

Comments

the reservation summarized that Site 4546 is probably a pre-Contact heiau and an associated shrine or burial, and noted that subsurface excavation would be required to be conclusive (p. 42-43). They also determined that Sites 4540 and 5590 probably include burials (pp. 62, 70) but that subsurface excavation would be required to be conclusive. The report recommends preservation of these sites, protection from further ordnance damage, and additional excavation and mapping. (p.79). Family obligation requires Native Hawaiian individuals to periodically visit the ancestral burials to assure that they are protected from disturbance and to acknowledge the presence of the spirit of their ancestors in their ancestral land. The 2002 Ogden Report recommends that "the entire area situated on the west side of the North Fire Break Road be set aside as an archaeological/cultural preserve. Military training exercises currently do not use this area, and should be banned from future use. This preserve area would include all of the area that was surveyed and mapped during the current phases of work, as well as those areas to the north that were not surveyed. " The report also recommends that management of the preserve should be coordinated with the Ukanipo Advisory Council as they are associated with the Ukanipo Heiau Complex.

Oral History Sources:
Prashad- p. 17 – burials near Ukanipo heiau
Maly: p. R-12, R-15, R-17, p. 48 – 49
Aila: phone conversation

I18-12 | I18-13 | Sixth, there is no assessment of the impact of military training upon hunting and gathering activities by Native Hawaiian families in Kahanahaiki, Makua and Ko'iahi. The majority of lands of the Makua Military Reservation are ceded lands which were designated as "Government Land" under the Mahele of 1848 (Indices, 1929: 41-42). According to the Indices of Land Awards, all government lands were subject to the following phrase "koe wale no ke kuleana o na kanaka e noho ana ma ua mau aina la" which is translated as "subject always to the rights of tenants." The right to access Makua for cultural, subsistence, and religious purposes is a right of those who are descended from families who lived in Makua. One such descendant, William Aila said in my phone discussions with him that his father and uncles hunted wild cattle in Makua after World War II. According to him, young men still hunt wild pig and goats in the valley. Another such descendant, Albert Silva, said in his interview with Kepa Maly in 1998 that hunting of pigs and goats for subsistence continues in Makua. The Draft EIS does not address the impact of continued live fire training upon subsistence hunting.

I18-14 | The mo'olelo (history) of Hi'iaka cited in the report of Prashad and Maly, and the many informants interviewed for all of the oral history reports speak of the former abundance and fragrance of maile lauli'ili'i in Ko'iahi. Maile is used for adornment for hula, significant life cycle events, and ceremonial protocol. According to Hawaiian tradition, as noted in Place Names of Hawaii'i (Pukui, 1984, p. 115) the finest maile lauli'i formerly grew in Ko'iahi. The informants indicated an interest in assessing the condition of the maile lauli'i in Ko'iahi and restoring it for sustainable use. They also identified many native plants which their families had gathered and used from Makua, such as ko'oko'olau and uhaloa for medicine; a'ali'i and wiliwili for lei; kukui nuts for food seasoning and medicine; coconuts for multiple uses; and hala (pandanus) for mats. They also gathered introduced fruits such as oranges, lemons, mangos, guavas, avocados and pineapple. Native bamboo grew by a spring near some mango trees.

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I18-12 | Kahanahaiki Valley is not used for training and the site complexes surrounding Ukanipo Heiau have been mapped and are protected. Further work cannot be accomplished because of the presence of unexploded ordnance.

I18-13 | Kahanahaiki Valley is not used for training and the site complexes surrounding Ukanipo Heiau have been mapped and are protected. Future decisions to train will be subject to review under NEPA, the National Historic Preservation Act, the Endangered Species Act, and other applicable statutes.

I18-14 | In Section 4.10 of the Draft EIS, the Army assesses impacts to access to MMR. Although MMR is an active training complex, the Army at this time allows limited public access to cultural sites. Public access depends in part on training requirements, safety and other applicable policy, requirements, regulations/laws.

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Families also farmed sweet potato, cucumber, pumpkin, and watermelon in the valley,

Hunting and gathering for subsistence, cultural, medicinal, and spiritual purposes are essential activities for Native Hawaiian families in rural communities such as those of the Wai'anae coast.

- I18-15 While entry into the Makua range is illegal, it will be difficult to gather information about such ongoing activities. Nevertheless, there is strong evidence that hunting and gathering activities in Makua has continued and most definitely would resume were live fire training to cease. While access for the gathering of maile lauli'ili'i is under consideration, access for other gathering activities are not taken into account. In addition, the Draft EIS does not adequately address the cumulative impact on the cultural resources hunted and gathered by Native Hawaiian families, should live fire military training resume. Of particular concern is the potential danger of wildfire upon these resources.

Oral History Sources:

Kelly Volume II: 218, 223, 229, 251, 253, 254, 274, 285, 297, 344, 349, 368-69, 386,

Prashad: p. 20,

Maly: p. 9, 26, 29, 30, 47, 51, 53, 68, 70 - 71, 72, 81, 93,

Aila: phone conversation

- I18-17 Seventh, there is no assessment in the Draft EIS of the impact of live-fire training upon the future use and value of the ceded public lands that are used for the Makua Military Reservation. The Army has a lease from the State of Hawai'i, through the year 2029, for 782 acres of ceded lands. The Army also has use of 3,236 acres of ceded lands held by the federal government (DEIS, page 3-11). The resumption of live fire training at Makua can render the ceded lands leased out by the State of Hawai'i and those held by the federal government useless for future habitation, diversified agriculture, for a park or other uses, unless it is cleaned to a level safe for human use. I could not find any estimate in the DEIS of what it would cost to clean Makua of unexploded ordnance, but the Supplemental Environmental Assessment for Routine Training at Makua Military Reservation (May 2001) estimated clean up for Kaho'olawe at \$14,000 per acre (3.2.3, p. 26). The ceded public lands were Crown and Government lands of the Kingdom of Hawai'i. These lands were claimed by the Provisional Government and Republic of Hawai'i at the time of the overthrow of the Hawaiian monarchy. At the time of Annexation, the Republic of Hawai'i ceded these lands of the Kingdom of Hawai'i to the U.S. federal government; however, the Native Hawaiian people never affirmed or consented to this transfer of their national lands. The U.S. Congress acknowledged in Public Law 103-150, the Apology Resolution, that these lands were ceded "without the consent of or compensation to the Native Hawaiian people of Hawai'i or their sovereign government." The Apology Resolution also states that "the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people or over their national lands to the United States, either through their monarchy or through a plebiscite or referendum." (Pub.L.No.103-150, 107 Stat. 1510). Legislation introduced in the U.S. Congress by Senator Daniel Akaka, called the Akaka Bill will acknowledge that Native Hawaiians have the right of self-governance and self-determination like Native American tribes. The majority of the lands in Makua, were designated government land of the Kingdom of Hawai'i under the Mahele of 1848 and are therefore considered Hawaiian national land. As a contiguous ahupua'a which is undeveloped it can provide important natural and cultural resources for a Native Hawaiian nation, provided it will be cleared of ordnance. Resumption of

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I18-15

In Section 4.10 of the Draft EIS, the Army assesses impacts to access to MMR. Although MMR is an active training complex, the Army at this time allows limited public access to cultural sites. Public access depends in part on training requirements, safety and other applicable policy, requirements, regulations/laws.

