

## Comments

F1-47 August 3, 2005, a wildfire unofficially attributed to spontaneous ignition of white phosphorus burned approximately 300 acres and escaped the south firebreak road, where it damaged about 25 acres of vegetation close to occurrences of listed plants. The Department, through the Service, recommends that the final EIS describe the location of past ordnance impact areas and surface danger zones used for white phosphorus rounds, and provide an estimate of the amount and location of white phosphorus likely still present in soils at MMR.

F1-48 Pages 3-251 through 3-255, Wildfire History and Fire Fighting Resources: The Service recommends that the Army commit to implementation of all actions proposed in the DEIS to improve wildfire suppression and pre-suppression management, including prescribed burns. The Department, through the Service, also recommends that the final EIS state the Army's commitment to ensure priority funding for implementing the Army's IWFMP.

F1-50 Pages 4-17 through 4-22, Summary of Impacts (Airspace): The final EIS should address the potential for bird-helicopter interactions associated with both day and night aircraft operations in the vicinity of Kaena Point NAR. Helicopter flight altitudes below 500 feet in this area would create a bird-strike risk impossible to mitigate. Throughout the nesting season, seabirds are flying between their nesting sites and offshore foraging areas, Laysan Albatross during the day and Wedge-tailed Shearwaters at night. Please address options to avoid bird strikes in the final EIS.

F1-51 Page 4-42, second paragraph: The final EIS should describe noise levels expected in ROI locations occupied by Oahu elepaio, assess potential effects, and propose mitigation for each alternative.

F1-52 Pages 4-70 through 4-85, Water Resources: The DEIS discussion of flooding is limited primarily to potential flood damage risk. Management actions specified in the Army's INRMP (e.g., ITAM program) and IWFMP (e.g., fire pre-suppression, vegetation control, and suppression) directly affect the land's ability to absorb and retain rainfall and runoff. In particular, relatively minor 5-year and 10-year storm events could transport large amounts of sediments and contaminants to sensitive nearshore marine environments. The Department, through the Service, recommends that the final EIS include an analysis of the potential effects to biological resources for each alternative due to any increase or decrease in frequency, duration, or magnitude of flood events.

F1-53 Page 4-76, Section 4.7 Water Resources, first paragraph: The discussion of dioxin movement in the fifth and seventh sentences seems contradictory. The fifth sentence states that dioxin is extremely insoluble and likely to be bound to sediment particles, which is true (EPA, 2005). The seventh sentence implies that dioxin is soluble enough to be transported in ground water miles from the recharge area.

Pages 4-99 through 4-138, Biological Resources: The DEIS does not adequately describe the potential adverse impacts to coral reef resources due to runoff. Impacts to corals and other benthic fauna from erosion and sediment transported in runoff are incorrectly

## Responses

F1-48

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

F1-49

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

F1-50

This has been discussed in Section 4.9. Please see the response to Comment F1-43.

F1-51

As shown by Figure 3-22 in the Draft EIS, most of the Oahu elepaio critical habitat areas are more than 2 km from the ordnance impact area at MMR. As noted in the Draft EIS, a study (VanderWerf et al. 2000) of the impact of high explosive artillery and mortar shell noise on Oahu elepaio at the Schofield Barracks artillery range found no effects on nesting behavior, brood rearing success, or other population parameters. The Schofield Barracks study included Oahu elepaio nests within 1 kilometer of the edge of the artillery range impact area, with the closest nest only 0.1 kilometers from the impact area. Peak unweighted noise levels at the monitored nest sites were as high as 130 decibels (unweighted peak). Videotapes of birds at the nest showed no response to blast noise events, even at the highest peak noise levels. Section 4.9 of the Draft EIS therefore concludes that noise from CALFEX events at MMR are not expected to have significant ecological effects on the Oahu elepaio.

F1-52

As stated in Section 4.7.3 of the Draft EIS, the proposed action is not expected to affect the frequency, duration, or magnitude of flood events at MMR.

**Comments**

**Responses**

(cont.)

