

## 4.11 HAZARDOUS MATERIALS AND WASTE

This section identifies potential hazardous material and waste impacts that may result from implementing the project alternatives. The impact analysis compares projected conditions to the affected environment and ROI described in Section 3.11. This section also addresses the following issues of concern identified by the public during the EIS scoping process:

- Types, use, and storage of ammunition;
- The impacts of UXO; and
- Potential contamination by various hazardous chemicals and materials (such as lead, pesticides, and PCBs).

### 4.11.1 Impact Methodology

Numerous federal, state, and local laws regulate the storage, use, recycling, disposal, and transportation of hazardous materials and waste. The primary goal of these laws is to protect human health and the environment.

The methods for assessing potential hazardous material and waste impacts generally include the following:

- Reviewing and evaluating each of the alternatives to identify the action's potential to use hazardous or toxic substances or to generate hazardous waste, based on the activities proposed;
- Comparing the location of proposed training activities with baseline data on known or potentially contaminated areas (i.e., potentially UXO-contaminated land);
- Assessing the compliance of each alternative with applicable site-specific hazardous material and waste management plans;
- Assessing the compliance of each alternative with applicable site-specific SOPs and health and safety plans in order to avoid potential hazards; and
- Using professional judgment to determine if any additional known or suspected potential hazardous material and waste impacts or concerns relate to each alternative. This determination is based on the current status of the range, since it is the guidance of the Army's restoration program that remedial activities be conducted only on closed ranges or those in the process of being closed and not on active or inactive ranges.

The overall methodology, including data sources and assumptions, used to conduct the hazardous materials and waste impact evaluation is consistent with the Army Manual for Installation Operations and Training (US Army 1998). This manual describes the various types of materials and waste that should be considered when assessing the potential impacts of the project alternatives.

#### **4.11.2 Factors Considered for Determining Significance of Impacts**

Regulatory standards and guidelines have been applied to determine the significance of each alternative's potential impact related to hazardous materials and waste. Factors considered in determining whether an alternative would have a significant safety hazard or hazardous material and waste impact include the extent or degree to which its implementation would result in the following:

- Cause a spill or release of a hazardous substance, as defined by 40 CFR Part 302 (CERCLA), or Parts 110, 112, 116, and 117 (CWA);
- Expose the environment or public to any hazardous substance through release or disposal (i.e., open burn/open detonation disposal of unused ordnance);
- Generate either hazardous waste or acutely hazardous waste, resulting in increased regulatory requirements over the long term or violating the standards established for the conditionally exempt small quantity generators and small quantity generators;
- Endanger the public or environment during the storage, transport, or use of ammunition;
- Expose military personnel or the public to areas potentially containing UXO;
- Increase the risk of accident or release from existing or proposed vehicles, equipment, procedures, or training practices;
- Contaminate soils, groundwater, or surface water with lead from ammunition (i.e., migration due to vehicle, equipment, and foot traffic on ranges, thereby increasing potential exposure to military personnel and the public);
- Cause a release of pesticides or potentially expose military personnel or the public to pesticides;
- Expose military personnel or the public to PCBs;
- Expose the public to electromagnetic fields with cycle frequencies greater than 300 hertz;
- Cause a spill or release of petroleum-based products; or
- Require the removal or upgrade of an underground storage tank.

### 4.11.3 Summary of Impacts

#### Summary of Potential Hazardous Materials and Waste Impacts

Impact Issues	No Action Alternative	Alternative 1 MMR (Reduced Capacity Use with Some Weapons Restrictions)	Alternative 2 MMR (Full Capacity Use with Some Weapons Restrictions)	Alternative 3 MMR (Full Capacity Use with Fewer Weapons Restrictions)	Alternative 4 PTA (Full Capacity Use with Fewer Weapons Restrictions)
Unexploded ordnance	⊙	⊙	⊙	⊙	⊙
Ammunition	○	⊙	⊙	⊙	⊙
General training	○	⊙	⊙	⊙	⊙
Lead from ammunition	○	⊙	⊙	⊙	⊗
Pesticides	○	⊙	⊙	⊙	⊙
Hazardous waste management	○	⊙	⊙	⊙	⊙
Polychlorinated biphenyls	○	○	○	○	○
Electromagnetic fields	○	○	○	○	○
Petroleum, oils, and lubricants	⊙	○	○	○	⊙
Depleted Uranium	○	○	○	○	⊙

