DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
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MAYOR

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DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

WW.CSE 14-008

January 24, 2014

Office of Environmental Quality Control
Department of Health, State of Hawaii
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

Attn: Mr. Herman Tuiolosega

SUBJECT: Kaneohe Bay #2 Wastewater Pump Station Force Main

To All Concerned:

With this letter, the City and County of Honolulu, Department of Design and Construction hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Kaneohe Bay #2 Wastewater Pump Station Force Main situated at Tax Map Key [TMK] 4-4-14:49, in the District of Koolaupoko on the island of Oahu for publication in the next available edition of the Environmental Notice.

Enclosed is a completed Office of Environmental Quality Control's (OEQC) Publication Form, two copies of the DEA-AFONSI, a PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Roy Tamashiro at (808) 768-8760.

Very truly yours,

for M. Yonamine

Chris T. Takashige, P.E., CCM
Director

Enclosures:
1. Draft Environmental Assessment for Kaneohe Bay #2 WWPS Force Main, Kaneohe, Oahu, Hawaii
2. OEQC Publication Form
3. CD Containing DEA-AFONSI in PDF and OEQC Publication in MS Word.

AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (FEBRUARY 2013 REVISION)

Project Name: Kaneohe Bay #2 Wastewater Pump Station Force Main
Island: Oahu
District: Koolaupoko
TMK: 4-4-14:49
Permits:

Potential Permits and Approvals Required

Permit or Approval	Agency
Federal	
Department of Army Permit	Corps of Engineers, US Army
State of Hawaii	
Community Noise Control/Variance	DOH, Indoor and Radiological Health Branch
Environmental Assessment	DOH OEQC
NPDES Permit -- Construction	DOH CWB
Water Quality Certification	DOH CWB
Stream Channel Alteration Permit	Commission on Water Resource Management
Historic Site Review	State Historic Preservation Division
City and County of Honolulu	
Excavation in Public Right-of-Way	Department of Planning and Permitting
Grubbing, Grading, Stockpiling, and Erosion Control	Department of Planning and Permitting
Street Usage Permit	Department of Transportation Services
Traffic Control	Department of Transportation Services

Proposing/Determination Agency:
Mr. Chris T. Takashige, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813
Phone: (808) 768-8836

Accepting Authority: Not Applicable

Consultant:
Ryan Yamauchi, P.E., Principal
Element Environmental, LLC
98-030 Hekaha St #9
Aiea, HI 96701
Phone: 808-488-1200

Status (check one only):

_X_ DEA-AFONSI

Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The Kaneohe Bay #2 Wastewater Pump Station (WWPS) is located at 44-029 Kaimalu Place, Kaneohe, on the island of Oahu, Hawaii. The force main from the WWPS is to be replaced as a condition of a compliance milestone for the First Amended Consent Decree issued to the City and County of Honolulu.

The Kaneohe Bay #2 WWPS has been in operation since 1965 and services about 300 acres. The majority of the area served by the WWPS is residential. In 2005, the trunk sewer that discharges into the WWPS was reconstructed, resulting in updated design flows for the subject force main. The new force main will be designed to meet the updated flows.

The Proposed Action involves replacing an existing force main via Horizontal Directional Drilling methods underneath the unlined and unnamed channel adjacent to the Kaneohe Bay #2 WWPS. The anticipated determination for this EA is a Finding of No Significant Impact (FONSI).

Alternatives to the Proposed Action include two Alternative Actions and No Action. The first Alternative Action consists of Pilot Tube Microtunneling. The second Alternative Action consists of Open Cut Trenching a new alignment. The No Action alternative consists of no change to the existing conditions.

Pre-Final Draft
Environmental Assessment for

Kaneohe Bay #2 Wastewater Pump Station Force Main

Kaneohe, Oahu, Hawaii

City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

January 2014

Pre-Final Draft
Environmental Assessment for

Kaneohe Bay #2 Wastewater Pump Station Force Main

Kaneohe, Oahu, Hawaii

Prepared for:

City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Prepared by:

Element Environmental
98-030 Hekaha Street, Unit 9
Aiea, Hawaii 96701

January 2014

S-1.0 Project Summary

S-1.1 Project Proponent and Project Summary

The Kaneohe Bay #2 Wastewater Pump Station (WWPS) is located at 44-029 Kaimalu Place, Kaneohe, on the island of Oahu, Hawaii. The force main from the WWPS is to be replaced as a condition of a compliance milestone for the First Amended Consent Decree hereinafter referred to as "Consent Decree" issued to the City and County of Honolulu (CCH).