F1-53

As the commenter notes, dioxin is extremely insoluble in water, but it can piggy-back on sediment particles, to which it tends to bind. If dioxin is detected in a groundwater sample, the explanation likely involves sediment that has migrated into the well. The most likely explanation is that contaminated sediment was introduced into the well during well construction or sampling, or by some other localized mechanism. Over time, the contaminated sediment would be purged from the well in the process of sampling. Particle transport by flowing groundwater cannot be entirely ruled out, though as the comment implies, this is unlikely to occur over great distances because sediment tends to be filtered by aquifer materials.

## Comments

F1-54 described as short-term effects from which recovery is rapid. This is not always the case; for example, sediment deposition can be harmful to reef organisms during periods of coral spawning and recruitment. In addition, long-term detrimental effects can result from the timing and magnitude of sediment deposition and other factors. The effects of runoff on coral reefs can be severe and may warrant legal action under the Clean Water Act and other authorities. The Department, through the Service, recommends that the final EIS include an expanded discussion of the potential effects of sedimentation in the nearshore marine environment of the ROI.

F1-55 Page 4-99, fifth paragraph: The final EIS should clarify that the basis for assessing impacts to aquatic resources should include all special aquatic sites defined under the Clean Water Act, including coral reefs.

F1-56 Page 4-101, last paragraph: The final EIS should clarify that the Army's mitigation approach is based in large part on the Army's proposed MIP Addendum provided to the Service in January 2005, not the interagency MIP submitted to the Service in May 2003. The MIP Addendum involves a smaller overall conservation area than the MIP (i.e., 23 Management Units totaling 2,404 acres [972.9 hectares] in the MIP Addendum, compared to 31 Management Units totaling 6,353 acres [2,572 hectares] in the MIP). The proposed MIP Addendum is part of the Army's proposed action for reinitiating ESA section 7 consultation on the preferred alternative. The final EIS should clarify that the Department, through the Service, has not completed our analysis of whether the MIP Addendum contains sufficient protective measures to avoid jeopardizing 28 endangered species identified for stabilization.

F1-58 Page 4-105, top of page: The final EIS should clarify that separate management plans for each type of threat do not require approval by the Service before the Army can begin implementation. Management actions will be reviewed in progress to assure their success, and if necessary will be altered according to adaptive management protocols.

F1-59 Page 4-108, first bulleted item: The final EIS should evaluate the significance of impacts to all aquatic habitats within the ROI, including an evaluation of the extent and degree of anticipated adverse impacts to coral reefs.

F1-60 Page 4-108, first full paragraph and bulleted items through page 4-109: The DEIS appears to limit evaluation of anticipated impacts in the marine environment to analysis of marine mammals under the Marine Mammals Protection Act. The final EIS should analyze all anticipated impacts to freshwater and marine environments (including nearshore marine habitats such as coral reefs and their associated biological communities).

Pages 4-120 through 4-123, Summary of Impacts (Biological Resources): The Department, through the Service, is concerned that impacts to endangered plants and nesting seabirds resulting from ground training on the Kaena Point trail are not adequately mitigated. Laysan Albatross are relatively tolerant of human disturbance. Nonetheless, regular use of the area by ground troops may attract more dogs and cats,

## Responses

F1-54  
Please see response to Comment F1-32.

F1-55  
Please see response to Comment F1-35.

F1-56  
The Army's mitigation approach is based on the level of training; this approach is structured around a mitigation program presented in both the MIP and its addendum. In the EIS, references to the MIP include both the MIP and its addendum.

F1-57  
The MIP Addendum has been analyzed per the Section 7 consultation. This information has been added to Section 4.9.2.

F1-58  
This information has been clarified in Section 4.9 of the EIS.

F1-59  
Under NEPA, only resources considered to be potentially impacted are discussed in the EIS. Section 4.9 includes assessment of impacts to coral ecosystems.

F1-60  
This is analyzed in Section 4.9 of the EIS.

