

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
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San Francisco, CA 94105

October 5, 2005

Mr. Gary Shirakata  
U.S. Army Corps of Engineers  
Honolulu Engineer District, Building 230  
Fort Shafter, HI 96858-5440

Subject: Draft Environmental Impact Statement for Military Training Activities at Makua Military Reservation, Hawai'i (CEQ # 20050292)

Dear Mr. Shirakata:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced Draft Environmental Impact Statement (DEIS) pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Our detailed comments are enclosed.

The project proposes to conduct live-fire military training exercises at Makua Military Reservation. Alternative 3 (Full Capacity with Fewer Weapons Restrictions) is the Army's preferred alternative. Based on our review, we are rating the Preferred Alternative 3 as Environmental Concerns – Adequate Information (EC-1) (see enclosed "Summary of Rating Definitions"). We have concerns regarding the introduction of additional weapons-related contaminants to soil and water currently contaminated by military activities, evidence of existing pollutant migration, and the use of weapons that have a high potential to cause wildfires. Wildfires encourage the spread of invasive species and expose soils to increased erosion, which can further encourage pollutant migration.

EPA recommends the Army select an alternative, and associated mitigation measures, that maximize pollution prevention opportunities at Makua. Site investigations revealed that contaminants are currently entering groundwater and are migrating off-site. While contaminant levels are not yet high enough to warrant regulatory action, they do present the Army with a valuable opportunity to slow the incremental contamination that will occur, to reduce existing sources of contamination and pollutant migration, and to potentially reduce Makua's future cleanup costs.

Toward this end, EPA recommends the selection of Alternative 1, which meets the stated training need with the least environmental impact. If the Preferred Alternative 3 is selected, we recommend modifying this alternative to reduce the training intensity to 28 training exercises per year, the number identified in the DEIS as necessary to meet the training need. We also recommend that the Army commit to prompt implementation of mitigation identified in the DEIS as "reducing source concentrations or mass of contaminants". Areas with increased levels

of contamination or “hotspots” should be removed as expeditiously as possible to reduce potential for further pollutant migration. The control of run-on and runoff from contaminated areas, including the Open Burn/Open Detonation (OB/OD) area, is also essential to reduce pollutant migration. We have also included other mitigation suggestions for your consideration.

We would like to commend the Army for a comprehensive, well-organized and well-researched document. The hydrogeological investigation that was performed helped characterize existing pollutant conditions and the extent and potential for pollutant migration. These studies provided the information needed to evaluate impacts of the proposed project, and EPA commends the Army for this effort. Additionally, the cumulative impacts section was thorough and well done.

We appreciate the opportunity to comment on this DEIS. EPA encourages the Army to take a long-term stewardship approach to site management at Makua to reduce future cleanup costs and benefit the residents of Hawaii. By selecting Alternative 1 or modifying Alternative 3 to reduce training frequency, removing contamination hotspots, and controlling run-on and runoff from contaminated areas, the Army will be embracing the pollution prevention pillar of its environmental strategy. EPA is available to provide assistance to the Army regarding pollution prevention and related topics. If you have questions, please contact me or Karen Vitulano, the lead reviewer for this project. Karen can be reached at 415-947-4178 or [vitulano.karen@epa.gov](mailto:vitulano.karen@epa.gov). Please also send one copy of the Final EIS to the address above (mail code: CED-2) once it is released for public review.

Sincerely,

/S/

Nova Blazej, Acting Manager  
Environmental Review Office  
Communities and Ecosystems Division

Enclosures:  
Summary of EPA’s Rating Definitions  
EPA’s Detailed Comments

### **Alternatives and Pollution Prevention Opportunities**

Project alternatives differ in training intensity and weapons use, increasing from Alternative 1 to Alternative 3. The DEIS states that Alternative 1 would deposit small amounts of the explosives RDX, TNT and HMX, and lead and other metals into surface soils. Alternative 2 substantially increases live-fire training from 28 to 50 combined arms live-fire exercises (CALFEXs) and adds use of tracer ammunition. As training intensity increases, the mass of the chemical residues would increase (p. ES-23). Alternative 3 describes the most intense training scenario, with up to 50 CALFEXs and the addition of high-explosive weapons.