The Kaneohe Bay #2 WWPS has been in operation since 1965 and services about 300 acres. The majority of the area served by the WWPS is residential. In 2005, the trunk sewer that discharges into the WWPS was reconstructed, resulting in updated design flows for the subject force main. The new force main will be designed to meet the updated flows.

In 2006 a section of the force main within the pump station was removed and replaced. The replaced section of pipe was corroded. The corroded condition of the pipe may be indicative of the condition of the force main to be replaced in the Proposed Action.

S-1.2 Purpose and Need of the Environmental Assessment

The Proposed Action involves replacing an existing force main via Horizontal Directional Drilling (HDD) methods underneath the unlined and unnamed channel adjacent to the Kaneohe Bay #2 WWPS. Therefore, the purpose of this Environmental Assessment (EA) is to ensure that an environmental review process is properly carried out in accordance with State laws. This EA has been prepared to comply with:

- Chapter 343 of the Hawaii Revised Statutes (HRS); and
- Title 11, Chapter 200 of the Hawaii Administrative Rules (HAR).

S-1.3 Alternatives

Alternatives to the Proposed Action include two Alternative Actions and No Action. The first Alternative Action consists of Pilot Tube Microtunneling (PTMT). The second Alternative Action consists of Open Cut Trenching a new alignment. The No Action alternative consists of no change to the existing conditions.

S-1.4 Environmental Impacts

Table S-1 on the following page includes an outline of the resource areas evaluated and a brief summary of the potential impacts of the Proposed Action, Alternative Actions, and No Action alternatives.

S-1.5 Anticipated Determination

The anticipated determination for this EA is a Finding of No Significant Impact (FONSI). The determination will be made after a public review period of the Draft EA and the Significance Criteria described in HAR Section 11-200-12(b) (described in Section 5 of this EA).

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Table S-1: Summary of Environmental Impacts

Resource Areas	Proposed Action – Horizontal Directional Drilling	Alternative Action – Pilot Tube Microtunneling	Alternative Action – Open Cut Trenching	No Action
Land Use	No change in land use classification or zoning.	No change in land use classification or zoning.	No change in land use classification or zoning.	No change in land use classification or zoning.
Transportation	Minor temporary short-term impacts due to construction activities in residential neighborhood.	Minor temporary short-term impacts due to construction activities in residential neighborhood.	Temporary short-term impacts due to construction activities along Kaneohe Bay Drive.	No impacts.
Social and Economic	Temporary short-term beneficial impacts due to construction activities.	Temporary short-term beneficial impacts due to construction activities.	Temporary short-term beneficial impacts due to construction activities.	No impacts.
Climate and Air Quality, Noise	Temporary short-term impacts due to construction activities. Need for BMPs during construction and remediation.	Temporary short-term impacts due to construction activities. Need for BMPs during construction and remediation.	Temporary short-term impacts due to construction activities. Need for BMPs during construction and remediation.	No impacts.
Flora and Fauna	Minimal impacts due to construction activities. No naturally occurring threatened or endangered plants or animals within the project site.	Minimal impacts due to construction activities. No naturally occurring threatened or endangered plants or animals within the project site.	Minimal impacts due to construction activities. No naturally occurring threatened or endangered plants or animals within the project site.	No impacts.

Resource Areas	Proposed Action – Horizontal Directional Drilling	Alternative Action – Pilot Tube Microtunneling	Alternative Action – Open Cut Trenching	No Action
Historic and Archaeological Resources	No impacts to known archaeological and cultural resources. Archaeological Monitoring Plan required.	No impacts to known archaeological and cultural resources. Archaeological Monitoring Plan required.	No impacts to known archaeological and cultural resources. Archaeological Monitoring Plan required.	No impacts.
Hazardous Materials, Visual Setting, Water Resources, Geographic Setting, and Utilities	No impacts.	No impacts.	Beneficial impacts to location of wastewater utility. Access to utility for future maintenance would be improved.	No impacts.

