Draft
ENVIRONMENTAL ASSESSMENT
for
WATER RECLAMATION FACILITY UPGRADE
MARINE CORPS BASE HAWAII
O‘AHU, HAWAI‘I

UID#: EAXX-007-17-XMC-1734030998

April 2025

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Abstract

Designation:	**Environmental Assessment**
Title of Proposed Action:	**Water Reclamation Facility Upgrade**
Project Location:	**Marine Corps Base (MCB) Hawaii, Oʻahu, Hawaiʻi**
Affected Region:	**City and County of Honolulu, Oʻahu, Hawaiʻi**
Action Proponent:	**MCB Hawaii**
Point of Contact:	**NEPA Program Manager, MCB Hawaii** Email comments to: MCBH.WRF.EA@stantecgs.com or Mail comments to: Peer Amble Stantec GS Inc. 737 Bishop Street, Suite 3050 Honolulu HI, 96813
Unique ID #:	**EAXX-007-17-XMC-1734030998**
Date:	**April 2025**

The Marine Corps has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), Department of Navy (DON) procedures/regulations for implementing NEPA at 32 Code of Federal Regulations (C.F.R.) Part 775, and Marine Corps Order 5090.2. For purposes of this EA, the DON has voluntarily elected to generally follow those Council on Environmental Quality regulations at 40 C.F.R. Parts 1500–1508 that were in place at the outset of this EA, in addition to DON's procedures/regulations implementing NEPA at 32 C.F.R. Part 775, to meet the agency's obligations under NEPA, 42 United States Code (C.F.R.) §§ 4321 et seq. The proposed action is to upgrade the existing Water Reclamation Facility (WRF) at Marine Corps Base (MCB) Hawaii Kaneohe Bay and construct and operate a new redundant wastewater treatment system resulting in an overall upgraded WRF. The proposed action would allow the WRF to maintain full capacity during maintenance activities, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action would occur at the existing WRF entirely within MCB Hawaii Kaneohe Bay. The proposed action would be constructed over a 3-year period from Fiscal Year (FY) 2025 through FY 2028. The construction would be done in phases to mitigate disruptions and maintain operation of the WRF.

This EA evaluates the potential environmental effects of the proposed action to the following resources: noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation.

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Summary

S.1 Proposed Action

Marine Corps Base (MCB) Hawaii Kaneohe Bay on the island of O'ahu, Hawai'i, operates a Water Reclamation Facility (WRF) to treat wastewater at the base. The WRF uses a "single-train treatment process," meaning it cannot operate effectively when components are offline for repair or maintenance. This facility currently treats water in accordance with National Pollutant Discharge Elimination System (NPDES) permit HI0110078 (hereafter referred to as the "NPDES wastewater permit"). MCB Hawaii coordinates planned maintenance events with the Hawai'i State Department of Health (DOH). In order for MCB Hawaii to ensure compliance with its NPDES wastewater permit, the base must have a means to continue to treat wastewater while components undergo repair or maintenance. The proposed action would also improve the overall quality of the treated effluent to R-1 standards, reduce overall water demand from the City and County of Honolulu Board of Water Supply, and improve the WRF to meet tsunami design standards.

More specifically, the proposed action would create a redundant capability through the construction of additional WRF components, which would be integrated with and adjacent to the existing WRF, thereby ensuring treated effluent continues to meet existing permit limitations during planned maintenance events and for unscheduled repairs. The new WRF capability would allow existing and new unit processes to be removed from service for maintenance activities while still maintaining the ability to process and treat effluent. With the proposed upgrade and the new redundant system, the WRF would provide a parallel redundant water reuse capability, provide disinfection for 100 percent of the treated effluent, and implement tsunami design standards. While the upgrade would increase capacity to treat effluent at the WRF, there is no plan to increase the volume of water treated at the WRF. Figure S-1 shows the proposed project location at MCB Hawaii Kaneohe Bay, and Figure S-2 shows the proposed WRF upgrades.

S.2 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system equal to the capacity of the existing facility. The proposed action, designed to meet water quality and disinfection permit standards, would also provide new water reuse capabilities on base, and be constructed to meet tsunami design requirements. The proposed action is needed to provide treatment processes that will ensure compliance with MCB Hawaii's NPDES wastewater permit and resolve outstanding deficiencies resulting from its 2019, 2021, and 2022 notices of violation.

S.3 Alternatives Considered

The Marine Corps implemented a design review process (Naval Facilities Engineering Systems Command [NAVFAC] Hawaii, 2024), which identified one reasonable alternative which meets the purpose and need of the proposed action. The Marine Corps considered and eliminated from detailed analysis new treatment technologies such as filtering systems, membrane bioreactors, and biofilm due to the complexities of operating such systems and their relative reliability and required maintenance. As such, only Alternative 1 and the No-Action Alternative are carried forward for analysis.

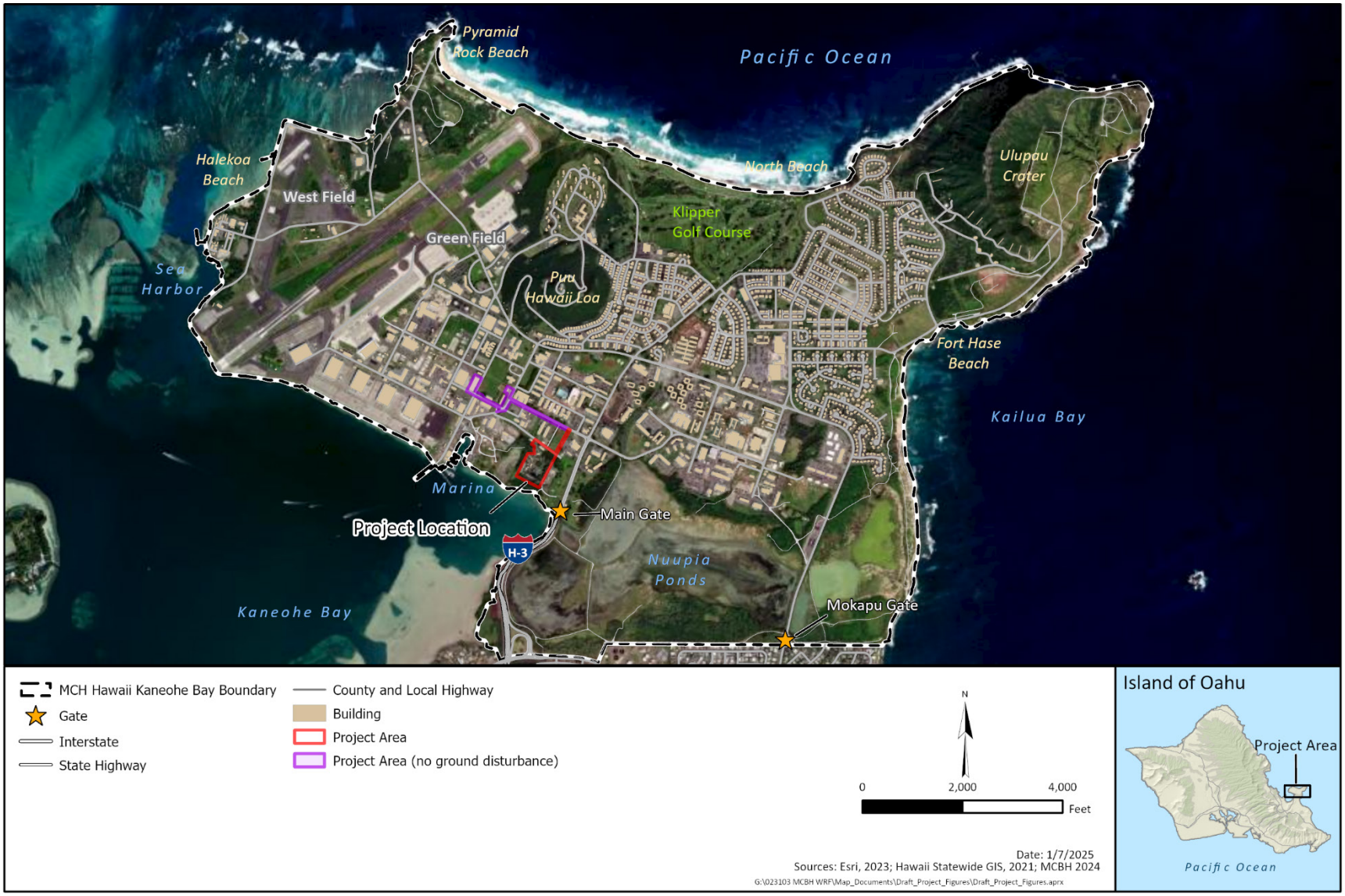

Figure S-1 Project Location at MCB Hawaii Kaneohe Bay

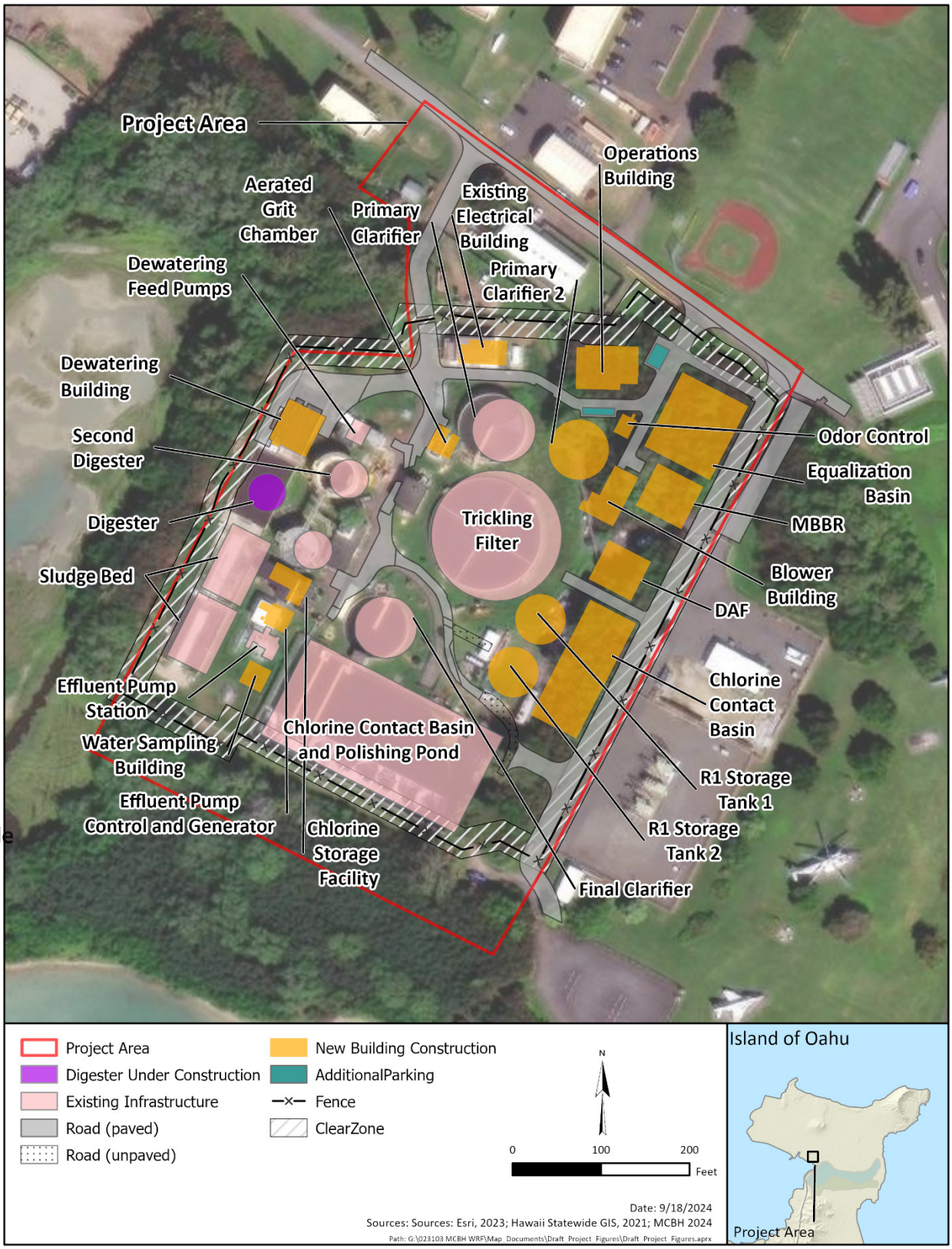

Figure S-2 Proposed Water Reclamation Facility Upgrades

S.4 Summary of Potential Environmental Effects of the Alternatives

Table S-1 presents a summary of potential environmental effects associated with the proposed action.

Table S-1 Summary of Potential Effects

Resources	*Alternative 1*	*No-Action Alternative*
Noise	• Less than significant effects. • Construction would be localized, temporary, and limited to daytime hours. • Proposed operations at WRF would be similar to existing WRF operations.	• Under the No-Action Alternative, the proposed action would not occur, and noise effects would remain at existing levels.
Air Quality	• Less than significant effects. • Construction activities would only minimally increase emissions and would not substantially contribute to global warming. • Proposed operations would involve no change in stationary source air emissions from WRF operations on an annual basis.	• Under the No-Action Alternative, the proposed action would not occur, and air quality would remain at existing levels.
Water Resources	• Less than significant effects to groundwater, surface water, wetlands, and floodplains. • The proposed action would follow the DOH NPDES Construction General Permit and would comply with the base individual MS4 NPDES permit #HIS000007 (hereafter referred to as the "MS4 permit"). • The upgraded WRF would improve the quality of the wastewater discharging into the municipal plant outfall. • The proposed action would follow a site-specific SWPPP, BMPs, and storm water runoff protection measures.	• Under the No-Action Alternative, the proposed action would not occur, and effects to water resources would remain at existing levels.
Cultural Resources	• Less than significant effects to archaeological resources. • No effects to historic resources.	• Under the No-Action Alternative, the proposed action would not occur, and the effects to cultural resources would remain at existing levels.
Terrestrial Biological Resources	• Less than significant effects to vegetation, wildlife, critical habitat, and ESA-listed species. • Pursuant to the USFWS, the barbed wire fence would not result in a take to hoary bat during the life of the fence. • Effects to Hawaiian Stilts would be minimized through BMPs such as prevention of standing water, bird deterrents and barriers, nest and chick protocols, and use of a full-time biological resources monitor.	• Under the No-Action Alternative, the proposed action would not occur and effects to terrestrial biological resources would remain at existing levels.

Resources	*Alternative 1*	*No-Action Alternative*
Utilities	• There would be beneficial effects to utilities. • The proposed action would not increase utilities demand, and all utility systems have adequate capacity to support the proposed action. • The proposed action would have beneficial effects to potable water through use of recycled water, and for storm water through installation of LID features that would reduce storm water discharge.	• Under the No-Action Alternative, the proposed action would not occur and effects to utilities would remain at existing levels.
Transportation	• Less than significant effects. • Construction traffic would be considerably less than 1% of average daily traffic volume on H-3 and have no effect to H-3 traffic.	• Under the No-Action Alternative, the proposed action would not occur and effects to transportation would remain at existing levels.

Legend: % = percent; BMP = Best Management Practice; DOH = Hawai'i State Department of Health; ESA = Endangered Species Act; LID = Low Impact Development; MS4 = Municipal Separate Storm Sewer System; NPDES = National Pollutant Discharge Elimination System; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service; WRF = Water Reclamation Facility.

S.5 Public and Agency Participation and Intergovernmental Coordination

The Marine Corps is soliciting public and agency input regarding the proposed action through publication of this Draft Environmental Assessment (EA). The Marine Corps published a notice of availability for review of the Draft EA in the *Honolulu Star-Advertiser* on April 8, 2025. The public has 30 days to comment on the EA as well as the National Historic Preservation Act (NHPA) Section 106 process to date. Prior to the release of the Draft EA, the MCB Hawaii Public Affairs Office coordinated with the local community at monthly Neighborhood Board meetings and other public engagement opportunities about the proposed action and the Draft EA public comment period.

The Draft EA is available on the State of Hawai'i's Environmental Review Program website: https://planning.hawaii.gov/erp and the MCB Hawaii website: https://www.mcbhawaii.marines.mil/Resources-Services/Pertinent-Information/Water-Reclamation-Facility-Upgrades-EA/.

Public comments on the Draft EA will be considered in the development of the Final EA prior to the Marine Corps rendering its decision on the proposed action. A detailed summary of public comments, revisions made to the EA in response to comments, and responses to comments will be provided in Appendix B of the Final EA.

In accordance with Section 106 of the NHPA, the Marine Corps coordinated with the Hawai'i State Historic Preservation Officer (SHPO), Native Hawaiian Organizations, interested parties, and the public regarding a finding of no effect to historic properties resulting from the undertaking (i.e., the proposed action) and to identify other parties entitled to be consulting parties (Appendix C).

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps is conducting formal consultation with the United States (U.S.) Fish and Wildlife Service (USFWS) regarding potential effects.

The proposed action falls under the Marine Corps' Coastal Zone Management Act (CZMA) De Minimis Activities List (State of Hawai'i CZMA letter, July 9, 2009). The Marine Corps notified the State of Hawai'i

Office of Planning and Sustainable Development, Planning Division, and the Planning Division acknowledged the Marine Corps' determination on January 8, 2025 (see CZMA correspondence in Appendix E). On February 12, 2025, the Planning Division acknowledged that the activities identified and described should not be subject to further review by the Hawaii Coastal Zone Management Program on the basis that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation/General Conditions."

Environmental Assessment

Water Reclamation Facility Upgrade

Marine Corps Base Hawaii

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Abbreviations and Acronyms

Item	Definition
APE	Area of Potential Effects
BMP	Best Management Practice
C.F.R.	Code of Federal Regulations
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A-weighted Decibel
DLNR	Department of Land and Natural Resources
DNL	Day-Night Average Sound Level
DoD	United States Department of Defense
DOH	Hawai‘i State Department of Health
DON	Department of the Navy
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
EPA	United States Environmental Protection Agency
FY	Fiscal Year
GHG	Greenhouse Gas
HAR	Hawai‘i Administrative Rule
HDOT	Hawai‘i Department of Transportation
ICRMP	Integrated Cultural Resources Management Plan
LID	Low Impact Development
L_{max}	Maximum A-weighted sound level
Marine Corps	United States Marine Corps
MBTA	Migratory Bird Treaty Act
MCB	Marine Corps Base
mgd	million gallons per day
MS4	Municipal Separate Storm Sewer System
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAVFAC	Naval Facilities Engineering Systems Command
Navy	United States Department of the Navy
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOAV	Notice of Apparent Violation
NOVO	Notice of Violation and Order
NPDES	National Pollutant Discharge Elimination System
ROI	region of influence
SHPO	Hawai‘i State Historic Preservation Officer
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
WRF	Water Reclamation Facility

1 Purpose of and Need for the Proposed Action

1.1 Introduction

Marine Corps Base (MCB) Hawaii Kaneohe Bay on the island of Oʻahu, Hawaiʻi, operates a Water Reclamation Facility (WRF) to treat wastewater at the base. The WRF uses a "single-train treatment process," meaning it cannot operate effectively when components are offline for repair or maintenance. This facility currently treats water in accordance with National Pollutant Discharge Elimination System (NPDES) permit HI0110078 (here after referred to as the "NPDES wastewater permit"). MCB Hawaii coordinates planned maintenance events with the Hawaiʻi State Department of Health (DOH). In order for MCB Hawaii to ensure compliance with its NPDES wastewater permit, the base must have a means to continue to treat wastewater while components undergo repair or maintenance. The proposed action would also improve the overall quality of the treated effluent to R-1 standards, reduce overall water demand from the City and County of Honolulu Board of Water Supply, and improve the WRF to meet tsunami design standards.

More specifically, the proposed action would create a redundant capability through the construction of additional WRF components, which would be integrated with and adjacent to the existing WRF, thereby ensuring treated effluent continues to meet existing permit limitations during planned maintenance events and for unscheduled repairs. The new WRF capability would allow existing and new unit processes to be removed from service for maintenance activities while still maintaining the ability to process and treat effluent to meet base needs. With the proposed upgrade and the new redundant system, the WRF would provide a parallel redundant water reuse capability, provide disinfection for 100 percent of the treated effluent, and implement tsunami design standards. While the upgrade would increase capacity to treat effluent at the WRF, there is no plan to increase the volume of water treated at the WRF.

The Marine Corps has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), Department of Navy (DON) procedures/regulations for implementing NEPA at 32 Code of Federal Regulations (C.F.R.) Part 775, and Marine Corps Order 5090.2. For purposes of this EA, the DON has voluntarily elected to generally follow those Council on Environmental Quality regulations at 40 C.F.R. Parts 1500–1508 that were in place at the outset of this EA, in addition to DON's procedures/regulations implementing NEPA at 32 C.F.R. Part 775, to meet the agency's obligations under NEPA, 42 United States Code (U.S.C.) §§ 4321 et seq.

1.2 Location

The proposed action would occur at the existing WRF at MCB Hawaii Kaneohe Bay, west of the Main Gate and east of the marina (Figure 1-1). The facility is adjacent to Kāneʻohe Bay on the southwest and the Salvage Yard wetland on the west. Existing support facilities are to the north, and power substation facilities and the main gate are to the east.

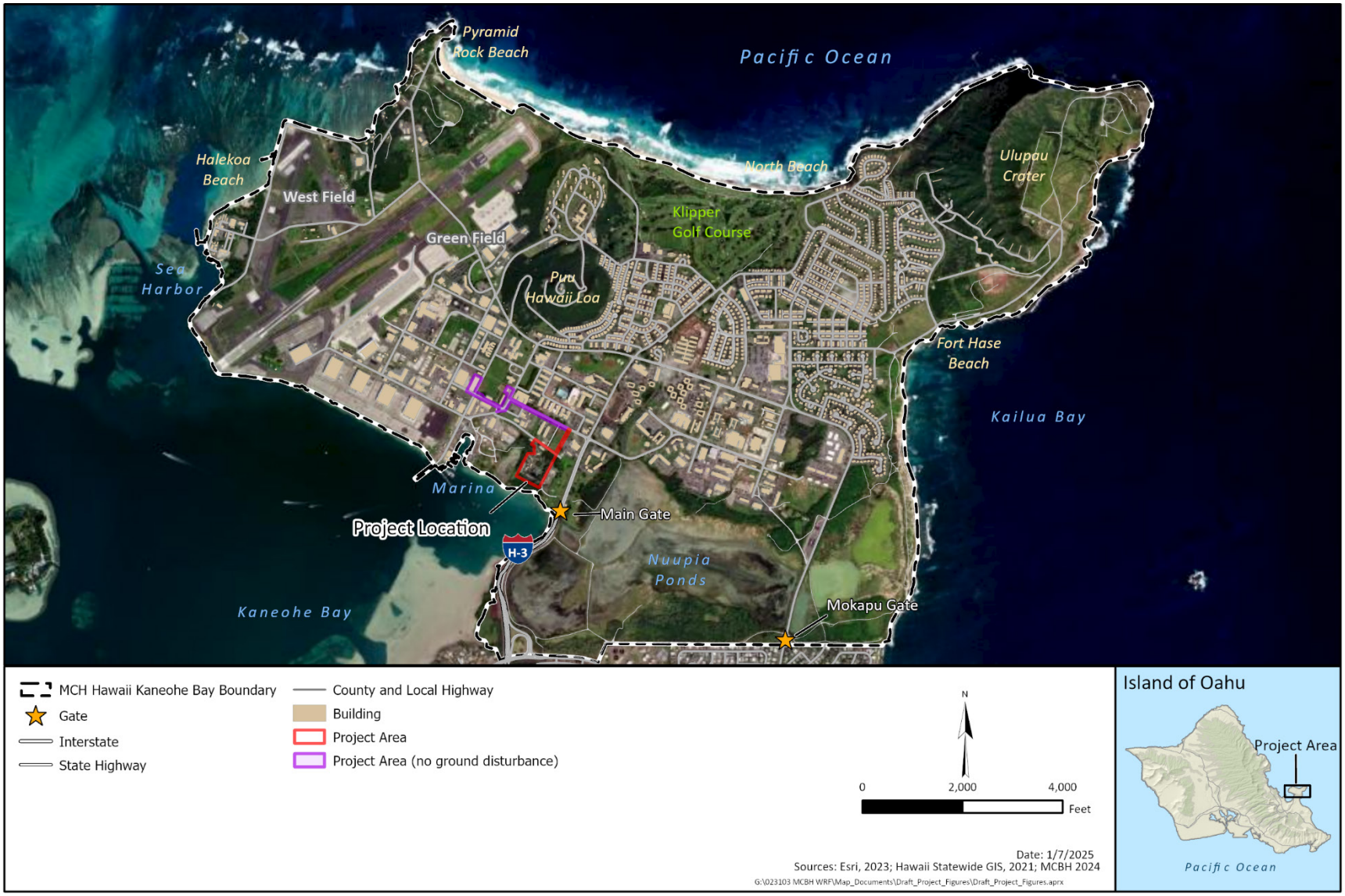

Figure 1-1 Project Location at MCB Hawaii Kaneohe Bay

1.3 Background

The WRF is a secondary biological treatment plant at MCB Hawaii Kaneohe Bay designed to accommodate an average daily flow of 2 million gallons per day (mgd). It is the only means of treating wastewater at MCB Hawaii Kaneohe Bay. The Marine Corps evaluated the existing capabilities of the WRF and the need for design improvements to ensure continued compliance with its DOH permit, which resulted in the proposed action that will not only improve the existing WRF but also provide a redundant system that would allow for full plant capacity even while maintenance and repair activities are conducted.

This proposed upgrade to the current facility and development of redundant capacity at the WRF has been in development for several years. The existing WRF lacks the capability to ensure that treated effluent continues to meet existing permit limitations during planned maintenance events and unforeseen repairs without significantly altering the flow process. In addition, upgrades are needed to improve treated water capabilities such that the improved water could again be used for irrigation purposes, thereby reducing overall water demand from the City and County of Honolulu Board of Water Supply.

Both MCB Hawaii and DOH recognize the need for WRF upgrades and added redundancy. In 2019, during DOH's Compliance Evaluation Inspection of the WRF, DOH identified a failure to operate or maintain wastewater treatment units and to monitor and report discharges exceeding permit levels. DOH conducted a second Compliance Evaluation Inspection on February 11, 2021, and this time issued a Notice of Apparent Violation (NOAV) to the MCB Hawaii Kaneohe Bay WRF (File No. 04006EBT.21, April 5, 2021) for the same deficiencies (DOH, 2021a). This NOAV required preparation of a Corrective Action Plan (CAP), which the Marine Corps subsequently submitted on May 20, 2021 (MCB Hawaii, 2021a). The CAP identified two WRF deficiencies (a secondary clarifier ring and the influent flowmeter) and plans for correcting them. Also in 2021, the base completed a separate study on how to best address the shortcomings of the existing facility and need for a redundant system.

On March 31, 2022, the Hawai'i state legislature supported DOH's findings and adopted State of Hawai'i House Resolution No. 63, H.D. 1 "urging Marine Corps Base Hawaii to upgrade the capacity of its sewage treatment plant and redundancy of the components to ensure that final effluent quality is in compliance with State permitting requirements" (State of Hawai'i, 2022). On May 6, 2022, DOH issued a Notice of Violation and Order (NOVO) to MCB Hawaii Kaneohe Bay for discharging wastewater in excess of the base's NPDES wastewater permit (DOH, 2022). The Marine Corps submitted a CAP Update on June 22, 2023, proposing installation of flow meters to address the deficiencies identified in the 2021 NOAV. The Marine Corps submitted a CAP closure notice on October 28, 2024, stating that all work had been completed (MCB Hawaii, 2024a).

1.4 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system equal to the capacity of the existing facility. The proposed action, designed to meet water quality and disinfection permit standards, would also provide new water reuse capabilities on base, and be constructed to meet tsunami design requirements. The proposed action is needed to provide treatment processes that will ensure compliance with MCB Hawaii's NPDES wastewater permit and resolve outstanding deficiencies resulting from its 2019, 2021, and 2022 notices of violation.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental effects of the proposed action. The process for identifying resources analyzed in this EA is summarized in Chapter 3, *Affected Environment and Environmental Consequences*. This EA evaluates the potential environmental effects of the proposed action to the following resources: noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation.

1.6 Relevant Laws and Regulations

The Marine Corps has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the proposed action (Appendix A).

1.7 Public and Agency Participation and Intergovernmental Coordination

The Marine Corps is soliciting public and agency input regarding the proposed action through publication of this Draft EA. The Marine Corps published a notice of availability for review of the Draft EA in the *Honolulu Star-Advertiser* on April 8, 2025. The public has 30 days to comment on the EA as well as the National Historic Preservation Act (NHPA) Section 106 process to date. Prior to the release of the Draft EA, the MCB Hawaii Public Affairs Office coordinated with the local community at monthly Neighborhood Board meetings and other public engagement opportunities about the proposed action and the Draft EA public comment period.

The Draft EA is available on the State of Hawai'i's Environmental Review Program website: https://planning.hawaii.gov/erp and the MCB Hawaii website: https://www.mcbhawaii.marines.mil/Resources-Services/Pertinent-Information/Water-Reclamation-Facility-Upgrades-EA/.

Public comments on the Draft EA will be considered in the development of the Final EA prior to the Marine Corps rendering its decision on the proposed action. A detailed summary of public comments, revisions made to the EA in response to comments, and responses to comments will be provided in Appendix B of the Final EA.

In accordance with Section 106 of the NHPA, the Marine Corps coordinated with the Hawai'i State Historic Preservation Officer (SHPO), Native Hawaiian Organizations, interested parties, and the public regarding a finding of no effect to historic properties resulting from the undertaking (i.e., the proposed action) (Appendix C).

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps is conducting formal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding potential effects.

The proposed action falls under the Marine Corps' Coastal Zone Management Act (CZMA) De Minimis Activities List (State of Hawai'i CZMA letter, July 9, 2009). The Marine Corps notified the State of Hawai'i Office of Planning and Sustainable Development, Planning Division, and the Planning Division acknowledged the Marine Corps' determination on January 8, 2025 (see CZMA correspondence in Appendix E). On February 12, 2025, the Planning Division acknowledged that the activities identified and described should not be subject to further review by the Hawaii Coastal Zone Management Program on the basis because the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation/General Conditions."

1.8 Permits and Approvals

Multiple permits and approvals are required for the construction and operation of the proposed action, including: (a) NPDES permit coverage under the State of Hawai'i general permits for discharges of storm water associated with construction activities (State General Permit Appendix C), (including compliance with the base individual Municipal Separate Storm Sewer System [MS4] NPDES permit #HIS000007, [here after referred to as the "MS4 permit"]), discharges of hydrotesting waters (Appendix F), and discharges associated with construction activity dewatering (Appendix G); (b) authorization from the DOH to construct (Hawai'i Administrative Rules [HAR] Title 11, Chapter 62); and (c) authorization from the DOH to use recycled water for general irrigation (HAR 11-62). DOH will decide whether general or individual permit coverage is required. The Marine Corps would continue to coordinate with the DOH and U.S. Environmental Protection Agency (EPA) to ensure all necessary permits are obtained for the proposed action. The plant must be operated in a manner that is consistent with the sewerage agreement between the Marine Corps and City and County of Honolulu.

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2 Proposed Action and Alternatives

This chapter describes the proposed action, alternatives development (including alternatives considered but not carried forward for analysis), Alternative 1, the No-Action Alternative, and best management practices (BMPs) incorporated into the proposed action to avoid or reduce environmental effects.

2.1 Proposed Action

The proposed action is to upgrade the existing WRF and construct and operate a redundant wastewater treatment system resulting in an upgraded WRF. Figure 2-1 shows the proposed action, and Figure 2-2 shows the equipment and material laydown areas and construction haul routes. The proposed action would allow the WRF to maintain full capacity during maintenance activities and unscheduled repairs of the existing system, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action would occur at the existing WRF entirely within MCB Hawaii Kaneohe Bay. The proposed action would be constructed over a 3-year period from Fiscal Year (FY) 2025 through FY 2028. The construction would be done in phases to mitigate disruptions to and maintain operation of the WRF.

The proposed WRF upgrades include:

- construction of associated sewage treatment facilities
- installation of security fencing
- redundancy upgrade
- tsunami designs
- ability to treat wastewater to reuse quality standards
- supporting improvements including vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates
- construction laydown locations outside the WRF

Table 2-1 lists the construction projects for the proposed action. The proposed construction would occur on previously disturbed areas within the existing WRF footprint, including landscaped areas. No modifications to the ocean outfall would occur under the proposed action, and there would be a decrease in total discharge quantities due to the capability to produce recycled water at the WRF. The upgraded WRF would operate similar to the existing WRF. Up to 5 additional personnel would be required to operate the upgraded WRF (Naval Facilities Engineering Systems Command [NAVFAC] Hawaii, 2024; MCB Hawaii, 2024b), over the five personnel needed to operate the existing WRF.

