Environmental Assessment
for
Kalākaua Phase 3 Housing Development
Residential Communities Initiative
Schofield Barracks, O‘ahu, Hawai‘i

Prepared for:

Commander, US Army Garrison, Hawai‘i

Prepared by:

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Honolulu, Hawai‘i

May 2011

ENVIRONMENTAL ASSESSMENT ORGANIZATION

This environmental assessment (EA) addresses the proposed action to implement the Army Residential Communities Initiative at a project site on Schofield Barracks. It has been developed in accordance with the National Environmental Policy Act and implementing regulations issued by the Council on Environmental Quality (40 CFR, Parts 1500-1508) and the Army (32 CFR, Part 651). Its purpose is to inform decision makers and the public of the likely environmental and socioeconomic consequences of the proposed action and alternatives.

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SECTION 1.0: ***PURPOSE, NEED, AND SCOPE*** summarizes the purpose of and need for the proposed action and describes the scope of the environmental impact analysis process.

SECTION 2.0: ***PROPOSED ACTION*** describes the proposed action to implement Residential Communities Initiative actions at the project site on Schofield Barracks.

SECTION 3.0: ***ALTERNATIVES*** examines alternatives for implementing the proposed action.

SECTION 4.0: ***AFFECTED ENVIRONMENT AND CONSEQUENCES*** describes the environmental conditions at the project site that could be affected by the proposed action and identifies potential environmental effects that could occur if the alternatives were implemented.

SECTION 5.0: ***FINDINGS AND CONCLUSIONS*** summarizes the resulting environmental effects.

SECTION 6.0: ***REFERENCES*** provides the bibliographical information for cited sources of information.

SECTION 7.0: ***LIST OF PREPARERS*** identifies persons who prepared this EA.

SECTION 8.0: ***PERSONS CONSULTED*** provides a listing of persons and agencies consulted during the preparation of this EA.

SECTION 9.0: ***DISTRIBUTION LIST*** identifies recipients of this EA.

APPENDIX A Coastal Zone Management Act Negative Determination Letter.

APPENDIX B Record of Nonapplicability of EPA General Conformity Rule (Air Quality)

ACRONYMS AND ABBREVIATIONS

Draft

Finding of No Significant Impact
Kalākaua Phase 3 Housing Development Under the
Army Residential Communities Initiative at Schofield Barracks, O‘ahu, Hawai‘i

In accordance with the Council on Environmental Quality Regulations (40 CFR, Parts 1500-1508) for implementing the procedural provisions of the National Environmental Policy Act (NEPA; 42 USC, Section 4321 et seq.) and the Army NEPA regulations (32 CFR, Part 651), the US Army conducted an environmental assessment (EA) of the potential environmental and socioeconomic effects of the proposed implementation of the Army's Residential Communities Initiative (RCI) at a 41.8-acre parcel on Schofield Barracks.

Purpose and Need

The purpose of the proposed action is to improve family housing and ancillary supporting facilities at Schofield Barracks. The proposed action is needed to provide affordable quality housing and ancillary facilities to service members and their families by constructing housing units to exceed current military and local housing construction standards.

Proposed Action

Consistent with the authorities contained in the 1996 Military Housing Privatization Initiative, the US Army Garrison, Hawai‘i (USAG-HI) in April 2005 conveyed all military family housing units and selected ancillary supporting facilities and granted a 50-year ground lease for the areas on which the housing and facilities are located to Island Palm Communities, LLC (IPC, formerly known as Army Hawai`i Family Housing, LLC).

USAG-HI proposes to add approximately 41.8 acres of the South Range area of Schofield Barracks to an existing 50-year ground lease held by IPC. On this parcel, 230 units of multifamily housing would be constructed as part of the Kalākaua Phase 3 Housing Development. The proposed end-state after build-out would be an increase of 155 housing units to the Schofield Barracks RCI housing from the 3,860 units proposed and previously analyzed under NEPA.

The proposed action includes measures to address potential effects on cultural resources. The privatization of family housing on USAG-HI lands is governed by a Programmatic Agreement (PA) among the US Army, Hawai‘i State Historic Preservation Office, and the Advisory Council on Historic Preservation. The Programmatic Agreement outlines what activities IPC is allowed to conduct with respect to cultural and archaeological resources, historic properties, and "exceptional trees" on Schofield Barracks. The 41.8-acre parcel would be incorporated into the Programmatic Agreement through an amendment.

Alternatives Considered

Alternatives analyzed in the EA include the proposed action and a no action alternative, as prescribed by the Council on Environmental Quality regulations. The no action alternative serves as a baseline against which the impacts of the proposed action and any alternatives can be evaluated. Under the no action alternative, USAG-HI would not implement the proposed action but would continue to redevelop the Schofield Barracks housing areas, an action that was addressed in a previous EA and record of environmental consideration.

IPC and the USAG-HI considered the following alternatives to the proposed action but eliminated them from further analysis for the reasons stated:

- **Use of more four-unit housing at other neighborhoods—**The Army dismissed this alternative because it wanted to retain the single-family home and duplex neighborhood massing;
- **Use of green space in other neighborhoods—**This alternative was dismissed because doing so would have negatively impacted quality of life in other neighborhoods;
- **Purchasing existing housing off-post—**The 2008 Housing Requirements Update took into consideration off-post housing stock when determining the on-post housing requirements. This alternative was dismissed because the Army was unable to identify sufficient stocks of suitable housing near Schofield Barracks; and
- **Building on tax map key 92005002 (2,396-acre parcel owned by IPC)—**This alternative was dismissed because this area is zoned for agricultural use (AG-1), and it was determined that it would be retained for agricultural uses. Constructing housing on the parcel was considered both cost prohibitive (no utility infrastructure and long distances to points of service) and undesirable, due to the requirement to for it to be rezoned from AG-1 to R5 (residential).

Factors Considered in Determining that No Environmental Impact Statement is Required

In the EA, which is attached and incorporated by reference into this finding of no significant impact (FNSI), the potential effects of the proposed action and the no action alternative on the following 13 resources areas were examined: aesthetics and visual resources, air quality, biological resources, cultural resources, environmental justice, hazardous materials and conditions, land use, noise, socioeconomics, transportation, utilities and public services, water resources, and geology, soils, and seismicity.

Implementing the proposed action would result in a combination of adverse and beneficial impacts. Under the proposed action, there would be minor adverse effects on aesthetics and visual resources, air quality, biological resources, environmental justice, hazardous materials and conditions, noise, transportation, utilities, water resources, and geology, soils, and seismicity. Beneficial effects are expected for hazardous materials and conditions (wildfires), land use, and socioeconomics. With incorporation of mitigation measures into the proposed action, there would be no effects on cultural resources.

Summary of Potential Environmental and Socioeconomic Consequences

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Aesthetic and Visual Resources		
• Conflict with visual resource regulations	None	None
• Degrade the visual character or quality of site and surroundings	Minor adverse	None
• Block or disrupt views	Minor adverse	None
• Create a new source of light or glare	Minor adverse	None

Summary of Potential Environmental and Socioeconomic Consequences

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Air Quality		
• Criteria air pollutants	Short-term, minor adverse; long-term, none	None
• Greenhouse gases	Minor adverse	None
Biological Resources		
• "Take" a sensitive status species or result in a jeopardy opinion	None	None
• Reduce the population of a sensitive species	None	None
• Damage or degrade wetlands or riparian habitat	None	None
• Interfere with the movement of any native resident or migratory wildlife species	Minor adverse	None
• Alter or destroy habitat	Minor adverse	None
• Introduce or increase the prevalence of undesirable nonnative species	Minor adverse	None
• Cause long-term loss or impairment of a substantial portion of local habitat	None	None
Cultural Resources		
• Archaeological resources	None	None
• Traditional Native Hawaiian resources	None	None
• Built environment resources	None	None
Environmental Justice		
• Low-income or minority groups	None	None
• Endangerment to children	None	None
Geology, Soils, and Seismicity		
• Erosion	Short-term, minor adverse; long-term, none	None
• Expansive soils	Minor adverse	None
• Seismicity	None	None
Hazardous Materials and Conditions		
• Munitions and explosives of concern	None	None
• Pesticides	Minor adverse	None
• Petroleum products	Minor adverse	None

Summary of Potential Environmental and Socioeconomic Consequences

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
• Installation Restoration Program sites	None	None
• Transport, use, storage, and disposal of hazardous substances	Minor adverse	None
• Wildfires	Beneficial	Minor adverse
Land Use	Minor beneficial	None
Noise		
• Construction noise	Short-term, minor adverse; long-term, none	None
• Operation and maintenance	Short-term, minor adverse; long-term, none	None
Socioeconomics		
• Population	None	None
• Employment and total income	Short-term, beneficial; long-term, none	None
• Demand for housing	Beneficial	None
• Demand on public services (for example, schools)	None	None
Transportation		
• Intersection operations	Minor adverse	None
• Roadway segment operations	Minor adverse	None
• Parking	None	None
• Pedestrian facilities	None	None
• Bicycle facilities	None	None
Utilities and Public Services		
• Police, fire, and emergency management	Minor adverse	None
• Potable water supply	Minor adverse	None
• Sanitary wastewater	Minor adverse	None
• Stormwater	Short-term, minor adverse; long-term, none	None
• Solid waste	Minor adverse	None
• Communications	None	None
• Electricity	Minor adverse	None
Water Resources		
• Surface water runoff and erosion	Short-term, minor adverse; long-term, none	None
• Flood hazards	None	None

Conclusion

Based on the findings in the EA, implementing the proposed action would have no significant direct, indirect, or cumulative effects on the resources above, so an environmental impact statement need not be prepared. This EA supports the issuance of a FNSI.

Public Comment

The EA and draft FNSI are available for review and comment for 30 days, from June 8, 2011, to July 7, 2011. Copies of the EA and draft FNSI can be obtained by contacting Carol L. Jones at the Hawai‘i RCI Office at Building 950, 215 Duck Road, Schofield Barracks, HI 96837, (808) 655-7394, FAX (808) 655-8090. Copies of the EA and draft FNSI are available for review at the Wahiawā Public Library, 820 California Avenue, Wahiawā ([808] 622-6345) and the Hawai‘i State Library, 478 South King Street, Honolulu ([808] 586-3500). Comments on the EA and the draft FNSI should be submitted to the Hawai‘i RCI Office at the address listed above or by electronic mail to carol.jones@us.army.mil no later than July 7, 2011.

_____ _____

DOUGLAS S. MULBURY Date
Colonel, US Army
Commander, US Army Garrison, Hawai‘i

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ENVIRONMENTAL ASSESSMENT
KALĀKAUA PHASE 3 HOUSING DEVELOPMENT
ARMY RESIDENTIAL COMMUNITIES INITIATIVE
SCHOFIELD BARRACKS, O'AHU, HAWAI'I

Approved by:

US ARMY GARRISON, HAWAI'I

DOUGLAS S. MULBURY
Colonel, US Army
Commander

May 2011

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ENVIRONMENTAL ASSESSMENT

LEAD AGENCY: US Army Garrison, Hawai‘i

TITLE OF PROPOSED ACTION: Kalākaua Phase 3 Housing Development, Residential Communities Initiative, Schofield Barracks Military Reservation, O‘ahu, Hawai‘i

AFFECTED JURISDICTION: The City and County of Honolulu

PREPARED BY: Tetra Tech, Inc.

APPROVED BY: Douglas S. Mulbury, Colonel, US Army, US Army Garrison, Hawai‘i

ABSTRACT: This environmental assessment (EA) considers the environmental and socioeconomic effects of the proposed implementation of the Army`s Residential Communities Initiative at a 41.8-acre parcel on Schofield Barracks. This report identifies, evaluates, and documents the effects of transferring the parcel on the Army's South Range to Island Palm Communities' 50-year ground lease for the developing, constructing, maintaining, and managing family housing and ancillary supporting facilities. A no action alternative is also evaluated. Implementing the proposed action is not expected to result in significant environmental impacts, so an environmental impact statement is not required, and a finding of no significant impact (FNSI) will be published in accordance with the Army regulation and the National Environmental Policy Act.

REVIEW COMMENT DEADLINE: The EA and draft FNSI are available for review and comment for 30 days, from June 8, 2011, to July 7, 2011. Copies of the EA and draft FNSI can be obtained by contacting Carol L. Jones at the Hawai‘i RCI Office at Building 950, 215 Duck Road, Schofield Barracks, HI 96837, (808) 655-7394, FAX (808) 655-8090. Copies of the EA and draft FNSI are available for review at the Wahiawā Public Library, 820 California Avenue, Wahiawā ([808] 622-6345) and the Hawai‘i State Library, 478 South King Street, Honolulu ([808] 586-3500). Comments on the EA and the draft FNSI should be submitted to the Hawai‘i RCI Office at the address listed above or by electronic mail to carol.jones@us.army.mil no later than July 7, 2011.

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EXECUTIVE SUMMARY

INTRODUCTION

In accordance with the Council on Environmental Quality Regulations (40 Code of Federal Regulations [CFR], Parts 1500-1508) for implementing the procedural provisions of the National Environmental Policy Act (NEPA; 42 US Code [USC], Section 4321 et seq.) and the Army National Environmental Policy Act regulations (32 CFR, Part 651), the US Army conducted an environmental assessment (EA) of the potential environmental and socioeconomic effects of the proposed implementation of the Army's Residential Communities Initiative (RCI) at a 41.8-acre parcel on Schofield Barracks.

This EA has been developed in accordance with NEPA and with implementing regulations issued by the Council on Environmental Quality and the Army (32 CFR, Part 651). Its purpose is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives.

This EA incorporates by reference and tiers off from the *Environmental Assessment of Implementation of the Army Residential Communities Initiative, O'ahu, Hawai'i* (US Army 2004a). That EA, completed in January 2004 and referred to as the 2004 EA, was an analysis of the Army's implementation of the RCI program at seven housing areas (Schofield Barracks, Wheeler Army Airfield, Helemanō Military Reservation, Fort Shafter, Aliamanu Military Reservation, Tripler Army Medical Center, and Kia'i Kai Hale). The proposed action covered in that EA included increasing the Schofield Barracks housing inventory from 3,424 units to 3,476 units. This EA also incorporates by reference and tiers off from the record of environmental consideration (REC) prepared for Implementation of the Community Development and Management Plan February 2004, developed for the Army RCI, O'ahu, Hawai'i (US Army 2004b). That REC, completed in September 2004 and referred to as the 2004 REC, analyzed revisions to the 2004 EA proposed action that increased the proposed Schofield Barracks housing inventory to 3,860 units. The proposed action in this EA addresses only incremental changes to the previous proposed action addressed in the 2004 EA and 2004 REC. These changes are limited to incorporating an additional parcel, the project site, and approximately 155 family housing units into the RCI program at Schofield Barracks. The proposed end-state housing inventory would be approximately 4,015 family housing units at Schofield Barracks.

BACKGROUND

The Army operates and maintains approximately 110,000 family housing units at its installations throughout the United States. In the 1990s, the Army assessed the military housing inventory and needs. More than 75 percent of the units did not meet modern Army housing standards. Despite this, at most installations, demand for adequate on-base housing exceeds supply. Before the RCI was implemented in 2005, the lack of adequate on-base housing was forcing many service members and their families to live in housing in need of repair or renovation or to live off-base, where the cost and quality of housing varied considerably. Often, the costs to service members and their families to live off-base are 15 to 20 percent greater than the costs to live on-base. The Army estimated that as much as $6 billion would be needed to bring its housing up to current standards and to address the housing deficit.

In recognition of these problems, Congress enacted Section 2801 of the 1996 Defense Authorization Act (Public Law 104-106, codified at Title 10 USC, Sections 2871to 2885). Also known as the Military Housing Privatization Initiative (MHPI), this law creates alternative authorities for improving and constructing military family housing. Congress's intent for enacting these additional authorities was to enable the military to obtain private sector funding to satisfy family housing requirements. By leveraging scarce public funding, the Army can obtain private sector funds for constructing, maintaining, managing, renovating, replacing, rehabilitating, and developing military family housing and ancillary support facilities.[1] The Army's implementation of the MHPI authorities is known as the RCI.

Consistent with the MHPI authorities, US Army Garrison, Hawai'i (USAG-HI) previously transferred responsibility for providing housing and ancillary support facilities to Army Hawai'i Family Housing, LLC, composed of the Army and Actus Lend Lease. In 2010, Army Hawai'i Family Housing, LLC changed its name to Island Palm Communities, LLC (IPC). USAG-HI proposes to add 41.8 acres at Schofield Barracks to an existing 50-year ground lease held by IPC. In turn, IPC would construct family housing on the parcel to add to the existing 10-acre Kalākaua Phase 3 parcel that is already in its ground lease.

Schofield Barracks is an approximately 13,632-acre Army installation in central O'ahu, approximately 18 miles northwest of downtown Honolulu (Figure 1-1). It is next to the town of Wahiawā and is directly north of Wheeler Army Airfield. Schofield Barracks is home to the 25th Infantry Division. Approximately 40 percent of the available land in the cantonment area is dedicated to family housing. The project site is a 41.8-acre parcel that is part of the South Range area of Schofield Barracks (Figure 1-2). It is bordered on the northwest by Lyman Road, on the north by a 10.5-acre parcel used for storing construction materials (and was part of the former Kalākaua Golf Course that will be converted to family housing under the previously evaluated RCI project in 2004), and on the northeast by the Post Cemetery. A vegetated gulch surrounds the rest of the parcel. The land had been used for pineapple cultivation since the 1940s and was acquired by the US Army in 2004. Del Monte Fresh Produce (Hawai'i), Inc., had been leasing the land from the James Campbell Estate to grow pineapples. The parcel is part of a larger acquisition made for Army training range use; however, this 41.8-acre parcel has been left idle and unused due to logistical and terrain considerations.

In 2008, the Army reevaluated the housing market and military family housing needs on O'ahu. The report, *Housing Requirements Update*, was an evaluation of the availability of housing for US Army families on O'ahu that met Army and Department of Defense standards for affordability, location, quality, and number of bedrooms (US Army 2008). Based on this study, the Army revised its housing requirement downward for O'ahu, although requirements for Schofield Barracks increased. At the same time, the ratio of four-bedroom homes to five-bedroom homes was increased, based on a shortage in the housing market and needs specific to local Army families. During the process of designing the new homes, the density of homes in specific neighborhoods was reduced.

[1]According to 10 USC, Section 2871, the term ancillary supporting facilities means "facilities related to military housing units, including childcare centers, daycare centers, tot lots, community centers, housing offices, dining facilities, unit offices, and other similar facilities for the support of military housing."

PROPOSED ACTION AND ALTERNATIVES

Consistent with the authorities contained in the 1996 Military Housing Privatization Initiative, USAG-HI in April 2005 conveyed all military family housing units and selected ancillary supporting facilities and granted a 50-year ground lease for the areas on which the housing and facilities are located to Army Hawai`i Family Housing, LLC.

USAG-HI proposes to add approximately 41.8 acres of the South Range area of Schofield Barracks to an existing 50-year ground lease held by IPC. Multifamily housing would be constructed on the parcel as part of the Kalākaua Phase 3 Housing Development. The proposed end-state after build-out would be a 155 housing unit increase to the Schofield Barracks RCI housing, from the 3,860 units proposed and previously analyzed under NEPA.

The proposed action includes measures to address potential effects on cultural resources. The privatization of family housing on USAG-HI lands is governed by a Programmatic Agreement (PA) among the US Army, Hawai‘i State Historic Preservation Office, and the Advisory Council on Historic Preservation. The Programmatic Agreement outlines what activities IPC is allowed to conduct with respect to cultural and archaeological resources, historic properties, and “exceptional trees” on Schofield Barracks. The 41.8-acre parcel would be incorporated into the Programmatic Agreement through an amendment.

Alternatives analyzed in the EA include the proposed action and a no action alternative, as prescribed by the Council on Environmental Quality regulations. The no action alternative serves as a baseline against which the effects of the proposed action can be evaluated. Under the no action alternative, USAG-HI would not implement the proposed action but would continue to redevelop the Schofield Barracks housing areas, an action that was addressed in a previous EA and record of environmental consideration.

IPC and the USAG-HI considered the following alternatives to the proposed action but eliminated them from further analysis for the reasons given:

- **Use of more four-unit housing at other neighborhoods—**The Army dismissed this alternative because it wanted to retain the single-family home and duplex neighborhood massing;
- **Use of green space in other neighborhoods—**This alternative was dismissed because doing so would have negatively impacted quality of life in other neighborhoods;
- **Purchasing existing housing off-post—**The 2008 Housing Requirements Update took into consideration off-post housing stock when determining the on-post housing requirements (US Army 2008). This alternative was dismissed because the analysis was unable to identify sufficient stocks of suitable housing near the Army installations; and
- **Building on tax map key 92005002 (2,396-acre parcel owned by the IPC)—**This alternative was dismissed because this area is zoned for agricultural use (AG-1), and it was determined that it should be retained for agricultural uses. Constructing housing on the parcel was considered both cost prohibitive (no utility infrastructure and long distances to points of service) and undesirable, due to the requirement for it to be rezoned from AG-1 to R5 (residential).

ENVIRONMENTAL CONSEQUENCES

Under the proposed action, minor adverse effects are expected for aesthetics and visual resources, air quality, biological resources, environmental justice, hazardous materials and conditions, noise, transportation, utilities, water resources, and geology, soils, and seismicity. Beneficial effects are expected for hazardous materials and conditions (wildfires), land use, and socioeconomics. By incorporating mitigation measures into the proposed action, there would be no effects on cultural resources.

Under the no action alternative, minor adverse effects are expected on hazardous materials and conditions (wildfires). No effects are expected for any other resources under the no action alternative.

Table ES-1 summarizes the predicted effects for each resource area from both the proposed action and the no action alternative.

MITIGATION

Mitigation would reduce, avoid, or compensate for most adverse effects. Table ES-2 summarizes the mitigation measures that would be implemented as part of the proposed action to minimize effects on affected resources. These measures are additions to those BMPs included in the CDMP Development Brief in Appendix A of the 2004 EA.

CONCLUSION

Based on the findings in the EA, implementing the proposed action, with the identified mitigation measures, would have no significant direct, indirect, or cumulative effects on the resources above, so an environmental impact statement need not be prepared. This EA supports the issuance of a finding of no significant impact.

Table ES-1
Summary of Potential Environmental and Socioeconomic Consequences

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Aesthetic and Visual Resources		
• Conflict with visual resource regulations	None	None
• Degrade the visual character or quality of site and surroundings	Minor adverse	None
• Block or disrupt views	Minor adverse	None
• Create a new source of light or glare	Minor adverse	None
Air Quality		
• Criteria air pollutants	Short-term, minor adverse; long-term, none	None
• Greenhouse gases	Minor adverse	None
Biological Resources		
• Take a sensitive status species or result in a jeopardy opinion	None	None
• Reduce the population of a sensitive species	None	None
• Damage or degrade wetlands or riparian habitat	None	None
• Interfere with the movement of any native resident or migratory wildlife species	Minor adverse	None
• Alter or destroy habitat	Minor adverse	None
• Introduce or increase the prevalence of undesirable nonnative species	Minor adverse	None
• Cause long-term loss or impairment of a substantial portion of local habitat	None	None
Cultural Resources		
• Archaeological resources	None	None
• Traditional Native Hawaiian resources	None	None
• Built environment resources	None	None

Table ES-1
Summary of Potential Environmental and Socioeconomic Consequences *(continued)*

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Environmental Justice		
• Low-income or minority groups	None	None
• Endangerment to children	None	None
Geology, Soils, and Seismicity		
• Erosion	Short-term, minor adverse; long-term, none	None
• Expansive soils	Minor adverse	None
• Seismicity	None	None
Hazardous Materials and Conditions		
• Munitions and explosives of concern	None	None
• Pesticides	Minor adverse	None
• Petroleum products	Minor adverse	None
• Installation Restoration Program sites	None	None
• Transport, use, storage, and disposal of hazardous substances	Minor adverse	None
• Wildfires	Beneficial	Minor adverse
Land Use	Minor beneficial	None
Noise		
• Construction noise	Short-term, minor adverse; long-term, none	None
• Operation and maintenance	Short-term, minor adverse; long-term, none	None
Socioeconomics		
• Population	None	None
• Employment and total income	Short-term, beneficial; long-term, none	None
• Demand for housing	Beneficial	None
• Demand on public services (for example, schools)	None	None
Transportation		
• Intersection operations	Minor adverse	None
• Roadway segment operations	Minor adverse	None
• Parking	None	None
• Pedestrian facilities	None	None
• Bicycle facilities	None	None

Table ES-1
Summary of Potential Environmental and Socioeconomic Consequences *(continued)*

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Utilities and Public Services		
• Police, fire, and emergency management	Minor adverse	None
• Potable water supply	Minor adverse	None
• Sanitary wastewater	Minor adverse	None
• Stormwater	Short-term, minor adverse; long-term, none	None
• Solid waste	Minor adverse	None
• Communications	None	None
• Electricity	Minor adverse	None
Water Resources		
• Surface water runoff and erosion	Short-term, minor adverse; long-term, none	None
• Flood hazards	None	None

Table ES-2
Summary of Mitigation Measures

Aesthetics and Visual Resources

- Design new homes and facilities in accordance with IPC design standards for Schofield Barracks;
- Develop a program to educate workers about best management practices (BMPs) related to visual effects before the project starts;
- Minimize dust by regularly watering exposed soils, stockpiling soil, and stabilizing soil to reduce effects on visual quality from air pollution;
- Use equipment exhaust mufflers to reduce effects on visual quality from air pollution;
- Restrict construction vehicle parking on-site or in other designated areas for the duration of construction; and
- Minimize light glare by shrouding outdoor lights and directing light downward, as well as using motion detectors, where practical, to provide light only when necessary.

Air Quality

- Implement standard management practices, such as watering area of exposed soil and covering trucks with tarps, to reduce fugitive dust.

Biological Resources

- Limit staging activities in areas not currently in heavy use;
- Control surface water runoff in accordance with a stormwater pollution prevention plan;
- Implement BMPs for oil spills, toxic substance cleanup, and construction fire hazards; and
- Maintain and enforce the pet policies outlined in the *Resident Guide & Community Standards Handbook* (IPC 2011).

Cultural Resources

- Amend the programmatic agreement (PA) to include the project site;
- Implement inadvertent discovery and monitoring clauses found in the PA at Sections V.B.1, V.B.2, and V.B.3.

Environmental Justice

- During construction, follow safety measures stated in 29 CFR, Part 1926, Safety and Health Regulations for Construction, and Army Regulation 385-10, Army Safety Program. This would be to protect the health and safety of residents, including children.

Geology, Soils, and Seismicity

- Employ a qualified geotechnical engineer and structural engineer for siting facilities, designing foundations for seismic safety, and stabilizing soil;
- Use common dust suppression techniques, such as spraying the ground with water;
- Implement BMPs prepared as part of the construction stormwater pollution prevention plan, which could include building during the summer when rainfall potential is low, using silt fences or hay bales to prevent eroded soil from being transported off-site, contouring to stop drainage from entering the site and to prevent run-on, and directing runoff to constructed siltation basins.

Table ES-2
Summary of Mitigation Measures *(continued)*

Hazardous Materials and Conditions

- Handle hazardous materials and waste in accordance with applicable laws and regulations.

Noise

- Limit construction to Monday through Saturday from 7:00 AM to 5:00 PM to avoid the times of day and the days of the week when noise effects would most annoy residents;
- Use standard soundproofing materials during construction of the new housing units to ensure residential noise levels are maintained below standards, as required by the State of Hawai`i and US Army noise guidelines;
- Provide public notification of the project and post a sign that provides a phone number for the public to call to register complaints about construction-related noise problems; and
- Use landscaping and fencing to provide a sound barrier.

Transportation

- Prepare a construction traffic management plan;
- Ensure that construction vehicles comply with applicable traffic laws; and
- Use standard construction traffic safety protocols.

Utilities

- Use a residential recycling program;
- Manage stormwater on-site so that there is no net increase in peak stormwater runoff;
- Install low-flow fixtures;
- Use latest energy-efficient appliances and equipment compatible with the Army's policy to reduce energy consumption;
- Install solar hot water heating for every housing unit; and
- Design neighborhood to Leadership in Energy and Environmental Design certification standards.

Water Resources

- Prepare and implement a stormwater pollution prevention plan;
- Implement Phase II stormwater management regulations of the Clean Water Act and construction BMPs;
- Implement the Installation Training Area Management program;
- Implement low impact development as an "integrated design" approach to new construction; and
- Design culverts and drainage swales to withstand a 100-year flood.

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ACRONYMS AND ABBREVIATIONS

SECTION 1.0
PURPOSE, NEED, AND SCOPE

SECTION 1.0
PURPOSE, NEED, AND SCOPE

1.1 BACKGROUND

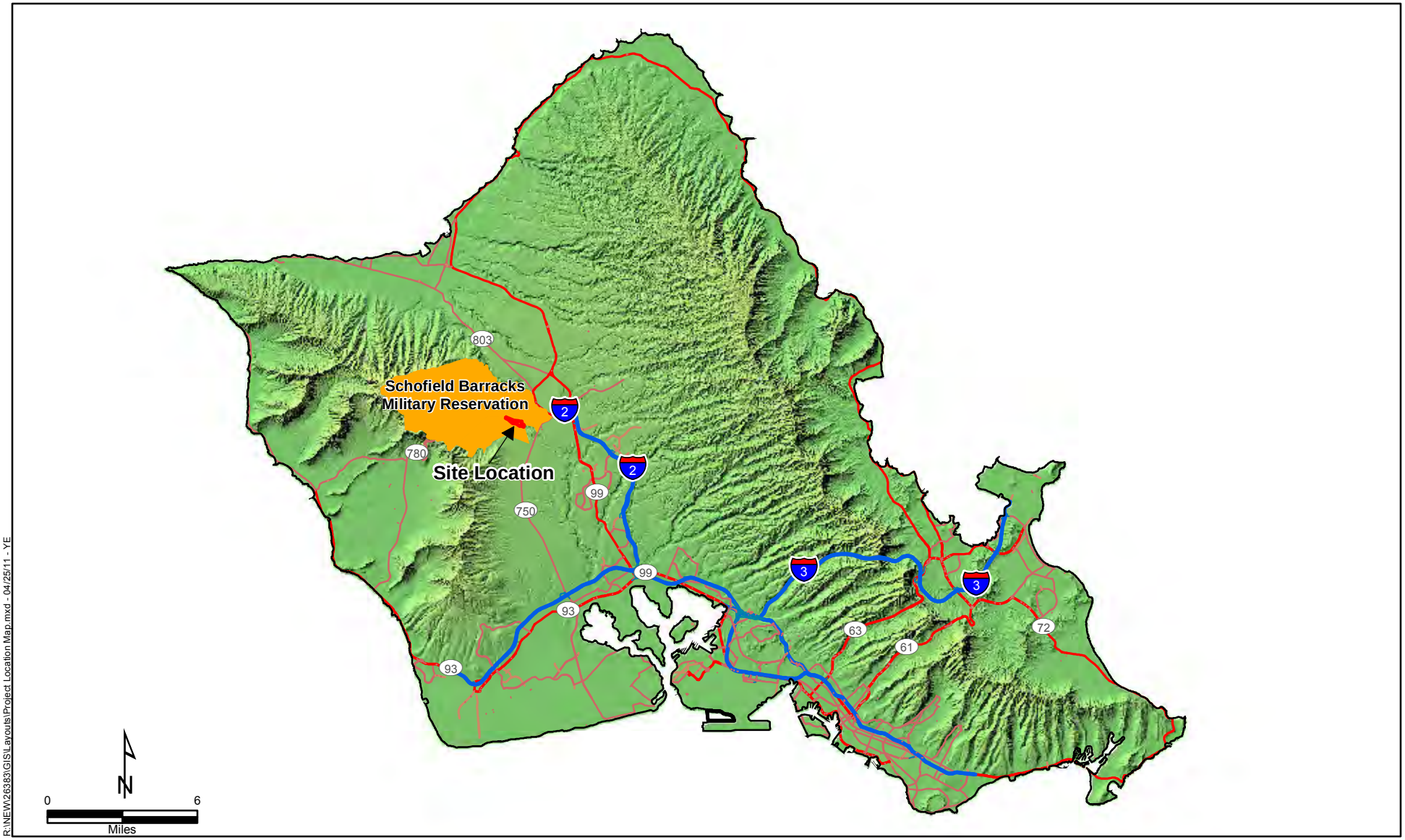
The Army operates and maintains approximately 110,000 family housing units at its installations throughout the United States. In the 1990s, the Army assessed the military housing inventory and needs. More than 75 percent of the units did not meet modern Army housing standards. Despite this, at most installations, demand for adequate on-base housing exceeds supply. Before the Residential Communities Initiative (RCI) was implemented in 2005, the lack of adequate on-base housing was forcing many service members and their families to live in housing in need of repair or renovation or to live off-base where the cost and quality of housing varied considerably. Often, the costs to service members and their families to live off-base are 15 to 20 percent greater than the costs to live on-base. The Army estimated that as much as $6 billion would be needed to bring its housing up to current standards and to address the housing deficit.

In recognition of these problems, Congress enacted Section 2801 of the 1996 Defense Authorization Act (Public Law 104-106, codified at Title 10 of the United States Code [USC], Section 2871-85). Also known as the Military Housing Privatization Initiative (MHPI), this law creates alternative authorities for improving and constructing military family housing. The Congressional intent in enacting these additional authorities was to enable the military to obtain private sector funding to satisfy family housing requirements. By leveraging scarce public funding, the Army can obtain private sector funds for constructing, maintaining, managing, renovating, replacing, rehabilitating, and developing military family housing and ancillary support facilities.[1] The Army's implementation of the MHPI authorities is known as the RCI.

Consistent with the MHPI authorities, US Army Garrison, Hawai'i (USAG-HI) previously transferred responsibility for providing housing and ancillary support facilities to Army Hawai'i Family Housing LLC, composed of the Army and Actus Lend Lease. In 2010, Army Hawai'i Family Housing LLC changed its name to Island Palm Communities, LLC (IPC). USAG-HI proposes to add 41.8 acres at Schofield Barracks Military Reservation to an existing 50-year ground lease held by IPC. IPC would construct family housing on the parcel to add to the existing 10-acre Kalākaua Phase 3 parcel that is already in IPC's ground lease.

Schofield Barracks is an approximately 13,632-acre Army installation in central O'ahu, approximately 18 miles northwest of downtown Honolulu (Figure 1-1). It is next to the town of Wahiawā and is directly north of Wheeler Army Airfield. Schofield Barracks is home to the 25th Infantry Division. Approximately 40 percent of the available land in the cantonment area is dedicated to family housing. The project site is a 41.8-acre parcel that is part of the South Range area of Schofield Barracks (Figure 1-2). It is bordered on the northwest by Lyman Road, on the north by a 10.5-acre parcel used as a construction materials storage area (which was part of the former Kalākaua Golf Course that will be converted to family housing under the previously evaluated RCI project in 2004), and on the northeast by the post cemetery. A vegetated gulch

[1]According to 10 USC, § 2871, the term ancillary supporting facilities means "facilities related to military housing units, including childcare centers, daycare centers, tot lots, community centers, housing offices, dining facilities, unit offices, and other similar facilities for the support of military housing."