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LIST OF APPENDICES

List of Acronyms and Abbreviations

amsl	above mean sea level
CCH	City and County of Honolulu
CIPP	cured-in-place pipe
CWB	Clean Water Branch, Department of Health, State of Hawaii
DOH	Department of Health, State of Hawaii
DR	dimension ratio
E2	Element Environmental, LLC
EA	Environmental Assessment
EPA	Environmental Protection Agency
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FONSI	Finding of No Significant Impact
ft	feet
HAR	Hawaii Administrative Rules
HDD	horizontal directional drilling
HDPE	high density polyethylene
HLA	Harding Lawson and Associates
HRS	Hawaii Revised Statues
kW	kilowatt
MCAS	Marine Corp Air Station
MCBH	Marine Corps Base Hawaii
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NWP	Nationwide Permit
OEQC	Office of Environmental Quality Control, State of Hawaii
PTMT	pilot tube microtunneling
PVC	polyvinyl chloride
RCP	reinforced concrete pipe
ROH	Revised Ordinances of Honolulu
rpm	revolutions per minute
SCADA	supervisory control and data acquisition
SHPD	State Historic Preservation Division, DLNR
SMA	Special Management Area
SMH	sewer manhole
TMK	Tax Map Key
UIC	Underground Injection Control
U.S.	United States
USACE	United States Army Corps of Engineers
UST	underground storage tank
WW	wastewater
WWPS	Wastewater Pump Station
WWPTF	Wastewater Preliminary Treatment Facility
WWTP	Wastewater Treatment Plant

Section 1 Purpose and Need for Action

This section presents the purpose of and need for the Proposed Action, the project background, and the purpose of this Environmental Assessment (EA).

1.1 Purpose and Need of Proposed Action

Based on the First Amended Consent Decree hereinafter referred to as "Consent Decree" as ordered entry on March 27, 2012, the City and County of Honolulu (CCH) is required to design and complete construction of a new force main for the Kaneohe Bay #2 Wastewater Pump Station (WWPS) by the compliance milestone of December 31st, 2016 (United States [U.S.] Department of Justice, 2012).

The objective of the project is to replace the existing force main and assess the dependability and improvement of the pumps and its motors, flow meter, piping, and valves within the pump station. The Proposed Action was chosen based on evaluating the alternative best encompassing the following evaluation criteria; hydraulic pumping requirements, constructability, the long term impacts on operations and maintenance, and the construction costs.

1.2 Project Background

The Kaneohe Bay #2 WWPS is located in a residential neighborhood at 44-029 Kaimalu Place (Tax Map Key [TMK] 4-4-14:49), located in Kaneohe, on the island of Oahu, Hawaii (Figures 1-1, 1-2). The WWPS is bordered on the north and south by residential homes. An unnamed and unlined channel is located along the western border of the WWPS site and the residential street Kaimalu Place is located adjacent to the east of the subject property.