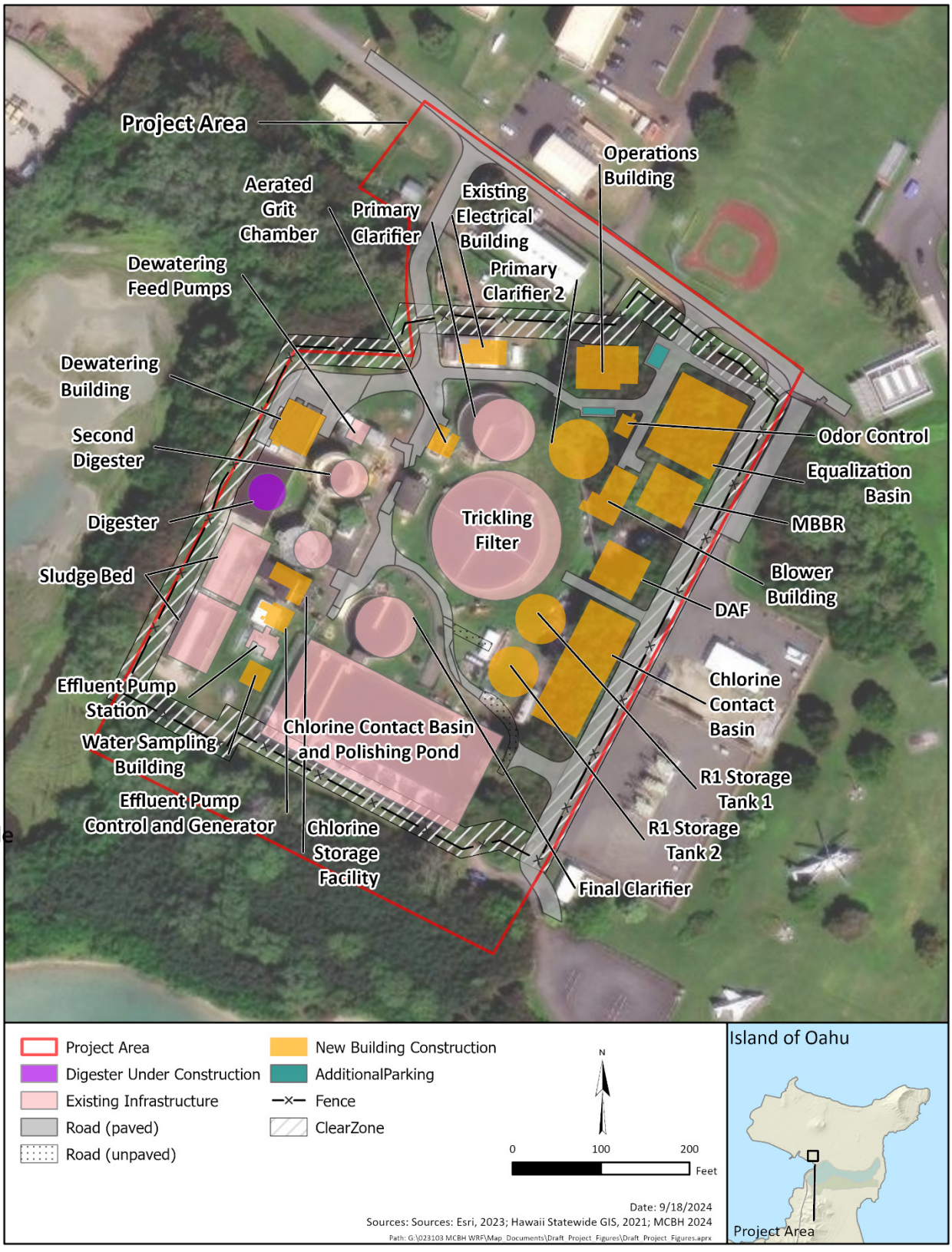

Figure 2-1 Proposed Water Reclamation Facility Upgrades

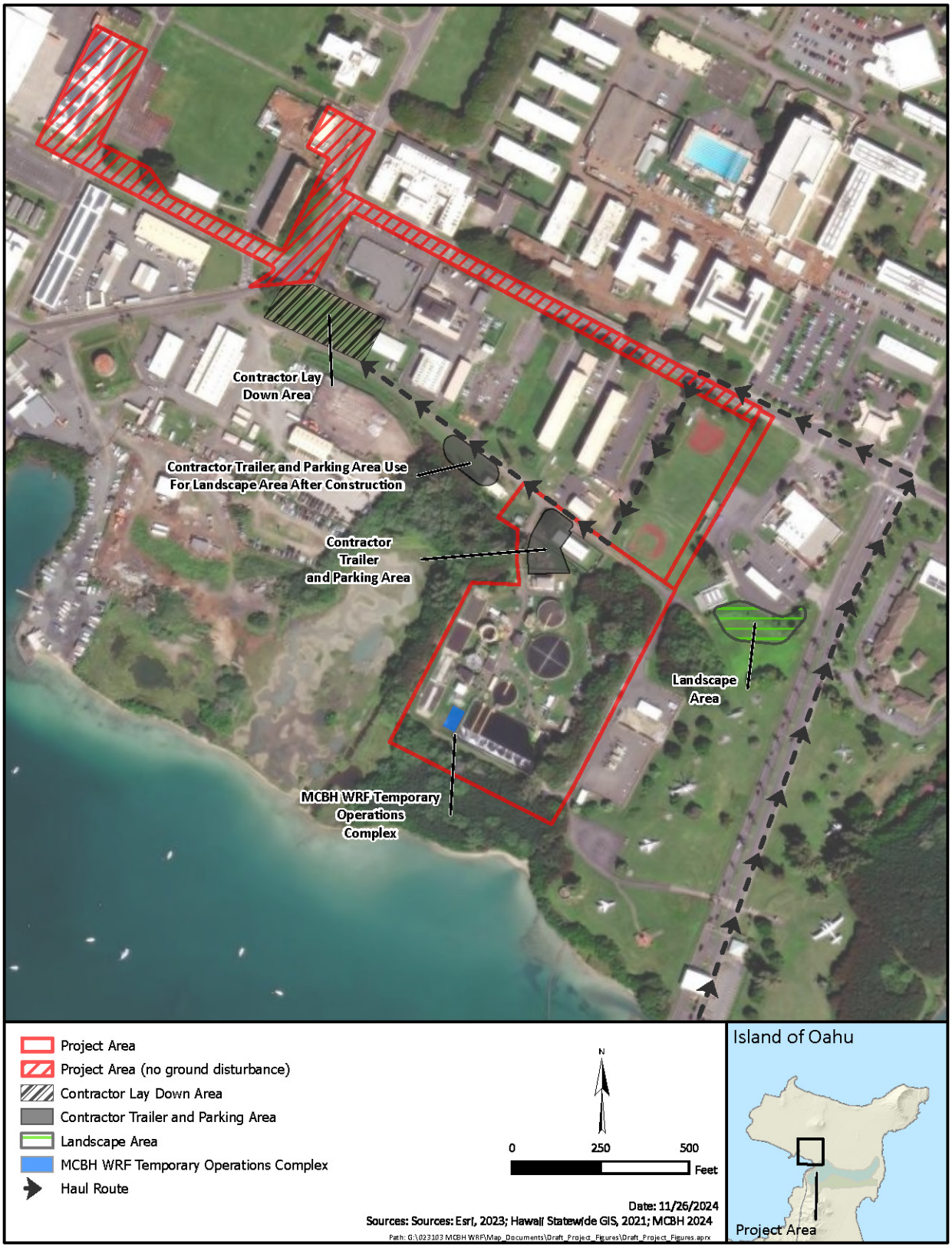

Figure 2-2 Proposed Construction Laydown Areas and Haul Routes

Table 2-1 Proposed Upgrade to MCB Hawaii Kaneohe Bay WRF

Component	*Area*	*Description*
New Facilities	1,475 SF	• Operations/Lab/Electrical Building located northeast of the existing electrical building • Sampler Building facing the existing driveway to allow easy pedestrian access • Dewatering building on the west side • Blower building on the east side
Tsunami Designs	7,803 SF	• Burners would be located on top of concrete structures to keep equipment above tsunami inundation level • Aeration blowers would be located on the second level of buildings to protect from flooding/inundation • Power duct banks in the yard would be designed to withstand seismic and tsunami events
Redundancy WRF Upgrade	NA	New Unit Processes: • Primary Clarifier 2, Equalization Tank, Fine Screens, Moving Bed Biofilm Reactors, Dissolved Air Flotation, Cloth Disk Filters, Chlorine Contact Channels for Disinfection, R-1 Storage Tanks, and Dewatering equipment Enabling system to produce R-1 water Unit Processes to be Matched for Redundancy include: • Aerated Grit Chamber and Anaerobic Digester
Utilities	21,175 SF	• Potable Water and Compressed Air • Electrical utilities include primary electrical distribution, secondary electrical distribution, transformers, exterior lighting, a supervisory control and data acquisition system, and telecommunications infrastructure • New electric feeder cables that utilize an existing conduit (no ground disturbance) • Communication Connection duct bank (21,175 SF trenching through grass area)
Fencing and Gates	2,193 LF 72,637 SF	Increased Fencing: • Perimeter fencing with clear zones and no trespassing signage would be placed; clear zone of 10 feet minimum exterior and 20 feet minimum interior (includes 70,000 square feet of vegetation removal) • The perimeter fence along the existing west side would remain • The facility would have a perimeter fence enclosure consisting of an 8-foot-tall fence with 7-foot-tall chain-link and 1-foot-tall single outrigger with barbed wire
Paving and Site Improvements	1,706 SF gravel 43,723 SF paved	• Site demolition, paving roadways, landscaping, and bollards • Existing gravel roads disturbed by construction activity would be replaced with gravel pavement • All new roads would be asphalt pavement • Storm drainage: new catch basins and curb inlets draining to a new pipe system • Additional lighting along roadways, parking areas, and gate entrances • Includes clearance of 17,000 SF of landscaped grass and scrub at the entrance
Parking	719 SF	• Three new parking spaces east of the new operations/lab/electrical building • Two additional parallel parking spaces provided south of operations building

Component	*Area*	*Description*
Total Disturbance Area	138,256 SF (3.0 acres)	

Notes: Construction components are shown in Figure 2-1.
Legend: LF = linear feet; MCB = Marine Corps Base; NA = not applicable; SF = square feet; WRF = Wastewater Reclamation Facility
Source: NAVFAC Hawaii, 2024.

2.1.1 Proposed Upgrades

2.1.1.1 New Facility Construction

The proposed action constructs new operational sewage treatment components and associated support equipment at the WRF at MCB Hawaii Kaneohe Bay. The proposed construction would take place in already developed areas. The associated treatment facilities to be constructed include an operations/lab/electrical building, a sampler building, a dewatering building, and a blower building (see Figure 2-1). The new facilities would house and safeguard equipment and utility infrastructure while also providing space for operational and laboratory needs. Along with new facility construction, many buildings and structures would be consolidated or removed from the WRF. Construction laydown areas outside the WRF would be used for staging equipment and materials during construction.

2.1.1.2 Redundancy WRF Upgrade

Proposed WRF upgrades include adding an additional process system to allow unit treatment systems to be taken offline for maintenance or repair without affecting the WRF's ability to meet its permit requirements. By providing integration with the existing treatment system, both systems would have the capability to produce R-1 recycled water.

2.1.1.3 Utilities

The proposed action would include upgrades to water, sewer, and electrical utilities. The project would incorporate energy-efficient designs, including a sanitary sewer system, gravity and pressure pipelines, and energy-efficient equipment and energy-saving materials in coordination with the Hawaiian Electric Company Energy. New electric feeder cables that utilize an existing conduit will be installed between the WRF and 3rd Street. There will be trenching between the WRF and 3rd Street for a new Communication Connection duct bank.

2.1.1.4 Paving and Site Improvements

Proposed paving and site enhancements include the demolition of existing structures, paving of access roads, landscaping, and installation of fencing. Paving would enhance pedestrian pathways and improve access roads. Additional site improvements would include constructing retaining walls; installing signage, fountains, handrails, and guardrails; and landscaping of lawns, grasses, and exterior plants.

2.1.1.5 Parking

An additional five parking spaces would be added outside the new Operations/Laboratory Building.

2.1.1.6 Tsunami Designs

New facilities constructed as a part of the upgrade to the WRF would meet Risk Category III and Tsunami Risk Category III requirements, resulting in a tsunami design consistent with American Society of Civil Engineers 7-16 Tsunami Geodesign Database. The designed upgrades would account for a maximum tsunami water inundation elevation of 21.3 feet above mean sea level, a peak flow velocity of 20 feet per second, and a future sea level rise of 1.3 feet at the site.

2.1.1.7 Fencing and Gates

The WRF upgrade includes installation of a perimeter fence enclosure consisting of a 7-foot-tall chain-link fabric fence with a 1-foot-tall single outrigger with barbed wire (8 feet total height) (see Figure 2-1).

2.1.2 Proposed Operations

The upgraded WRF would improve water treatment from the current level (secondary treatment) to tertiary treatment through the addition of equipment and processes such as filtration, disinfection, and de-chlorination. In addition, it would provide full redundancy and integration enabling future maintenance, repairs, and replacements to occur while continuing to meet treated effluent standards. Discharge of treated effluent would not change; the treated effluent would continue to be discharged to the municipal outfall and ultimately to Kailua Bay. In addition, the upgraded WRF would be capable of improving treated water from R-2 (having more restrictions on reuse) to R-1 (a higher grade of recycled water having less restrictions on reuse). R-2 level means recycled water where the wastewater has undergone oxidation and disinfection, while R-1 (the highest grade of recycled water) also undergoes filtration. The R-1 recycled water could be used for irrigation at the Klipper Golf course, thus reducing overall water demand from the City and County of Honolulu Board of Water Supply and a reduction in volume of effluent discharged into Kailua Bay. No change would occur to the pipe distribution system between the WRF and the Klipper Golf Course.

Figure 2-3 shows an overview of the treatment process that would be used at the upgraded WRF. The existing WRF is currently sized for a 2-mgd flow on an average daily flow basis. The upgraded WRF would include new treatment unit processes—a redundant wastewater treatment system—that also would have a 2-mgd average daily flow capacity, allowing unit processes to be removed from service for maintenance activities without negatively affecting effluent quality. The upgraded treatment facilities would be sized to accommodate higher peak flows, referred to as the Average Day Maximum Month conditions. These are based on the average peaking factors for average daily flow from 2018 to 2021. A backup aerated grit tank would be constructed to handle flow from the influent pump station, matching the existing tank's capacity to treat 2 mgd on average and up to 10 mgd peak flow during heavy rain events. MCB Hawaii Kaneohe Bay is not a combined sewer system, so on-base storm water is directed to the MS4 and does not affect the WRF. During heavy rain, the volume of water treated at WRF increases due to infiltration and inflow issues within the sewer collection system.

The new unit processes would become the main treatment train, receiving the majority of influent wastewater flow under normal conditions. The existing unit processes would still receive some influent wastewater to maintain biological growth for the trickling filter. Approximately 20 percent of the influent flow would be conveyed to the existing unit processes, which would also be routed to the new system for disinfection.

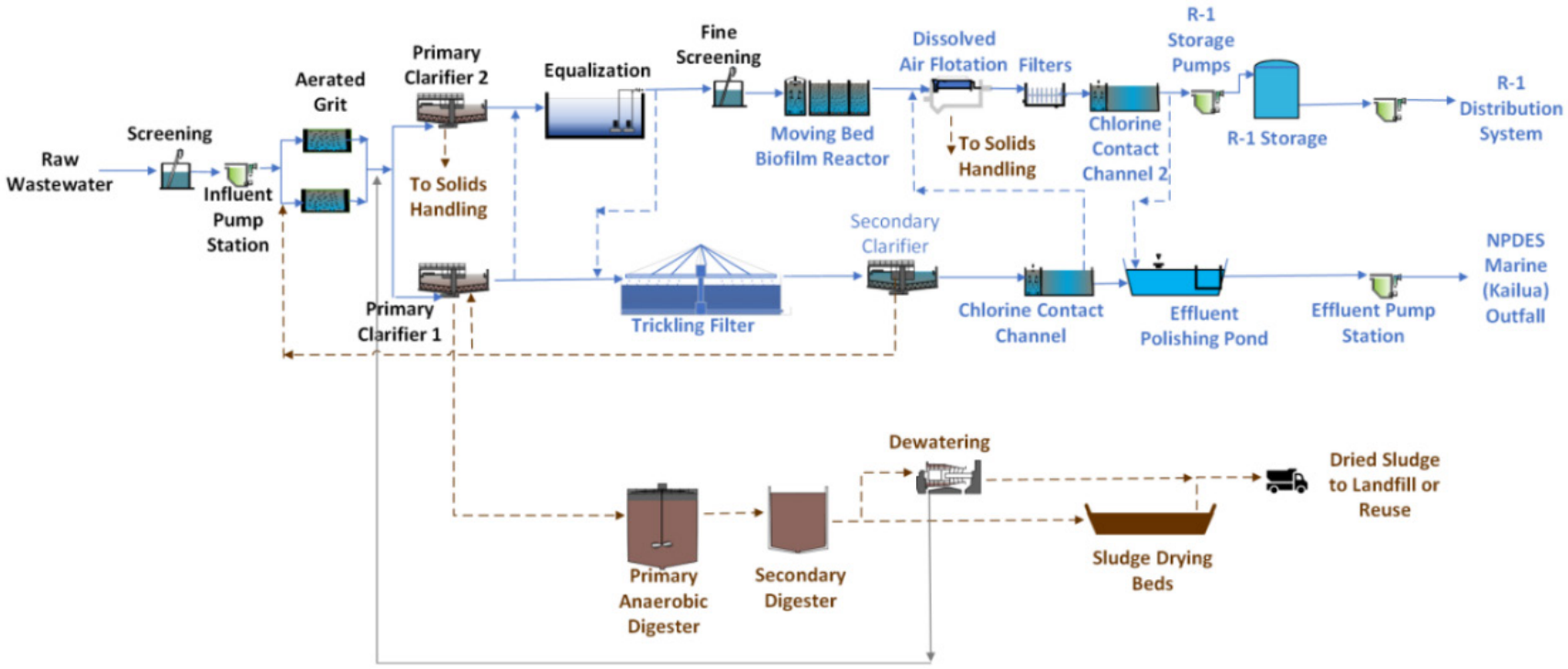

Figure 2-3 Water Reclamation Facility Process

The proposed action would result in a redundant wastewater reclamation and treatment process capable of producing R-1 quality water for reuse. The new R-1 water system would include two R-1 750,000-gallon concrete storage tanks on the southeast corner of the WRF that would protect against overfilling. The new system would be integrated with the existing treatment system resulting in both systems being able to produce R-1 water. The upgraded system would be designed to provide disinfection for 100 percent of the effluent treated by the tertiary treatment system.

The State of Hawai'i approves the use of recycled wastewater for landscape irrigation. The existing effluent chlorination system, currently inactive, was historically used for in-plant processes and to irrigate the Klipper Golf Course with R-2 quality reuse water via a 1-mile-long pipeline. The proposed action would allow the WRF to produce R-1-quality recycled water, which meets higher treatment and application standards than R-2 recycled water. The distribution pipeline within the WRF site used to convey water to the Klipper Golf Course would be re-aligned along the east side of the WRF. There would be no change to the pipe distribution system between the WRF and the Klipper Golf Course. When the new treatment process is online, the upgraded WRF would be able to convey R-1 water to the Klipper Golf Course. Any treated water not meeting R-1 quality would not be reused at the golf course; it would be managed using current processes. Any remaining treated effluent would continue to be directed to the Kailua Regional Wastewater Treatment Plant outfall for ocean disposal using the existing effluent pump system (i.e., Effluent Outfall 001). Irrigation of the Klipper Golf Course with R-1 quality recycled water would divert up to 1 mgd from being discharged through the Kailua Regional Wastewater Treatment Plant outfall, with the actual amount of treated effluent diverted for irrigation purposes based on the daily needs of the Klipper Golf Course. As noted in Section 2.1, no modifications of the ocean outfall or changes in outfall use would occur under the proposed action.

2.2 Alternatives

NEPA requires agencies to consider reasonable alternatives to the proposed action. The identification, consideration, and analysis of alternatives are important aspects of the NEPA process and contribute to the goal of informed decision making. The Marine Corps implemented a design review process (NAVFAC Hawaii, 2024), which identified one reasonable alternative which meets the purpose and need of the proposed action. Pursuant to NEPA, a No-Action Alternative is also included as a baseline for analysis.

2.2.1 Alternatives Considered but not Carried Forward for Analysis

The Marine Corps considered and eliminated from detailed analysis the alternatives below:

- New Treatment Technologies. New treatment technologies to include use of membrane bioreactors and ultraviolet disinfection treatment were considered but not carried forward for analysis because of the complexities of operating such systems and their relative reliability and required maintenance.
- Addition of another trickling filter. This is not possible due to insufficient space at WRF.

2.2.2 Alternatives Carried Forward for Analysis

The design review process identified WRF upgrades to the existing system and construction of a redundant treatment system as the only reasonable alternative. These upgrades comprise the proposed action (see description earlier in Section 2.1).

2.2.3 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur. The existing WRF would operate without the upgrades necessary to ensure continued treatment of wastewater during maintenance and repairs, and without a redundant capability to treat on-base wastewater. The No-Action Alternative does not meet the purpose and need for the proposed action; however, as required by NEPA, the No-Action Alternative is carried forward for analysis.

2.2.4 Best Management Practices

BMPs are policies, practices, and measures the Marine Corps would implement as part of the proposed action to avoid or minimize potential environmental effects to the proposed action or established, regularly occurring practices routinely implemented for Marine Corps projects. In other words, the BMPs identified in this document are inherently part of the proposed action and are not proposed mitigation measures specifically identified as part of this NEPA environmental review process. Table 2-2 lists BMPs that would be implemented as part of the proposed action. Proposed mitigation measures are discussed separately in Chapter 3.

Table 2-2 Proposed BMPs

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
Best Management Practices			
Storm Water Management	Minimize pollutants in storm water flows	BMPs include filter socks around and filter fabric inside the storm drains to prevent pollutants from getting into the storm sewer system. Any stockpiled sediment would require filter socks and be frequently watered down using a water truck for dust control. At contractor trailer/staging areas and temporary operations trailers, BMPs include stabilized construction entrance and exits, boundary fencing with fabric, filter socks around perimeter, and/or silt fencing.	Construction
Storm Water Low Impact Development (LID) Techniques	Minimize pollutants in storm water flows	LID techniques such as bio-retention, vegetated swales, and/or vegetated filter strips would be used as required for ongoing management and treatment of storm water. Compliance with the requirements of the MS4 permit.	Construction, Operations
Storm Water Permit Requirements	Minimize pollutants in storm water flows	Compliance with the requirements of the MS4 permit for the discharge of storm water associated with construction activity, including a SWPPP.	Construction
Storm Water Diversion to Wetlands	Enhance water flow to wetlands	While not part of the proposed action, if the opportunity arises in the future, it is recommended to divert overland flow of water to the Salvage Yard wetland.	Construction, Operations
Landscaping	Preferential planting of native plants	Include native plant vegetation restoration and landscape repair where possible for landscaping of new and renovated facilities.	Construction
Education	Minimize indirect effects to ESA-listed	All construction contractors and personnel would participate in MCB Hawaii Kaneohe Bay's existing	Construction, Operations

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
	species from contractors, personnel, and dependents	natural resources education program. The program would include, at a minimum, the following topics: (1) occurrence of natural resources (including ESA-listed species); (2) sensitivity of the natural resources to human activities; (3) legal protection for certain natural resources; (4) penalties for violations of federal law; (5) general ecology and wildlife activity patterns; (6) reporting requirements; (7) measures to protect natural resources; (8) personal measures that users can take to promote the conservation of natural resources; and (9) procedures and a point of contact for ESA-listed species observations.	
Cultural Resources	Identify cultural items subject to repatriation under NAGPRA.	• Monitoring would be performed in accordance with an archaeological monitoring work plan during construction activities involving ground disturbance.	Construction
Conservation Measures			
Prevention of Standing Water	Minimize attraction of birds	During construction, the contractor would take all reasonable actions to quickly rid the construction area of standing water as soon as it is discovered.	Construction
Bird Deterrents & Barriers	Minimize attraction of birds	The following deterrent efforts may be used to protect the Hawaiian Stilt by discouraging them from occupying areas of operation and construction. Some deterrents would result in the harassment of the birds to deter them from hazardous areas, while others are to control biologicals that attract birds. The following mitigations may be used separately or in combination to deter, frighten, or make the area uninviting for nesting, foraging, or loafing birds: • Physical deterrents, such as netting/wire over processes that attract stilts and ducks to prevent access • Visual deterrents such as predator decoys - moving or stationary • Larvicides, e.g., *Bacillus thuringiensis israelensis* to control the bloodworm larvae (Chironomidae). Additional deterrent technologies not listed above may be evaluated in the future with close coordination with USFWS prior to any implementation.	Construction, Operations
Biological Monitor	Minimize Effects to ESA-listed species	A full-time biological monitor familiar with identification and behavior of the ESA-listed species would be on-site during all phases of construction, to include, but not limited, to mobilization, demolition, construction activities, demobilization, earth moving, and operational activities, to ensure that no federally-listed waterbirds are harassed, injured, or killed by equipment and vehicle movement or construction activities.	Construction, Operations

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		• The biological monitor would educate WRF operational personnel, project personnel, and contractors about the presence of federally-listed species within and adjacent to the project site, legal responsibilities, agreed upon avoidance, minimization, and conservation measures, and notification protocols. • The biological monitor would continuously survey and monitor the WRF compound and project site throughout the day while contracted workers are on-site. • The biological monitor would check all exposed trenches and holes to ensure the proper protective measures have been installed and that they are covered at the end of each workday. • The biological monitor would check the area for standing water and alert the contractor to eliminate water as quickly as possible. • The biological monitor would notify the Environmental Natural Resources staff of any observed ESA violations or potentially unauthorized or illegal activities and actions.	
Nest and Chick Protocols	Minimize Effects to Hawaiian Stilts	If a Hawaiian Stilt nest or chicks are found within the WRF compound: • USFWS biologists, USFWS Special Agents, MCB Hawaii CLEO, and MCB Hawaii ECPD Natural Resources staff would be notified within 24 hours and would be provided access to witness mitigation measures. • If a nest is discovered, MCB Hawaii would establish a 50-foot buffer zone surrounding the nest and limit actions within the buffer that may harass, haze, intimidate, injure, or kill the nesting bird, eggs, or chicks by restricting access within the 50-foot buffer to all base personnel and contractors. If the 50-foot buffer is not sufficient to prevent disturbance to a nesting stilt, the USFWS would be consulted to determine how far to extend the buffer; construction outside the buffer area can be performed without limitations. Should the 50-foot buffer not be practical or effective considering the small footprint of the WRF, mitigations such as erecting a temporary fence that isolates the bird from construction activity may be implemented upon approval from USFWS and ECPD Natural Resources staff. • If the protective buffer or temporary fencing significantly affects construction schedules or site development activities that are necessary to	Construction, Operations

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		comply with regulatory requirements, WRF personnel (or its contractors) would consult with ECPD to implement a nest-specific plan to avoid the loss of eggs and death or injury of chicks, if feasible. Before any plan is implemented, ECPD would consult with USFWS to determine the appropriate course of action to mitigate adverse effects to the nesting bird. Delays in construction do not constitute an emergency and would be only evaluated on a case-by-case basis when the delay would result in a clear violation of the base's NPDES wastewater permit or applicable EPA regulations. • During an emergency situation, e.g., an unexpected and difficult or dangerous situation, which requires quick action to deal with and poses a threat to human health, the environment, or equipment damage, WRF personnel and/or their contractors may take immediate action and enter an established 50-foot buffer without prior notification to ECPD. Once the emergency action has been accomplished, WRF personnel and/or their contractors would depart the 50-foot buffer and notify ECPD at the earliest possible opportunity, but within 24 hours, with details on emergency action sequence and need.	
Notification of Dead, Dying, or Injured Birds	Timely response to wildlife incidents	The WRF personnel and construction contractors would notify the biological monitor, or in their absence, the ECPD Natural Resources staff within 24 hours of discovery of any dead, dying, or injured birds.	Construction, Operations
Dust Barrier	Reduce effects from fugitive dust on ESA-listed species	Eight-foot dust barrier fencing would be installed around the material and equipment laydown yard and temporary contractor on-site office space to limit fugitive dust, visual disturbances, act as a barrier to roaming chicks, and in general to keep wildlife out of active areas. The construction fence would remain in place until project completion. Water would periodically be sprayed on areas of barren soil created during construction activities to keep dust down when exposed to periodic trade winds.	Construction
Archaeological Monitoring	Reduce effects to archaeological resources	Conduct monitoring to minimize effects to any dissociated archaeological resources, including human remains, that may be present in sand fill material throughout the base and are protected under NAGPRA.	Construction
Access Barriers	Minimize waterbird access to the construction/demolition	Install a 3–4-foot barricade fence around the site to be demolished. It would remain in place until all debris is removed from the area.	Construction

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
	site to reduce risk of injury	During trenching and hole digging activities to install pipes or communication, utility, and electrical lines, open trenches and holes would be covered at the end of the workday or any extended period of time without activity, e.g., 2–3 hours or more.	
Pre-construction Surveys for Biological Resources	Minimize disturbance to sensitive species	Pre-construction surveys for special-status species with the potential to occur would be conducted daily by a qualified biologist. The biologist will identify what species are in the area, where they are located, determine if any nesting is occurring, and share this information with the contractors and facility operators to prevent injury or death to wildlife. A biological monitor would conduct nest surveys in the existing trees at each site and within 100 feet of the proposed project sites. Nest surveys would be repeated within 3 days of project initiation and after any subsequent delay of work of 3 or more days. If a nest or active brood is found: • MCB Hawaii Natural Resources staff would contact the USFWS within 48 hours for further guidance. • MCB Hawaii would establish a 50-foot buffer zone surrounding the nest and limit actions within the buffer that may harass, haze, intimidate, injure, or kill the nesting bird, eggs, or chicks by restricting access within the 50-foot buffer to all base personnel and contractors. If the 50-foot buffer is not sufficient to prevent disturbance to a nesting stilt, the USFWS would be consulted to determine how far to extend the buffer; construction outside the buffer area can be performed without limitations. Should the 50-foot buffer not be practical or effective considering the small footprint of the WRF, mitigations such as erecting a temporary fence that isolates the bird from construction activity may be implemented upon approval from USFWS and ECPD Natural Resources staff. • After hatching, a biological monitor would be on-site during construction until chicks have fledged. The biological monitor will advise the contractor and facility operators that chicks are active in the work area. • If a Pueo is spotted on the ground during pre-construction surveys, a nest survey would commence within 200 meters of the observed Pueo. If a nest is discovered, a 200-meter buffer would be erected to protect the nest.	Construction
Vegetation Maintenance	Minimize attractants for birds	Vegetation at the WRF would be maintained at a height not to exceed 3 inches within all landscaped	Construction, Operations

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		regions, and all vegetation would be removed from within sludge beds.	
Vegetation Trimming/Removal	Minimize disturbance to sensitive species	Removal, pruning, or trimming of trees and vegetation during bird nesting and bat pupping seasons would be avoided. • To the maximum extent practicable, tree trimming activities would avoid the peak White Tern egg-laying months (March and October) and nest surveys would be conducted prior to tree disturbance. If the tree scheduled for removal, pruning, or trimming is found to contain a nest, the tree would not be disturbed until the chicks have fledged. • No pruning or trimming of trees and vegetation 15 feet or greater would be removed during the Hawaiian hoary bat pupping season (June 1–September 15). If a bat is detected, tree trimming would not commence within 100 feet of the known roosting sites. If vegetation removal is proposed during the pupping season, consultation with USFWS is required.	Construction
Lighting	Bird/bat disorientation/fallout	MCB Hawaii is striving to incorporate wildlife-friendly lighting associated with existing lighting and with projects requiring new, repaired, or upgraded lighting (MCB Hawaii, 2022). Lighting would follow the rule–keep it low, long, and shielded. All lighting would meet the following minimum criteria unless otherwise determined by critical mission requirements: • Install light fixtures as low as possible to the ground. • Use long wavelength (greater than 560 nanometers) light sources. • Shielded, downward directed, and full cutoff so that the lamp or glowing lens is not visible from the side or above. Uplighting is prohibited. • Controlled. Only be “On” when needed. Ability to shut off lighting when not in use. • Use timers and motion-activated lighting to minimize unnecessary light remaining on throughout the night. • Minimize light trespass. Only light the required area–to conserve energy and to prevent unwanted light from trespassing into regions where it is not needed. • Minimize brightness. Use the lowest wattage or lumen output necessary for the needed purpose and personnel safety. This would conserve energy and reduce harmful effects to plants, animals, and people.	Construction

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		• Use full cutoff downward/shielded bollards in parking areas and sidewalks, and full cutoff downward/shielded wall packs for walkways and entrances/exits. • Minimize the height of pole lighting–15 feet in height or lower where possible. Night work would be minimized during proposed construction to the greatest extent possible. If night work occurs, the following measures would be implemented: • Night lighting would be shielded, directed downward, use motion detectors or other automatic controls, and the lowest possible lumens. The necessary amount of exterior light would be determined for safety purposes. • Contractor would notify the MCB Hawaii Environmental Division in advance of any night work and would be briefed on wildlife concerns (e.g., seabird fallout) and minimization measures. • If a downed seabird is observed, contractors would contact the MCB Hawaii Environmental Division immediately to report the observation. • Limit use of lights for activities during the seabird fledging period (September–December), especially during new moon phases.	
Noise	Reduce noise disturbance to birds and bats	Limit nighttime construction work, and where possible, install sound barriers around generators or implement other applicable technologies to mitigate noise.	Construction
Speed Limit	Reduce risk of wildlife strike	Maintain a 5 mile per hour speed limit within the project areas to include the driveway that provides access to the WRF back entrance.	Construction, Operations
Sludge Bed Barriers	Reduce risk of nesting in sludge beds	The sludge beds will be kept free of vegetation to make the beds less inviting to Hawaiian Stilts for nesting. Should Hawaiian Stilts nest in the drying beds, the biological monitor shall implement an appropriate stand-off distance to avoid disturbing the nesting birds, and the sludge beds will not be used until the chicks have hatched, fledged, and left the area.	Operations
Protecting Current Wastewater Processes	Maintain operational capability during construction	Provide silt fences, socks, and other protective devices around critical components to ensure dust, hyperchlorinated water, or other potential contaminants do not affect effluent quality.	Construction

Fencing	Minimize access for birds	Install a 2-foot silt fencing barrier at the base exterior of all new and existing fencing around the WRF perimeter, to reduce risk of chicks from entering the property from adjacent wetland.	Construction

Legend: BMP =Best Management Practice; CLEO = Conservation Law Enforcement; ECPD = Environmental Compliance and Protection Division; EPA = Environmental Protection Agency; ESA = Endangered Species Act; LID = Low Impact Development; MCB = Marine Corps Base; MS4 = Municipal Separate Storm Sewer System; NAGPRA = Native American Graves Protection and Repatriation Act; NPDES = National Pollutant Discharge Elimination System; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service; WRF = Water Reclamation Facility

Source: MCB Hawaii, 2024c.

3 Affected Environment and Environmental Consequences

This chapter presents a description of the existing environment and an analysis of the potential direct and indirect effects of Alternative 1 and the No-Action Alternative (cumulative effects are presented in Chapter 4). The affected environment is the construction footprint at the WRF at MCB Hawaii Kaneohe Bay, west of the main WRF entry gate and southeast of the marina. The level of detail and analysis for each resource varies with the level of potential environmental effect.

Significant effects are defined for NEPA in 40 CFR Section 1508.1mm as "adverse effects that an agency has identified as significant based on the criteria in Section 1501.3(d) of this subchapter." These criteria include the context of the action and the intensity of the effect. Context is associated with the location or region of influence (ROI) for the proposed action, which varies among resource areas. Intensity refers to the severity of the effect.

Environmental effects carried forward for more detailed analysis in this EA are noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation. Potential effects to the resource areas described below are negligible or nonexistent and, therefore, are not carried forward for further analysis in this EA.

Geological Resources. The proposed action would require modification to and construction of new infrastructure on MCB Hawaii as described in Section 2.1.2. All construction would be in areas that are developed or have been previously disturbed. For construction within landscaped areas, proposed construction would be implemented on soils that have slow runoff, high permeability, and low erosion potential. Construction would be subject to the NPDES storm water permit, NPDES Construction General Permit Conditions, and site-specific Storm Water Pollution Prevention Plans (SWPPPs) specifically designed to minimize erosion and soil loss. Project design and construction engineering control BMPs such as erosion socks, erosion control blankets, silt fencing, and fiber rolls would further reduce any potential for erosion, minimize sedimentation, reduce the flow of storm water, and minimize the transport of soils and sediment off-site. As such, there would be no effect to geological resources. For these reasons, geological resources are not evaluated further in this EA.