Project Location

Project Site - Kalākaua Phase 3 Housing

Schofield Barracks Military Reservation
Oʻahu, Hawaiʻi

TETRA TECH

Figure 1-1

Source: ESRI Street Map Data 2008; Projection: UTM NAD83 Zone 4.

R:\NEW\26383\GIS\Layouts\Project Site Map.mxd - 03/22/11 - YE

Project Site - Kalākaua Phase 3 Housing

Schofield Barracks Military Reservation
O'ahu, Hawai'i

0 600
Feet

TETRA TECH

Figure 1-2

Source: Imagery, ESRI 2009. Projection: UTM NAD83 Zone 4N.
Data aquired fromm Sam O. Hirota, Inc, Honolulu, HI
December 16, 2010.

surrounds the rest of the parcel. The land had been used for pineapple cultivation since the 1940s and was acquired by the US Army in 2004. The Del Monte Fresh Produce (Hawai‘i), Inc. had been leasing the land from the James Campbell Estate to grow pineapples. The parcel is part of a larger acquisition made for Army training range use; however, this 41.8-acre parcel has been left idle and unused due to logistical and terrain considerations.

In 2008, the Army reevaluated the housing market and military family housing needs on O‘ahu. The report, *Housing Requirements Update*, was an evaluation of the availability of housing for US Army families on O‘ahu that met Army and Department of Defense (DoD) standards for affordability, location, quality, and number of bedrooms (US Army 2008). Based on this study, the Army revised its housing requirement downward for O‘ahu, although requirements for Schofield Barracks increased. At the same time, the ratio of four-bedroom homes to five-bedroom homes was increased based on a shortage in the housing market and needs specific to local Army families. During the process of designing the new homes, the density of homes in specific neighborhoods was reduced.

1.2 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to improve military family housing and ancillary supporting facilities at Schofield Barracks. The proposed action is needed to provide affordable quality housing and ancillary facilities to service members and their families by constructing housing units to exceed military and local housing construction standards.

Vacancy rates of suitable housing near the Army installations were about 9 percent in 2008 and were projected to be 7.5 percent in 2013. Home prices were predicted to increase by 4.5 percent between 2008 and 2013, and rentals were predicted to increase by 2.6 percent. Approximately 33 percent of the rental housing inventory in 2008 was considered unsuitable. Home ownership affordability for military personnel is predicted to decline between 2008 and 2013. Rental affordability is predicted to remain steady as the weighted average housing allowances for military families on O‘ahu are projected to increase approximately 2.6 percent per year from 2008 to 2013 (US Army 2008).

IPC has been expected to achieve the following goals (US Army 1999):

- Ensure that eligible service members and their families have access to quality, attractive, and affordable housing by upgrading inadequate family housing and by building new housing to address any family housing deficit;
- Improve the appearance and functions of the residential community, while preserving historic properties, protecting cultural resources, and meeting environmental stewardship responsibilities;
- Provide ancillary support facilities that enhance the residential communities on the O‘ahu RCI installations;
- Maintain positive relations with the communities that surround the O‘ahu RCI installations; and
- Provide for the long-term effective management and operation of existing, renovated, and new housing units and ancillary support facilities.

1.3 SCOPE OF ANALYSIS

This environmental assessment (EA) has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969, 42 USC, Section 4321 et seq.; the Council on Environmental Quality (CEQ) regulations for implementing NEPA, 40 Code of Federal Regulations (CFR), Parts 1500-1508; and the Environmental Analysis of Army Actions (32 CFR, Part 651). The purposes of the EA are to analyze the environmental impacts, to present the findings, and to solicit public input so the Army can make an informed decision on the selection of an alternative.

This EA incorporates by reference and tiers off from the *Environmental Assessment of Implementation of the Army Residential Communities Initiative, O'ahu, Hawai'i* (US Army 2004a). That EA, completed in January 2004 and referred to as the 2004 EA, was an analysis of the Army's implementation of the RCI program at seven housing areas (Schofield Barracks, Wheeler Army Airfield, Helemanō Military Reservation, Fort Shafter, Aliamanu Military Reservation, Tripler Army Medical Center, and Kia'i Kai Hale). The proposed action covered in that EA included increasing the Schofield Barracks housing inventory from 3,424 units to 3,476 units. This EA also incorporates by reference and tiers off from the record of environmental consideration (REC) prepared for Implementation of the Community Development and Management Plan February 2004 developed for the Army Residential Communities Initiative, O'ahu, Hawai'i (US Army 2004b). That REC, completed in September 2004 and referred to as the 2004 REC, analyzed revisions to the 2004 EA proposed action that increased the proposed Schofield Barracks housing inventory to 3,860 units. The proposed action in this EA addresses only incremental changes to the previous proposed action addressed in the 2004 EA and 2004 REC. These changes are limited to incorporating an additional parcel, the project site, and approximately 155 family housing units into the RCI program at Schofield Barracks. The proposed end-state housing inventory would be approximately 4,015 family housing units at Schofield Barracks.

The authors of the EA identified, documented, and evaluated the potential environmental effects of implementing the RCI project at the project site. Section 2.0 describes the proposed action. Section 3.0 discusses alternatives to the proposed action, including no action, and explains why certain alternatives are not evaluated in detail. Section 4.0 describes environmental conditions of resources that could be affected by the proposed action and identifies potential environmental effects that could occur if the proposed action were implemented. Section 5.0 presents findings and conclusions regarding the potential environmental effects of the proposed action.

An interdisciplinary team of environmental scientists, biologists, ecologists, geologists, planners, economists, engineers, archaeologists, historians, and USAG-HI and IPC representatives reviewed the proposed action in light of existing conditions and identified relevant beneficial and adverse effects associated with the action. This EA focuses on effects likely to occur on the project site. The document analyzes direct effects (those caused by the proposed action and occurring at the same time and place) and indirect effects (those caused by the proposed action and occurring later in time or farther away but still reasonably foreseeable). The potential for cumulative effects is also addressed, and mitigation measures are identified, where appropriate.

This EA focuses on evaluating environmental effects that are reasonably foreseeable. Generally, the analysis covers RCI development through 2016. This is the period during which the Army would build, operate, and maintain family housing units and ancillary support facilities at Schofield Barracks. Potential environmental effects beyond 2016 are not analyzed in this EA.

For the RCI program, this EA is one of several measures to support decision making for family housing under Army management. Examples of other measures that contribute to RCI decision making are preparing a report of availability, consulting with the State Historic Preservation Officer and the US Fish and Wildlife Service, and compiling an environmental condition of property report.

1.4 PUBLIC INVOLVEMENT

USAG-HI invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including minority, low-income, disadvantaged, and native Hawaiian groups, are urged to participate in the decision making process.

The Army's NEPA guidance provides for public participation in the NEPA process. If the EA shows that the proposed action would not result in significant environmental effects, USAG-HI may issue a finding of no significant impact (FNSI). Following distribution of the EA and draft FNSI, there would be a 30-day review, during which agencies and the public could submit comments on the proposed action, the EA, or the FNSI. Throughout this process, the public could obtain information on the status and progress of the proposed action and the EA through the USAG-HI RCI Office (Carol L. Jones, Chief, Housing Division/RCI Project Manager, at [808] 655-7394).

1.5 FRAMEWORK FOR DECISION-MAKING

A decision on whether to proceed with the proposed action rests on numerous factors, such as USAG-HI's mission requirements, schedule, availability of funding, and environmental considerations. In addressing environmental considerations, USAG-HI is guided by several relevant statutes, implementing regulations, and Executive Orders that establish standards and provide guidance on environmental and natural resources management and planning. These include the Clean Air Act, Clean Water Act, Coastal Zone Management Act, Migratory Bird Treaty Act, Noise Control Act, Endangered Species Act, Farmland Protection Policy Act, National Historic Preservation Act, Archaeological Resources Protection Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), Executive Order 12088 (Federal Compliance with Pollution Control Standards), Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), and Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks). Where they provide a better understanding of project issues, key provisions of these statutes and Executive Orders are described in more detail in the text of the EA.

SECTION 2.0
PROPOSED ACTION

SECTION 2.0
PROPOSED ACTION

This section presents information on the proposed action, which is the preferred alternative. The proposed action would occur on a 41.8-acre parcel within the South Range area of Schofield Barracks; throughout this EA, that parcel is referred to as the project site.

This EA evaluates the environmental and socioeconomic effects of the proposed action and the no action alternative. Other alternatives are identified in Section 3. The proposed action is Army redevelopment of the project site.

Consistent with authorities contained in the 1996 MHPI, USAG-HI transferred responsibility for providing housing and ancillary support facilities to Army Hawai‘i Family Housing in April 2005. USAG-HI worked with Army Hawai‘i Family Housing (now known as IPC) to develop a Community Development and Management Plan (CDMP) to implement the MHPI at the family housing areas.

USAG-HI proposes to add approximately 41.8 acres of the South Range area of Schofield Barracks to an existing 50-year ground lease held by IPC. Multifamily housing would be constructed on the parcel as part of the Kalākaua Phase 3 Housing Development. The proposed final end-state after build-out would be a 155 housing unit increase to the Schofield Barracks RCI housing from the 3,860 units proposed in the 2004 REC**.**

2.1 THE ARMY RESIDENTIAL COMMUNITIES INITIATIVE

2.1.1 Army RCI Procedures

The MHPI grants authorities beyond traditional military construction appropriations for obtaining family housing and ancillary support facilities. The essence of the MHPI authorities is that they allow comprehensive access to private sector financial and management resources for improving, constructing, operating, and maintaining family housing.

Simply stated, the goal of the Army RCI is to provide affordable quality housing for service members, but implementing RCI projects is complex. Projects typically involve large numbers of family housing units (normally the installation’s entire inventory), as well as ancillary supporting facilities. The projects represent sizable financial stakes for both the private sector developer and the Army. Project implementation is complex because of the considerable amount of planning, coordination, and oversight related to engineering, finance, real estate, housing management, and local community involvement.

An RCI project normally addresses an installation’s entire inventory of family housing. It might also address required ancillary supporting facilities, such as community centers, neighborhood playgrounds, housing offices, and maintenance facilities. An RCI project typically has seven major steps, which are described in the 2004 EA.

2.1.2 Legislative Authorities

The scope of an RCI project is determined primarily by analyzing the condition of existing housing and by considering additional housing requirements to address the installation’s deficit of

affordable quality housing. These factors drive the amount of construction, demolition, and renovation and the number of ancillary supporting facilities needed at an installation. Negotiation of the CDMP includes selecting the appropriate legislative authorities to fulfill the installation's family housing needs. These provisions give the Army and the development entity exceptional flexibility to create successful business arrangements for the benefit of Soldiers and their families. The authorities included are summarized in the 2004 EA, along with their USC citations.

2.2 IMPLEMENTATION OF THE PROPOSED ACTION

This section provides an overview of the proposed action. In accordance with the CDMP, IPC proposes to build new housing and to improve existing housing. The USAG-HI family housing would be developed in a way that respects the natural and engineered environment in order to minimize impacts and to capitalize on the value of the environment. Planning would support the following environmental principles:

- Housing areas would be designed to respect the natural systems of topography, vegetation, and drainage;
- Developed areas would be designed to minimize ground disturbance and flows from surface water drainage;
- Valuable features of the landscape, such as street trees, shade trees, and open green spaces, would be preserved, sustained, and complemented with new plantings emphasizing the use of native or drought-tolerant species;
- Neighborhoods and social amenities would be sited to reduce the dependency on cars;
- Open-space networks would be used to link larger spaces, corridors, parks, and fragments of open space with a system of pedestrian and bike trails; and
- The sense of community would be heightened and the quality of outdoor life would be enhanced with improved and linked open spaces, strategic tree locations, trail systems, activity areas, and street layouts.

The proposed project would include adding a 41.8-acre parcel to IPC's 50-year ground lease. The parcel would be part of the Kalākaua Phase 3 Housing Development that consists of a 10.5-acre parcel that was part of the former Kalākaua Golf Course, which was included as part of the 2004 EA. The 41.8-acre expansion would accommodate an additional 230 housing units on a bordering parcel that is part of the Army's South Range. With the addition of the parcel, there would be an increase of approximately 155 units from what was proposed in the 2004 REC. The effects of adding 155 units to the Schofield Barracks housing inventory and developing the 41.8-acre parcel are analyzed in this EA.

The units at Kalākaua Phase 3 Housing would have four and five bedrooms, and most would be two-story duplexes. There would be 14 single-story four-bedroom units that would be adaptable to the American with Disabilities Act (ADA). The homes would be served by a new community road network, intersecting with Lyman Road at three entry points.

The USAG-HI Directorate of Public Works (DPW) has confirmed that existing utility systems have the capacity to service the homes with water, sewer, electricity, and communications. A looped water main would be serviced by two connections to existing eight-inch water mains in the Kalākaua Phase 1 neighborhood. Sewers would be connected to a new sanitary sewer main servicing the Lyman corridor, and sewage would be treated at the Schofield Barracks wastewater

treatment plant at Wheeler Army Airfield. Electrical service would be connected to existing switchgear in the Kalākaua Phase 1 neighborhood. Cable television (which also provides wired phone service) would be connected to existing circuits in the Kalākaua Phase 1 neighborhood.

Low impact construction methods and detention basins would be used to ensure that there would be no net increase in peak stormwater runoff.

Some of the details proposed in this EA could change as requirements and designs are refined. If the IPC or USAG-HI makes substantial changes in the proposed action that are relevant to environmental concerns, or if one of them identifies significant new circumstances or environmental concerns bearing on the proposed action or its effects, they would review the changes and new circumstances to determine if supplemental NEPA documentation must be done, as required under 32 CFR, Part 651.

Heavy equipment that would be used during construction and demolition includes scrapers, bulldozers, excavators, and heavy haul transporters. Temporary laydown and staging areas would be confined to the actual project sites and some nearby areas, if any are available, including the designated contractor storage yard area. Army diversion goals require 50 percent of nonhazardous construction and demolition debris to be diverted from landfill disposal. Waste materials would be recycled, disposed of at landfills, or diverted to H-POWER (the City and County of Honolulu's waste-to-energy facility). Hazardous materials, if encountered, would be handled in accordance with all applicable federal and state laws and regulations. Best management practices (BMPs) would be used to reduce potential effects during construction and demolition. Such practices include the following:

- Developing a program to educate workers about BMPs and safety standards before the project starts;
- Minimizing dust by regularly watering, stockpiling, and stabilizing exposed soil;
- Using equipment exhaust mufflers;
- Restricting parking of construction vehicles to the site or in other designated areas for the duration of construction;
- Using stormwater pollution prevention, such as silt fencing, dust control, and sediment traps;
- Placing seasonal and duration restrictions on construction; and
- Complying with State of Hawai‘i noise regulations and standards.

The proposed action would be implemented only after applicable regulatory agencies had been consulted and required permits had been obtained; consultation and permitting through these agencies may result in changes to the BMPs proposed in this document. A fire prevention and safety plan would be developed and implemented to reduce the possibility of an accidental fire that could spread to previously undisturbed or undeveloped vegetated areas at the South Range area. Archaeological and cultural resource sites would be avoided.

Implementing the proposed action is expected to involve coordination with the following agencies:

- Hawai‘i State Historic Preservation Division, in accordance with Section 106 of the National Historic Preservation Act;
- Hawai‘i State Office of Planning, pursuant to the Coastal Zone Management Act;
- Hawai‘i State Department of Health, Clean Water Branch; and
- US Fish and Wildlife Service.

Under the proposed action, the site would be consistent with the proposed master and land use plans for Schofield Barracks.

The estimated construction duration is from July 2012 to May 2014. The project description is based on the most current project information available.

The estimated energy consumption associated with the addition of 155 units to the Schofield Barracks housing inventory would be approximately 620 tons of air conditioning using 565,750 kilowatt hours per year; water supply with domestic water flow requirements of 77,500 gallons per day (based on Honolulu Board of Water Supply standards of 500 gallons daily use per single family/duplex unit); solar thermal water heaters with hot water consumption of an estimated 16.5 million gallons per year; electrical power for lights, receptacles, water heaters, and air conditioning systems using approximately 2,254,320 kilowatt hours per year; and a sewage system with total demand estimated at approximately 49,600 gallons per day (based on City and County of Honolulu’s sewer standards).

2.2.1 Community Development and Management Plan Provisions

As part of the approval and implementation of the Army RCI program, Actus Lend Lease developed a Community Development and Management Plan (CDMP) in coordination with USAG-HI in 2004. The CDMP included increasing the on-post housing inventory and to replace older housing, thereby addressing the housing deficit in modern housing with more bedrooms, and providing landscaping improvements, community centers, parks, and playgrounds. The *Environmental Assessment of Implementation of the Army Residential Communities Initiative, O‘ahu, Hawai‘i* (US Army 2004a), completed in January 2004, was an analysis of the Army’s implementation of the RCI program at seven housing areas (Schofield Barracks, Wheeler Army Airfield, Helemanō Military Reservation, Fort Shafter, Aliamanu Military Reservation, Tripler Army Medical Center, and Kia‘i Kai Hale). A record of environmental consideration (REC) was prepared for the Implementation of the Community Development and Management Plan the Army Residential Communities Initiative, O‘ahu, Hawai‘i in 2004 (US Army 2004b). That REC, completed in September 2004, analyzed revisions to the 2004 EA proposed action that increased the proposed Schofield Barracks housing inventory to 3,860 units.

The following discusses the provisions of the CDMP that IPC follows.

2.2.1.1 Lease of Land

USAG-HI would add a 41.8-acre parcel to IPC’s current 50-year ground lease under the proposed action. The lease would be subject to several Army conditions and to all existing easements, or those subsequently granted, and to established and future access routes for roadways and utilities. The lease would include clauses that would address the following:

- Prohibit IPC from storing hazardous wastes (above those quantities generated in routine operations and immediately disposed of after use) or from taking any actions that would cause irreparable injury to the land. IPC would be required to comply with all federal, state, interstate, or local applicable laws, regulations, conditions, or instructions affecting its activities. The Army also would include clauses in the leases permitting the Army to periodically inspect the property to ensure safety and proper use, in accordance with the terms of the lease.
- Prohibit discharging waste or effluent that would contaminate streams or other bodies of water or that would otherwise become a public nuisance.
- Require the added lands to also be added by amendment to the existing programmatic agreement (PA) among the US Army, Hawai'i State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation; therefore, those lands would be subject to the existing inadvertent discovery clause found in the PA.
- Require IPC to maintain all soil and water conservation structures, such as berms and stormwater percolation ponds, and to take appropriate measures to prevent or control soil erosion on the site. These measures would be addressed in permits (e.g., Section 404 permit) and stormwater pollution prevention plans.
- Prohibit IPC from cutting timber, mining, removing sand, gravel, or kindred substances, wasting any resource, or substantially changing the contour or condition of the site, except as authorized through permits or by the Installation Commander or designated representative.
- Require IPC to minimize removal of trees, shrubs, and groundcover and to protect trees from damage during project activities.

2.2.1.2 Existing Facilities

There are no facilities located on the 41.8-acre project site. Since the cessation of pineapple cultivation on the land around 2006, the land has lain fallow. The site is now overgrown with non-native trees, shrubs, and tall grasses.

2.2.1.3 Development Strategy

The CDMP Development Brief and list of additional actions to be taken included in Appendix A of the 2004 EA are incorporated by reference into this description of the proposed action. IPC would construct 230 family housing units on the 41.8-acre project site that is part of the larger 274-unit Kalākaua Phase 3 Housing. Of these 230 units, 155 would be in addition to the current Schofield Barracks housing inventory build-out plans.

Implementing the proposed action would require that IPC to operate and maintain family housing for the duration of the 50-year ground lease.

The privatization of family housing on USAG-HI lands is governed by a Programmatic Agreement (PA) among the US Army, Hawai'i State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation. The 41.8-acre parcel will be incorporated into the PA through an amendment. The PA outlines what activities IPC is allowed to conduct with respect to historic properties as well as "exceptional trees" within Schofield Barracks. The PA provides an inadvertent discovery clause in the case of archaeological resources discovered during project implementation. The inadvertent discovery and monitoring clauses found in the PA at Sections V.B.1, V.B.2, and V.B.3, summarized below, are included as part of the proposed

action. (Note that the required survey under Section V.B.2 has been completed; see Cultural Surveys Hawai'i 2009.)

- In the event of discovery of archaeological materials during any project activity, IPC would immediately stop work in the area and notify the USAG-HI Cultural Resources Management Program. IPC would take reasonable measures to protect the discovery until USAG-HI had evaluated the resource(s), had determined if additional compliance requirements under NAGPRA or NHPA apply, and had met those requirements. If the additional discovery were to contain historic properties, USAG-HI would comply with the provisions of 36 CFR, Part 800.13(b), and 43 CFR, Part 10. Any inadvertent discovery of human remains would be treated in accordance with NAGPRA, the USAG-HI NAGPRA Plan of Action, and Section 106 of the NHPA.
- All ground-disturbing activities within 100 feet of culturally sensitive areas indicated in Appendix A of the PA would be monitored by qualified staff.
- The O'ahu Council of Hawaiian Civic Clubs would be afforded an opportunity to provide cultural monitoring of ground-disturbing activities in culturally sensitive areas.

Archaeological surveys have not identified any surface or subsurface archaeological resources on the project site. It is unlikely that archaeological sites exist in the project site (Cultural Surveys Hawai'i 2009). If archaeological materials were discovered during any activity associated with the proposed action, IPC would immediately stop work in the area and would notify USAG-HI Cultural Resources Management Program staff. IPC would take reasonable measures to protect the discovery until USAG-HI has complied with the National Historic Preservation Act, 36 CFR, Part 800.13(b), Native American Graves Repatriation Act, and any other legal requirements. Any inadvertent discovery of human remains would be treated in accordance with the Native American Graves Repatriation Act.

2.2.1.4 Conveyance

The Army would convey the 41.8-acre parcel to IPC with encumbrances, notices, and requirements, obligating IPC to certain actions. The Army would identify any easements, rights-of-way, and trees listed in the City and County of Honolulu's Register of Exceptional Trees that might affect use of the property. These encumbrances would be in the form of covenants in the deed and would be binding on the transferee, as well as on any subsequent successors or assignees. Negotiated terms of transfer or conveyance could require IPC to maintain the status quo of historic buildings or archaeological sites or to require a consultation with the SHPO before any actions were taken affecting such resources.

2.2.1.5 Barrier-free Design

New family housing and ancillary supporting facilities must adhere to the Uniform Federal Accessibility Standards and the Americans with Disabilities Act Accessibility Guidelines promulgated by the Access Board (formerly known as the Architectural and Transportation Barriers Compliance Board), in accordance with the Architectural Barriers Act of 1968, Rehabilitation Act of 1973, and Americans with Disabilities Act of 1990. These standards require that at least five percent of new family housing be designed and built to be accessible, or easily modifiable for access, by persons with physical disabilities.

2.2.1.6 Construction Standards

Construction standards to be applied to family housing reflect consideration of both military specifications and local community building codes. Construction of housing would be based on sustainable design and development concepts and would seek to incorporate such considerations as sustainability, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. These measures would improve environmental and economic performance of facilities through the use of established and advanced industry principles, practices, materials, and standards.

2.2.1.7 Operation and Maintenance

For the duration of the 50-year lease, IPC would operate and maintain all existing and new family housing units and ancillary supporting facilities included in the RCI transfer, including associated parking lots and sidewalks, in accordance with the quality standards established in the CDMP. USAG-HI has the option of extending the period of operation and maintenance and the leases of land supporting family housing for an additional 25 years.

2.2.1.8 Rental Rates and Payments

The rental rate to be paid by any service member would not exceed his or her basic allowance for housing (BAH). The USAG-HI would continue to categorize family housing by grade group (for example, junior noncommissioned officer, senior noncommissioned officer, and company grade).

2.2.1.9 Occupancy Guarantee

USAG-HI would not guarantee IPC the level of occupancy of the housing units. Under certain circumstances, if houses were to become vacant and there were no service members waiting for housing, IPC could rent vacant family housing units to tenants other than service members. The priority of assignment for family housing would be detailed in the Community Development and Management Plan and would follow the guidelines in Table 3-3 (Priority of Assignment for Family Housing) in Army Regulation 210-50 (Housing Management).

2.2.1.10 Regulatory Controls

The development plan's intent is to adopt the International One- and Two-Family Dwelling Code, 1998 Edition, by the International Code Council, Inc., with standardized requirements for building, plumbing, mechanical, and electrical systems, by incorporating data from the following model codes and standards:

- Uniform Building Code, 1997 edition, with Honolulu City and County amendments;
- Uniform Mechanical Code, 1997 edition;
- Uniform Plumbing Code, 1997 edition, with Honolulu City and County amendments;
- National Electric Code, 2002 edition, with Honolulu City and County amendments;
- Illuminating Engineering Society Handbook, 9th edition;
- National Fire Protection Association Life Safety Code, NFPA 1, 101, 1997 edition;
- Uniform Fire Code, 1997 edition, and the 1999 Accumulative UFC Supplement, with Honolulu City and County amendments;

- Underwriters Laboratories, Inc., Fire Protection Equipment Directory, Building Materials Directory and in general as an example of a National Recognized Testing Laboratory;
- Americans With Disabilities Act and Accessibility Guidelines;
- Uniform Federal Accessibility Standards;
- Army's Sustainable Design and Development Principles, latest edition;
- Energy Star Standards for residential applications, latest edition; and
- Other applicable Hawai'i and federal codes and regulations.

All regulatory requirements and standards agreed to in the CDMP would apply to the proposed action.

2.2.1.11 Utilities

IPC reimburses DPW for the cost of all electric, water, and sewer services used in the ground lease. Tenants' use of these utilities is included in their rental contract. New units and renovated units are being provided with electricity meters and the tenants' use is reported to them monthly. Starting in July 2011, after an appropriate baseline of use is established for each residence, tenants will be eligible for an incentive program, whereby they can earn monetary rewards for conservation. A corresponding disincentive for wasteful use is a part of the incentive program.

2.2.1.12 Police and Fire Protection

Leased areas of the installation would continue to receive the same level of police and fire protection, though a portion of the total expenses for providing police and fire protection would be allocated to the future Lend Lease/Army partnership. Project areas served through municipal agreements (e.g., fire protection services provided to USAG-HI by the County of Honolulu) would remain as such through the transfer. Project areas served by Army fire and police (all other project areas) would remain as such through the transfer, as would mutual aid agreements with surrounding municipalities.

2.2.1.13 Implementation Commencement

Implementation of the proposed action would begin as early as July 2011.

2.2.1.14 Siting of New Housing

The Army evaluation of potential sites for additional family housing resulted in the project site shown in Figure 1-2. All housing would be constructed in the area delineated by the project site footprint. This footprint meets the criteria detailed below.

2.2.1.15 Proximity to Existing Housing

New family housing and ancillary supporting facilities should be near existing family housing. From a land use pattern perspective, this approach maintains consistency in adjacent land uses in larger general areas. It also results in residents being close to support facilities, such as schools, community clubs, the post exchange, the commissary, and auto service stations. Such proximity helps create a sense of small town neighborhoods, where principal shopping destinations are nearby. Locating new neighborhoods close to existing ones helps to reduce development costs by enabling use of utility corridors and other infrastructure. Keeping family housing in or near a generally developed portion of the installation also avoids opening newer, more distant areas. The

risk of potential effects on ecological systems (for example, wildlife disturbance and habitat fragmentation) is thus decreased. The housing on the project site would be located next to the Kalākaua and Solomon neighborhoods.

2.2.1.16 Sufficient Size

Lack of adequate acreage for proposed housing could adversely affect an otherwise pleasing atmosphere by creating too high a building density. Allocating an adequate amount of property would result in a density that strikes an appropriate balance between residents' desire for space and an appropriate use of land resources.

2.2.1.17 Physical Features

Any site for family housing must not be on steep terrain, in areas heavily incised by watercourses, or in any stream or wetland buffers or floodplains.

2.2.1.18 Compatible Land Use

Family housing parcels must not result in incompatible land uses (for example, in airfield runway accident potential zones or clear zones, in or near high noise areas, on contaminated properties, or next to off-base industrial property).

2.2.1.19 Minimal Loss of Natural, Ecological, and Cultural Resources

Family housing must be sited to minimize loss of natural, ecological, and cultural resources, such as wetlands, listed or sensitive species or their habitat, wildlife travel corridors, archaeological sites, historic buildings and associated landscape features, urban forest trees (especially those listed in the City and County of Honolulu's Register of Exceptional Trees), and structures listed on or eligible to be listed on the National Register of Historic Places.

2.2.1.20 Military Security

Parcels must be located so residents are not enabled or encouraged to interfere with military security requirements or to pose a risk of breaching military security. Housing areas should not be near sites supporting activities with access controlled for security reasons. Force protection may be provided if the need arises.

2.2.1.21 Operational Safety

Parcels should be away from operational areas to avoid potential safety risks to residents. Parcels for siting family housing should not be located so that residents would be required to travel past or through training areas when leaving the base.

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SECTION 3.0
ALTERNATIVES

SECTION 3.0 ALTERNATIVES

The Army identified six alternatives and a no action alternative to its proposed action.

3.1 PREFERRED ALTERNATIVE

Implementing the proposed action, as described in Section 2.2, is the Army's preferred alternative. Use of various MHPI authorities, proposed for and identified in the CDMP put forth by IPC (formerly known as Army Hawai'i Family Housing) and negotiated by USAG-HI, would achieve the purpose of and need for the proposed action, as described in Section 1.2. This alternative is evaluated in detail in Section 4.0.

3.2 OTHER ALTERNATIVES CONSIDERED

The IPC and the USAG-HI considered the following alternatives to the proposed action but eliminated them from further analysis:

- **Use of more four-unit housing at other neighborhoods—**The Army dismissed this alternative because it wanted to retain the single-family home and duplex neighborhood massing;
- **Use of green space in other neighborhoods—**This alternative was dismissed because doing so would have negatively affected quality of life in other neighborhoods;
- **Purchasing existing housing off-post—**The 2008 Housing Requirements Update took into consideration off-post housing stock when determining the on-post housing requirements (US Army 2008). This alternative was dismissed because the analysis was unable to identify sufficient stocks of suitable housing near the Army installations; and
- **Building on tax map key 92005002 (2,396-acre parcel owned by the IPC)—**This alternative was dismissed because this area is zoned for agricultural use (AG-1), and it was determined that it would be retained for agricultural uses. Constructing housing on the parcel was considered both cost prohibitive (no utility infrastructure and long distances to points of service) and undesirable due to the requirement to rezoned from AG-1 to R5 (residential).

3.3 NO ACTION ALTERNATIVE

Inclusion of the no action alternative is prescribed by Council on Environmental Quality regulations. The no action alternative serves as a baseline against which the effects of the proposed action and alternatives can be evaluated.

Under the no action alternative, the USAG-HI would not add the 41.8-acre parcel to the IPC's 50-year ground lease to construct housing units (proposed action), but would continue to redevelop the housing areas as addressed in previous environmental documentation.

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SECTION 4.0
AFFECTED ENVIRONMENT AND CONSEQUENCES

SECTION 4.0
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

AFFECTED ENVIRONMENT

This section is an overview of the baseline physical, biological, social, and economic conditions that occur within the region of influence (ROI) of the proposed action. Only the following environmental and socioeconomic conditions relevant to the proposed action are presented:

4.1 Aesthetic and Visual Resources;

4.2 Air Quality;

4.3 Biological Resources;

4.4 Cultural Resources;

4.5 Environmental Justice;

4.6 Geology and Soils;

4.7 Hazardous Materials and Conditions;

4.8 Land Use;

4.9 Noise;

4.10 Socioeconomics;

4.11 Transportation and Circulation;

4.12 Utilities and Public Services; and

4.13 Water Resources.

Section 4.0 is organized by resource, as listed above. As applicable, each section includes background on how the resource is related to the proposed action, provides an overview of relevant legislative requirements governing the resource, and discusses the general conditions of the resource in the ROI.

ENVIRONMENTAL CONSEQUENCES

This section is an evaluation of the potential effects on the resources affected by the proposed action and the no action alternative. This analysis includes likely beneficial and adverse effects on the human environment, including short-term and long-term effects and direct and indirect effects. The analysis of effects on resources focuses on environmental issues in terms of their potential to affect the resource. Detailed consideration is given to those resources that have a potential for environmental effects. Interpretation of effects in terms of their duration, intensity, and scale are provided where possible. Effects under the no action alternative are compared against baseline effects of each resource.

Section Organization

Each section describes the method used for analysis of effects and factors used to determine the significance of effects (40 CFR, Part 1508.8). Effects are described where they occur for each resource, including both direct and indirect effects. Direct effects are caused by the proposed

action and occur at the same time and place; indirect effects are caused by the proposed action but occur later in time or at a distance from the proposed action.

Terminology

To determine whether an effect is significant, CEQ regulations require the consideration of context and intensity of potential effects (40 CFR, Part 1508.27). Context normally refers to the setting, whether local or regional, and intensity refers to the severity and duration of the effect. Also, this EA includes a discussion of the possible conflicts between the proposed project alternatives and the objectives of federal, regional, state, and local land use plans and policies for the area concerned (40 CFR, Part 1502.16[c]).

Effects are described according to the following levels:

- Significant adverse effect;
- Significant adverse effect but mitigable to less than significant;
- Minor adverse effect;
- No effect; or
- Beneficial effect.

The baseline information from the 2004 EA is incorporated by reference and is updated or supplemented by the additional information in this section. Following the discussion of each resource's environmental conditions is a discussion of the environmental effects of the proposed action and the no action alternative. Unless otherwise stated, the ROI for the proposed action is the project site and adjacent lands. The current conditions of a resource's affected environment, along with information presented for the no action alternative, constitute the baseline for analysis of effects resulting from implementing the proposed action. There may be both adverse and beneficial effects in a single category for a resource; for instance, a project could interfere with an existing land use, such as recreation (an adverse effect), while expanding public access to different recreation resources (a beneficial effect). Where there are adverse and beneficial effects, both are described. Mitigation is identified where it may reduce the significance of an effect.

The cumulative effects of the proposed action, when added to other past, present, and reasonably foreseeable future actions, are presented in Section 4.13, Cumulative Effects Summary. Section 4.14, Mitigation Summary, presents the mitigation measures that would be implemented as part of the proposed action to minimize effects on affected resources.

4.1 AESTHETICS AND VISUAL RESOURCES

4.1.1 Affected Environment

Introduction and Region of Influence

This section describes the aesthetics and visual resources associated with the proposed action and no action alternatives, as described in Sections 2 and 3. Visual resources are the visible physical features on a landscape (e.g., land, water, vegetation, animals, structures, and other features). The ROI for visual resources consists of the immediate site for the proposed Kalākaua Phase 3 Housing Development project, under the proposed action, the no action alternative, and the surrounding landscape adjacent to this proposed site.