**LEGEND:**

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

The proposed project includes both nonlive-fire training and routine company-level CALFEXs conducted by the 25th ID and other military units. SOPs would be updated for new training methods and weapon systems to ensure safe handling and compliance with Army and regulatory procedures. Summarized below are the potential hazardous materials and waste impacts that have been identified. No new ordnance impact areas are being introduced to this installation. There are no significant impacts identified from hazardous materials and waste.

The PRGs referred to in the impact analysis are contaminant concentration levels established by EPA Region IX to evaluate contaminated sites that are on the National Priorities List or that are declared remedial sites under

CERCLA or RCRA. They are used for screening and initial site cleanup. PRGs are not legally enforceable standards but instead provide long-term targets to be used to analyze different remediation techniques and alternatives. Because neither MMR nor PTA is on the National Priorities List, declared closed, or a designated CERCLA or RCRA cleanup site, the use of industrial soil PRGs and drinking water PRGs in this EIS is for comparison purposes only. Further explanation of PRG applications in this evaluation is provided in Section 3.11.1.

### ***No Action Alternative***

Under No Action, MMR would be closed to military training. Army maintenance and stewardship programs would continue at a minimal level, if at all. The ICM areas are expected to remain off limits to Army personnel and the public, and security fencing would be inspected and maintained to prevent unauthorized access.

### ***Less Than Significant Impacts***

*Unexploded ordnance.* No new UXO would be introduced to the training area because there would be no live-fire training. Due to historic live-fire training at MMR, UXO is buried throughout the installation and could be unearthed by natural processes. As explained in Section 3.11, if UXO were discovered, EOD specialists would destroy all identified UXO where it is found, whether it is a result of the training just completed or from prior use of MMR. This is the current practice. UXO is a serious safety risk if encountered by members of the public or Army personnel. This is expected to be a less than significant impact because any members of the public accessing the installation would have authorized military escorts. All military escorts and security personnel would be trained to identify and avoid UXO.

*Petroleum, oils, and lubricants.* Past soil analysis confirmed that levels of VOCs, solvents, and constituents of petroleum products did not exceed the EPA's conservative public health criteria. No Action would pose less than significant impacts due to the storage of POLs, associated with ongoing range maintenance activities.

### ***No Impacts***

*Ammunition.* Under No Action, there would be no ammunition impacts because there would be no training at MMR.

*General training.* Under No Action, there would be no general training impacts because no training would take place.

*Lead from ammunition.* Lead was identified in soil samples collected during the current hydrogeologic sampling, at the Elk Objective area. Out

of all the samples taken, only one lead concentration was detected exceeding industrial PRGs, and it was detected in an isolated location. While no additional lead from ammunition would be deposited, soils contaminated with lead from previous training could be redistributed by natural processes. Because there would be no activities that could expose people to lead, there would be no impacts under No Action.

Pesticides. While the current hydrogeologic investigations have shown that pesticides are present in Mākua Valley, they were detected in areas with no direct exposure pathway to Army personnel, the public, or the off-site environment. Furthermore, there has been no indication of pesticide migration to areas with direct exposure potential. No Action assumes that herbicides would not be applied along the firebreak roads and that alien weeds and building pests would not be controlled at MMR; therefore, there would be no impacts from pesticides.

Hazardous waste management. Because no hazardous waste would be generated under this alternative, there would be no impacts.

Polychlorinated biphenyls. PCBs were detected in soil samples taken from the OB/OD area and from a remote location with no public access, but the PCB concentration at the OB/OD area was below the PRG. Because no activities under this alternative would result in additional PCB contamination or result in human exposure to contamination, there would be no impact.

Electromagnetic fields. Current sources of EMFs include the RAWS located at MMR. No Action assumes that the Army would no longer maintain the RAWS. Under this alternative, there would be no impact on Army personnel or the public from exposure to EMFs.