## Comments

- which are known to kill albatross, and some soldiers may inadvertently harass albatross in nest sites close to the trail. Wedge-tailed Shearwater burrows can be crushed by a single human footstep, killing or trapping the egg or bird inside, and burrows directly on the trail or at its edge could not be avoided by a column of troops. In addition, shearwaters are active at night and are sensitive to disturbance by artificial lighting; disoriented birds often become grounded, where they are vulnerable to predation and vehicle strikes. In general, Kaena Point is a fragile ecosystem that is extremely sensitive to erosion and only now is recovering from years of misuse. Using Kaena Point NAR as a regular ground-training site would directly conflict with the area's legal purpose, as well as with other Federal and State efforts to restore native plants and animals, including a U.S. Fish and Wildlife Service Cooperative Endangered Species Conservation Fund recovery land acquisition grant. In addition to the "BMPs" mentioned in the DEIS, the Service recommends the Army coordinate additional mitigation measures with PIFWO and DOFAW for inclusion in the final EIS. Such measures may include modification of standard operating procedures, habitat restoration efforts, additional predator control, shielding of artificial lights, and inclusion of fire suppression crews on all trail marches. To avoid impacts to nesting seabirds, the Department, through the Service, recommends assessing an alternate sites for trail marches, including Drum Road. Please address these issues in the final EIS.
- F1-61
- F1-62
- F1-63
- Page 4-120, first paragraph: Troops marching by nesting Oahu elepaio could cause a disturbance that would flush elepaio from their nests, and frequent disturbances could adversely affect the subspecies' reproductive fitness. The final EIS should address the potential impacts of noise and disturbance to elepaio resulting from the proposed intensity and frequency of troop marches along the Kuaokala trail.
- F1-64
- Page 4-121, second paragraph: Destruction of Wedge-tailed Shearwater burrows would constitute a violation of the Migratory Bird Treaty Act (MBTA). The MBTA includes no permit provision for authorizing the incidental take of birds, nests, or eggs. The final EIS should clarify how the National Defense Authorization Act for Fiscal Year 2004, which excludes take associated with military readiness activities from MBTA permitting requirements, applies to the proposed action.
- F1-65
- Page 4-121, third paragraph: The Department, through the Service, is concerned that smoking by soldiers cannot be totally prohibited during trail marches, and that trampling of endangered plants and introduction of invasive weeds cannot be totally avoided. Please evaluate these impacts in the final EIS.
- F1-66
- Pages 4-130, last two paragraphs, and 4-131, first three paragraphs: The DEIS does not address the risk of bird strikes in aircraft operation areas in the vicinity of Kaena Point NAR. Helicopters as close as 1,000 feet (305 meters) offshore and 300 feet (91 meters) above the ocean are likely to create bird-strike hazards. Please evaluate this issue in the final EIS.
- F1-67
- Pages 4-135 and 4-136, Summary of Impacts (Biological Resources): The final EIS should specify how greater safety restrictions on weapons and munitions, and more
- F1-68

## Responses

- F1-61  
Please see the response to Comment F1-13.
- F1-62  
Please see the response to Comment F1-13.
- F1-63  
Because these troop marches are conducted as part of live-fire training at MMR, use of alternate routes that do not lead into MMR, including Drum Road, would not be feasible. Use of Kuaokala Trail is subject to the conditions included in the permit issued by the State. For troop marches not conducted as part of MMR training activities, and therefore not included in the alternatives evaluated in the EIS, the Army will consider alternate routes.
- F1-64  
Please see the response to Comment F1-51. As shown on Figure 3-20 of the Draft EIS, there are no known populations of elepaio along the Kuaokala Trail.
- F1-65  
The act stated that the Migratory Bird Treaty Act would not apply to incidental taking of a migratory bird by a member of the Armed Forces during military readiness activities. The act defined "military readiness activity" to include all training and operations of the Armed Forces that relate to combat. As such, all of the actions proposed at MMR, would be considered military readiness activities under the act. In addition, Wedge-Tailed Shearwaters will not be impacted by Army training since the Army decided during formal Section 7 consultation not to use Kaena Point for road marches.
- F1-66  
The Army assures the Department that these measures have been successfully enforced during past training activities and will continue to be enforced as part of future training activities at MMR.
- F1-67  
Please see response to Comments F1-25 and F1-43.