Various guidelines and requirements affect the visual resources of Schofield Barracks, including the design, construction, and maintenance of structures and facilities. The proposed project would be subject to these guidelines and requirements, as well as other applicable design, construction, and maintenance guidelines and requirements for project structures, facilities, and landscaping. Installation guidelines and requirements affecting the proposed site are the Army Hawai‘i Family Housing Community Development and Management Plan (Army Hawai‘i Family Housing 2004) and the Schofield Barracks Real Property Master Plan (Belt Collins 1993).

Overview of Resource

Landscape Character of Surrounding Area

The visual landscape on Schofield Barracks is largely characterized by urban development features, with the rugged Wai‘anae Mountains to the west and Ko‘olau Mountains to the east dominating these respective backgrounds.

The western portion of Schofield Barracks is devoted to military training (Belt Collins 1993). This area extends from the valley floor into the rugged portions of the Wai‘anae Range. This area has been highly modified to support training and includes scattered structures, roads, and other support facilities, with linear straight lines that contrast with the irregular lines of the surrounding natural landscape. The visual features of lands around the proposed site vary. Lands immediately north, northwest, and northeast of the proposed site consist of dense structures, consistent with housing developments, such as the Phase 1 Kalākaua housing development, Schofield Barracks support facilities, and other urban features, including maintenance and supply facilities and the Schofield Barracks Post Cemetery (Figure 4.1-1). The area is heavily disturbed and contrasts sharply with the proposed site, which is undeveloped (Figure 4.1-2). Lands surrounding the proposed site to the immediate south, southwest, and southeast consist of mixed grassland, low shrubs, and trees that have a random arrangement, a coarser texture, and an overall pattern of subtle color variation of browns and greens. Additional open undeveloped space is farther south, near the base of the Wai‘anae Mountain Range. These undeveloped lands are consistent with the visual nature of the proposed site. Although backgrounds offer panoramic views of the surrounding mountains, the overall visual disturbance is high due to extensive modification of the landscape north, northwest, and northeast of the proposed site. However, the visual quality of the surrounding areas becomes less disturbed to the south of the proposed site, closer to the base of the Wai‘anae Mountains. The Wai‘anae and Ko‘olau Mountains are distinct background features in most views.

Figure 4.1-1 – Landscape across proposed site, looking northwest at Solomon Neighborhood

Figure 4.1-2 – Proposed Kalākaua Phase 3 housing development site

Off-post lands surrounding Schofield Barracks are highly developed. Buildings of various heights, primary and secondary roads, agricultural features, power lines, and other human-made features associated with Wahiawā or other developments are dominant nearby features.

Landscape Character of the Proposed Site

The project site for the proposed Kalākaua Phase 3 housing development is a 41.8-acre parcel south of the Schofield Barracks main cantonment on the South Range (Section 1, Figure 1-2). This 41.8-acre parcel had been used for pineapple cultivation since the 1940s. In 2004, the US Army acquired the property and made it part of the Army's training range. However, the land has been left idle and unused since the Army acquired the land. The other parcel of land that would comprise the 52.3-acre Kalākaua Phase 3 housing is a 10.5-acre parcel that is part of IPC's ground lease with the USAG-HI for construction of housing. Since about 2005, Lend Lease (IPC's construction partner) has used the 10.5-acre parcel as temporary construction offices and for staging construction materials.

The proposed housing development would be constructed on relatively flat, undeveloped open land consisting primarily of low-lying shrubs and grasses, with taller trees scattered throughout the site (Figure 4.1-2). Vegetation covers the extent of the proposed site and varies in density, with intermittent small clusters scattered throughout areas with less vegetation density. Views of the proposed site from the ridges of the Waiʻanae Mountains south of the installation offer more complete views of the proposed site but also may be intermittently affected by vegetation and topography, as well as by distance, depending on the viewing location. Although some scattered buildings exist on the lower flanks of the Waiʻanae Mountains southwest of the proposed site, views of the proposed site from these few locations are minimized by distance (between 1.5 and 2 miles away) and are obstructed by tall vegetation. Additionally, there is a small off-post neighborhood approximately 1.5 miles south of the proposed site. At this distance, distinct linear structures fade and are generally seen as forms and blocks. However, views to the proposed site are blocked by tall vegetation on the south side of the proposed site. Due to the distance and vegetation, this neighborhood does not view the proposed site clearly and so is not analyzed further. Potential views to the proposed site from trails in the Waiʻanae Mountains are obstructed by tall vegetation.

Sources of nighttime light near the proposed site are lighting on the exterior of various on-post housing and Schofield Barracks support facilities to the north. There is no nighttime light at the proposed site. The closest on-post publicly accessible areas with views of the proposed site are along Lyman Road, which partially borders the project on the north. The closest off-post publicly accessible area with views of the proposed site is on Kunia Road, approximately half a mile to the east.

4.1.2 Environmental Consequences

Methodology for Effects Analysis

Potential effects on aesthetics and visual resources are based on review of site conditions, applicable guidelines pertaining to visual resources, and proposed changes to the visual landscape (described in the description of the proposed action). Various actions that might create changes to the basic landscape elements were considered in identifying potential effects on visual resources.

Effects on visual resources can be either positive or negative, depending on the type and degree of visual contrasts introduced to a landscape. Primary viewers of the proposed housing development are considered people living and working on-post north of Lyman Road. These

viewers are considered highly sensitive to changes in the landscape. Where modifications repeat the general elements of the landscape, the degree of visual contrast is lower, and there are generally fewer effects. Where modification introduces pronounced changes, the degree of contrast is greater, as are the effects.

Factors Considered for Effects Analysis

Factors considered in determining whether an alternative would have a significant effect are the extent or degree to which its implementation would cause or result in the following:

- Conflict with regulations and policies governing visual resources;
- Degrade the visual character or quality of the site and its surroundings;
- Block or disrupt views or reduce public opportunities to view scenic resources; or
- Create a new source of light or glare.

Summary of Effects

The proposed action would have less than significant effects related to visual resource regulations, the visual character and quality of the site and surrounding areas, views, and light and glare. There would be no effects from the no action alternative.

Proposed Action

The proposed action would create short-term and long-term adverse effects on aesthetics and visual resources. Receptors sensitive to visual resources would be affected by these effects. The closest on-post facilities with receptors sensitive to visual resources are on residential and support properties that border the proposed site on the north, northeast, and northwest. These receptors are motorists traveling along Lyman Road and residents in the adjacent Kalākaua Neighborhood. The closest off-post publicly accessible vantage point from which project activities could be viewed is approximately half a mile east of the proposed site on Kunia Road.

Various guidelines and requirements affect the visual resources of Schofield Barracks, including the design, construction, and maintenance of structures and facilities. The proposed project would be subject to the guidelines and requirements according to the Army Hawai‘i Family Housing Community Development and Management Plan and Schofield Barracks Real Property Master Plan, as well as any state and local guidelines and requirements for project structures, facilities, and landscaping. There would be no effects on visual resources from conflicts with visual resource regulations.

During construction, best management practices (BMPs) would be used to reduce potential long-term visual resource effects. Such practices include the following, as related to visual resources:

- Developing a program to educate workers about BMPs related to visual effects before the project starts;
- Minimizing dust by regularly watering exposed soils, stockpiling soil, and stabilizing soil to reduce effects on visual quality from air pollution;
- Using equipment exhaust mufflers to reduce effects on visual quality from air pollution;
- Restricting parking of construction vehicles on-site or in other designated areas for the duration of construction; and

- Minimizing light glare by shrouding outdoor lights and directing light downward, as well as using motion detectors, where practical, to provide light only when necessary.

During construction, there would be short-term minor adverse effects on the visual character of the site and surroundings. From the proposed site location, an increase in traffic from project vehicles, construction activity, and construction equipment would be visible and would contrast with the surrounding vegetation and terrain. There would also be a slight decrease in visibility from fugitive dust from ground disturbance, but dust control BMPs would minimize this effect. Temporary laydown and staging areas would be confined to the actual project site and some nearby areas if any are available .This would contribute to the short-term minor adverse visual effects from construction. However, these adverse effects on the visual landscape of the proposed site would be less than significant because they would be limited to the two-year construction period.

With the construction of the proposed housing, there would be long-term, minor adverse effects on the visual character of the area. Construction of the proposed housing would reduce views of the open space from the neighborhood immediately north of Lyman Road, resulting in a minor change to the aesthetic and visual resources in the vicinity; however, the proposed development is considered appropriate for the designated use of the land and would be a design similar to the Kalākaua neighborhoods. The design of the proposed development would be consistent with standards contained in Section 1.8.1 of the Army Hawai‘i Family Housing Community Development and Management Plan (USACE 2004b), resulting in a Hawaiian-style exterior, similar in design to surrounding installation neighborhoods. As such, the proposed housing development would not be out of context with the housing developments north of Lyman Road and may be viewed from many directions as an extension of the neighborhood, resulting in a less than significant effect on the visual landscape of the area.

The proposed development would have a long-term minor adverse effect on the views of the Wai’anae Mountains for residents of the Kalākaua neighborhoods immediately north of the proposed site. Lyman Road, the Schofield Barracks Post Cemetery, and adjacent administrative lands are between existing and proposed housing developments, creating sufficient open unobstructed space between them. This space minimizes visual obstruction and therefore retains the views to the Wai‘anae Mountains to the west because the proposed housing development would not be constructed next to an existing neighborhood. The proposed development would be in the visual periphery of the existing neighborhood, when looking at the Wai‘anae Mountains, but it would not dominate the view.

With construction, there would be an increase in light and glare. To minimize long-term minor adverse effects from lighting, the proposed project would implement BMPs that include using proper outdoor lighting design, such as shrouding outdoor lights to keep stray light from illuminating unnecessary areas and equipping outdoor lights with motion detectors, where practical, to provide light only when necessary. Therefore, less than significant effects from light and glare are anticipated.

No Action Alternative

No effects would occur under the no action alternative. The 41.8-acre parcel at Schofield Barracks would not be added to the IPC ground lease, and no construction would occur at the proposed site related to the Kalākaua Phase 3 housing development. Therefore, visual resources in the area would remain unchanged.

4.2 AIR QUALITY

4.2.1 Affected Environment

Introduction and Region of Influence

Air quality in Hawai‘i is generally among the best in the nation, with ambient air quality concentrations well below federal and state standards. This situation is primarily due to the tendency for pollutants to disperse offshore with the trade winds and the limited number of emission sources on each island. The ROI for this analysis is the proposed action area and surrounding areas.

Overview of Resource

Air quality is assessed in terms of whether concentrations of air pollutants are higher or lower than established federal and state ambient air quality standards. The US Environmental Protection Agency (EPA) and the Hawai‘i Department of Health (HDOH) Clean Air Branch have established standards for the following air pollutants, which are collectively referred to as criteria pollutants: ozone, nitrogen oxides, carbon monoxide, sulfur dioxide, lead, and particulate matter (as inhalable particulate matter [PM_{10}] and as fine particulate matter [$PM_{2.5}$]). The purpose of these standards is to protect human health.

Areas where air quality is equal to or better than the ambient air quality standards are called attainment areas, and areas where air quality is worse are called nonattainment areas. Areas that have been classified as nonattainment areas in the past but that are currently in attainment are called maintenance areas, and areas of uncertain status are designated as unclassifiable.

Summary of Existing Conditions

Existing Air Quality

The HDOH Clean Air Branch operates several air quality monitoring stations on O‘ahu. There were no exceedances of state or federal ambient air quality standards recorded at any of these monitoring stations in 2009, which is the most recent year for which complete air quality data are available. Excluding exceedances due to the Kilauea Volcano on the Island of Hawai‘i, Hawai‘i was in attainment for all pollutants in 2009 (HDOH 2010).

There are no sources of air emissions in the project site because it is undeveloped. Emission sources at Schofield Barracks are personal and government vehicles, maintenance and warehousing equipment, and stationary sources, such as boilers, generators, and incinerators. In addition, military training emission sources are weapons detonation and off-road vehicles, the latter of which can cause relatively high but temporary emissions of fugitive dust in areas with fine soils.

Clean Air Act Conformity

Under the authority of the Clean Air Act, the EPA has promulgated the general conformity rule, which requires that federal agencies in nonattainment and maintenance areas perform a general conformity analysis and, where emissions could exceed specified thresholds, to prepare a formal conformity determination document. Because Hawai‘i is in attainment for all pollutants, a general conformity analysis is not required for the proposed action. The Army has documented this fact in a Record of Nonapplicability (Appendix B).

4.2.2 Environmental Consequences

Methodology for Analyzing Effects

Potential air quality effects from the proposed action were assessed using a custom project-specific spreadsheet model that calculates air pollutant and greenhouse gas (GHG) emissions from construction. Emissions during operation and maintenance would be a fraction of construction emissions.

The spreadsheet model uses a conventional approach to estimating emissions from construction equipment and activity. Construction was divided into four overlapping phases: site preparation, utility interconnect installation and foundation construction, building construction, and building finishing and paving. The type of equipment, number of each piece of equipment, and hours of operation needed for each phase was then estimated and engine emissions were calculated. The amount of area to be disturbed was used to calculate typical fugitive dust emission rates, taking into account dust control from watering using a water truck and natural precipitation patterns. Emissions of volatile organic gases from curing asphalt pavement were also calculated.

Factors Considered for Effect Analysis

Factors considered in determining whether the proposed action or alternatives would have a significant effect on air quality are the following:

- If it were to generate significant quantities of criteria pollutant emissions in a calendar year that could contribute to local or regional exceedances of federal or state ambient air quality standards or
- If it were to generate significant quantities of GHG emissions in a calendar year.

Summary of Effects

The proposed action would not have significant adverse effects from criteria pollutants or GHGs. Because the no action alternative would not change the present conditions at the project site, there would be no adverse effect on air quality.

Proposed Action

Construction

Air quality effects from the proposed action are primarily the result of temporary emissions from construction. The proposed action would require the operation of heavy equipment and construction vehicles for various activities, including site grading, excavating and pouring building foundations, installing buried and aboveground utility interconnects, erecting buildings, and paving roads and driveways. Also, there would be additional vehicle traffic to and from the project site associated with construction commuters and heavy trucks delivering construction materials and facility components. Construction would result in various sources of emissions, including engine exhaust, fugitive dust from site disturbance, fugitive organic compounds from surface coatings, such as paints and solvents, and fugitive organic compounds from curing asphalt. Standard management practices would be implemented as part of the proposed action, such as watering area of exposed soil and covering trucks with tarps, to reduce fugitive dust.

Criteria Pollutants

Table 4.2-1 summarizes criteria pollutant emissions from construction and on-site vehicle operations for the proposed action, based on estimates predicted by the project-specific spreadsheet model. Although Clean Air Act conformity analysis criteria do not formally apply to the proposed action, the general conformity de minimis threshold for maintenance areas of 100 tons per year of any criteria pollutant can serve as a useful indicator of significant emissions that could exceed federal or state ambient air quality standards. For each pollutant, the total emissions are substantially below 100 tons per year. Given that the anticipated quantities of construction emissions are relatively low, that construction emissions would be temporary and dispersed throughout the project area, that emissions would be dispersed by trade winds, and that Hawai‘i is in attainment for all criteria pollutants, the proposed action would be in compliance with both federal and state ambient air quality standards and therefore would have a minor adverse effect on air quality.

Table 4.2-1
Summary of Criteria Pollutant Emissions from Project Construction

Emissions Component	Pollutant Emissions, Tons per Year					
	ROG	**NO_x**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Site preparation	0.24	2.27	1.40	0.34	1.19	0.57
Utilities and building foundations	0.26	1.01	4.40	0.17	0.35	0.19
Building construction	0.64	4.28	4.15	0.69	3.99	1.78
Finishing and paving	2.23	1.53	1.41	0.22	1.56	1.09
Total	**3.36**	**9.09**	**11.37**	**1.44**	**7.09**	**3.62**

Source: Tetra Tech staff analysis

CO = carbon monoxide
NO_x = nitrogen oxides (ozone precursors)
ROG = reactive organic gases (ozone precursors)
SO_x = sulfur oxides

Greenhouse Gas Emissions

In addition to criteria pollutants, construction equipment would be a source of GHG emissions, primarily from engine fuel combustion. The major GHGs for fuel combustion sources are carbon dioxide, methane, and nitrous oxide. The overall global warming potential (GWP) of combined GHG emissions is typically presented as carbon dioxide equivalents (CO_2e).

Table 4.2-2 summarizes GHG emissions from construction and on-site vehicle operations for 2013, based on estimates predicted by the project-specific spreadsheet model. State and federal agencies have not yet established impact significance criteria for GHG emissions, but the EPA requires air permits for stationary sources that emit more than 75,000 tons per year of CO_2e. Using 75,000 tons per year as an indicator of significant emissions, the estimated GHG emissions are substantially lower and therefore would have a minor adverse effect on air quality.

Table 4.2-2
Summary of Greenhouse Gas Emissions from Project Construction

	Greenhouse Gas Emissions, Tons per Year			
Emissions Component	**CO_2**	**CH_4**	**N_2O**	**GWP (CO_2e)**
Site preparation	249.6	0.008	0.005	**251.4**
Utilities and building foundations	144.8	0.005	0.003	**145.9**
Building construction	652.0	0.017	0.012	**656.1**
Finishing and paving	214.4	0.006	0.004	**215.8**
Total	**1,260.8**	**0.035**	**0.025**	**1,269.2**

Source: Tetra Tech staff analysis

CH_4 = methane, GWP multiplier = 25
CO_2 = carbon dioxide, GWP multiplier = 1
GWP = global warming potential in carbon dioxide equivalents based on Intergovernmental Panel on Climate Change 2007
N_2O = nitrous oxide, GWP multiplier = 298

Operation and Maintenance

Minor long-term emissions would result from occupation of the new houses. Operation of the proposed action would introduce new sources of emissions, primarily vehicle traffic and ventilation systems. The emissions from these sources would be a fraction of the emissions generated during construction and would not generate significant quantities of criteria pollutant or GHG emissions. For these reasons, operation and maintenance of the new houses would have a minor adverse effect on air quality.

No Action Alternative

The no action alternative would not change or augment the existing emissions in the ROI. No effects are identified as resulting from the no action alternative.

4.3 BIOLOGICAL RESOURCES

4.3.1 Affected Environment

Introduction and Region of Influence

This section describes biological resources on the project site and adjacent areas. Biological resources include plant and animal species and their habitats. The project site is a 41.8-acre parcel south of Schofield Barracks' main cantonment in the South Range. Brief information is provided for relevant biological resources for O'ahu and Schofield Barracks to provide context for the resources considered in more detail for the project site.

The region of influence (ROI) for biological resources includes the project site plus a 100-foot-wide buffer surrounding the site. The buffer zone around this area is intended to capture all the biological resources that could be affected by the proposed action, either directly or indirectly, and to allow for flexibility in project design. The vegetated gulch to the south of the project site is the primary feature that could be indirectly affected outside of the project site.

Biological resources in the project site are described and the potential effects of the proposed action and the no action alternative are evaluated in the context of compliance with the applicable provisions of several statutes, Executive Orders, regulations, and management plans. Potential effects on wetlands are evaluated in the context of Section 404 of the Clean Water Act, Executive Orders, and applicable Army guidance. Sensitive species included in this analysis are those listed as threatened or endangered under the US Endangered Species Act (ESA), those that are listed as threatened or endangered by the State of Hawai'i, and those birds that are protected by the US Migratory Bird Treaty Act (MBTA). The proposed action and potential effects are evaluated for their compliance with the following three related guidance documents:

- *Biological Opinion on Routine Military Training and Transformation of the 2nd Brigade 25th Infantry Division (Light), US Army Installations on the Island of O'ahu* (BO; USFWS 2003a);
- *Implementation Plan for O'ahu Training Areas* (OIP; USAG-HI 2008); and
- *US Army Garrison Hawai'i Integrated Natural Resource Management Plan 2010-2014* (INRMP; USAG-HI 2010a).

Overview of Resource

Schofield Barracks extends from Kunia Road on the southeast to the crestline of the Wai'anae Mountains on the northwest. Sensitive plant and wildlife species on Schofield Barracks are most likely to occur in the higher elevations of the Wai'anae and Ko'olau Mountains. They are not likely to occur in the disturbed lowland areas that make up the ROI because the vegetation communities in the undeveloped border areas of Schofield Barracks are dominated by nonnative species surrounded by urban development. Relatively undisturbed vegetation is occasionally found in steep gulches primarily outside the ROI. Native species, such as 'ōhi'a (*Metrosideros polymorpha*) and koa (*Acacia koa*), may be present in gulches.

The project site is predominantly disturbed land that supports mostly nonnative plant and animal species. It was used for pineapple cultivation from the mid-1900s until 2004 when it was acquired by USAG-HI and designated as an Army training area. The site has gone largely unused since then. Because of the highly disturbed landscape that is overgrown with tall nonnative grasses

(over four feet over most of the area) and shrubs, it has a limited potential to contain sensitive biological resources, such as federally listed threatened or endangered species.

Vegetation

The vegetation community at Schofield Barracks consists primarily of disturbed weedy vegetation and species typical of urban landscaped areas including highly managed nonnative grasses, shrubs, and trees. Disturbed areas may be subject to invasion by noxious weeds and other highly invasive plants.

The ROI consists primarily of disturbed, lowland dry shrubland and grassland and agricultural fields. The flora is limited in diversity and is dominated by nonnative species or by species habituated to human disturbance and do not provide high-quality forage or habitat for wildlife species. The gulch area to the south of the site contains less disturbed vegetation.

Vegetation at Schofield Barracks is managed in accordance with the BO, OIP, and INRMP (USFWS 2003a; USAG-HI 2008, 2010a). The Army manages vegetation primarily to control pests, to maintain or increase the acreage of native ground cover, to control wildfire, and to maintain the military training mission. Although the Army monitors the entire installation for the presence of invasive species, the ROI is not in an area of focused vegetation management.

Schofield Barracks does contain numerous "exceptional trees," distinguished by their nomination to the City and County of Honolulu Register of Exceptional Trees; however, none of these trees occur in the ROI.

Wetlands

The US Army Corps of Engineers (USACE) conducted a wetlands delineation of possible wetlands on Schofield Barracks in 2004. No wetlands or deepwater habitats were found in or near the ROI on Schofield Barracks (USAG-HI 2010a). Waikele Stream with Waikele Gulch is next to the south side of the project site. It is dry most of the year, with intermittent flows following rain (Englund and Randall 1999).

Wildlife

Wildlife is managed at Schofield Barracks in accordance with the BO, OIP, and INRMP (USFWS 2003a; USAG-HI 2008, 2010a). Management priorities include controlling introduced feral ungulates (domesticated hoofed animals that have returned to a wild state, such as pigs), maintaining native species populations, and protecting sensitive species and their habitats. Because the ROI offers little wildlife habitat, no management actions are focused on this area. Because the habitat available for wildlife in developed and disturbed areas of Schofield Barracks is low quality, wildlife abundance and diversity is low and is dominated by nonnative species or by species habituated to human disturbance. (For a list of the nonnative species that may be found in the ROI, please refer to Table 4.3-1.)

There are native invertebrates at Schofield Barracks, such as various snail and fly species (USAG-HI 2010a). The highly disturbed areas of the ROI support mostly nonnative invertebrates associated with agriculture. However, native snail species, which are not listed as threatened or endangered, could occur in the gulch area (Mansker 2011a). Several species of nonnative snails are found at Schofield Barracks and have been purposely or accidentally introduced to the island and now threaten the native snail species through predation, the spread of disease, and competition for resources.

Table 4.3-1
Nonnative Wildlife Species Potentially Existing in or Around the ROI

Wildlife	Common Name	Scientific Name *Genus species*
Invertebrates	giant African snail	*Achatina fulica*
	bradybaenid land snail	*Bradybaena similaris*
	cannibal snail	*Euglandina rosea*
	zonitid land snail	*Hawaiia minuscula*
Amphibians	green and black poison dart frog	*Dendrobates auratus*
	bullfrog	*Rana catesbeiana*
	wrinkled frog	*R. rugosa*
	giant toad	*Bufo marinus*
	coqui frog	*Eleutherodactylus coqui*
	greenhouse frog	*E. planirostris*
	Cuban tree frog	*Osteopilus septentrionalis*
Reptiles	green anole	*Anolis carolinenesis*
	mourning gecko	*Lepidodactylus lugubris*
	stump-toed gecko	*Gehyra mutilata*
	tree gecko	*Hemiphyllodactylus typus*
	Indo-Pacific gecko	*Hemidactylus garnotii*
	house gecko	*H. frenatus*
	metallic skink	*Lampropholis delicata*
	gold dust day gecko	*Phelsuma laticauda laticauda*
	island blind snake	*Ramphotyphlops braminus*
Birds	spotted dove	*Streptopelia chinensis*
	common mynah	*Acridotheres tristis*
	red-vented bulbul	*Pycnonotus cafer*
	red-crested cardinal	*Paroaria coronata*
	red-billed leiothrix	*Leiothrix lutea*
	white-rumped shama	*Copsychus malabaricus*
	Japanese bush warbler	*Cettia diphone*
	rock dove	*Columbia livia*
	zebra dove	*Geopelia striata*
	Japanese white-eye	*Zosterops japonicus*
	nutmeg manikin	*Lonchura punctulatua*
	barn owl	*Tyto alba*
	Erchel's francolin	*Francolinus erckelii*
	ring-necked pheasant	*Phasianus colchicus*
	house sparrow	*Passer domesticus*
	chestnut manikin	*Lonchura malacca*
	northern cardinal	*Cardinalis cardinalis*
Mammals	feral cat	*Felis catus*
	feral dog	*Canis familiaris familiaris*
	Indian mongoose	*Herpestes auropunctatus*
	Polynesian rat	*Rattus exulans hawaiiensis*
	Norway rat	*R. norvegicus*
	black rat	*R. rattus*
	house mouse	*Mus musculus*

Sources: US Army and USACE 2004; USACE 2004b; USAG-HI 2005; US Army 2006, 2007

There are no native terrestrial amphibians or reptiles on the Hawaiian Islands. Nonnative amphibians and reptiles found on O‘ahu have the potential to inhabit Schofield Barracks and may incidentally occur in the ROI. These include a variety of nonnative frog and gecko species.

Wildlife at Schofield Barracks primarily consists of birds, with the greatest diversity found in the forested gully areas. Naturalized species, including the spotted dove (*Streptopelia chinensis*), common mynah (*Acridotheres tristis*), red-vented bulbul (*Pycnonotus cafer*), and red-crested cardinal (*Paroaria coronata*), occur on Schofield Barracks (US Army and USACE 2004; USACE 2004b; USAG-HI 2005; US Army 2006, 2007). Mostly nonnative and common birds, such as the aforementioned species, are expected to use the ROI because of the highly disturbed habitat. There are about a dozen typical nonnative bird species that have been introduced to O‘ahu that are likely to occur at Schofield Barracks and possibly in the ROI.

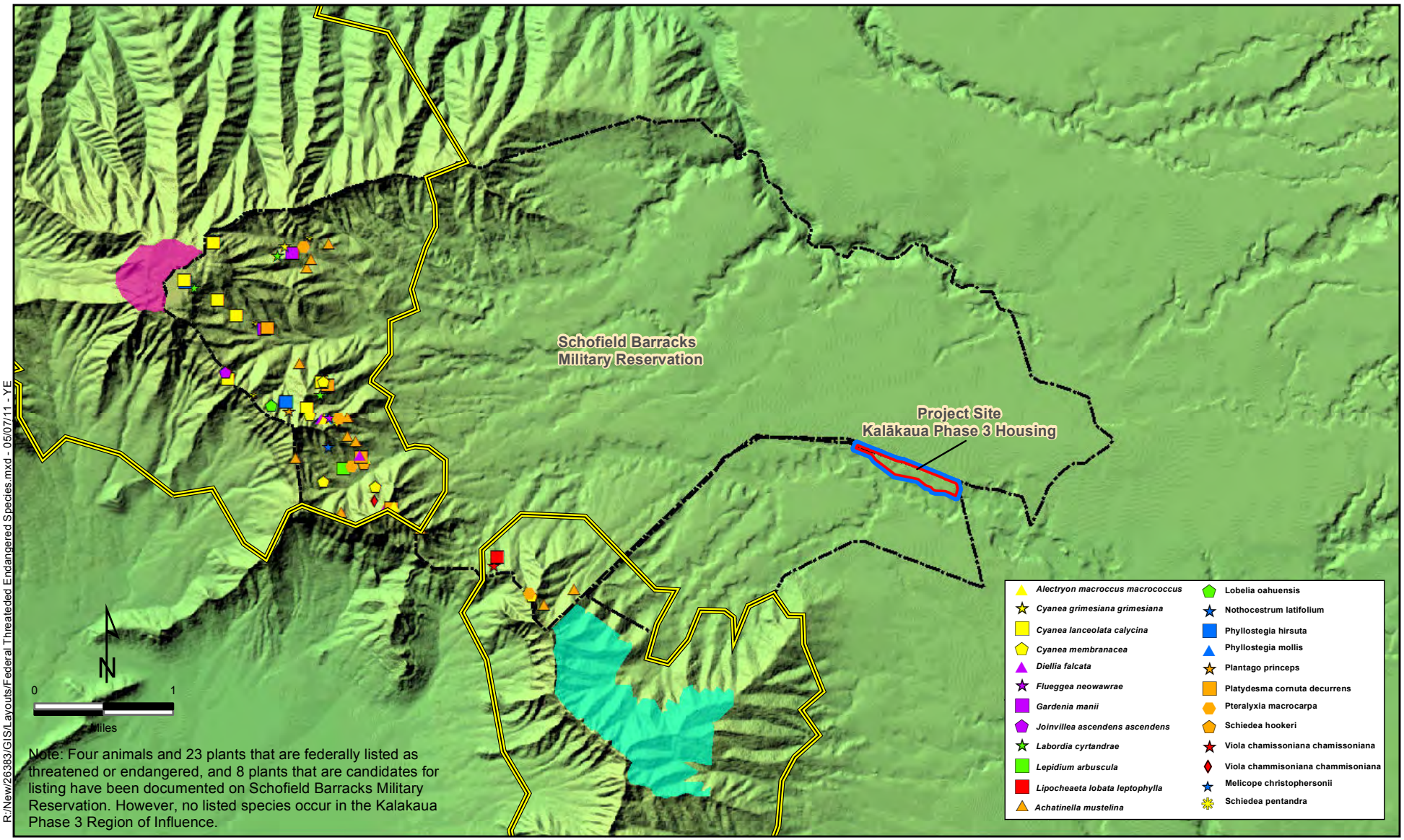
Nonnative mammals documented in the vicinity of Schofield Barracks include feral pigs, feral goats, feral cats, feral dogs, Indian mongoose (*Herpestes javanicus*), and several rat species.

Endemic fish and aquatic invertebrate species on Schofield Barracks (USAG-HI 2010a) are not found in or near the ROI because of a lack of surface water. The segment of Waikele Stream next to the project site is dry most of the year, with intermittent flows following rain (Englund and Randall 1999).

Sensitive Species

Sensitive species considered in this analysis include those listed or proposed for listing by the US Fish and Wildlife Service (USFWS) under the ESA or the State of Hawai‘i as endangered or threatened, as a candidate species for listing, as a species of concern, and species protected under the MBTA. Sensitive species are managed at Schofield Barracks in accordance with the BO, OIP, and INRMP (USFWS 2003a; USAG-HI 2008, 2010a). Management focuses on preserving and restoring the habitat for such species, as well as controlling invasive plant and animal species that may displace them.

There are three species of mammals, seven birds, five reptiles (all sea turtles), seven insects, and numerous snails that are listed as threatened, endangered, or proposed for listing by the USFWS on O‘ahu (USFWS 2010a; Table 4.3-2). Of these species, only four have been documented at Schofield Barracks (USAG-HI 2010), the O‘ahu ‘elepaio (*Chasiempis sandwichensis ibidis*), O‘ahu tree snail (*Achatinella mustelina*), and two species of picture wing fly (*Drosophilia montgomeryi* and *D. substenoptera*). All of these species were considered in this analysis. However, because of a lack of suitable habitat in the ROI and distance from the Ko‘olau Mountains, it is unlikely that any of these species occur in the ROI, so they were excluded from further consideration (USAG-HI 2010; USFWS 2010a; Figure 4.3-1, Table 4.3-2). In addition, none of these species have been seen in the ROI. There is designated critical habitat for O‘ahu ‘elepaio on SMBR, but it is not in or near the ROI (USAG-HI 2010a).



TETRA TECH

Region of Influence
Project Site
Schofield Barracks Millitary Reservation Boundary

Critical Habitat

'Elepaio *(Chasiempis sandwichensis ibidis)*
Picture-Wing Fly *(Drosophilia montgomeryi)*
Picture-Wing Fly *(Drosophilia substenoptera)*

Federal Threatened, Endangered, and Candidate Species Documented on Schofield Barracks Military Reservation in Relation to Kalākaua Phase 3 Housing Biological Region of Influence

Schofield Barracks Military Reservation
O'ahu, Hawai'i

Figure 4.3-1

Source: U.S. Fish and Wildlife Service, Pacific Islands Office, 2004. Statewide Picturewind, April 2010; HINHP (Plants) 2002

Table 4.3-2
Federal Threatened, Endangered, and Proposed Wildlife Species That Could Occur on O‘ahu, Schofield Barracks, and in the ROI

Common Name	Scientific Name	Status	Occurrence		
			O‘ahu	Schofield Barracks	ROI
Insects					
O‘ahu picture-wing fly (6 species)	*Drosophila* spp.	E, Ch	X	X (2 species)	
Pacific Hawaiian damselfly	*Megalagrion pacificum*	PE	X		
Snails					
O‘ahu tree snail (41 species)	*Achatinella* spp.	E	X	X (1 species)	
Reptiles					
Loggerhead sea turtle	*Caretta caretta*	T	X		
Green sea turtle	*Chelonia mydas*	T	X		
Leatherback sea turtle	*Dermochelys coriacaeae*	E	X		
Hawksbill turtle	*Eretmochelys imbricate*	E	X		
Olive ridley sea turtle	*Lepidochelys olivacea*	T	X		
Birds					
Hawaiian duck	*Anas wyvilliana*	E	X		
O‘ahu ‘elepaio	*Chasiempis sandwichensis ibidis*	E, CH	X	X	
Hawaiian coot	*Fulica alai*	E	X		
Common moorhen	*Gallinula chloropus sandvicensis*	E	X		
Black-necked stilt	*Himantopus mexicanus knudseni*	E	X		
O‘ahu creeper	*Paroreomyza maculata*	E	X		
Newell’s shearwater	*Puffinus auricularis*	T	X		
Mammals					
Hawaiian hoary bat	*Lasiurus cinereus semotus*	E	X		
Humpback whale	*Megaptera novaeangliae*	E	X		
Hawaiian monk seal	*Monachus schauinslandi*	E, CH	X		

Source: USFWS 2010a

Notes: T = threatened, E = endangered, P = proposed for listing, CH = critical habitat designated on O‘ahu, X = occurs. No animal species are currently candidates for listing on O‘ahu. No listed or proposed animal species have been documented or are expected to occur in the ROI due to a lack of suitable habitat.