I18-16

In Section 4.10 of the Draft EIS, the Army assesses impacts to access to MMR. Although MMR is an active training complex, the Army at this time allows limited public access to cultural sites. Public access depends in part on training requirements, safety and other applicable policy, requirements, regulations/laws.

I18-17

Because nonmilitary use of ceded lands is not proposed by the Army and is not reasonably foreseeable, the EIS does not evaluate the impacts of proposed training on those activities. Use of ceded lands beyond those addressed in the EIS would be assessed in a separate NEPA document.

I18-18

Because remediation of MMR is not proposed at this time, discussion of this issue is beyond the scope of the EIS.

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<p>I18-19 military live fire training at Makua will only exacerbate the problem of unexploded ordnance removal upon the close of the reservation and make restoration of the valley's natural and cultural resources more expensive, if not prohibitive. The Draft EIS failed completely to analyze this issue. Kelly: Vol. 1, p. 19</p>	<p>I18-19 Please see response to Comment I18-18.</p>
<p>I18-20 Eighth, there is no assessment in the Draft EIS of the impact of burning the native ecosystem off of the landscape and increased erosion as the result of these fires upon cultural resources used for subsistence in the streams and the muliwai, including native plants and aquatic life, in the Makua Military Reservation.</p> <p>Informants interviewed for the reports describe the muliwai as important fishing areas where the community caught 'o'opu and 'opae when the streams flowed and where they stocked fish for harvest when the ocean was too rough. Army training and management of Makua have contributed to the destruction and degradation of the streams and the muliwai. Resumption of live-fire military training would further delay proper management of the springs, streams, and muliwai in order to restore the cultural resources identified by informants as having the potential to thrive in Makua streams and muliwai.</p>	<p>I18-20 These issues were addressed in Sections 4.7 and 5.3.7 of the Draft EIS. In addition, Section 5.3.8 of the Draft EIS identified impacts associated with prescribed burns in combination with the potential for wildfire-related soil erosion.</p>
<p>I18-21</p> <p>I18-20 Section 174C-101 of the Hawai'i Revised Statutes defines Native Hawaiian water rights. It states that "traditional and customary rights of ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778 shall not be abridged or denied by this chapter. Such traditional and customary rights shall include, but not be limited to, the cultivation or propagation of taro on one's own kuleana and the gathering of hihiwai, opae, 'o'opu, limu, thatch, ti leaf, aho cord, and medicinal plants for subsistence, cultural, and religious purposes." Traditionally, Native Hawaiian families gathered 'opae, 'o'opu, aholehole and other fish from the muliwai during the rainy season. Military activities, primarily live-fire training, that have caused wildfires that destroyed the native plant life have reduced the ability of the land to absorb the rain. Informants observe the disappearance of springs and wells that were plentiful in their lifetime. Informants attribute this to a cumulative reduction in the level of the water table in Makua. This has impacted the life cycle of stream life that Native Hawaiians customarily gathered seasonally for subsistence. According to informants, the denuding of the landscape has also contributed to erosion and the deposition of sediment in the muliwai that has impacted the life cycle of the aquatic life in those ponds.</p> <p>Oral History Sources: Kelly Volume II: p.212 - Ko'iahi stream used to have 'opae, ahole-hole, until toads introduced. [Note: this is the only source to attribute the decline to toads. Other informants in subsequent interviews conducted in the 1990's report seeing 'opae and 'o'opu and attribute the decline to the reduction of the water table due to fires destroying the native vegetation] Wai komo had mullet, alamihi, aholehole and 'opae. Makua stream had o'opu. p. 246 - when rain a lot, the 'opae and mullet were plentiful by the bridge p. 330 – 331 - in the stream had aholehole, mullet, 'opae when the rain runs down the mountain. Maly: R-12, Mr. Silva explained the relation of the streams and dune ponds to the fishery: "The stream-dune ponds had awa'aua [Chanos chanos] like that and 'opae [shrimp], 'aholehole [Kuhlia sandvicensis]. These ponds were an important fishery resource for the community when the oceans were too rough to go out. They go there, they only take what they need. He points</p>	<p>I18-21 In Section 4.10 of the Draft EIS, the Army assessed impacts to access to MMR. Although MMR is an active training complex, the Army at this time allows limited public access to cultural sites. Public access depends in part on training requirements, safety and other applicable policy, requirements, regulations/laws. Live-fire training at MMR does not restrict access to resources outside the installation boundaries, such as the muliwai. The Draft EIS identified the effects of proposed training as negligible on the muliwai and as significant on MMR streams.</p>

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out that the Makua stream bed and muliwai on the 'Ohikilolo side of the church lot, was a very important fishing resource, where there were 'o'opu and 'opae as well when there was a lot of rain and the stream flowed. Silva's transcript referring to the stream resources is on p. 53, 54, and p.90.

R-13 Mr. Bailey - The muliwai or dune-banked ponds were stocked with fish – “They caught mullet and aholehole [Kuhlia sandvicensis], the fish that can adapt to fresh, or brackish water. You also get aholehole and papio (young crevalle or jack fish).” p. 106 of the transcript.

Aila: In phone conversation, Aila spoke of seeing bullets in the muliwai which washed down from the streams, as an impact upon the streams and the muliwai. Aila observed an aeo (Hawaiian stilt), a male, female and juvenile auku'u (native heron) and an 'alae'ula at the muliwai, native birds that frequent wetlands.

I18-22 Ninth, there is no assessment in the Draft EIS of the cumulative impact of burning and denuding the landscape, replacing native ecosystems with alien plants, and the deposition of toxic contaminants associated with military training upon the water table and the inland springs and wells. Informants interviewed for reports speak of many wells and springs in Makua – which were destroyed by the Army. Despite being destroyed, the water sources that had been tapped by those wells should still be under the surface. A complete and thorough Draft EIS should assess the cumulative impacts of military training upon the water table, the effects of resumed live-fire training upon the water table, and measures that can be implemented to restore the water table in Makua.