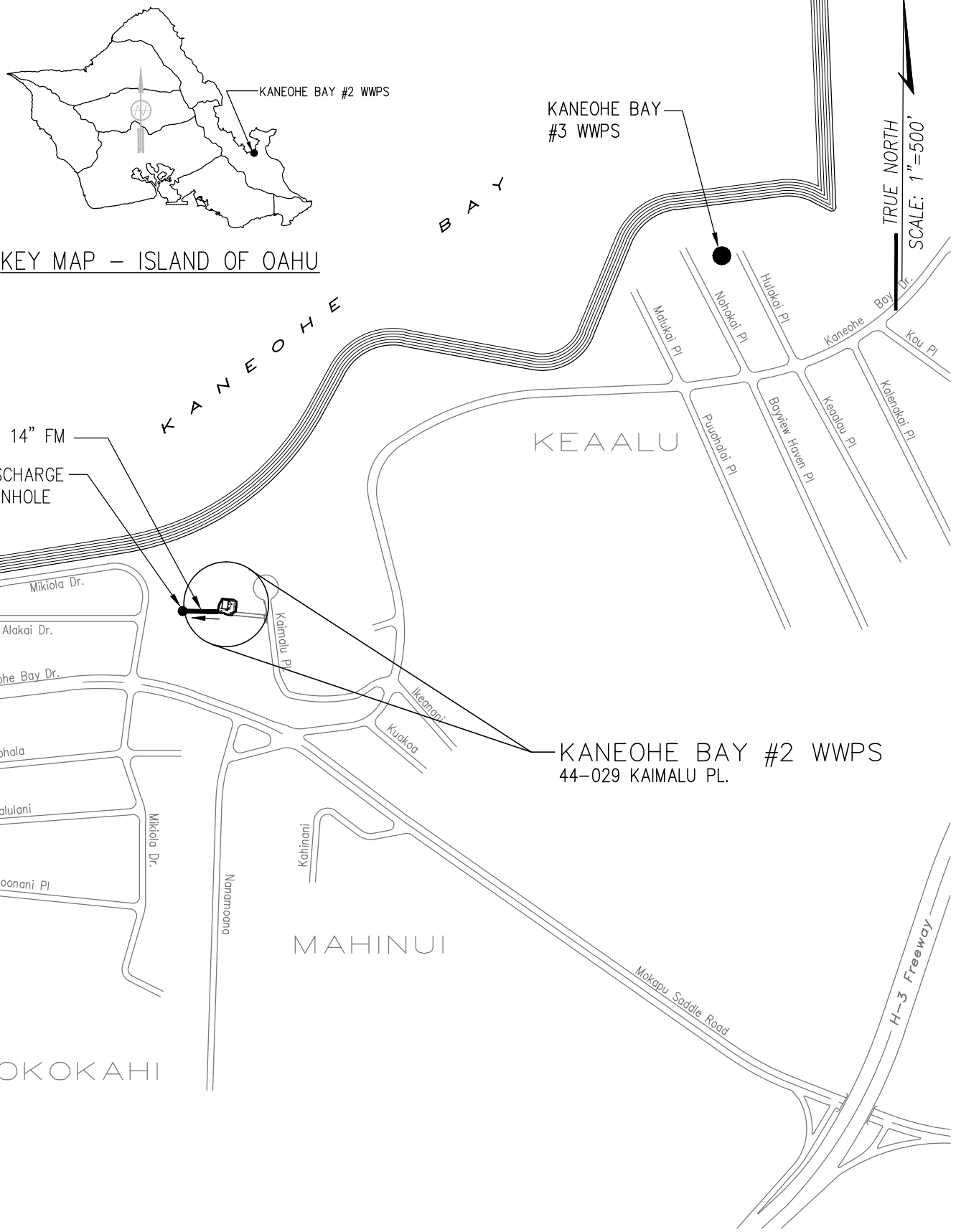
The Kaneohe Bay #2 WWPS has been in operation since 1965. It is a wet pit/dry pit type pump station, consisting of a pump room with an underground dry pit that houses three pumps and two-compartment wet well that receives incoming wastewater from a 24-inch influent line. In 1987, the WWPS was expanded to include a new retaining wall, an emergency generator, and an underground storage tank (UST). The WWPS serves a tributary of approximately 300 acres (Figure 1-3) and the majority of service consists of residential neighborhoods between Nanamoana Street and Olina Street on Kaneohe Bay Drive, from the H-3 freeway to the Kaneohe Bay coastline, including the upstream WWPS facilities Kaneohe Bay #3 and #4. In 2005, Fukunaga updated the design flows for the Kaneohe Bay #2 WWPS in a Trunk Sewer Reconstruction project (Fukunaga, 2005). The proposed new force main will be designed to meet the updated flows from the Trunk Sewer Reconstruction project.

In 2006, a section of the force main within the pump station from the pump discharge to the bypass valve box was removed and replaced. There was corrosion on this section of piping. The corroded condition of the replaced pipe may be indicative of the condition of the existing force main. The force main replacement will comply with the requirement in the Consent Decree. The proposed project also includes assessment of the dependability and improvement of the pumps and their motors, flow meter, piping and valves within the pump station.