There are numerous plant species protected by the ESA on O‘ahu (USFWS 2010b). There are 23 species documented on Schofield Barracks that are threatened or endangered and eight that are candidates for listing (USAG-HI 2010a). Plant critical habitat exists on Schofield Barracks only along the northwest boundary and the southwest corner. All of these species were considered in this analysis. However, because of a lack of suitable habitat, the disturbed nature of the ROI, and the distance from the Ko‘olau Mountains, it is unlikely that any of these species occur in the ROI; as a result, they would not be affected by the proposed action and were thus excluded from further consideration (Figure 4.3-1).

In March 2010 the USFWS updated the list of species protected under the MBTA and added 24 Hawaiian species, 17 of which are also listed or proposed for listing under the ESA (USFWS 2010c). The following indigenous bird species have been recorded at the Main Post of Schofield Barracks: O‘ahu ‘elepaio, O‘ahu creeper (*Paroreomyza maculata*), ‘i‘iwi (*Vestiaria coccinea*),

ʻapapane (*Hiatione sanguinea sanguinea*), Oʻahu ʻamakihi (*Hemignathus virens chloris*), white-tailed tropicbird (*Phaethon lepturus dorotheae*), black-crowned night heron (*Nycticorax nycticorax hoactli*), Pacific golden-plover (*Pluvialis fulva*) and Hawaiian short-eared owl (*Asio flammeus sandwichensis*), also known as pueo (USAG-HI 2010b). All of these species are now included under the MBTA.

The ROI provides only marginal habitat for two of these species, the Pacific golden-plover and Hawaiian short-eared owl (pueo). There is limited potential for these species to commonly occur in the ROI because the project site is vegetated with tall shrubs, trees, and dense nonnative grasses that are at least four feet high. The Pacific golden-plover is in greatest abundance in Hawaiʻi from August through May where it is common on Oʻahu. It has been documented on Schofield Barracks and forages in grassy areas (Hawaiʻi Audubon Society 1997). Plovers are not likely to use the project site because the grass is thicker and taller than optimal for foraging. The pueo is also listed by the State of Hawaiʻi as endangered and is described in the INRMP as a keystone species (USAG-HI 2010). This owl is active during the day and nests on the ground (Mitchell et al. 2005). Pueo occupy a variety of habitats, including grasslands, shrublands, and urban areas. It is unlikely that pueo would be regularly found in the ROI because they typically hunt in open areas with vegetation that is less dense than in the ROI and short enough for them to see prey while soaring overhead. The dense and tall grass and shrubs in the ROI are not likely suitable for pueo nesting or hunting. The remainder of the migratory birds that have been documented on Schofield Barracks require habitats, such as forest or wetlands, that do not occur in the ROI; as a result, they would not be affected by the proposed action and were excluded from further analysis (USFWS 2010a; USAG-HI 2010a, b).

4.3.2 Environmental Consequences

Methodology for Analyzing Effects

Effects were assessed based on how the proposed action and no action alternative would affect biological resources primarily in the ROI, with an emphasis on sensitive biological resources protected by federal and state law, and Army guidance. The proposed action was also assessed for consistency with the BO, OIP, and INRMP (USFWS 2003a; USAG-HI 2008, 2010a).

Factors Considered for Effects Analysis

An action is considered to have a significant adverse effect on biological resources if it would result in any of the following:

- Cause the "take" of a highly sensitive resource, such as a threatened and endangered or special status species;
- Result in a jeopardy biological opinion by the USFWS;
- Reduce the population of a sensitive species, as designated by federal and state agencies, or a species with regional and local significance. This can happen with a reduction in numbers, by alteration in behavior, reproduction, or survival, or by loss or disturbance of habitat;
- Damage or degrade wetlands or riparian habitat regulated by the local, state, or federal government or another sensitive habitat, such as designated critical habitat, identified in local or regional plans, policies, or regulations or by the USFWS;

- Interfere with the movement of any native resident or migratory wildlife species (including aquatic species) or with established native resident or migratory wildlife corridors;
- Alter or destroy habitat that would prevent biological communities in the area from reestablishing themselves;
- Introduce or increase the prevalence of undesirable nonnative species; or
- Cause long-term loss or impairment of a substantial portion of local species-dependent habitat.

An effect is considered significant but mitigable if the result of the proposed action would have a significant effect on biological resources but compensatory mitigation is included to reduce the level of effect to below significant levels.

Summary of Effects

The proposed action would have minor adverse effects on biological resources. There would be no effects from the no action alternative.

Proposed Action

There are limited sensitive biological resources in and next to the ROI, so the effects on biological resources from implementing the proposed action would be adverse but minor. Permanent effects would occur from converting an undeveloped field into housing and other infrastructure. These effects are minor because of the highly disturbed nature of the biological resources at the project site. Some effects would also occur from construction that would cause short-term disturbances to wildlife in the vicinity. The proposed action may affect the Pacific golden-plover, but effects would be minor because there is abundant alternative habitat for this common species in adjacent areas. The proposed action may affect pueo, but the effects would be minor as the project site provides only marginal habitat.

Vegetation

If the proposed action were implemented, the vegetation described above would be permanently lost in the footprint of the project area. This vegetation is generally nonnative weeds, so there would be no effect on native vegetation communities. Landscaped areas surrounding homes would be converted to different species and structure of vegetation, which would primarily be nonnative draught-tolerant grasses, shrubs, and trees, replacing the nonnative weeds. Noxious weeds thrive in disturbed soils, so that ground-disturbing construction projects always have potential to spread noxious weeds. Because the site is already primarily weeds, and BMPs to minimize the spread of noxious weeds would be used, both short-term and long-term adverse effects related to noxious weeds would be minor. Staging and construction can destroy vegetation, and eliminating the vegetation in an area exposes soil, increasing the potential for erosion. Construction runoff may contain chemical agents that could harm vegetation by percolating into the root zone where the agents could be absorbed. Construction vehicles are often heavy and could disturb root zones if driven near trees. Dust and debris from construction and demolition could damage vegetation in the vicinity of those project activities.

BMPs would include limiting staging activities in areas not currently in heavy use, controlling surface water runoff in accordance with a stormwater pollution prevention plan, and implementing BMPs for oil spills, toxic substance cleanup, and construction fire hazards.

Construction staging areas would be located in already disturbed areas. These BMPs would reduce the short-term adverse effects to negligible or minor.

Wetlands

No wetlands are present in or next to the ROI, so that there would be no effect from implementing the proposed action.

Wildlife and Wildlife Habitat

If the proposed action were implemented, potential wildlife habitat would be permanently lost in the footprint of infrastructure, as described for vegetation. Because of the poor quality of habitat and limited diversity of wildlife, this would be a minor adverse effect. After construction is completed, the area would continue to represent very limited wildlife habitat. The species composition would likely shift somewhat due to infrastructure, different vegetation structure and species, and presence of humans and pets. However, it would continue to be dominated by species that tolerate human-altered landscapes and people. Behavior of wildlife in the gulch area next to the project site could be indirectly adversely affected by humans, pets, vehicles, and lighting in the long term, but these effects would likely be minor. The potential for any pets to harass wildlife and for cats to eat native birds is minimized by the pet policies in effect for IPC (2011), which strictly forbid pets from running loose. There is some limited potential for cats to encounter Pacific golden-plover in grassy yards if residents are not in compliance with pet policies. Wildlife road kill would increase in the ROI, but the most vulnerable species would be nonnative mammals.

Temporary effects from construction would increase the amount of traffic, noise, and human activity, which would likely deter wildlife from using areas in and near the project site. Construction would mostly affect nonnative species adapted to stressed or nonnative environments. Wildlife using the gulch area next to the site may flush due to noise and visual and vibration disturbances during construction. All temporary adverse effects would be minor due to the limited sensitive biological resources in the ROI.

Sensitive Species and Habitats

There is no suitable habitat or designated critical habitat for any animal or plant species listed as threatened or endangered by the USFWS in the ROI (USAG-HI 2010a; USFWS 2010a, 2010b; Figure 4.3-1). Therefore, implementing the proposed action would have no effect on federal listed species.

The pueo is a Hawai‘i listed endangered species and protected by the MBTA (Mitchell et al. 2005; USFWS 2010c). The ROI provides only marginal pueo habitat because the tall shrubs, trees, and dense nonnative grasses are less than ideal for hunting and nesting. However, because the pueo has been documented in shrubby and urban areas, there is a limited potential for it to occur in the ROI. For these reasons, potential adverse effects are primarily limited to slightly reducing the quantity of available habitat on O‘ahu. Because the species can occur in open, shrubby, and urban areas, some limited habitat would remain, after construction.

The Pacific golden-plover, protected by the MBTA, is known to occur at Schofield Barracks and may occur in the ROI and may be displaced from the project site during construction. The MBTA prohibits the take of protected birds and their nests but does not regulate disturbances to their habitats. Because the species would not be present during the breeding season and no direct mortality is expected, adverse effects, if any, would be minor. Implementing the proposed action

would convert the densely vegetated site to landscaped grasses, which could improve foraging habitat for Pacific golden-plover in the project area.

Adverse effects on other bird species protected by the MBTA are unlikely because they are not expected to be found in the ROI due to lack of suitable habitat.

In January 2011, the Army Natural Resource Section was asked for information on any issues it would identify about implementing this project, but it identified no issues (Mansker 2011).

No Action Alternative

Under the no action alternative, the proposed action would not be constructed, so there would be no related effects. The highly disturbed vegetation community on the project site would remain and would gradually change in vegetative composition and structure but would remain dominated by nonnative vegetation for the foreseeable future, in the absence of any management.

4.4 CULTURAL RESOURCES

4.4.1 Affected Environment

Introduction and Region of Influence

Cultural resources consist of archaeological resources, Native Hawaiian traditional resources and sacred sites, and built environments, such as historic buildings, structures, districts, and landscapes. Resources can be either prehistoric (pre-Contact) or historic (post-Contact). Historic properties are cultural resources that are eligible for listing on or that are listed on the National Register of Historic Places (NRHP), including individual sites, artifacts, and districts. Traditional resources or sacred sites that are historic properties are referred to as traditional cultural properties (TCPs). In general, cultural resources must be a minimum of 50 years old to be considered historic, but considerations may be made for resources that have achieved national significance in the past 50 years, such as buildings and sites associated with the Cold War.

There are numerous cultural resource laws and regulations that govern the management of cultural resources at Schofield Barracks. The most pertinent ones with regard to the proposed action are the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the American Indian Religious Freedom Act (AIRFA), the Native American Graves Protection and Repatriation Act (NAGPRA), Executive Order (EO) 13007 (Indian Sacred Sites), EO 13175 (Consultation and Coordination with Indian Tribal Governments), Curation of Federally Owned and Administered Collections (36 CFR, Part 79), the Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR, Part 68), and DoD guidelines, including Army regulations.

The privatization of family housing on USAG-HI lands are also governed by a programmatic agreement (PA) among the US Army, Hawai'i State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation. Although the ROI (described below) is not included in this PA, it would be incorporated through an amendment if added to IPC's ground lease. The PA outlines what activities IPC is allowed to conduct with respect to historic properties and "exceptional trees" on Schofield Barracks. The PA provides an inadvertent discovery clause in the case of archaeological resources discovered during the project. Additionally, the PA requires that project areas within 100 feet of culturally sensitive areas be surveyed and ground disturbance within that buffer be monitored for archaeological resources.

The ROI for cultural resources is equivalent to the area of potential effect under Section 106 of the NHPA. The ROI for the proposed action is the 41.8-acre project site on South Range, as depicted in Figure 1-2 in Section 2, as well as the depths below ground to be disturbed during construction.

Overview of Resource

Cultural resources previously identified on Schofield Barracks are archaeological, Native Hawaiian, and built environment resources. There are three culturally sensitive areas next to the ROI: two archaeological sites and one historic locality, all of which are across Lyman Road from the ROI. Additionally, the Post Cemetery is immediately east of the ROI. There are no exceptional trees in or next to the ROI.

A cultural resource survey for the Grow the Army project covered the ROI (Cultural Surveys Hawai'i 2009). Other studies that have also covered the ROI and general area are GANDA (2004), IARII (2003), and SCS/CRMS (2002).

Archaeological Resources

The ROI was most recently surveyed in 2009 by Cultural Surveys Hawai'i, Inc. (2009). Survey efforts included a series of subsurface tests to examine the potential for buried archaeological deposits in the ROI. The survey did not identify any surface or subsurface archaeological resources. Pineapple plants and plastic mulch fill were encountered throughout the area, suggesting the former pineapple plantation land use of the ROI. Further, Cultural Surveys Hawai'i concluded that it is unlikely archaeological sites exist in the ROI.

Native Hawaiian Traditional Resources

As a general rule, access to Army land is restricted to DoD personnel. However, Army staff work regularly with Native Hawaiians and Range Control to provide access to specific sites on request, subject to mission requirements and public safety. The Army provides copies of cultural resources reports produced for the cultural resource management program to Native Hawaiian groups with ties to Schofield Barracks lands.

The ROI is in Wai'anae Uka, a part of the Wai'anae *ahupua'a* and an area known in Hawaiian traditions as an important training area for chiefs and the location of important prehistoric battles. Six TCPs have been identified on Schofield Barracks, and several other traditionally significant localities are nearby. However, no TCPs have been identified in or next to the ROI (IARII 2003).

Built Environment Resources

The ROI is undeveloped, and there are no historic buildings nearby (Lucking 2011). The Schofield Barracks historic district is approximately one mile east of the project site and is roughly bounded by Foote Avenue, Wright Avenue, McMahon Road, and Wright-Smith Road (GANDA 2007). There are no identified historic landscapes in the boundary of the project site.

The post cemetery was established in 1912. Expansion plans were dated 1942, but it was not expanded until after World War II, after which graves were placed in the expansion area. This is the extent of the Post Cemetery as it now exists (Lee 2011).

A couple of years ago the Army was asked about the past land use of areas around the Post Cemetery. Investigations turned up a story by Private First Class Alan Hartshorne, who was in the 47th Engineers stationed at Schofield Barracks from 1940 through World War II. Hartshorne visited the Tropic Lightning Museum at Schofield Barracks several years before the investigation and told the Army cultural resources personnel that he was on burial detail after the bombing of Pearl Harbor. His job was to help collect bodies from Schofield Barracks and Wheeler Army Air Field and bury them in the Post Cemetery. The cemetery was too small to hold all of the coffins, so they started burying them in the area in the back of the cemetery. Since the cemetery was not expanded until after World War II, at least part of the land used for burying those killed in the Pearl Harbor attack is accounted for in the expansion.

It is unlikely that the burials extended beyond the Army-owned land into what is the project site as those lands were owned by the James Campbell Estate and were planted with pineapple crops since before World War II and up until 2005. Evidence of military burials on the pineapple lands behind the cemetery has never been brought to the attention of USAG-HI cultural resources section personnel, whose opinion is that it is more likely that the side of the cemetery was used if there were any potential burials outside of the Post Cemetery boundary (Lee 2011).

4.4.2 Environmental Consequences

Methodology for Analyzing Effects

The methods for assessing potential effects on cultural resources are identifying significant cultural resources in the ROI under the proposed action and determining potential direct and indirect effects on these resources. Identified resources are described above.

Effects on cultural resources are evaluated in terms of significance. A significant effect is defined as expected and unmitigable on known cultural resources. An effect on a known cultural resource or a likely effect on unknown cultural resources that could be mitigated is considered to be significant but mitigable to less than significant (minor). This category also includes unlikely or unanticipated effects on known or unknown cultural resources that could be mitigated. A minor (less than significant) effect would be one on NRHP-ineligible cultural resources or cultural resources not of concern to Native Hawaiians, historical societies, or agencies. If, during project implementation and operation, no cultural resources were identified or discovered, then the project would not have any effects on cultural resources.

Factors Considered for Effects Analysis

The factors that determine the significance of potential effects on cultural resources in an ROI are determined based on the federal laws and regulations that set the standards for cultural resources protection.

Section 106 of the NHPA requires that federal agencies consider the possible effects of their actions on NRHP-eligible properties in their boundaries. In addition to archaeological and other cultural sites, eligible properties are those resources considered significant for their importance to Native Hawaiian groups. Section 106 and its implementing regulations state that an undertaking has an effect on a historic property (an NRHP-eligible or listed resource) when that undertaking may alter those characteristics of the property that qualify it for inclusion on the NRHP.

Under Section 106, an undertaking is considered to have an adverse effect on a historic property when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include the following:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property or alteration of its setting when that character contributes to the property's qualifications for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or changes that may alter its setting;
- Neglect of a property, resulting in its deterioration or destruction; and
- Transfer, lease, or sale of a property without adequate provisions to protect its historic integrity.

Traditional and ethnographic resources, including sacred sites, burials, and cultural items, are also protected under the AIRFA, ARPA, and NAGPRA, whether or not they are considered NRHP-eligible. Factors considered in determining whether an action would have a significant effect on cultural resources include the extent or degree to which its implementation would have an adverse effect on a historic property or TCP, as defined under Section 106 of the NHPA, or would violate the provisions of AIRFA, ARPA, or NAGPRA.

An adverse effect on a historic property, as defined by the NHPA, is not necessarily a major adverse effect under NEPA. While mitigation under the NHPA does not necessarily negate the

adverse nature of an effect, mitigation under NEPA can reduce its significance. NHPA and NEPA compliance are separate and parallel processes, and the standards and thresholds of the two are not precisely the same.

Public concerns are also considered as part of effects analysis under NEPA. The concerns expressed by the public during previous analyses emphasized the following needs:

- Continuing access to traditional and religious sites for ceremonial purposes and to hunting and gathering areas;
- Protecting and preserving archaeological and traditional sites;
- Interpreting significance based on Native Hawaiian tradition and the knowledge of community elders and for community involvement in managing cultural resources on Army land; and
- Complying with federal and state laws and regulations concerning cultural resources protection.

Summary of Effects

The proposed action is expected to have no effects on cultural resources, and there would be no effects from the no action alternative.

Proposed Action

While no archaeological or traditional/ethnographic resources have been reported or discovered in the ROI, the potential still remains for a resource to exist. As part of the proposed action, the project site would be incorporated into the PA and the inadvertent discoveries clause would apply. Therefore, no effects on these resources and no effects on the built environment resources are expected.

Archaeological resources. As a result of the proposed action, new permanent structures and buildings would be erected in an area where no archaeological resources have been encountered during surveys and subsurface testing. Further, the ROI is considered unlikely to include archaeological sites that would be encountered during project activities. However, three culturally sensitive areas are next to the ROI, as is the Post Cemetery. None of these culturally sensitive areas or the Post Cemetery would be affected by the proposed action. Because the potential for encountering buried resources is low, the proposed action is expected to have no effect on archaeological resources. Under the proposed action, the project site would be incorporated into the PA, which would include the application of an inadvertent discovery and a monitoring measure to protect unidentified cultural resources, as well as those identified resources within 100 feet of ground-disturbing activities. If unanticipated archaeological resources were discovered during project activities, disturbance of these resources would be handled in accordance with the PA. The proposed action incorporates the PA's inadvertent discovery and monitoring clauses, described below.

Incorporated PA Inadvertent Discovery and Monitoring Clauses: The PA regarding the Military Housing Privatization Initiative would be amended to include the ROI. The inadvertent discovery and monitoring clauses found in the PA at Sections V.B.1, V.B.2, and V.B.3, summarized below, are included as part of the proposed action. (Note that the required survey under Section V.B.2 has been completed; see Cultural Surveys Hawai'i 2009.)

- In the event of discovery of archaeological materials during any project activity, IPC would immediately stop work in the area and notify the USAG-HI Cultural Resources Management Program. IPC would take reasonable measures to protect the discovery until

USAG-HI had evaluated the resource(s), had determined if additional compliance requirements under NAGPRA or NHPA apply, and had met those requirements. If the additional discovery were to contain historic properties, USAG-HI would comply with the provisions of 36 CFR, Part 800.13(b), and 43 CFR, Part 10. Any inadvertent discovery of human remains would be treated in accordance with NAGPRA, the USAG-HI NAGPRA Plan of Action, and Section 106 of the NHPA.

- All ground-disturbing activities within 100 feet of culturally sensitive areas indicated in Appendix A of the PA would be monitored by qualified staff.
- The O‘ahu Council of Hawaiian Civic Clubs would be allowed to provide cultural monitoring of ground-disturbing activities in culturally sensitive areas.

Traditional/ethnographic resources: The presence of traditional or ethnographic resources or concerns in the project area is unknown but is unlikely, due to the absence of prehistoric Native Hawaiian archaeological resources. The Army at Schofield Barracks complies with all laws, regulations, and EOs requiring access for religious or traditional uses by Native Hawaiians. As such, the proposed action is expected to have no effects. Application of the PA’s inadvertent discovery and monitoring clauses to avoid inadvertent effects on archaeological resources would also address buried traditional or ethnographic resources.

Built environment resources: Since there are no built environment resources in or next to the ROI, there is no potential to affect these types of cultural resources. If there were unmarked burials to the west of the Post Cemetery, then they would be on land already in IPC’s ground lease and would be covered by the PA’s inadvertent discovery and monitoring clauses. This is discussed further under the cumulative effects in Section 4.14.

Because the proposed action would occur far from the Schofield Barracks Historic District, it would not affect the historic landscapes of the National Register district at Schofield Barracks or the Post Cemetery.

No Action Alternative

Under the no action alternative, no construction or ground-disturbing activities would occur. The potential to disturb cultural resources would not exist, so there would be no effect on cultural resources.

4.5 ENVIRONMENTAL JUSTICE

4.5.1 Affected Environment

Introduction and Region of Influence

The ROI for environmental justice concerns is Honolulu County on O‘ahu. The proposed action and the no action alternative were reviewed and evaluated to identify potential beneficial or adverse effects on environmental justice populations in the ROI. Low-income and minority populations in the ROI are the focus of the environmental justice analysis, as required under EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. Populations under the age of 19 are identified, and the potential for their exposure to health and safety hazards as a result of the proposed project are described to satisfy EO 13045, Protection of Children from Environmental Health and Safety Risks. The baseline year for environmental justice data is 2009, the most recent year that data are available.

Overview of Resource

Environmental Justice

On February 11, 1994, President Clinton issued EO 12898, which was designed to focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities. Environmental justice analyses are performed to identify potential disproportionately high and adverse effects from proposed actions and to identify alternatives that might mitigate these effects. Data from the US Census Bureau’s 2009 American Community Survey were used to identify low-income and minority populations in the ROI for this environmental justice analysis. Minority populations included in the census are Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, Hispanic, of two or more races, and “other.” Poverty status, used in this EA to define low-income status, is reported as the number of persons with income below the poverty level.

The demographic profile of the ROI and of Hawai‘i is unique. While many other regions in the United States have large non-white populations, Hawai‘i and the ROI are the only large population centers with a majority of Asian and of Native Hawaiian and other Pacific Islander residents. As shown in Table 4.5-1, these groups accounted for 41.7 percent and 8.2 percent of the total population of Honolulu County. These groups account for less than 4.5 percent and 0.1 percent of the total United States population. Persons describing themselves as Black or African American constitute only 3 percent of the ROI population, compared to 12.4 percent of the total United States population. White people account for 74.8 percent of the United States population, and 23 percent of the ROI population (US Census Bureau 2010a, 2010c).

The Census Bureau bases the poverty status of families and individuals on 48 threshold variables, including income, family size, number of family members under the age of 18 and over 65, and amount spent on food. In 2009, approximately 9.9 percent of the ROI residents were classified as living in poverty, lower than Hawai‘i’s poverty rate and the poverty rate for the United States (US Census Bureau 2010a, 2010b, 2010c).

Table 4.5-1
2009 – Race, Ethnicity, and Poverty Status for
Honolulu County, Hawai'i, and the United States

	Percentage of Population		
	ROI	**Hawai'i**	**United States**
White	23.0	26.9	74.8
Black or African American	3.0	2.3	12.4
American Indian and Alaska Native	0.3	0.3	0.8
Asian	41.7	37.1	4.5
Native Hawaiian and Other Pacific Islander	8.2	8.8	0.1
Other	0.8	1.0	4.9
Two or More Races	22.9	23.6	2.4
Hispanic or Latino[1]	8.1	9.0	15.8
Living in Poverty[2]	9.9	10.4	14.3

Source: US Census Bureau 2010a, 2010b, 2010c
[1]Persons of Hispanic origin can be of any race.
[2]Percentage of individuals living below the Census-defined poverty line.

Numbers do not add up to 100 percent because persons of Hispanic origin can be of any race and are therefore also included in the other race categories.

The latest survey estimated 9.9 percent of the ROI residents were classified as living below poverty. This level is lower than the Hawai'i and United States averages. Other than Schofield Barracks residents, there are no other residential populations close to the project site.

Protection of Children

EO 13045 requires federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children.

According to the US Census Bureau (2010a), there are approximately 223,335 children under the age of 19 in Honolulu County. Historically, children have been present at Schofield Barracks as residents and visitors (e.g., family housing, schools, and users of recreation facilities). During construction on Schofield Barracks, the Army has taken precautions for their safety by a number of means, including fencing, limiting access to certain areas, and providing adult supervision.

The health and safety of children is a primary consideration in planning any activity, related or unrelated to Army activities.

4.5.2 Environmental Consequences

Methodology for Analyzing Effects

Honolulu County is the ROI for environmental justice effects and potential health and safety effects on children. The proposed action and the no action alternative were reviewed and evaluated to identify potential effects (positive or negative) on conditions in the ROI.

To determine whether low-income and minority populations could be disproportionately affected by the alternatives, the proportion of low-income people and minorities in the areas surrounding the project site were identified. If low-income and minority populations were identified, the preparers of this section assessed the potential for construction or operational activities to cause these populations to be displaced, their income or employment to be lost, or for there to be

adverse effects on their health or on environmental conditions. To evaluate whether children could encounter disproportionate environmental health or safety effects, the population under the age of 19 surrounding the proposed project areas was computed. The potential environmental health and public safety risks identified for the proposed action and the no action alternative were then evaluated for proximity to populations of children.

Factors Considered for Effects Analysis

Factors considered in determining whether an alternative would have a significant effect on environmental justice included the extent or degree to which its implementation would:

- Change any social, economic, physical, environmental, or health conditions to disproportionately affect any particular low-income or minority group or
- Disproportionately endanger children in areas on or near the installation.

Summary of Effects

The proposed action would not have adverse environmental justice effects and would not disproportionately endanger children. There would be no effects under the no action alternative.

Proposed Action

Effects on Low-Income or Minority Groups

Because there are no nonmilitary residential areas close to the project site, there are no low-income or minority groups that could be disproportionately affected or displaced by the proposed action. There would be no effect on social, economic, physical, environmental, or health conditions from the proposed action. The proposed action would not result in disproportionate effects on any low-income or minority group in the ROI.

Endangerment of Children

During construction, safety measures stated in 29 CFR, Part 1926, Safety and Health Regulations for Construction, and Army Regulation 385-10, Army Safety Program, would be followed to protect the health and safety of residents, including children. As a result of the proposed action, there would be an increase in the amount of children in the area. As part of the project, three detention basins would be constructed to manage stormwater on-site. These detention basins would be properly fenced and maintained, minimizing the potential safety threat to children in the area and the population as a whole. Although children make up a large portion of the population in the ROI, there would be no substantial disproportionate effects on them, resulting in minor adverse effects.

No Action Alternative

The no action alternative would not have any disproportionate effects on low-income or minority populations or children because there would be no change to the existing conditions.

4.6 GEOLOGY, SOILS, AND SEISMICITY

4.6.1 Affected Environment

Introduction/Region of Influence

The ROI for the geologic, soil, and seismicity effects analysis is the project site where ground-disturbing activities would occur under the proposed action. A brief overview of the regional geologic setting is presented, followed by a more detailed discussion of the geologic setting at Schofield Barracks.

Overview of Resource

Geology

Schofield Barracks is in the southern edge of the Schofield Plateau, a broad saddle of land between the Koʻolau Mountains to the east and the Waiʻanae Mountains to the west. The relatively flat plateau lies approximately 250 to 800 feet above sea level and consists mainly of alluvial deposits shed from the Waiʻanae Mountains to the east and lava flows from the ancient Koʻolau volcanoes to the west (Stearns 1935).

The thickness of the alluvium generally increases toward the center of the Schofield Plateau. Beneath the alluvium is soil that developed in place on the surface of the Koʻolau volcanics. This soil surface is underlain by saprolite (basalt that has been intensely weathered in place but retains many of the remnant features of the original rock). Saprolite is exposed in some stream channels at Schofield Barracks (HLA 1992) and grades with depth into less weathered basalt; thus, relatively soft materials (alluvium, ancient soil, saprolite, and weathered basalt) are found at depths of 100 to 200 feet below the ground surface. Schofield Barracks is underlain by a 100-foot-thick or greater sequence of saprolite, over which has developed an approximately 10-foot-thick layer of clay-rich soil (HLA 1992).

Soils

The principal soil type in the project site boundary is Kunia silty clay. These are well-drained soils found on nearly level ground in upland terraces and fans at elevations of 700 to 1,000 feet. Permeability is moderate, runoff is slow, and erosion hazard is slight. The surface layer is dark, reddish-brown silty clay about two feet thick, grading to a blocky silty clay loam to a depth of about six feet and underlain by gravelly silty clay (USDA 2011).

The soils exposed in Waikele Gulch south of the project site belong mainly to the Helemanō and Manana series (Figure 4.6-1). Helemanō soils are well-drained silty clays that occur in V-shaped gulches; erosion hazard is severe to very severe. Manana soils are silty clay loams that are well drained, and the erosion hazard is slight (USACE 2004b).

Seismicity

Oʻahu is in Seismic Zone 2A, having a moderate potential for seismic damage (USGS 2001). The risk of strong ground shaking at Schofield Barracks is relatively low due to its distance from the south coast of the Island of Hawaiʻi, where most recent earthquake activity is centered. In 1998, the USGS's National Seismic Hazard Mapping Project estimated that there was about a 10 percent chance that ground accelerations of more than 15 percent of gravity would occur in firm rock areas in Oʻahu over the next 50 years (Klein et al. 1998).

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MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:10,800 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 4N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Oahu, Hawaii
Survey Area Data: Version 6, Dec 31, 2006

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Soil Survey

Schofield Barracks Military Reservation
O'ahu, Hawai'i

TETRA TECH

Figure 4.6-1

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Slope Stability

The project site abuts Waikele Gulch on the south. In the vicinity of the project site, the Waikele Stream channel is more than 100 feet below the rim of the gulch, as shown in Figure 4.6-2. Although the landslide hazard of slopes bounding the southern edge of the property has not been evaluated, the slopes are potentially vulnerable to failure, especially under load conditions after buildout.

Waikele Gulch was formed by downcutting of the meandering Waikele Stream. Although the stream is intermittent in this reach, it is subject to flash flows from occasional intense rainfall in the Wai‘anae Mountains to the west. Over time, the force of stream flows bearing on the outer curve of a meander can erode and undercut the slope above, leading to its failure.

4.6.2 Environmental Consequences

Methodology for Analyzing Effects

The proposed action was evaluated for adverse effects on people and the environment in the context of geologic conditions in the ROI. It was evaluated to determine the significance of the change to the geologic environment, if any, with respect to the factors identified below.

Factors Considered for Effects Analysis

Considered in determining whether the proposed action would have a significant effect on geology is the extent to which its implementation would do the following:

- Increase the exposure of people or structures to geologic hazards;
- Cause a substantial loss of soil (such as through increased erosion);
- Conflict with federal, state, or local statutes or regulations; or
- Alter the function of the landscape (for example, altering drainage patterns through large-scale excavation, filling, or leveling).

Summary of Effects

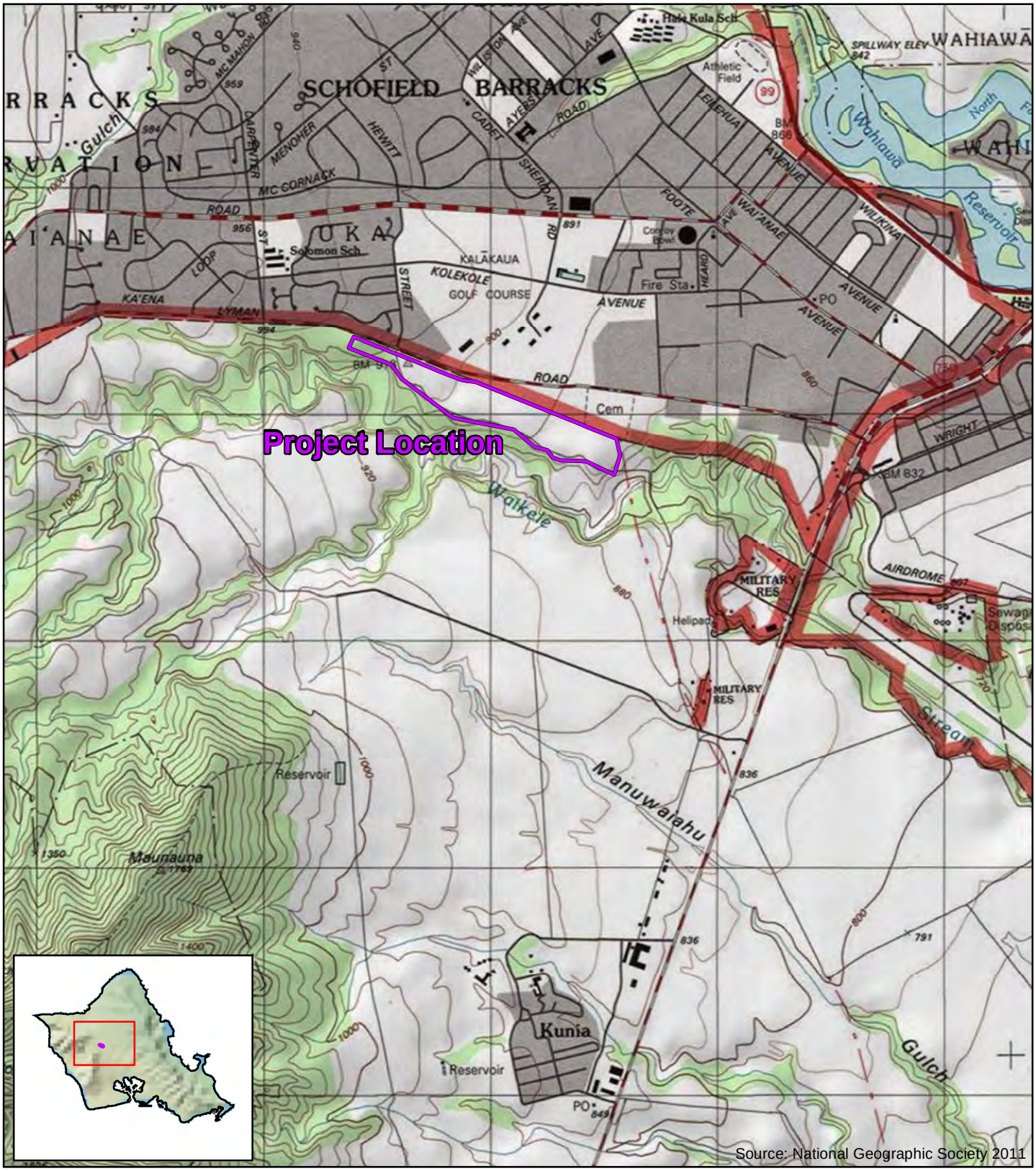
Under the proposed action, short-term adverse effects from erosion are anticipated during construction. The proposed action may also have minor adverse effects from expansive soils. There would be no effects from the no action alternative.