Oral History Sources:

Kelly Volume II: p. 208, p. 222, p. 230, p. 232, p. 375, p. 387, p. 387-88, p. 392

p. 387 - Makua is a real damp area. Makua is green. Always has. That rain come out, and if you dig 10 to 15 feet you hit all the water you like. We was raised upon on the well water.

Brackish; further back you hit the spring water. The informant spoke also of water tunnels that McCandless had developed to provide water for his cattle and for his beachside home.

Prashad: p. 22 – Walter Kamana – stated that there was an artesian well near aunt's home, mango trees near house and Hawaiian “spring” bamboo that grew near the mango trees and that there were 12 to 15 wells plus natural water running down the mountainside. He described how waterfalls emptied into a streambed with a three-way split. The stream ran from Nanaui, Molohiki and Kuahi before joining into one single bed. There was a water supply in Molohiki.

Maly: p. R-12, p. 13, p. 24, p. 54, p. 90, p. 93, p. 174

Aila: in phone conversation also identified a well by the mango tree and spoke of several springs.

I18-23 Tenth, there is no assessment in the Draft EIS of the impact of increased erosion and the changes in the hydrology of Makua Valley upon coastal and nearshore marine life along the coast and in the ocean. Informants speak of the abundant marine resources of Makua, from 'opihi, pipipi and seaweeds, to the catching of various species of fish, kona crab, and muhe'e. The informants speak of the importance of fresh water streams, including underground springs that well up in the nearshore ocean, for the spawning of marine life in the ocean waters off of Makua. Kupuna informants even spoke of observing the nesting of turtles on Makua Beach. The effect of military training, especially of wild fires on denuding the landscape and the potential for the run off of sediment into the ocean is not addressed. The effect of the increased noise and activities upon turtle nesting is not discussed. The marine resources of Makua are an important

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I18-22

These issues were addressed in Sections 4.7 and 5.3.7 of the Draft EIS.

I18-23

Please see responses to Comments F1-32 and I18-22. The impact of increased erosion upon coastal and nearshore marine life in the coastal area and in the nearshore ocean environment was addressed in Section 4.9.4 of the Draft EIS and found to be less than significant.

I18-24

There is no documentation of turtle nesting occurring in the ROI, and thus this topic was not discussed. Sediment impacts were addressed in the Draft EIS (see pages 3-82, 4-114, 4-124, 4-138, 5-52, etc).

These issues were addressed in Sections 5.3.7 and 5.3.9 of the Draft EIS.

Comments

- I18-25 subsistence resource for the residents of the Wai'anae coast and a complete and thorough EIS which assesses the impacts of continuing military ground training exercises upon the nearshore marine resources is necessary.
Oral History Sources:
Kelly, Volume II: p. 246, 255, 283, 325, 327, 364, 366, 397
Prashad: p. 17, 22,
Maly: p. R-12, R-14, R-17, 18, 64, 65, 105, 106, 108, 111,
Aila: phone conversation
- I18-26 Eleventh, there is no assessment in the Draft EIS of the impact of military training upon the ability of Native Hawaiian families to continue their connection to ancestral 'aumakua or family guardian spirits in the Makua Military Reservation – the pueo (owl), the mo'o (water dragon lizard), the mano (shark) – and the ability of Native Hawaiian descendants to offer ho'okupu to these deities in their natural settings. Informants spoke of their family 'aumakua in Makua Valley and lamented their inability to connect to these family guardian spirits. In the oral history interview with Kepa Maly, the group of Makua family descendants called Kupu Ka 'Aina provide an insight into this problem:
 In Makua Valley, water was a very important and sacred resource. One of the famous springs, not far inland from the former Naiwi family residence, and the present-day Army Range Control Facilities, was the spring called "Mo'o Punawai." This spring was accessed by a hole in the side of a small pali (cliff) . . . It was a significant water source for the families of Makua, and is associated with stories of the mo'o (water guardian) and the shark Nanaue. While trying to work with the Army, Uncle Ivan told the Army about the spring and showed it to them; telling them how sacred it was to the Hawaiians of the area. A while later, when Uncle Ivan went back to Makua, the Army had covered the entrance to the cave, burying Mo'o Punawai. This broke Uncle Ivan's heart, and caused him great pain. It is because of experiences like that, that it is hard for us to just tell everything.
 Then again, we wonder why it is that we have to give up all of our secrets to prove what we know, practice, and believe. This isn't required of other native peoples. So why is it that the Hawaiians have to divulge everything?
 Other informants spoke of a shrine to a shark 'aumakua in Makua and of the experience of offering ho'okupu upon the shrine. Contemporary descendants of Native Hawaiian Makua families can revive ceremonies at these sites if access to these sites can be allowed.
Oral History Sources:
Kelly: p. 212, 222, 233 - 234, 246
Prashad: p. 12, p. 16, p. 22
Maly: p. 111, 174
Aila: phone conversation
- I18-27 Twelfth, there is no assessment in the EIS of the impact of military training upon access by Native Hawaiian families upon traditional trails to cultural use areas within Kahanahaiki, Makua and Ko'iahi. Informants describe a number of trails used traditionally to access resources, to hike over to Waialua, and to hike into Ka'ena. Native Hawaiians whose families lived in Makua, and who live in Wai'anae have expressed an interest in accessing those trails and in keeping
- I18-28 them open through periodic use. Again, a full and thorough EIS should assess the conditions of

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- I18-25
 The effects of proposed training on nearshore marine resources were assessed in Section 4.9 of the Draft EIS. The Army conducted an additional study regarding marine resources. The results are contained in Appendix G-8. The Army plans on developing a monitoring program for the MMR nearshore marine resources.
- I18-26
 The Draft EIS acknowledges that the impact of training on access by Native Hawaiians for all purposes will be impacted at a significant and unmitigable level.
- I18-27
 The Draft EIS acknowledges that the impact of training on access by Native Hawaiians for all purposes will be impacted at a significant and unmitigable level.
- I18-28
 The Draft EIS acknowledges that the impact of training on access by Native Hawaiians for all purposes will be impacted at a significant and unmitigable level.

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I18-28|the trails and the feasibility of allowing periodic access to them by Makua and Wai'anae families.
Oral History Sources
Kelly Volume II: p. 223
Prashad: p. 9, p. 23,
Maly: p. 68, p. 90
Aila: phone conversation

Concluding Observations

I18-14|Military training will disturb and prevent access to cultural resources for hunting and gathering
 by contemporary descendants of Makua and Wai'anae families. It will prevent descendants of
 I18-27|Makua families from accessing trails and sustaining connections to their family 'aumakua. It
 will prevent descendants of families of Makua and Wai'anae from assuming their kuleana
 (obligation) as Native Hawaiians.