1.3 Purpose of the EA

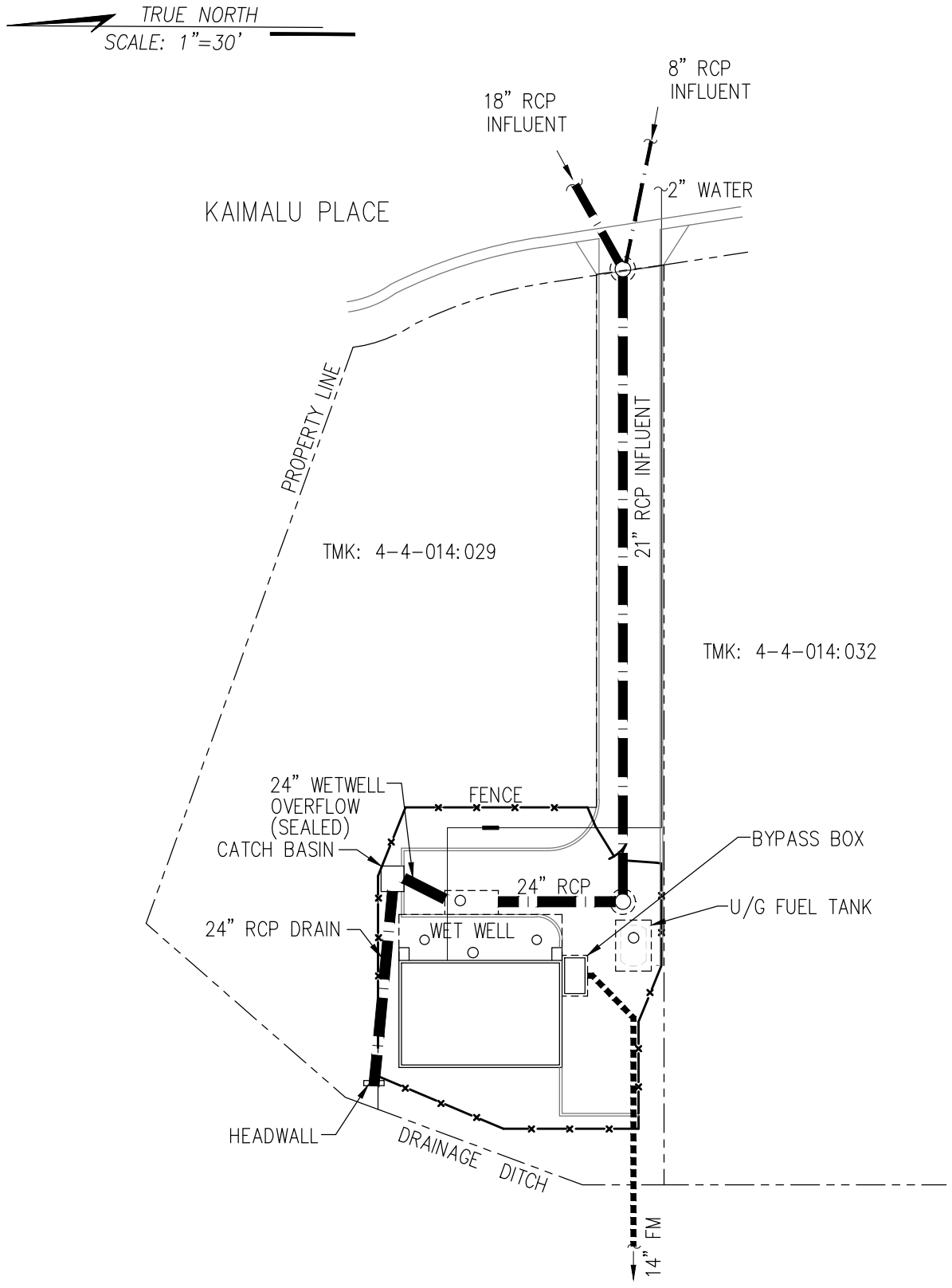
This EA was completed to assess the potential environmental and construction-phase impacts for the replacement of the WWPS force main. The EA has been prepared to comply with the requirements of Chapter 343 of the Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HAR) of the State of Hawaii Department of Health (DOH) (DOH, Title 11, Chapter 200, Environmental Impact Statement Rules).

Coordination with interested and affected parties is required; the Draft EA will be distributed to the agencies listed in Section 7. This EA was prepared by Element Environmental, LLC (E2) for the CCH Department of Design and Construction under Project No. 2009108 and was based on the preliminary engineering study under the Scope of Services for the project.



REFERENCE: O&M MANUAL, RMTC, 1997

	DATE: JAN 2014	PROJECT TITLE: KANEOHE BAY #2 WWPS FORCE MAIN ENVIRONMENTAL ASSESSMENT REPORT
	FIGURE TITLE: SITE LOCATION MAP	FIGURE NO.: 1-1

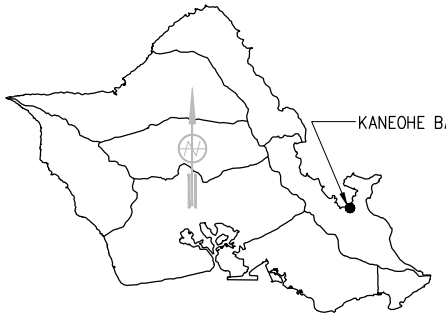


30' 0 15' 30'

SCALE: 1" = 30'

