a more thorough analysis of alternatives at PTA was

needed. In response to this feedback, the Army decided to conduct a full operational analysis of PTA to determine if there were reasonable alternatives that could be considered as a replacement for the CALFEX capability of MMR in the EIS. This analysis was based on key operational, time, economic, and legal criteria. This section explains the additional PTA locations that were analyzed, but eliminated from consideration due to operational restrictions. The analysis was focused solely on CALFEX capabilities as convoy live fire would be performed at existing facilities at PTA along the Redleg Trail on the East side of the installation. Ultimately, the Army could use the USMC convoy live fire proposed for PTA. This decision assumes that the USMC range is not available.

Key stakeholders from the Army, Marine Corps and USACE coordinated to determine all potential locations on PTA where an MMR replacement range could be located. Eight locations were identified as potentially feasible for a future range with CALFEX capabilities. The initial considerations were based largely on the ability to place the range, as well as design and size criteria discussed below. Figures 2-6 and 2-7 show the location of the eight alternatives considered in this analysis. There were other smaller ranges located on PTA (i.e. Ranges 10 and 14) that were considered, but excluded from analysis because they did not meet the operational capacity requirements.

Initial Pōhakuloa Training Area Screening Analysis

Range Design. The existing MMR range was designed as a CCAAC in the 1980s. The alternative PTA ranges analyzed were of similar size and functionality to that at MMR in order to ensure comparison of like capabilities. These alternatives utilized current Army and/or Marine Corps range design standards with possible minor modifications (i.e., target additions, minor maneuver lane variations, etc.) to meet current CALFEX requirements (Table 2-8). Larger ranges, such as the MPRC range were also considered as equivalent even though their maneuver area may be larger than that of MMR.

Range Size. The total MMR acreage used for CALFEXs is 1,136 acres (460 hectares), including SDZs. The SDZs are reduced in size due to the large mountain range that surrounds the range and serves as an effective backstop. Comparison of the PTA range alternatives was based solely on the size of the maneuver area. The MMR maneuver area is 812 acres (329 hectares). A standard IPBC and USMC Live Fire and Maneuver (LFAM) both have approximately 988 acres (400 hectares) of maneuver area, thus can be considered equivalent in terms of size. Scout Reconnaissance ranges only 289 acres (117 hectares) and thus are not equivalent to the area of MMR.