I18-17|Military training will exacerbate the amount of ordnance that will have to be cleaned to return
 the ceded public lands to the state and Native Hawaiian people, increasing the cost of a clean up
 and restricting future uses of these lands.

I18-22|Military training increases the potential for wildfires, adding to the cumulative impact of fire
 I18-23|upon the landscape and related erosion upon the streams, the muliwai, water springs and wells,
 I18-24|and coastal and nearshore marine resources.

I18-27|Makua is an ahupua'a within the moku or district of Wai'anae. Native Hawaiians of the
 Wai'anae moku have expressed an interest in reincorporating the cultural resources of Makua
 within the range of their cultural activities. This is a serious claim that must be honored.

Letter I19

Comments

Responses

James "Sparky" Rodrigues
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 Wai'anae Hawaii 96792
 696-2823

Submitted via email (DO NOT use Email address)

I19-1 | I have repeated asked for more time, 120 days, to review and digest the content of the three volumes. The Army took several years compiling the document and you ask us to make comment. This is totally unfair and unreasonable. This is part of the social impact not addressed in the EIS. The information is reported in terms not easily understandable for most of us.

For example. The air quality study. three samples taken... demonstrating effort, clean bill of health for the activities conducted with a no significant impact. However in truth the test were done after training activity was reduced. No documentation on the level of intensity and the level of weapons systems used. measuring a match vs a bon fire. the test presented itself as honest but in truth is not. the other item not taken into consideration is air direction while testing.

I19-2 | It appears that test were done when wind blew away from the monitoring devices. NO real testing during intense live fire training makes the air test a sham. NO testing with the wind blowing toward the testing instruments. Testing protocol should have documented each and every training event. Testing should be conducted and several locations within and outside of MMR. The test results gives false results and impressions.

I19-3 | The document does not include MSDS or Health implications of each chemical constituent our community is being exposed. There are no Health baselines to identify how training will further impact our communities health. Community includes all aspects.

I19-4 | The SEGMENTING of the Stryker/Transformation EIS did not give our community a clear understanding of training requirements that would include Makua. We were assured that the Strykers would not be used in Makua. We were promised that if the Strykers came to Hawaii, Makua would no longer be used as a live fire training area. COMMUTATIVE IMPACT from all Military activity and industry upon our community MUS be addressed and included in this EIS.

I19-5 | Our community consistently testified that Makua is not appropriated for Live Fire training and should be returned to a cultural and traditional use.

I19-1

The Army extended the public review period from 60 days to 75 days. The commentor received Volume 1 of the Draft EIS and a CD containing all three volumes at the beginning of the review period. In addition, the commentor was notified that paper copies of the three volume sets were available for review at several local libraries. In response to comments, an additional 60 days were provided to the community to review the Draft EIS and associated studies related to marine resources and archaeological surveys, from February 2 to April 3, 2007.

I19-2

CALFEX monitoring was done during typical company-level CALFEX events, including use of artillery and mortar support units, use of aviation support units, and use of demolition charges. CALFEX monitoring was done on days with prevailing winds from typical northeast and east-northeast directions. Air monitoring stations were located north, east, south, and west of the main target areas in the ordnance impact area, allowing for monitoring of resulting air emissions regardless of wind direction. At MMR, wind directions varied throughout the course of the day, primarily due to surface heating and topographic effects. Coastal valleys on the western and southern sides of the Hawaiian Islands experience offshore wind flows at night, with winds rotating to on-shore and upslope directions during the day. As shown in Figure 3-5 of the Draft EIS, the sampling locations were inside the MMR boundary as well as at Makua Beach and the Silva Ranch. The sampling conditions were addressed in the Appendix G-6 of the Draft EIS.

I19-3

The impacts resulting from various chemical compounds have been assessed both in the Draft EIS and in the supporting investigations by analyzing air, water, and soil samples against health-based criteria in Chapter 4 and 5. Chapter 4 addresses health based criteria by comparing collected data to health-based EPA Region IX Preliminary Remediation Goals (PRGs).

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(Cont.)

I19-4

The SBCT EIS, Chapter 2 (page 2-43), section on Combined Live-Fire Maneuver Training, addresses how SBCT forces would conduct dismounted training to include company-level CALFEXs. MMR is important to military training in Hawaii, and thus SBCT forces would use MMR if the ranges were available after completion of the MMR Final EIS and ROD. The MMR EIS contains an analysis of the potential environmental impacts associated with dismounted CALFEXs for current forces and the SBCT (see Chapter 5). Two separate EISs were prepared for two different proposed actions, training at MMR and SBCT transformation. For these reasons, segmentation did not occur.

I19-5

The Army thanks you for your comment and appreciates your participation in this public review process. Your comment has been considered and has been included as part of the administrative record for this process

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I19-6 Technical assistance is needed to translate the content of the volume of material to properly understand the content of the document. TetraTech has thousands of educated professionals focusing their skills and talents to create the Makua Draft EIS. We are not able to compete on a level playing field. The sheer power of the USArmy budget focused on the Makua EIS further weights against the Wai'anae community. We are at a disadvantage socially and economically when dealing with these odds.

I19-6 The Army provided Malama Makua with funds for technical assistants to assist Malama Makua and other members of the Waianae Coast in understanding the issues involved during the EIS process in order to facilitate and inform public participation and comment in the NEPA process.

I19-1 I received my copies of the EIS nearly a month into the review time. This is not enough time for comments based on the volume of information to review. You deny our community the ability to participate fully in the EIS Process.

I19-7 The assessment of psychological impacts on the civilian population is outside the scope of NEPA. The focus of NEPA is on the environment. Pursuant to CEQ Regulations 40 CFR Part 1500, "NEPA is our basic national charter for protection of the environment." "The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment."

I19-7 As a Vietnam vet, training in my community has a negative impact on me and my family. Reliving the wartime stresses every time the convoy passes, chopper flies overhead and the sound of explosives as well as gunfire. This has gone on for years and is getting more difficult to endure emotionally and mentally. These impacts are not addressed in the EIS. I'm sure the mental health and quality of life is diminished because of the live fire training for our entire community. This is not included in the EIS.

I19-8 Property value is not discussed. My property is devalued because of the military in my community. Other properties of comparable size and build are 2 to 300% higher in value. Property Values of our community is not compared to other communities in this EIS.

I19-8 The EIS addresses the environmental effects expected from military training at MMR, and the associated socioeconomic issues that would result from those environmental effects. Socioeconomic issues were addressed in Sections 4.12 and 5.3.12 of the Draft EIS.

I19-9 Half of all students entering the 9th grade on the Wai'anae coast do not graduate high school. Of those who do graduate high school only a small number enters college. Education, employment and income of our community is not included in your EIS. The level of homelessness is not included in your EIS. All part of the COMMUTATIVE IMPACTS to activities documented in your EIS.