REFERENCE: O&M MANUAL, RMTC, 1997

	DATE: JAN 2014	PROJECT TITLE: KANEOHE BAY #2 WWPS FORCE MAIN ENVIRONMENTAL ASSESSMENT REPORT
	FIGURE TITLE: SITE PLAN	FIGURE NO.: 1-2



KEY MAP – ISLAND OF OAHU

TRIBUTARY AREA FOR KANEOHE BAY #5 WWPS

KANEOHE BAY #5 WWPS

KANEOHE BAY #4 WWPS

KANEOHE BAY #3 WWPS

KANEOHE BAY #2 WWPS

110 LF 14" FM

DISCHARGE MANHOLE

TRIBUTARY AREA FOR KANEOHE BAY #4 WWPS

TRIBUTARY AREA FOR KANEOHE BAY #3 WWPS

TRIBUTARY AREA FOR KANEOHE BAY #2 WWPS

TRUE NORTH

SCALE: 1"=1000'

KANEOHE

Nuuanu Pond

Paku Pl

Bay Dr.

Malae Pl

Kaneohe

Aina Moi Pl

Olina Pl

Niu Pl

Anu Pl

YACHT CLUB KNOLLS

Aumoana Pl

Laha Pl

YACHT CLUB TERRACE

Kaneohe Bay Dr.

Hulakai Pl

Nohokai Pl

Malukai Pl

Hoko

Kou Pl

Kealalau Pl

Kalenakai Pl

Bayview Haven Pl

Puuohalai Pl

KEAALU

Mikiola Dr.

Alakai Dr.

Kaneohe Bay Dr.

Kaimalii Pl.

Ikeanani

Kuakoa

Puamohala

Malulani

Hoonani Pl

Mikiola Dr.

Nanamoana

Kahinani

MAHINUI

KOKOKAHI

H-3 Freeway

Mokapu Saddle Road

Quarry Road

1000' 0 500' 1000'

SCALE: 1" = 1000'

REFERENCE: O&M MANUAL, RMTC, 1997

	DATE: JAN 2014	PROJECT TITLE: KANEOHE BAY #2 WWPS FORCE MAIN ENVIRONMENTAL ASSESSMENT REPORT
	FIGURE TITLE: TRIBUTARY AREA	FIGURE NO.: 1-3

Section 2 Proposed Action and Alternatives

This section provides a description of the proposed action and alternatives developed and evaluated to address the project purpose and need described in Section 1 (E2, 2012). A description of the affected environment is presented in Section 3, and an evaluation of the impact the Proposed Action and Alternatives has on the environment is presented in Section 4.

The scope of work for this project considered the traditional open trench replacement of the force main on either side of the unlined channel and rehabilitation of the drainage way-crossing section of the existing pipe using slip-lining or cured-in-place pipe (CIPP), and also evaluation of the alternatives for the replacement of the force main with a new alignment. The existing force main is 48 years old and a section within the pump station has already been replaced due to corrosion. These alternatives all consider the replacement of the entire length of the force main from the pumps to the discharge manhole. Figure 2-1 shows the site layout. Figure 2-2 shows the existing force main plan and profile.

Three alternatives for replacement were considered as follows:

- Alternative 1 – Horizontal Directional Drilling (HDD) New Force Main Alignment
- Alternative 2 – Pilot Tube Microtunneling (PTMT) New Force Main Alignment
- Alternative 3 – Open Cut Trench New Alignment

Initially, two other alternatives were considered and screened for analysis, but were dropped from further evaluation:

- Rehabilitation of Existing Pipe –The Consent Decree mandates the design and construction of a new force main. Also, this alternative would require a toll by pass pipe be constructed to do the rehabilitation, which would be similar to a new force main.
- Open Cut New Alignment Using a Coffer Dam – This alternative requires construction of a coffer dam with in the unlined channel so that the force main can be installed using open cut trenching methods. This alternative was eliminated from consideration for the following reasons:
    - Constructability – The channel is very shallow and bringing in the equipment and materials for the construction of the coffer dam by barge is infeasible. To bring materials in through the pump station access road or other residents' driveways requires a significant disruption to the residents.
    - Permitting – Since work will be completed in the waterway, the U.S. Army Corp of Engineers (USACE) and DOH would require Clean Water Act Sections 401 and 404 permits. Potential delays for permitting are a concern.
    - Cost – The cost of constructing a coffer dam is higher than the cost of the other alternatives evaluated.