Proposed Action

Under the proposed action, the project would employ a qualified geotechnical engineer and structural engineer would be employed for siting of facilities, foundation seismic design, and soil stabilization.

Erosion

During construction, ground disturbance could increase the potential for soil erosion from wind and water. However, the effects would be temporary and would be reduced by implementing BMPs. Wind erosion would be reduced by using common dust suppression techniques, such as regularly watering exposed soils and soil stockpiles and by stabilizing soil. Excavation, grading, trenching, and other earth-disturbing activities may expose soils to runoff and create water



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Steep Slopes

Schofield Barracks Military Reservation
O'ahu, Hawai'i

N

0 2,000

Feet

Steep Slopes

TETRA TECH

Figure 4.6-2

erosion. Soil loss from construction is anticipated to be primarily from water erosion due to the properties and moisture content of the soils (US Army 2008a). Water erosion would be reduced by implementing BMPs for stormwater pollution prevention. Additionally, the ground surface for this site has only a shallow grade sloping to the south, which would minimize the potential for water erosion. Stormwater BMPs include building during the summer when rainfall potential is low, using silt fences and constructing sediment traps to prevent eroded soil from being transported off-site, and contouring to stop drainage from entering the site and to prevent run-on. Temporary and permanent erosion and sedimentation control measures would be implemented. As a result, the proposed action would have minor adverse effects from erosion.

Expansive Soils

Fine-grained clay sediments or expansive soils, such as those at the project site, often have a high shrink-swell potential. Where expansive soils are present, structural damage may occur over a long period. Standard construction practices, as described in the current Uniform Building Code, would dictate the types of engineering needed for construction in areas of high shrink-swell potential. Geotechnical considerations, including scarifying, moisture conditioning, and recompacting subgrade soils before placing permanent structures, were included in the geotechnical report completed in October 2008 for the site (USACE 2009). Standard BMPs used to ensure that effects from expansive soils are minor are as follows:

- Designing foundation types to account for changing soil patterns;
- Special earthwork preparation to keep the moisture regime near constant;
- Use of reinforcing concrete slabs;
- Measures to ensure drainage would be directed away from foundations and roadways; and
- Foundation studies to identify appropriate site-specific measures.

As a result of implementing BMPs, the proposed action would have minor adverse effects on expansive soils.

Seismicity

The proposed action would comply with the International Building Code (2006), UFC 1-200-01, and Occupational Safety and Health Administration excavation standards for protection from seismic hazards, which would ensure minor adverse effects from seismic events.

No Action Alternative

Under the no action alternative, use of the site would not change, and no large-scale ground-disturbing activities would occur. No adverse effects on the geology, soils, and seismicity are expected under the no action alternative.

4.7 HAZARDOUS MATERIALS AND CONDITIONS

4.7.1 Affected Environment

Introduction and Region of Influence

The term hazardous materials refers to any biological, chemical, or physical material that has the potential to harm humans, animals, or the environment, either by itself or through interaction with other factors. Solid waste, petroleum products, and munitions and explosives of concern (MEC) are included in this definition. Hazardous conditions are those that may expose people or property to the threat of injury or loss of life, such as wildfire hazards.

The ROI is defined as the 41.8-acre property (the project site) and surrounding areas that could affect or be affected by conditions at this property. For hazardous materials, the ROI includes the project site and adjacent lands. For wildfire hazards, the ROI extends to contiguous lands to the west, south, and east with similar vegetation that would allow a fire to spread to the project site under dry conditions.

Overview of Resource

Hazardous materials and wastes can negatively affect human health and safety as well as the environment. To minimize these risks, hazardous materials are subject to a variety of regulations that govern their use, storage, disposal, and transport. The primary federal agencies responsible for regulating hazardous materials and wastes are the EPA, the Occupational Safety and Health Administration, and the US Department of Transportation. The US Army is the lead agency or shares authority with other federal agencies for implementing many federal regulations at Schofield Barracks. Some of the primary federal regulations addressing hazardous materials are CERCLA, RCRA, the Toxic Substances Control Act, the Clean Water Act, and the Safe Drinking Water Act. The risk of wildfires is managed through the Integrated Wildland Fire Management Plan, which addresses fire actions for Army training lands and fits in the larger framework of the USAG-HI wildfire management program for all Army lands in Hawai‘i.

Summary of Existing Conditions

The 41.8-acre property is vacant and unused, and access is controlled; therefore, there is no current use, transport, storage, or disposal of hazardous materials at the site, no potential for spills or releases of hazardous materials, and no potential for human exposure to hazardous materials.

An ECP report that identifies environmental conditions that may affect the suitability to transfer the site is being prepared concurrently with this EA (USACE 2011). According to the findings of the ECP report and interviews with USAG-HI personnel, there are no known concerns with lead-based paint, asbestos-containing building materials, accumulation of radon in indoor air, or mold growth. There are no transformers or other equipment that could contain polychlorinated biphenyls. There are no issues concerning radioactive materials or medical or biohazardous waste (Sage 2011). There is no evidence of underground or aboveground storage tanks or oil/water separators on the site.

Munitions and Explosives of Concern

The Military Munitions Response Program (MMRP) manages sites with MEC, including unexploded ordnance, discarded military munitions, and munitions constituents, to minimize safety and environmental risks. The MMRP addresses only closed or transferred ranges. There

are five open MMRP sites at Schofield Barracks, none of which are on or next to the project site. The nearest MMRP site is the southern pistol ranges, which are approximately 1,000 feet east of the site (Weston Solutions 2009). These consist of two pistol ranges, covering a total of 1.3 acres, that were used during the 1940s. The pistol ranges are close to each other and are therefore treated as a single site under the MMRP (US Army 2010b).

The project site has not been used for training involving MEC, and Schofield Barracks Range Control considers the project site a very low risk for the presence of MEC (Garo 2011). A small unarmed practice bomb was found on the western portion of the site during a 2005 soil investigation. In response to this finding, a geophysical survey of the surrounding area was conducted, and no other indications of MEC were found (US Army Engineer District 2006). Live-fire training occurs at Schofield Barracks but not near the site.

Historic Pesticide Use and Disposal

The site is included in the Del Monte Corporation's O'ahu Plantation Superfund site. Superfund is a common name for CERCLA, which authorizes EPA to respond to hazardous waste sites. The most serious Superfund sites are included in the National Priorities List (NPL). Del Monte Corporation's O'ahu Plantation was added to the NPL in 1994 due to releases of fumigants to soil and groundwater. Fumigants were used to control pests during pineapple cultivation.

The primary releases of fumigants occurred at the Kunia Village, approximately a mile south of the project site; however, fumigants were applied to soil on the project site from approximately the 1940s to 2006, when pineapple cultivation was ended. The primary fumigants used by Del Monte Corporation were chloropicrin, ethylene dibromide (EDB), DD (a mixture of 1,3-dichloropropene and 1-2-dichloropropene), and Telone II (92 percent 1,3-dichloropropene). Numerous other fumigants were used on a small or experimental scale (ICF Technology, Inc. 1995). The primary fumigants that are the contaminants of concern at the Superfund site are EDB, 1,2-dibromo-3-chloropropane (DBCP), 1,2-dichloropropane (1,2-DCP), and 1,2,3-trichloropropane (1,2,3-TCP).

Fumigants are volatile, meaning they evaporate readily, so they would not likely remain in soil in concentrations that would pose an exposure risk to persons at the site.

The Del Monte Corporation reported burying one or more cylinders containing approximately 43.5 pounds of methyl bromide (a fumigant) in Field 71 in November 1980 in deteriorating containers (ICF Technology, Inc. 1995). Field 71 appears to roughly correspond to the 41-8 acre parcel; therefore, it is likely that the methyl bromide was buried on this site. A geophysical survey of a 6,000-square-foot portion of the project site was conducted by Golder Associates in 1998, and no buried containers could be found; however, the container(s) may still be buried on the project site (Golder Associates 1998; USACE 2002). Golder Associates concluded that the amount of methyl bromide was small, approximately 10 percent of the amount of methyl bromide that could legally be applied to one acre at the time, was unlikely to reach groundwater, and was therefore "unlikely to present an environmental hazard to any media" (Golder Associates 1998). Methyl bromide is volatile and not persistent, and if the cylinders were buried in 1980 in poor condition, as described by Golder Associates, no methyl bromide or only residual levels of methyl bromide likely remain, which would not affect health or safety of people or the environment.

Investigation of the Del Monte Corporation Superfund site has also identified numerous sites where empty fumigant drums were buried (ICF Technology, Inc. 1995). None of the known

burial sites are on or next to the project site; however, unknown burial sites could exist on the project site.

A 2005 soil investigation that included samples collected from the western portion of the project site detected the following organochlorine pesticides: gamma-chlordane, gamma-benzene hexachloride (also known as lindane), dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethylene, dichlorodiphenyltrichloroethane, and heptachlor epoxide. Pesticide concentrations were well below the HDOH Tier 1 Environmental Action Levels (EALs; US Army Engineer District 2006). According to Public Works Technical Bulletin 200-1-31, legally applied pesticides (specifically chlordane) do not require remediation under CERCLA or RCRA and can be managed in place, which is consistent with the pesticide application exception described in 42 USC, Section 9607(i) (USACE 2004c). No evidence of improper or illegal application of pesticides was encountered as part of this investigation.

Petroleum Products

Before 1981, fumigants were commonly mixed with diesel or naphtha (commonly known as white gas) or paint thinner (a solvent) to achieve the proper dilution before injection (USACE 2002). During a 2005 soil investigation, which included samples collected from the western portion of the project site, total petroleum hydrocarbons as diesel (TPH-diesel) were detected, but at concentrations well below the HDOH Tier 1 EAL (US Army Engineer District 2006).

Installation Restoration Program Sites

The Installation Restoration Program (IRP) is an ongoing DoD-administered program for identifying, evaluating, and remediating contaminated sites on federal lands under DoD control. The IRP provides a method to evaluate past disposal sites, to control the migration of contaminants, to minimize potential hazards to human health and the environment, and to clean up contamination.

The project site is not in an IRP site. Only two IRP sites at Schofield Barracks have ongoing activity; "no further action" has been approved at all other IRP sites. The two open sites are Operable Unit 2, groundwater contaminated with trichloroethene (TCE), and Operable Unit 4, the former Schofield Barracks Landfill (US Army 2010b).

Operable Unit 2 addresses widespread contamination of groundwater with TCE, a once common industrial degreasing solvent. Schofield Barracks was placed on the EPA's National Priorities List (also known as Superfund) in August 1990, primarily as a result of elevated levels of TCE discovered in wells supplying drinking water to the installation. In August 2000, the EPA removed Schofield Barracks from the NPL because it determined that the remedy for the site, including continued wellhead treatment of groundwater and long-term monitoring, was adequate to protect human health and the environment (EPA 2011). Water treatment by air stripping and groundwater monitoring are ongoing (US Army 2010b; US Army Environmental Command and USAG-HI 2007). TCE and carbon tetrachloride are widespread in area groundwater and could be present in groundwater beneath the project site (Nelson 2011; US Army Environmental Command and USAG-HI 2007). No wells or other sources of drinking water are on the project site.

Operable Unit 4 addresses the former Schofield Barracks Landfill, which occupied 45 acres approximately a mile north of the project site east of Kahoʻolawe Street and operated from approximately 1942 until December 1981. Groundwater has been contaminated but it is localized

(USACE 2002); because of this, and its distance from the project site, the landfill has not affected the project site and is not discussed further.

Wildfires

Although fires can be started by many sources, including cigarettes and lightning, most wildfires at Schofield Barracks have been started on training ranges during training. The severity of such fires varies by location and depends on topography, plant types, and moisture levels, the location of firebreaks, accessibility of the site for fire suppression, and wind levels. From 1999 until 2002, over 100 fires occurred annually at Schofield Barracks. From 1993 to 2002, approximately 90 percent of all fires burned less than 10 acres, and approximately 50 percent of all fires burned less than an acre. No fire history was available for the project site, which was not acquired by the Army until 2004 (25th Infantry Division [Light] and US Army 2003).

Vegetation is the fuel for any wildfire. Vegetation at the project site has been classified as tall alien grassland, the primary fuel source of concern at Schofield Barracks. Adjacent lands to the south and west have been classified as tall alien grassland or eucalyptus forest, which also has a high fire potential. There is a small area of Christmasberry shrubs south of the eastern portion of the site, which has a lower fire potential and can sometimes act as a firebreak. The areas north of the site are generally developed, and developed areas have a low wildfire potential (25th Infantry Division [Light] and US Army 2003).

4.7.2 Environmental Consequences

Methodology for Analyzing Effects

Effects from hazardous materials and conditions were assessed for both phases of the proposed action: construction and operation and maintenance (O&M). Effects relative to each area of concern described in Section 2.5.1 were assessed. In addition, effects from the transport, storage, use, and disposal of hazardous materials were assessed, including reasonably foreseeable upset and accident conditions and worker exposure to hazardous materials.

Significance Criteria for Effects Analysis

An action is considered to have a significant adverse hazardous materials and conditions effect if it would result in any of the following:

- Expose people to hazardous materials or conditions at the project site (for example, MEC, pesticides, and petroleum products);
- Create a substantial hazard to people or the environment through the transport, storage, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or
- Increase wildfire danger or expose people or property to a substantial fire danger.

Summary of Effects

There would be no significant effects from the proposed action or from the no action alternative. Short- and long-term minor adverse effects would result from the proposed action; long-term minor adverse effects would result from the no action alternative.

Proposed Action

Existing Hazardous Materials or Conditions

Munitions and Explosives of Concern

MEC is not likely to be present at the project site, but, because the project site has been next to Schofield Barracks, there is a possibility that MEC is present. The US Army is responsible for MEC response. If MEC or suspected MEC were encountered during construction, it would not be disturbed, ground-disturbing activities would be suspended, and Army personnel would be contacted immediately to respond. MEC response procedures would be further detailed in a management plan prepared before earthwork and construction begins. By following this protocol, there would be no effects from construction.

O&M of the proposed action would not involve MEC. Also, the project site is sufficiently distant from firing ranges and ammunition storage places that residents would not be exposed to hazards involving MEC. Therefore, there would be no effects from O&M.

Pesticides

Construction of the proposed action would include ground-disturbing activities in areas where organochlorine pesticides have been detected in soil and where fumigants are known to have been released to soil. The concentrations of organochlorine pesticides in samples collected from the western portion of the project site were below the HDOH Tier 1 EALs for residential use. Fumigants vaporize readily and are not expected to be found in soil at concentrations of concern. The risk of encountering pesticides in soil at concentrations that exceed regulatory action levels is low, but additional confirmation sampling may be conducted before construction to confirm that pesticide concentrations are below levels of concern. Due to the low risk of pesticide levels of concern and IPC's commitment to collect additional confirmation samples if necessary, short-term minor adverse effects would occur from construction.

It is possible that construction could uncover evidence of buried containers of methyl bromide or empty drums of fumigants. If these were encountered, work in the area would stop and access to the area would be restricted until the containers were properly removed and disposed of, along with any contaminated soil. Therefore, there would be no effect from construction. If the containers were found and removed, a beneficial effect would result.

During O&M, IPC would control pests on the project site using an integrated pest management approach. Integrated pest management is an environmentally sensitive approach to pest management that emphasizes nonchemical methods of pest control, such as trapping and weeding, using chemical pest control only when necessary. If chemical pesticides were required, they would be applied by trained personnel, and only EPA-registered pesticides would be used. Because IPC would keep chemical pesticide application to a minimum, would use trained personnel to apply chemical pesticides, and would use only EPA-registered pesticides, there would be no effect from O&M.

Petroleum Products

Construction would include ground-disturbing activities in areas where TPH-diesel has been detected in soil. The concentrations of TPH-diesel in samples collected from the western portion of the project site were below the HDOH Tier 1 EALs for residential use. The risk of encountering petroleum products in soil at concentrations that exceed regulatory action levels is low, but additional confirmation sampling may be conducted before construction to confirm that

concentrations are below levels of concern. Due to the low risk of petroleum products at levels of concern and IPC's commitment to collect additional confirmation samples if necessary, short-term minor adverse effects would occur from construction.

During O&M, small amounts of gasoline, oil, and other automobile fluids may occasionally leak onto roads, parking areas, and driveways. In addition, residents would likely store and use small amounts of petroleum products for home use, such as propane for barbecue grills. These materials may occasionally be spilled, but the amounts would be small and the spills would be localized. Spills on paved surfaces would retain the substance, allowing for cleanup. IPC would develop a management plan that would detail procedures for timely and effective spill response, including procedures for residents to report spills. For these reasons, long-term minor adverse effects would occur from O&M.

Installation Restoration Program Sites

Groundwater beneath the project site may contain concentrations of TCE or carbon tetrachloride that exceed regulatory action levels for drinking water (IRP Operable Unit 2). The potentially contaminated groundwater is several hundred feet below ground surface and would not be encountered during construction. During O&M, drinking water would be provided from established sources that are monitored for contaminants. For these reasons, neither construction nor O&M of the proposed action would access groundwater or interfere with the management of this IRP site, so there would be no effect.

Transport, Use, Storage, and Disposal of Hazardous Substances

Construction would involve the transport, use, storage, and disposal of hazardous substances, and accidental releases or spills could result. Construction requires the operation of heavy equipment and construction vehicles. Hazardous materials required for construction are petroleum products, compressed gases, paint, cleaners, and pesticides. It would not always be practical to remove construction equipment from the site for refueling and general maintenance, such as changing fluids and lubricating parts; therefore, these activities could take place on-site. Other hazardous or regulated materials that would be used during construction are paints, adhesives, curing compounds, concrete, and fertilizer. Construction would also generate waste, such as construction debris, used oil and other vehicle fluids, and sanitary waste.

To minimize risks to people and the environment, IPC would implement regulatory requirements and standard industry BMPs for managing construction involving hazardous materials and conditions. These requirements and BMPs would be detailed in a site-specific construction management plan that addressed regulatory compliance, BMPs, spill response, and emergency response procedures. For these reasons, short-term minor adverse effects would occur from construction.

Hazardous materials required during O&M are those used by IPC maintenance personnel, for example paints and lubricants, and those used by residents, for example cleaning products and propane tanks. During O&M, small amounts of these materials may occasionally be spilled, but the amounts would be small and the spills would be localized. IPC would develop a site-specific O&M management plan that would detail procedures for timely and effective spill response, including procedures for residents to report spills. For these reasons, long-term minor adverse effects would occur from O&M.

Wildfires

Construction of the proposed action would result in a beneficial effect because it would reduce the amount of tall alien grassland, a primary fire fuel of concern, at Schofield Barracks. The grassland would be replaced with lawns and managed vegetation with a lower fire risk.

During O&M, there would be some risk of wildfires started west or south of the site in undeveloped areas with high fire potential (eucalyptus forest or tall alien grassland). The housing area would be bordered by areas of managed vegetation or roads. IPC would work with Schofield Barracks to ensure that these would serve as an effective firebreak. The housing area would also include a number of fire hydrants that would be readily accessible to fire response personnel. As a result, the proposed action would have minor adverse effects regarding wildfires.

No Action Alternative

Implementing the no action alternative would not alter the affected environment for hazardous materials and conditions. Overall, effects would range from no effect to long-term minor adverse effects, as described below.

Existing Hazardous Materials or Conditions

Pesticides and petroleum products would remain in soil at the site at concentrations below regulatory action levels. Because the concentrations are low, there would be no risk to people or the environment and no effect. Buried fumigant containers may exist on the site, but these would remain buried and the site would remain unused; therefore, there would be no effect. TCE could also be present in groundwater beneath the site, but ongoing efforts to address IRP site Operable Unit 2 would reduce these concentrations over time to levels acceptable to HDOH and the EPA, so there would be no effect.

Transport, Use, Storage, and Disposal of Hazardous Substances

If the site were to remain vacant and unused, there would be no transport, use, or storage of hazardous materials; therefore, there would be no risk of spills or of exposing people or the environment to hazardous materials and no effect. Access to the site is controlled by fences, and the site is made more inaccessible by overgrown vegetation; therefore, the likelihood of illegal disposal of hazardous materials through dumping or landfilling is low, and no effect is expected.

Wildfires

The tall alien grassland that covers the site would continue to be a primary fire fuel of concern. However, the site is unused, so there is a low possibility that wildfires would start there. Also, Lyman Street would likely provide an effective firebreak from the houses and other facilities north of the site, and there is no development directly west, south, and east of the site. Therefore, effects would be short- and long-term minor adverse.

4.8 LAND USE

4.8.1 Affected Environment

Introduction and Region of Influence

Land use changes in support of the proposed action would be limited to Schofield Barracks. There would be no acquisition of land or permanent release of military land under the proposed action. For the purpose of the land use evaluation, the ROI for implementing the proposed action is the 41.8-acre project site on the South Range at Schofield Barracks, as shown in Figure 1-2.

Regulatory Framework

The purpose of the Coastal Zone Management Act (CZMA) of 1972, as amended (16 USC, Section 145 et seq.), is to encourage coastal states to manage and conserve coastal areas as unique irreplaceable resources. Federal activities that affect any land or water use or natural resource of the coastal zone must be carried out in a manner consistent with the enforceable policies of federally approved, state coastal zone management programs. The CZMA states that land subject solely to the discretion of the federal government, such as federally owned or leased property, is excluded from the state's coastal zone. Based on the parameters of the proposed action, the Army concluded that a federal consistency determination from the Hawai'i Coastal Zone Management Office is not required. A negative determination letter of no effect has been prepared and will be submitted to that office. This determination considered the Hawai'i Coastal Management Plan objectives and policies, which include the following resource areas: recreational, historic, scenic and open space, coastal ecosystems, economic uses, coastal hazards, and development management. The letter is included in Appendix A.

The Farmland Protection Policy Act (FPPA) of 1981 is intended to minimize the impact of federal programs on the unnecessary and irreversible conversion of farmland to nonagricultural uses. In accordance with this act and to assist the federal government in evaluating the impacts of converting farmland to nonagricultural uses, the Army completed the Farmland Conversion Rating Form, in coordination with the US Department of Agriculture Natural Resource Conservation Service (NRCS) in 2003. This form, filed in compliance with the FPPA, addressed the effects of converting agricultural lands on the South Range (which encompasses the ROI) to military training land use (US Army and USACE 2004).

Overview of Resource

Schofield Barracks is on O'ahu in Hawai'i, 18 miles northwest of Honolulu. Land use at Schofield Barracks is defined by the Schofield Barracks Real Property Master Plan, Volume I (Belt Collins 1993) and accompanying existing and proposed land use maps (USAG-HI 2009). The land use plan component of the Real Property Master Plan serves as a guide to overall long-range growth and development of the installation. The Real Property Master Plan states that solutions to land use problems at Schofield Barracks must consider:

- The planned demolition of large blocks of older temporary facilities to create available acreage for more appropriate uses and
- Long-range site planning to redefine land use zone boundaries that will improve zone functional interrelationships and interzone flow.

The Real Property Master Plan and its land use component consider potential Schofield Barracks future facilities improvements and were prepared to structure future land use in a way that minimizes such potential problems as incompatible land use and traffic congestion. The Real Property Master Plan arranges functions and facilities to encourage maximum efficiency, to minimize travel requirements, to minimize traffic congestion and vehicle fuel use at Schofield Barracks, and to improve morale and quality of life at Schofield Barracks.

South Range

South Range abuts the central portion of the southeastern perimeter of Schofield Barracks Main Post and consists of approximately 1,402 acres designated as training area. WAAF lies next to the installation to the southeast, and the town of Wahiawā lies to the north. The Schofield Barracks Main Post extends from Kunia Road on the southeast to the crestline of the Waiʻanae Mountains on the northwest. Land uses in the South Range area are entirely designated as training areas. There are no recreation activities allowed at South Range.

When the United States acquired the South Range property from the James Campbell Estate in 2004, it was being used for pineapple agriculture and contained state-designated Unique and Other agricultural lands (HDBEDT 2009). Land uses surrounding South Range include military, agriculture, and forest. The Main Post is to the north, and Field Station Kunia and WAAF are to the east. Land to the south was previously used for pineapple agriculture, and land to the west is forest reserve. South Range includes land in the State Conservation District (State of Hawaiʻi Land Use Commission 2008), but this land is not close to the ROI.

Main Post

Main Post land uses are training (including ranges), impact area, conservation land, and cantonment. The Main Post lands are in the urban, conservation, and agricultural state land use districts. Recreation opportunities at the Main Post are skeet shooting, bowling, swimming, and hiking. The Main Post contains a variety of land uses, in two major subsections:

- West of Waikōloa Gulch: range training areas, impact areas, and primary mobilization areas and
- East of Waikōloa Gulch: Schofield Barracks administration, support, and residential facilities in a relatively flat area.

The Main Post has the following subareas of similar functional activities interspersed with family housing and outdoor recreation areas:

- Troop billeting and administration;
- Maintenance (motor vehicle);
- Maintenance and warehousing (equipment);
- Maintenance and warehousing (general purpose);
- Maintenance (direct support); and
- Community support.

Project Site

The project site at South Range consists of 41.8 acres that are designated as training areas under the Army land use plan. Land uses for areas next to the project site are training, family housing, services, and green space. The proposed future Army land use plan designates the project site for family housing. Proposed land uses for areas next to the project site are the same as existing uses (USAG-HI 2009). The project site is in the State Agricultural District (State of Hawai‘i Land Use Commission 2008).

4.8.2 Environmental Consequences

Methodology for Analyzing Effects

Effects on land use were assessed based on whether the proposed action would be consistent with installation, site-specific, and surrounding land uses.

Factors Considered for Effects Analysis

The evaluation of potential effects on land use was based on the proposed action's consistency with the following:

- Existing and planned land uses at Schofield Barracks;
- Conflict with the objectives, policies, or guidance of state and local land use plans;
- Conflict with the objectives, policies, and guidance of the Farmland Protection Policy Act of 1981, which is intended to minimize the impact of federal programs on the unnecessary and irreversible conversion of farmland to nonagricultural uses;
- Unique characteristics of the geographical area (40 CFR, Part 1508.27), such as forest reserves, parks, and prime farmlands; and
- CZMA.

Summary of Effects

The proposed action is consistent with the relative regulatory framework, such as the CZMA and the FPPA, proposed Army land use plans, and uses in surrounding areas. However, the proposed action is not consistent with the State of Hawai‘i land use district (State of Hawai‘i Land Use Commission 2008), Central O‘ahu Sustainable Communities Plan (City and County of Honolulu Department of Planning and Permitting 2002), or the City and County of Honolulu Land Use Ordinance agricultural zoning (City and County of Honolulu Department of Planning and Permitting 2011). There would be minor beneficial effects because construction of the proposed housing units at this location would provide housing that meets Army standards and would locate the housing in an intended area close to other housing, training, and community support areas.

The effects evaluation for the no action alternative is based on a comparison to the baseline effects; no effects are anticipated from the no action alternative.

Proposed Action

The primary land use change related to the proposed action is the conversion of 41.8 acres of unused Army training land to family housing. The proposed addition of this land to IPC's 50-year ground lease for the development of family housing would not result in any land use incompatibilities. Although the land use at the project site would be altered to accommodate new

residences, this development would be consistent with land use directives for this site, such as the CZMA, and those contained in the Schofield Barracks Real Property Master Plan, Volume I, and proposed future land use maps (USAG-HI 2009). Although the proposed action is not consistent with the State Land Use Agricultural District, the Central Oʻahu Sustainable Communities Plan, and City and County of Honolulu Land Use Ordinance agricultural zoning, there are no significant effects expected from implementing the proposed action. This is because the inconsistency of these land use plans and designations was already evaluated when the land in the ROI was acquired by the Army in 2004 and the land use changed from agricultural to military training (US Army and USACE 2004). The land use is consistent with Schofield Barracks Master Planning.

Under the proposed action, there would be minor beneficial effects. The proposed Kalākaua Phase 3 housing development would supplement off-post housing supply and on-post housing units that do not comply with Army RCI standards. This would provide service members and their families with affordable quality housing that meets military and local housing construction standards, as defined by the USACE Centers of Standardization, as well as standards for design established by the Army that would minimize environmental effects. The location of the proposed action is not close to designated forest preserves on the South Range, so no negative effects on such designated zones are expected. The location of the proposed action encourages efficiency by locating additional family housing on-post and are thus close to installation facilities and services. This would improve zone functional interrelationships and interzone flow with the neighboring Phase 1 Kalākaua housing development that is immediately north of Lyman Road.

The proposed action is consistent with proposed Army land use plans and uses in surrounding areas. There would be minor beneficial effects because construction of the proposed housing at this location would provide facilities that meet Army standards and would locate the facilities in an intended area close to other family housing, training, and community support areas

No Action Alternative

The effects evaluation for the no action alternative is based on a comparison to the baseline conditions and the probable effects. Because there would be no change in land use under the no action alternative, the project site would remain in an undeveloped state as part of Army training lands. There would be no effects under the no action alternative.

4.9 NOISE

4.9.1 Affected Environment

Introduction and Region of Influence

Noise is defined as unwanted sound and can be intermittent or continuous, steady or impulsive. Human response to noise is extremely diverse and varies according to the source, the sensitivity and expectations of the receptor, the time of day, and the distance between the source and the receptor.

Sound levels decrease as the distance from the source increases. The ROI for noise includes the project site and the surrounding areas where sound generated at the project site is audible. Generally, the ROI extends no more than a half mile to a mile from the project site, depending on the sound source.

Overview of Resource

Sound is caused by vibrations that generate waves of minute air-pressure fluctuations in the surrounding air. The decibel (dB) is the accepted unit of measurement for sound. Because human hearing is not equally sensitive to all sound frequencies, various frequency weighting schemes have been developed to approximate the way people hear sound. The A-weighted decibel scale (dBA) is normally used to approximate human hearing response to sound. The C-weighted scale (dBC) is frequently used to evaluate artillery firing and blast noise, since low-frequency components of such impulse sound sources can induce window rattling or building vibrations. Average sound exposure over 24 hours is often presented as a day-night average sound level (DNL), where nighttime values (10 PM to 7 AM) are increased by 10 dB to account for the greater disturbance potential from nighttime sound. To account for sound from individual events, such as detonations, the Army uses a metric abbreviated as PK15(met), which is the peak sound level that is likely to be exceeded only 15 percent of the time.

The DoD evaluates the acceptability of noise levels at military installations according to three noise level zones:

- Zone I—DNL levels below 65 dBA or 62 dBC and PK15(met) less than 87 dB;
- Zone II—DNL levels of 65 to 75 dBA or 62 to 70 dBC and PK15(met) between 87 and 104 dB; and
- Zone III—DNL levels above 75 dBA or 70 dBC and PK15(met) greater than 104 dB.

Under Army Regulation 200-1, all types of land uses are considered compatible with Zone I. Educational and residential land uses are not compatible with Zone II noise levels, unless special acoustic treatments and designs are used to ensure acceptable interior noise levels. Residential and educational land uses are not compatible with Zone III noise levels. Table 4.9-1 presents a range of example sound levels and the noise level zones in which they fall.

Table 4.9-1
Common Sound Levels

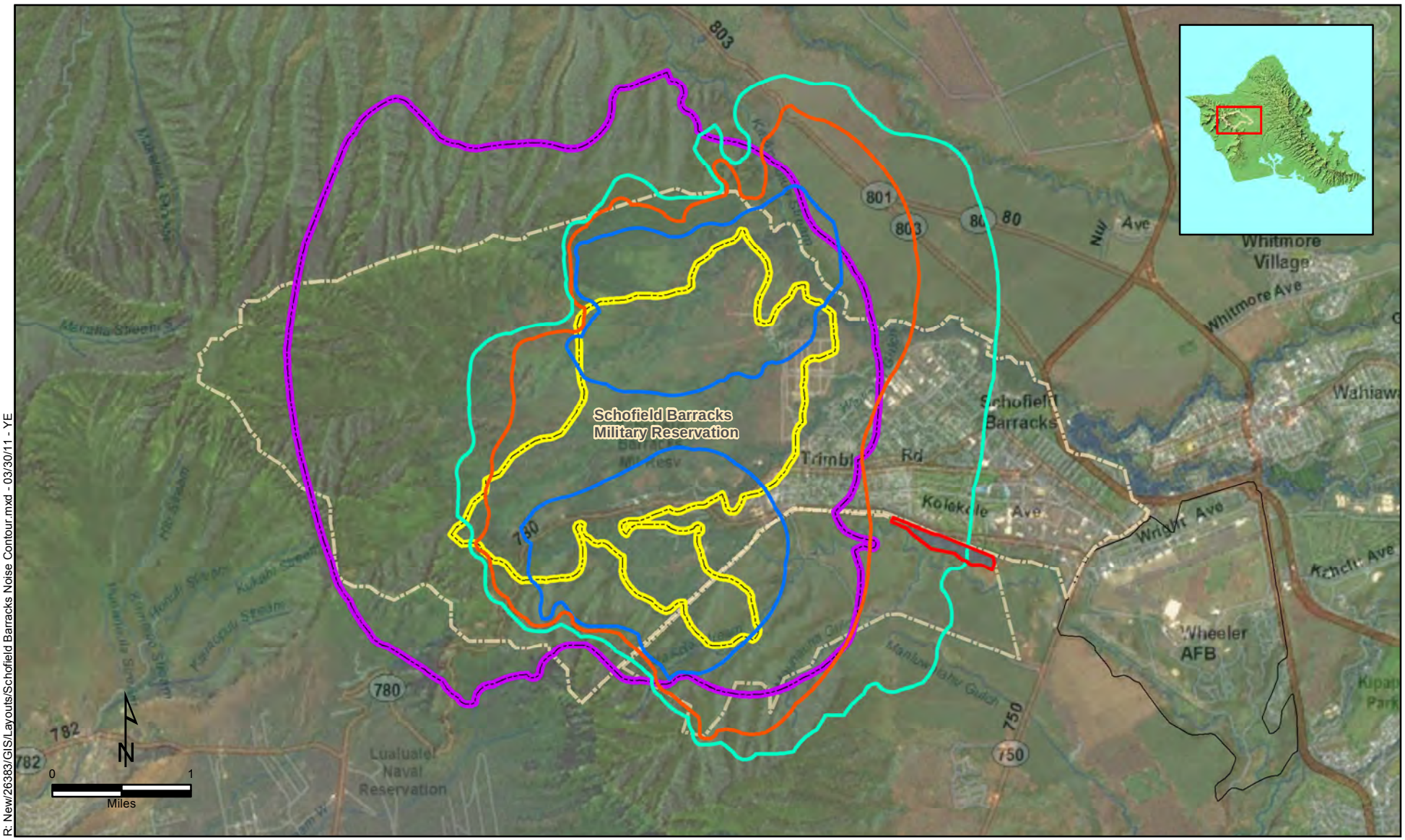
dBA	Example Conditions
Zone III (DNL levels above 75 dBA or 70 dBC)	
120	Air raid siren at 50 feet.
90	Jackhammer at 50 feet.
85	Bulldozer, excavator, pneumatic wrench, or paver at 50 feet.
80	Table saw at 25 feet.
Zone II Noise Levels (DNL levels of 65-75 dBA or 62-70 dBC)	
75	Street sweeper at 30 feet.
70	Busy 6-lane freeway at 300 feet.
65	Typical daytime busy downtown background conditions.
Zone I Noise Levels (DNL levels below 65 dBA or 62 dBC)	
60	Typical daytime urban mixed use area conditions.
55	Typical urban residential area away from major streets.
50	Typical suburban daytime background conditions.
40	Typical suburban area at night.