EPA recommends that in selecting an alternative, the Army consider pollution prevention (P2) opportunities that exist within this decision. In 1993, the Council on Environmental Quality (CEQ) issued guidance on integrating P2 in federal planning and decisions under the National Environmental Policy Act (NEPA). The Department of Defense (DOD) policy on pollution prevention also emphasizes reducing the generation or release of pollutants caused by DOD activities and the incorporation of P2 at installations and into all phases of acquisition, operations, maintenance, support and ultimate disposal of weapon systems over the system life-cycle (DOD Instruction 4715.4, Sect 4.1.2, 4.2.2). The DEIS identifies P2 as one of the four pillars of the Army environmental strategy (p. 3-120).

EPA recommends that in selecting an alternative, the Army consider the potential for off-site pollutant migration. The hydrogeological investigation has identified areas of existing pollutant migration, but has also revealed opportunities to prevent continued migration.

EPA also recommends that the Army consider the magnitude and cost of future cleanups. While the socioeconomic impact analysis describes the contribution of Makua Military Reservation (MMR) to the economy using employment levels, income, and population, it does not include a cost analysis of the implementation of the various alternatives, nor does the DEIS consider future site cleanup costs in this decision.

#### **Recommendation:**

Since the magnitude of pollutant deposition and potential for migration increases as the intensity of the training increases with each Alternative, EPA recommends that the Army select or modify an alternative so that these P2 opportunities are captured while still meeting the purpose and need of the project. The DEIS states that a minimum of 28 CALFEXs per year are needed to meet the project need (p. 1-7). While all alternatives meet the purpose and need, Alternative 1 does so with the least environmental impact, therefore EPA recommends the Army select Alternative 1 for this project. Alternative 1 would also foster resource protection in the Makua Valley consistent with the Army's long-term conservation subzone goal of preserving resources (ES-17).

While Alternative 1 provides less flexibility than Alternative 3, the DEIS notes that the

training conditions of Alternative 1, which contain a maximum of 28 CALFEXs, represent a substantial increase in the intensity of live-fire training compared to recent training levels (p. ES-23). If the Army deems the use of tracer and/or high-explosive ammunition vital to its training needs, EPA recommends reducing the number of CALFEXs in the preferred alternative from 50 to 28 to reduce the environmental risk and impact from these weapons.

The Final EIS should also include within the socioeconomic analysis, an estimate of indirect costs that will be incurred in the future related to cleanup activities from the different alternatives.

## **Soil and Water Contamination**

### Opportunities for Preventing Migration of Contaminants

The impact methodology for assessing soil and water contamination on MMR uses EPA Region 9's Preliminary Remediation Goals (PRGs) as measures of significance. These are risk-based pollutant concentrations for screening-level evaluations of contaminated sites. The DEIS uses the industrial soil PRG as the final determination of significance. The use of industrial PRGs is appropriate in terms of evaluating human health risk for Soldiers due to their limited time on-site for training, however this impact assessment method does not anticipate future land uses. The Army should consider future environmental management and the cost benefits of preventing pollutant deposition and migration.

Since the DEIS uses PRGs in the impact assessment method, we note that the PRG Users Guide<sup>1</sup> suggests that when a PRG is exceeded at a site, further evaluation of the potential risks is appropriate. Further evaluation may include consideration of ambient levels of the contaminant in the environment. The DEIS does consider background levels in its discussion; however where background concentrations cannot account for a pollutant level present in soils, EPA recommends further action. Since contamination is expected to be unevenly distributed on the site and associated with targets and detonation areas, an opportunity exists to reduce contamination and potential migration onsite via a targeted removal of contamination hotspots. The areas sampled that yielded results exceeding industrial PRGs should be priority. Based on the results from the hydrogeological investigation, priority areas would include the lead location in Objective Elk (119,000 mg/kg detected, industrial PRG is 750 mg/kg) and the dioxin location in the Makua Stream Firing Area (2.44 and 2.33 ug/kg detected, industrial PRG is 0.016 ug/kg).