Depleted Uranium. Due to vegetative growth and explosive hazards, a 2007 Army survey and an aerial visual observation were unable to determine whether DU is present at MMR. Soil samples were collected in areas where sediment had deposited from past runoff/erosion events. Ten soil samples were collected around the perimeter of the MMR during the scoping survey. All of the samples were analyzed for isotopic uranium by alpha spectrometry. All of the results are consistent with naturally occurring concentrations of uranium. None of the results indicate uranium depletion (Cabrera Services 2008).

A characterization survey for DU at MMR is expected to be completed in late 2008. If DU is found to be present, a decision on how to address the issue will be made.

**Alternative 1 (Reduced Capacity Use with Some Weapons Restrictions)****Less Than Significant Impacts**

Unexploded ordnance. Potential impacts from UXO under Alternative 1 would be similar to those under No Action. However, Alternative 1 would involve 19 to 28 company-level CALFEXs, which could elevate the threat of new UXO to MMR.

The only weapons used at the site that can produce UXO are grenades, mortars, artillery, rockets, and missiles; all other ammunition is either inert or is incapable of producing UXO. Of the newly introduced weapons, the 120mm mortar, the 155mm howitzer, and the Javelin missile could produce UXO.

EOD specialists would continue to destroy all identified UXO in order to minimize safety hazards and the impact on the environment, as discussed under No Action. As discussed in Section 3.11, Unexploded Ordnance, following training, a group of 30 to 40 people, including EOD specialists and Soldiers, conduct two surface sweeps of the ordnance impact area to identify UXO (Husemann 2003d). EOD specialists destroy all identified UXO where it is found, whether it is a result of the training just completed or from prior use of MMR. No known unexploded rounds are left in place at the conclusion of a training exercise. These procedures ensure that training at MMR would not increase the amount of UXO on the site (USARHAW and 25th ID[L] 2001a).

All future potential UXO would be contained within the MMR ordnance impact area, and no new ordnance impact areas would be introduced under Alternative 1. The CALFEX training area is strictly monitored for UXO following training. Because these measures would continue, no significant UXO impacts are expected from live-fire training at MMR under Alternative 1.

Although EOD specialists initially cleared the northern valley of MMR, including a portion of the trail from DMR, UXO has been discovered on the trail in this area. If UXO were suspected or encountered during maneuvers or as foot traffic disturbs the earth, EOD specialists would follow procedures outlined in the Skills Level 2 through 4 Manual and Field Manual 21-16, Unexploded Ordnance Procedures (HQDA 1994), detailing the types of UXO, safety guidelines, and handling procedures, as discussed in Section 3.11. Unit personnel would also be informed about the presence of UXO and would be trained to identify the material, as is the current practice. Because these practices are implied under the current SOPs, the potential exposure is not expected to be significant; however,

the potential exposure of personnel and the public to UXO from continued use of MMR under Alternative 1 is a less than significant impact.

Ammunition. The general use of any kind of ammunition poses a safety risk to Soldiers. However, the Army follows existing SOPs during training to limit safety impacts from ammunition to less than significant. The 120mm mortar, the 155mm howitzer, and the Javelin missile would be the new weapon systems introduced to MMR under Alternative 1. Residual chemical components resulting from the detonation of high explosive weapons are expected to be minimal, as warheads are designed to combust completely on impact.

The 120mm mortar is a high explosive weapon typically used against personnel, bunkers, and light materiel targets. The steel projectile is loaded with explosive TNT. Based on the amount of explosive charges added, the 120mm mortar can be fired from 656 feet (200 meters) to 23,622 feet (7,200 meters) (Federation of American Scientists 1998). Because the 120mm mortar is similar to existing mortar systems, this new weapon is not expected to introduce a new threat to the environment and is not expected to be a significant impact.

When used during training, the high explosive 155mm howitzer would replace the high explosive 105mm howitzer currently used at MMR. Like the 105mm howitzer, this new weapon system is a self-mobilized combat support weapon, and there are no tracks on the firing unit that could degrade the land surface. It allows 360 degree firing capabilities. The 155mm howitzer system has a projectile range of up to 72,178 feet (22,000 meters). The system also includes a .50-caliber machine gun as a secondary weapon (Federation of American Scientists 2000c). The firing points used for the 105mm howitzer also would be used for the 155mm howitzer, and the same number of rounds would be fired. Because this munition would be used interchangeably with an existing munition with similar composition, capabilities, and handling, this change is not expected to introduce new impacts to the environment.