I19-9 The EIS addresses the environmental affects expected from the proposed action and the associated socioeconomic issues that would result from those environmental effects in Sections 3.12.2, 3.12.3, and 4.12.3.

I19-10 Troop harassment of citizens while on duty and off duty is not included in the EIS.

Poor institutional memory of pass commanders promises to the community. Poor behavior of leadership and troops demonstrate cultural insensitivity toward the host culture and beliefs.

I19-10 Harassment of community members by Soldiers is not authorized by Army commanders, and will be dealt with in accordance with the Uniform Code of Military Justice.

I19-11 Endangered species out planting with no fire plan demonstrate the failure of the Fish & Wildlife to protect our resources. Denying the cultural practitioners to participate in the determining practices to preserve cultural resources. Continuing current practices will further force endangered species in Makua to go extinct as the fire plan has failed every fire occurrence. Maintenance of native resources have failed and based on the EIS will continue to fail.

ALL of the above issues must be included in the study. A finding of NO USE is the preferred choice for Makua.

Mahalo, James "Sparky" Rodrigues. 10-6-05

Comments**Responses**

(Cont.)

I19-11

The 2005 ignition of a white phosphorous round and the 2003 prescribed burn are both good examples of the success of the Army's wildfire management plan. In both cases, firefighting resources were able to stop the fire before it burned onto lower Ohikilolo, where there are two endangered plant populations, *Chamaesyce celastroides* var. *kaenana* and *Hibiscus brackenridgei* ssp. *moku-leianus*. The intensive management of endangered species currently occurring within Makua Valley is not only maintaining the current on-site resources but also bolstering their numbers on- and off-site. In fact, two different endangered plant species, *Cyanea superba* and *Phyllostegia kaalaensis*, have been saved from extinction as a direct result of Army actions. The natural resources program collects propagules and other plant material as a means of storing the genetic material for the species threatened by military activities. Due to this collection, there is material available to propagate these two species and reintroduce them back into the wild and there are now over 100 individuals of

I19-11 (part 2)

the *Cyanea superba* in Makua. No species have gone extinct due to Army training activities in Hawaii.

Letter I20

Comments

**Review of Draft Environmental Impact Statement:
Military Training Activities at Makua Military Reservation, Hawai'i
March 2005**

By
Goro Uehara¹
Review prepared October 5, 2005

In an agreement between Malama Makua and the Department of the Army, the Army agreed to complete an environmental impact statement that includes, among other actions, studies to identify potential contamination of soil, surface water, and ground water, and of potential impacts on air quality, associated with training activities at Makua Military Reservation (MMR). My review will primarily focus on the soil and surface water study and the conclusions reached by the investigators.

My personal knowledge of the soils and vegetation of Makua is based on a review of the Soil Survey Report of Oahu published by the U.S. Department of Agriculture, and two visits to Makua Valley made within the last six years. My first visit to Makua Valley was made in late 2001 to collect soil samples to conduct a greenhouse bioremediation study of contaminated soils from the Open Burn/Open Detonation (OB/OD) site. This study showed that guinea grass (*Panicum maximum*), one of the dominant plants in the valley, is very effective in detoxifying RDX and HMX, two chemicals associated with the use of explosives in the MMR. Another plant that was found to degrade the two chemicals was beach naupaka (*Scaveaola sericea*). Since both species do not adsorb RDX and HMX, it is more likely that they contribute to chemical degradation by supporting a healthy microbial soil population that, in turn, consumes and degrades the chemicals. My second visit to Makua Valley was made in 2002 as part of my review of the draft work plan for the Army's hydrogeologic study.

Impact of fires on soil and water quality

Based on the bioremediation study, it now appears that vegetative cover not only protects the soil from the elements, but creates an unseen, below-ground environment that favors degradation of toxic chemicals. Burning of vegetation associated with live-fire training at MMR interferes with these natural processes promoting remediation of past contamination in Makua Valley. It also prevents build-up of soil organic matter and results in gradual loss of soil health. Soil organic matter is an important adsorbent of chemicals and prevents their movement into the groundwater with infiltrating rain water. Although the draft environmental impact statement (DEIS) recognizes fires as a problem in other contexts, it fails to take into account the long-term, adverse impacts on the soil's ability to provide important environmental services such as adsorbing and filtering water, sequestering carbon, recycling nutrients, reducing runoff and detoxifying chemicals.

I20-1

I20-2

¹ A copy of my resume is attached hereto.

Responses

I20-1

The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate. Fires associated with live fire training is addressed in the IWFMP.

I20-2

Please see response to Comment I20-1.

Comments

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Biased Soil Sampling

- I20-3 The Army did not correct the problems with its sampling methodology that I identified in comments on the draft hydrogeologic investigation work plan I prepared in 2002, and, thus, the sampling that was conducted failed to allow the Army to provide a reasonable picture of the amount and distribution of contaminants in the topsoil at MMR.² While the biased sampling scheme may have been designed to include the most highly contaminated sites, it greatly diminished the value of the samples for modeling purposes.
- I20-4
- I20-5 Modeling of ecosystem processes in spatially variable landscapes requires unbiased data that reflect the true spatial variability in the area under study. The purpose of models is to mimic natural processes that occur over space and time in the MMR. The biased sampling reduces the probability that the model will be able to mimic accurately processes such as transport of contaminants over space and time in the valley.

Model Calibration and Validation

- In Appendix G-1 (Hydrogeologic Investigation Report), page 168, the report states that "The model was calibrated to the February 14 flow event by comparing flows of water and sediment with measured flows, and the adjusting parameters until an acceptable match is achieved." In the same paragraph, the report goes on to say that "The model provides acceptable agreement between the simulated and measured stream flows." It appears from a reading of this section that the measured data set that was used to calibrate the model was reused to compare predicted versus measured results. If so, this is not a valid way of testing the capability of a model to predict transport processes over space and time in a watershed. Validation of a model requires comparison of predicted outcomes with independent sets of observed data not used in model calibration. If the Hydrogeologic Investigation Report failed to validate the model in this manner, results obtained from application of the model are not reliable.
- I20-6
- I20-7

Model Application

- If the Army now has a simulation model that performs as claimed in the Hydrogeologic Investigation Report, it should be able to simulate past, present and future rainfall events of varying intensities, and assess the impact of rare rainfall events that occur once in 10, 25, 50, 100 or 1000 years on Makua Valley's ecosystem under alternative land uses, including military training. A model serves no useful purpose if it is developed simply to prove that it can predict hydrologic processes in Makua Valley. Why was the model not used to investigate the impact of alternative military training practices, including worst-case scenarios, on such processes as soil erosion and sediment transport to the ocean?
- I20-8

² For your convenience, a copy of my comment letter is attached hereto.