Hazardous Materials and Waste. Construction activities would result in a short-term increase in the use of hazardous materials that would cease at the completion of construction. The hazardous materials to be used are common to construction and include such items as diesel fuel, gasoline, and propane to fuel the construction equipment; hydraulic fluids, oils, and lubricants; welding gases; paints; solvents; adhesives; and batteries. All hazardous materials would be handled and disposed of per applicable regulations and consistent with other construction projects at MCB Hawaii Kaneohe Bay. This includes hazardous materials from facilities demolition/renovation activities such as lead and asbestos should these be encountered during construction. These materials, if encountered, would be taken by licensed transporters and disposed of in permitted landfill facilities in accordance with applicable federal, state, and local laws and regulations. Adherence to applicable BMPs and Standard Operating Procedures (SOPs) during construction would reduce the likelihood and volume of accidental releases, allow for accelerated spill response times, and enable timely implementation of cleanup measures, thereby minimizing potential effects to the environment. Hazardous materials associated with construction activities and operation of the WRF following the upgrade would be delivered and stored in a manner that would prevent these materials from leaking, spilling, and potentially polluting soils, ground, and surface waters and in accordance with applicable federal, state, and local regulations. Public transportation routes would be utilized for the conveyance of hazardous materials to the construction site. Transportation of all materials would be conducted in compliance with U.S. Department of

Transportation regulations. For these reasons, hazardous materials and waste are not evaluated further in this EA.

Marine Biological Resources. The proposed action does not include in-water construction. ESA-listed marine species do not haul out on the shoreline adjacent to the WRF. The proposed action does not change the potential for in-water effects to marine species. For these reasons, effects to marine biological resources are not further analyzed in this EA.

Socioeconomics. Construction personnel would come from the existing population on Oʻahu, so the proposed action would result in no changes to populations outside the base, with no corresponding effects to employment or industry characteristics; demand for schools, housing, and recreational facilities; or changes to the demographic, economic, and fiscal environment of Kailua, Kāneʻohe, and the County of Honolulu. Construction is expected to last from 2025 through 2028, and the total construction cost is currently estimated at approximately $319 million (NAVFAC Hawaii, 2024). Therefore, proposed construction may provide some minor, temporary beneficial effects to the local economy from construction-related jobs and purchasing, but no long-term increase in employment would result. It is assumed the expenditures would occur evenly over the construction period. Implementation of the proposed action would have direct economic effects such as employment of construction workers and purchasing materials. The construction workers are expected to come from the local workforce. Therefore, it is assumed that there would not be an increase in population or demand for housing in the local communities or elsewhere on Oʻahu. Economic activity associated with construction of the proposed action would provide short-term economic benefits to the local economy. The proposed action would involve an increase in personnel of five additional personnel. This would be a negligible change in the overall number of MCB Hawaii Kaneohe Bay personnel in relation to the overall base population. For these reasons, socioeconomics is not further analyzed in this EA.

Public Health and Safety. The proposed construction would occur entirely on Marine Corps property at MCB Hawaii Kaneohe Bay where public access is allowed only under very limited circumstances. The proposed action does not change these restrictions or affect public access. Construction would occur solely in operational areas on base, ensuring no disturbance to surrounding residential areas. All sites would be secured and monitored during non-work hours. The WRF currently discharges to an ocean outfall that is also used by the Kailua Regional Wastewater Treatment Plant. With the improved functions at the WRF, effluent water would continue to remain below the limits set by the NPDES wastewater permit, and the potential for pollutants to enter Kailua Bay would decrease. The DOH would continue to provide advisory notices if discharges to the municipal outfall exceed permitted levels. Treated effluent at the municipal pipeline discharge location would continue to meet federal and state standards outlined in the Clean Water Act, so no public safety issues would occur for Kailua Bay. In addition, the proposed action includes integration of tsunami design components to minimize potential effects to the WRF during tsunami events and allow it to continue operations effectively during these events. Therefore, public health and safety is not evaluated further in this EA.

Land Use. MCB Hawaii Kaneohe Bay is an existing military installation, and all proposed construction and operation would occur within base boundaries and be consistent with the military mission. No new land uses would result from the proposed action. Proposed upgrades would occur at the existing WRF and would include odor control features, so there would be no actual or perceptible change to activities at or immediately surrounding the WRF. Therefore, land use is not evaluated further in this EA.

Recreation. The proposed construction would occur entirely on Marine Corps property at MCB Hawaii Kaneohe Bay where public access is allowed only under very limited circumstances. The proposed action

does not change these restrictions or affect public access. The WRF currently discharges to a pipeline that is also used by the Kailua Regional Wastewater Treatment Plant. Construction actions would be confined to previously developed areas at the WRF and would not have any effect to recreational activities off base. As such, the proposed action would have no effect to recreation. Therefore, recreation is not evaluated further in this EA.

3.1 Noise

Noise is generally defined as unwanted sound that can interfere with normal activities and/or otherwise diminishes the quality of the natural environment. Noise may be intermittent or continuous, steady or impulsive, and stationary or transient. Stationary sources are normally related to specific land uses, such as an amusement park or industrial plant. Transient noise sources move through the environment, either along relatively established paths (e.g., highways, railroads, and aircraft flight tracks around airports), or randomly. Responses to noise vary according to the type of noise and the characteristics of the sound source, the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source (e.g., an aircraft) and the receptor (e.g., a person or animal). This section analyzes effects to human receptors; effects to wildlife are addressed in Section 3.5, *Terrestrial Biological Resources*.

The physical characteristics of noise include its intensity, frequency, and duration. The large variation in sound intensities affecting humans range from a soft whisper to a jet engine resulting in sound levels typically presented using a logarithmic scale. The unit used to measure the intensity of sound is the decibel (dB) and human hearing ranges from approximately 20 A-weighted decibels (dBA) (the threshold of hearing) to up to 120 dB (the threshold at which sound causes physical discomfort).

The frequency of sound is measured in cycles per second, or hertz. Low frequency sounds are heard as rumbles or roars, and high frequency sounds are heard as screeches. Sound measurement is further refined by "weighting." The human ear is most sensitive to frequencies in the 1,000 to 4,000 hertz range. Sound meters calibrated to emphasize frequencies in this range are termed "A-weighted," and sound is identified in terms of dBA. Unless otherwise stated in the EA, dB units refer to dBA-weighted sound levels.

The duration of a noise event and the number of times it occurs are also important considerations in assessing noise effects. For example, at approximately 3 feet, sound from normal human speech ranges from 63 to 65 dBA, operating kitchen appliances range from about 83 to 88 dBA, and rock bands approach 110 dBA (Cowan, 1994). A difference of 3 dBA represents a doubling of sound level in terms of energy.

The human response to noise can vary according to the type, source, number of events, and distance between the source and the receptor. From a physical standpoint, there is no distinction between noise and desired sound, as both consist of vibrations through air. The distinction arises from the brain's perception of the sound as wanted, expected or pleasant, as opposed to "noise," which is perceived as unpleasant, loud, disruptive, or annoying to hearing. "Annoying" in this instance is defined by the EPA as any negative subjective reaction on the part of an individual or group in response to "noise" (EPA, 1974).

Day-night average sound level (DNL) is the primary method utilized by the Department of Defense (DoD) for assessing long-term environmental noise, which is the sound level measured over a 24-hour period. The DNL defines two time periods of measurement: "Daytime" from 7:00 a.m. to 10:00 p.m. local time and "Nighttime" from 10:00 p.m. to 7:00 a.m. (often referred to as "DNL nighttime"). DNL weights noise events occurring between 10:00 p.m. and 7:00 a.m. with a 10 dB adjustment equivalent to 10 times the number of noise events (DoD, 2020). The adjustment accounts for the added intrusiveness of noise events affecting people during the DNL nighttime period. Most people are routinely exposed to sound levels of 50 to 55 DNL or higher (Federal Interagency Committee on Urban Noise, 1980). The DoD has adopted 65 dBA DNL as the threshold for potential land use incompatibility (DoD, 2021). Areas exposed to less than 65 dB DNL are considered compatible for all land uses.

3.1.1 Affected Environment

The affected environment section below describes the existing conditions for noise sources currently experienced at MCB Hawaii Kaneohe Bay. Proposed activities occurring in the noise ROI (the project area and immediately surrounding areas) would consist of demolition, renovations, and construction upon impervious surfaces that would follow standard construction conservation measures for the control of noise. Operation of the WRF following the proposed upgrade would also occur.

3.1.1.1 MCB Hawaii Kaneohe Bay

The WRF is located at the southern end of MCB Hawaii Kaneohe Bay, near an industrial setting with a variety of existing noise sources. The primary on-site noise sources are typical of Marine Corps air installations and include aircraft operating at the airfield, training activities at installation ranges, and vehicle traffic on base roadways. The WRF is 0.5 miles from the 65 dBA DNL contour surrounding the airfield, so the average noise level is lower than 65 dBA.

The closest on-base noise-sensitive receptors to the WRF are housing and a school 0.5 mile away. The closest off-base noise-sensitive receptors are the residences located to the south in Kaneohe at approximately 0.6 miles from the WRF.

3.1.2 Environmental Consequences

Analysis of potential noise effects includes assessing noise levels that would occur from the proposed action and determining their potential effects to noise-sensitive receptors.

A reference table of anticipated maximum sound levels that could be generated from proposed construction activities was made utilizing the Federal Highway Administration's Road Construction Model. Demolition, renovations, and construction would include several common pieces of construction equipment, such as clam shovel, concrete saw, compactor, dozer, excavator, jackhammer, generator, dump truck. Details of the estimated maximum A-weighted sound level (L_{max}) at 50 feet from the source are summarized in Table 3.1-1. As the distance increases between the construction equipment source and the receiver, the L_{max} decreases.

Table 3.1-1 Estimated Maximum Sound Levels of Construction Equipment at Kaneohe Bay

Equipment Description	L_{max} ***@ 50ft (dBA)***
Clam Shovel	93
Concrete Saw	90
Compactor	80
Dozer	85
Excavator	85
Jackhammer	85
Generator	82
Dump Truck	84

Legend: ft = foot/feet; dBA = A-weighted decibel; L_{max} = maximum sound level
Source: Federal Highway Administration, 2006

3.1.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and there would be no change to noise.

3.1.2.2 Alternative 1

Construction

The proposed demolition, renovations, and construction within the WRF would result in short-term, intermittent noise effects from the operation of heavy equipment, power and hand tools, and construction vehicles. Construction would occur sporadically throughout daytime hours; nighttime construction (during the hours of 10:00 p.m. to 7:00 a.m.) would be minimized to the greatest extent possible.

The proposed construction footprint is entirely within operational areas of the WRF, which is already subject to and generates industrial noise. All construction would be consistent with existing noise onboard MCB Hawaii Kaneohe Bay. HAR Chapter 11-46, *Community Noise Control*, specifies acceptable noise levels for a Class A zoning district (equivalent to lands zoned for residential, conservation, or public space) to be 55 dBA during hours of 7:00 a.m. to 10:00 p.m. (DOH, 1969). The rule further states that "[n]oise levels shall not exceed the maximum permissible sound level for more than ten percent of the time within any twenty-minute period, except by permit or variance." While construction noise levels can exceed these levels, such noise levels (Table 3.1-1) decrease to 54 dBA at 500 feet. As both on- and off-base noise-sensitive receptors are located significantly farther away from the proposed construction at WRF (0.4 to 0.6 mile away) than 500 feet, they would not be affected. Therefore, Alternative 1 construction would have less than significant noise effects.

Operations

Proposed operations at WRF would be similar to existing WRF operations. The new equipment and facilities would reside entirely within the existing WRF footprint and be similar to existing WRF equipment and facilities, generating similar noise levels. As there would be no change in noise levels from operations, Alternative 1 operations would have less than significant noise effects.

3.2 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). The concentration of various pollutants in the atmosphere defines the air quality in a region or at a specific location. Many factors influence a region's air quality, including the type and quantity of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Most air pollutants originate from human-made sources, including mobile sources (e.g., aircraft, cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Natural sources, such as volcanic eruptions and forest fires, also release pollutants into the air.

Under the Clean Air Act, the EPA established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for six criteria air pollutants, including ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide (SO_2), lead, and particulate matter with diameters less than or equal to 10 and 2.5 micrometers. The EPA classifies NAAQS as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. The EPA designated short-term standards to protect against acute health effects and established long-term standards to protect against chronic health effects.

The EPA designates areas in compliance with the NAAQS as attainment areas and designates areas that violate a federal air quality standard as nonattainment areas. The EPA designates areas that have transitioned from nonattainment to attainment as maintenance areas; these areas must adhere to maintenance plans to ensure continued attainment. The Clean Air Act requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated as nonattainment. State and local air quality management agencies develop these plans, known as State Implementation Plans, and submit them to the EPA for approval.

GHGs are gas emissions that trap heat in the atmosphere. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The scientific community predicts the natural hazards associated with this global warming will produce negative economic and social consequences across the globe.

3.2.1 Affected Environment

The air quality ROI includes the east side of the island of O'ahu in Honolulu County, where MCB Hawaii Kaneohe Bay is located, and the State of Hawai'i for GHGs and natural hazards effects. The latest 2022 data from the DOH indicates the state is in attainment except for exceedances for SO_2 in communities near the volcano on Hawai'i Island (DOH, 2024), which the EPA considers as a natural, uncontrollable event. Because the state is in attainment of the NAAQS, it is not subject to the Clean Air Act's General Conformity Rule.

Emission sources in operation at MCB Hawaii Kaneohe Bay generally include fuel combustion by aircraft engines and motor vehicles, boilers, and generators.

3.2.2 Environmental Consequences

This analysis evaluates the effects to air quality based on estimated direct and indirect emissions associated with the proposed action.

3.2.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and there would be no change to air quality.

3.2.2.2 Alternative 1

Because the State of Hawai'i is in attainment of the NAAQS, the proposed action is not subject to the Clean Air Act's General Conformity Rule.

Construction

Construction activities during implementation of the proposed action would generate short-term, temporary air emissions such as fugitive dust and combustion of fossil fuels from construction equipment. The proposed construction activities would occur over 3 years from FY 2025 to FY 2028 with actual equipment operations anticipated to start from 2026. Estimates of construction equipment emissions were based on the estimated hours of usage and emission factors for each anticipated mobile source. This analysis evaluated nitrogen oxides, volatile organic compounds, carbon monoxide, particulate matter with diameters less than or equal to 10 and 2.5 micrometers, SO_2, and GHGs in terms of carbon dioxide equivalent (CO_2e) related to heavy-duty diesel equipment and on road trucks and commuter vehicles from the EPA's Motor Vehicle Emission Simulator emission factor model (EPA, 2023). The earth disturbance-related fugitive dust emissions were estimated based on the areas with potential ground disturbance and EPA AP-42 particulate matter emission factors. Table 3.2-1 summarizes the predicted annual construction emissions under Alternative 1 and detailed air emissions calculations are presented in Appendix F.

Table 3.2-1 Alternative 1 Construction Activity Air Emissions Inventory

Year	*Emission (tons)*						
	VOC	***NO_x***	***CO***	***$PM_{2.5}$***	***PM_{10}***	***SO_2***	***CO_2***
2026	0.02	0.30	0.26	0.16	1.52	0.001	181.63
2027	0.02	0.30	0.26	0.16	1.52	0.001	181.63
2028	0.02	0.30	0.26	0.16	1.52	0.001	181.63

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM = particulate matter (PM_{10} and $PM_{2.5}$ are particles with aerodynamic diameters less than or equal to a nominal 10 and 2.5 micrometers, respectively); SO_2 = sulfur dioxide; VOC = volatile organic compound

The prevailing northeast trade winds around MCB Hawaii Kaneohe Bay disperse air pollutants. Dust BMPs such as regular watering, the temporary nature of the effects, and the distance to downwind sensitive receptors (0.4 to 0.6 miles away) would also lessen the effects of ground-level release, dispersion, and transport of air pollutant emissions. Together, the BMPs, the intermittent and temporary nature of the action, and prevailing winds result in Alternative 1 construction having a less than significant effect to air quality. All construction activities would comply with the provisions of HAR 11-60.1-33, *Fugitive Dust*.

Effects due to GHG emissions are analyzed in Section 4.4, *Cumulative Effects*.

Operations

Proposed operations would involve stationary source air emissions consistent with existing WRF operations; the upgraded WRF would operate similar to the existing WRF. As a result of the prevailing northeast trade winds around MCB Hawaii Kaneohe Bay, emissions from the proposed minor change in WRF operations compared to the No-Action Alternative would have a less than significant effect to air quality.

Effects due to GHG emissions are analyzed in Section 4.4, *Cumulative Effects*.

3.3 Water Resources

Water resources include marine waters, groundwater, surface water, wetlands, and floodplains. This section identifies the existing condition of water resources and analyzes the effects of the proposed action on those resources. The affected environment for water resources consists of the construction footprint at MCB Hawaii Kaneohe Bay WRF and the immediate marine waters of Kāneʻohe Bay and Kailua Bay. Potable water usage and distribution are discussed in Section 3.6, *Utilities*.

3.3.1 Affected Environment

A description of water resources is presented below for MCB Hawaii Kaneohe Bay. The ROI for water resources includes marine waters, groundwater, surface water, wetlands, and floodplains at and immediately surrounding the WRF and at Klipper Golf Course where recycled water can potentially be used. Because construction is proposed at MCB Hawaii Kaneohe Bay, the description of the affected environment for that location contains floodplain data.

3.3.1.1 Marine Waters

HAR 11-54, *Water Standards*, classifies Kailua Bay and Kāneʻohe Bay as marine water quality Class AA (DOH, 2021b). Fresh water enters the ocean from rainfall, intermittent small streams, and surface drainage from MCB Hawaii Kaneohe Bay and the communities of Kailua and Kaneohe. Water in shallow areas mixes slowly with deeper waters of the bay (Kāneʻohe Bay Information System, 2022). Freshwater mixing occurs more in the winter; during the summer, fresh water remains at the surface. Marine water quality is affected by several parameters, including nutrient levels, turbidity, salinity, and microbial content, which are critical for sustaining marine life and ensuring the health of the ecosystem. MCB Hawaii uses the municipal ocean outfall east of MCB Hawaii Kaneohe Bay under the NPDES wastewater permit (October 2024). Water quality samples are regularly collected at seven shoreline stations in Kailua Bay near the Kailua Reginal Wastewater Treatment Plant and post them online.

Groundwater results from the infiltration of water through surface soils and permeable rock materials. The Mōkapu Peninsula's thin layer of surface soil, combined with its layer of rock and sediments, provide little depth for groundwater drainage. Groundwater resources at Mōkapu Peninsula consist of an unconfined, low salinity caprock aquifer above a confined, freshwater basalt aquifer. There are no potable water wells on the base because the peninsula sits atop an area of brackish basal groundwater.

3.3.1.2 Surface Water

Surface water resources generally consist of ponds, lakes, rivers, and streams. The WRF is located within the Koolau Poko watershed (a 65-square mile watershed subdivided into 19 sub-watersheds) and specifically within the Puʻu Hawaiʻiloa sub-watershed. Rainfall averages 40 inches per year (Rainfall Atlas of Hawaiʻi, 2024). There are no freshwater surface waters at the WRF. The Nuʻupia Ponds Complex is an estuarine system 0.2 mile from the WRF. Storm water runoff from inland areas of Mōkapu Peninsula (including Klipper Golf Course) flows south to the Nuʻupia Ponds Complex, ultimately connecting to Kāneʻohe Bay. Stormwater outfalls at MCB Hawaii Kaneohe Bay are regulated under the MS4 permit as outlined in the Storm Water Management Plan (MCB Hawaii, 2023a).

3.3.1.3 Wetlands

Eight protected wetland complexes are located at MCB Hawaii Kaneohe Bay: (1) Hale Koa Wetland; (2) Sag Harbor Wetland; (3) Salvage Yard Wetland; (4) Percolation Ditch Wetland; (5) Motor Pool Wetland; (6)

Kāneʻohe Klipper Golf Course Ponds; (7) Temporary Lodging Facility Wetland; and (8) Nuʻupia Ponds Complex, a designated and protected Wildlife Management Area containing endangered flora and fauna. The Salvage Yard Wetland and the Nuʻupia Ponds Complex are adjacent to the WRF. Operations at the WRF do not impede wetland functions and resources.

3.3.1.4 Floodplains

There are two types of flood-designated areas at MCB Hawaii Kaneohe Bay: flood zones designated by the Federal Emergency Management Agency (FEMA), which are shown in Flood Insurance Rate Maps, and floodplains specific to the Mōkapu Central Drainage Channel. The WRF is in FEMA Zone D, an area where flood hazards are possible, but undetermined (Figure 3.3-1). Coastal regions adjacent to the WRF to the west and north are in FEMA Zones VE (1 percent or greater annual chance of coastal flooding and an additional hazard of storm waves), and AE (1 percent annual chance of flooding). Portions of the ROI are within the Tsunami Evacuation Zone.

Box culverts west of the WRF drain the runway area southward to Kāneʻohe Bay. In addition, a narrow center portion of the base covering an area east of G Street to Craig Avenue is drained by a channel discharging southward into Kāneʻohe Bay.

3.3.2 Environmental Consequences

This analysis focuses on the potential effects of the proposed action on marine waters, groundwater, surface water, wetlands, and floodplains. Groundwater analysis focuses on the potential for effects to the quality, quantity, and accessibility of groundwater, and marine and surface water quality considers the potential for effects to improve or degrade current water quality. The assessment of wetlands considers the potential for effects to the hydrology, soils, and vegetation that support a wetland. The analysis of floodplains considers whether the project may impede the functions of floodplains and drainage systems in conveying floodwaters.

3.3.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and thus there would be no change to water resources.

3.3.2.2 Alternative 1

Construction

The proposed construction at the WRF would not significantly affect marine water quality during the construction period. With implementation of BMPs, including sediment barriers, storm water management systems, and spill containment protocols (see Table 2-2), effects to marine waters would be avoided. The Marine Corps would obtain NPDES general permit coverage for the proposed action under the State of Hawaiʻi general permit for discharges of storm water associated with construction activities.

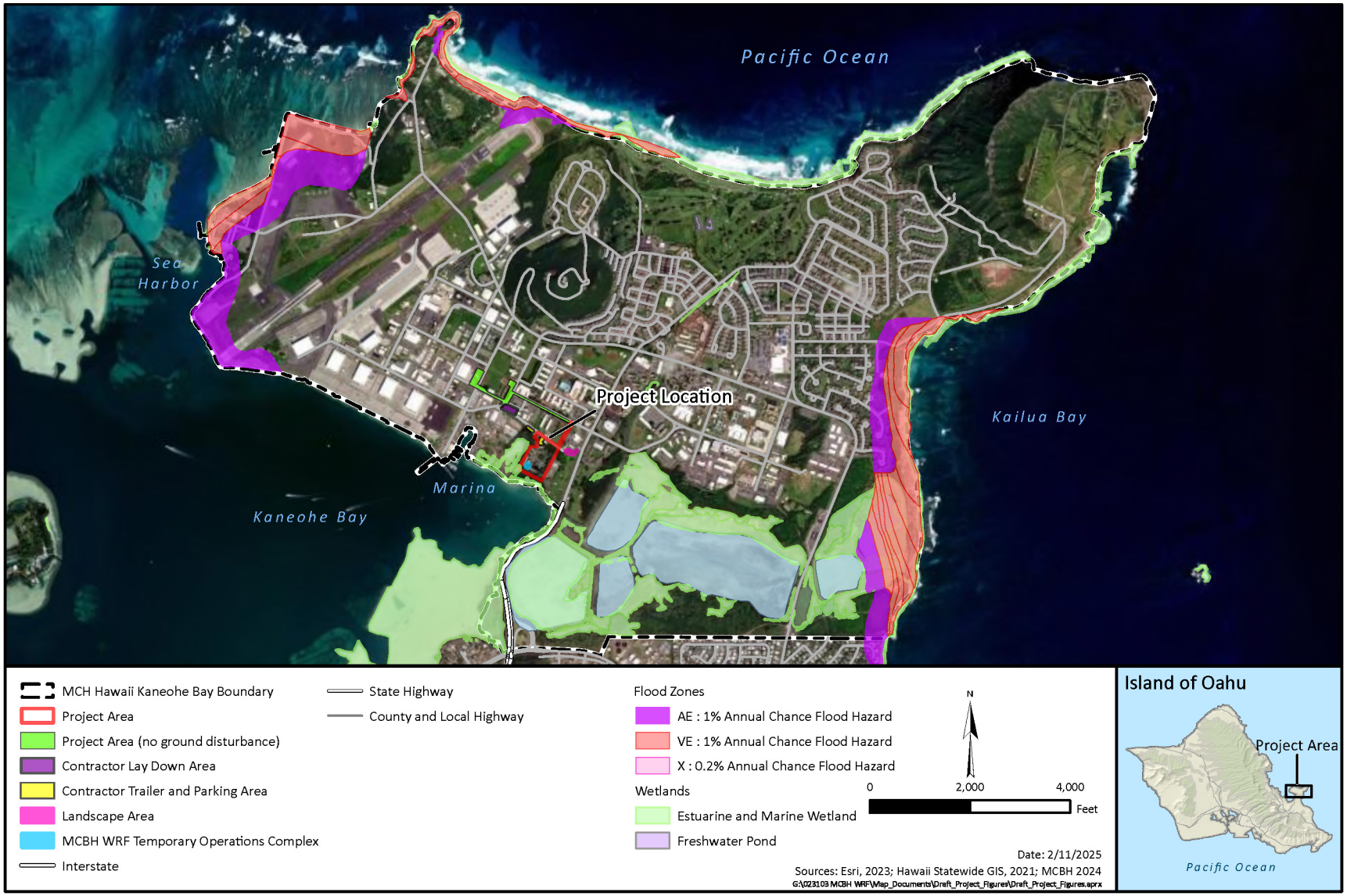

Figure 3.3-1 Water Resources and Flood Zones at MCB Hawaii

The construction project would take place near the Salvage Yard Wetland and the Nu'upia Ponds Complex. Although these two wetlands are adjacent to the WRF, no construction would occur beyond the WRF property. BMPs in Table 2-2 would be implemented and monitored to ensure that sediment deposition and sediment runoff does not affect the nearby wetland environments. This includes storm water management BMPs such as filter socks, storm water Low Impact Development (LID) techniques (e.g., bio-retention and vegetated swale/filter strips) to minimize potential sediments entering the wetlands. In addition, if the opportunity arises in the future, there could potentially be a diversion overland flow of water to the Salvage Yard wetland to enhance water flow to the wetland (see Table 2-2). There would be less than significant effects to groundwater and drinking water because there are no potable water wells on the base.

Alternative 1 would include approximately 3.0 acres of ground-disturbing activities. Much of this is in the previously disturbed portions of the existing WRF footprint, and impervious surface area would be similar to what currently exists at the WRF. As required base wide at MCB Hawaii Kaneohe Bay, all new facilities would implement LID elements and appropriate BMPs to maintain storm water discharges to pre-development hydrologic conditions and the storm water pollution control measures would comply with the MS4 permit. Stormwater runoff from the WRF area would continue to flow south to the Nu'upia Ponds Complex and into Kāne'ohe Bay. The impervious surface area at the upgraded WRF would be similar to the amount at the existing WRF, so the storm water drainage flows and volumes would be similar to the existing WRF. The project design features in Table 2-2, including bioretention, vegetated swales, and pervious pavement, are designed to manage storm water volumes to prevent any potential flooding or ponding in the ROI. In addition, the proposed construction would occur in compliance with the MS4 permit (MCB Hawaii, 2023a), which includes authorized storm water and non-storm water discharges. The Storm Water Management Plan addresses runoff from industrial sites into Kāne'ohe Bay, Nu'upia Ponds, Kailua Bay, and the Mōkapu Central Drainage Channel and identifies approved storm water management procedures and design features consistent with the MS4 permit and EPA Federal Facility Compliance Agreement requirements. The MS4 permit would also include the development of a site-specific construction SWPPP and a Notice of Intent under Appendix C from DOH. The SWPPP would identify BMPs such as runoff detention basins and silt fencing to reduce the potential for contaminants to be transported off-site. Application of conservation measures would further minimize runoff. Removed materials, debris, and soil resulting from construction activities would be contained and properly disposed of in accordance with applicable regulations.

Coastal regions to the west and the east of the WRF are in FEMA flood zones. Per Executive Order (EO) 13690, it is the policy of the United States to improve the resilience of federal assets against the effects of flooding. The proposed action would provide additional protection against flooding because it would be designed to meet tsunami requirements. The construction projects at the WRF are outside of the floodplains identified by FEMA (see Figure 3.3-1).

For these reasons, Alternative 1 construction would have less than significant effects to water resources.

Operations

The upgraded WRF would improve the quality and reduce the amount of the wastewater discharging into the municipal outfall. The wastewater that is ultimately discharged into marine waters would continue to meet permit requirements. During maintenance events at the WRF, the upgrade would allow redundancy in the system, so the water would continue to meet water quality standards and permit requirements during these events.

The WRF location is not near drinking water sources because there are no potable water wells on base. The improved functions and facilities at the WRF would continue to not impede groundwater resources. MCB Hawaii Kaneohe Bay coordinates with the City and County of Honolulu Board of Water Supply regarding drinking water use. Potable water usage and distribution are discussed in Section 3.6, *Utilities*.

The operations at the WRF would not impede wetland functions and resources. The facility's upgrades focus on improving effluent treatment and redundancy, which can assist in reducing any potential pollutants into the nearby wetland regions. Once the proposed construction and renovation projects become operational, the proposed facilities and new impervious surfaces would continue to generate storm water runoff. Projects included as part of the proposed action would be designed with LID techniques such as bio-retention, and vegetated swale/filter strips to minimize potential sediments entering the wetlands so that additional runoff would be minimized, and that predevelopment hydrology is maintained. Additional storm water outfalls would not be needed for the proposed action, so there would be no change to the MS4 permit.

The proposed action would result in the ability to reuse R-1 level water at the Klipper Golf Course, reducing the overall water demand from the City and County of Honolulu Board of Water Supply and the amount of effluent discharged to the municipal outfall. The R-1-quality recycled water would meet higher treatment and application standards than R-2 recycled water. Any treated water not meeting R-1 quality would not be reused at the golf course; it would be managed using current processes. Therefore, there would be no degradation of water quality through irrigation of the Klipper Golf Course with R-1 quality recycled water. Additional analysis of potable water is presented in Section 3.6, *Utilities*.

The WRF is outside of the floodplains identified by FEMA (see Figure 3.3-1). Therefore, there would be no expected effect to floodplains.

For these reasons, Alternative 1 operations would have beneficial but less than significant effects to water resources.

3.4 Cultural Resources

Cultural resources are the physical evidence or places of current and past human activity. Cultural resources can include historic properties that consist of buildings, structures, objects, districts, and sites that are listed in or eligible for listing in the National Register of Historic Places. Historic properties can include archaeological and architectural resources. Archaeological resources are generally sites where human activity measurably altered the earth and/or left deposits of physical remains. Architectural resources include standing buildings, structures, and other built-environment resources of historic or aesthetic significance. Cultural resources can also include Native American Graves Protection and Repatriation Act (NAGPRA) cultural items as defined in Section 3001 of title 25, U.S.C. (NAGPRA); Native Hawaiian sacred sites as defined in EO 13007, *Indian Sacred Sites*, May 24, 1996; archaeological resources as defined in section 470 aa-mm of Title 16, U.S.C. (Archaeological Resources Protection Act); archaeological artifact collections and associated records as defined in 36 CFR 79 (Curation of Federally Owned or Administered Archeological Collections); and DoD Instruction 4712.16.

3.4.1 Affected Environment

The affected environment for cultural resources is based on the area of potential effects (APE) of an NHPA Section 106 undertaking through consultation with the SHPO. An APE is defined in 36 CFR Section 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE encompasses new construction and landscaping; construction laydown areas and building demolitions; renovations and modifications; and the locations of where new buildings or structures could potentially detract from the integrity of setting and feeling of cultural resources through visual, audible (noise), or atmospheric changes. The location of the APE is shown in Figure 3.4-1.

There are no known NAGPRA cultural items located within the APE. No Native Hawaiian sacred sites have been identified within the APE during prior consultation with Native Hawaiian Organizations. Therefore, these resources will not be analyzed in this EA.

3.4.1.1 Historical Background

Detailed historical backgrounds for MCB Hawaii Kaneohe Bay are found in the MCB Hawaii Integrated Cultural Resources Management Plan (ICRMP) (Tomonari-Tuggle and Clark, 2021) in Appendix C.

Figure 3.4-1 Cultural Resources and the Area of Potential Effects

3.4.1.2 Archaeological Resources

MCB Hawaii has conducted numerous inventories of archaeological resources at MCB Hawaii Kaneohe Bay identifying properties and determining their eligibility for listing in the National Register of Historic Places. The results of these studies are summarized in MCB Hawaii's ICRMP (Tomonari-Tuggle and Clark, 2021), and *Cultural Landscape Report* (MCB Hawaii, 2018). There have been more than 240 cultural resource projects undertaken at MCB Hawaii Kaneohe Bay. These projects include archaeological surveys, inventories, monitoring, historical architectural inventories and documentation, cultural landscape reporting, and historical and interpretative projects. See Figure 3.4-1 for generalized locations of archaeological resources. Through the results of these studies, Cultural Resource Management Zones and a model of archaeological sensitivity (Tomonari-Tuggle and Clark, 2021: II–86) have been developed. Within each Cultural Resource Management Zone, archaeological sensitivity varies based on: (1) an analysis of known site distribution combined with the study of historical settlement/land use and environmental factors to develop a model of pre-contact and early historic settlement patterns; (2) historic and modern development that would have affected site preservation (e.g., landfills, areas where sand has been mined and/or used as fill, dredged areas, ordnance target areas); and (3) areas that have been previously investigated and found to not contain archaeological sites (Tomonari-Tuggle and Clark, 2021). Figure 3.4-2 depicts the MCB Hawaii Kaneohe Bay archaeological sensitivity map. The majority of the APE is located on reclaimed land created during the World War II era using dredged fill material from Kāneʻohe Bay. Therefore, the archaeological sensitivity of this area (Figure 3.4-2) has been identified in the ICRMP as an area with "no archaeology remains." The area proposed for trenching for new duct banks north of the WRF site is located within a "low" probability area, and previous archaeological studies confirm this area is largely composed of man-made fill. These studies recorded no evidence of subsurface archaeological deposits or sites.

In addition to known archaeological resources and the modeled archaeological sensitivity, disturbed human remains have been found in redeposited sand fill at various and random locations throughout the peninsula. In the 1930s and during World War II, sand was mined from the northern dunes (the Mōkapu Burial Area) and human remains were unknowingly transported with the fill sand. This fill typically occurred in utility trenches, under and around building foundations and concrete pads, and has been found in secondary disturbed contexts at the north end of the airfield. For this reason, MCB Hawaii has consistently required monitoring of ground-disturbing activities to identify any presence of human skeletal remains and ensure any encountered are treated under conditions agreed upon with Native Hawaiian descendants and organizations (Tomonari-Tuggle and Clark, 2021).