## Comments

- F1-68 effective fire management and revegetation programs, would reduce the severity of impacts associated with the elevated risk of fire associated with the preferred alternative. The Service is concerned about the effectiveness of the INRMP and IWFMP to reduce wildfire ignitions, owing to the fact that about 61 percent of historical fires at MMR for which complete records are available have been ignited by weapons systems and munitions that will be resumed for use under the preferred alternative (tracer ammunition, anti-tank missiles, and TOW missiles). The Department, through the Service, is unable to evaluate the impacts of the preferred alternative due in large part to lack of information on the malfunction/misfire risk of these previously used weapons systems and munitions, and of long-range, high fire-risk weapons systems and munitions that have never been used before at MMR (120mm HE mortars, 155mm HE howitzers, 2.75-caliber rockets, and Javelins). Please address these issues in the final EIS.
- F1-22
- F1-69 Page 4-136, second paragraph: The Department, through the Service, recommends that the Army commit to restoring damaged habitat after each fire, and provide a restoration plan in the final EIS. Given that restoration of native forest in Hawaii has achieved limited success in few locations and only with intensive management, the final EIS should estimate the required timeframe needed to achieve successful restoration after fire.
- F1-70 Page 4-137, first paragraph: The DEIS concludes that night ground training is unlikely to adversely affect wildlife, including Hawaiian hoary bats and Wedge-tailed Shearwaters. However, the DEIS also states that Hawaiian hoary bats have been confirmed in the ROI. If bats are present, it is not clear how night ground training would avoid effects to this species. The final EIS should provide more information to support this conclusion. In addition, the final EIS also should note that night ground training under unshielded, artificial lighting may adversely affect Wedge-tailed Shearwaters in Kaena Point NAR.
- F1-71
- F1-72 Page 4-137, second paragraph: The Department, through the Service, is concerned that the preferred alternative includes sniper training on C-ridge. Use of this area would expose vegetation to damage from trampling and the spread of invasive weeds, and may also adversely affect the ground-nesting Pueo (*Asio flammeus*). This area has burned in the past without direct use, due to misfired projectiles and the July 2003 escaped prescribed burn, which destroyed listed plants. The final EIS should examine the risk of wildfire associated with shooting from C-ridge and include mitigation measures for damage to native species there.
- F1-72
- F1-73 Page 4-177, last paragraph: The final EIS should incorporate an impact assessment methodology that estimates the *frequency* of wildfire in addition to the *probability* of wildfire ignition. The Service is concerned that recurring fires will exacerbate the encroachment of invasive, fire-adapted grasses into native forest. The final EIS should discuss the results of fire behavior models or other geospatial methods that simulate both the spatial and temporal patterns of fire spread resulting from successive, fire-induced vegetation changes. Fire behavior modeling also should simulate fire behavior at ignition points outside the firebreak road, to account for the potential misfire of long-range, high fire-risk weapons systems and munitions. In addition, the final EIS should describe actions the Army has already implemented and will implement in future to reduce
- F1-75

## Responses

- F1-68  
There is a difference between the risk of a small fire starting in the impact zone and the risk that a fire will escape control and damage sensitive areas outside the impact zone. Many fires can ignite safely in the impact area and be contained if the vegetation and weather conditions during training are controlled. This can be done, and is already part of the mitigation plan. If a fire ignition in the impact zone (which is managed by controlling vegetation and weather) does show potential to cross the boundary road and become a threatening fire, a wildland fire team will be on hand to suppress the fire at a safe line within or at the fire boundary road. One issue that invites further study, consultation and planning is vegetation management between the boundary road and the grass/forest ecotone. The management approach considers discouraging the growth of fires that escape suppression at the boundary road and encouraging the recovery of the forest where it once grew in this zone.
- F1-69  
The Army will be developing a post-fire revegetation recommendation as part of the formal Section 7 process with the help of local botanical experts.
- F1-70  
There are no resident bats within the Waianae Mountains. Section 4.9.4 has been revised to clarify this issue. Please see the response to Comment F1-39.
- F1-71  
Wedge-Tailed Shearwaters will not be impacted by Army training since the Army decided during formal Section 7 consultation not to use Kaena Point for road marches.
- F1-72  
During formal Section 7 consultation, the Army has decided not to use C-Ridge due to potential fire impacts.

**Comments**

**Responses**

(cont.)

F1-73

This analysis was completed during the formal Section 7 consultation.

F1-74

The EIS relies on the fire behavior analysis conducted for preparation of the Integrated Wildland Fire Management Plan. Excerpts of this plan are included in Appendix J.

F1-75

Section 4.14 and Appendix J addressed the impacts of wildfire and mitigation.