Ammunition handling and methods of use would not change. The Stryker, which would be used at MMR under Alternative 1, would fire MK 19 (40mm), 7.62mm, and .50-caliber machine guns from the roads into the CCAAC and the ordnance impact area. The Stryker also would fire 120mm mortars into the ordnance impact area. The SOPs for using these munitions would be updated to incorporate the Stryker as the firing point.

Demolitions training, which includes shape and cratering charges, would also be used under this alternative. This type of training has occurred in the past at MMR near Objective Deer but was discontinued in 1998 due to

potential impacts on cultural sites. As described in Chapter 2, demolitions training uses a shape charge composed of C4 plastic explosive to create a narrow borehole and a cratering charge containing ammonium nitrate to expand that borehole into a wide crater. Ammonium nitrate is a hazardous, unstable chemical with high reactivity and toxic smoke and fumes. Once detonated, ammonium nitrate is similar to other munitions generating nitrogen dioxide, carbon dioxide, water, carbon, and nitrogen. Most of these substances would be burnt off in the explosion. No new substances would be introduced to the environment by demolitions training. SOPs would be updated to ensure that the material is handled and stored according to manufacture specifications in order to minimize this impact. Demolitions training is a localized technique that would not escape the existing ordnance impact area or potentially produce UXO.

As a standard practice when methods or equipment is changed, SOPs are updated to include proper handling and safe storage methods. MMR SOPs would be updated to address the high explosive 120mm mortar system, the high explosive 155mm howitzer, Javelin missiles, demolitions training using shape and cratering charges, and Stryker firing points. SOPs already exist for safe management of weapon systems previously used at MMR. Right and left firing limits as well as projectile limitations would be established for all ordnance. The SOPs would specify safety precautions, such as storage and handling protocol, as well as respirator use and distance and time requirements to avoid residual fumes from the ammonium nitrate in the cratering charges. As these procedural guidelines would be updated in conjunction with these changes, there are no significant hazardous materials or waste-related impacts under Alternative 1. The impact level relating to ammunition under Alternative 1 is expected to be less than significant.

*General training.* Equipment and vehicles used during training activities may expose additional areas to potential leaks or spills to the environment. The Stryker and the UAV would be used in future training efforts at MMR. Up to five Strykers would be used as command and control vehicles and would be restricted to the administrative area and the existing roadways at MMR. Two to three Strykers would be used to fire MK 19 (40mm), 7.62mm, and 50-caliber machine guns from the road into the CCAAC and the ordnance impact area. Strykers also would fire 120mm mortars at the ordnance impact area.

No training would be conducted on Mākua Beach. Equipment and vehicles used in training would present a risk of spills, releases, or accidents involving hazardous materials or wastes during training under Alternative 1. The UAV is the only new aircraft to be used at MMR. The UAV would take off from MMR or be flown in from WAAF before a

CALFEX to obtain pictures for reconnaissance and photo observation. Per SOPs, the Army would undertake the following measures to minimize the potential for spills or other harm to the environment during any on-site operational activities within a specific project area:

- Implement applicable spill response and contingency plans following any release to the environment. This includes reporting spills to the appropriate local, state, and federal government agencies, as required, based on the type and volume of the release;
- Refuel training equipment on relatively flat, paved surfaces when possible;
- Refuel when there is no precipitation. Secondary containment would surround the fueling area to prevent an accidental release from migrating beyond the immediate area. Unless necessary, fueling would not be conducted near navigable bodies of water or storm sewer inlets;
- Maintain training equipment to prevent drips or leaks from hoses or reservoirs containing hazardous materials or substances; and
- Maintain all vehicles and equipment to ensure proper working order prior to training events at MMR.

Based on the measures listed above, there would be no significant impact, and no mitigation would be necessary.