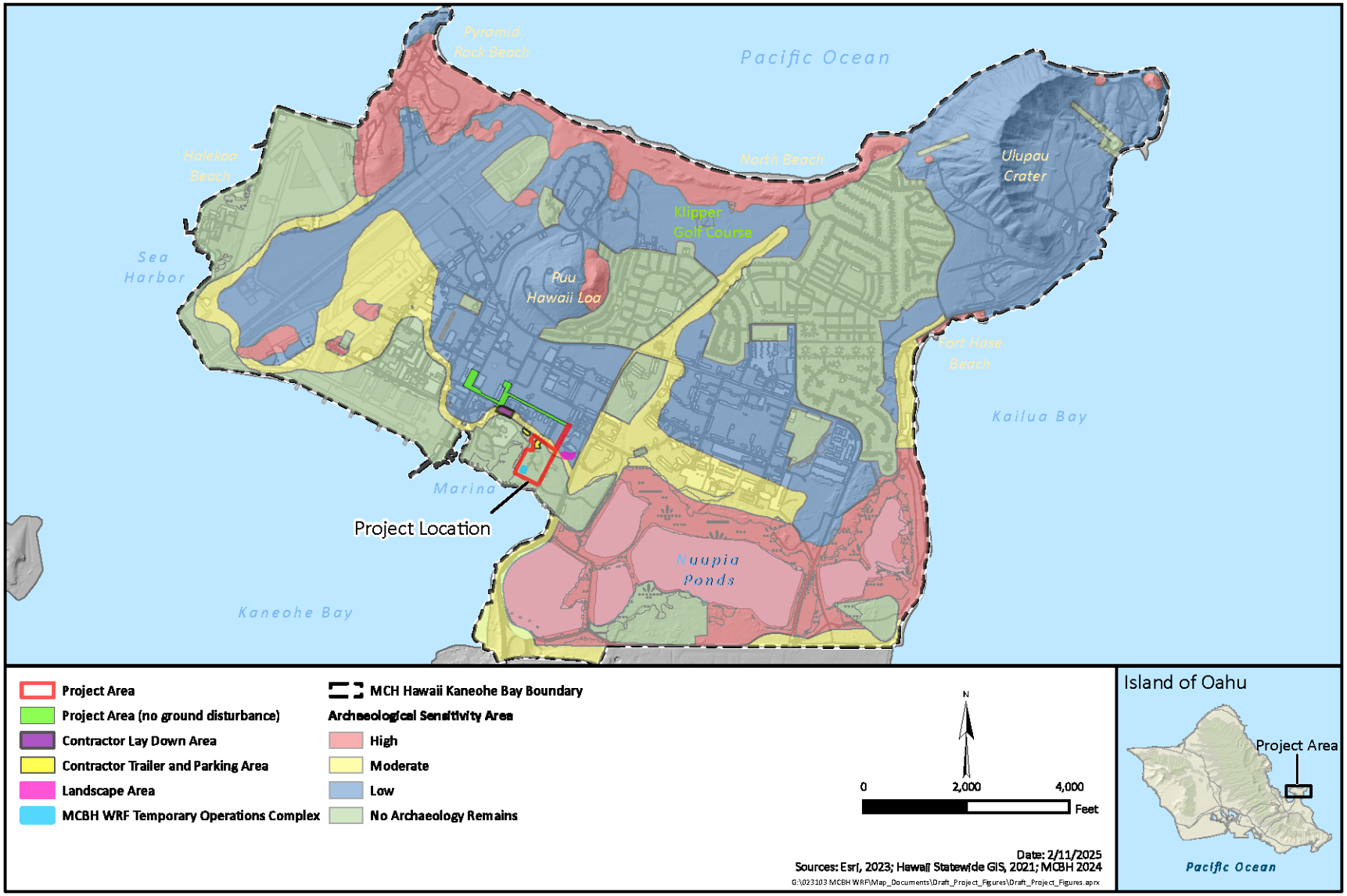

Figure 3.4-2 Archaeological Sensitivity Areas at MCB Hawaii Kaneohe Bay

3.4.1.3 Architectural Resources

There are no historic architectural properties, including districts, structures, buildings, objects, and/or subsurface archaeological sites, in the APE for this undertaking (Tomonari-Tuggle and Clark, 2021). The APE is not located within a historic district nor is it visible from a historic district.

3.4.2 Environmental Consequences

NEPA incorporates NHPA analysis of historic properties as part of the overall evaluation of environmental consequences and also addresses environmental effects to all other categories of cultural resources. NEPA and NHPA are separate statutes that evaluate and address effects differently. For example, effects of a proposed action on a historic property can be "adverse" under the NHPA Section 106 without triggering a determination of "significance" under NEPA, and a proposed action that has been determined to result in no adverse effects to historic properties under NHPA Section 106 of the NHPA can rise to the level of "significance" under NEPA for factors other than effects to historical resources.

The analysis of potential effects to historic properties is based on the following considerations: (1) physically altering, damaging, or destroying all or part of a property; (2) altering characteristics of the surrounding environment that contribute to property significance; (3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or (4) neglecting the property to the extent it deteriorates or is destroyed.

Under Section 106, adverse effects to historic properties must be resolved through measures that avoid, minimize, or mitigate the effects. Under NEPA, potential effects can be mitigated through avoiding, minimizing, or reducing effects, as well as compensating for effects to the human environment. Mitigation of effects to cultural resources, including historic properties as required by Section 106 and NEPA, can reduce those effects below the threshold of concern for NEPA.

3.4.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and there would be no change to cultural resources.

3.4.2.2 Alternative 1

Construction

Archaeological Resources

Construction projects at the WRF include the following activity types: demolishing existing buildings and structures, constructing new buildings and structures, modifying/renovating buildings, repaving, adding fencing, installing underground utilities within the construction footprints, and staging construction equipment. Proposed communications duct bank trenching would occur through the softball field between the WRF and 3rd Street, (see Figure 2-2). The proposed electric feeder cables outside the WRF would utilize an existing conduit and would not involve any ground disturbance. Although primarily located in an area of filled land with no potential for NRHP-eligible archaeological sites to be present, the possibility of fill sand mined from the northern dunes (the Mōkapu Burial Area) containing human remains creates the potential for effects to archaeological resources. Archaeological monitoring would occur during project-related ground-disturbing activities as a BMP consistent with SOP 3, *Work in*

Archaeologically Sensitive Areas, per the MCB Hawaii ICRMP (Tomonari-Tuggle and Clark, 2021). The monitoring would be performed in accordance with an archaeological monitoring work plan that would be reviewed and approved by the MCB Hawaii Cultural Resource Manager. This would incorporate requirements of NAGPRA and applicable SOPs described in the 2021 MCB Hawaii ICRMP (Tomonari-Tuggle and Clark, 2021). Any archaeological resources identified would be considered post-review discoveries under NHPA Section 106, and actions to mitigate effects to those resources would be developed in accordance with 36 CFR 800.13.

For these reasons, Alternative 1 construction would have less than significant effects to archaeological resources.

Architectural Resources

No historic architectural resources would be affected by the construction because no such resources are present within the APE. Therefore, Alternative 1 construction would have no effect to architectural resources.

Operations

As there are no historic structures or known archaeological resources or historic properties within the APE, and the WRF would operate similar to existing conditions, Alternative 1 operations would have no effect to archaeological or architectural resources.

3.5 Terrestrial Biological Resources

Terrestrial biological resources include native and introduced plant and animal species and their habitats. This analysis focuses on species that are important to the function of ecosystems or are protected under federal or state law at the WRF. Biological resources are divided into the following categories: *Vegetation, Wildlife, and Special-status Species.*

- *Vegetation:* Potential project-related effects to existing vegetation may be caused by removal of vegetation during construction, disturbance from vehicle and foot traffic, and indirect sources such as changes to storm water or wastewater volumes and pollutant loads.
- *Wildlife:* Potential stressors to wildlife habitat may include those described above for vegetation and lighting related to construction and operations, nesting/breeding season disturbance, potential wildlife-vehicle or equipment strikes, and changes in the noise environment during construction and operations. Special consideration is given to bird species protected under the Migratory Bird Treaty Act (MBTA) and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds.*
- *Special-status Species* are defined in this EA as species that are listed as threatened or endangered under the ESA and other species of concern as recognized by state or federal agencies. Stressors for special-status species are similar to those described above for vegetation and wildlife but can vary by species (see effect analysis for Special-status Species in Section 3.5.2).

The Marine Corps prepared a Final Biological Assessment (Appendix D) in October 2024 to initiate informal consultation with USFWS, Pacific Islands Office, under Section 7 of the ESA.

3.5.1 Affected Environment

Sections 3.5.1.3 and 3.5.1.4 present an overview of federal and state special-status species, respectively, for the ROI, which is the WRF and the surrounding areas on base and over the immediately adjacent nearshore waters of Kaneohe Bay.

3.5.1.1 Vegetation

The ROI consists mostly of modified landscape with little native vegetative communities within the WRF. The WRF is mostly encompassed by non-native and invasive trees such as koa haole (*Leucaena leucocephala*), kiawe (*Prosopis pallida*), ironwood (*Casuarina equisetifolia*), and Christmas berry (*Schinus terebinthifolius*), as well as guinea grass (*Megathyrsus maximus*). Small amounts of native vegetation occur outside the WRF. Other non-native landscape vegetation consists of a variety of fruit trees, mowed open Bermuda grass (*Cyndon dactylon*) surrounding much of the facility infrastructure, and ornamental plants. The western side of the facility is the Salvage Yard wetland, which is composed of native and non-native wetland-associated vegetation communities such as pickleweed (*Batis maritima*).

3.5.1.2 Wildlife

Wildlife in the ROI includes native and non-native species of birds, reptiles, mammals, and arthropods that are consistent with those species found in a developed and urbanized coastal environment on O‘ahu. Invasive and feral mammalian species in or near the WRF include rats (*Rattus spp.*), cats (*Felis catus*), and mongoose (*Herpestes javanicus*). Several non-MBTA avian species are present within the ROI such as Spotted Dove (*Spilopelia chinensis*), Zebra Dove (*Geopelia striata*), Red-crested Cardinal

(*Paroaria coronata*), Warbling White-eye (*Zosterops japonicus*), Common Myna (*Acridotheres tristis),* and Java Sparrow *(Padda oryzivora).*

Many birds present in the Hawaiian Islands, and all resident seabirds are protected under the MBTA. Regularly observed MBTA-listed species in the WRF are Black-crowned Night Heron or ʻAukuʻu (*Nycticorax nycticorax*), Pacific Golden Plover or Kōlea (*Pluvialis fulva*), Ruddy Turnstone or ʻAkekeke (*Arenaria interpres*), and Western Cattle-egret (*Ardea ibis*). Other common MBTA-listed species include: Northern Cardinal (*Cardinalis cardinalis*), Sanderling or Hunakai (*Calidris alba*), and Wandering Tattler or ʻŪlili (*Heteroscelus incanus*). Ducks observed in the WRF are the MBTA-listed Mallard (*Anas platyrhynchos*) or hybrids of Hawaiian Duck or Koloa Maoli (*Anas wyvillianas*) with Mallards. MBTA-listed birds that have the potential to occur in the WRF include House Finch (*Haemorhous mexicanus*), Northern Pintail (*Anas acuta*), Northern Shoveler (*Spatula clypeata*), and Black Noddy (A*nous minutus*).

3.5.1.3 Special-status Species – Federal

ESA-listed species with the potential to occur in the ROI are listed in Table 3.5-1 and are identified by their common name, Hawaiian name, and regulatory status. The text below provides additional context for the species listed in Table 3.5-1. There is no federally designated critical habitat for any ESA-listed species within the ROI. Given the conservation measures implemented in the 2011 MCB Hawaii Integrated Natural Resources Management Plan, National Oceanic and Atmospheric Administration (NOAA) Fisheries determined that the areas subject to the Integrated Natural Resources Management Plan are precluded from Hawaiian monk seal critical habitat (80 *Federal Register* 50925). Proposed critical habitat for the green sea turtle (*Chelonia mydas*) exist just outside of the ROI, beyond the southern edge of the WRF. There are no federal special-status species plants in the ROI.

Table 3.5-1 Special-status Species Known to Occur or with Potential to Occur in the ROI

Scientific Name	*Common Name*	*Hawaiian Name*	*Regulatory Status*
Birds			
Asio flammeus	Hawaiian Short-eared Owl	Pueo	SE*
Gygis alba	White Tern	Manu o Kū	ST
Himantopus mexicanus knudseni	Hawaiian Stilt	ʻAeʻo	FE, SE
Hydrobates castro	Band-rumped Storm-petrel	ʻAkē ʻakē	FE, SE
Pterodroma sandwichensis	Hawaiian Petrel	ʻUaʻu	FE, SE
Puffinus newelli	Newell's Shearwater	ʻAʻo	FT, ST
Mammals			
Aeorestes semotus	Hawaiian Hoary Bat	ʻŌpeʻapeʻa	FE, SE

Notes: Selections for Regulatory Status column include: FE = federal endangered; FT = federally threatened; ROI = region of influence; SE = state endangered; ST = state threatened.
*The Pueo is state listed as endangered only on the island of Oʻahu.

Source: MCB Hawaii, 2022, 2023b; L. Bookless, personal communication, August 24, 2023.

Waterbirds

The Hawaiian Stilt or *ʻAeʻo* (*Himantopus mexicanus knudseni*) is an endangered wading shorebird that is common in the ROI. They use mudflats, shallow open water, flooded fields, coastal wetlands, and ephemeral bodies of water for nesting, loafing, and foraging. Hawaiian Stilts have been observed on MCB Hawaii Kaneohe Bay, including the ROI, for decades. Behaviors such as loafing, foraging, and

occasional nesting have been observed in the WRF. Nesting occurs from March–August with a peak in May–June, and at MCB Hawaii Kaneohe Bay, Hawaiian Stilt nesting season peaks in June–July (Department of Land and Natural Resources [DLNR], 2015). Hawaiian Stilts have nested twice in the WRF sludge drying beds in the last 5 years. During the January and August Biannual State Waterbird Surveys for the past 5 years in the WRF, the average number of Hawaiian Stilts counted at each seasonal survey event was nine (personal communication, L. Bookless, 2024). Outside of the WRF, Hawaiian Stilts have been routinely recorded foraging in nearby areas, including the entry driveway of the WRF. As many as 15 Hawaiian Stilts have been counted at one time foraging or loafing in the ROI (personal communication, L. Bookless, 2024).

The Hawaiian Gallinule or ʻAlae ʻula (*Gallinula galeata sandvicensis*) and Hawaiian Coot or ʻAlae keʻokeʻo (*Fulica alai*) are endangered waterbirds that regularly nest, loaf, and forage at MCB Hawaii Kaneohe Bay. These waterbirds utilize a variety of freshwater lowland habitats and can be somewhat secretive, although they can be observed swimming across open waters. These waterbirds utilize brackish and saltwater habitats and typically forage in shallow waters. The Hawaiian Coot and Hawaiian Gallinule are rarely observed within developed regions of the base and have not been observed in the ROI. The Hawaiian Duck is also not likely to occur at MCB Hawaii Kaneohe Bay. Since the Hawaiian Gallinule, Hawaiian Coot, and Hawaiian Duck are unlikely to be observed in the project, only the Hawaiian Stilt will continue forward for effect analysis in the waterbird section.

Pertinent to all waterbirds, avian botulism is a paralytic disease caused by ingestion of a toxin produced by a naturally occurring bacteria in the soil. Avian botulism outbreaks have occurred in the WRF from 2014 to 2016 and in 2020, with suspected cases occurring from 2017 to 2019. These outbreaks have resulted in deaths and illnesses of ducks, including the death of one Hawaiian Stilt (during the 2016 outbreak) in the WRF. During outbreak events, MCB Hawaii Kaneohe Bay Natural Resources staff promptly initiate collaborative efforts with U.S. Geological Survey and DLNR to reduce any effects to waterbirds. Monitoring for avian botulism-like symptoms is routinely conducted on MCB Hawaii Kaneohe Bay (MCB Hawaii, 2023b).

Seabirds

The endangered Hawaiian Petrel or ʻUaʻu *(Pterodroma sandwichensis*), threatened Newell's Shearwater or *ʻA*ʻo (*Puffinus newelli*), and endangered Hawaiian distinct population segment of Band-rumped Storm-petrel ʻAkē ʻakē (*Hydrobates castro*) have not been documented within the ROI. However, all three species have the potential to transit near or within the ROI (MCB Hawaii, 2023b).

Hawaiian Hoary Bat

The Hawaiian hoary bat or ʻōpeʻapeʻa (*Aeorestes semotus*) has been detected on a transitory basis at MCB Hawaii Kaneohe Bay but not at the WRF; no roosting sites or nests have been identified on base. Hawaiian hoary bats are a nocturnal solitary species, using echolocation to hunt for insects, typically from dusk until dawn, and roosting individually (rather than in a colony) during the day. They roost in native and non-native trees and forage along the edges of forest and within shrublands and open spaces, including pastures, roadways, forest gaps, and over areas of fresh/brackish water, as well as open saltwater (MCB Hawaii, 2023b). The bats prefer to roost and raise their young in trees that are greater than 15 feet tall. While the species is considered ubiquitous across the state, limited information and data is available regarding their ecology or population status. Surveys completed in 2021, including one site 0.35 miles southeast of the WRF and the Salvage Yard wetland, detected bats during August through December, which overlaps with the reproductive season, but foraging activity was rarely

observed (Pinzari et al., 2021). Despite low detection rates, the WRF may be used by foraging bats and some locations may harbor suitable roost habitat (Pinzari et al., 2021).

3.5.1.4 Special-status Species – State

There are no state special-status species plants in the ROI.

Hawaiian Short-eared Owl

The endemic land-dwelling Hawaiian Short-eared Owl or Pueo (*Asio flammeus*) is state-listed as endangered on O'ahu and found throughout the main Hawaiian Islands. Pueo occupy a variety of habitats but are most commonly observed utilizing open habitats like grasslands or shrublands for foraging and nesting efforts. Pueo are ground-nesting and tend to be more active during the day and crepuscular periods (dawn and dusk) (MCB Hawaii, 2023b). At least seven Pueo were estimated to utilize MCB Hawaii Kaneohe Bay during the 2020–2021 breeding season, and it is likely that the number of Pueo utilizing the area varies between seasons and from year to year (Price Lab, 2022). The study involved global positioning system-very high frequency, tagging of Pueo, recorded observational behaviors such as transitioning within the WRF, and roosting/perching and nesting in areas of MCB Hawaii Kaneohe Bay (Price Lab, 2022).

White Tern

The White Tern or Manu-o-Kū (*Gygis alba*) is state-listed as threatened. White Terns have been observed on MCB Hawaii Kaneohe Bay and have the potential to occur within the airspace, tree canopy, or near the WRF. Breeding adults remain close to nest sites and forage in inshore areas such as shoals and banks with occasional forays into offshore waters. The nests are on tree branches, buildings, or other man-made structures, rock ledges, or on the ground (DLNR, 2015). In Hawai'i, White Terns breed year-round, but most eggs are laid between February and June, with two peaks in egg-laying occurring in March and October (VanderWerf and Downs, 2018). White Terns have not been documented at or around the WRF.

3.5.2 Environmental Consequences

The environmental consequences section below describes the effects of the No-Action Alternative and Alternative 1 (construction and operations) to vegetation, wildlife, and special-status species in the ROI. A detailed analysis of ESA-listed species is in the Final Biological Assessment for the MCB Hawaii Kaneohe WRF (Appendix D).

3.5.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and there would be no change to biological resources.

3.5.2.2 Alternative 1

Construction

Vegetation

The construction of new infrastructure identified in Section 2.1.1 would result in the removal of over 70,000 square feet of landscaped area and vegetation along the perimeter fence line (see Table 2-1), as well as designated sections within the WRF. Minimal vegetation removal would occur for the

communications duct bank trenching (8,000 square feet), which would occur through the softball field between the WRF and 3rd Street (see Figure 2-2). The proposed electric feeder cables outside the WRF would utilize an existing conduit and would not involve any ground disturbance. No notable ecological communities occur in the proposed perimeter fence line area, the communications duct bank trenching, or other portions of the ROI. Site preparation and construction activities would involve the clearing of non-native trees and scrub along the perimeter and eastern edge of the WRF in mostly previously disturbed and landscaped areas, in addition to landscaped grass areas among the existing infrastructure. Within the proposed perimeter fence line of the WRF, roughly 17,000 square feet of landscaped grass and scrub at the entrance would be cleared and utilized as a trailer and vehicle parking area. In addition, two portions of landscaped grass to the west of the WRF would be utilized as contractor lay down areas and trailer and parking areas during construction. As referenced in the BMPs, landscape areas (20,000 square feet) containing native plants for restoration efforts for new or renovated facilities, are located to the east of the WRF.

Vegetative restoration would include landscape and maintenance efforts in accordance with the MCB Hawaii Landscape Manual. The only plants permitted for landscaping use are identified on an approved list within the manual; non-approved landscaping plants must be reviewed and approved by MCB Hawaii Natural Resources staff (MCB Hawaii, 2023b). With the removal of mostly non-native trees and scrub in the ROI, and the vegetative restoration required by the MCB Hawaii Landscape Manual, the construction activities would have less than significant effects to vegetation.

Wildlife

Effects identified for birds generally apply to all species present. Unique effects specific to individual species or groups of birds are further detailed where applicable. The effect analysis below details the following "stressors" that can affect wildlife: habitat, water quality, strike, fallout/disorientation, and noise disturbance. Deterrents would be used during the construction period to discourage wildlife from occupying construction areas and to minimize potential negative effects to wildlife, although deterrents used on most bird species would not apply to the Hawaiian Stilt (see detailed discussion below). Examples of a variety of physical, chemical, and visual bird deterrents are discussed in Table 2-2.

Habitat

The entire perimeter of the WRF would be cleared of vegetation (over 70,000 square feet) in preparation for fence installment. The removal of non-native dominant trees effect Western Cattle-egrets and Black-crowned Night Herons that currently utilize the trees for loafing and roosting. The addition of parking spaces at the WRF would remove landscaped grassy areas which serve as foraging grounds, loafing areas, and potential nesting sites for waterbirds. Wildlife would be flushed from existing habitat, such as the clarifier and polishing pond, throughout the construction process. Effects to habitat would be moderate as existing species are mobile and similar habitat is adjacent to the WRF. When disturbances from construction activities occur, wildlife would be able to temporarily leave the immediate area of construction and relocate to the nearby Salvage Yard wetland.

Water Quality

Standing water attracts avian wildlife such as waterbirds and Western Cattle-egrets. Although ponding water is already present in the WRF, BMPs would be implemented to minimize potential effects to wildlife. This includes a biological monitor at WRF who would check the area for standing water and alert the contractor to eliminate water as quickly as possible (see Table 2-2). Construction activities would comply with MS4 permit requirements and the existing Storm Water Management Plan (MCB

Hawaii, 2023a), thereby minimizing effects to water quality. In addition, BMPs such as the use of bioretention techniques, vegetated swales and filter strips, and retention basins would further minimize effects. Such protocols would ensure that federal and state water quality standards remain in compliance and the waters of Kāneʻohe Bay and Salvage Yard wetland are not affected.

Strike

A bird strike is a collision between an airborne animal and a moving vehicle, building, or infrastructure, such as power lines (MCB Hawaii, 2023b). Minimal risk of injury or death due to strike during construction is expected, as BMPs described above to prevent temporary ponding and excess lighting would minimize attraction of birds to the construction area thereby minimizing risk of strike.

Fallout/Disorientation

Seabird fallout can occur when unnatural lighting at night attracts and disorients birds to areas that may place them in dangerous conditions leading to their injury or death, as well as increased risk for potential bird aircraft strikes. Many bird species are attracted to facilities with lights, therefore lighting use during nighttime construction is a potential stressor to nocturnal or light-sensitive species. To minimize this potential effect, night work would be minimized during proposed construction (see Table 2-2). If lighting is required during construction, all exterior lights would meet or exceed MCB Hawaii, USFWS, NOAA, and/or International Dark-Sky Association standards for exterior lighting and the type of work to be undertaken (MCB Hawaii, 2022). Additional BMPs to further reduce risk of fallout include the elimination of lighting on the top of buildings and relocating lights as close to the ground as possible (see Table 2-2). In addition, all on-site contractors would be briefed on how to conduct construction in the presence of light-attracted bird species (L. Bookless, personal communication, March 6, 2022). Effects from lighting on seabirds in the WRF would have less than significant effect due to MCB Hawaii Kaneohe Bay BMPs.

Noise Disturbance

Construction-related noise may temporarily displace wildlife from habitat in the immediate vicinity of the noise source in the ROI; however, the habitat in the ROI consists of mostly WRF-related infrastructure and landscaped area. Although the construction is expected to be implemented over a 3-year period, construction would occur in areas where existing machinery and equipment are in regular use. In these areas, wildlife has either adapted to the routine noise of the equipment or would temporarily relocate from construction areas to adjacent habitat, such as the neighboring Salvage Yard wetland. To mitigate noise disturbances, sound barriers would be installed around generators during the construction operations.

For the reasons listed above, Alternative 1 construction would have less than significant effects to wildlife.

Special-status Species

Special-status species in the ROI would be subject to a variety of physical disturbances during construction. A detailed analysis of ESA-listed species is in the Final Biological Assessment (Appendix D).

Special-status Species – Federal

Waterbird

Proposed construction would potentially disturb Hawaiian Stilts by adding stressors related to standing water, trenching and holes, demolition, noise, lighting, and water quality. These effects would be minimized with BMPs and conservation measures such as those described in Table 2-2. Specifically, effects associated with standing water would be reduced with measures for storm water management such as diversion features to enhance water flow to nearby wetlands, removing standing water once discovered, and incorporating storm water LID designs. To further reduce effects, open trenches and holes would be covered at the end of the workday. BMPs such as prevention of standing water and use of a full-time biological resources monitor during construction would minimize the potential for effects to Hawaiian Stilts (see Table 2-2). A fence would be installed at the demolition site to prevent Hawaiian Stilt chicks accessing the WRF from the adjacent wetland, and bird species other than the Hawaiian Stilt would be deterred using a combination of mitigations to make the area uninviting for nesting, foraging, or loafing birds. Vegetation at the WRF would be maintained at a height not to exceed 3 inches within all landscaped regions, and all vegetation would be removed from within sludge beds. In addition, a dust barrier would be installed and a variety of storm water management BMPs would be used to further reduce risks to Hawaiian Stilts. Construction would occur at previously developed and actively used areas where machinery is in regular use and occasionally create a noise environment consistent with a construction area, so birds have either adapted to the general noise construction areas or would temporarily relocate from the construction areas to adjacent similar habitats. To further reduce this disturbance, sound barriers around generators would be installed where possible, and nighttime work would be limited. Work lights are required during periods when night work is conducted. While not the norm, some elements of the construction project may require 24/7 operations to complete critical component replacement in as short a time as possible. To reduce this disturbance, the facility would implement a variety of wildlife-friendly lighting standards such as installing fixtures low to the ground, be recessed, pointed downward, using long wavelength light sources, and shielding lights.

Seabirds

The effects from construction to the Hawaiian Petrel, Newell's Shearwater, and Hawaiian Band-rumped Storm-petrel from lighting and noise are as described above for general wildlife. For the reasons listed there, Alternative 1 construction would have less than significant effects to seabirds.

Hawaiian Hoary Bat

As discussed above, the construction activities in the WRF involve the removal of non-native dominated trees along the perimeter. While the Hawaiian hoary bat has the potential to forage or roost in the trees surrounding the WRF, no documentations of such behaviors have been recorded (Pinzari et al, 2021). The sporadically located trees are not suitable for Hawaiian hoary bat due to a lack of closed canopy which the bat seeks for protection from environmental factors. Tree trimming/removal activities are required to be done outside of the hoary bat pupping season (June 1–September 15). Considering the absence of bats on the ROI and BMPs (such as no tree trimming/removal during the pupping season), Alternative 1 construction would have less than significant effects to Hawaiian hoary bats.

Special-status Species – State

Hawaiian Short-eared Owl

Although Pueo have been recorded (via global positioning system trackers) transitioning through the ROI, presence of this species in the WRF during construction activities is unlikely. If adults, nests, or chicks are found and/or flushed out during construction activities, personnel must stop work and inform MCB Hawaii Natural Resources staff of the species' presence (Price Lab, 2022). The effects to the Pueo from noise are as described above for general wildlife. Therefore, Alternative 1 construction would have less than significant effects to the Pueo.

White Tern

White Terns have the potential to occur in the tree canopy or other areas at and around the WRF. Tree trimming activities would avoid the peak egg-laying/nesting months (March and October) and nest surveys would be conducted prior to tree removal, pruning, or trimming activities. If a tree scheduled for removal or trimming is found to contain a nest, the tree would not be disturbed until the chicks have fledged (approximately 48 days) (MCB Hawaii, 2023b). The effects to the White Tern from noise are as described above for general wildlife. Therefore, Alternative 1 construction would have less than significant effects to the White Tern.

Operations

Vegetation

The operations of new infrastructure would result in additional infrastructure and treatment facilities in the WRF. Vegetation management in the WRF would continue to include maintenance of landscaped grass and ornamental plants. Vegetation management efforts would be in accordance with the MCB Hawaii Landscape Manual. The approved landscaped plants would include native vegetation, which require less water, fertilizer, and chemicals (MCB Hawaii, 2023b). Such sustainable methods of vegetation management would improve ecosystem functions such as water conservation, erosion control, filtration of non-point source pollution from storm water runoff, and noise absorption. Regular vegetation clearing along the fence line would be necessary for safety and security of facility operations. Trees would be removed or trimmed along the perimeter fence of the WRF to create clear zones, with the exception of the western fence in order to not disturb vegetation along the Salvage Yard wetland. Given the regular maintenance of landscaped areas, Alternative 1 operations would have less than significant effects to vegetation.

Wildlife

The effect analysis below details the following "stressors" that can affect wildlife: habitat, water quality, strike, fallout/disorientation, and noise disturbance. Deterrents would be used during operational activities to discourage wildlife from occupying operational areas and to minimize potential negative effects to wildlife. Examples of a variety of physical, chemical, and visual bird deterrents are discussed in Table 2-2.

Habitat

The entire perimeter of the WRF would be regularly cleared of vegetation from the fence line area. With the reduction of trees within and along the perimeter of the WRF, the area is less attractive for Western Cattle-egret to roost and loaf in the ROI. Until the existing sludge beds are no longer needed and are removed, they will be kept free of vegetation to discourage nesting. The additional parking spaces could

create more consistent flushing of wildlife from foraging in the landscaped grass. Additionally, vegetation would be maintained to reduce the attraction of birds to the area for nesting purposes. Deterrents would also flush out wildlife from current habitat, such as the polishing pond and clarifiers, which are used by wildlife for resting, loafing, and foraging grounds. Existing species are mobile and similar habitat is adjacent to the WRF. When disturbances from operational activities occur, wildlife would be able to vacate the WRF and relocate to the nearby Salvage Yard wetland.

Water Quality

Standing water attracts avian wildlife such as waterbirds and Western Cattle-egrets. Although ponding water is already present in the WRF, BMPs would be implemented to minimize potential effects to wildlife. This includes a biological monitor at WRF who would check the area for standing water and alert the contractor to eliminate water as quickly as possible (see Table 2-2). Operational activities would comply with MS4 permit requirements and the existing Storm Water Management Plan, thereby minimizing effects to water quality (MCB Hawaii, 2023a). In addition, BMPs such as the use of bioretention techniques, vegetated swales and filter strips, and retention basins would further minimize effects. Such protocols would ensure that federal and state water quality standards remain in compliance and the waters of Kāneʻohe Bay and Salvage Yard wetland are not affected.

Fallout/Disorientation

Lighting during nighttime operations is a potential stressor to nocturnal or light-sensitive species. To minimize this potential effect, MCB Hawaii incorporates wildlife friendly lighting (see Table 2-2). Lights would meet or exceed MCB Hawaii, USFWS, NOAA, and/or International Dark-Sky Association standards for exterior lighting and the type of work to be undertaken. Additional BMPs to further reduce risk of fallout (see Table 2-2) include the elimination of lighting on the top of buildings and relocating lights as close to the ground as possible.

Strike

Minimal risk of injury or death due to vehicle or equipment collisions during operations is expected. BMPs described above to prevent temporary ponding and excess lighting would minimize attraction of birds to the operational areas thereby minimizing risk of strike.

Noise Disturbance

Operations noise may temporarily displace wildlife from habitat in the immediate vicinity of the noise source in the ROI; however, the habitat in the ROI consists mostly of WRF-related infrastructure and previously disturbed areas. Wildlife in the ROI are acclimated to existing operations noise at the WRF. Noise from newly constructed machinery and equipment would be the same as existing operational noise and thus not noticeably increase noise from operations.

For the reasons listed above, Alternative 1 operations would have less than significant effects to wildlife.

Special-status Species

A summary analysis for each special-status species is presented below for effects associated with the facilities operation at the WRF MCB Hawaii Kaneohe Bay.

Special-status Species – Federal

Waterbird

Proposed operations could result in new stressors related to standing water, noise, lighting, water quality, sludge drying beds, and the secondary clarifier. The sludge drying beds and secondary clarifier could attract Hawaiian Stilts. To reduce this risk, the sludge beds will be kept free of vegetation to make the beds less inviting to Hawaiian Stilts for nesting (see Table 2-2). Should Hawaiian Stilts nest in the drying beds, the biological monitor shall implement an appropriate stand-off distance to avoid disturbing the nesting birds, and the sludge beds will not be used until the chicks have hatched, fledged, and left the area. A variety of deterrents would be used to reduce effects from the secondary clarifier, such as netting, predator decoys, and noises. In addition, BMPs would be implemented to minimize the potential for effects to Hawaiian Stilts (see Table 2-2). These include the proposed bird deterrents and barriers, nest and chick protocols, and use of a full-time biological resources monitor as identified in Table 2-2. To minimize potential lighting effects, the facility would implement a variety of wildlife-friendly lighting standards such as installing fixtures low to the ground, be recessed, pointed downward, using long wavelength light sources, and shielding lights.

Seabirds

The effects from operations to the Hawaiian Petrel, Newell's Shearwater, and Hawaiian Band-rumped Storm-petrel from lighting and noise are as described above for wildlife. Therefore, Alternative 1 operations would have less than significant effects to seabirds.

Hawaiian Hoary Bat

Any operational tree trimming/removal would be required to occur outside of the hoary bat pupping season (June 1–September 15) to reduce risk of injury, death, or disturbance to Hawaiian hoary bats as discussed in Table 2-2. The main stressor for the Hawaiian hoary bat would be barbed wire placed on top of the compound fence. The compound is enclosed with chain-link fence and has been for decades. The fence does not currently have barbed wire; however, it may be installed on the fence as part of the WRF expansion project. Approximately 2,100 linear feet of security fencing would include three strands of barbed wire fencing, totaling approximately 6,300 linear feet. Based on the USFWS formula to determine potential bat take, the barbed wire fence would not result in a take during the life of the fence. The effects to the Hawaiian hoary bat from lighting and noise are as described above for wildlife. Therefore, Alternative 1 operations would have less than significant effects to Hawaiian hoary bats.

Special-status Species – State

Hawaiian Short-eared Owl

If adult Pueo, nests, or chicks are found and/or flushed out during operational activities, personnel must stop work and inform MCB Hawaii Kaneohe Bay Natural Resources staff of the species' presence (Price Lab, 2022). The effects to the species from noise are as described above for general wildlife. Therefore, Alternative 1 operations would have less than significant effects to the Pueo.