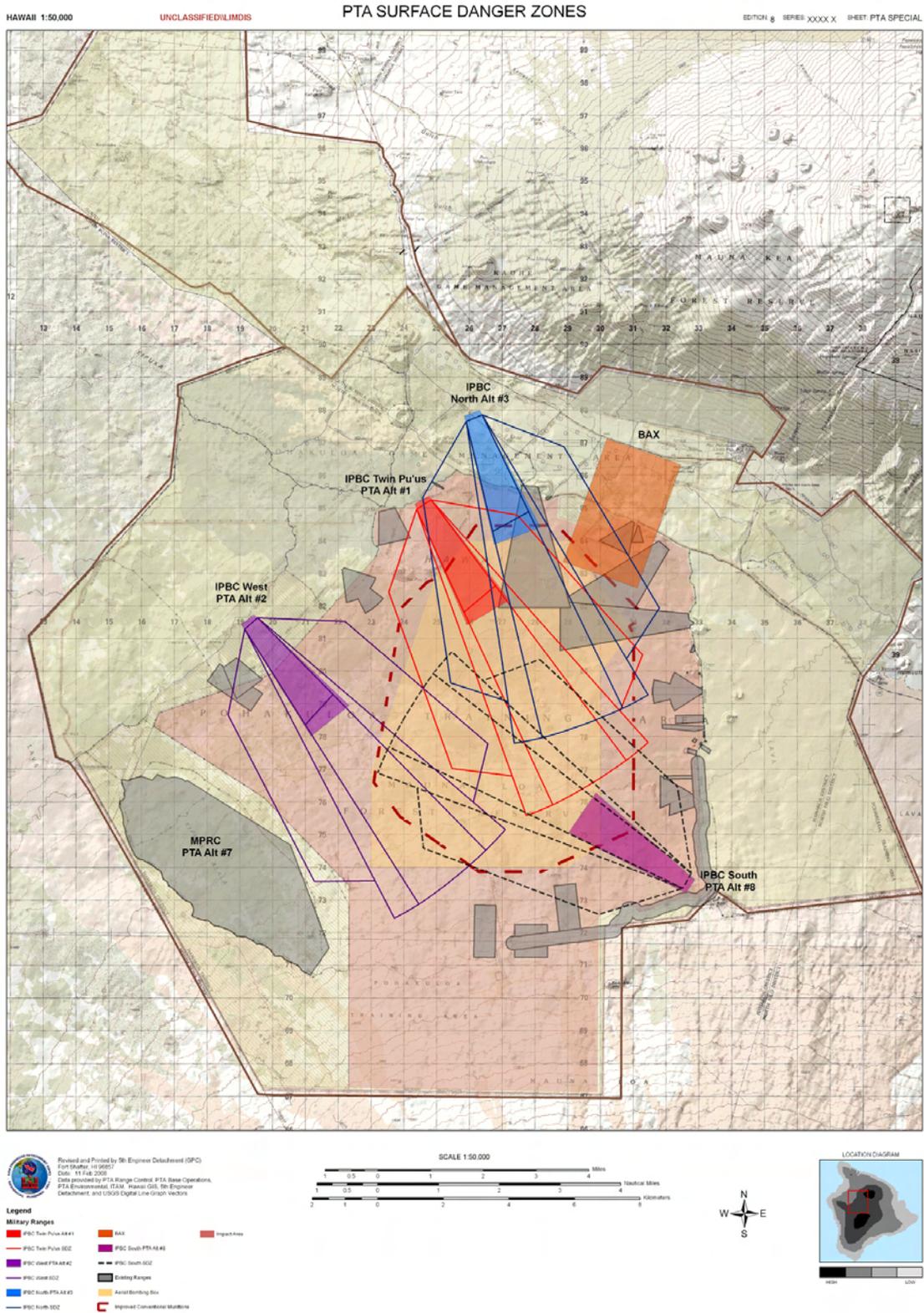


Figure 2-7. Surface Danger Zones, PTA

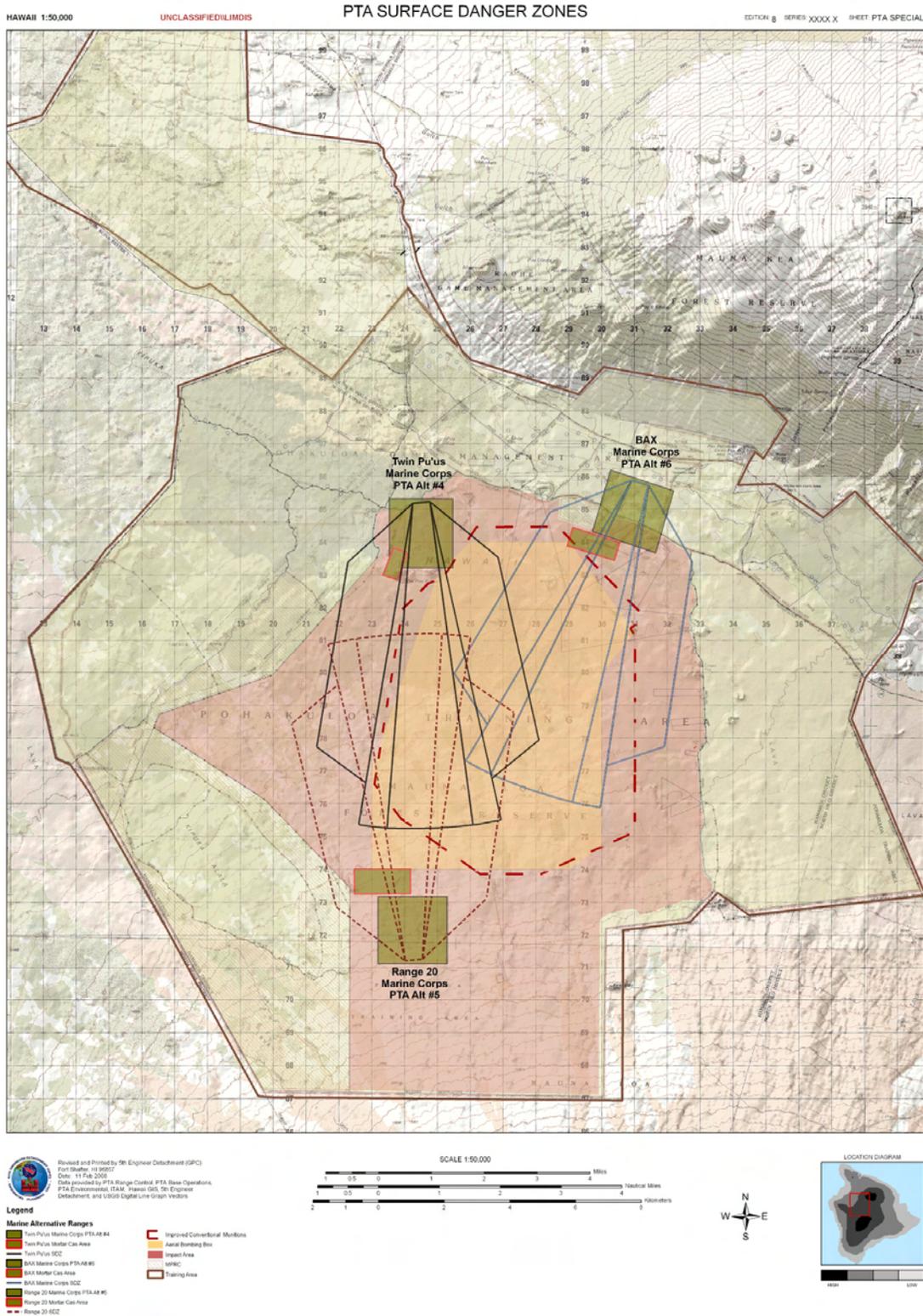


Figure 2-8. Surface Danger Zones, PTA

**Table 2-8
Summary of Standard Range Design Area Requirements**

Range Type	Maneuver Area Requirements				Meets Min. Mākua Size Requirements
	Std Range Length (meters)	Std Range Width (meters)	Std Range Area (meters ²)	Std Range Area (acres)	
Mākua (CCACC)	2,000 (avg)	1,643	3,286,000	812	NA
Std BAX	4,000	2,400	9,600,000	2,372	Yes
Std MPRC	4,500	1,000	4,500,000	1,112	Yes
Std IPBC	4,000	1,000 (avg)	4,000,000	988	Yes
Std ISBC	1,000	750 (avg)	750,000	185	No
Std Scout Recce	1,800	650	1,170,000	289	No
Std USMC LFAM	2,000	2,000	4,000,000	988	Yes

Operational Analysis of Pōhakuloa Training Area Alternatives

Based on the criteria used, the CALFEX/Twin Pu‘u location (PTA Alternative 1) was found to be the only operationally feasible PTA alternative for consideration as a replacement range for the MMR. Although there are very challenging issues to overcome with respect to construction and operation of a range at this location, the Twin Pu‘us location has the least significant operational challenges.