Water contamination can result from soil contamination and pollutant deposition from training activities. The DEIS indicates that migration of contamination into water resources is presently occurring. Groundwater sampling revealed explosive compounds RDX and 2,4,6-TNT in groundwater, with RDX levels above the tap water PRG. Benzene, Heptaclor epoxide, dioxin and furan isomers, BHC, and toluene were all detected above their respective PRGs (pp. 3-87 – 3-89). Pollutants were also detected in the vadose zone, having not yet reached groundwater, in

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<sup>1</sup> Users Guide and Background Technical Document for USEPA Region 9's Preliminary Remediation Goals (PRG) Table. Available at <http://www.epa.gov/Region9/waste/sfund/prg/files/04usersguide.pdf>

concentrations high enough to exceed tap water PRGs. While this evaluation method is conservative, it does indicate a slow, incremental contamination of MMR.

Evidence of off-site contaminant migration is present in the sediment sampling results of the muliwai, the brackish water pools near the mouths of the three onsite streams, which EPA conducted in 1999. This sampling detected chemical contaminants, although not in concentrations sufficient to warrant further action at that time (p. 3-75). It would be advantageous and consistent with Army P2 policy and CEQ guidance, for the Army to prevent or slow further chemical loading on the site. This would reduce potential health risks, especially since the health effects of RDX occur at relatively low concentrations (p. 4-78). It would also further the Army's stewardship, consistent with the long-term conservation subzone goal of preserving resources (p. ES-17), and minimize future cleanup costs.

#### Recommendation:

The DEIS identifies the fate and transport of chemical contaminants as an issue of concern (p. 3-94). To reduce pollutant migration potential, EPA recommends the targeted removal of contaminated soil or "hotspots" in all areas where contaminants exceeded PRGs, with priority for those areas that exceeded industrial PRGs, specifically Objective Elk and the Makua Stream Firing Area.

Hotspot removal is consistent with the mitigation identified in the DEIS to be taken if future monitoring reveals significant impacts to surface waters. Page 4-71 identifies this mitigation as "controlling run-on and runoff from areas with surface soil contamination; capturing and treating contaminated surface water or groundwater; and reducing source concentrations or mass of contaminants". The DEIS defines "significant impacts" to include "a conflict with a state or federal anti-degradation policy" (p. 4-71). Existing contamination of waters already indicates a conflict with Hawaii anti-degradation policy (Appendix A, p. A-14). Therefore, mitigation is warranted. Targeted contamination hotspot removal (reducing source concentrations) and the control of run-on and runoff from the OB/OD and other contaminated areas should be mandatory mitigation for this project. A commitment to this mitigation should be included in the Final EIS and the Record of Decision (ROD).

Additionally, we recommend that the Army commit to the mitigation measure listed on page 4-77 which addresses flood hazards and hazardous materials. This measure includes modifications to hazardous materials storage procedures to ensure that hazardous materials are not stored within the 100-year flood zone.

Finally, the selection of Alternative 1 with the lowest level and frequency of training should be considered, since this alternative would add the least amount of additional contaminants to the site as is necessary to meet the training need. We discourage the use of the additional training area in Alternative 3 because this area includes portions of Makua Stream. If this area will be used in the selected alternative, mitigation should be identified in the Final EIS to avoid troop impacts to this riparian area.

#### Ecological impacts

As the DEIS notes, PRGs do not consider impacts to ecological receptors. The DEIS evaluates impacts to ecological receptors using other criteria. EPA commends the Army for including this evaluation in the appendix. It is important that the Army disclose a summary of these results within the EIS. Additional discussion of some results is also appropriate.

Recommendation:

In the Final EIS, include a summary of the results presented in Appendix K of the Hydrogeological Investigation Report (Appendix G-1) that gauges impacts to ecological receptors. Further discuss the impacts of compounds that are not naturally occurring, especially those with levels detected well over the evaluation criteria or that bioaccumulate in the food chain such as mercury, dieldrin and polychlorinated biphenyls (PCBs).

We note that the Open Burn/Open Detonation (OB/OD) area contains the persistent and bioaccumulative compound dieldrin. The Army should implement the mitigation mentioned on p. 4-71 which includes “controlling run-on and runoff from areas with surface soil contamination” to contain and/or prevent the migration of this contaminant. A commitment for this mitigation should be documented in the ROD.