White Tern

Any routine tree trimming activities would avoid the peak egg-laying/nesting months (March and October) and nest surveys would be conducted prior to tree removal, pruning, or trimming activities. If a tree scheduled for removal or trimming is found to contain a White Tern nest, the tree would not be disturbed until the chicks have fledged (approximately 48 days) (MCB Hawaii, 2023b). The effects to the

White Tern from noise are as described above for general wildlife. Therefore, Alternative 1 operations would have less than significant effects to the White Tern.

3.6 Utilities

The term "utilities" refers to infrastructure supplying MCB Hawaii Kaneohe Bay with electrical power, potable water, wastewater, storm water, solid waste, and information technology/communications. This section describes the existing conditions of utilities and discusses potential effects to utility capacity and services that could result from implementation of Alternative 1.

3.6.1 Affected Environment

This section describes the existing conditions for utilities and associated infrastructure. The ROI for utilities includes electrical power, potable water, wastewater, storm water, solid waste, and information technology/communications areas in the ROI. The utilities include the existing WRF (west of the main WRF entry gate and southeast of the marina), existing support facilities (to the north), power substation facilities and the main gate (to the east), locations of construction staging areas, and locations of the proposed support facilities. Table 3.6-1 describes the existing conditions of each utility system. There are currently no utilities deficiencies identified in operating the existing WRF.

Table 3.6-1 Existing Conditions for Utilities at MCB Hawaii Kaneohe Bay

Utility	*Existing Conditions*
Electrical Power	• Hawaiian Electric Company services and maintains MCB Hawaii electrical power and associated infrastructure. • The electrical power system includes overhead transmission lines, substations, and distribution lines. • Electrical tie-ins are present at the existing WRF. • MCB Hawaii is currently undertaking two electrical system modernization projects. Phase 1 is currently underway and will be completed by 2026, and Phase 2 will commence in 2026 and be completed by 2030. The projects will involve the repair and update of components of the electrical distribution system on base, including substations, switch stations, and electronic controls and sensors servicing the WRF. • MCB Hawaii generates 5 MW of solar energy on base, with initiatives to support an additional 1.5 MW of solar generation. • Generators for the existing and new plants are used for backup power.
Potable Water	• The City and County of Honolulu Board of Water Supply provides potable water. • Groundwater sources supplying water to the MCB Hawaii system include the Kaluanui Wells, Ma'akua Well, Punalu'u Wells II, and Waihe'e Tunnel. • MCB Hawaii Kaneohe Bay owns and maintains a potable water distribution system that delivers water to tenants throughout the base. • The State of Hawai'i approves the use of recycled wastewater for landscape irrigation. The existing effluent chlorination system is currently inactive, so recycled water is no longer being used at Klipper Golf Course for irrigation.

Utility	*Existing Conditions*
Wastewater	• The WRF is the only means for treating wastewater at MCB Hawaii Kaneohe Bay and is designed to accommodate an average daily flow of 2 mgd. • Treated effluent is pumped to the Kailua Regional Wastewater Treatment Plant outfall for ocean disposal using the existing effluent pump system (i.e., Effluent Outfall 001). This is done in accordance with the NPDES wastewater permit. • The existing effluent chlorination system is currently inactive. • MCB Hawaii Kaneohe Bay has a separate sanitary sewer system. In this system, one set of pipes collects wastewater from tenants to deliver to the WRF for treatment.
Storm Water	• On-base storm water is directed to the MS4 through separate pipes. Typically, the WRF does not treat storm water; however, during heavy rain events, the volume of water treated at WRF increases due to infiltration and inflow issues within the sanitary sewer collection system.
Solid Waste	• MCB Hawaii Kaneohe Bay maintains the MCB Hawaii Recycling and Waste Management Center, and one of three permitted solid waste landfills on Oahu. These facilities serve MCB Hawaii Kaneohe Bay tenants. All treated wastewater sludge from the WRF is taken to the solid waste landfill on base. • Green waste from on-base units and tenants is accepted at the MCB Hawaii Kaneohe Bay landfill; other green waste is disposed of off base. The private landfill in Waiʻanae is the only permitted C&D debris landfill on Oʻahu. All construction waste generated at MCB Hawaii Kaneohe Bay is disposed of at the private landfill. • The private landfill accepts up to 3,000 tons of C&D waste per day, of which approximately 80 percent is reused or recycled using their sorting facility (2024).
Information Technology/Communications	• MCB Hawaii Kaneohe Bay S-6 provides secure telecommunications to the installation in support of 21st-century voice, data, and video requirements. • MCB Hawaii Kaneohe Bay S-6 IT/COMM infrastructure currently services the existing WRF. • The IT/COMM systems typically consist of cables within buried conduit, encased in concrete, and running between manholes/handholes.

Legend: C&D = construction and demolition; DOH = Hawaiʻi Department of Health; IT/COMM = information technology/ communications; MCB = Marine Corps Base; mgd = million gallons per day; MS4 = Municipal Separate Storm Sewer System; MW = megawatt; NOVO = Notice of Violation and Order; NPDES = National Pollutant Discharge Elimination System; PVT = PVT Land Company, Ltd.; WRF = Water Reclamation Facility

3.6.2 Environmental Consequences

The effect analysis for utilities compares the existing capacity and demand on a utility to the projected capacity and demand needed for construction and operation of the upgraded WRF under Alternative 1. The effects analysis evaluates the potential for effects to utility infrastructure.

3.6.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur. This would result in an increased potential for discharges to occur that do not meet water quality standards and permit requirements for operation of the existing WRF. As a result, the No-Action Alternative would potentially adversely affect utilities.

3.6.2.2 Alternative 1

Table 3.6-2 describes the effects to each utility as a result of Alternative 1. For the reasons presented in Table 3.6-2, including lack of increased utilities demand and that all utility systems have adequate capacity to support the proposed action, Alternative 1 construction and operations would have beneficial but less than significant effects to utilities.

The proposed action would result in an increase of five personnel, which would not have a notable change to utilities demand at the installation. In addition, the upgraded WRF would provide the capability to reuse treated wastewater, thereby reducing overall potable water demand at the base. No change would occur to the pipe distribution system between the WRF and the Klipper Golf Course. The R-1 recycled water would be used for irrigation at the Klipper Golf Course, thus reducing overall water demand from the City and County of Honolulu Board of Water Supply. Any treated water not meeting R-1 quality would not be reused at the golf course; it would be managed using current processes. Irrigation of the Klipper Golf Course with R-1 quality recycled water would potentially divert up to 1 mgd from being discharged through the municipal outfall, with the actual amount of treated effluent diverted for irrigation purposes based on the daily needs of the Klipper Golf Course.

Table 3.6-2 Summary of Effects to Utilities

Utility	*Construction*	*Operation*
Electrical Power	• Existing users may experience short-term electrical power outages during construction activities as the WRF is brought online. • Potential outages would be brief and occur during daylight hours. • BMPs such as providing advance notice of expected outages to customers, would be implemented to minimize the effects of these disruptions. • Generators for construction would be used for backup power. Electrical power disruptions from construction would have a negligible effect to the current system and customers. • All utility systems have adequate capacity to support the proposed action.	Generators for the upgraded WRF would be used for backup power. Alternative 1 would result in beneficial effects to electrical power through electrical utility upgrades, consolidation of buildings/structures, and incorporation of energy-efficient design to reduce the overall electrical usage of the WRF. All utility systems have adequate capacity to support the proposed action.
Potable Water	• Water use during construction and operations of the WRF would not exceed the system capacity or result in any disruption of service for existing users. • No change would occur to the pipe distribution system between the WRF and the Klipper Golf Course. • All utility systems have adequate capacity to support the proposed action.	Alternative 1 would result in beneficial effects to potable water use at MCB Hawaii Kaneohe Bay as a result of reduced water use of the upgraded WRF and with reuse of R-1 recycled water for irrigation purposes. In addition, the R-1 system would allow use of in-plant water for WRF operations and maintenance (e.g., lubrication, wash downs), which would reduce potable water use at the facility. All utility systems have adequate capacity to support the proposed action.

Utility	*Construction*	*Operation*
Wastewater	• During construction of the upgraded WRF, the WRF would remain operational and continue to treat MCB Hawaii wastewater in a manner consistent with the NPDES wastewater permit effluent requirements. • Portable toilets would be provided for the construction workforce. The toilets would be routinely emptied, and the sewage would be treated at the WRF. • All utility systems have adequate capacity to support the proposed action.	Alternative 1 would result in beneficial effects to wastewater because of: • Improved water treatment from secondary to tertiary treatment, allowing disinfection for 100 percent of the effluent treated by the system and thereby improving the quality of the treated water. • Increased capacity and efficiency of the WRF to accommodate higher peak flows and store and treat up to 10 mgd during heavy rain events. • Improvement of treated wastewater to achieve R-1 level water (the highest grade of recycled water). • Ability to reuse R-1 level water at the Klipper Golf Course, reducing the overall water demand from the City and County of Honolulu Board of Water Supply at MCB Hawaii Kaneohe Bay. • Resolution of issues related to the single-train treatment process by providing redundancy in the system that allows for effective operations while components are offline for repair or maintenance, increasing the efficiency of the system. • No changes or modifications to the ocean outfall or its use would occur, and the treated effluent would continue to be discharged to the ocean outfall in the same manner as is currently done. All utility systems have adequate capacity to support the proposed action.
Storm Water	• Construction BMPs, including compliance with the requirements of the MS4 permit, applicable SWPPP, use of storm drain filter socks, and use of LID techniques to avoid, prevent, and/or contain contamination of water resources, would minimize effects to storm water. • All utility systems have adequate capacity to support the proposed action.	• Upgraded storm water conveyance and management systems would accommodate increases in storm water due to an increase in impervious surfaces from the paving of roads and walkways. • Upgraded water and sewer utilities, gravity and pressure pipelines, and WRF would facilitate compliance with the MS4 permit. No modifications or changes in ocean outfall use would occur. Alternative 1 would include installation of LID features that would reduce storm water discharge on base. Therefore, with the implementation of BMPs in Table 2-2, Alternative 1 would result in beneficial effects to storm water. • All utility systems have adequate capacity to support the proposed action.
Solid Waste	• Construction of Alternative 1 would generate solid waste typical of standard	Operations under Alternative 1 would result in a negligible increase in solid waste generated by

Utility	*Construction*	*Operation*
	construction projects, such as building materials and plumbing or electrical materials. Solid waste would be managed consistent with the MCB Hawaii Recycling and Waste Management Center Recycling and Waste Guide. This would address locations where solid waste containers would be provided during construction and procedures for waste collection, handling, and off-base disposal. Construction and demolition materials would be disposed of at the PVT Landfill in Waianae and would not affect capacity or services at the MCB Hawaii landfill. Green waste and other materials that can be diverted from the landfill would be managed separately and would be disposed of off base. With the implementation of these measures, effects would be negligible. • A solid waste management plan would be prepared for construction addressing the waste disposed and recycled. • All utility systems have adequate capacity to support the proposed action.	the WRF and support facilities. All treated wastewater sludge from the WRF would continue to be taken to the solid waste landfill on base. The existing solid waste management system has sufficient capacity to accommodate operations of Alternative 1. Therefore, Alternative 1 would have less than significant effects to solid waste. All utility systems have adequate capacity to support the proposed action.
Information Technology/ Communications	• Construction of Alternative 1 could result in a one-time, short-duration outage as a result of installation of new IT/COMM infrastructure and tie-in of new service. BMPs such as providing advance notice of expected outages to customers would be implemented to minimize the effects of these disruptions. • All utility systems have adequate capacity to support the proposed action.	Operations under Alternative 1 would not result in effects to IT/COMM. The existing IT/COMM has sufficient capacity to accommodate the requirements of Alternative 1. Therefore, Alternative 1 would have no significant effects to IT/COMM. All utility systems have adequate capacity to support the proposed action.

Legend: BMP = best management practice; IT/COMM = information technology/communications; LID = Low Impact Development; MCB = Marine Corps Base; mgd = million gallons per day; MS4 = Municipal Separate Storm Sewer System; NPDES = National Pollutant Discharge Elimination System; PVT = PVT Land Company, Ltd.; SWPPP = Storm Water Pollution Prevention Plan; WRF = Water Reclamation Facility

3.7 Transportation

The discussion of transportation involves effects to off-base and on-base roadways, bus routes, bikeways, pedestrian facilities, and the two access gates into MCB Hawaii Kaneohe Bay.

3.7.1 Affected Environment

Figure 3.7-1 shows the transportation ROI, which is the network immediately outside MCB Hawaii, the road system internal to the installation, the two access gates, and public transit elements in the vicinity. The road system consists of interstates, state roads, county roads, and roads internal to the installation managed by MCB Hawaii Kaneohe Bay.

3.7.1.1 Roadway Characteristics

External Roadways

Vehicle traffic into MCB Hawaii Kaneohe Bay is achieved by using the H-3 interstate federal highway, which connects from the H-1 in Aiea and runs east to MCB Hawaii Kaneohe Bay Main Gate. Other state and county roads provide access routes to the Base. These roadways and roadway characteristics are listed in Table 3.7-1.

Table 3.7-1 External Roadway Characteristics

Roadway	*Description*	*Road Type (HDOT, 2024a)*	*# of Lanes*	*2022 AADT (HDOT, 2024b)*	*Peak Hour Traffic*
H-3 (Between MP 14.86 and 15.316)	From Halawa, around Kaneohe, and to MCB Hawaii Kaneohe Bay Main Gate	Interstate	Four–six (two–three in each direction)	14,386	Not available
Mokapu Road (Route 6015 between MP 0 and 0.598)	From Intersection of Kaneohe Bay Drive north to MCB Hawaii Kaneohe Bay Mokapu Gate (Back Gate)	Major collector	Four (two in each direction)	9,500	Not available
Mokapu Blvd. (Route 65 between MP 3.29 and 4.148)	From the intersection of Oneawa Street north to Mokapu Road	Principal arterial	Four (two in each direction)	9,900	Not available
Kaneohe Bay Drive (Route 6511 Between MP 0 and 2.587)	From Mokapu Saddle Road north the MCB Hawaii Kaneohe Bay	Major collector	Two (one in each direction)	9,700	Not available

Roadway	*Description*	*Road Type (HDOT, 2024a)*	*# of Lanes*	*2022 AADT (HDOT, 2024b)*	*Peak Hour Traffic*
North Kalaheo Ave. (Route 6012 Between MP 0 and 2.114)	From Kailua Road north to Mokapu Road	Major collector	Two (one in each direction)	12,700	Not available

Notes: HDOT Federal-Aid Classification Update (HDOT, 2012). No updated guidance provided as this document was based on the 2010 census figures; AADT is a basic measurement that indicates vehicle traffic load on a road segment. AADT estimates the mean traffic volume across all days for a year for a given location along a roadway.

Legend: AADT = annual average daily traffic; HDOT = Hawaii Department of Transportation; MP = mile post; MCB = Marine Corps Base Hawaii

On-Base Roadways

Roadways that are in the immediate area of the ROI and are potential construction delivery haul routes include:

- From the Main Gate: Travel on G Street to take the first left at 3rd Street, then the first left turn onto [insert name], followed by a right turn onto [insert name], and the driveway for the WRF is on the left.

The on-base roadways and roadway characteristics are listed in Table 3.7-2.

Table 3.7-2 On-Base Roadway Characteristics

Roadway	*Description*	*# of Lanes*	*2022 AADT*	*Peak Hour Traffic*
G Street	Main road from Main Gate; principal arterial	Four (two in each direction)	TBP	Not available
3rd Street	Principal arterial	Two (one in each direction)	TBP	Not available
1st Street	Arterial	Two (one in each direction)	TBP	Not available
Mokapu Road	Principal arterial	Four (two in each direction)	TBP	Not available

Legend: AADT = annual average daily traffic; TBP = to be provided.

3.7.1.2 Bus Routes

Honolulu County public bus routes connect throughout the island of O‘ahu (City and County of Honolulu, 2023a). There are no county bus stops on MCB Hawaii Kaneohe Bay (City and County of Honolulu, 2023b). The bus routes closest to MCB Hawaii Kaneohe Bay are Route 61, which runs east to west along Kaneohe Bay Drive, and Route 66, which runs north to south between Kailua and the Base. Routes 85 and 87 run from downtown Honolulu. Bus route PH4 starts from Pearl Habor into Kāne‘ohe to Kailua. The distance from the nearest bus stop to the main gate is approximately 0.8 mile. The distance from the nearest bus stop to the Mokapu Gate is approximately 1 mile.

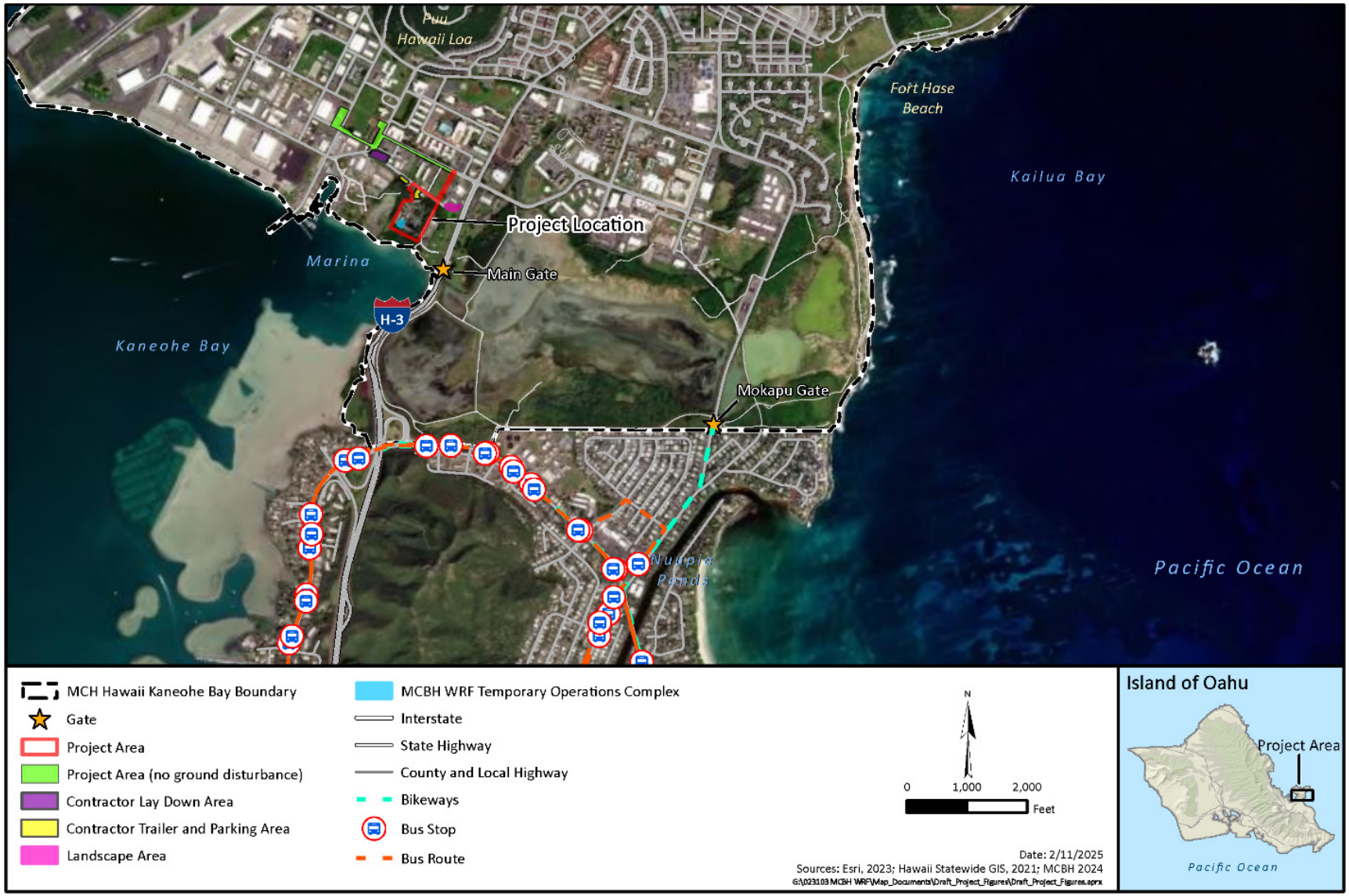

Figure 3.7-1 Roadways near MCB Hawaii Kaneohe Bay

3.7.1.3 Bike Ways and Pedestrian Facilities

The existing bikeway network includes a variety of shared use paths, bike lanes, and bike routes shared with roadways throughout Kāneʻohe, Kailua, and the MCB Hawaii Kaneohe Bay (City and County of Honolulu, 2019). A shared bikeway and pedestrian use path along the east side of H-3 between Kaneohe Bay Drive and MCB Hawaii Kaneohe Bay main gate can be used from the nearest bus stop. Another bike route along a shared roadway is from Kaneohe Bay Drive between Mokapu Road and H-3. These bikeways connect other bikeways within the Kailua community. Pedestrian facilities on-base and off-base include sidewalks and crosswalks.

3.7.2 Environmental Consequences

3.7.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and there would be no change to transportation.

3.7.2.2 Alternative 1

Construction

Under Alternative 1, construction traffic would occur on the segment of the H-3 freeway between the Mōkapu Interchange and the MCB Hawaii Kaneohe Bay main gate. Construction traffic would be required to enter and exit the installation through the main gate. The Marine Corps estimated construction traffic using a recent comparable construction project (Mōkapu Elementary School improvements) would be approximately 68 additional vehicle trips per day entering and exiting the installation at the main gate in the morning and afternoon peak periods, representing a 7% increase over normal conditions if all traffic were to occur in the same hour (MCB Hawaii, 2021b). While such an increase could cause minor delays in entering the base, it is similar to fluctuations that occur with other construction projects at MCB Hawaii Kaneohe Bay and are accommodated without affecting H-3 traffic (MCB Hawaii, 2021b). The entrance to the main gate is at the end of the H-3 and approximately 0.5 miles from the last H-3 exit. Construction traffic would be considerably less than 1 percent of average daily traffic volume on H-3 and have no effect to H-3 traffic, which averages 13,400 trips per day. As such, only traffic entering MCB Hawaii Kaneohe Bay would be minimally affected by the proposed action and would not change the LOS of H-3 off base during peak or non-peak hours. Construction vehicles and equipment would be limited to entering the installation through the main gate, so project construction would not affect the off-base neighborhood near Mōkapu gate. A Hawaiʻi Department of Transportation (HDOT) permit would be required to transport oversized equipment and overweight vehicles on state roadways, such as the H-3.

For these reasons, Alternative 1 construction would have less than significant effects to transportation outside MCB Hawaii Kaneohe Bay.

Operations

Operations would see an increase of five personnel. Additional personnel are anticipated to live off base in levels consistent with existing conditions; as such, no effects to off-base road networks are anticipated. As a result, the change in traffic for personnel commuting or driving in the community would not change the LOS of H-3 average daily traffic volumes. In addition, this would not represent a substantial change from personnel working on base, and the amount and type of operational vehicle traffic (e.g., deliveries and maintenance vehicles) would not change noticeably from current operations at the WRF. For these reasons, Alternative 1 operations would have less than significant effects to transportation.

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4 Cumulative Effects

This section (1) defines cumulative effects; (2) describes past, present, and reasonably foreseeable future actions in the ROI; (3) analyzes the incremental interaction the proposed action may have with other reasonably foreseeable actions; and (4) evaluates cumulative effects potentially resulting from these interactions.

4.1 Definition of Cumulative Effects

Cumulative effects are defined in 40 CFR 1508.1(g) as "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."

Cumulative effects arise when a relationship exists between a proposed action and other actions expected to occur in a similar location and/or during a similar time period. To identify cumulative effects, the analysis addresses the following three fundamental questions.

- Does a relationship exist such that affected environmental components of the proposed action might interact with the affected environmental components of past, present, or reasonably foreseeable actions?
- If one or more of the affected environmental components of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by effects of the other action?
- If such a relationship exists, does an assessment reveal any potentially significant effects not identified when the proposed action is considered alone?

4.2 Scope of Cumulative Effects Analysis

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the timeframe in which the effects could be expected to occur. Cumulative effects assess the effect of the proposed action when viewed in context with other past, present, and reasonably foreseeable actions. Past actions are considered part of the "baseline" analysis, unless they are incomplete or ongoing, and future actions are included where they are sufficiently certain to occur. The timeframe for cumulative effects centers on the timing of the proposed action. Effects of past actions are reflected in current baseline conditions.

4.3 Past, Present, and Reasonably Foreseeable Actions

Actions included in the cumulative effects analysis for MCB Hawaii Kaneohe Bay are shown in Table 4.3-1.

Table 4.3-1 Past, Present, and Reasonably Foreseeable Actions

Index #	*Action*	*Year*	*Description*
MCB Hawaii Kaneohe Bay			
1	Regimental Consolidated Communications/ Electrical Facility	2018–2022	• Consolidation of facilities (20,423 square feet) in over seven facilities around the base.
2	Mōkapu Gate Entry Control AT/FP Compliance	2018–2022	• Includes demolition; Building 1188 is 2,800 square feet.
3	District CHW and DHW Plant for Buildings 7046, 6047, and 7057-7059	2020	• Centralize water production to eliminate redundant chiller. New facility for the chiller pad, along with water lines (900 square feet).
4	Corrosion Control Hangar	2019–2023	• Support paint stripping activities for tilt-rotor and rotary-wing aircraft (31,904 square feet).
5	Bachelor Enlisted Quarters (Aviation Support)	2020	• Demolition: Walkways 1003, 1004, and 1005; Buildings 227, 228, 3000 and cooling plant (341,001 square feet).
6	Waikulu Family Housing	2018	• Redeveloped into 375 three- and four-bedroom duplexes and multiplexes.
7	Hana Like Family Housing	2018	• Redeveloped into 182 three- and four-bedroom duplexes and multiplexes.
8	Mōkapu Elementary School Campus Improvements	2023	• Redevelopment of existing school campus for classrooms, administration, library, and cafeteria facilities, along with a covered play court, playfield, and surface parking lots (162,000 square feet).
9	Helicopter Squadrons Deactivation	2021–2022	• AH-1/UH-1 squadron and the CH-53E squadron were deactivated, and the RQ-21 squadron was divested from the VMU squadron. This resulted in a decrease of approximately 841 personnel plus family members.
10	Airfield Guard Houses	2025	• Relocate Guard Houses along Mōkapu Road.
11	Dog Kennel	2024	• Construct a new dog kennel facility.
12	Rappel Tower and Gas Chamber	2021	• Demolition: Building 6042. Reconstruct in place, total of 3,700 feet (larger than Building 6042).
13	Bachelor Enlisted Quarters	2022–2026	• 180-person quarters. Buildings 1655 and 1656 (48,470 square feet).
14	Phase 1 Electrical Distribution Modernization, Base-wide	2022–2026	• Repair and upgrade various components of the electrical distribution system, including substations, switching stations, and addition of SCADA System. Renovates primary substations 5033, 820, 5092 (13,681 square feet).
15	Bachelor Enlisted Quarters	2024–2028	• 200-person quarters. Demolition: Building 386, 1634, and 1635 (47,620 square feet).
16	H-3 Main Gate Entry Control AT/FP Compliance	2025–2028	• Demolition: Buildings 1636 and 1637. Reconstruct in place.

Index #	*Action*	*Year*	*Description*
17	Maintenance Facility	2029	• New consolidated maintenance facility and warehouse storage, and replacement van pads. Demolition: Van Pads C and D (53,733 square feet).
18	Phase 2 Electrical Distribution Modernization	2026–2030	• Repair and upgrade various components of the electrical distribution system and upgrade substation 1125. Demolition: Building 1274.
19	Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron	2023–2028	• Home base a Marine Corps MQ-9 Marine Unmanned Aerial Vehicle Squadron and a KC-130J Aerial Refueler Transport Squadron at MCB Hawaii Kaneohe Bay. • Conduct approximately 8,280 annual aircraft operations. • Station approximately 676 personnel plus dependents at MCB Hawaii Kaneohe Bay.
20	New Aircraft Hangar and Apron	2025	• Replace Hangar 103 and construct a new parking apron.
21	KC-130J Wash Rack	2026	• Construct a new wash rack for KC-130Js.
22	Flightline Security Fencing	2026	• Repair existing flightline fencing. • Construct new flightline fencing. • Construct two new parking structures on 1st Street.
23	Air Traffic Control Company M Compound	2028	• Facility for Air Traffic Control Company M with Company Headquarters, Operations Building, Operations Vehicle Laydown, Vehicle Maintenance Building, Van Pads, Communications Shop, and storage.
24	Alternate Communications Feeder	2030–2034	• New communications ductbank.
25	C-40 Aircraft Maintenance Hangar and Parking Apron	2025–2027	• Construct and operate a modified Type III aircraft hangar at MCB Hawaii Kaneohe Bay with an aircraft apron and other supporting infrastructure modifications to support C-40A aircraft maintenance and operations. • Demolish existing Hangar 104 and existing site elements.
26	MCB Hawaii Ground Forces Modernization Construction Projects	8-year period from Fiscal Year (FY) 2024 through FY 2031	• 3d Marine Littoral Regiment Armory Expansion • 1st Low-Altitude Air Defense Headquarters & Service Battery Compound • Navy/Marine Corps Expeditionary Ship Interdiction System Facility • Consolidated Secure Communications Facility • 3d Littoral Anti-Air Battalion Air Control Battery Compound • Live-Virtual Constructive Training Environment Complex • Consolidated Paraloft and Dive Shop and 3d Radio Battalion Boat Shop • Ground/Air Task-Oriented Radar Climate Controlled Warehouse and Pad

Index #	*Action*	*Year*	*Description*
27	MCB Hawaii Ground Forces Modernization Training	FY 2024	• Training with updated ground forces equipment at multiple existing training locations at MCB Hawaii Kaneohe Bay.
28	Electrical System Modernization	Phase 1: present-2026 Phase 2: 2026-2030	• The projects involve the repair and update of components of the electrical distribution system on base, including substations, switch stations, and electronic controls and sensors servicing the WRF.
29	Kailua Regional Wastewater Treatment Plant Upgrades	Ongoing–2030	• Upgrades to facilities and treatment processes to improve effluent water quality discharges. This includes upgrade one of two bio towers and reinstalling an ultraviolet disinfection process.

Legend: AT/FP = Anti-terrorism Force Protection; CHW = Chilled Water; DHW = Domestic Hot Water; EA = Environmental Assessment; EIS = Environmental Impact Statement; GCS = Ground Control Station; HART = Honolulu Area Rapid Transit; MCB = Marine Corps Base; MWSS = Marine Wing Support Squadron; SCADA = Supervisory Control and Data Acquisition; TBP = To Be Provided; VMU = Marine Unmanned Aerial Vehicle Squadron; WWTP = Wastewater Treatment Plant.

Source: MCB Hawaii, 2024d.

4.4 Cumulative Effect Analysis

Noise. The past, present, and future actions at MCB Hawaii Kaneohe Bay would include the use of construction equipment that would result in increased temporary intermittent noise levels within the affected environment. The timing of some future projects in Table 4.3-1 may overlap temporally and geographically with the construction period of the proposed action (scheduled to occur over a 3-year period) and operation of the upgraded WRF. However, noise level increases would be temporary and typical of standard construction activities as identified in the noise resource section. While individual construction activities would temporarily increase noise levels in the construction area, the varied scale, location, timing of future construction, and the relatively short duration of the proposed action noise effects would result in less than significant cumulative effects. Operations of the upgraded WRF would result in noise identical to current operations. For these reasons, the proposed action, when added to noise emissions from past, present, and future actions, would not result in significant construction or operations cumulative noise effects.

Air Quality. The projects listed in Table 4.3-1 using construction equipment would result in increased temporary air emissions of both criteria pollutants and GHGs in the affected environment similar to those described for construction in the air quality resource section. Future projects may overlap temporally and geographically with the construction period of the proposed action and operation of the upgraded WRF; however, the area is in attainment of the NAAQS for all criteria pollutants, and the incremental increase to air emissions identified for the proposed action would be well below threshold limits even when considered along with the projects in Table 4.3-1 (see Section 3.2, *Air Quality*). For these reasons, the proposed action, when added to emissions from past, present, and future actions would not result in significant cumulative air quality effects within the affected environment.

GHG Emissions. Construction emissions are estimated to occur over a 3-year period. Implementation of the proposed action would contribute to emissions of GHGs from the combustion of fossil fuels. With regards to GHGs, this analysis estimates the total GHG emissions, in terms of CO_2e exclusively generated within the State of Hawai‘i as a result of the 3-year construction activities, to be approximately 200.2 tons (181.6 metric tons) per year. Construction activities associated with the proposed action would

increase GHG emissions compared to the No-Action Alternative. Based on the statewide GHG projection of 19.93 million metric tons of GHGs for 2025 (DOH, 2024), the estimated annual average GHG increase over the 3-year construction period would be less than 0.0009 percent of the 2025 GHG projection. Such a temporary and small annual increase over the 2025 projection level would be negligible. Therefore, Alternative 1 construction would have less than significant effects to GHGs, resulting in no meaningful effect to natural hazards in the future with respect to the GHG concentration level in the atmosphere. Implementation of the Proposed Action during operation would not result in changes to GHG emissions compared to the baseline condition. Therefore, Alternative 1 under both construction and operations would have less than significant effects to GHG emissions and subsequent effects to natural hazards.

Water Resources. The projects listed in Table 4.3-1 would have less than significant effects to water resources. All projects at MCB Hawaii Kaneohe Bay would be constructed in accordance with MS4 permit regulations, incorporate LID features to limit the increase in storm water runoff, and incorporate standard BMPs such as those in the Storm Water Management Plan (MCB Hawaii, 2023a). The proposed action includes only a minimal increase in personnel and thus would not contribute to any change in water usage. The proposed Kailua Regional Wastewater Treatment Plant upgrades listed in Table 4-1 along with the proposed action would improve water quality of the effluent being discharged into Kailua Bay. For these reasons, the proposed action would not result in significant cumulative water quality effects to water resources.

Cultural Resources. Past, present, and reasonably foreseeable future projects in Table 4.3-1 could adversely affect cultural resources within the Mōkapu House Lots Archaeological District at Pali Kilo, the Naval Air Station Kaneohe Bay Administration District, and the Waimānalo Archaeological District. All the projects with a federal nexus have been or would be reviewed under NHPA Section 106 to determine effects to historic properties, and subsequently any adverse effects would be avoided, minimized, or mitigated pursuant to NHPA requirements. The proposed action does not adversely affect archaeological resources, would have no effect to historic properties, and would not result in effects to cultural resources. For these reasons, the proposed action would not result in significant cumulative effects to cultural resources.

Terrestrial Biological Resources. While the proposed action, along with the activities in Table 4.3-1, contribute to the continued urban buildup of the Mōkapu Peninsula, construction-related projects would occur at previously developed and actively used areas. Construction noise would be temporary and similar to operational activities that currently occur throughout the installation. Operational noise of the upgraded WRF would be identical to noise generated by operation of the existing WRF. In addition, BMPs identified in Table 2-2 would be applied to future projects to further avoid or minimize potential effects to wildlife (including ESA-listed species) during the construction. BMPs to educate contractors and military personnel about natural resources and ESA-listed species would also continue to be implemented. The projects in Table 4.3-1 are largely upgrades to or replacement of existing infrastructure; therefore, the nature of the projects would not significantly introduce new noise sources nor significantly increase the amount of impervious surfaces at MCB Hawaii Kaneohe Bay. Regarding a cumulative increase in barbed wire on Mōkapu Peninsula, which poses a risk of entanglement for the Hawaiian hoary bat, proposed fencing would minimize use of barbed wire fencing (see Table 2-2). For these reasons, the proposed action would not result in significant cumulative effects to terrestrial biological resources.