Source: Data compiled by Tetra Tech staff

Summary of Existing Conditions

The primary existing noise sources at Schofield Barracks are small arms and large caliber weapons firing that occur during training, which takes place seven days a week; multiple training exercises often occur simultaneously and over the course of a day. Noise contours have been developed for Schofield Barracks based on noise for combined training activities, as shown in Figure 4.9-1 (separate contours have been developed for small arms and large caliber weapons firing). These contours represent a weighted day-night average of noise conditions, where a penalty is applied to nighttime noise. Using data from 2007 and 2008, the project site is outside the Zone II noise contour, which is approximately 1,200 feet to the east (US Army Public Health Command 2010).

Because individual large caliber weapons firing have produced temporary sound levels loud enough to result in complaints from areas where average noise levels are considered acceptable, the Army has developed another set of noise contours for Schofield Barracks, as shown in Figure 4.9-2. The project site is in the area where the PK15(met) is between 115 and 130 dB, which equates to a moderate risk of complaints. All military family housing at Schofield Barracks and large portions of the neighboring town of Wahiawā and the Wheeler Army Airfield are also in this noise contour (US Army Public Health Command 2010).



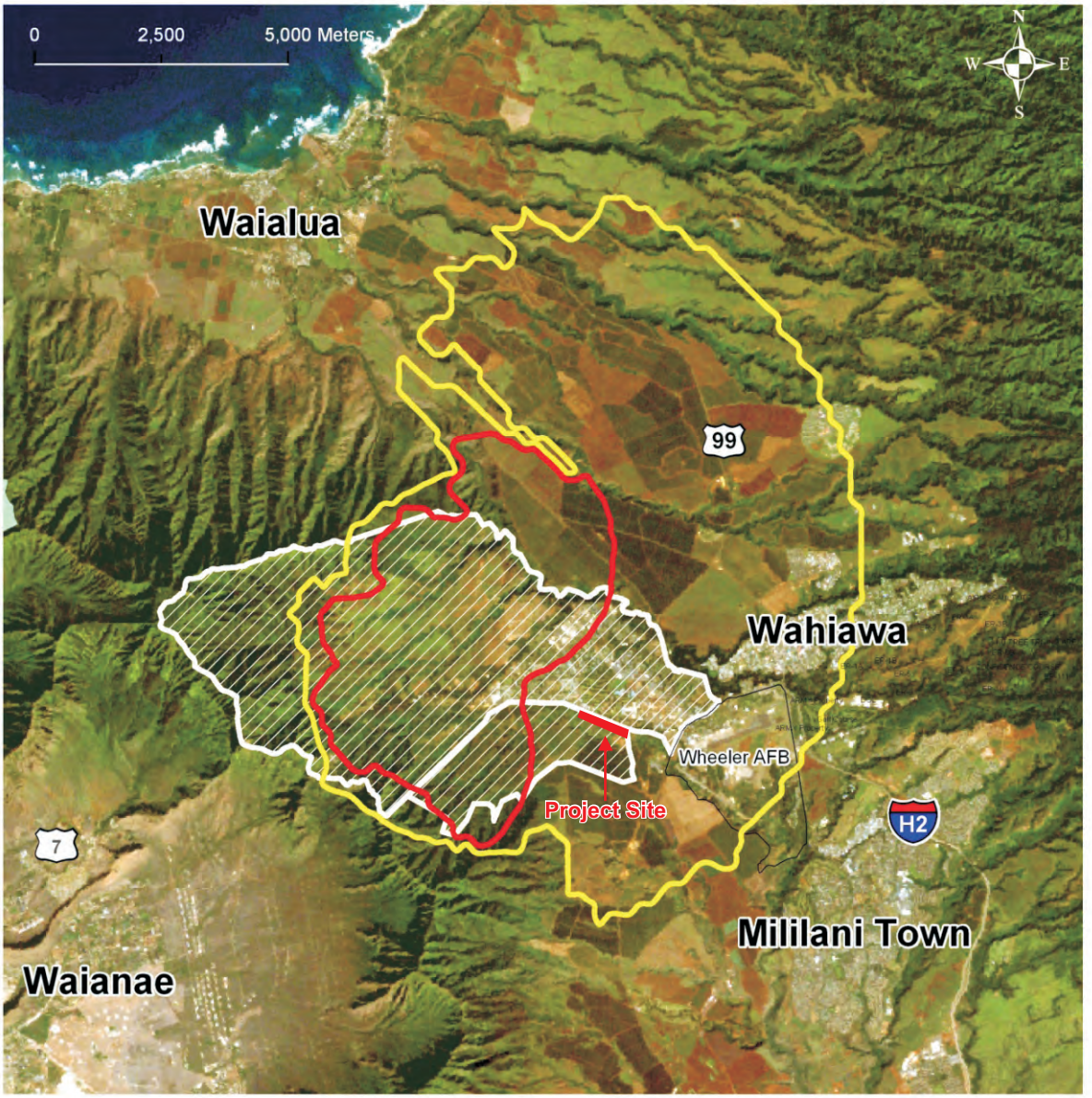
Noise Contour

Scofield Barracks Military Reservation
O‘ahu, Hawai‘i

TETRA TECH

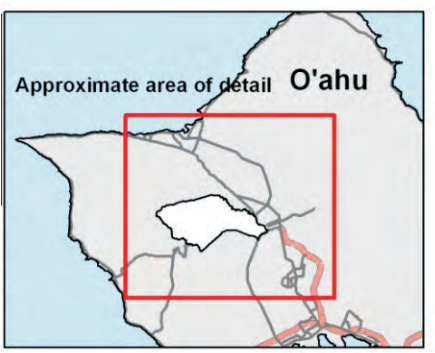
Figure 4.9-1

Source: US Army Public Health Command 2010; Imagery ESRI 2009; Projection: UTM NAD83 Zone 4



Legend

- Island of Oah`u
- Schofield Barracks
- 115-130 dBPK15(met) Moderate Risk of Complaints
- >130 dBPK15(met) High Risk of Complaints



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Noise Complaint Risk

Schofield Barracks Military Reservation
Oʻahu, Hawaiʻi

TETRA TECH

Figure 4.9-2

Source: US Army Public Health Command 2010

4.9.2 Environmental Consequences

Methodology for Analyzing Effects

Potential effects of the proposed action and no action alternative on noise were evaluated by examining the typical noise generated by construction and operational activities, compared to DoD guidance regarding noise exposure and distance to nearby sensitive receptors.

Factors Considered for Effects Analysis

Factors considered in determining whether an alternative would have a significant effect are the extent to which its implementation would generate temporary noise during construction or long-term noise during operation and maintenance that would exceed DoD or applicable regulatory standards.

Summary of Effects

The proposed action would introduce temporary noise from construction and new operational noise sources, such as ventilation systems and vehicle traffic; however, these effects would be minor adverse, as described below. Because the no action alternative would not change the present conditions at the project site, there is no anticipated adverse effect from noise.

Proposed Action

Construction

Construction noise could temporarily disturb military family housing across Lyman Road to the north over the span of approximately 23 months. Construction-related noise generally produces levels of 80 to 90 dBA at a distance of 50 feet. The houses are at least 75 feet from the edge of construction, so noise levels would not exceed 90 dBA. Noise generally attenuates by 6 dB for each doubling of distance, so only the houses nearest the edge of construction would experience levels near 80 to 90 dBA. In addition, standard building construction provides average noise dampening of 20 dB, indoor noise levels would be even lower. Construction would also be limited to daytime. Because construction noise would be temporary, would affect a limited area, and would be limited to daytime, effects would be minor adverse.

Operation and Maintenance

The proposed action would introduce new sources of sound, such as ventilation systems and vehicle traffic. These are typical sources of background noise in any residential area and would not likely be perceived as unwanted or annoying sound; therefore, effects from these new sound sources would be minor adverse.

The proposed action would be constructed outside the DoD Zone II noise contour, based on the most recent data available (2007 and 2008) in an area compatible with residential land use. The proposed action would be constructed in the PK15(met) noise contour, where single events of large caliber weapons firing may be between 115 and 130 dB up to 15 percent of the time. Although residents of the newly constructed houses may find sound from these events unwanted, because average sound levels would be acceptable for residential construction, residential development would be compatible with the existing noise environment.

No Action Alternative

The no action alternative would not change or augment the existing noise sources in the ROI. No effects are identified as resulting from the no action alternative.

4.10 SOCIOECONOMICS

4.10.1 Affected Environment

Introduction and Region of Influence

The ROI for socioeconomic conditions is Honolulu County on O‘ahu. The proposed action and the no action alternative were reviewed and evaluated to identify potential beneficial or adverse effects in the ROI. The socioeconomic indicators used for this study were population, employment levels and distribution among business sectors, income, housing, and quality of life. These indicators characterize the ROI.

The baseline year for socioeconomic data is 2009 because that is the most recent year that data for most of the socioeconomic indicators were available. Since general population information is available from the 2010 Census only at the national and state levels, 2009 data is used for showing population trends.

Overview of Resource

Population

As shown in Table 4.10-1, the population of the state increased by 8.8 percent between 1990 and 2000. The population increase in Honolulu County (4.4 percent) was half that of the state. Honolulu County’s population (ranked first in the state) made up 72.2 percent of the state population in 2000 and 70.0 percent in 2009. Honolulu County’s population increased by about 4 percent between 2000 and 2009, and the population for the state of Hawai‘i increased by almost 7 percent during the same period (HDBEDT 2010).

Table 4.10-1
Population Trends for the State of Hawai‘i and for Honolulu City and County

	1990	2000	2009	Percent Change 1990-2000	Percent Change 2000-2009
Hawai‘i	1,113,491	1,211,566	1,295,178	8.8	6.9
Honolulu County (O‘ahu)	838,534	875,061	907,574	4.4	3.7

Source: HDBEDT 2010

Economy, Employment, and Income

Table 4.10-2 shows the distribution of employment for Honolulu County among the various industry sectors, and the changes experienced in these sectors between 2000 and 2009. The Educational Services and Health Care and Social Assistance sector employed the greatest number of workers in 2000 and 2009. The second largest employer sector was the Arts, Entertainment, and Recreation, and Accommodation, and Food Services sector.

Table 4.10-2
Sector Employment for Honolulu County

Sector	Honolulu County			
	Number of Persons, 2000	Percentage of Total, 2000	Number of Persons, 2009	Percentage of Total, 2009
Total employment	383,148	100.0	417,361	100.0
Agriculture, forestry, fishing and hunting, and mining	4,046	1.1	3,349	0.8
Construction	20,657	5.4	26,592	6.4
Manufacturing	14,494	3.8	17,018	4.1
Wholesale trade	13,211	3.4	11,144	2.7
Retail trade	46,914	12.2	44,540	10.7
Transportation and warehousing, and utilities	24,877	6.5	23,307	5.6
Information	10,515	2.7	7,997	1.9
Finance and insurance, and real estate and rental and leasing	28,643	7.5	29,515	7.1
Professional, scientific, and management, and administrative and waste management services	37,837	9.9	45,473	10.9
Educational services, and health care, and social assistance	76,091	19.9	93,570	22.4
Arts, entertainment, and recreation, and accommodation, and food services	52,743	13.8	57,885	13.8
Other services, except public administration	17,308	4.5	18,035	4.3
Public administration	35,812	9.3	38,963	9.3

Source: US Census Bureau 2000a, 2010a

In 2009, the ROI civilian labor force was 443,950, with 417,361 people employed and 26,589 people unemployed. The average annual unemployment rate was 6 percent in 2009, lower than Hawai‘i’s average annual unemployment rate of 7.1 percent. In 2009, the per capita personal income (PCPI) was $28,849. This was marginally higher than the state of Hawai‘i’s PCPI of $28,142, and 9.4 percent higher than the national PCPI of $26,409 (US Census Bureau 2010a, 2010b, 2010c).

According to the Army Stationing and Installation Plan (ASIP) data for fiscal year (FY) 2011, Schofield Barracks employs approximately 21,409 people, about 14,235 of whom are military personnel and 7,174 of whom are civilians. These figures exclude WAAF and other stations under Schofield Barracks (US Army 2011).

Housing

Table 4.10-3 shows housing occupancy for the state and Honolulu County in 2000 and 2009. Between 2000 and 2009 the total number of housing units and the number of occupied housing units in Honolulu County increased by a lower percentage than the state average. In 2009, 8.3 percent (28,223 units) of the housing units in Honolulu County were vacant, one percent lower than the vacancy rate in 2000 (9.3 percent). As shown in Table 4.10-3, the total number of housing units increased by 7 percent between 2000 and 2009 (US Census Bureau 2000c, 2010b).

Table 4.10-3
State and County Housing Availability Trends

	Hawai‘i			Honolulu County		
	2000	2009	Percent Change 2000 to 2009	2000	2009	Percent Change 2000 to 2009
Total	460,542	515,663	12	315,988	338,119	7
Occupied	403,240	446,136	10.6	286,450	309,896	8.2
Owner-occupied	227,888	252,881	11	156,290	169,532	8.5
Renter-occupied	175,352	193,255	10.2	130,160	140,364	7.8
Vacant	57,302	69,527	21.3	29,538	28,223	(4.7)

Source: US Census Bureau 2000b, 2000c, 2010a, 2010b

Schools

More than 15,000 military dependent students attend Hawai‘i’s public schools, approximately 8 percent of total enrollment. The ROI has four school districts: Central, Honolulu, Leeward, and Windward. Children living on Schofield Barracks attend schools in the Central District, which has 25 public schools. The public schools serving the Schofield Barracks community are Solomon Elementary School, Hale Kula Elementary School, Wheeler Intermediate School, and Leilehua High School (Hawai‘i DOE 2010a, 2010b).

School enrollment in the ROI for the 2009/2010 school year was 118,534 students. At the University of Hawai‘i in west O‘ahu, for 2009, there were 1,133 students. Community colleges in west O‘ahu had 7,484 students in 2009 (HDBEDT 2010).

4.10.2 Environmental Consequences

Methodology for Analyzing Effects

The ROI is Honolulu County on O‘ahu. The proposed action and no action alternative were evaluated to identify potential beneficial or adverse effects on conditions in the ROI. Effects on population, employment, housing, and quality of life were evaluated qualitatively.

Factors Considered for Effects Analysis

Factors considered in determining whether an alternative would have a significant effect on socioeconomics include the extent or degree to which its implementation would change the following:

- Population;
- Employment and total income in Honolulu County;
- Demand for housing; or
- Demand on schools.

Summary of Effects

The proposed action would have short-term beneficial effects on the local economy from marginal increases in employment and income during construction.

The no action alternative would have no effects on population, employment, or income, and demand on schools would not change. There would be a minor adverse effect on housing because the additional units would not be constructed, resulting in a shortage of adequate housing for military personnel on the local military reservations.

Proposed Action

Long-term and short-term beneficial effects would occur from implementing the proposed action. The projected construction expenditures for housing development would marginally increase employment and income in the ROI for the duration of construction and would have a short-term beneficial effect. Providing additional housing units at Schofield Barracks would add to the Army's inventory of housing, providing quality living conditions for Soldiers and their families.

Minor adverse effects on population and schools resulting from the construction of the proposed action are expected in the localized vicinity of the project site as people relocate from off-post housing to on-post housing. This is not expected to have effects for the larger ROI because there is no population increase on O'ahu associated with the proposed action. Construction of this housing development would not increase the population or substantially overburden schools in the ROI. The proposed action would result in an increase of 155 units in the housing inventory on Schofield Barracks, although it is not an overall increase for O'ahu, as identified and analyzed in previous NEPA documentation. The population shift resulting from the construction of new housing units at Schofield Barracks is anticipated to have a minor adverse effect on the community. It is possible that some of the Army personnel and their families live in adjacent communities and their children may already attend on-post schools and those in nearby communities. However, it is hard to predict where the residents for the Kalākaua Phase 3 neighborhood would come from. Sometimes these are displaced residents from other older neighborhoods that are being demolished, but typically it is whoever is highest on the waiting list, matched up with housing appropriate to their rank and family size.

No Action Alternative

Under the no action alternative, existing conditions would not change; however, if this housing development were not constructed, there would continue to be a shortage of adequate housing for Soldiers and their families stationed on O'ahu. This would work against Army initiatives to improve the Soldiers' quality of life and would result in a minor adverse effect on the demand for suitable housing. There would be no adverse effects on population, employment and total income, and public services as a result of the no action alternative.

4.11 TRANSPORTATION AND CIRCULATION

4.11.1 Affected Environment

Introduction and Region of Influence

Transportation and circulation refers to the movement of vehicles and pedestrians along and next to roads. The ROI is the 41.8-acre South Range (the project site) and perimeters, including adjacent roadways, in Schofield Barracks.

Overview of Resource

Schofield Barracks Military Reservation

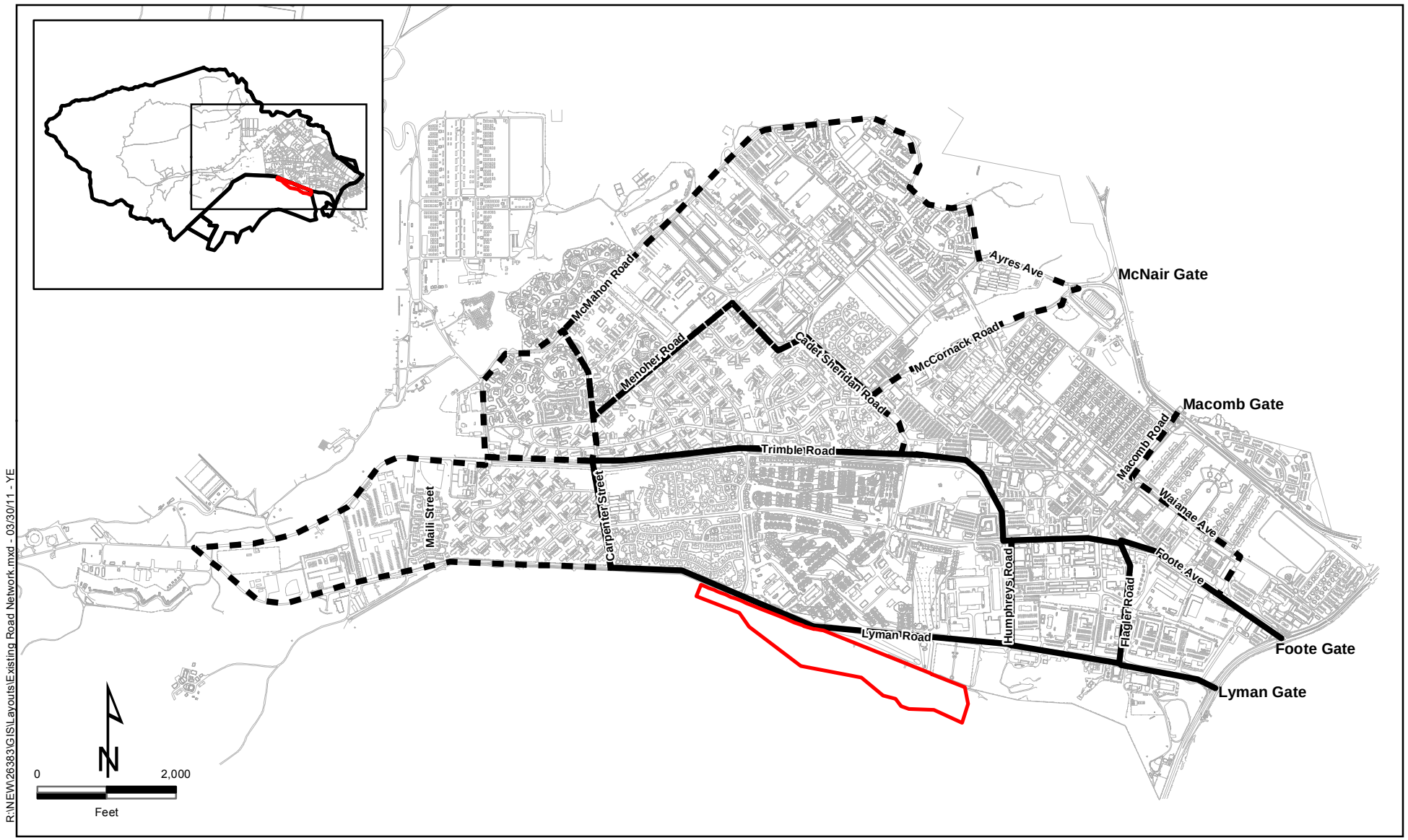
The two main roadways that serve Schofield Barracks are Foote Avenue/Trimble Road and Lyman Road (Figure 4.11-1). Both roadways traverse the main compound and are oriented in an east-west direction. Foote Avenue connects the Foote Gate with the Central Area, which contains the commercial area and barracks. West of the commercial area, Foote Avenue turns into Trimble Road (heading north), which continues west to the training areas. Foote Avenue/Trimble Road is a four-lane roadway between the Foote Gate and Beaver Road, which is approximately 1.2 miles west of the commercial area. Commercial and visitor traffic enters Schofield Barracks from Lyman Gate, at the intersection of Lyman Road and Kunia Road, southwest of the Foote Gate. Lyman Road runs parallel to Foote Avenue on the southern boundary of Schofield Barracks and extends west to the training ranges.

There are several areas at Schofield Barracks that are periodically congested. The first is the commercial area in the central portion of the Main Post. The PX, food courts, commissary, and other shops are here. The commercial area attracts both vehicular and pedestrian traffic, and peak traffic hours are lunch time and weekends (Nakashima 2008).

Another area of congestion is at the gates along Kunia Road, especially during periods of heightened security, when traffic backs up onto Kunia Road. In order to contend with these obstructions, the Army has been reconfiguring the gate areas to increase the capacity to help relieve congestion. The four main gates to Schofield Barracks are Foote Gate, Lyman Gate, Macomb Gate, and McNair Gate, all of which are staffed by sentries. A fifth gate to Schofield Barracks, Kolekole Gate, is manned by the Navy as it controls access to and from the Naval Magazine Pearl Harbor, Lualualei Branch, through Kolekole Pass.

In addition, Lyman Road may become congested during the morning and evening commute hours and during lunch time. Vehicles turning left from Lyman road onto side streets leading to housing or army facilities may cause traffic congestion along Lyman Road. Most of the traffic occurs between the Lyman Gate and Humphreys Road. However, this additional traffic could extend to Hewitt Road or possibly Carpenter Street (Miyamoto 2011).

Not all major roads have continuous pedestrian sidewalks, requiring pedestrians to walk on the unpaved areas next to these roads in some places. Cyclists must share travel lanes with vehicles because there is not a formal network of bicycle lanes on-post.



Existing Road Network

Project Site

Primary Road

Secondary Road

Scofield Barracks Military Reservation
O'ahu, Hawai'i

Figure 4.11-1

TETRA TECH

Source:Subject Property aquired fromm Sam O. Hirota,Inc,
Honolulu, HI December 16, 2010;
Projection: UTM NAD83 Zone 4N

Project Site

The project site is an undeveloped area at the northern edge of the South Range, abutting the southern boundary of Schofield Barracks's Main Post, and has no transportation network. It is bordered by Lyman Road on the north and extends roughly from Hewitt Street on the west to Humphreys Road on the east. Access throughout the proposed action area would be provided by connections to the transportation network in Schofield Barracks and a newly developed internal road network, connecting the proposed development to Schofield Barracks via Lyman Road.

Lyman Road is a two-lane east-west roadway. It extends along the southern Schofield Barracks boundary, from the Lyman Gate at Kunia Road, to the range and exercise facilities to the west. Only the Humphreys Road intersection is signalized due to the high turning volume at that intersection. Humphreys Road is a two- to three-lane street, extending from Kolekole Avenue south to about 0.16 mile south of Lyman Road. It is a major collector street on Schofield Barracks, linking the Foote Gate to service areas. There are sidewalks on either side of Humphreys Road north of Lyman Road. There is only one unimproved access road into the South Range area off Lyman Road, which provides access to the training facilities (Fehr and Peers 2009). Pedestrian and bicycle facilities next to the project site include pedestrian sidewalks along Lyman Road on the north side and an asphalt paved path (for pedestrian and cyclist) along the south side.

The highest traffic volumes on Lyman Road occur on midweek days, with the peak volumes on Wednesdays. Near the Lyman Gate, the 24-hour midweek vehicle count average is 7,823 heading westbound on Lyman Road and 6,614 heading eastbound. At Hewitt Street, near the project site, the average was 2,502 vehicles heading westbound and 2,447 heading eastbound, a decrease of 68 percent westbound and 63 percent eastbound from the measurements taken at the gate. Traffic volumes decreased again by a similar percentage between Hewitt Street and Mellichamp Road to the west (Fehr and Peers 2009).

Level of service (LOS) is a qualitative description of the freedom of traffic flow, ranging from A, with the best operating conditions, to F, with traffic volumes exceeding capacity. Intersections and roadways are designed for flow at LOS D or better. LOS D for Lyman Road would be 90 percent of capacity, which is equivalent to a two-way average volume of 16,800 vehicles per day. Near the Lyman Gate, where traffic volumes were the heaviest, the two-way average weekday volume was below this threshold. Even at peak conditions, delays at the Lyman Road intersections with Humphreys Road and at Mellichamp Road did not exceed 10.5 seconds per vehicle (consistent with intersection operations LOS A or B; Fehr and Peers 2009).

4.11.2 Environmental Consequences

Methodology for Analyzing Effects

Effects on local circulation, parking, access, and vehicle, pedestrian, and bicycle safety in the vicinity of the proposed project sites were qualitatively evaluated.

Factors Considered for Effects Analysis

Factors considered in determining whether an alternative would have a significant effect are the extent or degree to which its implementation would cause or result in the following:

- Increases in vehicle trips on local roads that would disrupt or alter local circulation patterns;

- Lane closures or impediments that would disrupt or alter local circulation patterns;
- Activities that would create potential traffic safety hazards;
- Increased conflicts with pedestrian and bicycle routes or fixed-route transit;
- Increased demand on public transportation in excess of planned or anticipated capacity at the time of increase;
- Increased demand for bicycle and pedestrian facilities in excess of planned or anticipated capacity at the time of increase;
- Increased parking demand in excess of the supply; or
- Impeded emergency access on or off the site.

Summary of Effects

Under the proposed action there would be short-term, minor adverse effects from an increase in construction-related vehicles and activities. Traffic changes on Lyman Road and other roads on Schofield Barracks may result from redistributing traffic during construction. Changes in traffic conditions would result in long-term, minor adverse effects. There is the potential for minor long-term beneficial effects as additional Army families could live on-post and be provided with the opportunity to walk to work and to other installation facilities, instead of driving.

There would be no expected shortage of available parking under the proposed action. No effects on pedestrians or bicyclists are anticipated under the proposed action.

Proposed Action

Under the proposed action, there would be new road construction to provide access to the proposed Kalākaua Phase 3 neighborhood. There are three proposed entry sites from the Kalākaua Phase 3 development to Lyman Road: one just east of Hewitt Street, one west of Kai‘ona Street, and one between these two entrances. Traffic turning onto Lyman Road from the proposed development would be managed at all three intersections by stop signs on each of the new roads. Existing roads would provide adequate access through Schofield Barracks to the proposed development; however, traffic distribution along major access ways, particularly Lyman Road, could be altered in the long term by increased travel to the proposed development. The proposed action would result in a long-term increase in traffic from personal vehicles along Lyman Road, which would provide access between Schofield Barracks and the new residential area, and at the Lyman Gate, which would provide access between the Kalākaua Phase 3 residential area and areas outside the installation. The three entry points to the proposed neighborhood would be offset from the intersections with Lyman Road to ease congestion that could be caused by traffic turning off of Lyman Road.

Turning traffic off of Lyman Road into the Kalākaua Phase 3 neighborhood could slow traffic along Lyman Road, which could cause delays if it were to occur during peak travel times. This would not likely result in delays that would exceed the LOS D threshold at the western end of Lyman Road near Mellichamp Road, where the average two-way weekday traffic volume was about 9.4 percent of the LOS D threshold (Fehr and Peers 2009), nor would it be likely to exceed the LOS D threshold on Lyman Road east of Hewitt Street, where the average two-way weekday traffic volume was about 29.5 percent of the LOS D threshold (Fehr and Peers 2009). However, if the residential area were to generate an additional 2,363 two-way vehicles per day on Lyman Road west of Road A and east of Hewitt Street, roadway operations in this area would reach the

LOS D threshold. It is unlikely that the 230 residences at the Kalākaua Phase 3 Development would generate this level of traffic near Road A since more traffic would likely be moving toward training facilities in the South Range area and activity areas on Schofield Barracks than toward Road A, which is close to the Lyman Gate. Similarly, because traffic generated by the proposed residential area would be most likely to move westward and northward, the proposed residential development would not be likely to have a significant effect on inbound peak-hour congestion at the Lyman Gate. In addition to providing entry points from Lyman Road that do not align with the streets on the other side of Lyman Road, the proposed action would be set back to allow for a widening of Lyman to four lanes, with a grassed median to further reduce potential traffic congestion.

There is the potential for minor long-term beneficial effects as additional Army families could live on-post and be provided with the opportunity to walk to work and to other installation facilities, instead of driving.

Public safety would be protected from potential effects due to increased traffic volumes by traffic calming measures, which are included in the design of the proposed action. These measures include short streets, curvilinear roads, and rear-loaded alleys, intended to slow traffic to posted speed limits.

There would be short-term, minor adverse effects from an increase in construction-related vehicles and activities. A construction traffic control plan would be implemented to manage and minimize construction-related effects on vehicular traffic, pedestrians, and bicyclists. The contractor would hire a licensed civil engineer, with a minimum of five years of traffic control design experience, to prepare traffic control and phasing plans for all proposed road and/parking lot closures. The traffic control plan would ensure that vehicular and pedestrian access is maintained at all times to all buildings.

No Action Alternative

No effects on transportation and circulation are expected under the no action alternative because traffic conditions would remain unchanged.

4.12 UTILITIES AND PUBLIC SERVICES

4.12.1 Affected Environment

Introduction and Region of Influence

Utility infrastructure generally refers to the supporting infrastructure in a community that enables a population to function in a specified area. Components of a community's utility infrastructure are electricity, natural gas, potable water, stormwater, solid waste treatment, and wastewater and sewage treatment. This resource is evaluated to determine if upgrades to the utility infrastructure would be required to support the proposed action to construct Phase 3 of the Kalākaua Housing Development at Schofield Barracks. For the purpose of this evaluation, the ROI is Schofield Barracks, and the scope of this analysis includes utility distribution lines and associated facilities servicing the ROI. Public utilities and services for Schofield Barracks that are part of the proposed action are police, fire, and emergency medical services and infrastructure for water, wastewater, stormwater, solid waste management, communications, and electricity. The following section addresses current public utilities and services in the ROI.

Overview of Resource

Police, Fire, and Emergency Medical Services

The Honolulu Fire Department, which has a policy of responding to fires on military installations, sends pumper trucks and firefighting personnel to assist the Federal Fire Department with fires on military installations (USACE 2009). The Federal Fire Department, under the supervision of Commander, US Naval Station Pearl Harbor, provides fire protection to Army installations on O'ahu. Typically, the Fire and Emergency Services Division also educates the on-post community about fire prevention practices and provides courtesy fire inspections on request.

Medical services are available to all Soldiers and their families and include access to Tripler Army Medical Center (TAMC) in Honolulu, which provides a full complement of medical facilities. Ambulance service is provided from TAMC, and medical evacuation by helicopter is also available from outlying training areas and ranges.

Security at all the installations is provided through the Provost Marshall's Office and the Military Police. The Military Police enforce laws, regulations, and directives, administer physical security programs, investigations, crime prevention program, absent without leave apprehension, and vehicle and weapons registration, and act as a liaison with civil law enforcement agencies.

Potable Water Supply and Distribution

Potable water is supplied to Schofield Barracks by deep groundwater wells and is treated at the Schofield Barracks Water Treatment Plant on the East Range, between the H-2 Freeway and Kamehameha Highway and across from WAAF's Kawamura Gate (USACE 2009). This facility can produce and treat up to 8.0 million gallons of wastewater per day (mgd). The Main Post infrastructure consists of five pump stations, 307,139 linear feet of distribution system piping, 690 valves, 482 fire hydrants, and 94 meters (USACE 2004). The Schofield Barracks distribution and storage system is supplied via a 24-inch main, and the water treatment facility receives water through a 12-inch submain connected to the 24-inch main. The State of Hawai'i Department of Land and Natural Resources permit allocates a 12-month moving average of 5.648 mgd to the Army from the groundwater aquifer, approximately 640 feet below the surface. The moving average ranges from a low of 3.849 mgd in January to a high of 6.948 mgd in September. The

average for FY 2002 was 5.346 mgd, the average for FY 2004 was 4.105 mgd, and the average for FY 2005 was 3.085 mgd (the FY 2005 average is slightly lower for a number of reasons, including deployments and the conversion of the Kalākaua Golf Course to family housing; Anderson 2005).

Potable water is pumped from the deep wells by four pumps at a rate of 2,000 gallons per minute and is chlorinated before flowing into five air stripper towers, where organic carbon contaminants, such as TCE, are removed. The water is then chlorinated a second time and injected with a fluoride solution before it enters a 200,000-gallon underground storage tank. This clear storage tank contains seven booster pumps that transmit water into the distribution systems and storage tanks at the Army installations served by the Schofield Barracks system: Schofield Barracks, East Range, Helemanō Military Reservation, and the Naval Computer and Telecommunications Area Master Station, Wahiawa. The quality of water coming from the treatment plant is good and in compliance with the Safe Water Drinking Water Act (USACE 2009). Five of the booster pumps have a capacity of 1,400 gallons per minute, and two booster pumps have a capacity of 1,040 gallons per minute (USACE 2004). Three pumps are used to control flows, with a maximum of two pumps operated at any given time.

The distribution system is divided into a low zone for the network, which runs north and east to serve the eastern portion of Schofield Barracks, and a high zone for the western network, which extends to the western portion of Schofield Barracks. Water passes through 20-, 16-, and 12-inch pipes before filling up two two-million-gallon steel tanks used for distribution throughout the area served by the Schofield Barracks Water Treatment Plant (USACE 2009).