### **Fire Risk and Secondary Impacts**

The DEIS conveys the significant risk of wildfire from the action alternatives. The weapon use in Alternatives 2 and 3 have an especially high potential to cause wildfires. Alternative 2 includes the use of tracer ammunition, historically the most common cause of wildfires on MMR (p. 3-250), accounting for 49% of ignition sources (p. ES-30). Tracers would be used once per week, including nighttime training when it is more difficult to extinguish a fire, and during the most fire-prone months (p. 4-182). Alternative 3 further adds the use of inert tube-launched, optically-tracked, wire-guided (TOW) missiles, 2.75-caliber rockets, and illumination munitions, which are capable of igniting a wildfire because of their explosive and flammable properties. TOW missiles and 2.75 rockets also have greater destructive force and potential for misfires and ricochets beyond specified target areas (p. ES-27).

Site factors adding to the increase in wildfire risk and threat from damage include: the highly flammable fuels between the Makua valley floor and native habitats at higher elevations; and the rugged terrain which limits accessibility for fire suppression efforts (p. 3-249). Past experience shows fire can burn quickly out of control and weather conditions can change rapidly (p. 4-92). While the Army has an Integrated Wildland Fire Management Plan (IWFMP), this plan has been relied on only to a limited extent in the past to manage wildfire ignition and this did not include the use of tracers (pp. 4-183 and 5-69). The DEIS clearly states that the increased potential for wildfires ignition in Alternatives 2 and 3 are beyond the Army’s ability to adequately manage these sources (p. ES-34).

Recommendation:

If an alternative is selected that uses high fire-risk weapons (Alternative 2 or 3), a commitment to the mitigation identified on page 4-182 is essential. This includes increasing staff and training for the Wildfire Management Program and improvements to fire fighting infrastructure, such as additional water storage capacity and water distribution system upgrades.

### Erosion

The DEIS identifies erosion as a significant secondary impact from wildfire, which removes protective vegetation and exposes soils. Erosion is a direct impact from troop movements and explosives detonation. Evidence of soil erosion has been observed on site, and the soils in range areas are considered susceptible to erosion (p. 4-91). A study is cited that estimated an annual sediment discharge rate from the Makua Valley of approximately 1,100 tons per year (p. 3-103). Cumulative impacts to soil erosion will also occur from the Army's prescribed burns (p. 5-41). The DEIS notes that erosion can cause contaminants in soils to be transported to streams (p. 4-80).

Alternatives 2 and 3 increase erosion impacts due to the substantial increase in wildfire ignition sources and the increase in number of detonations and troop disturbance resulting from more CALFEXs. The DEIS notes that this increased vulnerability to erosion would probably reduce effectiveness of mitigation measures, such as revegetation (p. 4-96).

#### Recommendations:

While the DEIS identifies significant impacts from all three action alternatives on soil erosion, the impacts vary by degree. EPA recommends the selection of Alternative 1, with the least fire and erosion risk. Alternately, EPA recommends modifications to the Preferred Alternative 3 to reduce the frequency of use of high fire-risk weapons.

The DEIS identifies additional mitigation on page 4-92 that the Army could implement for erosion impacts. This includes the development of an erosion control plan for MMR to include provisions and methods for monitoring and identification of management practices for addressing erosion problems. These management practices could include reseeded slopes or planting vegetation buffers, constructing run-on and runoff controls, recontouring or filling damaged areas, or avoiding damaged areas. EPA strongly recommends the inclusion of this mitigation in the Final EIS, with a commitment to its implementation included in the ROD.

### Invasive species

The spread of invasive species is another secondary impact from wildfire. The magnitude of the impact increases as the level and frequency of training increases across the three alternatives (p. 4-109).

Wildfire poses a major threat to the Hawaiian ecosystem, since native plants and animals are not adapted to fire (p. 4-115). After a fire, flammable nonnative grasses spread and increase the chances the area will be impacted by a subsequent fire, which further spreads nonnative species



in a self-perpetuating process (p. 3-123). Native plants are also impacted by non-native feral pigs and goats (p. 3-127).