Responses

I20-3

The sampling of all environmental media including air, soil, sediment, surface water and ground water was designed and the locations selected to maximize the data collected to ascertain the full range of impact of past and present military training at MMR. Further, soil samples collected at MMR were located in the areas of maximum concentrations of training activities. Background samples provided additional information to expand the spatial coverage. The sampling and analysis plan distributed to the public in 2002, as well as Appendix G-1 of the Draft EIS discuss soil study methodology and data.

I20-4

Please see response to Comment 20-3.

I20-5

Soil samples collected at MMR were located in the areas of maximum concentrations of training activities. Background samples provided additional information to expand the spatial coverage. The sampling and analysis plan distributed to the public in 2002, as well as Appendix G-1 of the Draft EIS, discuss soil study methodology and data. The data collected are representative of the existing conditions at MMR and were incorporated modeling.

I20-6

The surface water modeling was conducted in accordance with scientific practices. It is common to use data sets for calibration and comparison. Appendix G-1 has been revised to include expanded comparison to other surface water flows.

I20-7

The surface water modeling uses parameters obtained from both field data and information from the literature as discussed in Appendix G-1. It is standard practice in the surface water modeling field to use both field collected and literature obtained parameters to design the model.

Comments

Responses

(Cont.)

I20-8

The model simulates suspended sediment discharge and stream discharge for the 100 year storm event, which was the objective of the modeling effort. Appendix G-1 will be revised to provide a discussion of bed load.

Comments

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Model input

I20-9 To perform properly, a model needs reliable input data. The saying "garbage in, garbage out" applies here. In Appendix G-1, page 76, paragraph 3, the report states that "Soil hydraulic properties that control infiltration values for different soil types throughout the Makua Valley are input parameters required for the model. Values for shallow vertical hydraulic conductivity (Ks) varied from 0.10 to 25 cm hr⁻¹ (Figure 2.27). Most of the project area has the somewhat higher infiltration values of 25 cm hr⁻¹" The claim that most of the project area has infiltration rates of 25 cm/hr is not only highly unlikely, it would result in erroneous results if used in the model. Twenty five cm is equivalent to 10 inches. This implies that most of Makua valley could withstand rainfall intensities of up to 10 inches per hour. The soils of Makua valley, like most of the valley soils along the Waianae coast are high in the mineral smectite. These soils shrink and crack when dry and swell when wetted. They could accommodate 10 inches of rain for a few minutes owing to the large cracks that allow preferential flow to occur until the soil is saturated and the cracks seal to form an impermeable surface. The letter "s" in Ks is added when the hydraulic conductivity is measured for a water saturated soil. It would be more correct to say that most of the project area has soils with saturated hydraulic conductivities of 0.1 cm/hr. Most hydrologic models that require hydraulic properties of soils are sensitive to errors in Ks. Error exceeding two orders of magnitude should have been noticed by the model calibrators.

I20-10

Conclusion

I20-11 Inadequate knowledge of the soils of Makua Valley and incorrect assumptions about their properties and behavior have resulted in a DEIS that fails to give clear evidence of the long-term, cumulative effect of using the valley for military training. The long-term build-up of chemicals from explosives, the loss of remediating benefits of vegetation from fires and the inability to estimate the impact of hydrologic events on the fate of chemicals preclude concluding that Makua Valley can be used for military training without undergoing significant, adverse environmental changes.

I20-12

Responses

I20-9

The value of 25 cm/hr is a hydraulic conductivity value of the material, not an infiltration rate. The hydraulic conductivity is a variable in Darcy's law $V=KI$, where the rate (V) is reduced by the vertical gradient (I).

I20-10

Please see response to Comment I20-9. A hydraulic conductivity value of 25 cm/hr (20 ft/day) is a reasonable value for Makua (the average K of slug test data is 12.6 ft/day).

I20-11

The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate. Soil sampling at the various locations (including background locations) provided information to evaluate the likely pathways of contaminate migration at MMR.

I20-12

The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate. Results of extensive sampling results reported by the analytical laboratory of soil, surface water, and groundwater showed no pattern of contamination.

Letter I21

Review of US Army Corps of Engineers
Hydrological Investigation Report for Makua Military Reservation
February 2005

By

William Meyer¹
October 5, 2005

INTRODUCTION

The hydrogeologic investigation completed for the Makua Draft Environmental Impact Statement (draft EIS) follows the description of work outlined in the "Hydrogeologic Investigation Work Plan, Makua Military Reservation" dated October 2002. The latter plan was completed following comments on a draft version of the plan submitted for public review in June 2002. The objective of the investigation as stated in the October 2002 workplan was to "evaluate the potential for chemicals from Army operations to have impacted the surface water or ground-water flowing off of Makua Military Reservation, (p.3-2)."

I21-1 | This is a change from the objectives stated in the June 2002 draft plan for which the stated purpose was to "provide information related to evaluating if Army operations have impacted groundwater, surface water, or soil throughout the Makua valley (Hydrogeologic Investigation Work Plan, Makua Military Reservation" June 2002, p. 8)." As also stated the "studies will evaluate whether there is the potential for any contaminates to be transported beyond the boundaries of MMR (Makua Military Reservation) that may contaminate the Muliwai Ponds, or any marine resources, or wildlife on or near Makua Beach" (Hydrogeologic Investigation Work Plan, Makua Military Reservation" June 2002, p. 8).

I21-2 | Despite the apparent change in objective, it is not possible to fully evaluate the potential for chemicals from Army operations to have impacted the soil, surface water or ground-water flowing off of Makua Military Reservation (MMR) without first establishing the extent that soil, surface water, and ground-water are impacted on the reservation at the present time.

I21-3 | Contaminant transport from the MMR by hydrologic processes would occur by overland flow and via the ground-water system. An evaluation of these means of transport requires construction and calibration of models that simulate overland flow and the ground-water system underlying the MMR. Overland flow includes both transport of contaminated sediment and contaminants dissolved in water.

¹ Please see attached resume.

Responses

I21-1

Sampling was conducted pursuant to the Final Sampling and Analysis Plan, which was developed with input from the community.

I21-2

The hydrogeologic assessment represents a widespread evaluation of the potential for contamination as reflected in Appendix G-1. Sampling was conducted of soil, sediment, surface water, and groundwater with no pattern of contamination that would impact off-site receptors.

I21-3

The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate.