Utilities. The proposed action would have less than significant effects to utilities (see Section 3.9, *Utilities*) because the existing utilities system is adequate for the construction and operations of the upgraded WRF. There would be either no effect or beneficial effect (for wastewater system) to utilities from the proposed action. With regards to capacity, none of the utilities (power, water, wastewater, solid waste, and information technology/communications) servicing the proposed action or the other projects in Table 4-1 are at capacity. The proposed action would not contribute to a change in demand for utility services at MCB Hawaii Kaneohe Bay. Other projects in Table 4.3-1 include electrical modernization projects that will be complete by 2030. This modernization would improve the electrical utilities system on base. At any given time, no more than three construction projects would be underway, including the proposed action. Even at three times the volume, the proposed construction components would still represent a very small percentage increase above existing utility usage. Consequently, actions identified in Table 4.3-1 would not individually or collectively exceed the capacity of the various utility systems. Furthermore, operation of the upgraded WRF would involve an increase of five personnel, which is not a substantial change to personnel currently working or residing at MCB Hawaii Kaneohe Bay. For these reasons, the proposed action would not result in significant cumulative effects to utilities.

Transportation. Transportation associated with MCB Hawaii Kaneohe Bay construction projects may overlap in time with those in some of the projects in Table 4.3-1 and may contribute to traffic on roadways on H-3. The construction portion of the proposed action would increase average daily traffic volume on H-3 less than 1 percent. At any given time, no more than three construction projects would be underway, including the proposed action. Even at three times the volume, the proposed construction components would still represent a very small percentage increase above existing average daily traffic volume on H-3. As such, construction would not result in a significant cumulative effect. Furthermore, operation of the upgraded WRF would involve an increase of five personnel, which is not a substantial change to personnel currently working or residing at MCB Hawaii Kaneohe Bay. For these reasons, the proposed action would not result in significant cumulative effects to transportation.

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APPENDIX A
REGULATORY SETTING

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Appendix A: Regulatory Setting

The Marine Corps has prepared this Environmental Assessment (EA) based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the proposed action:

- American Indian Religious Freedom Act (42 United States Code [U.S.C.] 1996)
- Archeological and Historic Preservation Act (54 U.S.C. sections 312501–312508)
- Archaeological Resources Protection Act (16 U.S.C sections 470aa–470mm)
- Chapter 344, State Environmental Policy
- Clean Air Act (42 U.S.C. sections 7401–7671q)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. section 9601 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Energy Independence and Security Act, United Facilities Criteria 3-210-10
- Executive Order (EO) 11988, Floodplain Management (42 Federal Register 26951)
- EO 11990, Protection of Wetlands (42 Federal Register 26961)
- EO 12088 as amended, Federal Compliance with Pollution Control Standards
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, and the Migratory Bird Treaty Act (66 Federal Register 3853, 16 U.S.C. sections 703–712)
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management (72 Federal Register 3919)
- Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. section 136 et seq.)
- Hawai‘i Coastal Zone Management Program
- Hawai‘i State Plan
- Marine Corps Environmental Compliance and Protection Program (Marine Corps Order 5090.2)
- Migratory Bird Treaty Act (16 U.S.C. section 703 et seq.)
- National Environmental Policy Act (NEPA), 42 U.S.C. sections 4321-4370h
- Navy procedures for implementing NEPA (42 U.S.C. section 4331; 40 CFR parts 1500–1508; 32 CFR part 775)
- National Historic Preservation Act of 1966, as amended (54 U.S.C. 100101 et seq.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. sections 3001-3013)
- Noise Control Act (42 U.S.C. section 4901 et seq.)
- O‘ahu General Plan
- Policies and Responsibilities for Implementation of the National Environmental Policy Act Within the Department of the Navy (32 Code of Federal Regulations [CFR] part 775)
- Pollution Prevention Act (NPA), 42 U.S.C. sections 13101-13109
- Protection of Historic Properties, 36 CFR Part 800
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Safe Drinking Water Act (42 U.S.C. section 300f et seq.)
- State of Hawai‘i Energy Goal
- Toxic Substances Control Act (15 U.S.C. sections 2601 et seq.)

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APPENDIX B
PUBLIC COMMENTS AND RESPONSES

To Be Provided in Final EA

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APPENDIX C
NATIONAL HISTORIC PRESERVATION ACT
SECTION 106 CONSULTATION

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Subject:	Section 106_LFE/144-23 Water Reclamation Facility (WRF) Redundancy Upgrades_MCBH
Date:	Tuesday, November 26, 2024 8:01:39 PM
Attachments:	LFE-144-23_Sec106_WRF_Redundancy_Upgrades_P-875_MCBH_signed.pdf

Aloha All,
Please find attached our letter (LFE/144-23) initiating Section 106 consultation on the proposed Water Reclamation Facility (WRF) Redundancy Upgrades (P-875) project aboard Marine Corps Base Hawaii (MCBH). The project would construct and operate a redundant wastewater treatment plant at MCBH Kaneohe Bay.

Respectfully,

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UNITED STATES MARINE CORPS
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5090
LFE/144-23
26 November 2024

Dr. Jessica Puff
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuhihewa Building
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707

Dear Dr. Puff:

SUBJECT: SECTION 106 CONSULTATION: P-875 WATER RECLAMATION FACILITY REDUNDANCY CONSTRUCTION AND UPGRADES ABOARD MARINE CORPS BASE HAWAII, DISTRICT OF KOʻOLAUPOKO, AHUPUAʻA OF KANEOHE, ON THE ISLAND OF OʻAHU, TMK 1-4-4-008:001

Marine Corps Base Hawaii (MCBH) is consulting with your office in compliance with Section 106 of the National Historic Preservation Act regarding the P-875 Water Reclamation Facility (WRF) Redundancy Construction and Upgrades (HI20220052) project aboard MCBH. This letter initiates our Section 106 consultation for this undertaking. The project is the subject of an Environmental Assessment.

PROJECT DESCRIPTION

The proposed undertaking is to construct and operate a redundant wastewater treatment system at MCBH Kaneohe Bay. The project will be located at the existing WRF in the south-central portion of Mokapu Peninsula [enclosure 1]. It would enable the WRF to maintain full capacity during maintenance activities, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action would be constructed over a 3-year period from Fiscal Year (FY) 2025 through FY 2028. The construction would be done in phases to mitigate disruptions and maintain operation of the WRF, which is currently the only means for treating wastewater generated by the base.

The existing WRF uses a “single-train treatment process,” meaning it cannot operate effectively when components are offline for repair or maintenance. The facility treats water in accordance with National Pollutant Discharge Elimination System (NPDES) effluent limitations, and planned maintenance events occur in coordination with Hawaiʻi State Department of Health (DOH). The proposed undertaking would ensure MCBH complies with its DOH discharge permit #HI0110078 for treatment of wastewater while components undergo repair or maintenance. The proposed redundancy would also enable the base to achieve compliance with 40 Code of Federal Regulations (CFR) 122.41(4) by having adequate backup to ensure treated effluent continues to meet existing permit limitations during normal periods of equipment downtime. The proposed upgrade is also necessary to improve the overall quality of the treated effluent to R-1 standards, which would create additional uses for the water on base and further reduce overall water demand at the base.

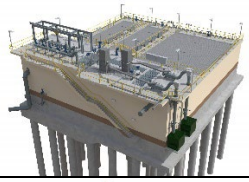
The proposed WRF upgrades include: (1) construction of associated sewage treatment components which would be integrated with and adjacent to the existing WRF systems; (2) redundancy upgrades to existing WRF process units; (3) installation of security fencing; (4) implementation of tsunami design

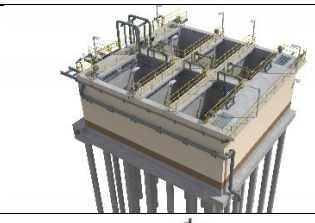
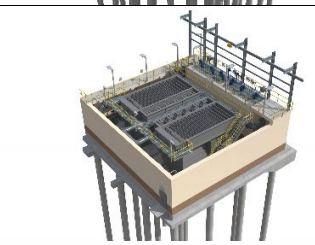
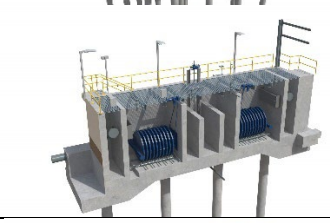
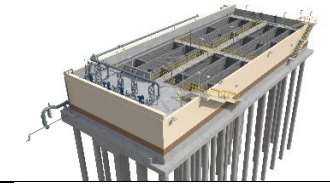
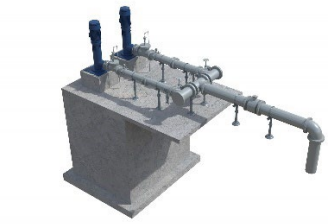
standards for all individual basins, facilities, utilities, and specific elements deemed critical to WRF operations; (5) ability to produce water for reuse; (6) supporting improvements including vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates; (7) installation of a standby generator, bridge crane and SCADA system; and (8) construction laydown locations outside the WRF [enclosure 2].

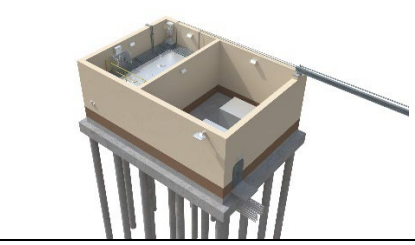
Construction Projects – New Structures: Most of the proposed construction would occur on previously disturbed areas within the existing WRF footprint. The tree planting would occur in undeveloped landscaped area to the east of the WRF [enclosure 4]. No modifications to the ocean outfall would occur. After completion of the project, the upgraded WRF would operate like the existing WRF. Up to ten (10) personnel would be required to operate the upgraded WRF.

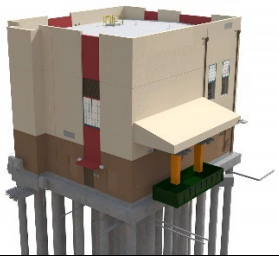
The new construction includes above-grade one and two-story concrete structures on deep piles (approximately 60 feet deep) with mat foundations, using augur-cast piles. Other excavation activities have a maximum depth of 18 feet. Table 1 lists these new structures and process unit upgrades. The new Grit Chamber, Clarifier, Equalization Tank, MBBR, DAF, Filters, Chlorine Contact Basins and Chemical Storage, R-1, and Digester will be designed as hydraulic basins in accordance with ACI 350-06. As stated above, these new structures will have concrete walls supported on mat foundations with deep piles.

Table 1. Proposed New WRF Machinery and Process Upgrades (P-875)

New Construction	Facility Number	Description	Photo
Aerated Grit Chamber	40	Match existing	
Primary Clarifier	41	One 65-foot x 15.5-foot side water depth	
Equalization Basin	42	One 1.18 million gallons	
Odor Control Structure	43	Improve existing	

Moving Bed Biofilm Reactor (MBBR)	51	Two 150,000-gallon trains, three cells each, Blower supporting (3) process air blowers	
Dissolved Air Flotation (DAF)	52	Two 16-foot-wide x 32-foot-long tanks	
Filters	53	Two cloth disk filters	
Blower	54		
Chlorine Contact Basin (Disinfection)	60	Chlorine contact channels, each with volume of 400,000 gallons	
Chemical Storage	61		
Polishing Pond	63		

R-1 Storage Tanks	66	Two 781,000-gallon tanks (each)	
Water Sampling Structure	67		
Operations, Lab, and Electrical Structure	70		
Generator Fuel Tank and Transformers	71		
Anaerobic Digester	81	One 281,000-gallon digester, matching existing	
Dewatering Feed Pumps	81	Two sludge feed pumps to pump sludge from digester Facility 875 to centrifuges. Two centrifuges with sludge conveyor to transfer sludge to holding bin. Polymer storage and metering pump system for sludge conditioning prior to dewatering	

Dewatering Structure	82		
Waste Gas Burner	83		

Built-in equipment: The undertaking also includes installation of a new standby generator, one bridge crane, and a supervisory control and data acquisition (SCADA) system(s) to support the WRF process upgrades.

Electrical/Data/Communications work: The project will install new primary electrical distribution (approximately 1,900 feet long), secondary electrical distribution, transformers, exterior lighting, and new data/communications lines (approximately1,200 feet long) and connections as shown on enclosure 4. The trenching will require a maximum depth of 18 feet.

Mechanical utilities: The project will install new mechanical utilities consisting of a sanitary sewer system, potable water distribution, fire and water distribution system, and storm water drainage. Other new mechanical utilities include process pipes, R1 pipes and pumps to convey treated wastewater and reuse water; interconnecting process, process air, and chemical feed piping; and gravity and pressure pipelines. The demolition and excavation work associated with mechanical utilities work will be located within the WRF project area. The excavation work associated with the mechanical utilities will have a maximum depth of 18 feet.

Site preparation and landscape area: The undertaking will carry out site clearing and grubbing work, earthwork, grading, dewatering, paving roadways, and landscaping. Existing roads would be gravel pavement and new roads would be asphalt pavement. Storm drainage, new catch basins, and curb inlets would drain to a new pipe system. The project will also plant new trees in a landscape area east of the WRF as shown on enclosure 4. The site preparation and landscaping work will have a maximum depth of 18 feet.

Fencing and Gates: The project would install perimeter fencing with clear zones of 10 feet minimum exterior and 20 feet minimum interior. The perimeter fence along the existing west side would remain and the project would not disturb the existing vegetation on this side. The proposed WRF perimeter fence consists of an 8-foot tall fence with 7-foot tall chain link and 1-foot single outrigger with barbed wire.

Parking: Three new parking spaces and two parallel parking spaces would be installed.

Demolition: Proposed demolition of existing mechanical structures would include the Laboratory and Office Facility 892, Digester 902, Fuel Tank 898, Sludge Beds 893 and 899, Compressor 5091, and Generator 6850. A list of the existing WRF mechanical structures, including those to be demolished, is provided in Table 2 below, along with the installation date, type and function, eligibility for the National Register (NR), proposed impact by the project, and location within the WRF. Ground disturbing activities associated with the demolition of this machinery may extend to a maximum depth of 6 feet.

Construction laydown areas: The project requires temporary contractor laydown areas for contractor parking, construction fencing, heavy equipment parking, temporary office trailer with temporary utilities, and fuel storage as shown on enclosure 4. At the end of the construction, the laydown area will be restored to existing or better condition by the contractor.

AREA OF POTENTIAL EFFECT

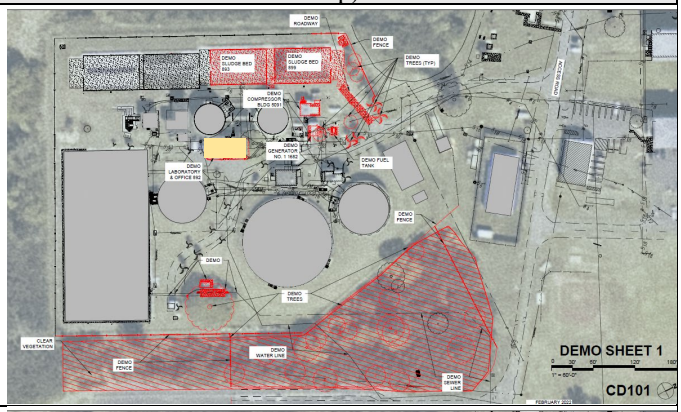
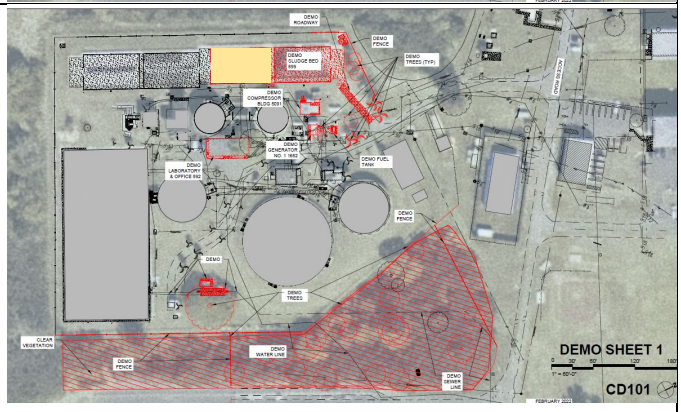
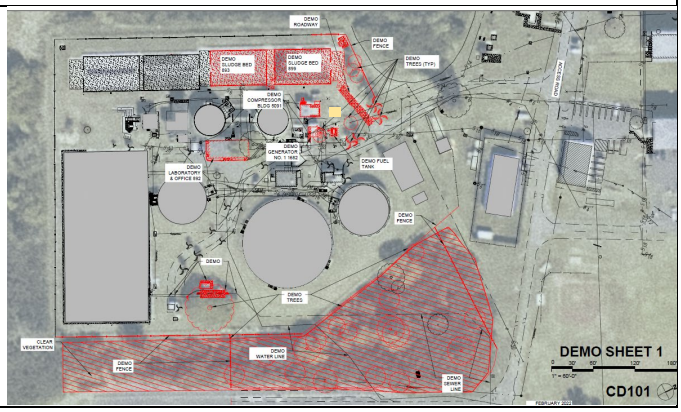
The area of potential effects (APE) has been determined to include the footprint of the P-875 WRF Redundancy project as shown on enclosure 4, including temporary contractor laydown areas, electrical/data/communication work, and landscape area designated for tree planting east of the WRF.

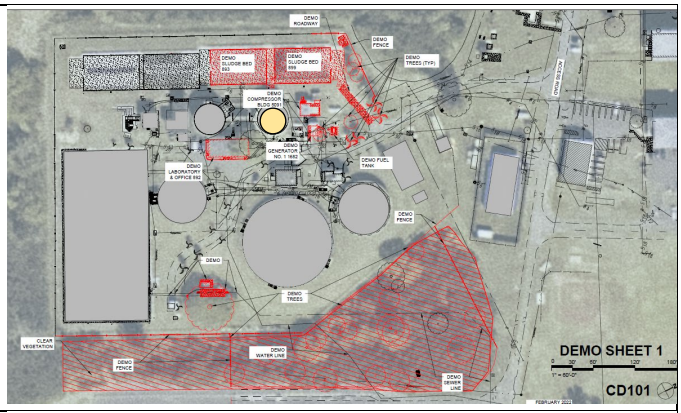
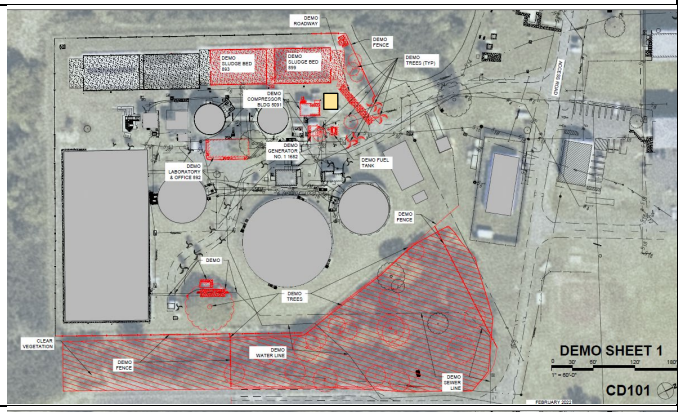
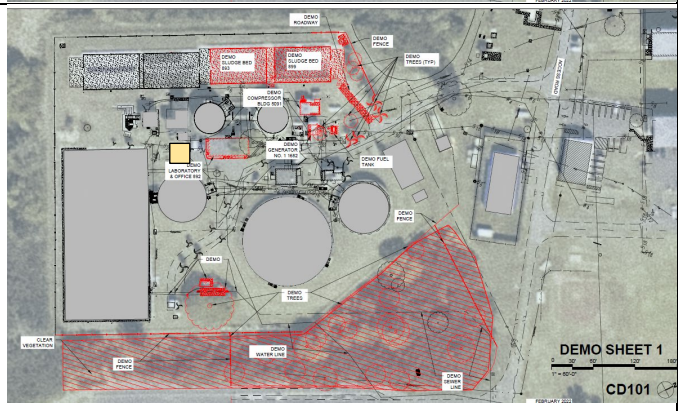
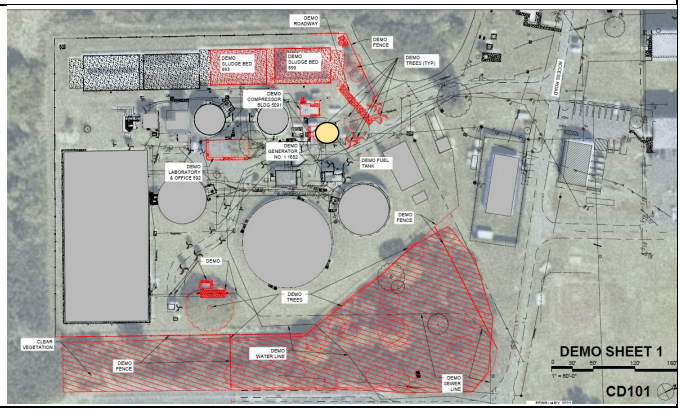
IDENTIFICATION OF HISTORIC PROPERTIES

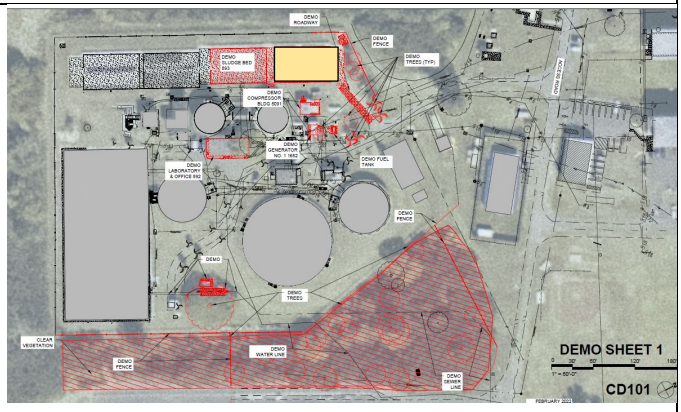
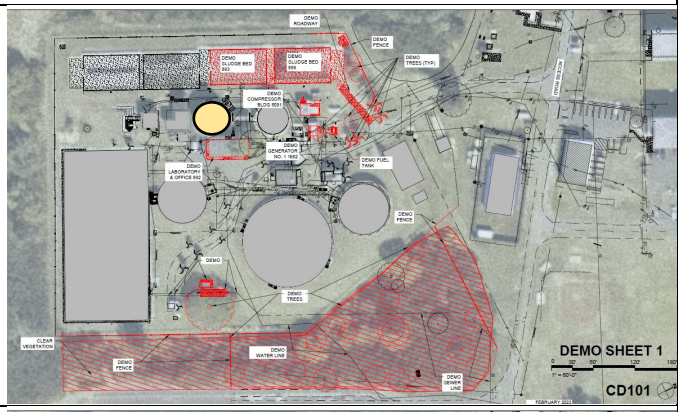
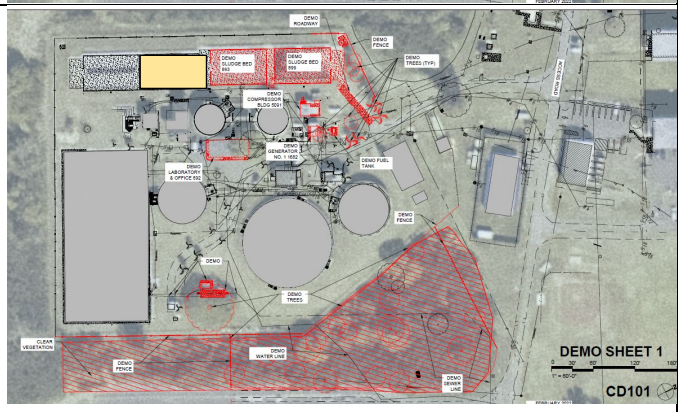
There are no historic properties, including districts, structures, buildings, objects, sites, and/or subsurface archaeological deposits, in the project APE. Table 2 below lists existing mechanical units at the WRF, including the installation date, type and function, NR-eligibility, project impact, and location within the WRF site. Some of these were included in the Wil Chee - Planning et al. 2014 "Historic Context and Building Inventory, Marine Corps Base Hawaii," which assessed structures built during the "Cold War" period from 1946 to 1992. The 2014 study includes concurrence on eligibility from the State Historic Preservation Officer (SHPD) as Appendix F. This study did not assess select WRF systems, pipes, valves, beds, devices, and tanks because they were machines, not buildings. These are identified with an asterisk in Table 2 and include an assessment of NR-eligibility based on the National Park Service (NPS) "National Register Bulletin No.15: How to Apply the National Register Criteria for Evaluation," and the NPS Best Practices Review, Issue 4, July 2023, "Evaluating Common Resources," which includes the following guidance on structures:

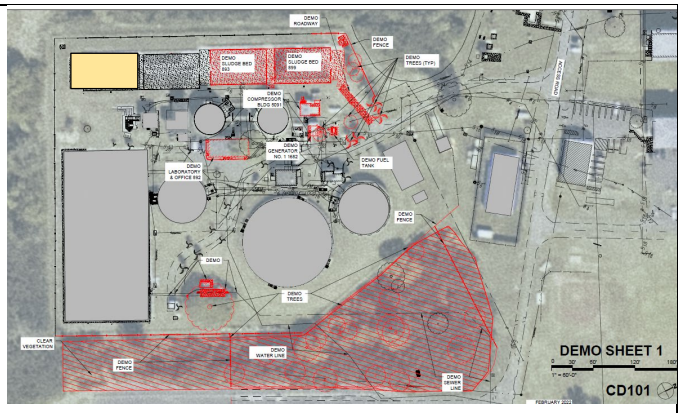
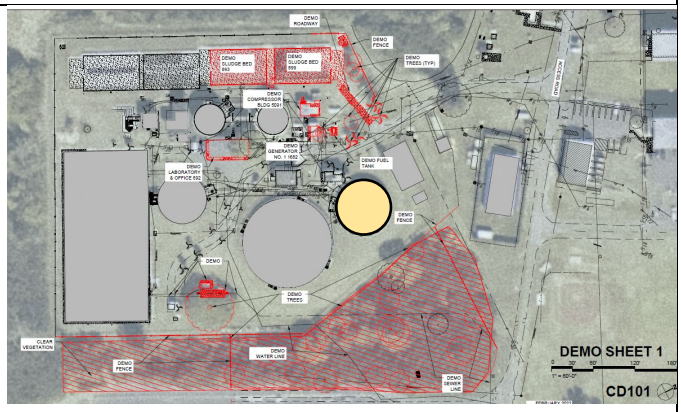
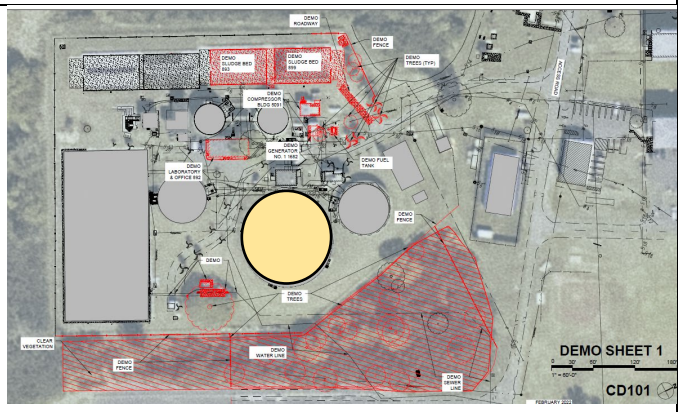
> A structure is eligible as a specimen of its type or period of construction if it is an *important* example (within its context) of building practices of a particular time in history. For properties that represent the variation, evolution, or transition of construction types, it must be demonstrated that the variation, etc., was an *important* phase of the architectural development of the area or community in that it had an impact as evidenced by later buildings ("Distinctive Characteristics of Type, Period and Method of Construction," p. 18, emphasis added.)

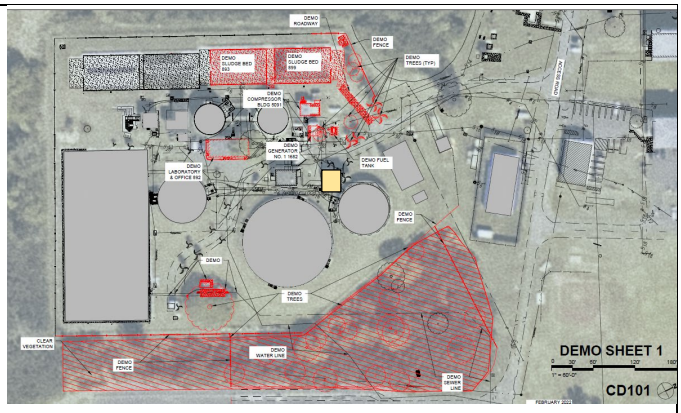
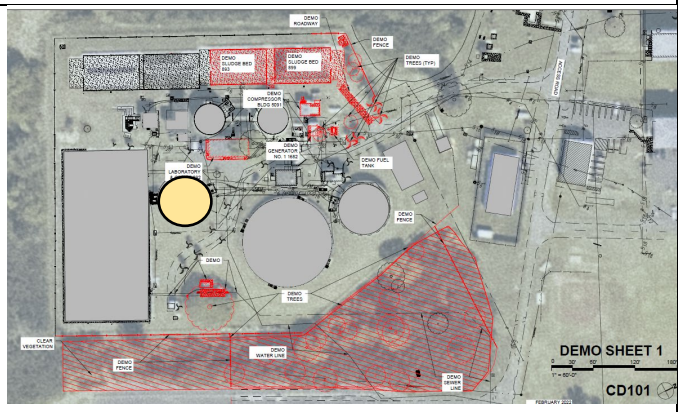
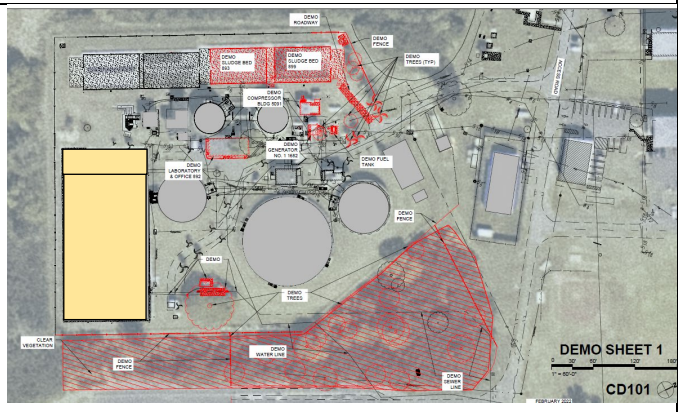
Table 2. Existing WRF Structures (limits of demolition shown in red)

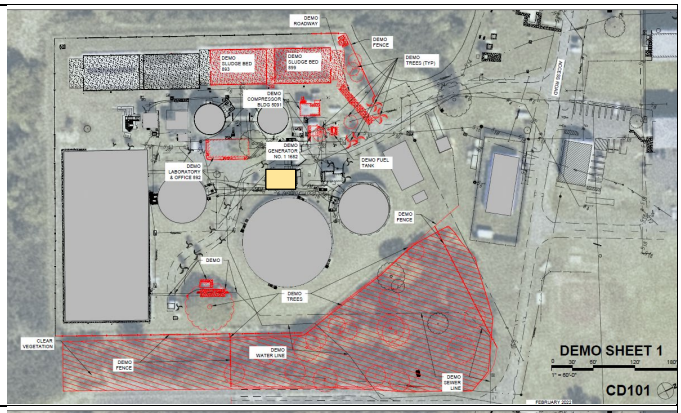
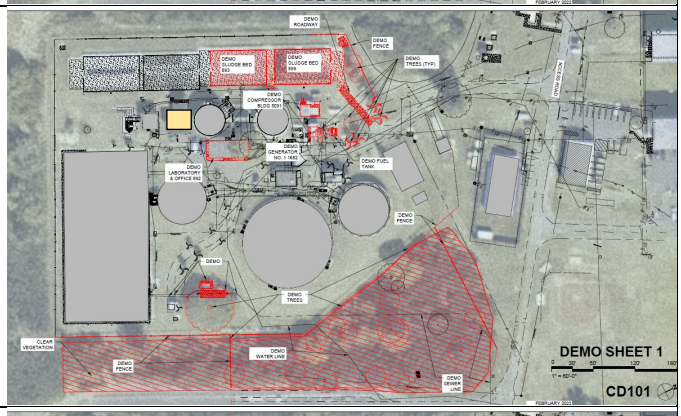
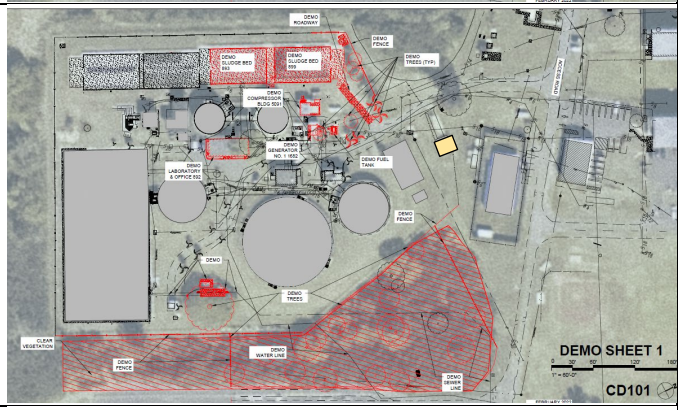
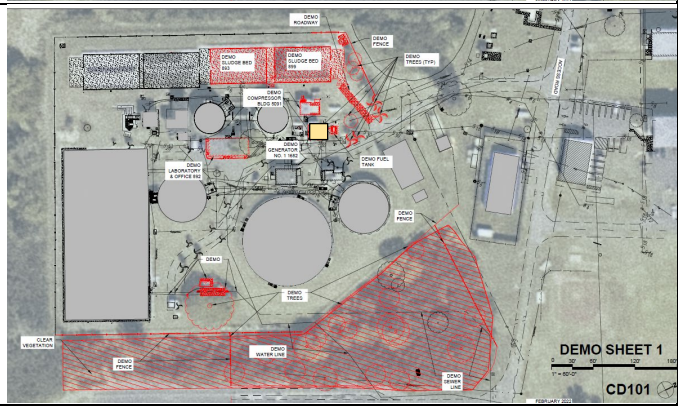
Facility No. (in yellow)	Type and Function	Build Date; NR-eligibility	Project Impact	Location (WRF west side is top of map; WRF south side is left side of map; WRF north side is right side of map; and WRF east side is bottom of map)
892	Laboratory & Office	1947; NE (Wil Chee et al.2014)	Demolish	
893	Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Demolish	
894	Sewage Treatment Comminuter (Headworks) Comminuters are grinders used for raw sewage solids in plant headworks and pump stations.	1947; NE*	Retain	