## Comments

F1-75 wildfire risk by restricting the encroachment effect. Clarification of long-term fire risks in the final EIS will help the Department, through the Service, evaluate the effectiveness of the Army's INRMP, IWFMP, and MIP Addendum in protecting native forest from the synergistic, long-term effects of fire and invasive species on biological resources, including listed species. Please address these issues in the final EIS.

F1-76 Page 4-178, first paragraph: The final EIS should examine the potential of buried white phosphorus to become exposed to spontaneous oxidation/ignition by geomorphological processes and by projectile impacts associated with military training.

F1-77 Page 4-183, second paragraph: The DEIS does not specify how the existing October 2003 IWFMP would be modified to account for fire response and suppression procedures under the preferred alternative. The Service's existing biological opinion for routine training at MMR is predicated on IWFMP implementation to minimize wildfire impacts to listed species and critical habitat. However, the effectiveness of the IWFMP is untested for managing wildfire response at night and in conjunction with the day or night use of tracers, illumination rounds, 120mm HE mortars, 155mm HE howitzers, inert TOW missiles, 2.75-caliber rockets, and Javelins. The Service is concerned that certain IWFMP modifications may compromise the Army's wildfire response effort in some circumstances. For example, as part of the Army's recent reinitiation of ESA section 7 consultation on the preferred alternative, the Army proposes to relax the IWFMP's requirement for an on-site helicopter and crew during live-fire exercises involving only small arms qualifications (ball ammunition) and demolitions. The final EIS should clarify that IWFMP standard operating procedures apply to all live-fire exercises, not just CALFEXs, and modifications to the October 2003 IWFMP standard operating procedures should be described in detail.

F1-78 Page 5-69, second full paragraph: The wording of this paragraph is unclear. There is no "USFWS Plant Critical Habitat project" and the mere designation of critical habitat does not protect endangered and threatened species from wildfire. Designation of critical habitat only requires Federal agencies to consult with the Service under ESA section 7 if proposed actions funded, authorized, or permitted by the Federal government may affect the conservation value of critical habitat. Please clarify the meaning of this paragraph in the final EIS.

F1-79 Page 6-3, last paragraph: The final EIS should explain why resources, staff, and funds for conservation measures such as the MIP would constitute an irreversible and irretrievable commitment of resources under NEPA.

## SUMMARY COMMENTS

The Department, through the Service, is concerned that the Proposed Action in the DEIS is likely to result in significant, unmitigable impacts to biological resources at MMR, including the irretrievable loss of individuals of federally threatened and endangered species, as a result of wildfire and the spread of invasive species. The Department, through the Service, is also concerned that impacts to nesting seabirds, native tree snails,

## Responses

F1-76  
Fires started by exposed white phosphorus would be put out in accordance with IWFMP guidance.

F1-77  
To the extent changes are made to the IWFMP, such changes would be made in coordination with the USFWS, thus giving the USFWS the opportunity to fully evaluate the adequacy of the impact methodology and mitigation proposals. Appendix J contains SOPs that would occur during all live-fire exercises.

F1-78  
The text has been revised in the EIS to clarify the meaning of the paragraph.

F1-79  
This statement has been deleted from the EIS.

### Comments

and native vegetation cannot be mitigated for the Army's use of the Kaena Point and Kuaokala trails as a regular ground-training site. Major features of the Army's mitigation program are contained in the Army's INRMP, IWFMP, and MIP Addendum, which the Army intends to modify to address impacts associated with the Proposed Action. Drafts of these documents were not provided in the DEIS for public review, and the Army's proposed MIP Addendum is part of the Proposed Action now under ESA section 7 consultation. In addition, the DEIS lacks sufficient information on the misfire risk of the Proposed Action's weapons systems and munitions, and the long-term spatial and temporal effects of recurring wildfires. These important components of the Proposed Action should be made available for public review in the Final EIS, prior to decision-making.

Based on reasons summarized above, the Department considers the information presented in the DEIS inadequate for meaningful analysis of the Proposed Action's significant impacts to biological resources, including listed species and critical habitat. We recommend the final EIS provide additional information regarding the Army's wildfire impact methodology, proposed mitigation programs, and other issues raised in this letter. Furthermore, the Department also recommends the Army identify Alternative 1, with the exception of night live-fire training, use of Stryker vehicles, and use of the Kaena Point and Kuaokala trails, as its preferred alternative in the final EIS because it would reduce the potential risk of wildfire ignitions.