Comments

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I21-4 Although the October workplan stated that it incorporated changes to the scope of work from that outlined in the June version of the plan based, in part, on recommendations and comments received from consultants hired by Malama Makua, **these changes failed to address the full extent of the concerns I raised in my letter to the U.S. Army dated August 6, 2002.**²

SITE CHARACTERIZATION

I21-5 Evaluating the potential for compounds associated with present and historic training to be transported beyond the boundaries of MMR initially requires sampling of the soil, surface water and ground-water (both the saturated and the unsaturated zones) within and beyond MMR in order to determine if contaminants associated with activities of the U.S. Army in MMR are present. As stated in my August 6, 2002 letter, for site characterization, the sampling program conducted for the Draft EIS must be obtained in a scientifically acceptable manner that satisfies requirements for investigating the spatial and temporal distribution of potential contaminants. **Neither the June or October 2002 workplan, nor the work performed for the Draft has EIS satisfied these requirements.**

I21-5 **The MMR encompasses about 4,170 acres and sampling must be conducted in a manner that incorporates the entire area. This was not done however.**

Soil Sampling

I21-7 Instead of collecting samples on a non-biased spatial basis throughout the MMR, sample collection was purposely biased. Soil samples were only collected from 18 areas of concern (as identified by the Army), and an additional 22 sites located, for the most part, outside of the roads that form the boundaries of the areas of concern. Further bias was introduced in that, as stated in the Draft EIS, "*The samples were collected as discrete samples biased toward visual observations.*" The introduction of bias in the sampling program does not adhere to generally accepted scientific practice. **This failure means the results obtained from the soil sampling program conducted for the Draft EIS should not be considered as representative of the full range of potential impacts of past and present activities of the U.S. Army with regard to soil contamination.**

I21-4 Some specific comments made in my August 6, 2002 letter for soil sampling that were not incorporated in the work performed for the Draft EIS are as follows:

² For your convenience, I've enclosed a copy of that letter.

Responses

I21-4
 The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate.

I21-5
 The sampling of all environmental media (including air, sediment, soil, surface ground water) present at MMR can be used to scientifically evaluate training (both historic and present) and the likelihood of contaminants being transported off MMR. The sampling of environmental data are reported in Appendix G.

I21-6
 The EIS was prepared in accordance with the National Environmental Policy Act and with applicable federal and Army regulations. Review of the Draft EIS by the US Environmental Protection Agency found the document to be adequate. Sampling of media at MMR that could potentially be contaminated was conducted.

I21-7
 Soil samples collected at MMR were located in the areas of maximum concentrations of training activities. Background samples provided additional information to expand the spatial coverage. The sampling and analysis plan distributed to the public in 2002, as well as Appendix G-1 of the Draft EIS, discuss soil study methodology and data.

I21-8
 The sampling of all environmental media including air, soil, sediment, surface water and ground water was designed and the locations selected to maximize the data collected to ascertain the full range of impact of past and present military training at MMR. Further, soil samples collected at MMR were located in the areas of maximum concentrations of training activities.

Comments

Responses

(Cont.)

I21-8

Background samples provided additional information to expand the spatial coverage. The sampling and analysis plan distributed to the public in 2002, as well as Appendix G-1 of the Draft EIS discuss soil study methodology and data.

Comments

Responses

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- I21-7 a. Given the objective of the sampling program, it is necessary to collect samples on a non-biased basis throughout the MMR. The biased sampling program described in the draft work plan (and carried out in the work performed for the Draft EIS) has a strong potential to cause the Army to reach the conclusion that contaminated soil is not moving from contaminated sites during runoff events, when the opposite would actually be true.
- I21-8 b. The draft plan leaves substantial room for conducting a soil sampling program that would not result in an ability to evaluate the approximate spatial distribution of potential contaminants within the entire MMR.
- I21-7 c. The draft plan leaves substantial room for conducting a soil sampling program that would not result in an ability to evaluate the approximate temporal distribution of potential contaminants within the entire MMR.
- I21-9 d. A more definitive non-biased soil sampling program in terms of the spatial coverage for the MMR as whole needs to be specified before soil sampling actually occurs.
- I21-9 e. All of the samples collected (not only 10 percent, as proposed by the draft work plan) need to be analyzed for all contaminants.

Instead of chemical analysis being conducted on all samples, only twenty percent of the collected samples were actually analyzed for contaminants. This reduction in sample analysis further biases the sampling program.

Vadose Zone (Unsaturation Zone) Monitoring

The vadose zone, which, in modern hydrology texts is referred to as the unsaturated zone, occurs between the ground-surface and the ground-water table below which openings in rocks are fully saturated with water. The pores in the unsaturated zone, by way of contrast, contain a mixture of air and water. For contaminants to enter the ground-water system underlying the MMR, they must first pass through the unsaturated zone. Most generally, this movement is the result of contaminants dissolved in water passing through the unsaturated zone to the ground-water table. Precipitation is the most common source of water for this movement.

I21-10 **The unsaturated zone sampling program conducted for the draft EIS did not permit the spatial and temporal distribution of contaminants in the unsaturated zone to be established within the MMR. Water samples were collected only at three locations, making it impossible to fully identify the potential impacts of past and present activities of the U.S. Army with regard to contamination of the unsaturated zone in the MMR.**

I21-9

The selection of analyses in the sampling analysis plan was based upon the history of past and present training activities at MMR, thereby optimizing data usability and evaluation of soil contaminants.

I21-10

In accordance with the sampling analysis plan, vadose zone samples were collected in those locations most likely to contain contamination. The lack of contamination in the groundwater wells shows there is no evidence of widespread vadose zone contamination. Appendix G-1 provides further data and discussion on these issues.

Comments

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I21-11 In addition to the need to establish a sampling program that follows acceptable scientific procedure, I also recommended in my May 13, 2002 letter to Mr. Calvin Mashita and in my August 6, 2002 review of the Draft Work Plan, that sampling of the unsaturated zone should be conducted over one or more years to fully account for seasonal and potentially longer variations in the rate and concentration of contaminant movement. **Rather than follow this recommendation, samples were only collected twice, once in April and once in June 2003. This sampling frequency makes it impossible to evaluate potentially longer variations in the rate and concentration of contaminant movement as a result of 1) variations in the movement of water through the unsaturated zone and 2) possible variations in the amount and type of contaminant available as a source of contamination.**

Sampling of water in the unsaturated zone was conducted at two locations in the OB/OD area (B-1 and B-2) and at one location in the Junk Car pit (B-3). Lysimeters were set at 30 and 42 feet at B-1 and 30 and 45 feet at B-2. The lysimeter at B-3 was set at a depth of 19 feet. Water samples were collected in April and June, 2003. As stated in the draft EIS, "results (of the sampling) indicate that RDX and several other contaminants have migrated to depths of at least 50 feet (15 meters) below the surface beneath the OB/OD area (p. 3-91)." In fact, significant concentrations of RDX were found at B-1 in both lysimeters (4.8 mg/l at 30 feet and 2.9 mg/l at 45 feet). Concentrations at B-2 were 0.027 mg/l and 0.033 mg/l at depths of 30 feet and 42 feet respectively. Significant concentrations of HMX were also found in the deepest lysimeter at B-1 (1.4 mg/l)