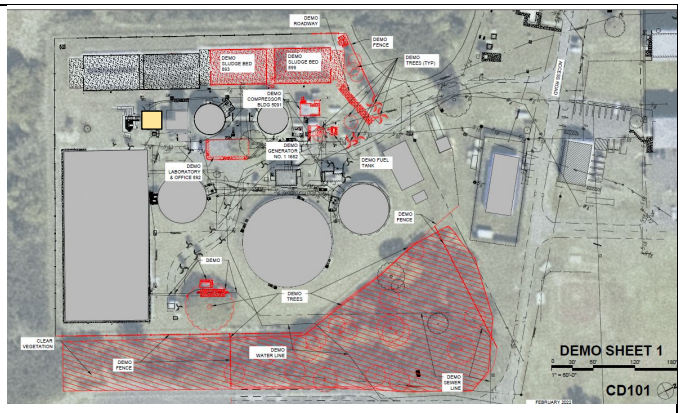
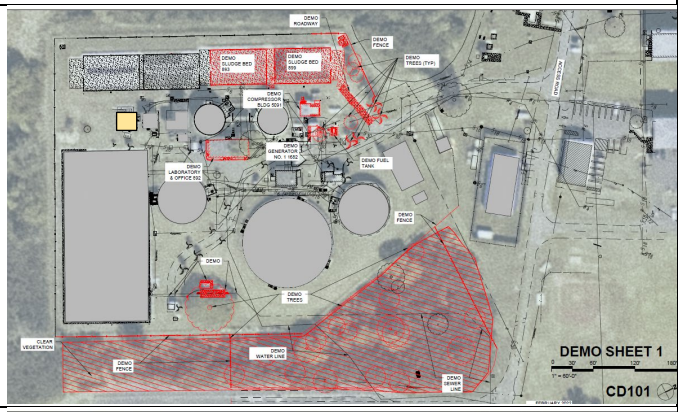
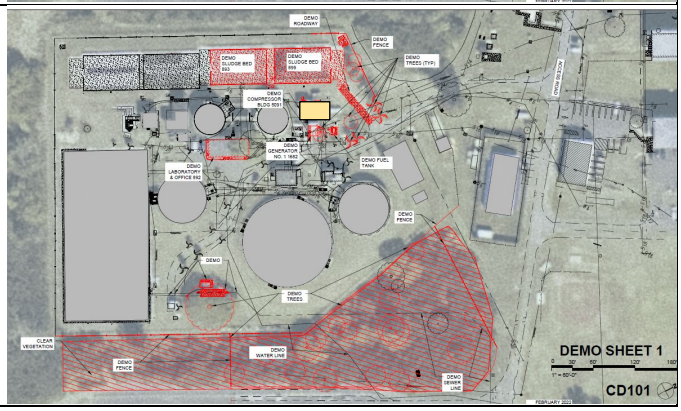
895	Secondary Digester Tank Digesters are systems (lagoons or tanks) used for recycling waste at different temperature ranges.	1947; NE*	Retain	
896	Paint Storage Structure for paint storage.	1947; NE (Wil Chee et al. 2014)	Retain	
897	Sewage Treatment Chlorinators Chlorinators are systems used for disinfection and one of the primary mechanisms for destruction of pathogenic organisms.	1947; NE*	Retain	
898	Fuel Tank Industrial fuel storage tanks are standards certified containers, which provide safe storage of chemicals, solvents, oil, petro, diesel, and other	1979; NE*	Demolish	

	flammable liquids.			
899	Sewage Treatment Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Demolish	
902	Digester No. 2 Digesters are systems (lagoons or tanks) used for recycling waste at different temperature ranges.	1952; NE*	Demolish	
977	Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Retain	

978	Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Retain	
1376	Primary Clarifier Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation.	1972; NE*	Retain	
1377	Trickling Filter This is a type of wastewater treatment system consisting of a fixed bed of rocks, coke, gravel, slag, polyurethane foam or other media over which sewage flows downward and causes a layer of microbial slime (biofilm) to grow.	1972; NE*	Retain	

1378	Aerated Grit Chamber Form of grit chamber consisting of a standard spiral flow aeration tank with air diffusion tubes at one end of tank about .6 to 1 meter from bottom.	1972; NE*	Retain	
1379	Final Clarifier Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. The final or secondary clarifier is one of the unit processes that determines the capacity of the low effluent suspended solids levels.	1972; NE*	Retain	
1380	Polishing Pond and Chlorine Contact Basin. Polishing ponds are facultative lagoons providing a type of waste stabilization pond for tertiary treatment of wastewater.	1972; NE*	Retain	

1403	Lift Station A wastewater lift station is a pump system that removes wastewater from a lower elevation to a higher elevation.	1973; NE*	Retain	
1413	Chlorine Storage Structure for chlorine storage.	1972; NE (Wil Chee et al. 2014)	Retain	
1622	General Storage Shed	1979; NE (Wil Chee et al. 2014)	Retain	
1682	Emergency Generator Device for generating electricity that is used in the even of a failure of the regular power supply.	1976; NE*	Demolish	

1683	Effluent Pump Control and Generator No.2 Effluent or dewatering pumps are used in septic tanks, low pressure pipes, and other treatment processes to pump effluent or wastewater.	1976; NE*	Retain	
1684	Sewage Pump Devices that automatically pump sewage without needing manual intervention.	1976; NE*	Retain	
5091	Compressor. Mechanical device that increases the pressure of gas by reducing its volume.	1989; NE*	Demolish	

In addition, there are no National Register (NR)-eligible archaeological deposits or sites. The WRF was built entirely on man-made filled lands that could not, therefore, contain any subsurface deposits or sites [enclosure 5]. Previous archaeological investigations (Fong 2013; Sasaki and Filimoehala 2021; Vernon and Gosser 2021) confirm that the WRF project area is composed largely of man-made fill covered by a deep layer of modern fill material [enclosure 6].

In the area north of the WRF site in the area proposed for trenching for new Duct Banks, the ground is also composed largely of filled lands. Previous archaeological studies overlapping this area (Asbury-Smith and Dega 2002; Eakin 2012; Fong 2013; Schilz et al. 1996b; Schilz et al. 1997; Sholin and Dye

2011; Wulzen and Haun 1996) confirm this area is largely composed of man-made fill. These studies recorded no evidence of subsurface archaeological deposits or sites. In the portion of the project proposed for trenching for new duct banks, Jimenez et al. (1998) found only shoreline deposits with thin or nonexistent terrigenous deposits and layers of clay and sand deposits representing bay/lagoonal environments from 1928 (1998:18, 23). This study concluded that "There is no potential for encountering intact cultural deposits in trenches excavated in the pre-1928 offshore areas. The deposits in this zone consist of landfill on top of bay/lagoonal deposits of clay, sand and coral" (Jimenez et al. 1998:31).

Table 3 below provides a list of previous archaeological investigations in or near the project APE, which includes citation, title of report, type of investigation, and location of any findings within the APE. See enclosure 6 for the location of each study in relation to the APE.

Table 3. Previous Archaeological Investigations in the Project APE

Citation	Report	Type of Investigation	Findings within APE
Asbury-Smith and Dega 2002	Removal of Underground Storage Tanks and Oil/Water Separators	Archaeological monitoring and sampling	None
Charvet-Pond and Rosendahl 1992f	Archaeological Monitoring Southwest Periphery of Nuupia Pond and Lawrence Road, Third Street, and Selden Street	Archaeological monitoring	None
Eakin 2012	Third Street Repairs	Archaeological monitoring	None
Fong 2013	Archaeological Monitoring Report In Support of the Repairs and Upgrades for the Water Reclamation Facility	Archaeological monitoring	None
Jimenez et al. 1998	Repairs to Sanitary Sewer System	Archaeological monitoring	None
Jordan and Reith 2011	Water Line Replacement, Water Lines H10707M and H10709M	Archaeological monitoring	None
Prishmont et al. 2001	Base Realignment and Closure (BRAC) Program	Archaeological monitoring	None
Roberts et al. 2002	Outside Cable Rehabilitation (OSCAR) Project	Archaeological monitoring	None
Sasaki, Jennifer and Darby Filimoehala 2021	Draft Archaeological Monitoring Report in Support of Wastewater Reclamation Facility Electrical Distribution System Project	Archaeological monitoring	None

Vernon and Gosser 2021	Archaeological Monitoring Report in Support of Construction to Replace B902, Primary Digester [WRF]	Archaeological monitoring	None
Wulzen and Haun 1996	Trenching for Water Pipe in Support of Project KB9562RS and Fence Post Excavation for Expansion of the Canine Obstacle Course Buildings 1095 and 1096	Archaeological monitoring	None

BEST MANAGEMENT PRACTICE

Altough there is no potential for encountering NR-eligible subsurface deposits or sites, all ground disturbing activities associated with the P-875 WRF Redundancy project shall be monitored by a qualified archaeologist as a best management practice due to the potential for dissociated cultural material, including human remains, to be present in dune sand used as construction material during initial base construction at MCBH Kaneohe Bay. If Native American Graves Protection and Repatriation Act (NAGPRA) cultural items, including human remains, are encountered during any ground disturbing activities associated with this undertaking, all work shall stop, and the items will be secured and protected. Treatment shall proceed under the authority of NAGPRA.

DETERMINATION OF EFFECT

MCBH has determined that the proposed P-875 WRF Redundancy Construction and Upgrades project will result in no historic properties affected in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) there are no known historic properties in the APE; 2) the mechanical units more than 50 years old and not included in the 2014 Wil Chee et al. "Historic Context and Building Inventory" are not National Register (NR)-eligible specimens of a type or period of construction that are important examples (within this context) of building practices of a particular time in history and do not represent variation, evolution, or transition of construction types that were an important phase of the architectural development of the area or community (NPS Best Practices Review, Issue 4, July 2023, "Evaluating Common Resources, p.18;" and 3) previous archaeological investigation have shown that there is no potential to encounter subsurface NR-eligible deposits or sites in areas of ground disturbance because the ground is composed of man-made filled lands and modern fill material.

We request your review of and concurrence of the above determinations within 30 days of receipt of this letter. As defined in 300 CFR 800.4(d)(1)(i) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. MCBH is also forwarding a copy of this letter to the additional consulting parties listed below as part of the Section 106 consultation process for this proposed undertaking. Therefore, we request review and comments from these consulting parties regarding the above determinations within 30 days of receipt of this letter.

5090
LFE/144-23

Should you or your staff have any questions or concerns please contact the MCBH Cultural Resources Management staff, Ms. June Cleghorn via email at june.cleghorn@usmc.mil, Ms. Jessica Leger via email at jessica.leger@usmc.mil, or Dr. Wendy Wichman via email at wendy.j.wichman.ctr@usmc.mil.

Sincerely,

HART.JEFFRY.P.1242350568 Digitally signed by HART.JEFFRY.P.1242350568 Date: 2024.11.26 12:19:21 -10'00'

J. P. HART
Major, U.S. Marine Corps
Director, Environmental Compliance and Protection Division
By Direction of the Commanding Officer

Enclosure:
1. Location of the P-875 WRF Redundancy project.
2. Rendering of the proposed P-875 WRF Redundancy project including existing and new facilities and processes. Note: Table 1 lists the proposed new structures; and Table 2 lists existing structures, including those proposed for demolition.
3. Figure showing location of the existing infrastructure, new construction, roads and fencing.
4. Drawing showing the project APE, including existing WRF; contractor lay down areas (no ground disturbance); new duct banks for electrical/data/communication work in blue area that requires trenching; electrical/data/communication work in green area that requires no ground disturbance; and landscape area east of the WRF designated for tree planting.
5. Location of WRF within an area of man-made filled land based on the Geologic Map used for a previous archaeological study at the WRF (Vernon and Gosser 2021:Fig.2). Note: There is no potential for archaeological resources to be present within this area of man-made filled land.
6. Location of previous archaeological investigations in relation to the WRF project (Vernon and Gosser 2021:Fig.6).

Copy to:
Ms. Anuhea Diamond, Kaulamealani Diamond; Diamond ʻOhana
Ms. Skye Razon-Olds, Kulamanu Napoleon, Kaleleonalani Napoleon; Olds ʻOhana
Ms. Emalia Keohokalole, Keohokalole ʻOhana
Ms. Nau Kamali`i; Boyd ʻOhana
Ms. Donna Ann Camvel; Paoa Kea Lono ʻOhana
Mr. Cy Harris; Kekumano ʻOhana
Ms. Terrilee Napua Kekoolani Raymond; Kekoolani ʻOhana
Ms. Cathleen Mattoon; Koolauloa Hawaiian Civic Club
Mr. Clive Cabral; Temple of Lono
Chair; Office of Hawaiian Affairs
Chair; Oahu Island Burial Council
Ms. Kiersten Faulkner, Historic Hawaii Foundation
Ms. Elizabeth Merritt, National Trust for Historic Preservation

References:

Asbury-Smith, Pamela, and Michael Dega
2002 Archaeological Monitoring and Sampling During Removal of Underground Storage Tanks and Oil/Water Separators at U.S. Marine Corps Base Hawaii, Kane‘ohe Bay, O‘ahu Island, Hawai‘i. Prepared for U.S. Army Corps of Engineers, Honolulu District, Fort Shafter. Scientific Consultant Services, Honolulu.

Charvet-Pond, Ann, and Paul H. Rosendahl
1992f Archaeological Monitoring Southwest Periphery of Nuupia Pond and Lawrence Road, Third Street, and Selden Street, Marine Corps Air Station, Kaneohe Bay, TMK 4:4:08. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Inc., Hilo.

Eakin, Joanne
2012 Archaeological Monitoring in Support of Third Street Road Repairs, Marine Corps Base (MCB) Hawaii, Kāne‘ohe Bay, Kāne‘ohe Ahupua‘a, Ko‘olaupoko District, O‘ahu, Hawai‘i. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Southeastern Archaeological Research, Inc., Honolulu.

Fong, Jeffrey W. K.
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Jimenez, Joseph A., Thomas R. Wolforth, Robert B. Rechtman, and Alan E. Haun
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2001 Archaeological Monitoring in Support of the Base Realignment and Closure (BRAC) Program Relocating Barbers Point Naval Air Station Operations to Marine Corps Base Hawaii Kaneohe Bay, O‘ahu Island, Hawai‘i. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Roberts, Alice K. S., Katharine S. Brown, and Eric W. West
2002 Archaeological Monitoring and Sampling for Outside Cable Rehabilitation (OSCAR) Project, Marine Corps Base Hawaii (MCBH-KB), Kaneohe Bay, Ko‘olaupoko District, Island of O‘ahu, Hawai‘i. U.S. Army Corps of Engineers, Honolulu District, Fort Shafter. Garcia and Associates, Kailua, O‘ahu.

Sasaki, Jennifer and Darby Filimoehala
2021 Draft Archaeological Monitoring Report in Support of Wastewater Reclamation Facility Electrical Distribution System Project, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii. Prepared for SU-MO Builders, Inc., Honolulu, Hawaii. International Archaeology, LLC. October 2021.

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Schilz, Allan J., James Landrum, and Jane Allen
1996 Archaeological Monitoring for Negation of Adverse Effect of KB975MS Repair of Effluent Irrigation System ("Reef") Marine Corps Base Hawaii. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division. Ogden Environmental and Energy Services Co., Inc., Honolulu.

1997 Archaeological Monitoring of KB-163MS, Repairs to Sanitary Sewer System (RESEW) at Marine Corps Base Hawaii Kaneohe Bay. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Sholin, Carl E. and Thomas S. Dye
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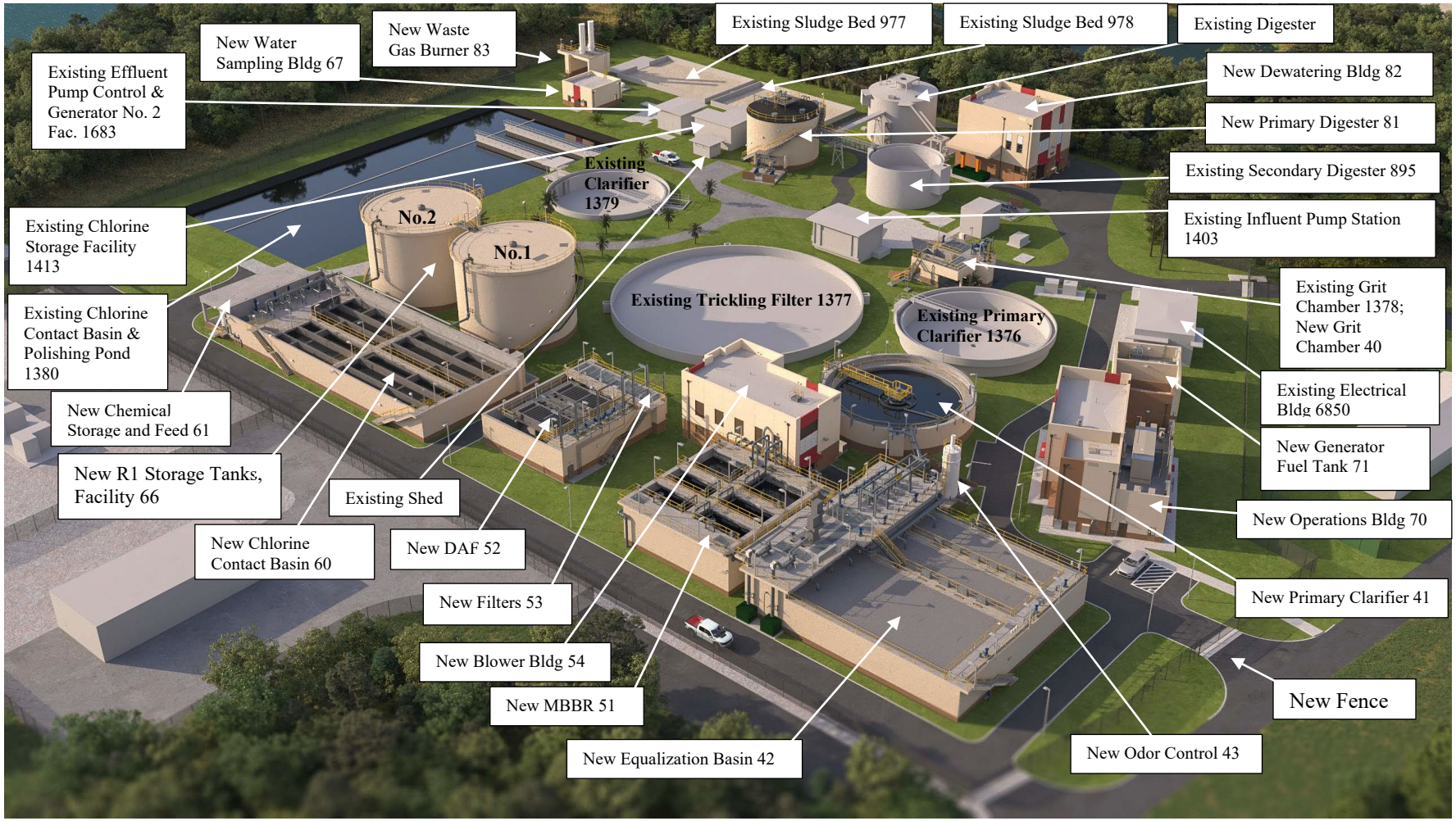
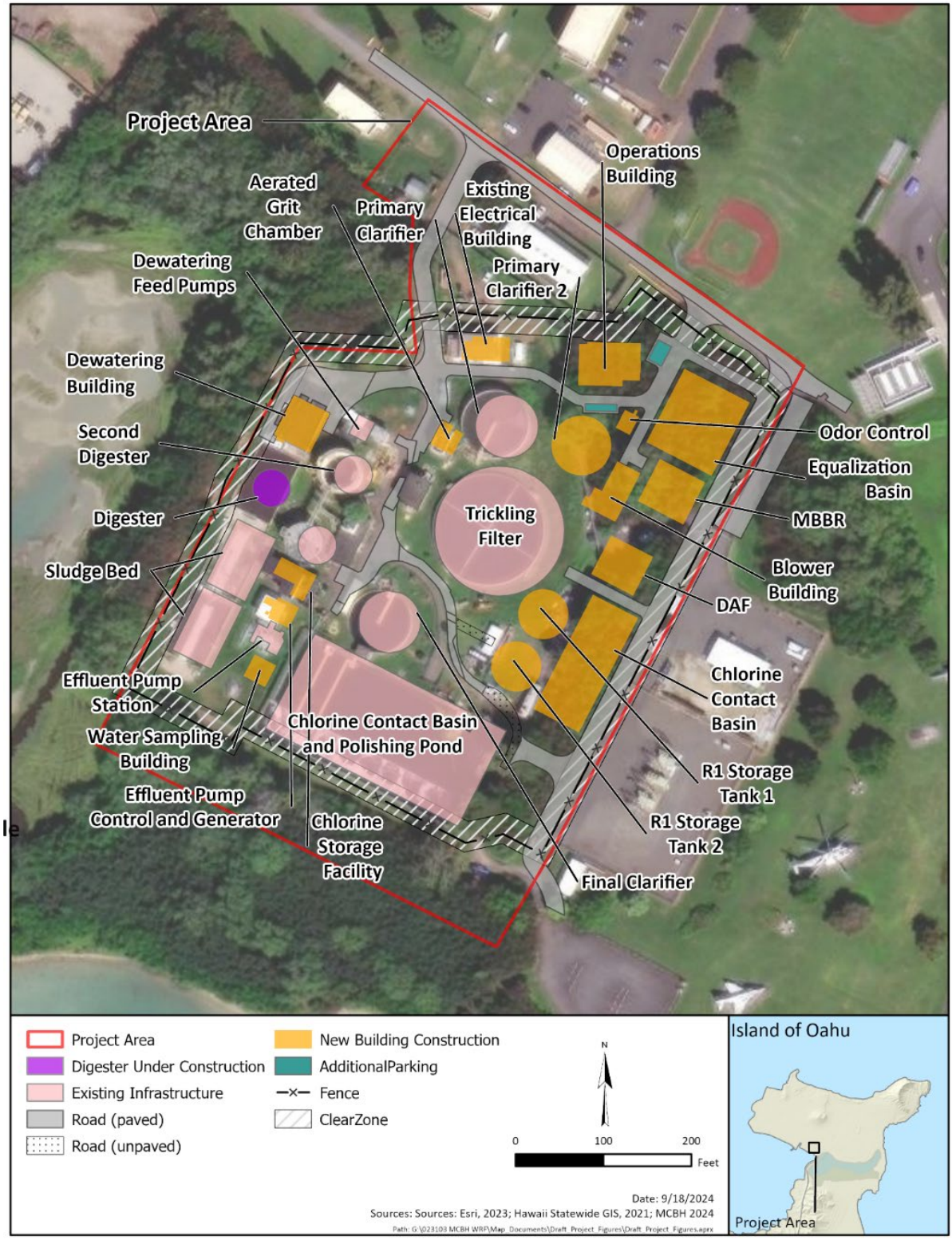
1996 Archeological Monitoring of Trenching for Water Pipe in Support of Project KB9562RS and Fence Post Excavation for Expansion of the Canine Obstacle Course Buildings 1095 and 1096, Marine Corps Base Hawaii, Kaneohe Bay. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division. Paul H. Rosendahl, Ph.D., Inc., Hilo

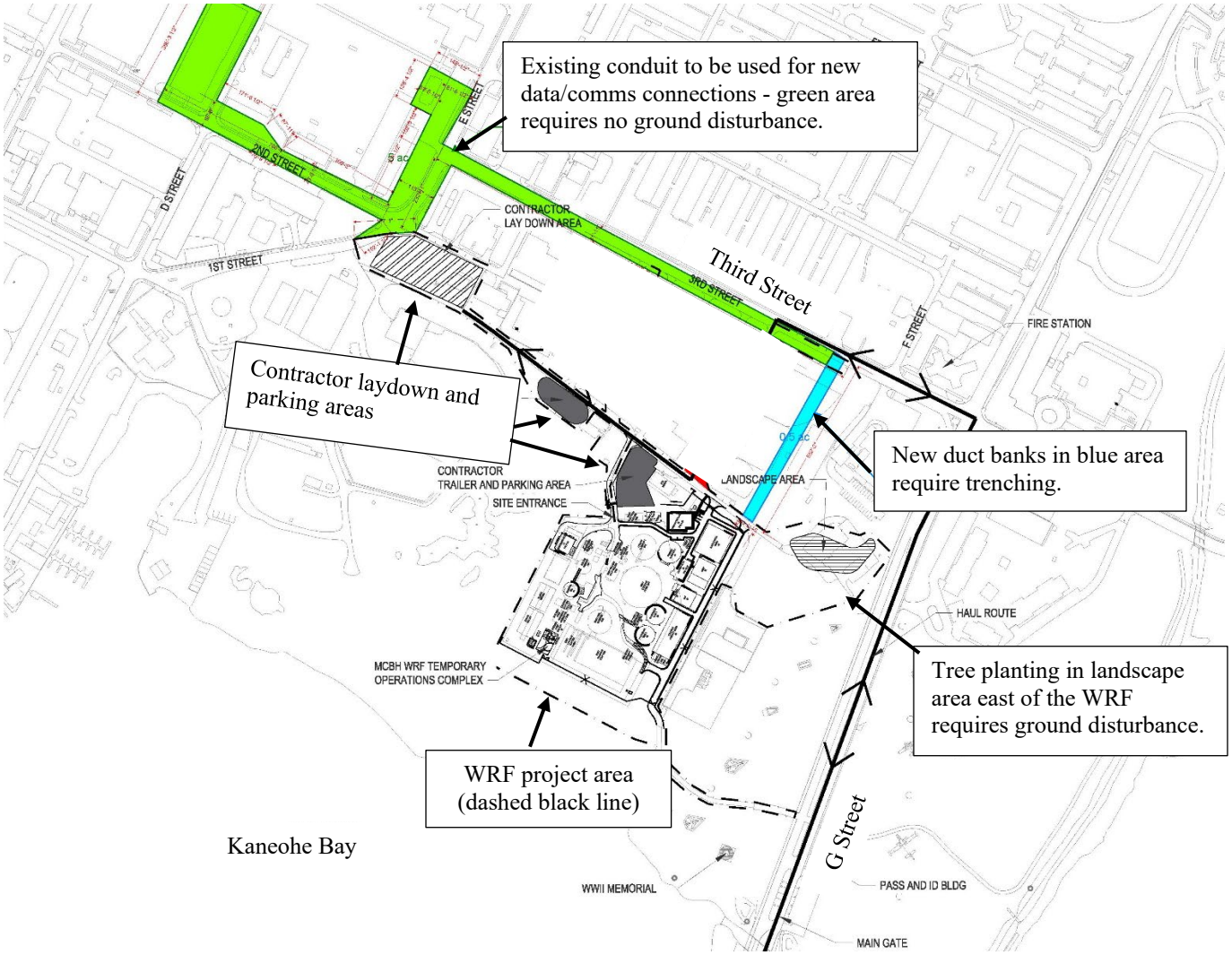
Enclosure 1. Location of the P-875 WRF Redundancy project at MCBH Kaneohe Bay.



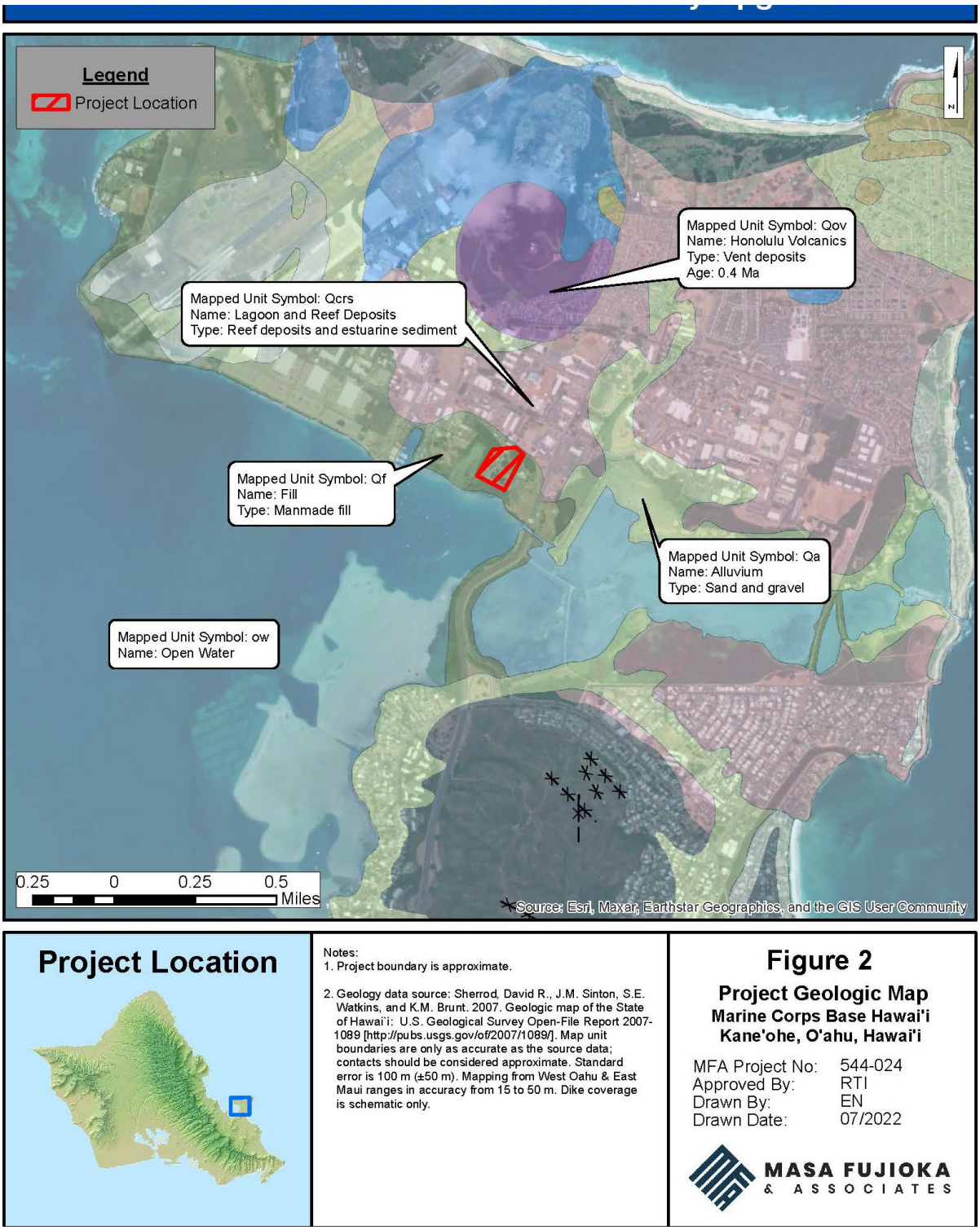
Enclosure 2. Rendering of the completed P-875 WRF Redundancy Upgrade project including new and upgraded structures and unit processes. Note: Table 1 describes the function of the new units; and Table 2 describes existing facilities including those proposed for upgrades or demolition.



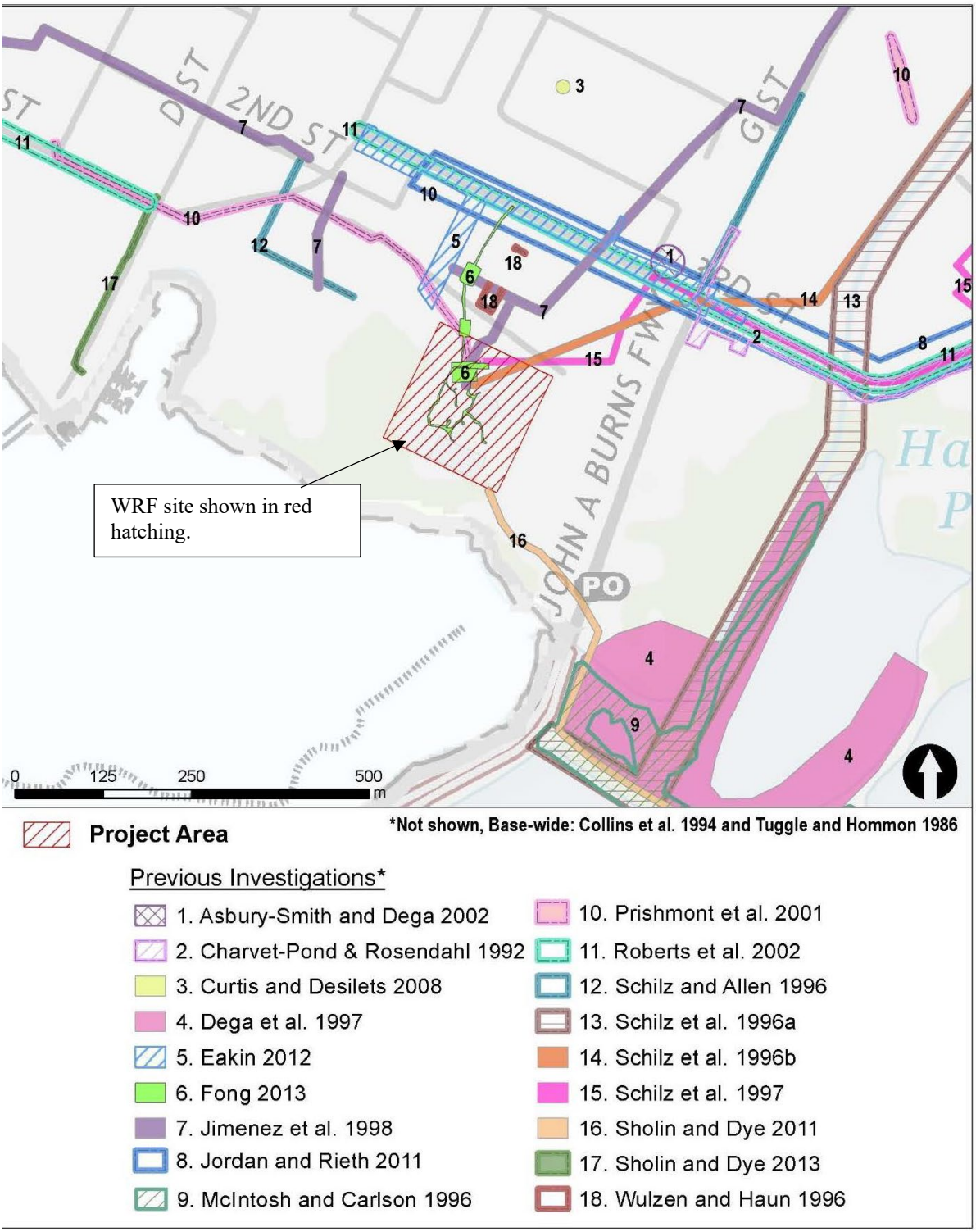
Enclosure 3. Figure showing existing infrastructure (pink), new construction (orange), roads, parking, and fencing.



Enclosure 4. Drawing showing the project APE, including existing WRF; contractor lay down areas (no ground disturbance); new duct banks for electrical/data/communication work in blue area that requires trenching; electrical/data/communication work in green area that requires no ground disturbance; and landscape area east of the WRF designated for tree planting.



Enclosure 5: Location of the WRF project area (outlined in red) within the man-made filled land (shown in green) where there is no potential for archaeological resources to be present. Note: Map was based on the Geologic Map that was used for a previous archaeological study at the WRF (Vernon and Gosser 2021:Fig.2).