The average domestic daily demand for the combined Schofield Barracks /WAAF water system was estimated at 2.5 mgd for fiscal year 2007 (USACE 2009), which is approximately 31 percent of the 8.0 mgd capacity. Actual consumption for fiscal year 2007 was approximately 933 million gallons per year (USACE 2009). The combined peak domestic demand, including the largest fire flow requirements, is 6.68 mgd (USACE 2009). This is approximately 83 percent of the 8.0 mgd capacity.

Fire flow is the required number of gallons per minute at a specified pressure at the site of a fire for a specified period. The minimum required fire flow is two flows of 1,000 gallons per minute for two hours or one flow of 2,000 gallons per minute for three hours (Belt Collins 1993).

Sanitary Wastewater

The Army privatized the sanitary wastewater system at Schofield Barracks, which is now operated by AQUA Engineering, a private contractor. AQUA Engineering also maintains the wastewater collection systems. Wastewater is conveyed from Schofield Barracks to the existing Schofield Barracks Wastewater Treatment Plant (WWTP) near the west end of the WAAF. The WWTP has a design flow capacity of 4.2 mgd, a maximum design flow capacity of 10 mgd, and a design peak flow capacity of 15 mgd. It is currently permitted to treat 3.2 mgd. The infrastructure that services Schofield Barracks consists of approximately 96 miles of sewer pipe ranging in diameter from 4 to 21 inches. Wastewater is collected into three gravity sewers and is directed to the WWTP (USACE 2004).

The WWTP is a secondary treatment facility constructed in 1976. Domestic users generate approximately 92 percent of the wastewater, with the remaining eight percent generated by industrial discharges (USACE 2004). The WWTP processes an average daily flow of 1.91 mgd from Schofield Barracks, WAAF, Camp Stover, Kunia Military Reservation, Leilehua Golf

Course, and Helemanō Military Reservation (USACE 2009). The USAG-HI DPW estimates a maximum daily flow of 2.8 mgd during periods of minimal or no deployment. Based on a sewer model, the existing sewer system is not sufficient, and overflows could result during a one year/one hour storm (Schneider 2009). The system does not have redundant backup, so continuous maintenance is required to avoid spills (C. H. Guernsey & Company 2001). The Army has recently upgraded the treatment level from secondary to advanced tertiary, and upgrades to the existing sewer lines at Schofield Barracks have been planned. These upgrades would improve capacity of the sewer system.

Effluent wastewater is discharged to an irrigation ditch owned and operated by Dole Company. The WWTP operates under a permit, in accordance with the National Pollutant Discharge Elimination System (USACE 2009).

The wastewater system infrastructure at Schofield Barracks provides sufficient support for current mission support requirements. At a current load of 1.91 mgd, the system is operating at approximately 45 percent of capacity (USACE 2009).

Stormwater

The stormwater drainage system on Schofield Barracks consists of a network of piping, catch basins, manholes, trenches, culverts, and swales. This system collects and transports the rainwater on the base to a variety of outlets, including Kaukonahua Stream, for the northern portions of Schofield Barracks, and Waikele Stream for the southern portions (DPW 2003, cited in USACE 2004).

Solid Waste Management

Current solid waste stream records are nonrepresentative due to deployments, ongoing infrastructure upgrades, and housing privatizations. Based on the waste and recycling streams generated in 2002, however, the Schofield Barracks generates an estimated 1,720 tons of industrial solid waste annually, which represents about 50 percent of the total estimated annual industrial waste stream generated by Army installations in Hawai‘i (USACE 2004). Recyclable materials generated at Schofield Barracks are sent to a recycling facility at Building 1087B, which is operated by Goodwill Industries (USACE 2004). Only a small portion of waste goes to Waimānalo Gulch Landfill because the Army diverts 90 percent of the waste stream to H-Power, a waste-to-energy system that converts municipal waste to power, and only the ash produced is deposited at the landfill.

Solid waste is transported by private contractor to H-Power for incineration. H-Power then generates energy from the waste. The H-Power facility is capable of processing more than 2,000 tons per day of municipal solid waste into refuse-derived fuel for combustion, while generating energy from this renewable source (H-Power 2011).

Communications

Verizon Hawai‘i provides commercial telephone service on official government cable to housing areas, mainly from direct-buried cable lines that are deteriorated and in need of maintenance. AT&T/Hawaiian Information Transfer System provides official phone service to the Army in duct lines. The Army is responsible for repairing and maintaining the official phone lines and for providing underground ducts for the commercial phone lines (C. H. Guernsey & Company 2001). Buried telephone lines supplying telecommunications to the housing areas at Schofield Barracks

are already in poor condition and are scheduled for maintenance or replacement in a five-year plan.

Electricity

Hawaiian Electric Company provides Schofield Barracks and surrounding installations with electricity. The electrical system at Schofield Barracks consists of two 44 kilovolt (kV) distribution substations, 1.9 circuit miles of 44-kV overhead subtransmission line, 33 circuit miles of 7.2-kV overhead primary distribution line, 659 pole-mounted transformers, 15.7 circuit miles of 7.2-kV underground primary distribution line, and 280 pad-mounted transformers. The pole-mounted transformers range in size from less than 15 kilovolt amperes (kVA) to 167 kVA, and the pad-type transformers range in size from 50 kVA to 3,000 kVA in the Main Point service area. There are also approximately 1,293 streetlight fixtures and 431 streetlight poles (USACE 2004).

Power is supplied to Schofield Barracks by the Castner and Menoher substations, which are supplied by one radial circuit, 44kV Hawaiian Electric Company tap; the service point is at the Castner substation. The 44 kilovolts are transformed to 7,200 volts at each substation. The Castner substation is made up of two main buses: Castner A, which is fed by two five-megavolt ampere (MVA) transformers and distributes power on six feeders, and Castner B, which is fed by two 5-MVA transformers and distributes power on 10 feeders. The Menoher substation is fed by one Army-owned 44-kV overhead line from the Castner substation. The Menoher bus is fed by two 5-MVA transformers and distributes power on five feeders. If Menoher were to be shut down for any reason, much of the housing at Schofield Barracks would be without power. A Hawaiian Electric Company backup 44-kV line from the Mikilua circuit along Kolekole Avenue was constructed to serve the Menoher substation, but the connections to the Castner substation cannot be closed while the backup line is in use or the breakers will be blown off-line due to the difference in impedance in the backup line (C. H. Guernsey & Company 2001).

The system capacity, as identified in the 1993 Schofield Barracks Real Property Master Plan, is 30,000 kVA (Belt Collins 1993). The system provides an excess capacity of 8,111 kVA, mainly from the Castner A (at 74 percent capacity) and Menoher (at 47 percent capacity) buses. Projected future loads were estimated at 4,822 kVA. Both Castner A and Menoher are expected to accommodate future loads, but Castner B (currently at 98 percent capacity) would be above capacity. Anticipated system upgrades that would increase system voltage from 7.2 kV to 12.47 kV would accommodate the projected future loads (Belt Collins 1993). New larger transformers and modern vacuum switchgear were installed at Castner substation in 2002, and an $11 million system repair project is underway at Schofield Barracks (C. H. Guernsey & Company 2001).

At Schofield Barracks, IPC homes also have photovoltaic systems that produce electricity. These homes use approximately 52.4 million kWh per year and supply approximately 3.5 million kWh (6.7 percent) of that demand from their own photovoltaic systems (Cranmer 2011).

4.12.2 Environmental Consequences

Methodology for Analyzing Effects

The methods used to determine whether a project alternative would have a significant effect on public services and utilities are as follows:

- Review and evaluate existing and past activities to identify the action's potential to affect public services and utilities;
- Review and evaluate each project alternative to identify the action's potential to affect public services and utilities; and
- Assess the compliance of the proposed alternative with applicable federal, state, or local regulations, guidelines, and pollution prevention measures.

The utilities section analyzes potential effects on police, fire, and emergency medical service, potable water, wastewater, stormwater, solid waste management, communications, and electrical utility infrastructure. Potential infrastructure shortfalls, inconsistencies, inadequacies, or deficiencies identified between the existing infrastructure and the requirements of a project alternative would all be characterized as potential effects.

Factors Considered for Effects Analysis

Factors considered in determining whether an alternative would have a significant effect on utilities are the extent or degree to which its implementation would result in the following:

- Interrupt or disrupt any public utility service, as a result of physical displacement and subsequent relocation of public utility infrastructure, to the extent that the result would be a direct, long-term service interruption or permanent disruption of essential public utilities; or
- Require an increase in demand for public services or utilities beyond the capacity of the utility provider to the point that substantial expansion, additional facilities, or increased staffing levels would be necessary.

Summary of Effects

Minor adverse effects on public service and utilities in the ROI would result if the proposed action were implemented. The proposed action would meet current federal standards for building energy efficiency and maximizing water conservation. Increased demand on public utilities and services would occur under the proposed action. The increased demand would be met by infrastructure in the Kalākaua Phase 1 neighborhood located just north of Lyman Road, such as potable water, electrical, and communications demands; sewer demands would be met by the existing WWTP near the west end of the WAAF. Connecting to this existing infrastructure would minimize environmental effects, resulting in only minor effects on public utilities and services, and would not require any increase in public service and utility staffing.

The no action alternative would have no effects on public services and utilities in the ROI.

Proposed Action

The sections below discuss the effects of implementing the proposed action on utility infrastructure and supply. The proposed action would include the construction of new military housing units on 41.8 acres of land on Schofield Barracks, which would result in a net gain of 155 units. The construction project would meet current standards for design established by the US Army that would minimize environmental effects. Proposed construction of housing units would be based on sustainable design and development concepts and would seek to incorporate consideration of matters such as sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. Construction of the proposed housing project would be designed to be in accordance with EO 13123 (Greening the Government

through Efficient Energy Management), which requires federal agencies to define energy efficient goals and outline measures to achieve them, and other applicable laws and executive orders.

Police, Fire, and Emergency Medical Services

Minor adverse effects on public services such as law enforcement, fire protection and emergency medical are expected to occur under the proposed action in the short term and long term. Short-term effects during the two-year construction period would slightly increase demand for these services due to the potential for accidents typical of construction sites. Over the long term, demand for these services would increase because the proposed action would slightly increase the resident population in the ROI (Schofield Barracks) as people relocate from off-post housing over to Schofield Barracks. However, existing services in the ROI are adequate to accommodate an increase in demand, so effects on police, fire, and medical services are expected to be minor adverse.

Potable Water Supply and Distribution

Implementation of the proposed action would result increase demand on the existing potable water supply and distribution system due to the slight increase in the permanent residential population in the ROI.

The proposed development would increase residential units on Schofield Barracks by 155, using approximately 77,500 gallons of potable water per day (based on Honolulu Board of Water Supply Standards of 500 gallons daily per single family or duplex unit). This equals approximately 2.3 million gallons a month and over 27 million gallons per year. To service the new housing units, a looped water main would be installed and serviced by two connections to existing eight-inch water mains in the Kalākaua Phase 1 neighborhood, just north of Lyman Road. As stated, the facility can produce and treat up to 8.0 mgd, with actual consumption for fiscal year 2009 at 3.2 mgd, which is approximately 40 percent of capacity. Although demand for potable water would increase under the proposed action, the existing facility and storage capacity would be able to accommodate this increase. As such, implementation of the proposed action would result in minor adverse effects on the water distribution system.

Construction of the proposed housing development would incorporate new water conservation measures into contemporary construction standards, and features within the Energy Policy Act of 2005 would be included to reduce the demand on the potable water supply and distribution system.

Sanitary Wastewater

The proposed action would generate additional wastewater resulting in increased demand on the existing wastewater collection and treatment system. The estimated daily sanitary sewage generated under the proposed action would be approximately 49,600 gallons per day (based on City and County of Honolulu sewer standards). This equals approximately 1.4 million gallons a month and over 17 million gallons of sanitary sewer water per year. At a capacity of 4.2 mgd (and 126 million gallons per month), the existing WWTP has adequate design capacity to service the proposed housing development, but existing sewer lines in the ROI have reportedly experienced overflows during heavy rains and are in need of upgrades. Upgrades to the wastewater collection system and sewer lines have been planned (USACE 2009) and are expected to occur before the new housing would be made available for occupancy.

Because the capacity of the WWTP could accommodate the increase in processing of wastewater, and because there is no wastewater collection system at the project site, construction of new sewer infrastructure connecting to the WWTP would be required under the proposed action. This would include installing additional sewer connections to a new sanitary sewer main servicing the Lyman corridor. Because the WWTP is processing sewage at 45 percent of capacity (1.91 mgd), the facility would be able to accommodate an increase in demand from the proposed action, resulting in minor adverse effects on the sanitary wastewater collection and treatment system at Schofield Barracks.

Additionally, construction would incorporate water conservation measures into contemporary construction standards, such as the installation of low-flow fixtures, further reducing wastewater generated and minimizing demand on the wastewater collection and treatment facilities.

The existing WWTP has adequate design capacity to accommodate the estimated daily sanitary sewage generated under the proposed action, resulting in minor adverse effects on the sanitary wastewater collection and treatment system.

Stormwater

Under the proposed action, the new stormwater infrastructure would include low impact development techniques, in accordance with Section 438 of the Energy Independence and Security Act of 2007 (42 USC, Section 17094). Adherence to this law is required because the proposed housing development would be over 5,000 square feet and would need to maintain predevelopment stormwater hydrology (US Army 2010a). To achieve this, the proposed development would implement low impact development techniques such as using bio-retention planters that provide flow control and water quality treatment, permeable paved services, and rainwater harvesting and use.

Use of these stormwater control techniques would result in minor adverse effects on the stormwater drainage system at Schofield Barracks.

Solid Waste Management

Under the proposed action, debris generated from construction and long-term operation would increase solid waste streams from current levels.

The construction of the proposed housing development would require clearing and grubbing of soil and roots and subsequent potential soil cleanup. It would also generate solid waste material as a direct result of constructing the proposed housing units. Waste materials generated from these activities would be recycled or diverted to H-Power, which converts waste to energy, and only the ash produced would be deposited at the Waimānalo Gulch Landfill. Some materials, such as certain plastics, may not be eligible for recycling or incineration and would be disposed of according to federal, state, and local regulations. Although the capacity of solid waste facilities is finite and there are environmental effects associated with incineration, the contribution of solid waste resulting from clearing and grubbing would not cause any major adverse effect or exceed the capacity of the facilities; therefore, the proposed action would have a minor adverse effect on solid waste management.

The long-term operation and occupancy of the proposed housing units would place an increased demand on the solid waste collection and disposal system at Schofield Barracks. However, additional solid waste generated from the proposed action would not exceed the capacity of H-

Power or the Waimānalo Gulch Landfill, resulting in long-term minor adverse effects on the solid waste management system.

Communications

The proposed action would require the installation of additional communications infrastructure, resulting in an increased demand on communication systems at Schofield Barracks. Communication systems at the project site would be connected to the communications infrastructure in the Kalākaua Phase 1 neighborhood just north of Lyman Road. While increased demand on the communications system would result from implementing the proposed action, no effects are expected because the existing system, in concert with additional communications infrastructure, would be adequate to handle the demand.

Electricity

The proposed action would result in long-term increased demand on the electrical distribution system in the ROI. The construction of housing would include lighting, fire protection, alarm systems, water heaters, and air conditioning. To provide these services, the project would be connected to the switchgear substation in the Kalākaua Phase 1 neighborhood. The construction of the residences would comply with current energy conservation directives issued by the DoD. The latest energy-efficient appliances and equipment compatible with the Army's overall policy would be used to reduce energy consumption. The homes would be built to LEED certification standards and would include solar hot water heating, which would reduce the electricity demand compared to older homes. As such, although the proposed action would increase the electrical demand in the ROI, the effects would be minor adverse, as the existing electrical system in the Kalākaua Phase 1 neighborhood would be able to accommodate this new demand.

No Action Alternative

Under the no action alternative, conditions affecting public services and utilities would remain approximately as they are now. Because no major changes are anticipated under the no action alternative, no effects on public services and utilities are expected.

4.13 WATER RESOURCES

4.13.1 Affected Environment

Introduction and Region of Influence

Water resources include both groundwater and surface water. The ROI for groundwater is the high-level aquifer underlying the project site. The ROI for surface water is the portion of the Waikele watershed containing the project site and downstream of it. These are described in more detail below.

Overview of Resource

Groundwater

Schofield Barracks is in the Schofield Plateau groundwater area of the central Oʻahu groundwater flow system, the largest and most productive flow system on Oʻahu (Oki 1998). The central flow system is bounded on the east by the crest of the Koʻolau Mountains and on the west by the crest of the Waiʻanae Mountains (USACE 2004b).

The Schofield Plateau lies on the divide between the northern and southern parts of the central Oʻahu flow system. The northern part includes the Mokulēʻia, Waialua, and Kawailoa hydrologic units, while the southern part includes the ʻEwa, Pearl Harbor, Moanalua, Kalihi, Beretania, and Kaʻimukī hydrologic units (Mink and Lau 1990). The Schofield Plateau subsurface is bounded on the north and south by vertical low permeability features that reduce or prevent groundwater flow and act like groundwater dams. These features might be dike intrusions or possibly depositional features (Oki 1998). Because the groundwater elevation inside these "dams" is higher than outside, the groundwater in the Schofield Plateau is called high level groundwater.

The Koʻolau basalt formation consists of nearly horizontal basalt flows interbedded on the western margin with alluvial deposits, resulting from erosion of the Waiʻanae Mountains. Weathered basalt is rich in clay minerals that restrict the downward flow of water. Instead, most groundwater recharge occurs in steep upland areas or in deeply incised stream channels, where fractured bedrock is exposed or at shallow depth. Runoff that reaches the plateau tends to percolate slowly and contributes little to groundwater recharge (HLA 1992).

Groundwater occurs in three types of groundwater aquifer systems. Beneath the Schofield Plateau, groundwater occurs in the Schofield high-level groundwater body, where groundwater elevations are in the range of 275 feet above mean sea level. Depth to groundwater is approximately 600 feet or more, depending on the ground surface elevation. Water levels in the high-level groundwater body are higher than in the surrounding region because groundwater flow in the center of the plateau is laterally restricted by natural subsurface barriers called dams—possibly dike intrusions or buried volcanic ridges—that block flow to the north and south (USACE 2004).

Underlying the high-level aquifers is the basal aquifer, a freshwater lens occupying porous and permeable volcanic rocks beneath the island. The freshwater lens of the basal aquifer floats on denser salt water. The freshwater lens is thickest near the center of the island and tapers off toward the edges of the island. Beneath the Schofield Plateau, groundwater elevations in the basal aquifer are in the range of only 10 to 30 feet above mean sea level (Oki 1998). The Oʻahu basal aquifer underlies Schofield Barracks and most of southern Oʻahu.

The third groundwater system is the dike-impounded groundwater system associated with the dike intrusions within the Wai‘anae volcanics underlying the Wai‘anae Mountains. The dike-impounded groundwater system is recharged by runoff from the mountains, but lateral flow of this groundwater is blocked by vertical dike intrusions. Groundwater levels vary locally in the area of dike-impounded groundwater.

In addition to the three main groundwater systems, groundwater may also occur locally in perched aquifers above the high-level groundwater body or the basal aquifer. Perched aquifers are localized, permeable groundwater-bearing strata that are underlain by strata with much lower permeability that restrict downward groundwater flow (USACE 2004b).

The project site is in the southwest corner of the Schofield high-level water body, next to the Waianae dike-Impounded groundwater body, which recharges it on the west, and is bounded on the south by the Southern Groundwater Dam (Golder Associates 2010). Some of the groundwater in the Schofield high-level water body is captured by wells that supply drinking water to Schofield Barracks, and some of the groundwater flows south across the southern groundwater dam into the Pearl Harbor basal water body.

Ground Water Quality

In August 1990, Schofield Barracks was placed on the EPA’s National Priorities List (also known as Superfund) due to elevated levels of TCE discovered in wells supplying drinking water to the installation. TCE is an industrial degreasing solvent used at multiple locations in Schofield Barracks. The EPA removed Schofield Barracks from the NPL in August 2000, finding that the wellhead treatment of groundwater and long-term monitoring adequately protects human health and the environment (EPA 2011). Water treatment by air stripping and groundwater monitoring are ongoing (US Army 2010b; US Army Environmental Command [USAEC] and US Army Garrison, Hawai‘i 2007). TCE and carbon tetrachloride are widespread in area groundwater and could be present in groundwater beneath Schofield Barracks and thus the 41-8 acre parcel of South Range (Nelson 2011; US Army Environmental Command and USAG-HI 2007).

Surface Water and Drainage

Schofield Barracks lies near the drainage divide between the Kaukonahua watershed to the north and the Waikele watershed to the south. The South Range area of Schofield Barracks lies within the Waikele watershed, which is one of the largest watersheds on O‘ahu, encompassing about 49 square miles. Waikele Stream discharges to the West Loch of Pearl Harbor (USACE 2004b).

The northwestern branch of Waikele Stream originates in the Honouliuli Forest Preserve, along the east slope of the Wai‘anae Mountains south of Schofield Barracks, flows through Waikele Gulch next to the project site, and joins Waikakalaua Stream from the east near Mililani (USACE 2004b; HDOH 2003). The segment of Waikele Stream next to the South Range parcel is dry most of the year, with intermittent flows following rainfall (Englund and Randall 1999). US Geological Survey records show that mean monthly flows measured at a gage at WAAF ranged from 0.00 cubic feet per second (cfs) in June to 7.01 cfs in December between 2007 and 2010 (USGS 2010). During the 2010 water year, the mean daily discharge was zero on 328 days of the year. Groundwater apparently supports the base flows in the lower reaches of Waikele Stream. According to Englund and Randall (1999) about 80 percent of the base flow in the lower reach of Waikele Stream originated from Waikele Springs, near Waipahu.

Most of the project site drains overland to Waikele Gulch, the deeply incised channel of Waikele Stream. Some of the drainage in the 10.5-acre Kalākaua Phase 3 parcel drains to a ditch that runs along Lyman Road. This is part of the installation's stormwater collection system, which conveys stormwater to a point of discharge on Waikele Stream in WAAF.

Surface Water Quality

The State of Hawai'i classifies the Waikele watershed as second tier Category I, under the Hawai'i Unified Watershed Assessment (HDBEDT and HDOH 2000). Category I watersheds do not meet, or face imminent threat of not meeting, clean water and other natural resource goals.

An impaired water body is one that is not attaining water quality standards that support the designated uses of the water body. Section 303(d) of the federal Clean Water Act (CWA) requires each state to list impaired water bodies or segments of water bodies. Studies must then be performed to identify the sources of the pollutants that cause the impairment and the total maximum daily loads (TMDLs) that can be discharged to the water body without exceeding the applicable water quality standard.

The Waikele Stream is listed as a Priority 1 impaired water body. According to the 2006 State of Hawai'i Water Quality Monitoring and Assessment Report, an exceedance of levels of total nitrogen (N) and nitrite/nitrate (NO_2/NO_3) in both wet and dry conditions has been identified for the Waikele Stream. Turbidity is listed as a possible source of impairment. The EPA lists Waikele Stream as in need of TMDLs for nitrite/nitrate, total nitrogen, and turbidity (EPA 2006). The Waikele Stream has been given a high priority for TMDL development (HDOH 2008).

The State of Hawai'i has taken the approach of prioritizing the assessment of streams that are tributaries of impaired coastal waters to address the sources that contribute to those impairments. Although the entire stream network of Waikele Stream is listed, in reality only the perennial flow segments of Waikele Stream actually contribute to the impairment. In 2003, HDOH began a biological assessment of Waikele Stream at five stations on perennial reaches of the stream and its principal tributaries as a first step in developing a TMDL for the stream network (HDOH 2003).

Summary of Existing Conditions

Groundwater underlying the project site occurs in the Schofield high-level water body, at a depth of about 270 feet below the ground surface. Because of the depth and underlying geology, very little if any recharge of groundwater occurs through infiltration of rainwater at the project site. Any significant local groundwater recharge probably occurs through infiltration along the channel of Waikele Stream. Groundwater beneath the project site may be in the area affected by former solvent releases, including TCE. (The contaminated groundwater is being addressed by wellhead treatment.)

Surface water from the project site drains to the adjacent intermittent reach of Waikele Stream. Although Waikele Stream is listed as a Priority 1 impaired water body due to nutrients and possible turbidity, the impairment is observed in the perennial reaches of the stream, several miles downstream of the project site.

4.13.2 Environmental Consequences

Methodology for Analyzing Effects

The evaluation of potential effects on water resources is based on the project's potential to affect water quality, surface water runoff volumes and drainage patterns, and flood hazards.

Factors Considered for Effects Analysis

An alternative is considered to have a significant effect on the resource if they result in any of the following:

- Degradation of surface or groundwater quality in a manner that would reduce the existing or potential beneficial uses of the water;
- Noncompliance with existing or proposed water quality standards or with other regulatory requirements related to protecting or managing water resources;
- Alteration of the pattern of surface or groundwater flow or drainage in a manner that would adversely affect the uses of the water within or outside the project region; or
- Increased potential for flooding or the amount of damage that could result from flooding, including flooding from runoff.

Summary of Effects

Short-term, minor adverse effects from silt runoff and water quality degradation on these resources are anticipated during project construction. Under the proposed action, there would be no effects on water resources because project infrastructure design would follow BMPs to prevent an increase in the potential for flood hazards.

There would be no effects under the no action alternative.

Proposed Action

During construction of the new buildings and supporting infrastructure, there would be an increased potential for water quality degradation due to silt runoff from disturbed areas at the construction site. Effects on water quality would be short term and minor.

Compliance with stormwater discharge requirements under the NPDES permit program requires construction projects that would disturb one acre or more to obtain permit coverage, which involves preparing a site-specific stormwater pollution prevention plan (SWPPP). In Hawai‘i, the administration of the NPDES permit program has been delegated to the HDOH. The proposed action would include engineering BMPs for erosion and sediment control and implementation of a SWPPP. Erosion and sediment control measures used during construction are expected to prevent water quality degradation from stormwater runoff. Implementing Phase II stormwater management regulations of the CWA and construction BMPs, as well as continued implementation of the ITAM program would ensure that nonpoint source contamination of surface water is minor adverse.

Increases in stormwater runoff may occur as a result of an increase in impervious area at the project construction sites for new roads and infrastructure, as compared to existing undeveloped conditions. Federal legislation directs the implementation of low impact development as an "integrated design" approach to new construction. This approach includes the use of cisterns and

rain barrels, rain gardens, bio-retention cells, soil amendments, reforestation, permeable pavement (asphalt, concrete, pavers or blocks), grass and bio-swales, green roofs, and other techniques to limit stormwater runoff to predevelopment hydrology to the maximum extent technically feasible (US Army 2010a). To comply with this mandate, the new residential area would be designed to respect the natural systems of topography and drainage and to ensure that stormwater is conveyed away from structures and directed to drainage and infiltration systems.

The new storm drainage system would include water detention and quality control structures, which would be built to ensure that post-development peak flow discharges were equal to or less than predevelopment peak flow discharges, with both discharges based on a 100-year frequency storm. If any part of the drainage structure were in the ordinary high water mark, the design-build contractor would need to obtain a USACE Section 404 permit, a State Department of Health 401 Permit, and a Department of Land and Natural Resources Stream Channel Alteration Permit.

The proposed action would include culverts and drainage swales designed to withstand a 100-year flood. Potential increases in runoff would likely be offset by surface-holding impoundments and other BMPs. Consequently, conditions that would increase the potential for flood hazards are not expected.

No Action Alternative

Under the no action alternative, conditions affecting water quality, surface runoff volumes, drainage, or flood hazards would remain approximately as they are. Currently, no effects on water resources are believed to occur as a result of activities in the ROI. Under the no action alternative, the project site would remain as part of the Army Range land. Any projects involving major changes to the project site, if proposed, would require preparation of additional NEPA documentation. Since no major changes are anticipated under the no action alternative, no effects on water resources are expected.

4.14 CUMULATIVE IMPACTS

4.14.1 Introduction

Cumulative impacts are the direct and indirect effects of a proposed project's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR, Part 1508.7). Guidance for implementing NEPA recommends that federal agencies identify the temporal and geographic boundaries of the potential cumulative effects of a proposed action (CEQ 1997). For the purposes of this EA, the temporal boundary of analysis is from approximately 2009 to 2016. This boundary encompasses a range in which data are reasonably available and forecasts can be reasonably made.

The geographic boundaries of analysis vary, depending on the resource and potential effects. For most resources, the ROI for cumulative impacts is the same as the ROI used to analyze the effects from the proposed action and no action alternative. Resources with farther-reaching impacts, such as air quality or socioeconomics, are analyzed with a more regional perspective. The analysis area is described under each resource. Specific projects that are similar in size or scope or have the potential to cumulatively affect the resources evaluated for the project are identified in Table 4.14-1. Some resources would be affected by several or all of the described activities, while others could be affected very little or not at all.

4.14.2 Cumulative Projects

Projects expected to occur over the life of the proposed project are presented below.

Table 4.14-1
Cumulative Projects

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
Battle Command Training Center	Schofield Barracks/ WAAF	US Army	Construct a Battle Command Training Center.	Completed	Completed
Information Systems Facility	Schofield Barracks/ WAAF	US Army	Construct an Information Systems Facility to support 25th Infantry Division for Army Transformation.	Completed	Completed
Army Growth and Force Structure Realignment	Schofield Barracks	US Army	Various new facilities and increase in personnel. Approximately 1,700 more personnel are scheduled to be stationed at Schofield Barracks/WAAF.	Ongoing	2013
USAG-HI FY 05 Modularity	Schofield Barracks/ WAAF	US Army	Increase in personnel associated with restructuring the 25th ID headquarters elements, 3rd Brigade and Aviation Brigade to a modular force structure.	Completed	Completed

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
Warrior in Transition Facilities	Schofield Barracks	US Army	Construct Warrior in Transition Complex, consisting of 120-person barracks, administration and operations space, Soldier family assistance center, and a parking structure.	To begin 2011	2013
Whole Barracks Renewal Program	Schofield Barracks/ WAAF/ HMR/ TAMC	US Army	Upgrade barracks. Includes several individual projects in the Whole Barracks Renewal program, such as barracks construction and renovation and battalion headquarters.	Ongoing	2013
Stryker Brigade Combat Team Transformation	O‘ahu and Hawai‘i	US Army	Multiple construction projects and land acquisitions for converting the 2nd Brigade of the 25th ID (L) into a Stryker Brigade Combat Team.	Ongoing	2015
Headquarters and Headquarters Company (HHC) 8th MP Brigade (WGHDAA)	Schofield Barracks	USAG-HI	The HHC 8th MP Brigade (100-person organization) relocated to and reorganized at Schofield Barracks starting December 16, 2006. The project did not demolish or construct any structures.	Completed	Completed
Child Development Center	Schofield Barracks	US Army	Construct a 195-child-capacity standard design Child Development Center, measuring 22,999 square feet, for children ages 6 to 10.	Completed	Completed
Gate alignments	Schofield Barracks/ WAAF	US Army	Three gate alignments at Schofield Barracks and two at WAAF.	Ongoing	Ongoing
82nd Engineering Company	Schofield Barracks/ Fort Shafter	US Army	The 82nd Engineering Company moved from Korea to Hawai‘i in October 2005.	Completed	Completed
Prescribed burns at Army installations in Hawai‘i	MMR, Schofield Barracks (McCarthy Flats), Pohakuloa Training Area, and Dillingham Military Reservation	US Army	Conduct controlled burns of dangerous vegetation to reduce fuel load at ranges. This also facilitates unexploded ordinance clearance and surveys for cultural sites.	Ongoing	Ongoing, seasonal

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
Residential Communities Initiative	Army Installations on O‘ahu	US Army	8,132 housing units on seven Army installations have been transferred to IPC, including 3,424 units on Schofield Barracks and 657 units on WAAF. There is ongoing construction, renovation, and demolition on these installations.	Ongoing	2020
Integrated Training Area Management (ITAM)	All O‘ahu ranges	US Army	The intent of the ITAM program is to systematically provide uniform training land management capability across USAG-HI and to ensure that the carrying capacity of the training lands is maintained over time.	Ongoing	Unknown
Implementation of the INRMP	O‘ahu	US Army	The INRMP “preserves, protects, and enhances natural and cultural resources and complies with all applicable laws and regulations, while improving the Army’s capability to conduct training and maintain military readiness.”	Ongoing	Ongoing
Implementation of the Integrated Cultural Resource Management Plan (ICRMP)	O‘ahu	US Army	The intent of the ICRMP is to preserve, protect, and enhance cultural resources. It complies with all applicable laws and regulations, while improving the Army’s capability to conduct training and maintain military readiness.	Ongoing	Ongoing
Implementation of Proposed Range and Training Land Program Development Plan actions	O‘ahu	US Army	A planning document for managing range facilities and training areas, based on Army training doctrine and resource guidance.	Ongoing	Ongoing
Improvised Explosive Device Defeat Training Lane	Schofield Barracks	USAG-HI	Use mostly existing trails and add some structures for improvised explosive device defeat training course.	2009	Completed
AAFES shoppette renovations	HMR	USAG-HI	Interior and exterior renovations to AAFES shoppette.	2009	Completed

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
New barracks (68823)	Schofield Barracks	USAG-HI	Construct a barracks on Schofield Barracks for approximately 192 persons, with private vehicle parking, on a site bounded by Montague, Sutton, and Menoher, which was formerly used for family housing but is now abandoned. This would help alleviate the shortage of barracks that meet current housing standards.	2009	2012
Stryker Brigade Combat Team Transformation - Military Trail from Schofield Barracks to HMR	Schofield Barracks/ HMR	US Army	Construct an approximately seven-mile-long military vehicle trail between Schofield Barracks and HMR.	2009	2010
8th Theater Sustainment Command (TSC) Motor Pool	Schofield Barracks	USAG-HI	To provide modern facilities for 8th TSC units stationed at Schofield Barracks, construct a standard design tactical vehicle maintenance facility, organizational vehicle parking, hardstand, related facilities, and site work on a vacant site near Lyman and Trimble Roads, which previously had warehouses.	2010	2013
Sewer line upgrades	Schofield Barracks/W AAF	USAG-HI	Replace sewer lines along Lyman Road and other roads at Schofield Barracks.	2010	2011
Residential Communities Initiative water tank	HMR	US Army	Construct an elevated water tank next to the existing tank to provide adequate water pressure to the family housing area at HMR.	2010	2011
Outdoor Recreation Complex	Schofield Barracks	Army non-appropriated funds (NAF)	Construct a building for outdoor recreation equipment checkout and recreational vehicle storage and a maintenance building. The existing recreation facility does not provide the full range of recreation services.	2010	2011

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
Multipurpose ball fields	Schofield Barracks	Army NAF	Construct a multipurpose athletic field, with soccer field, four softball fields, batting cages, and running path, at the athletic field area. A new announcer's building will include concessions, restrooms, and storage. The current number of athletic fields available to Schofield Barracks Soldiers and families is inadequate.	2010	2011
New barracks (52267)	Schofield Barracks	USAG-HI	Construct a barracks on Schofield Barracks for approximately 228 persons, with private vehicle parking, on a site bounded by Montague, Wilson, and Menoher, which was formerly used for family housing but is now abandoned. This would help alleviate the shortage of barracks spaces that meet current housing standards.	2011	2014
Upgraded Air Support Operations Center	WAAF	Air Force	Renovate and reconfigure Buildings 203 and 204, construct storage facilities, resurface motor pool pavement, add vehicle parking, and conduct site work.	2010	2012
Temporary Organizational Parking, 249th Engineering Battalion	Schofield Barracks	USAG-HI	Construct temporary parking area for 249th Engineer Battalion along Matthews Avenue. There are no permanent parking areas available for the 249th to accommodate their additional vehicles and equipment.	2010	2011
Regional SATCOM facility	WAAF	USAG-HI	Substandard building is scheduled for demolition. Construct satellite communications planning facility, including administrative, work, and training spaces and equipment storage.	2010	2011

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
Training Support Center	Schofield Barracks	USAG-HI	Construct training support center with parking lot near training areas at South Range for using simulations equipment and to provide weather protection for training equipment, which is subject to rapid deterioration if left exposed to the weather.	2012	2013
Centralized Vehicle Wash Facility	Schofield Barracks	USAG-HI	Construct a centralized vehicle wash facility near training areas at Lyman and Trimble Roads to eventually replace inefficient and inferior individual motor pool wash racks. Facility will include a tank to use recycled water.	2012	2013
New barracks (57394)	Schofield Barracks	USAG-HI	Construct a barracks on Schofield Barracks, with private vehicle parking, near Lyman Road, on a previously developed area used for motor pools. This would help alleviate the shortage of barracks spaces that meet current housing standards.	2013	2015
Unit Facilities (31311), Phase I	Schofield Barracks	USAG-HI	Construct standard design unit facilities to accommodate the modular force structure, on a previously developed area used for motor pools, including a 500-stall parking structure. Current facilities are inadequate.	2013	2015
Unit Facilities (52582), Phase I	Schofield Barracks	USAG-HI	Construct standard design unit facilities, including company operations facility, tactical equipment maintenance facility, unit storage, organizational parking, and related facilities and site work, including road and utility connections. Current facilities are inadequate to support the modular force structure.	2014	2018

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
Unit Facilities (67176), Phase II	Schofield Barracks	USAG-HI	Construct standard design unit facilities to accommodate the modular force structure on a previously developed area used for motor pools. Includes brigade headquarters, battalion headquarters, 600-space parking structure, company operations facility, tactical equipment maintenance facility, unit storage, and related site work. Current facilities are inadequate.	2014	2018
Unit Facilities (67114), Phase II	Schofield Barracks	USAG-HI	Construct standard design unit facilities, including tactical equipment maintenance facility, unit storage, organizational parking, and related facilities and site work, including road and utility connections. Current facilities are inadequate to support the modular force structure.	2014	2018
Division Headquarters Facilities, Phase I	Schofield Barracks	USAG-HI	Construct Division Headquarters operational complex, including general purpose administrative area, battalion headquarters, company operations facility, band facility, tactical equipment maintenance facility, organizational parking, parking structure, unit storage, and related site work. Renovate Building 580 on Schofield Barracks. Current facilities do not meet current facilities standards.	TBD	2017
Troop store/mini mall	Schofield Barracks	Army NAF AAFES	Construct new store.	2012	2013
Auto Skills Center	Schofield Barracks	Army NAF	Construct auto skills center, to include 40 bays, office, storage, tool room, classroom and locker rooms. The existing auto skills center does not meet the needs of Schofield Barracks and nearby installation populations.	2013	2014

Table 4.14-1
Cumulative Projects *(continued)*

Project	Related Project Location	Project Sponsor	Project Description	Project Start	Projected Completion Date
25th CAB MEDEVAC Reorganization	WAAF	USAG-HI	The 25th CAB MEDEVAC company will reorganize to meet the Army's approved design change for the Air Ambulance company. The reorganization will result in the addition of three UH-60 helicopters (Blackhawks) and 24 personnel.	2010	TBD
Combat Aviation Brigade (CAB) Complex	WAAF	USAG-HI	Construct a CAB Complex at WAAF, including infrastructure, aircraft aprons, taxiway, hangars, barracks, unaccompanied enlisted personnel housing, operational and headquarter facilities, dining facilities, organizational parking, vehicle maintenance facilities, storage and support facilities, oil and hazardous materials storage facilities, and a new access gate. This would be constructed in mostly open grassy fields.	2012	2017
Restore and Modernize Leilehua Golf Course	Schofield Barracks	USAG-HI	Improvements include removing/pruning overgrown and improperly placed trees, rebuilding the cart path system, which is in severe disrepair, upgrading tee and green complexes to accommodate high use of the course, and making some drainage improvements.	2011	2012
Ball field complex	WAAF	USAG-HI	Construct a multipurpose athletic field, with eight softball fields and one football field.	TBD	TBD
Non-Potable Water Transmission System to Leilehua Golf Course	Schofield Barracks	USAG-HI	Construct water lines and a one-million-gallon nonpotable water storage tank to provide R-1 effluent from the Schofield Barracks Wastewater Treatment Plant to the golf course for irrigation.	2012	TBD

NAF: nonappropriated funds
R-1: recycled water treated to the highest level (significant reduction in bacterial and viral pathogens). Water suitable for direct contact irrigation of edible crops eaten raw. (HDOH 2002)
TBD: to be determined

4.14.3 Aesthetic and Visual Resources

Cumulative projects would comply with applicable regulations and policies governing visual resources, so there would be no cumulative effects on visual resources from conflicts with visual resource regulations.