The remaining seven alternatives had at least one significant operational limitation. The IPBC/North (PTA Alternative 3), and Marine Corps LFAM (PTA Alternative 6) alternatives were eliminated due to SDZs that would overlap the BAX. This would lead to critical throughput issues that could not be readily mitigated. The IPBC/Southeast (PTA Alternative 8) also had critical SDZ limitations since its boundaries would be located in the impact area of a convoy live-fire range proposed to be constructed along Redleg Trail. The Range 20 Marine Corps alternative (PTA Alternative 5) was eliminated due to terrain considerations. This location is in an area of extremely rocky/unvegetated ‘a‘ā lava flows in the area would be unsuitable for dismounted maneuver due to safety concerns.

The economic considerations are relatively consistent for each of the alternatives. All sites, with the exception of the MPRC, would require some level of UXO clearance as their footprint crosses into the existing impact area. All sites would also require a significant and similar level of infrastructure improvement to support a new range. PTA Alternatives #2 and #3 would both require the establishment of a new duded impact area. Although establishing new impact area can be done, there are many approvals necessary and expanding duded impact areas does not

maximize use of the installation range complex for future range requirements. The MPRC range (PTA Alternative 7) was eliminated due to various settlement agreements into which the Army has entered. A detailed explanation of the MPRC requirements is provided in Chapter 5, Cumulative Projects and Impacts.

Table 2-9 contains a complete summary of the operational analysis.

Alternatives eliminated due to operational limitations:

- PTA Alternatives 3, 6, and 8 – SDZ restrictions
- PTA Alternative 4 – Range design restrictions
- PTA Alternative 5 – Terrain suitability
- PTA Alternatives 2 and 3 – Requirement for new impact areas
- PTA Alternative 7 – Legal requirements

Alternative remaining: IPBC/Twin Pu‘u (PTA Alternative #1)

The PTA BAX as currently configured was not considered as a reasonable alternative to include in this analysis due to schedule usage and throughput issues. The PTA BAX would be capable of conducting modified company CALFEX training with extensive ground softening work to accommodate Soldiers maneuvering on foot. However, because of throughput shortfalls and schedule conflicts, the Army analyzed possible sites at PTA that could be devoted solely to CALFEXs. Convoy LFXs are already being conducted at PTA. The USMC has proposed to build a convoy live fire training facility at PTA as well. The Army would be able to use this range if it were to be built.

2.5.2 Conduct Training at a Replacement Training Facility at Another Army Installation on O‘ahu

The significant limiting factor for this alternative is the lack of suitable maneuver training acreage. The following paragraphs provide information about the suitability of each of the Army’s training land holdings on O‘ahu as a location for a replacement training facility. Information on the available training areas at these installations is presented in Appendix C.

Tripler Army Medical Center, Helemanō Military Reservation, Āliamanu Military Reservation, Fort Shafter, and Fort DeRussy are excluded from this consideration, as they are small, they are located in heavily urbanized areas, and they are fully occupied by buildings. WAAF is likewise excluded because it is built up, and the only available maneuver terrain is too small and far too steep and forested to be suitable.