The Department appreciates the opportunity to comment on the DEIS. If you have questions regarding our comments or recommendations, please contact PIFWO Field Supervisor Patrick Leonard at (808) 792-9400 or contact Lloyd Woosley, Chief of the USGS Environmental Affairs Program, at (703) 648-5028 or at [lwoosley@usgs.gov](mailto:lwoosley@usgs.gov).

Sincerely,



Patricia Sanderson Port  
Regional Environmental Officer

cc: OEPC, HQ  
USGS, Reston, VA  
FWS, Portland, OR

### Responses

F1-80

A meaningful analysis of impacts to endangered species and critical habitat was completed during the formal Section 7 consultation process which resulted in a non-jeopardy Biological Opinion. During the formal Section 7 consultation process, the Army decided not to use C-Ridge and Kaena Point for training and illumination munitions because of concerns raised by the USFWS. The Army is actively involved in endangered species management at Kahanahaiki management unit located at the peak of C-Ridge as specified in the MIP addendum.

**Comments**

**Responses**

**REFERENCES**

Alley, W.M. and others, 1999, Sustainability of Ground-Water Resources, Circular 1186, U.S. Geological Survey, Denver, Colorado, page 15.

Todd, D.K., 1980, Groundwater Hydrology, 2nd edition, John Wiley & Sons, New York, page 363 (footnote).

U.S. Environmental Protection Agency, Consumer Fact Sheet on Dioxin, available on the Internet at: [http://www.epa.gov/safewater/contaminants/dw\\_contamfs/dioxin.html](http://www.epa.gov/safewater/contaminants/dw_contamfs/dioxin.html) (accessed August 25, 2005)

Letter F-2

Comments

Responses



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

**FAX COVER SHEET:**

**TO:** Gary Shirakata  
U.S. Army Corps of Engineers, Honolulu Engineer Dist

**Date:** October 5, 2005

**Fax No.** 808-438-7801

**No. of Pages** 14  
**(incl. cover sheet)**

**FROM:** Karen Vitulano, Environmental Review Office

**Phone No.** 415-947-4178

**Fax No.** 415-947-3562

**SUBJECT:** EPA Comments on Draft EIS - Military Training Activities at Makua  
Military Reservation

**COMMENTS:**

## Comments



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 REGION IX  
 75 Hawthorne Street  
 San Francisco, CA 94105-3901

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 state 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 DE as "reducing source concentrations or mass of contaminants". Areas with increased levels of

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## Responses

F2-1

Since the 2005 Draft EIS, the Army completed the studies of the effects of military activities on the Muliwai and near-shore ecosystems. These studies have been included in Appendix G of the EIS.

F2-1

## Comments

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,



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

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

## Responses

## Comments

## Responses

**SUMMARY OF EPA RATING DEFINITIONS**

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

**ENVIRONMENTAL IMPACT OF THE ACTION*****"LO" (Lack of Objections)***

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

***"EC" (Environmental Concerns)***

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

***"EO" (Environmental Objections)***

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

***"EU" (Environmentally Unsatisfactory)***

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

**ADEQUACY OF THE IMPACT STATEMENT*****Category 1" (Adequate)***

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

***"Category 2" (Insufficient Information)***

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonable alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

***"Category 3" (Inadequate)***

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussion are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

**Comments**

EPA DETAILED COMMENTS ON THE MAKUA MILITARY RESERVATION MILITARY TRAINING ACTIVITIES DRAFT ENVIRONMENTAL IMPACT STATEMENT, OCTOBER 5, 2005

**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.

F2-2 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).

F2-3 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.

F2-4 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:**

F2-5 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

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F2-2

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process. Consistent with Army policy, the Army would consider pollution prevention opportunities that exist within this decision.

F2-3

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process. In addition, Section 4.7 of the Draft EIS identified impacts associated with the potential for off-site pollutant migration.

F2-4

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process. At this time, because cleanup is not proposed, and because an estimate of costs associated with any potential cleanup activities is speculative, the EIS has not been revised to include this estimate.