Cumulative projects would have cumulative effects on the visual character of sites and surroundings from demolition and construction. These effects are similar to those described in Section 4.1. Similarly, minor adverse long-term effects are expected as views would be disrupted with the new facilities. BMPs would be implemented to reduce effects associated with disrupting views.

Cumulative projects would have cumulative effects on the visual character of sites and surroundings, scenic views, and light and glare from operations. These effects are similar to those described above. To minimize long-term effects from lighting and glare, the proposed action would include such BMPs as using proper outdoor lighting design, for example, shrouding outdoor lights to keep them from illuminating unnecessary areas and equipping certain outdoor lights with motion detectors to provide light only when necessary. Therefore, minor adverse effects from light and glare are anticipated.

As undeveloped areas are developed, the sprawl across the natural landscape of the built environment and modifications becomes more pronounced. The conversion of the natural landscape to a built environment is further aggravated when undeveloped areas become limited and land use designations are revised to allow for continued development of undeveloped areas. The finite amount of visual resources is more evident on the Hawaiian Islands, where land is limited, than in the continental United States. Although short- and long-term adverse cumulative effects could occur, island-wide effects and the conversion of undeveloped areas to developed areas and the subsequent loss of local aesthetics and visual resources would be more substantial. The proposed action would not, in any case, cause the significance level to rise above minor adverse.

4.14.4 Air Quality

Cumulative air quality effects occur when multiple projects affect the same geographic areas at the same time or when sequential projects extend the duration of air quality effects on a given area over a longer period. The air quality effects of the proposed action are primarily due to temporary construction (operational effects are minor). Temporary construction-related air quality issues include local fugitive dust and more regional issues related to ozone precursor emissions from construction equipment engine exhaust.

Criteria Pollutants

Emissions of criteria pollutants from cumulative projects would affect the local area, but effects should be minimal because the proponents of the cumulative projects are expected to use such BMPs as dust minimization practices to ensure that their projects comply with air quality standards. Thus, cumulative air quality effects from the proposed action and other local and regional projects are considered minor adverse.

Greenhouse Gas Emissions

GHG emissions from sources associated with the proposed action would combine with the GHG emissions from other cumulative projects. As noted above, state and federal agencies have not yet

established impact significance criteria for GHG emissions. However, given the relatively small quantities of GHG emissions estimated for the proposed action, its GHG emissions would make a minor contribution to global climate change, and the proposed action would not contribute considerably to cumulative GHG emissions.

4.14.5 Biological Resources

Hawai‘i’s biological uniqueness is under constant pressure from development, construction, and general human pressures, which individually and collectively hasten the deterioration of native landscapes and forests. Declines in native habitats, no matter how minor, contribute in a proportionally meaningful way, with adverse consequences on vegetation and wildlife. Adverse cumulative effects are expected over time due to this trend toward general decline of native habitats, vegetation, and wildlife species, largely resulting from continued habitat loss.

Because it is assumed that the Army would follow identified protocols to protect biological resources, it is also assumed that cumulative projects would comply with applicable regulations and policies governing biological resources. Therefore, there would be no cumulative effects on biological resources from conflicts with natural resource regulations. The cumulative projects would likely increase activity within the area and may involve construction-related activities, an increase in human presence, noise, erosion, dust, and a continued removal of habitat (even though it is already disturbed). These effects would be adverse for biological resources.

The ROI has limited, if any, sensitive biological resources and is already highly disturbed. However, the development of any habitat may contribute in a cumulative fashion to a reduction in the quality and quantity of biological resources, such as potential marginal habitat for pueo. Effects on biological resources would be minor in the ROI because the biological resources affected by the proposed action are primarily limited to common native and alien species. Therefore, the contribution of the proposed action to the overall adverse cumulative effects of numerous projects would be minor.

4.14.6 Cultural Resources

In general, projects involving construction, demolition, and ground-disturbing activities, such as the RCI build-out on O‘ahu, have the potential to affect architectural, archaeological, and traditional/ethnographic resources. There has been some anecdotal information regarding the possibility of unmarked World War II-era burials in a portion of the former Kalākaua Golf Course, south of Lyman Road, abutting the cemetery (Lee 2011). This 10.5-acre parcel is in IPC’s ground lease and will be built out as part of the RCI program (it is not part of the proposed action analyzed in this EA), so the inadvertent discoveries and monitoring clauses of the PA will be in effect during development. Additional monitoring by USAG-HI staff for burials during ground disturbing activities on the 10.5-acre parcel, which is not on the project site and not part of the proposed action analyzed in this EA, will be resolved through the existing PA process.

Other projects, such as implementing an INRMP and ICRMP for installations on O‘ahu, present opportunities to protect, preserve, and enhance cultural resources. Still others, such as prescribed burns at Army installations, present a balance of effects and protection potential for archaeological and traditional/ethnographic resources.

No adverse cumulative effects on cultural resources are anticipated as a result of the proposed action, so it would not contribute to a cumulative impact. There are no known cultural resources

on the project site, and those conducting a site survey did not identify any surface or subsurface archeological resources. The proposed action includes adopting the PA and the inadvertent discoveries and monitoring clauses would apply, as described in Sections 2.1.1.1 and 4.4.2. Similar measures are expected to be used at construction sites for other projects throughout the Hawai‘i installations to preclude significant cultural resources effects. Therefore, the proposed action would not combine with any other actions to produce incrementally different effects on cultural resources.

4.14.7 Environmental Justice

There has always been a gap between the cost of living and average family income in Hawai‘i that persists today, with approximately 9.9 percent of the population living in poverty. However, despite this, Hawai‘i continually ranks high in quality of life studies.

The proposed action would not result in any effect on minority or low-income populations and would not contribute to a cumulative effect on environmental justice. Further, the proposed action would not contribute to any adverse effects relating to the endangerment of children.

4.14.8 Geology, Soils and Seismicity

The proposed action includes using both temporary and permanent erosion and sedimentation control measures to minimize erosion effects. Erosion and sedimentation control measures are expected to be applied as necessary at surrounding project locations where foreseeable land-disturbing activities would occur to preclude significant erosion effects. In addition, each project is anticipated to take the appropriate measures to preclude significant effects from expansive soils. Minor adverse cumulative effects with respect to geology, soils, and seismicity are expected.

4.14.9 Hazardous Materials and Conditions

Cumulative effects related to hazardous materials and conditions could result from the increased use of hazardous substances, the increased potential for accidental releases of hazardous substances, the increased generation of hazardous waste, the potential to exceed disposal capacity at local or regional permitted disposal facilities, and the increased risk of wildfires associated with the combined effects of other known or reasonably anticipated projects and the proposed action. The ROI for cumulative effects is the ROI for hazardous materials and conditions, plus the areas affected by the cumulative projects listed in Table 4.14-1.

The proposed action and many of the projects described in Table 4.14-1 would involve construction. This would result in an incremental increase in the transportation, use, and storage of common hazardous and toxic substances, such as petroleum, oils, lubricants, and solvents, for the duration of these activities. The rate of generation of hazardous waste and the chance for an accidental release of hazardous materials would also increase incrementally. All projects are expected to comply with all relevant laws, ordinances, and regulations and to implement standard industry BMPs related to hazardous materials management, which would minimize risks to human health and the environment. Therefore, the cumulative effect would be minor adverse.

Although the proposed action would overlap the construction schedule of some of the cumulative projects, the amount of solid and hazardous waste generated on a daily basis would not likely exceed local and regional disposal capacity.

The proposed action does not involve MEC or burning and would not contribute to this cumulative effect.

4.14.10 Land Use

Past, present, and reasonably foreseeable future development at Schofield Barracks, including projects listed in the Schofield Barracks/Wheeler Army Airfield Master Plan (USAG-HI 2009), has contributed to, and would continue to contribute to, cumulative effects on land use at the installation. The past, present, and reasonably foreseeable future development of new facilities provide long-term minor beneficial effects on land use. Future changes to land use designations provide structured land use in a way that contributes to the efficiency of the modular force structure and minimizes potential problems, such as incompatible land use activities. The proposed action would provide beneficial minor contributions in the long-term; therefore, the past, present, and reasonably foreseeable future actions, combined with the proposed action, would have minor beneficial long-term cumulative effects on land use.

4.14.11 Noise

The ROI for cumulative effects is Schofield Barracks and a one-mile buffer around it. Existing noise levels in this ROI can be relatively high, primarily due to small arms and large-caliber weapons firing associated with training. The past, present, and reasonably foreseeable future actions, when combined with the proposed action, would not significantly alter existing noise levels in the ROI or exceed established DoD noise levels or applicable regulatory standards and would therefore have a minor adverse cumulative effect on noise levels.

4.14.12 Socioeconomics

The cumulative projects would increase economic activity and demand for services in the region. These projects would temporarily increase regional employment and spending during their construction phases. As such, the proposed action would marginally contribute to cumulative beneficial effects on the economy in the ROI.

4.14.13 Transportation and Circulation

Development projects are actions that can lead to an increase in traffic or change in vehicular, pedestrian, and bicycle circulation, and roadway projects are often designed to address these changes. The development projects listed in Table 14.1-1 are likely to result in increased personnel at Schofield Barracks and the ROI, as described in Section 4.11, which would result in minor long-term adverse effects on traffic, such as increased vehicle traffic and congestion at gates, intersections, and major throughways, particularly during peak travel times. The road, intersection, and gate alignment improvements would provide minor long-term beneficial effects on vehicle, pedestrian, and bicycle circulation and parking. The construction projects described in Table 14.1-1 would have minor short-term adverse effects on vehicular, pedestrian, and bicycle circulation for the duration of each construction period.

Implementation of the proposed action, in addition to proposed Army growth initiatives and construction projects identified in Table 14.1-1, would add to the minor adverse transportation cumulative effects (increased vehicle traffic and congestion). For example, with the addition of Grow the Army (GTA) Project, consisting of new housing, motor pools, and other facilities, traffic volumes within Schofield Barracks could increase by between 40 and possibly 50 percent (Miyamoto 2011). However, these increases would be concentrated throughout different areas of

the installation than the proposed action. According to the simulations presented in the Transportation Impact Analysis (Fehr and Peers 2009), the increase in the number of vehicles on Lyman Road as a result of the GTA project would reduce the LOS at the Lyman Road and Humphries Road intersection to LOS B during the evening commute hours. It would remain at LOS B during the morning commute hours. The proposed action would likely add to traffic at this intersection and could further decrease the level of service. It could also add to the traffic at the Hewitt Road and Carpenter Street intersections; however, neither the potential contribution of the much broader GTA project nor the proposed development at these intersections have been modeled. Most of the traffic effects associated with the GTA project would occur at the Mellichamp Road intersection and proposed Mellichamp Road Extension, which were projected to see LOS of F in the evening and LOS E in the morning at Mellichamp Road and the Mellichamp Road Extension, respectively. Measurable traffic contributions from the proposed development would be unlikely to extend westward to Mellichamp Road.

Implementation of mitigation measures for transportation effects for the projects shown in Table 14.1-1, such as those identified in Final SPEIS for Army Growth (US Army 2008b) and the site-specific TIA (Fehr and Peers 2009), also would reduce the adverse cumulative effects of the proposed action. For example, recommendations identified in the site-specific Army Growth TIA document include infrastructure improvements and staggered exercise or reporting times. The proposed action is anticipated to provide additional housing on-post, which may reduce the need for Army families to live off-post and to commute to Schofield Barracks and provide the opportunity to walk to work, thus having a minor beneficial effect on transportation. Therefore, the past, present, and reasonably foreseeable future actions, combined with the proposed action, would have minor adverse and minor beneficial cumulative effects on transportation and circulation.

4.14.14 Utilities and Public Services

Past, present, and future projects would cumulatively increase the demand for public services and utilities in the Schofield Barracks ROI in the short term and long term. The ROI for the cumulative effects on public services and utilities is the overlap of the ROIs of the proposed action and the areas affected by the cumulative projects listed in Table 14.1-1 and any other past, present, or reasonably foreseeable future action.

The proposed action and cumulative projects would increase electrical and potable water consumption, wastewater generation, stormwater and solid waste generation, and demands on communication systems. However, significant cumulative effects are not anticipated because the Army is expected to ensure that the capacity of infrastructure systems is not exceeded by upgrading existing and constructing new critical infrastructure where existing infrastructure would not be sufficient to meet anticipated utility demand. Additionally, including BMPs, such as porous pavement, evaporation detention ponds, and bio-swales to reduce stormwater runoff, would also mitigate cumulative effects. Presumably, the projects listed in Table 4.14-1 would not occur without environmental review to identify mitigation for these and potentially other issues. When compared to the cumulative projects list, the proposed action would increase the demand for public services and utilities in the short term and long term, but this demand would be met from the existing infrastructure in the Kalākaua neighborhood north of Lyman Road and other existing infrastructure, such as the SBWTP and WWTP, thereby making the proposed action's contribution to cumulative effects minor adverse.

4.14.15 Water Resources

Minor adverse cumulative effects on water resources are anticipated. During construction of the new facilities under the proposed action, there would be an increased potential for water quality degradation due to silt runoff from disturbed areas at the construction site. However, implementing a SWPPP, which includes engineering BMPs for erosion control, would control localized silt runoff from reaching receiving waters. Similar measures are expected to be used at construction sites for other projects throughout the installation to preclude significant water quality degradation from construction.

4.15 MITIGATION SUMMARY

Mitigation actions would be expected to reduce, avoid, or compensate for most adverse effects. Table 4.15-1 summarizes the mitigation measures that would be implemented as part of the proposed action to minimize effects on affected resources. These measures are additions to those BMPs included in the CDMP Development Brief in Appendix A of the 2004 EA.

Table 4.15-1
Summary of Mitigation Measures

Aesthetics and Visual Resources

- Design new homes and facilities in accordance with IPC design standards for Schofield Barracks;
- Develop a program to educate workers about BMPs related to visual effects before the project starts;
- Minimize dust by regularly watering exposed soils, stockpiling soil, and stabilizing soil to reduce effects on visual quality from air pollution;
- Use equipment exhaust mufflers to reduce effects on visual quality from air pollution;
- Restrict construction vehicles parking on-site or in other designated areas for the duration of construction; and
- Minimize light glare by shrouding outdoor lights and directing light downward, as well as using motion detectors, where practical, to provide light only when necessary.

Air Quality

- Implement standard management practices, such as watering area of exposed soil and covering trucks with tarps, to reduce fugitive dust.

Biological Resources

- Limit staging activities in areas not currently in heavy use;
- Control surface water runoff in accordance with a stormwater pollution prevention plan;
- Implement BMPs for oil spills, toxic substance cleanup, and construction fire hazards; and
- Maintain and enforce the pet policies outlined in the *Resident Guide & Community Standards Handbook* (IPC 2011).

Cultural Resources

- Amend the PA to include the project site;
- Implement inadvertent discovery and monitoring clauses found in the PA at Sections V.B.1, V.B.2, and V.B.3.

Environmental Justice

- During construction, follow safety measures stated in 29 CFR, Part 1926, Safety and Health Regulations for Construction, and Army Regulation 385-10, Army Safety Program. This would be to protect the health and safety of residents, including children.

Table 4.15-1
Summary of Mitigation Measures *(continued)*

Geology, Soils, and Seismicity

- Employ a qualified geotechnical engineer and structural engineer for siting facilities, designing foundation for seismic safety, and stabilizing soil;
- Use common dust suppression techniques, such as spraying the ground with water;
- Implement BMPs prepared as part of the construction stormwater pollution prevention plan, which could include building during the summer when rainfall potential is low, using silt fences or hay bales to prevent eroded soil from being transported off-site, contouring to stop drainage from entering the site and to prevent run-on, and directing runoff to constructed siltation basins.

Hazardous Materials and Conditions

- Handle hazardous materials and waste in accordance with applicable laws and regulations.

Noise

- Limit construction to Monday through Saturday from 7:00 AM to 5:00 PM to avoid the times of day and the days of the week when noise effects would most annoy residents;
- Use standard soundproofing materials during construction of the new housing units to ensure residential noise levels are maintained below standards, as required by the State of Hawai`i and US Army noise guidelines;
- Provide public notification of the project and post a sign that provides a phone number for the public to call to register complaints about construction-related noise problems; and
- Use landscaping and fencing to provide a sound barrier.

Transportation

- Prepare a construction traffic management plan;
- Ensure that construction vehicles comply with applicable traffic laws; and
- Use standard construction traffic safety protocols.

Utilities

- Use a residential recycling program;
- Manage stormwater on-site so that there is no net increase in peak stormwater runoff;
- Install low-flow fixtures;
- Use latest energy-efficient appliances and equipment compatible with the Army's policy to reduce energy consumption;
- Install solar hot water heating for every housing unit; and
- Design neighborhood to LEED certification standards.

Water Resources

- Prepare and implement a stormwater pollution prevention plan;
- Implement Phase II stormwater management regulations of the CWA and construction BMPs;
- Implement the ITAM program;
- Implement low impact development as an "integrated design" approach to new construction; and
- Design culverts and drainage swales to withstand a 100-year flood.

SECTION 5.0
FINDINGS AND CONCLUSIONS

SECTION 5.0
FINDINGS AND CONCLUSIONS

5.1 INTRODUCTION

This EA identifies, documents, and evaluates the potential environmental effects of implementing the proposed action and the no action alternative at the 41.8-acre project site in the South Range, Schofield Barracks. Section 4.0 describes existing environmental conditions at the USAG-HI family housing areas that could be affected by the proposed action and identifies potential environmental effects that could occur if the alternatives were implemented. The following resources were addressed in Section 4.0:

- Aesthetics and visual resources;
- Air quality;
- Biological resources;
- Cultural resources;
- Environmental justice;
- Geology, soils, and seismicity;
- Hazardous materials and conditions;
- Land use;
- Noise;
- Socioeconomics;
- Transportation;
- Utilities; and
- Water resources.

5.2 FINDINGS

Table 5-1 summarizes the predicted effects for each resource area from both the proposed action and the no action alternative.

Under the proposed action, minor adverse effects are expected for aesthetics and visual resources, air quality, biological resources, cultural resources, environmental justice, hazardous materials and conditions, geology, soils, and seismicity, noise, transportation, utilities, and water resources. Beneficial effects are expected for hazardous materials and conditions (wildfires), land use, and socioeconomics.

Minor adverse effects are expected on wildfires under the no action alternative. No effects are expected for all other resources under the no action alternative.

Table 5-1
Summary of Potential Environmental and Socioeconomic Consequences

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Aesthetic and Visual Resources		
• Conflict with visual resource regulations	None	None
• Degrade the visual character or quality of site and surroundings	Minor adverse	None
• Block or disrupt views	Minor adverse	None
• Create a new source of light or glare	Minor adverse	None
Air Quality		
• Criteria air pollutants	Short-term minor adverse; long-term none	None
• Greenhouse gases	Minor adverse	None
Biological Resources		
• Take a sensitive status species or result in a jeopardy opinion	None	None
• Reduce the population of a sensitive species	None	None
• Damage or degrade wetlands or riparian habitat	None	None
• Interfere with the movement of any native resident or migratory wildlife species	Minor adverse	None
• Alter or destroy habitat	Minor adverse	None
• Introduce or increase the prevalence of undesirable nonnative species	Minor adverse	None
• Cause long-term loss or impairment of a substantial portion of local habitat	None	None
Cultural Resources		
• Archaeological resources	None	None
• Traditional Native Hawaiian resources	None	None
• Built environment resources	None	None

Table 5-1
Summary of Potential Environmental and Socioeconomic Consequences *(continued)*

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Environmental Justice		
• Low-income or minority groups	None	None
• Endangerment to children	None	None
Geology, Soils, and Seismicity		
• Erosion	Short-term minor adverse; long-term none	None
• Expansive soils	Minor adverse	None
• Seismicity	None	None
Hazardous Materials and Conditions		
• MEC	None	None
• Pesticides	Minor adverse	None
• Petroleum products	Minor adverse	None
• IRP sites	None	None
• Transport, use, storage, and disposal of hazardous substances	Minor adverse	None
• Wildfires	Beneficial	Minor adverse
Land Use	Minor beneficial	None
Noise		
• Construction noise	Short-term, minor adverse; long-term, none	None
• Operation and maintenance	Short-term, minor adverse; long-term, none	None
Socioeconomics		
• Population	None	None
• Employment and total income	Short-term, beneficial; long-term, none	None
• Demand for housing	Beneficial	None
• Demand on public services (for example, schools)	None	None
Transportation		
• Intersection operations	Minor adverse	None
• Roadway segment operations	Minor adverse	None
• Parking	None	None
• Pedestrian facilities	None	None
• Bicycle facilities	None	None

Table 5-1
Summary of Potential Environmental and Socioeconomic Consequences *(continued)*

Resource	Environmental and Socioeconomic Consequences	
	Proposed Action	**No Action Alternative**
Utilities and Public Services		
• Police, fire, and emergency management	Minor adverse	None
• Potable water supply	Minor adverse	None
• Sanitary wastewater	Minor adverse	None
• Stormwater	Short-term, minor adverse; long-term, none	None
• Solid waste	Minor adverse	None
• Communications	None	None
• Electricity	Minor adverse	None
Water Resources		
• Surface water runoff and erosion	Short-term, minor adverse; long-term none	None
• Flood hazards	None	None

5.3 CONCLUSIONS

Implementing the proposed action, with the identified mitigation measures, would have no significant direct, indirect, or cumulative effects on the resources above, so an environmental impact statement need not be prepared. This EA supports the issuance of a finding of no significant impact.

SECTION 6.0
REFERENCES

SECTION 6.0
REFERENCES

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PERSONS CONSULTED

SECTION 8.0
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SECTION 9.0
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Office of State Planning
Department of Business, Economic Development and Tourism
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Honolulu, HI 96813

State Historic Preservation Division
Department of Land and Natural Resources
33 South King Street, 8th Floor
Honolulu, HI 96813

Wahiawā Public Library
820 California Avenue
Wahiawā, HI 96786

Hawai‘i State Library
478 South King Street
Honolulu, HI 96813

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APPENDIX A
COASTAL ZONE MANAGEMENT ACT NEGATIVE DETERMINATION LETTER

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

REPLY TO
ATTENTION OF:

MAY 25 2011

Directorate of Public Works

Mr. Abbey Seth Mayer, Director
Office of Planning
Department of Business, Economic Development and Tourism
P.O. Box 2359
Honolulu, Hawai'i 96804-2359

Dear Mr. Mayer:

The US Army Garrison, Hawai'i (USAG-HI) proposes to add 41.8 acres at Schofield Barracks Military Reservation (SBMR) to the existing 50 year ground lease held by the privatized housing partner (Island Palms Communities, Limited Liability Company) for development of Phase 3 of the Kalakaua Neighborhood. The proposed final end-state after build-out would be a 155 housing unit increase from the current 3,860 units proposed in 2004. This action is part of the effort to provide Army families with modern, new homes that improve their quality of life.

The Proposed Action would involve adding a 41.8 acre parcel that is adjacent to the existing footprint for privatized housing along Lyman Road at SMBR, into the existing Resident Communities Initiative (RCI) footprint. The additional 4-5 bedroom housing units to be constructed here would be part of the neighborhood development to be called Kalakaua Phase 3 (see enclosure). The area was formerly cultivated for pineapple crops until 2004, when 1,500 acres of land was purchased by the Army as part of a land acquisition for training purposes. Subsequently, this portion of the acquisition was found to not be suitable for training due to logistical issues. It has remained unused and overgrown by brush in recent years. Existing utility infrastructure is sufficient to support this development, which would help fulfill a backlog of Army family housing requirements.

The enclosed environmental assessment (EA) was prepared in accordance with the National Environmental Policy Act of 1969 and to comply with requirements of the National Historic Preservation Act and other federal and state laws. The EA addresses Coastal Zone Management Program (CZMP) policy areas under the following environmental consequences sections:

CZMP	EA
Recreational Resources	Land Use
Historic Resources	Cultural Resources
Open Space and Scenic Resources	Land Use and Visual Resources
Coastal Ecosystems	Biological Resources, Water Resources
Economic Uses	Socioeconomics

Coastal Hazards	Geology, Soils and Seismicity
Managing Development	Land Use
Public Participation	Public Involvement
Beach Protection	Geology, Soils and Seismicity, Water Resources
Marine Resources	Biological Resources, Water Resources

The USAG-HI has concluded that a federal consistency determination is not required because all of the proposed action will be on federal land. All construction activities will take place within SBMR and there are no anticipated impacts to areas outside of the installation boundary. Additionally, no direct, indirect, or cumulative effects resulting from the construction of the projects, as well as the operation of the facilities are anticipated to impact the State's coastal zone.

If you have any questions, the point of contact is Wesley Nakamoto, RCI Environmental Protection Specialist. He may be reached by telephone at (808) 655-7675, or by email at Wesley.nakamoto@us.army.mil.

Sincerely,

Robert Eastwood

Robert Eastwood
Director of Public Works

Enclosure

APPENDIX B
RECORD OF NONAPPLICABILITY OF EPA GENERAL CONFORMITY RULE (AIR QUALITY)

Record of Non-Applicability for Proposed Development

For the Kalakaua Phase 3 Neighborhood at Schofield Barracks Military Reservation, Oahu, Hawai'i

The Military Housing Privatization Initiative (MHPI), contained in Section 2801 of the 1996 Defense Authorization Act, gave the Army new alternative authorities for improving and constructing military family housing. The Army in Hawai'i, implemented this program in 2005 under the Army Residential Communities Initiative (RCI). Since that time, the privatized entity, Island Palm Communities, LLC (IPC, formerly known as Army Hawai'i Family Housing, LLC), has greatly improved the condition of on-post family housing for personnel stationed at the seven Oahu RCI installations. Thousands of housing units have been constructed, maintained, renovated, and managed to the benefit of Army families. This proposed development represents an additional 155 housing units to the Schofield Barracks Military Reservation family housing inventory. The additional housing would be constructed on land that would include a 41.8-acre parcel that the Army Hawaii is proposing to transfer to IPC's 50-year ground lease. This parcel of land is adjacent to the existing Kalakaua Neighborhood, within the boundaries of the Schofield Barracks installation. The State of Hawai'i is designated as an attainment area for the federal ozone standard. The area is in attainment or unclassified for the remainder of the federal ambient air quality standards.

The proposed Army action has been evaluated in compliance with Section 176(c) of the Clean Air Act (42 USC 7506) and with the US Environmental Protection Agency (EPA) rule promulgated at 40 CFR Part 93. The requirements and procedures set forth in the EPA general conformity rule apply only to federal agency actions undertaken in locations designated as nonattainment or maintenance areas for one or more of the federal ambient air quality standards (40 CFR 93.153(b)). Because all portions of Hawai'i are classified as attainment or attainment/unclassifiable for each of the federal ambient air quality standards (40 CFR 81.312), pursuant to 40 CFR 93.153(b), I find that the requirements of the EPA general conformity rule are not applicable to the proposed US Army action.

Installation Environmental Coordinator

5/26/11

Date

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ACRONYMS AND ABBREVIATIONS

1,2-DCP	1,2-dichloropropane
1,2,3-TCP	1,2,3-trichloropropane
ADA	American with Disabilities Act
AIRFA	American Indian Religious Freedom Act
ARPA	Archaeological Resources Protection Act
ASIP	Army Stationing and Installation Plan
BAH	basic allowance for housing
BMP	best management practice
BO	biological opinion
CAB	Combat Aviation Brigade
CDMP	Community Development and Management Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CO	carbon monoxide
CO_2e	carbon dioxide equivalents
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DBCP	1,2-dibromo-3-chloropropane
DD	1,3-dichloropropene and 1-2-dichloropropene
DNL	day-night average sound level
DoD	US Department of Defense
DPW	Directorate of Public Works
EA	environmental assessment
EAL	environmental action level
EDB	ethylene dibromide
EO	Executive Order
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
FPPA	Farmland Protection Policy Act
FNSI	finding of no significant impact
FY	fiscal year
GHG	greenhouse gas
GWP	global warming potential
HCZMP	Hawai‘i Coastal Zone Management Program
HDOH	Hawai‘i State Department of Health
HHC	Headquarters and Headquarters Company

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ACRONYMS AND ABBREVIATIONS

ICRMP	Integrated Cultural Resource Management Plan
INRMP	Integrated Natural Resource Management Plan
IPC	Island Palm Communities
IRP	Installation Restoration Program
ITAM	Integrated Training Area Management
kV	kilovolt
kVA	kilovolt amperes
LOS	level of service
MBTA	Migratory Bird Treaty Act
MEC	munitions and explosives of concern
mgd	million gallons per day
MHPI	Military Housing Privatization Initiative
MMRP	Military Munitions Response Program
MVA	megavolt ampere
N	nitrogen
N_2O	nitrous oxide
NAF	non-appropriated funds
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2/NO_3	nitrite/nitrate
NOx	nitrogen oxides
NPL	National Priorities List
NRCS	US Department of Agriculture Natural Resource Conservation Service
NRHP	National Register of Historic Places
O&M	operation and maintenance
OIP	O‘ahu Implementation Plan
PA	programmatic agreement
PCPI	per capita personal income
$PM_{2.5}$	fine particulate matter
PM_{10}	inhalable particulate matter
RCI	Residential Communities Initiative
REC	record of environmental consideration
ROG	reactive organic gases
ROI	region of influence
SHPO	State Historic Preservation Office
SOx	sulfur oxides
SWPPP	stormwater pollution prevention plan
TAMC	Tripler Army Medical Center
TCE	trichloroethene
TCP	traditional cultural property
TMDL	total maximum daily load

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ACRONYMS AND ABBREVIATIONS

TPH	total petroleum hydrocarbons
TSC	Theater Sustainment Command
USACE	US Army Corps of Engineers
USAG-HI	US Army Garrison, Hawai‘i
USC	United States Code
USFWS	US Fish and Wildlife Service
WAAF	Wheeler Army Airfield
WWTP	wastewater treatment plant

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RECYCLED
PAPER