Although ICMs would not be used in live-fire training practices, ICM areas are present near the CCAAC. In this area, no training or maneuvers would be conducted due to a significant safety risk, and no military personnel would be admitted. Because training activities conducted under Alternative 1 would follow existing protocol and SOPs, no significant impacts are expected.

Lead from ammunition. Training activities proposed under Alternative 1 would continue to deposit lead from small arms into firing range berms. Although lead was identified in soil samples collected during the current hydrogeologic investigation at the Elk Objective, only one sample taken from an isolated location contained a lead concentration exceeding industrial PRGs. Taking into account the limited lead findings on the range following years of historic live-fire training, the expected increase in lead deposition under Alternative 1 is expected to be a less than significant impact. As a part of routine training, military personnel could continue to redistribute soils previously contaminated with lead or otherwise be exposed to lead-contaminated soils during ground maneuvers. However, because the exposure risk is relatively low and training cleanup activities

would continue, by following BMPs, the impact would be kept to a less than significant level.

Pesticides. Of the various pesticides available for use on plants and animals, only herbicides, such as Round Up, are currently used on MMR, and they would be used only along the outside edge of the firebreak roads on a monthly to bi-monthly basis, due to UXO concerns. The grass would be cut to control the wildfire fuel loads within the CCAAC.

Pesticides currently used at MMR could accumulate in the environment. As a part of routine training, military personnel could be exposed to pesticide-contaminated soils during ground maneuvers. BMPs, such as routine monitoring, adhering to manufacturer guidelines, and training cleanup, would maintain pesticide impacts at a less than significant level. Activities associated with Alternative 1 would not affect pesticide management on MMR.

While the hydrogeologic investigations have shown that pesticides are present in Mākua Valley, they were detected in areas with no direct exposure pathway to Army personnel, the public, or the off-site environment. Furthermore, there was no indication of pesticide migration to areas with direct exposure potential. There were no pesticides detected in the air monitoring conducted during recent CALFEXs. DDT was detected in one *muliwai* sediment sample at a less than significant level to human health or the environment. Three herbicide compounds were detected at less than significant concentrations in three *muliwai* sediment samples. Under Alternative 1, the Army would include pesticide constituents in the monitoring program to ensure that increased training and increased movement on the range would not accelerate pesticide migration on- or off-site or indirectly expose Army personnel to pesticide contamination.

Hazardous waste management. There would be two new wastes to profile under Alternative 1. As discussed in Section 3.11.4, unused propellant from artillery and mortar training is burned in the on-site burn pan. Propellant from each type of munition is burned separately, and residues from the burning are bagged and stored separately in the HWSSP until analytically profiled and properly disposed of. Like the 105mm high explosive howitzer, the 155mm howitzer would use powder bag charges for weapons firing. This waste would be profiled separately, but there would be no change in the amount of unused propellant burned in the on-site burn pan due to this substituted munition. Incorporating the 120mm mortar system into training at MMR would produce a second new waste to profile through this process. As this munition is similar to existing weapon systems, munitions constituents would be the same, and no new handling

or disposal procedures would need to be adopted. The increased quantity of residue generated under Alternative 1 would be minor, and MMR would continue as a conditionally exempt small quantity hazardous waste generator with conditional exclusions under RCRA. For these reasons, the impact from hazardous waste management under Alternative 1 is expected to be less than significant.

### No Impacts

Polychlorinated biphenyls. PCBs were detected in one soil sample collected in the OB/OD area during the current hydrogeologic sampling, but the concentration was below the PRG. There are no existing PCB sources on MMR and no additional PCB-containing fluids or materials would be introduced under Alternative 1. Training would not create a risk of exposure to PCBs.

Electromagnetic fields. As discussed in Section 3.11.4, sources of EMFs include the existing RAWs and mobile equipment used during training. The Army would continue to manage EMFs. Because no new sources of EMFs would be introduced under Alternative 1, there would be no impact related to Army personnel or public exposure to EMFs.