**Table 2-9
Summary of Operational Feasibility Analysis**

Operational Impact Criteria	IPBC / Twin Pu'us / PTA Alt #1	IPBC / West PTA Alt #2	IPBC / North PTA Alt #3	Twin Pu'us Marine Corps PTA Alt #4	Range 20 Marine Corps PTA Alt #5	BAX Marine Corps PTA Alt #6	MPRC PTA Alt #7	IPBC / Southeast PTA Alt #8
Can the Army standard design in TC 25-8 for this range be accommodated under this alternative within allowable waivers or modifications?	○	○	○	⊗	○	○	○	○
Does the site provide the equivalent size and capability of Makua Company Combined Arms Assault Course (CCAAC)?	○	○	○	○	○	○	○	○
Can the Surface Danger Zone (SDZ) for this range be accommodated without infringing on adjacent training facilities or ranges?	⊖	○	⊗	○	○	⊗	○	⊗
Is the terrain suitable for dismounted infantry maneuver?	⊖	⊖	⊖	⊖	⊗	⊖	⊖	⊖
Has the range been sited to maximize use of the installation range complex for future requirements by leaving the maximum amount of suitable contiguous land mass available for future needs?	○	⊖	⊖	○	○	○	○	○
Is the terrain susceptible to wildfires which could cause lengthy shutdowns?	⊖	⊖	⊖	⊖	○	○	⊖	○
Does this alternative require either electrical power lines or fiber optic cable in excess of 10,000 feet, or for water lines to be constructed?	○	○	○	○	○	○	○	○
Does this alternative encroach into the ICM?	⊖	○	⊖	⊖	⊖	⊖	○	⊖
Does this alternative require a new duded impact area to be established?	○	⊗	⊗	○	○	○	○	○
Does this alternative minimize construction costs for the range? ¹	⊖	⊖	⊖	⊖	⊖	⊖	○	⊖
Would the use of this location have significant impacts at other locations due to legal, settlement, or formal agreements that the Army has entered into?	○	○	○	○	○	○	⊗	○
Summary of Alternative Feasibility	⊖	⊗	⊗	⊗	⊗	⊗	⊗	⊗

LEGEND:

- ⊗ = Not Feasible – Unacceptable limitations
- ⊖ = Feasible – Moderate limitations and challenges
- ⊙ = Feasible – Minor limitations and challenges
- = Feasible – No limitations or challenges

¹ For this criterion, construction cost does not consider the potential cost that may arise for mitigating potential environmental impacts. It represents only the relative cost of construction for each particular location.

Constructing a replacement training range at one of the O‘ahu installations does not meet the adequate acreage requirement for an existing training area of at least 1,136 acres (460 hectares) that would support a company-level CALFEX. Also, other Army properties on O‘ahu do not have an ordnance impact area, do not have suitable land areas for creating an ordnance impact area, and do not currently support live-fire training. Therefore, this option does not meet screening criterion 2.

Dillingham Military Reservation

This installation has 451 acres (182 hectares) of usable maneuver land and no ordnance impact area or ranges. Dillingham Airfield does not provide sufficient acreage to construct a replacement facility that would meet mission requirements. This site does not meet screening criteria 1 and 2.

Kahuku Training Area

There are 4,569 acres (1,849 hectares) of usable maneuver land on the Kahuku Training Area. However, usable land potentially available for a replacement facility at Kahuku Training Area is not contiguous, and the terrain is too steep in most locations. The only level terrain is used as an aircraft landing/pickup zone and is still not large enough for a replacement facility. Also, there are no ranges or ordnance impact areas at Kahuku Training Area. This site does not meet screening criteria 1 and 2.

Kawailoa Training Area

Of the total 18,038-acre (7,300-hectare) area at Kawailoa, only 5,310 noncontiguous acres (2,149 hectares) are considered suitable for maneuvers; there are no ranges or ordnance impact areas. Almost none of the land is topographically suitable for live-fire maneuver training of the type conducted at MMR. Rough terrain and the lack of a range and ordnance impact areas at Kawailoa Training Area make it unsuitable as a site for a replacement facility. This site does not meet screening criteria 1 and 2.

Schofield Barracks Military Reservation

SBMR is in central O‘ahu and is divided into two main land areas, referred to as the Main Post and Schofield Barracks East Range (SBER) (see Figure 1-1). Principal training areas at the Main Post include the West and South ranges, the ordnance impact area, and the cantonment area. SBMR is the primary range complex in Hawai‘i for individual weapons qualification with limited light maneuver training areas. Training and ordnance impact areas are west of the cantonment area. The wooded eastern slope of the Wai‘anae Mountains in the western portion of the installation is used primarily for tactical infantry maneuver training, including land navigation training. SBMR has approximately 11,448 acres

(4,635 hectares), of which two parcels totaling approximately 1,235 acres (498 hectares) are suitable for maneuver training.