Enclosure 6: Previous archaeological investigations in relation to the WRF are shown in red hatching (Vernon and Gosser 2021:Fig.6).

APPENDIX D
ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

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From: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Sent: Thursday, December 12, 2024 8:42 AM
To: Bookless CIV Lance S <lance.bookless1@usmc.mil>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>; Crile CIV Patrick David <patrick.crile@usmc.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hirano CTR Wesley R <wesley.hirano.ctr@usmc.mil>
Subject: [Non-DoD Source] Re: [EXTERNAL] RE: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Lance,

Thank you for your response. I appreciate the clarification you've provided for this project and will have these measures incorporated into the biological opinion. As you are aware, this consultation was initiated on November 4, 2024 and the original deadline for the completion of this biological opinion was set for February 20, 2025. However, due to our request for additional information and added recommendations to the avoidance and minimization measures, an extended timeframe would best allow for a more thorough evaluation of the potential impacts resulting from this project.

Since 42 days have passed from the time I sent my initial email requesting for additional

information to your most recent response (October 28, 2024 through December 9, 2024), we would like to add an extension of 42 days to ensure that all pertinent information is adequately reviewed and considered. The revised submission deadline for this biological opinion would be no later than **April 3, 2025**.

Thanks so much, looking forward to your response and will be able to address any further questions/concerns.

Best,
Nikki

Nicole R. Imamura
Fish and Wildlife Biologist | Planning and Consultation Team
Pacific Islands Fish and Wildlife Office
US Fish and Wildlife Services
300 Ala Moana Blvd Rm 3-122
Honolulu, Hawai'i 96850
(808) 460-7074

From: Bookless CIV Lance S <lance.bookless1@usmc.mil>
Sent: Monday, December 9, 2024 10:54 AM
To: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>; Crile CIV Patrick David <patrick.crile@usmc.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hirano CTR Wesley R <wesley.hirano.ctr@usmc.mil>
Subject: [EXTERNAL] RE: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

From: Bookless CIV Lance S
Sent: Monday, December 9, 2024 10:55 AM
To: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>; Crile CIV Patrick David <patrick.crile@usmc.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hirano CTR Wesley R <wesley.hirano.ctr@usmc.mil>
Subject: RE: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Nikki,

Here are the Avoidance, Minimization, and Conservation measures and BMPs MCBH can commit to:

1. We will cover the secondary clarifier, also called the final clarifier, with netting not to exceed ¾ inches mesh diameter, and may evaluate using balls as possible secondary, but not primary, additional deterrent measure.

2. Larvicides may be used to control the blood worms in the secondary clarifier.

3. If we need access to the clarifier to facilitate maintenance, we will use hand-clapping or whistling to deter the stilts from hanging out in and around the clarifier.

4. We will cover the wet well with netting or metal grating and/or construct a barrier around the equipment to keep birds out.

5. We do not plan to cover the sludge beds, but will keep it vegetation free and may avoid putting sludge in it from May-July to reduce the likelihood stilts will attempt to use it as a nest site. Once the new redundant facility is constructed, the sludge beds will likely only be used as a last resort backup due to unforeseen equipment failure requiring the digester material be diverted to it.

We recommend the BO cover the next 10 years.

The proposed fence with barbed is identified in Figure 2-1 of the BA and is identified by the symbol "-X---X-" . The perimeter fence encloses the entire WRF.

R/s,

Lance Bookless

Senior Natural Resources Mgr /Installation Pest Mgt Coordinator/Certified arborist
Marine Corps Base Hawaii
Environmental Division
Box 63062 B1359
MCBH Kaneohe Bay, HI 96863-3062

☎: (808) 496-7000
: (808) 781-7636
✉: lance.bookless1@usmc.mil

From: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Sent: Tuesday, November 26, 2024 4:11 PM
To: Bookless CIV Lance S <lance.bookless1@usmc.mil>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>
Subject: [Non-DoD Source] Re: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Lance,

I'm currently working on drafting the BO, and I wanted to quickly follow up to see if you

had any questions regarding some of the concerns I've noted earlier. I also wanted to follow up on your confirmation regarding the conservation measures proposed in Ryan's previous email. If you'd like to discuss further, please let me know.

Mahalo,
Nikki

Nicole R. Imamura
Fish and Wildlife Biologist | Planning and Consultation Team
Pacific Islands Fish and Wildlife Office
US Fish and Wildlife Services
300 Ala Moana Blvd Rm 3-122
Honolulu, Hawai'i 96850
(808) 460-7074

From: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Sent: Monday, October 28, 2024 7:15 PM
To: Bookless Lance <lance.bookless1@usmc.mil>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>
Subject: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Lance,

Hope all has been well with you. I wanted to update you as I will be the POC for the Wastewater Reclamation Facility BO. After reading through the BA, I wanted to touch base and get some clarification on a few of the concerns we've noted.

- Looking at the overall timing of this project, a 3 year period does not seem to cover operations beyond that timeframe. Would you prefer to have this BO cover general operations beyond the construction upgrades? If so, we would recommend that the BO cover no more than 10 years total.

- For the areas impacting the Hawaiian hoary bat, is there a proposed location for the barbed wire installation? If so, we would need a map of the action area.

- In terms of stilt impacts, we had some concerns with the bird deterrents and hazing efforts listed under the BMPs. I spoke with Ryan and he mentioned he provided feedback on the hazing measures awhile back (which I've attached below), so we wanted to recommend a few alternatives. In general, the hazing methods listed would cause adverse effects and do more harm than good, so it would be best to alter the wording. If you'd like to implement hazing, we'd recommend using hand-clapping and noise-making (i.e.

whistling) to help deter the stilts. If any type of hazing is implemented, we would analyze its impacts, but it also needs to be clear what the hazing is for (i.e. prevent stilts from occupying areas of construction equipment that may cause injury?).

If you have any questions regarding these comments or would like to discuss further, please let me know.

Thanks so much,
Nikki

Nicole R. Imamura
Fish and Wildlife Biologist | Planning and Consultation Team
Pacific Islands Fish and Wildlife Office
US Fish and Wildlife Services
300 Ala Moana Blvd Rm 3-122
Honolulu, Hawai'i 96850
(808) 460-7074

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

In Reply Refer To:
2025-0014888-S7

November 4, 2024

Lance Bookless
Senior Natural Resources Manager
Marine Corps Base Hawai‘i
Environmental Division
Box 63062 B1359
MCBH Kāne‘ohe Bay, HI
96863-3062

Subject: Initiation of Formal Consultation for Marine Corps Base Hawai‘i Wastewater Reclamation Facility (WRF) Upgrade Kāne‘ohe Bay, Hawaii

Dear Mr. Bookless:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of the Marine Corps Base Hawai'i (MCBH) October 8, 2024, electronic mail for the proposed Wastewater Reclamation Facility upgrades in Kāne‘ohe Bay, Hawaii requesting initiation of formal section 7 consultation under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq*.). At issue are the potential adverse effects of the proposed project on the endangered Hawaiian stilt or Ae‘o (*Himantopus mexicanus knudseni*). Additionally, you requested our concurrence with your determination that the proposed action is not likely to adversely affect the endangered Hawaiian hoary bat or ‘ōpe‘ape‘a (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel or ‘Ua‘u (*Pterodroma sandwichensis*), the threatened Newell's shearwater or ‘A‘o (*Puffinus newelli*), and the endangered Hawai‘i Distinct Population Segment (DPS) of band-rumped storm petrel or ‘Akē ‘akē (*Hydrobates castro*) pursuant to section 7 of the Act.

All information for you to initiate formal section 7 consultation was either included in your electronic mail or is otherwise accessible for consideration and reference. Formal consultation was initiated on October 8, 2024. We have assigned log number 2025-0014888-S7 to this consultation. Please refer to this number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually

agree to an extension). Therefore, we expect to provide you with our biological opinion no later than February 20, 2025.

As a reminder, the ESA requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice ensures agency actions do not preclude the formulation or implementation or reasonable and prudent alternatives that avoid jeopardizing the continued existence or endangered or threatened species or destroying or modifying their critical habitats.

We appreciate the opportunity to assist you with the proposed project. If you have questions regarding this response, please contact Nikki Imamura, Fish and Wildlife Biologist (phone: 808-792-9400, email: nikki_imamura@fws.gov).

Sincerely,

LORENA WADA Digitally signed by LORENA WADA Date: 2024.11.04 14:22:52 -10'00'

Lorena Wada
Planning and Consultation Team Manager

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

IN REPLY REFER TO
5090
LFE/136-24
8 Oct 24

Earl Campbell
Field Supervisor
U.S. Fish and Wildlife Service, Pacific Islands Office
Room 3-122, Box 50088
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

SUBJECT: SECTION 7 FORMAL CONSULTATION FOR MARINE CORPS BASE HAWAII WATER RECLAMATION FACILITY UPGRADES

Dear Mr. Campbell,

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations (50 CFR Part 402), Marine Corps Base Hawaii (MCBH) requests formal consultation related to the proposed Water Reclamation Facility (WRF) upgrades (Figure 1). The Proposed Action would create a redundant capability through the construction of additional WRF components, which would be adjacent to and integrated with the existing WRF, thereby ensuring treated effluent continues to meet existing permit limitations during planned maintenance events. The new WRF capability would allow existing unit processes to be removed from service for maintenance activities while still maintaining the ability to operate at full capacity. With the proposed upgrades, the new redundant system would provide a parallel redundant water reuse capability, provide disinfection for 100 percent of the effluent treated, and implement tsunami design standards. There is no plan to increase overall discharge levels.

ESA-listed species with the potential to occur at the MCBH Kaneohe Bay WRF are listed in Table 1. Early coordination with the United States (U.S.) Fish and Wildlife Service (USFWS) occurred on June 26, 2023, including a pre-consultation phone conversation between L. Bookless and J. Kwon, regarding the biological assessment and that endangered waterbirds currently forage in and around operational components of the WRF. On August 3, 2023, USFWS conducted a pre-consultation site visit to the MCBH Kaneohe Bay WRF. On August 6, 2024, an additional pre-consultation site visit between D. Christensen and Ryan Pe'a occurred to discuss recent WRF activities and updates to the Proposed Action.

Table 1 Species Included in Biological Assessment Analysis

Common Name	*Scientific Name*	*Hawaiian Name*	*ESA Status*
Hawaiian stilt	*Himantopus mexicanus knudseni*	ʻAe ʻo	Endangered
Hawaiian hoary bat	*Aeorestes semotus*	ʻŌpeʻapeʻa	Endangered
Hawaiian petrel	*Pterodroma sandwichensis*	*ʻUaʻu*	Endangered
Newell's shearwater	*Puffinus newelli*	ʻA ʻo	Threatened
Hawaii DPS of band-rumped storm petrel	*Hydrobates castro*	ʻAkē ʻakē	Endangered

Legend: DPS = Distinct Population Segment; ESA = Endangered Species Act.

MCBH Kaneohe Bay has determined the proposed construction activities and WRF operations "Will Affect" the Hawaiian stilt. To reduce this impact, avoidance and minimization measures identified in Table 4-1 and described within Section 5.1 of the BA would be required as part of the Proposed Action to help protect stilts and reduce impacts of operating this critical public health and federally mandated facility. MCB Hawaii Kaneohe Bay has evaluated the potential stressors on the Hawaiian hoary bat and seabirds and determined that construction activities and WRF operation impacts may affect but are "Not Likely to Adversely Affect" the bat or seabird populations. MCBH Kaneohe Bay requests concurrence with these determinations.

Please direct correspondence regarding this matter to Lance Bookless, MCBH Senior Natural Resource Manager at lance.bookless1@usmc.mil, (808) 257-7000.

Sincerely,

HART.JEFFRY.P.1242350568 Digitally signed by HART.JEFFRY.P.1242350568 Date: 2024.10.08 18:02:04 -10'00'

J. P. HART
By direction

Enclosure: 1. Biological Assessment of the Proposed MCB Hawaii WRF Upgrades

APPENDIX E
COASTAL ZONE MANAGEMENT ACT COORDINATION

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From:	Mendes, Debra L
To:	Santos CIV Thomas E
Cc:	Peer Amble; Stephen Wenderoth; Maynard, Ryan M CIV USN (USA); Bomar CIV Jacquelyn C; Hart Maj Jeffry P; Glover CTR Rachel K; LaLonde Capt Ryan David
Subject:	[Non-DoD Source] Re: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA
Date:	Wednesday, February 12, 2025 12:03:41 PM

Aloha Thomas Santos,
Thank you for the additional information.

This email acknowledges the U.S. Marine Corps proposed use of the Navy/Marine Corps De Minimis Activities under CZMA list for the proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe, Hawaii. We acknowledge that the activities identified and described should not be subject to further review by the Hawaii CZM Program on the basis and conditions that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions." This acknowledgment does not represent an endorsement of the proposed federal agency activity nor convey approval of any regulations administered by any state or county agency.

Thank you.
Debra

~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~
Debra L. Mendes
Hawaii Coastal Zone Management Program
PO Box 2359
Honolulu, HI 96804-2359
Ph: 808.587.2840
Email: Debra.L.Mendes@hawaii.gov
~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~

From: Santos CIV Thomas E
Sent: Wednesday, February 12, 2025 9:47 AM
To: Mendes, Debra L
Cc: Peer Amble; Stephen Wenderoth; Maynard, Ryan M CIV USN (USA); Bomar CIV Jacquelyn C; Hart Maj Jeffry P; Glover CTR Rachel K; LaLonde Capt Ryan David
Subject: [EXTERNAL] RE: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Ms. Mendes,

As requested, please see below for a general description of the construction and installation activities associated with the proposed action for this project.

The proposed WRF upgrades include:

- construction of associated sewage treatment facilities
- installation of security fencing
- redundancy upgrade
- tsunami designs
- ability to treat wastewater to reuse quality standards
- supporting improvements – vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates
- construction laydown locations outside the WRF

New Facility Construction

The proposed action constructs new operational sewage treatment components and associated support equipment at the WRF at MCB Hawaii Kaneohe Bay. The proposed construction would take place in already developed areas and would be constructed over a 3-year period from Fiscal Year (FY) 2025 through FY 2028. The construction would be done in phases to mitigate disruptions to and maintain operation of the WRF. The associated treatment facilities that would be constructed include an operations/lab/electrical building, a sampler building, a dewatering building, and a blower building. The new facilities would house and safeguard equipment and utility infrastructure while also providing space for operational and laboratory needs. Along with new facility construction, many buildings and structures would be consolidated or removed from the WRF. Construction laydown areas outside the WRF would be used for staging equipment and materials during construction.

Redundancy WRF Upgrade

Proposed WRF upgrades include adding an additional process system to allow unit treatment systems to be taken offline for maintenance or repair without affecting the WRF's ability to meet its permit requirements. By providing integration with the existing treatment system, both systems would have the capability to produce R-1 recycled water.

Utilities

The proposed action would include upgrades to water, sewer, and electrical utilities. The project would incorporate energy-efficient designs, including a sanitary sewer system, gravity and pressure pipelines, and energy-efficient equipment and energy-saving materials in coordination with the Hawaiian Electric Company Energy. New electric feeder cables that utilize an existing conduit will be installed between the WRF and Third Street. There will be trenching between the WRF and Third Street for a new Communication Connection duct bank.

Paving and Site Improvements

Proposed paving and site enhancements include the demolition of existing structures, paving of access roads, landscaping, and installation of fencing. Paving would enhance pedestrian pathways and improve access roads. Additional site improvements would include: constructing retaining walls; installing signage, fountains, handrails, and guardrails; and landscaping of lawns, grasses, and exterior plants.

Parking

An additional five parking spaces would be added outside the new Operations/Laboratory Building.

Tsunami Designs

New facilities constructed as a part of the upgrade to the WRF would meet Risk Category III and Tsunami Risk Category III requirements, resulting in a tsunami design consistent with American Society of Civil Engineers 7-16 Tsunami Geodesign Database. The designed upgrades would account for a maximum tsunami water inundation elevation of 21.3 feet above mean sea level, a peak flow velocity of 20 feet per second, and a future sea level rise of 1.3 feet at the site.

Fencing and Gates

The WRF upgrade includes installation of a perimeter fence enclosure consisting of a 7-foot-tall chain-link fabric fence with a 1-foot-tall single outrigger with barbed wire (8 feet total height).

Please let me know if you have any further questions regarding this project.

Thank you!

V/R

Thomas Santos

NEPA Program Manager
Environmental Compliance and Protection Division
Marine Corps Base Hawaii
Kaneohe Bay, HI
DSN: 315-496-7139
Commercial: 1-808-496-7139
Cell: 808-272-5549
E-mail: Thomas.e.santos.civ@usmc.mil

From: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Sent: Monday, February 10, 2025 2:48 PM
To: Santos CIV Thomas E <thomas.e.santos.civ@usmc.mil>

Cc: Peer Amble <Peer.Amble@cardno-gs.com>; Stephen Wenderoth <Stephen.Wenderoth@cardno-gs.com>; Maynard, Ryan M CIV USN (USA) <ryan.m.maynard4.civ@us.navy.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; Glover CTR Rachel K <rachel.glover.ctr@usmc.mil>; LaLonde Capt Ryan David <ryan.d.lalonde.mil@usmc.mil>
Subject: [Non-DoD Source] Re: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Thomas,
Apologies again.
I have the map you provided back on 1/8/25. Upon receipt of general description of the construction and installation activities we should be able to issue a CZM acknowledgement statement.
thank you,
Debra

~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~
Debra L. Mendes
Hawaii Coastal Zone Management Program
PO Box 2359
Honolulu, HI 96804-2359
Ph: 808.587.2840
Email: Debra.L.Mendes@hawaii.gov
~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~

From: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Sent: Monday, February 10, 2025 2:29 PM
To: Santos CIV Thomas E <thomas.e.santos.civ@usmc.mil>
Cc: Peer Amble <Peer.Amble@cardno-gs.com>; Stephen Wenderoth <Stephen.Wenderoth@cardno-gs.com>; Maynard, Ryan M CIV USN (USA) <ryan.m.maynard4.civ@us.navy.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; Glover CTR Rachel K <rachel.glover.ctr@usmc.mil>; LaLonde Capt Ryan David <ryan.d.lalonde.mil@usmc.mil>
Subject: Re: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Hello Thomas Santos,
Apologies for the delay in response!

Can you please provide the following for the proposed activities being covered under the De Minimis list:

1. General description of constructions and installation activities
2. Site location map

Thank you,
Debra

~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~
Debra L. Mendes
Hawaii Coastal Zone Management Program
PO Box 2359
Honolulu, HI 96804-2359
Ph: 808.587.2840
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~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~

From: Santos CIV Thomas E
Sent: Thursday, February 6, 2025 9:40 AM
To: Mendes, Debra L
Cc: Peer Amble; Stephen Wenderoth; Maynard, Ryan M CIV USN (USA); Bomar CIV Jacquelyn C; Hart Maj Jeffry P; Glover CTR Rachel K; LaLonde Capt Ryan David
Subject: [EXTERNAL] RE: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Aloha Ms. Mendes,

Wanted to check on the status of the subject notification and e-mail below that was sent earlier last month to ensure it was received by your office. We are standing by for any questions or RFIs your office may have regarding this notification.

Mahalo!

V/R

Thomas Santos
NEPA Program Manager
Environmental Compliance and Protection Division
Marine Corps Base Hawaii
Kaneohe Bay, HI
DSN: 315-496-7139
Commercial: 1-808-496-7139

Cell: 808-272-5549
E-mail: Thomas.e.santos.civ@usmc.mil

From: Santos CIV Thomas E
Sent: Wednesday, January 8, 2025 7:33 AM
To: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Cc: Peer Amble <Peer.Amble@cardno-gs.com>; Stephen Wenderoth <Stephen.Wenderoth@cardno-gs.com>; Maynard, Ryan M CIV USN (USA) <ryan.m.maynard4.civ@us.navy.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; Glover CTR Rachel K <rachel.glover.ctr@usmc.mil>
Subject: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Aloha Ms. Mendes and Happy New Year,

The U. S. Marine Corps is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA), as implemented by the Council on Environmental Quality regulations, Department of the Navy Regulations, and Marine Corps Order 5090.2 for implementing NEPA. The proposed action is to construct improvements to the existing Water Reclamation Facility (WRF) and install a second (i.e., "redundant") wastewater treatment system.

The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system of similar capacity as the existing WRF, meet water quality and disinfection permit standards, provide new water reuse capabilities on base, and meet tsunami design requirements.

The proposed action would occur at the existing WRF at MCB Hawaii Kaneohe Bay, west of the Main Gate and east of the marina (project location map attached). The facility is adjacent to Kāneʻohe Bay on the southwest and the Salvage Yard wetland on the west. No construction work would take place within the Salvage Yard wetland. Existing support facilities are on the north, and power substation facilities and the main gate on the east.

The proposed action falls within the Navy/Marine Corps De Minimis Activities Under CZMA, Item 1: New Construction, Item 2: Utility Line Activities, Item 3: Repair and Maintenance, Item 10: Studies and Data Collection and Survey Activities, and Item 11: Demolition.

> Item 1. Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.
>
> Item 2. Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation,

backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.

Item 3. Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.

Item 10. Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.

Item 11. Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.

The relevant project mitigation/general conditions under the De Minimis agreement for New Construction, Utility Line Activities, Repair and Maintenance, Studies and Data Collection and Survey Activities, and Demolition actions are: 1, 2, 3, 6, 8, 9, 10, 11, 12, 13, 14, 16:

1. Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.

2. If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.

3. Turbidity and siltation from project related work will be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

6. No project-related materials (fill, revetment, rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).

8. No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.

9. Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.

10. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

11. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).

12. Section 106, of the National Historic Preservation Act (NHPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.

13. Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.
14. The National Environmental Policy Act (NEPA) review process will be completed.
16. Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA).

If you have any questions or would like more information, you can reach me by e-mail at Thomas.e.santos.civ@usmc.mil or by phone at (808) 496-7139.

Mahalo!

V/R

Thomas Santos
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APPENDIX F
AIR EMISSIONS CALCULATIONS

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F.1 Construction Activity Inputs

Construction activities associated with the Water Reclamation Facility (WRF) Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay in O'ahu, Hawai'i would involve demolition of existing structures, construction of new buildings for various uses, installation of resiliency structures to elevate certain equipment above tsunami inundation levels, installation of new wastewater treatment processes and utilities, fencing, pavement, and other site improvements.

A construction estimate to identify equipment, material, and manpower requirements for the construction activities associated with the proposed action as to construction crew and equipment requirements and productivity was performed based on data presented in:

"2003 RSMeans Facilities Construction Cost Data", R.S. Means Co., Inc., 2002
"2011 RSMeans Facilities Construction Cost Data", R.S. Means Co., Inc., 2010

The assumptions and calculations are based on the program cost estimates developed for the work that roughly quantify the major components of the work.

Some portions of the work are considered incidental or as not generally accretive to equipment use and emissions. For example, erosion control and fence removal are expected to be relatively low-intensity low-frequency work items. Additionally, because no subgrade construction is noted in the project descriptions and the site is and will remain generally flat, it is assumed that no mass grading activities are required (other than excavation necessary specifically to construction building foundation elements).

The construction phases considered with manpower and equipment estimates include:

- One building demolition
- Structure construction
  - Four new facility buildings that would involve construction of foundation, enclosure, mechanical system, finishes, and interior utility installations
  - Tsunami design with 7,803 feet of concrete structure to elevate various systems above inundation levels
  - Redundancy WRF Upgrades including constructing a primary clarifier, equalization tank, moving biofilm reactor, and storage tanks
  - Utilities
  - Parking and site improvement
- Utility trenching

F.2 Equipment Operations and Emissions

The quantity and type of equipment estimated using RSMeans methods for the activities necessary to implement the proposed action as described above are inputs for further quantification of air emissions. All equipment was assumed to be diesel-powered. For the equipment without a specified horsepower rating per RS Means, the average level for the similar equipment types were applied using the United States (U.S.) Army Corps of Engineers construction equipment database.

Estimates of equipment emissions were based on the estimated hours of usage and emission factors for each mobile source for the project. Emission factors related to diesel nonroad equipment were estimated from U.S. Environmental Protection Agency's (EPA's) Motor Vehicle Emission Simulator

(MOVES). The national default input parameters applicable for Honolulu County where the proposed project is located were used in emissions factor modeling.

The EPA recommends the following formula to calculate hourly emissions from nonroad engine sources:

$$M_i = N \times HP \times LF \times EF_i$$

Where:

M_i = mass of emissions of i^{th} pollutants during inventory period;
N = source population (units);
HP = average rated horsepower;
LF = typical load factor; and
EF_i = average emissions of i^{th} pollutant per unit of use (e.g., grams per horsepower-hour).

Typical load factors for various equipment types will be based on Appendix A of EPA's "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling" (EPA, 2010).

The estimated construction equipment emissions are summarized in Table F-1.

F.3 Vehicle Operations and Emissions

The quantity and trips of construction commuter vehicles and material hauling trucks were estimated based on the projected manpower and material required for demolition and construction activities estimated using RSMeans method.

Truck and commuting vehicle operations would result in indirect emissions. MOVES4 was used to predict truck and commuter vehicle running emission factors. As stated earlier, projected vehicle operations were based on RSMeans trip forecasts and assumed average travel distance for each truck and commuting vehicle trip off site. The estimated vehicle trips resulting emissions are summarized in Table F-2, including MOVES emission factors, and annual travel distances in miles.

F.4 Fugitive Dust (Earth Disturbance)

In addition to engine emissions, fugitive dust emissions resulting from earth disturbance (e.g., excavation and transferring of excavated materials into dump trucks) were estimated with particulate emission factors from the Wrap Fugitive Dust Handbook (Western Regional Air Partnership, 2006). The particulate matter (PM) emission factors are the following:

PM_{10} = 0.11 (tons/acre-month)
$PM_{2.5}$ = PM_{10} emission factor × ratio [0.1 for construction and demolition activity]

PM emissions were calculated using the following equation:

$$E = EF \times acres \times months\ of\ activity$$

Where:

E = fugitive dust emissions (tons)
EF = emission factor (ton/acre-month)

The amount of earth disturbed was based on square footage of land disturbed by new or modified buildings, other impervious surfaces, and other ground disturbances as summarized in Table 2-1 of the environmental assessment (EA). Estimated fugitive dust emissions for PM_{10} and $PM_{2.5}$ are shown in Table F-3.

F.5 Combined Construction Emissions

The estimated total annual construction emissions during the 3-year construction duration are summarized in Table F-4.

Table F-1. Total Construction Equipment Emissions

Equipment	HP	Days	Hours	Load Factor	Emission Factor (g/hp-hr)							Emissions (tons)						
					CO	SO_x	$PM_{2.5}$	PM_{10}	NO_x	VOC	CO_{2e}	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_x	VOC	CO_2e
Backhoe loader, 48hp	48	116	928	0.59	0.420	0.002	0.050	0.051	2.628	0.117	697.97	0.012	0.000	0.001	0.001	0.076	0.003	20.22
Backhoe loader w/ attachment	48	2	16	0.43	0.420	0.002	0.050	0.051	2.628	0.117	697.97	0.000	0.000	0.000	0.000	0.001	0.000	0.25
Compressor, 250 cfm	74	9	72	0.43	0.438	0.002	0.052	0.054	2.767	0.092	591.95	0.001	0.000	0.000	0.000	0.007	0.000	1.49
Compressor, 600 cfm	122	54	432	0.43	0.156	0.001	0.037	0.039	0.656	0.038	531.43	0.004	0.000	0.001	0.001	0.016	0.001	13.28
Concrete pump, small	425	52	416	0.43	0.575	0.002	0.085	0.088	2.065	0.126	531.81	0.048	0.000	0.007	0.007	0.173	0.011	44.57
Crane, 80-ton	402	46	368	0.43	0.161	0.001	0.026	0.027	0.694	0.037	531.38	0.011	0.000	0.002	0.002	0.049	0.003	37.26
Crane, 90-ton	450	66	528	0.43	0.161	0.001	0.026	0.027	0.694	0.037	531.38	0.018	0.000	0.003	0.003	0.078	0.004	59.84
Crane, hydraulic, 12 ton	240	120	960	0.43	0.061	0.001	0.013	0.014	0.257	0.019	531.21	0.007	0.000	0.001	0.002	0.028	0.002	58.01
Crane, hydraulic, 33 ton	350	1	8	0.43	0.161	0.001	0.026	0.027	0.694	0.037	531.38	0.000	0.000	0.000	0.000	0.001	0.000	0.71
Crane, SP, 12 ton	74	6	48	0.43	0.284	0.002	0.028	0.029	2.620	0.065	591.80	0.000	0.000	0.000	0.000	0.004	0.000	1.00
Crane, SP, 5 ton	51	20	160	0.43	0.284	0.002	0.028	0.029	2.620	0.065	591.80	0.001	0.000	0.000	0.000	0.010	0.000	2.29
Crawler-type drill, 4"	225	54	432	0.59	0.045	0.001	0.011	0.011	0.180	0.013	536.92	0.003	0.000	0.001	0.001	0.011	0.001	33.94
Diesel hammer, 41k ft-lb	164	63	504	0.43	0.498	0.002	0.115	0.119	2.217	0.181	532.45	0.020	0.000	0.005	0.005	0.087	0.007	20.86
Dozer, 300 HP	300	7	56	0.59	0.045	0.001	0.011	0.011	0.180	0.013	536.92	0.000	0.000	0.000	0.000	0.002	0.000	5.87
Dump truck, 16-ton	286	2	16	0.59	0.019	0.001	0.006	0.006	0.112	0.010	536.86	0.000	0.000	0.000	0.000	0.000	0.000	1.60
Front end loader, 1.5 cy, crl	118	7	56	0.21	0.585	0.002	0.121	0.125	1.273	0.186	627.97	0.001	0.000	0.000	0.000	0.002	0.000	0.96
Front end loader, TM, 2.5cy	177	1	8	0.21	0.508	0.002	0.096	0.099	1.110	0.172	627.83	0.000	0.000	0.000	0.000	0.000	0.000	0.21
Gas engine vibrator	5.4	87	696	0.59	2.461	0.002	0.232	0.239	4.183	0.838	605.63	0.006	0.000	0.001	0.001	0.010	0.002	1.48
Gas welding machine	24.8	112	896	0.21	2.381	0.003	0.276	0.284	4.062	0.560	700.21	0.012	0.000	0.001	0.001	0.021	0.003	3.60
Grader, 30,000 lb	150	34	272	0.59	0.075	0.001	0.017	0.018	0.272	0.012	536.95	0.002	0.000	0.000	0.000	0.007	0.000	14.25
Hydraulic excavator, 3.5 cy	424	26	208	0.59	0.088	0.001	0.017	0.018	0.259	0.018	536.98	0.005	0.000	0.001	0.001	0.015	0.001	30.80

Equipment	HP	Days	Hours	Load Factor	Emission Factor (g/hp-hr)							Emissions (tons)						
					CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_{2e}	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
Rammer/Tamper, 8"	4	11	88	0.59	2.552	0.002	0.250	0.258	4.224	0.837	599.62	0.001	0.000	0.000	0.000	0.001	0.000	0.14
Roller, vibratory	114	7	56	0.59	0.120	0.001	0.029	0.030	0.388	0.018	537.03	0.000	0.000	0.000	0.000	0.002	0.000	2.23
Tandem roller, 10 ton	114	110	880	0.59	0.120	0.001	0.029	0.030	0.388	0.018	537.03	0.008	0.000	0.002	0.002	0.025	0.001	35.04
Tractor truck, 240 HP	240	107	856	0.59	0.054	0.001	0.012	0.013	0.204	0.015	536.95	0.007	0.000	0.002	0.002	0.027	0.002	71.74
Light Truck	325	20	160	0.59	0.174	0.001	0.028	0.029	0.492	0.029	537.10	0.006	0.000	0.001	0.001	0.017	0.001	18.16
Water tank truck, 5000 gal	407	7	56	0.59	0.031	0.001	0.008	0.008	0.137	0.011	536.88	0.000	0.000	0.000	0.000	0.002	0.000	7.96
											Total:	0.175	0.001	0.030	0.031	0.674	0.044	487.75

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; HP = horsepower; NO_X = nitrogen dioxide; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur dioxide; VOC = volatile organic compound

Table F-2. Total Construction On-Road Vehicle Emissions

Vehicle Type	Fuel Type	Road Type	Speed	Distance Driven	Crew Days of Use	Driving Emissions (g/mile)							Driving Emissions (tons)						
						CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_{2e}	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
Passenger Truck	Gasoline	Urban Unrestricted	25	5	6778	3.848	0.002	0.009	0.046	0.194	0.065	457.89	0.144	0.000	0.000	0.002	0.007	0.002	17.11
Passenger Truck	Gasoline	Urban Restricted	55	15	6778	3.501	0.002	0.008	0.043	0.155	0.054	430.38	0.392	0.000	0.001	0.005	0.017	0.006	48.23
Single Unit Short Haul Truck	Diesel	Urban Unrestricted	25	5	2012	1.862	0.003	0.222	0.328	4.370	0.453	1071.82	0.021	0.000	0.002	0.004	0.048	0.005	11.89
Single Unit Short Haul Truck	Diesel	Urban Restricted	55	15	2012	1.862	0.003	0.222	0.328	4.370	0.453	1071.82	0.062	0.000	0.007	0.011	0.145	0.015	35.66

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_X = nitrogen dioxide; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur dioxide; VOC = volatile organic compound

Table F-3. Fugitive Dust Emissions

Conversions	
0.1	$PM_{2.5}/PM_{10}$ [fugitives]
0.11	PM10tons/acre-month [fugitives]
1.142007	Assumption – Total disturbance areas are evenly divided over 3 construction years.
Monthly	
0.125621	PM_{10} tons / month
0.012562	$PM_{2.5}$ tons / month
Yearly	
1.507449	PM_{10} tons / year
0.150745	$PM_{2.5}$ tons / year

2026 Emissions (Tons)	
PM_{10}	1.50744924
$PM_{2.5}$	0.150744924
2027 Emissions (Tons)	
PM_{10}	1.50744924
$PM_{2.5}$	0.150744924
2028 Emissions (Tons)	
PM_{10}	1.50744924
$PM_{2.5}$	0.150744924

Legend: $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter

Table F-4. Combined Annual Construction Emissions

Emission Type	Emissions (tons)						
	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
	2026						
On Road	0.206	0.000	0.004	0.007	0.073	0.010	37.63
Off Road	0.058	0.000	0.010	0.010	0.225	0.015	162.58
Fugitive Dust			0.151	1.507			
Total	0.265	0.001	0.164	1.525	0.297	0.024	200.21
	2027						
On Road	0.206	0.000	0.004	0.007	0.073	0.010	37.63
Off Road	0.058	0.000	0.010	0.010	0.225	0.015	162.58
Fugitive Dust			0.151	1.507			
Total	0.265	0.001	0.164	1.525	0.297	0.024	200.21
	2028						
On Road	0.206	0.000	0.004	0.007	0.073	0.010	37.63
Off Road	0.058	0.000	0.010	0.010	0.225	0.015	162.58
Fugitive Dust			0.151	1.507			
Total	0.265	0.001	0.164	1.525	0.297	0.024	200.21

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen dioxide; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur dioxide; VOC = volatile organic compound

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