Petroleum, oils, and lubricants. Under Alternative 1, no change in the usage, storage, or management of POLs would occur. Only necessary quantities of petroleum products would be staged on-site during training events; they would be removed following each event. Products stored on site for management or contractor use would continue to follow existing SOPs. Field investigators have discovered no POL constituents above EPA Region IX PRG levels. There would be no impacts under Alternative 1.

Depleted Uranium. The description for the No Action Alternative is applicable to this alternative. The Army has not confirmed that DU has been used on MMR. No DU containing ammunition would be introduced under this alternative, thus there would be no impact under Alternative 1.

### **Alternative 2 (Full Capacity Use with Some Weapons Restrictions)**

#### Less Than Significant Impacts

Unexploded ordnance. The UXO impacts and handling procedures shown under Alternative 2 are the same as those identified under Alternative 1. Although tracers would be added to the training inventory at MMR under this alternative, these munitions do not produce UXO.

Ammunition. Because the Army would introduce the same weapon systems, vehicles, and demolitions training under this alternative as

described under Alternative 1, the impacts would be similar. The increased use of the range under Alternative 2 is expected to use greater amounts of ammunition than under Alternative 1. In addition, tracer ammunition would be reinstated into the weapons training inventory. The range officer would designate specific firing points for tracers and all ordnance before each training exercise to prevent rounds from escaping the ordnance impact area and firebreak road. With this precaution, the impact of tracer munitions is expected to be less than significant in regards to impacts specific to hazardous materials or waste.

Although not technically a hazardous materials or waste impact, tracer ammunition carries a significant threat of wildfire outbreak due to its ignitable components. Further discussion on the burnout times of tracers and wildfire impacts is presented in Chapter 2 and in Section 4.14.

General training. Training activities and associated impacts are the same as those described under Alternative 1.

Lead from ammunition. Impacts under this alternative are similar to those described under Alternative 1. However, due to the increased number of CALFEXs under this alternative, there would be a greater amount of lead deposition.

Pesticides. Impacts under Alternative 2 are similar to those discussed under Alternative 1. Under Alternative 2, the Army would include pesticide constituents in the monitoring program to ensure that increased training and increased movement on the range would not accelerate pesticide migration on- or off-site.

Hazardous waste management. Hazardous waste management impacts under Alternative 2 are the same as those identified under Alternative 1.

#### No Impacts

Polychlorinated biphenyls. There are no existing PCB sources on MMR, and no additional PCB-containing fluids or materials would be introduced under Alternative 2. The proposed training activities would not generate a risk of exposure. Impacts are the same as identified under Alternative 1.

Electromagnetic fields. No new sources of EMFs would be introduced under Alternative 2. There is no change from Alternative 1. There would be no impact on the public from exposure to EMFs.

Petroleum, oils, and lubricants. Impacts under Alternative 2 are the same as those described under Alternative 1.

Depleted Uranium. The description for the No Action Alternative is applicable to this alternative. The Army has not confirmed that DU has been used on MMR. No DU containing ammunition would be introduced under this alternative, thus there would be no impact under Alternative 2.

***Alternative 3 (Full Capacity Use with Fewer Weapons Restrictions)***

***Less Than Significant Impacts***

Unexploded ordnance. The impacts and handling procedures from UXO under Alternative 3 would be similar to those identified under Alternative 2. Although tracers, inert TOW missiles, and illumination munitions would be added to the training inventory at MMR under this alternative, these munitions do not produce UXO. The 2.75-caliber rockets would also be added to the munitions inventory under Alternative 3 and could produce additional UXO. Potential UXO would be contained within the MMR ordnance impact area, and no new ordnance impact areas would be introduced under Alternative 3. The CALFEX training area is strictly monitored for UXO following training. Because these measures would continue, no significant UXO impacts are expected from live-fire training at MMR under Alternative 3.

Ammunition. Ammunition impacts would be similar to those described under Alternative 2. In addition to the weapon systems described under Alternative 2, Alternative 3 would use inert TOW missiles, 2.75-caliber rockets, and illumination munitions. These weapon systems and tracer rounds have historically presented the greatest training-related threat of wildfire ignition for Mākua Valley. Both the inert TOW missiles and the 2.75-caliber rockets would be a potential wildfire source due to the elevated temperature of their thrusters and metal parts; the explosive warhead on the 2.75-caliber rocket also would present a wildfire hazard.