SBER contains 2,223 acres (898 hectares) of usable maneuver land and has no live-fire training facilities or ordnance impact areas. SBER provides training lands for tactical field exercises by other Army and Marine Corps units. The western maneuver area on SBER is composed of about 2,223 acres (900 hectares). This area is valuable for rappelling, jungle survival, and patrolling operations. Several open areas are used for air assault and airborne operations. Unit uses include limited battalion and company-level Army Training and Evaluation Program (ARTEP) missions. Climate, terrain, and vegetation provide training conditions similar to areas of potential conflict in the Pacific and Pacific Rim. The eastern portion of SBER has extremely rugged terrain and is densely forested. No live-fire exercises are conducted on SBER; all exercises are limited to pyrotechnics and blank ammunition. The Army has established a 1,000-foot (305-meter) noise buffer zone between the boundaries of the range and the adjacent Wahiawā residential areas. The use of small arms blank ammunition is not authorized in SBER training areas 1A, 1B, 2, 3A, and 3B between the restricted hours of 6:00 PM and 6:00 AM. The use of pyrotechnics and explosion simulators is also prohibited in those training areas.

The SBMR ordnance impact area has been developed with adjacent range complexes along two perpendicular lines to form an L. Ranges have been built as close together as possible due to limited space and could not be built facing each other due to ballistic safety issues. While CALFEXs have been conducted at SBMR in the past, they were limited in scope and required using several contiguous ranges, thereby displacing the training activities that regularly occur on those ranges.

The SBCT range modifications at SBMR would require constructing various training and support facilities, acquiring additional land for a motor pool, using small arms fire, and changing training activities. A BAX will be constructed at SBMR for company gunnery and training, and qualification requirements of the weapons systems included as part of the SBCT. This would close and consolidate several ranges. 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. The primary use of the BAX would be for SBCT mounted training exercises using the Stryker vehicle. 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. Moreover, because of the range

configuration and impact area, operating the BAX to support Stryker mounted training would require temporarily closing adjacent SBMR ranges, including Qualification Training Range (QTR) 1 and the other primary dismounted maneuver live-fire range, the Infantry Battle Area KR5. Conversely, when other adjacent ranges are in use, the BAX cannot be used because the SDZs of the adjacent ranges overlap onto the BAX. For these reasons, the modified SBMR ranges would not have sufficient capacity (i.e., available training days) to accommodate most of USAG-HI's dismounted CALFEX training. The Army reached the same conclusion in its report to Congress. For these reasons, use of SBMR would not meet screening criterion 1, as it could not accommodate all unit training requirements while supporting modified CALFEXs. In addition, given the overlapping SDZs and range configuration, SBMR would not meet screening criterion 2.

The Army also considered the option of constructing a replacement training range at SBMR, but this has been eliminated from detailed evaluation because it does not meet the purpose and need requirement for an existing training area of at least 1,136 acres (460 hectares) that supports company-level CALFEXs. The absence of an existing training facility does not satisfy the Army's immediate training needs. Also, the maneuver training area of 1,235 acres (498 hectares) is composed of two noncontiguous parcels that would not satisfy the 1,136-acre (460-hectare) training area requirement. Alternatively, when the BAX at SBMR is constructed, the amount of available training area would be further reduced. Because there is no existing training range, the Army would have to construct one to standard, requiring undue delay and cost, which would not meet screening criterion 4, while also generating substantial adverse environmental impacts.

Another option is to conduct live-fire training, in particular company-level CALFEXs and convoy LFXs, at MMR until a replacement facility could be constructed at SBMR. Use of a new replacement facility, such as one that could be constructed on the site for the BAX, would require temporarily closing adjacent SBMR ranges. For this reason, this option does not meet screening criterion 1. Construction of this new range also would require undue delay and cost, which would not meet screening criterion 4.