I21-13 **Because samples were obtained in only April and June, 2003, seasonal or longer term trends in the downward movement of contaminants at these location is unknown. Also the great variability of the concentration of RDX and HMX at B-1 and B-2 suggest the potential exists for even greater variability in the concentration of these compounds over the OB/OD area than that observed at the two sites. Thus, measurements obtained at B-1 and B-2 cannot be assumed to characterize contaminant levels at the OB/OD area.**

I21-15 The EIS states that "the maximum depth of migration of RDX or other compounds was not determined, but given the low permeability of the sediments beneath the OB/OD area, which impedes the downward movement of ground water, it is likely that the concentrations would decrease substantially with depth (p.3-91)." **This statement is pure speculation and not supported by the data itself, given that extremely high concentrations of RDX and HMX were found in the deep lysimeter at B-1. Impediment of the rate of downward movement of water will not, in and of itself, reduce the concentration of a contaminant with depth given sufficient time for contaminant movement. Chemical binding of the contaminant with soil particles can, but, as stated in the report, "RDX tends to bind to the surface of soil particles if the soil contains natural organic material. But most of the natural organic material in**

Responses

I21-11
 It is common practice to collect groundwater samples over one year to evaluate the seasonal impacts from basinwide groundwater flow. The impact to the vadose zone by seasonal variation is limited; therefore, two rounds of sampling are acceptable to evaluate the vadose zone contamination that could potentially impact off-site receptors.

I21-12
 Please see response to Comment I21-11.

I21-13
 Sampling of downgradient wells established no downward movement of contaminants off-site. Please see Appendix G-1.

I21-14
 RDX and HMX were not detected in the downgradient monitoring wells (Appendix G). The two boreholes B-1 and B-2 were placed in the regions shown from geophysical data to have the greatest potential for having been trenched and therefore the greatest potential for contamination.

I21-15
 RDX and HMX are not detected in the downgradient monitoring wells. The two boreholes B-1 and B-2 were placed in the regions shown from geophysical data to have the greatest potential for having been trenched. These areas would most likely contain the highest concentrations of RDX and HMX. Also, retardation rates of RDX and HMX in the vadose zone is well documented (ERDC, 2002) to occur the further from the source area that the RDX travels in solution. In order for the RDX and HMX to be of a concern, there has to be an impacted receptor. There is no known impacted receptor.

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most soils is found in the surface layer of the soil. The amount of natural organic material tends to diminish greatly with depth below the root zone of plants... At depths 30 to 50 feet (9 to 15 meters), the amount of RDX that binds with the sediment particles would be much less than in the surface soils, and a larger percentage of RDX would remain in the soil pore water (p.3-92)." **Thus, chemical binding would not be expected to significantly reduce the concentration of RDX in pore water as it moved below the deeper lysimeters. The ability of soil particles to bind with a given contaminate also has an upper limit and once this limit is reached, additional binding will not occur. In addition, as discussed below, volcanic rock underlies the OB/OD area at an altitude of about 300 ft. in the area of the OB/OD, or about 150 ft below land surface, and this rock would not be expected to contain natural organic material.**

I21-16

Given that the use of the OB/OD area has fluctuated over time, thereby causing the source of contaminants to similarly fluctuate, it is entirely possible that higher concentrations of contaminants exist below the two deepest lysimeters at B-1 and B-2. This consideration further refutes the Draft EIS assumption that concentrations of contaminants measured at B-1 and B-2 decrease below the deepest lysimeters.

I21-17

The Draft EIS also states that "*there is no indication that RDX has migrated to the depth of the groundwater aquifer beneath the OB/OD area; RDX was not detected in groundwater from MW-5, the nearest well to the OB/OD area.*" **This statement lacks scientific credibility and is not consistent with statements made within the draft EIS.**

I21-18

In the first place, it is not possible to determine if RDX has migrated to the depth of the groundwater aquifer beneath the OB/OD because there are no wells from which to obtain samples at this location. In the second place, although MW-5 is located between the OB/OD area and the ocean, there is no reason to expect that the well automatically samples water that has moved from the area toward the ocean. Just the opposite may be true. As stated in the draft EIS, "*there are generally two components of ground-water flow to the ocean: the regional ground-water flow in the Waianae volcanic rocks (...) and potentially the ground-water flow in perched layers in the alluvium ...*" (p. 59, Appendix H). This movement is shown in figure 2.17 (p. 58). Thus, if the contaminant moved into the regional flow system, it would not be detected by the well. Finally, based on a 14 ft. water level established for MW-5 (p. 159), the depth of freshwater flow at MW-5 is approximately 560 ft. below sea level, applying the Ghyben-Herzberg principle. MW-5 is screened from 20 ft above sea level to a depth of 85 ft below sea level (table 2.6, p.57). This leaves about 475 ft of freshwater flowing below the well. Given these

I21-19

considerations, there is no reason to expect that an absence of RDX at MW-5 indicates that RDX has not migrated to the ground-water aquifer beneath the OB/OD area.

I21-20

Although MW-5 is stated to be an "*an "early warning well" to measure the potential for contamination from upland areas, such as the OB/OD area or impact area, to discharge to the ocean,*" it fails in this regard due to the large part of the freshwater column flowing below the well and owing to other possible paths of contaminant flow.

Responses

I21-16

Please see response to Comment I21-15.

I21-17

Please see response to Comment 21-15.

I21-18

Analysis of the data supports the assessment that there was no impact to off-site receptors from the RDX and HMX in groundwater flow from the OB/OD area (see Appendix G-1).

I21-19

MW-5 is directly in the flow path of groundwater flowing from beneath the OB/OD area and the ocean. Given the low detection limit of the explosive method (EPA 8330), and flow within a porous media environment, dispersion of the compound dissolved in water flowing downgradient would show at least trace levels in well MW-5 if RDX was flowing downgradient. Trace levels of RDX were not found in MW-5.

I21-20

All monitoring wells at MMR were designed to provide "sampling support" to each other, i.e. wells located downgradient of MW-5 were also sampled to determine if contaminants moved passed MW-5 and would then be picked up by multiple sampling events for other monitoring wells. Given the low detection limit of the explosive method (EPA 8330), and flow within a porous media environment, dispersion of the compound dissolved in water flowing downgradient would show at least trace levels in well MW-5 if RDX was flowing downgradient. It is necessary for the RDX to first travel though the shallow part before it travels to the deeper parts of the water column. Trace levels of RDX were not found in MW-5.