The 2.75-caliber rocket would be fired directly into the ordnance impact area from helicopters flying in a downward path. The downward firing position enhances the penetration potential of the munition into the ground, thus avoiding indirect landing outside of the firebreak road. Although the rocket can be fired to a range of 32,808 feet (10,000 meters), the new munition would be fired at close range in order to ensure greater accuracy. Helicopters would transport this weapon, which would not be stored on the installation. The rocket motor has been documented as being sensitive to EMF exposure (Federation of American Scientists 2000b).

The Army would consider this and other weapon hazards when incorporating safe storing and handling measures for the newly introduced weapons into the training plans and SOPs to minimize safety hazards. These precautions and the aforementioned measures for handling and

using the new munitions would minimize the impact to human health and the environment. SOPs already exist for safe management of weapon systems previously used at MMR.

The range officer would designate specific firing points for tracers and all ordnance before each training exercise to prevent rounds from escaping the ordnance impact area and firebreak road. Because safety precautions would be taken and SOPs would be updated in conjunction with the changes in training or the use of new munitions, there are no significant hazardous material or waste-related impacts associated with Alternative 3.

General training. General training-related impacts would be the same as those described under Alternative 1.

Lead from ammunition. Impacts under this alternative are similar to those described under Alternative 2. Sniper training, to be introduced from the ridgeline between the northern and southern valleys, would be directed into the ordnance impact area, preventing the spread of lead contamination to new areas. Cleanup protocol of this firing point following training would be identical to existing procedures and would therefore maintain a less than significant impact level under Alternative 3.

Pesticides. Pesticide impacts under Alternative 3 are the same as those described under Alternative 1.

Hazardous waste management. Hazardous waste management impacts are the same as those identified under Alternative 1.

#### No Impacts

Polychlorinated biphenyls. Impacts under this alternative are the same as those described under Alternative 1.

Electromagnetic fields. No new sources of EMFs would be introduced under Alternative 3; there is no change from Alternative 2. There would be no impact on the public from exposure to EMFs.

Petroleum, oils, and lubricants. Impacts under this alternative are identical to those described under Alternative 1.

Depleted Uranium. The description for the No Action Alternative is applicable to this alternative. The Army has not confirmed that DU has been used on MMR. No DU containing ammunition would be introduced under this alternative, thus there would be no impact under Alternative 3.

***Alternative 4 (Full Capacity Use with Fewer Weapons Restrictions), Pōhakuloa Training Area******Significant Impacts Mitigable to Less than Significant***

***Lead from ammunition.*** Based on the results of a 2002 soil study at PTA, the highest lead concentrations were detected in samples from Ranges 9, 10, and 11. Two of these samples exceeded the industrial soil PRG.

At the training ranges, berms would be used to stop projectiles fired at the ranges that are expected to contain significant quantities of lead and potentially UXO. The Army would retain lead-contaminated soils from existing berms on-site and use the soils in the construction of new berms associated with the new ranges. If lead-contaminated soils were not reused at the site for new berm construction, contaminated soils would be remediated for lead in accordance with applicable federal and state standards.

***Less Than Significant Impacts***

***Unexploded ordnance.*** The impacts and handling procedures from UXO under Alternative 4 would be similar to those identified under Alternative 3. Less than significant impacts are expected from live-fire training at PTA due to the location and orientation of this range and procedures in place to detect and destroy UXO. Potential UXO would be contained within the existing PTA ordnance impact area, and no new ordnance impact areas would be introduced under Alternative 4. This impact area is in a very remote location that is closed and inaccessible to the public. The CALFEX training area would be strictly monitored for UXO following training and existing procedures would be implemented to remove and or destroy UXO.

***Ammunition.*** SDZs are configured toward a cumulative ordnance impact area (approximately 51,000 acres [20,634 hectares]) in the central portion of PTA. Their designation would place emphasis on the effects of ricochets at closer ranges. Although ICMs are no longer used on any Army training land due to the extreme safety risk (HQDA 2001), there is a 16,800-acre (6,800-hectare) ICM impact area within the larger impact area. ICMs, also referred to as cluster bombs, are artillery munitions that contain multiple submunitions. The ordnance impact area and ICM area are not accessible to the public.