2.5.3 Conduct Training at a Site in the Continental United States

Under this alternative, training previously conducted at MMR would instead be conducted at installations in CONUS.

The closest CONUS installation with the required facilities is Yakima Training Center (YTC) in eastern Washington; other available facilities are at National Training Center (NTC) Fort Irwin, California, and Joint Readiness Training Center (JRTC) Fort Polk, Louisiana (Table 2-10). While unit rotations at these combat training centers (CTCs) provide a limited venue for conducting company-level CALFEXs, they have significant demand for use by units other than the 25th ID. This alternative does not satisfy the purpose and need because it would not provide company-level CALFEX training close to the home-station at SBMR. In addition, the time of travel would require significant separation of Soldiers from their families and would adversely impact morale and quality of life; therefore, this option does not meet screening criterion 3. Units would also be responsible for transporting Soldiers and equipment across long distances, which would deplete their training resources and would impede their ability to meet sequential unit training requirements; therefore, this option does not meet screening criterion 4.

Yakima Training Center

This training center has a multipurpose range complex that can support CALFEXs, as well as battalion and brigade maneuver training.

The availability of range facilities at Yakima for 25th ID CALFEXs over the long term cannot be guaranteed. Yakima Training Center is a primary mobilization station for Army Reserve and National Guard units in the Pacific Northwest and supports the training and development of two SBCTs as part of the Army's transformation. The two enhanced separate brigades of the Washington Army National Guard and Oregon Army National Guard also use Yakima Training Center for live-fire training and maneuvers. Facilities at Yakima Training Center were built to support units assigned to the region and may not be available to accommodate the additional training demands of the 25th ID. The YTC could not provide sufficient range capacity to meet the units' sequential training events requirements; therefore, this option does not meet screening criterion 1.

USAG-HI staff estimates that preparation prior to and after each deployment would take five days total. Flight times are estimated at six hours each way. Assuming that maneuver training is to be conducted four times per year, approximately 40 training days would be lost during deployments. In addition to the loss of training days, transporting troops and equipment would incur significant cost and would result in additional separation from family; therefore, this option does not meet screening criteria 3 and 4.

Table 2-10
CONUS Army Installations Considered

Installation, State	Total Area (acres [hectares])	Current Mission
Yakima Training Center, Washington	316,786 (128,253)	Providing maneuver and live-fire training in support of Fort Lewis and other military units.
National Training Center at Fort Irwin, California	636,251 (257,591)	Providing tough, realistic, combined arms and services joint training for brigades and regiments in a mid- to high-intensity environment, while retaining the training feedback and analysis focus at the battalion/task force level.
Joint Readiness Training Center at Fort Polk, Louisiana	198,759 (80,469)	Training infantry brigade task forces and their subordinate elements. The training center focuses on improving unit readiness by providing highly realistic, stressful, joint and combined arms training across the full spectrum of conflict.

USAG-HI staff estimates that preparation prior to and after each deployment would take five days total. Flight times are estimated at six hours each way. Assuming that maneuver training is to be conducted four times per year, approximately 40 training days would be lost during deployments. In addition to the loss of training days, transporting troops and equipment would incur significant cost and would result in additional separation from family; therefore, this option does not meet screening criteria 3 and 4.

National Training Center Fort Irwin and Joint Readiness Training Center Fort Polk

Just as infantry company commanders are required to conduct an annual company-level CALFEX, infantry battalion commanders are required to conduct a battalion-level rotation at either the NTC or JRTC once during their command (approximately 18 months). Typically, rotations to these training centers are brigade-sized (three battalions, or the equivalent of nine companies).

The NTC and JRTC make up two of the Army's three CTCs, whose mission is to provide tough, realistic, combined arms and services joint training for brigades and regiments in a mid- to high-intensity environment. Training feedback and analysis is focused at the battalion

task force level. This is primarily accomplished by testing the capabilities of an infantry brigade combat team in force-on-force nonlive-fire maneuver engagements. In addition to this primary training mission, secondary training objectives can also be accomplished, including company-level CALFEXs.