F2-5

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

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F2-6 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.

F2-4 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

F2-7 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, Heptachlor 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

<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>

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F2-6

The Army's approach has been to look at the highest level of activity under each alternative, with the likelihood that the actual intensity and frequency of training may be below that level. For this reason the preferred alternative has not been modified in the EIS. The Army will consider this recommendation in developing its Record of Decision for this project.

F2-7

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process. At this time, because cleanup is not proposed, and because an estimate of costs associated with any potential cleanup activities is speculative, the EIS has not been revised to include this estimate.

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

F2-8 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:

F2-9 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.

F2-9 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).

F2-10 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.

F2-5 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.

F2-11

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F2-8

The results of the Hydrogeologic Investigation, as discussed in the EIS, indicate that the quantities of contaminants resulting from use of explosives on the training range have not caused a significant health risk. Estimates of residual explosives that would result from continued use of explosives, as presented in the EIS, indicate that future chemical loading would be minimal.

F2-9

The mitigation measures in Section 4.7.3 of the EIS have been revised to incorporate remedial actions at the OB/OD Area.

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The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

F2-11

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

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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:

F2-12

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).

F2-13

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).

F2-12

There is no evidence that bioaccumulative chemicals, such as mercury, dieldrin, or PCBs have resulted from past training activities, and these compounds would not result from future live-fire training activities. A review of the hydrogeologic investigation results indicate that the ecological effects from any historical sources of these compounds at MMR would be insignificant, especially in comparison to other sources, such as runoff from urban or agricultural areas, or air-fall from power plants.

F2-13

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

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Recommendation:

F2-14

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:

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F2-6

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.

F2-15

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).

F2-14

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

F2-15

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

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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:**

F2-5 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  
 F2-6 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  
 F2-16 invasive species and detail how the Army's actions are consistent with these requirements.

F2-17 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:**

F2-18 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.

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F2-16 The EIS has been revised in Section 3.9.4 to include discussion of this executive order.

F2-17 The EIS has been revised in Section 4.9.4 to include this mitigation measure.

F2-18 Burning of excess propellant (resulting from artillery/mortar training) is an integral part of training and therefore, exempt from the Solid and Hazardous Waste Regulations. This process should not be confused with disposal. EPA's Military Munitions Rule (MMR), allows the Army to burn the excess propellant charges as a legitimate part of training as long as the units (artillery/mortar MOS) burning the excess propellant are receiving training value. The Army employs Best Management Practices to eliminate burning excess propellants on the ground that would otherwise create an increased fire risk that could jeopardize the many protected species at MMR. Use of the Donovan Blast Chamber to dispose of excess propellant would require the RCRA Permitting.

Range Clearing (thermal destruction of UXO on-site) is also exempt from the Solid and Hazardous Waste Regulations. Range Clearing operations are controlled and conducted by the Explosive Ordnance Division, which follows strict protocols to ensure the safety of the environment and personnel. Use of the Donovan Blast Chamber will require additional non-EOD protocol implementation which would require additional resources (personnel/funding/etc) to maintain operations.

Currently, all unserviceable munitions are sent to ammo depots in the continental United States. The Army does not have a RCRA Permitted Treatment Storage and Disposal Facility and found it more economical to ship unserviceable munitions off island for processing.

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**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:**

F2-19 | 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:**

F2-20 | 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.

F2-21 | 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.

F2-22 | 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.

F2-19

The Army thanks you for your comment and appreciates your recommendations and will consider them as it moves forward with the NEPA process. Your comment has been considered and has been included as part of the administrative record for this process.

F2-20

Per the NOAA consultation, a hydrophonic study will be conducted during the first CALFEX event at MMR. Results of that study will be used in further consultation with NOAA. At the present time, NOAA has concurred with the Army's "not likely to adversely affect" determination for marine resources based on the hydrophonic model.

F2-21

This mitigation was considered in detail but it was determined that Army activities must occur during the proposed time of day due to fire avoidance protocols and other considerations. Schedules could not be adjusted. Per consultation with and concurrence by NOAA, the noise modeling study determined that helicopter noise is not likely a significant source of disturbance for the dolphins.

F2-22

Per Section 7 consultation with NOAA, these pass-by flights will be conducted.

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