During training, ordnance is temporarily stored in ammunition holding areas on PTA for safety and security purposes. At the completion of training, unused ammunition is returned to the ammunition supply point on WAAF. Permanent ammunition storage is not authorized on PTA.

Additional ammunition would be brought from WAAF or Lualualei to PTA via boat (LSV or barge) or helicopter. If boats were used, the ammunition would be driven from Kawaihae Harbor to PTA. There have been no accidents involving the transport of ammunition in the last two years. Per state regulation, military convoys are not authorized to operate on state highways during “rush hour” between the hours of 6:00 AM and 8:30 AM or between 3:00 PM and 6:00 PM, Monday through Friday. Movements on Saturday, Sunday, and holidays are by special request only. Military convoys are also 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.

General training. General training-related impacts would be the same as those described under Alternative 1.

Pesticides. Although Alternative 4 would generate a slight increase in the amount of pesticides used on these installations in order to maintain the proposed ranges, pest management would continue to be managed by DPW in accordance with the USAG-HI Integrated Pest Management Plan, and pesticides would continue to be stored at the Environmental Shop on PTA. This impact would be considered less than significant.

Hazardous Waste Management. Hazardous waste generated under Alternative 4 is the same as described under Alternative 1. PTA would continue as a small quantity generator and no new handling or disposal procedures would need to be adopted. For these reasons, the impact from hazardous waste management under Alternative 4 would be expected to be less than significant.

Petroleum, oils, and lubricants. Soil samples analyzed in 1993 indicated that four areas were contaminated with low concentrations of petroleum-based substances (likely used motor oil and fuel oil such as kerosene). Gross petroleum was not apparent based on field observations and analytical results indicated that VOCs and SVOCs were below EPA PRGs. If left in place, this would pose minimal, if any, threat to human health and the environment (US Army and USACE 2004). Under Alternative 4, no change in the usage, storage, or management of POLs would be required, and impacts would be less than significant.

Depleted Uranium. In 2006 and 2007, The Army conducted a survey for DU at the ranges at SBMR, MMR, and PTA. The survey confirmed that DU is present at PTA. The DU present at PTA includes components of

the Davy Crockett weapons system. These components have been found only in the impact areas of PTA and all sampling data analyzed to date indicate that DU remains within the impacts areas. After several surveys DU has not been found in other locations though additional sampling continues (Cabrera Services 2008).

There are several reasons that there would be little or no risk to either local residents or employees who work on the installation. First, the fragments from the spotting rounds are well inside controlled areas (impact ranges) of garrison property where contact with the material would be unlikely because access to impact areas is restricted. Second, DU is only slightly radioactive. Third, DU's properties have been studied for decades, and are well understood by scientists and health experts. Many non-military agencies, to include the World Health Organization (WHO) and RAND Corporation, have found that possible impacts to health from DU at impact sites are extremely unlikely (Cabrera Services 2008). Finally, the potential for DU to move or migrate from the PTA impact areas is very unlikely due to the hydrogeological conditions.

AR 385-63, *Range Safety*, prohibits the use of DU ammunition for training worldwide. This policy has been in effect for over 20 years. Thus, no additional DU containing ammunition would be introduced under Alternative 4.

#### No Impacts

Polychlorinated biphenyls. A preliminary assessment/site inspection of four potential contaminant sources (a former pesticide storage area, a fire training area, and two landfills) was conducted within the boundaries of PTA in 1993. The analytical results for soil sampling in these areas indicated that PCB concentrations were all below the listed PRG. Devices that were found to contain regulated levels of PCB have been either removed and upgraded with non-PCB devices, or were retrofilled or removed, drained, packaged, and disposed of in accordance with 40 CFR Part 761. There are no existing PCB sources on PTA and no additional PCB containing fluids or materials would be introduced under Alternative 4. (US Army and USACE 2004).

Electromagnetic fields. Because no new sources of EMFs would be introduced under Alternative 4, there would be no impact related to Army personnel or public exposure to EMFs.