While unit rotations at CTCs have provided a limited venue for conducting company-level CALFEXs, the 25th ID would have to compete for range use with several other major units throughout the Army. There would not be sufficient time annually to meet the CALFEX needs of the 25th ID units stationed on O‘ahu. These CTCs cannot provide sufficient range capacity to meet all unit live-fire training requirements; therefore, this option does not meet screening criterion 1. In addition, similar to the foregoing CONUS sites, the requirement to transport Soldiers and equipment would separate them from their families and would result in substantial costs, while disrupting the sequential unit training cycle; therefore, this option does not meet screening criteria 3 and 4.

2.5.4 Conduct Training at a Site Outside the United States

Under this alternative, training previously conducted at MMR would instead be conducted at installations outside the United States, such as Thailand and Korea.

Conducting CALFEXs at one of these ranges would necessitate additional movement of personnel and equipment and increased costs for service and support. The substantial travel time for the 25th ID from SBMR to an overseas site would reduce the availability of companies and other units for other routine training activities. The longer travel time could warrant the movement of larger units, resulting in substantially longer periods of deployment and decreased readiness for wartime operations. The longer periods of deployment would also have adverse effects on Soldier morale.

This alternative has been eliminated from detailed evaluation because it does not meet the purpose and need. It would not provide company-level CALFEX training in an area close to SBMR. It also would result in unacceptable hardship to Soldier and family quality of life; therefore, this option does not meet screening criterion 3. Moreover, the time and cost associated with transport of units and equipment would be excessive and would disrupt the ability of each unit to accomplish sequential training requirements; therefore, this option does not meet screening criterion 4.

2.5.5 Acquire Property on O‘ahu and Conduct Training at a New Training Facility

This alternative has been eliminated from detailed evaluation because it does not meet the purpose and need, which is to provide military training

at an existing training area of at least 1,136 acres (460 hectares) that is in close proximity to SBMR. The option of constructing a replacement training range on O‘ahu does not satisfy the Army’s immediate training needs. Acquisition of new property on O‘ahu would require establishing a new duded impact area, which is both procedurally difficult and lengthy and would result in environmental impacts. The acreage requirement for a new facility is 1,136 acres (460 hectares), plus additional acreage for SDZs and buffer areas. Because MMR’s unique topography reduces the size of required SDZs, a replacement range may have to be substantially larger than MMR. Also, acquiring new property on O‘ahu with sufficient acreage to support an ordnance impact area, maneuver area, and SDZs and using that property for live-fire training would present prohibitive public concerns, such as noise, safety, and land acquisition. As a result, this alternative would not meet screening criteria 1, 2, and 4 because it would not provide near-term range capacity, would not result in feasible range design, and would not be accomplished within reasonable time and cost parameters.

Another option is to conduct live-fire training, in particular company-level CALFEXs and convoy LFXs, at MMR until a replacement facility could be constructed on O‘ahu. While this option would satisfy the Army’s immediate training needs, it has been eliminated for the reasons described above.

2.5.6 Move Stationary Ranges to Mākua Military Reservation and Conduct Combined-Arms Live-Fire Exercises and Convoy Live-Fire Exercises at Schofield Barracks Military Reservation

Under this alternative, qualification ranges would be moved from SBMR to MMR. The maneuver live-fire training proposed for MMR would be conducted at SBR. This alternative would require an enormous expense to reconstruct ranges at MMR. This alternative would present additional traffic, noise and safety impacts along Farrington Highway because units would go to MMR for very brief training events rather than the week-long CALFEXs proposed. Finally, the limited space at MMR would not allow all stationary ranges to be relocated there. Throughput problems at SBMR would persist and live-fire maneuver training would require closing down other essential ranges. For these reasons, this alternative is unreasonable and was not evaluated further.