**Recommendation:**

EPA recommends the selection of Alternative 1 with the least fire risk, to lessen impacts on native plants from the further spread of invasive species. Alternately, EPA recommends modifying the Preferred Alternative 3 to minimize fire risk and associated impacts on native plants. The Final EIS should also reference Executive Order 13112 on invasive species and detail how the Army's actions are consistent with these requirements.

The DEIS states that 5,577 feet of fencing constructed to keep out feral pigs and goats was burned in a fire. EPA recommends replacing this fencing as mitigation for impacts to native plants from the spread of fire and nonnative species. Commitments to this mitigation should be detailed in the Final EIS and ROD.

### **Munitions Waste Management**

The DEIS states that excess propellant charges from mortars and artillery are burned in a burn pan in the open field south of the helipads, and all identified unexploded ordnance (UXO) is destroyed in place during cleanup activities after each CALFEX (p. 2-24). Detonating UXO in place impacts soils and erosion without the benefits of training, and open burning in a burn pan releases air pollutants.

**Recommendation:**

The Army should explore the benefits and practicability of using a Controlled Detonation Chamber such as Transportable Donovan Blast Chamber for use in disposing of UXO and excess propellant charges, as well as unserviceable munitions, which are now shipped back to ammunition depots in the continental U.S. (p. 3-228). The Donovan Blast Chamber is highlighted on the following Army Corps of Engineers website: <http://hq.environmental.usace.army.mil/programs/fuds/fudssuccess/donovan/donovan.html>. The blast chamber captures fine particle pollutants and filters gases from blasts through an air pollution control system before they are released into the air. If this technology is practicable for CALFEXs during the 242 days of on-site training, it should be considered. Additionally, the Army should check with the State of Hawaii to determine whether the burning of excess propellant in the burn pan constitutes treatment of a hazardous waste under the Resource Conservation and Recovery Act (RCRA), and if so, what regulatory requirements apply.

### **Green Ammunition**

The DEIS states that green ammunition will be used in the future for small arms ammunition and will be useful in reducing lead deposition (p. 2-29, 4-161). There are preliminary indications

that green ammunition that uses tungsten may complicate lead cleanup efforts by lowering pH in certain soils (see National Park Service advisory at <http://data2.itc.nps.gov/digest/printheadline.cfm?type=Announcements&id=3726>).

Recommendation:

The Army should assess local soil properties at MMR when deciding on use of tungsten containing ammunition. The Army should coordinate this decision with long-term site cleanup planning.

### Impacts to Spinner Dolphins

The shallow location at Makua Beach is preferred habitat by spinner dolphins (p. 3-136), and they come into shallow nearshore waters during early morning and late afternoon periods (p. 3-135). Most of the CALFEX exercises are estimated to occur in the early morning, and helicopters will hover for approximately 3 to 4 half-hour periods during the 5 to 6 hours for each training week (p. 4-41).

Hawaiian spinner dolphins are known to be more sensitive to aerial disturbance than other species (p. 4-126). The Army plans to conduct a direct hydrophonic noise study to collect noise levels above and below the water surface to gauge impacts to marine wildlife (p. 4-129). However, the DEIS does not indicate if this study will incorporate the effect of aerial disturbance, in addition to noise, on spinner dolphins, or what the Army will do to mitigate these potential impacts.

Recommendation:

In the Final EIS, include specific information regarding the hydrophonic study and whether aerial disturbance of spinner dolphins will be monitored as part of this study. If aerial disturbance is not included, the study parameters should be changed to integrate aerial disturbance into the study, since helicopter noise and aerial disturbance are inextricably linked. Also include the criteria for evaluating significance of the study results and suggest mitigation that will lessen impacts.

Consider the following mitigation for spinner dolphins: arrange timing of helicopter flyovers to avoid dolphin residence times; and adjust training schedules so timing of the loudest blasts, such as from demolitions training, avoid times when dolphins are present. We also recommend the potential additional mitigation identified on page 4-127, which includes performance of a pass-by flight before training to assess the presence of marine wildlife and limiting low-flying over areas where they are present, be included in the Final EIS and ROD.