2.1 Proposed Action – Horizontal Directional Drilling

Alternative 1 is the preferred alternative and therefore, the Proposed Action. HDD is a trenchless installation method that involves drilling a horizontal bore path of near-straight or

very gradual curvature that is steered and tracked from the surface (Figure 2-3). The pilot borehole is typically drilled at an angle between 8 and 20 degrees from the horizontal and transitions to horizontal as the required depth is reached. The curvature of the bore is determined by the allowable joint deflection and allowable curve radius for the pipe. The pilot hole is then enlarged by pulling back increasingly larger reamers from the pipe insertion point toward the rig. The final borehole diameter is typically 1.5 times the largest outside diameter of the new pipe. The pipe is then pulled into the enlarged borehole with the drill rig. The pulling head and product pipe are connected to the reamer using a swivel, which isolates the product pipe from the rotation of the HDD drill pipe.

Drilling mud (typically a mixture of bentonite and water) is used to lubricate the cutting head during the drilling operation to reduce friction and stabilize the reamed bore path prior to and during pull back. The drilling mud suspends the drill cuttings in slurry within the annulus between the bore wall and pipe and transports the cuttings to the surface. Two pipe materials were considered for this technology, high density polyethylene (HDPE) and fusible polyvinyl chloride (PVC). Fusible PVC is a stiffer material and requires a larger bend radius.

The advantages of HDD include:

1. The drill rig is operated from the surface, so shafts are not required. Construction of shafts, particularly to the depths required for this project, would add significantly to the cost of the project.

2. Dewatering (and associated permits and disposal) is not required.

3. The drill is steerable. Wireline tracking is recommended for the drilling of the pilot hole to reduce the potential for the borehole to veer off-path and encounter the existing force main pile foundations. For comparison purposes, it should be noted that the ability to steer the HDD drill rig may be relatively less accurate than PTMT (see PTMT section, below).

4. The cost of HDD is generally lower than PTMT.

5. Work under the drainage way will not trigger permits related to work in or over navigable waters.

6. HDD typically has a shorter project duration and fewer surface disruptions for the neighborhood residents than traditional open cut and trench projects.

7. HDD has been done successfully in Hawaii, and local HDD contractors are available.

If HDD is selected as the preferred option, the following items must be considered:

1. The drill rig is operated from the surface, so sufficient space is needed. This method requires a work area at the entry location with space to accommodate the drill rig (set up approximately 30 feet from the entry point), mud pit, rods, and any other equipment as needed, including a forklift, water truck, and mixing truck.

TRUE NORTH

SCALE: 1"=20'

T.M.K.: 4-4-18: 88

T.M.K.: 4-4-18: 89

T.M.K.: 4-4-18: 90

T.M.K.: 4-4-18: 91

T.M.K. 04-04-14:049

T.M.K. 04-04-14:029

323° 05' 24" (STA. MIKI-9 TO STA. 19) 94.86

(STA. 13 TO STA. MIKI-9) 102° 43' 45" 366.29

(STA. MIKI-9 TO STA. 17) 13° 56' 32"

283° 49' 19" (STA. 19 TO STA. 21) 53.84

99.05 (STA. 20 TO STA. 23) 23° 21"

275° 11' 23" (STA. 17 TO STA. 20) 122.75

270° 33' 48" (STA. 25 TO STA. 2) 135.19

S-14 FORCE MAIN

SEWER EASEMENT

WOOD FENCE H=7'

CMU WALL

WOODEN STORAGE

CARPORT

CONC. DWY.

BUILDING

WWPS

SMH TOP=8.24 INV.=7.18

D.I. TOP=7.75

SMH TOP=5.75 INV.=0.24

SMH(NOT VISIBLE) (PER PLAN)

FUEL LINES

C.L. FENCE H=4' WOOD FENCE H=6'

SMH(FILLED W/SLUDGE) TOP=7.23

SMH(FILLED W/SLUDGE) TOP=7.28

SMH(FILLED W/SLUDGE) TOP=7.26

SMH(FILLED W/WATER) TOP=6.59 BOT=(-)14.41

SMH TOP=6.96

20' 0 20' 40'

SCALE: 1"=20'

element environmental llc

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PROJECT TITLE:

KANEOHE BAY #2 WWPS FM
ENVIRONMENTAL ASSESSMENT REPORT

FIGURE TITLE:

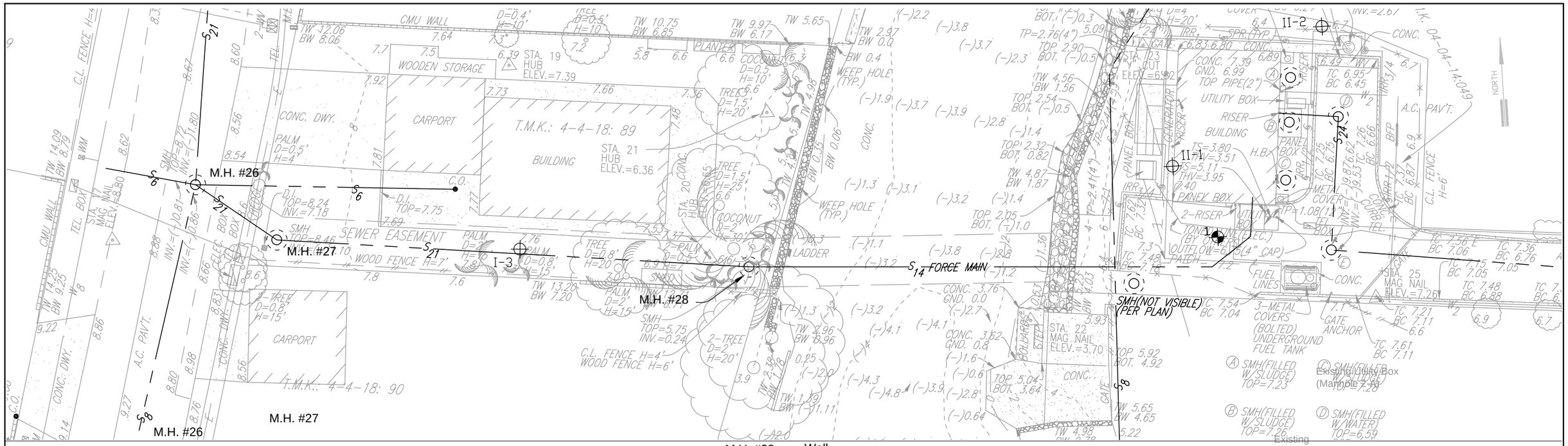
SITE LAYOUT

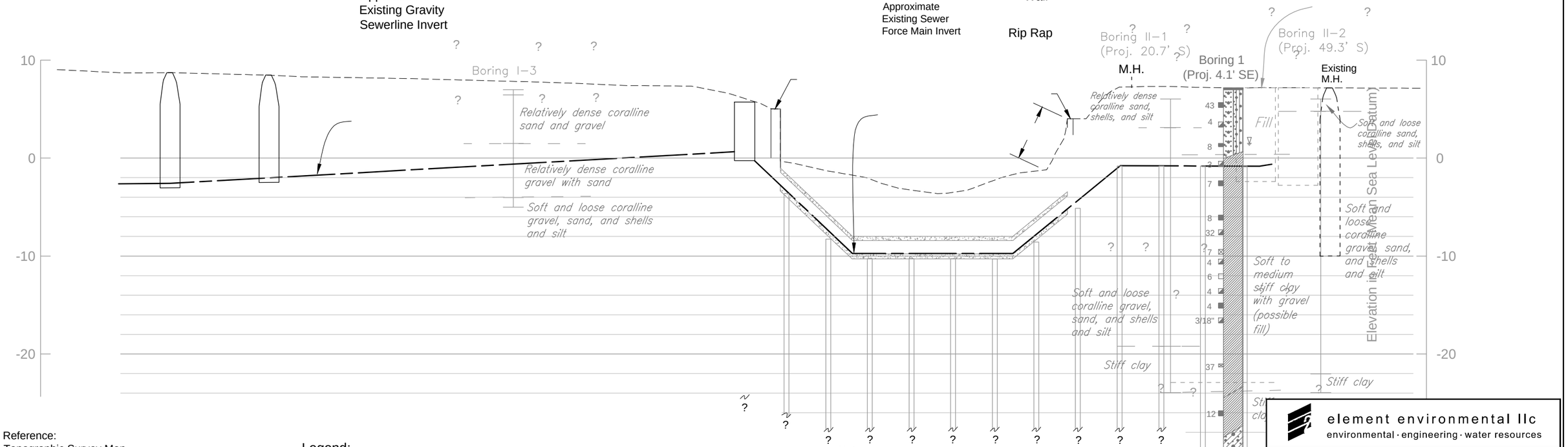
DATE:

JAN 2014

FIGURE NO.:

2-1





Reference:
Topographic Survey Map
From: ControlPoint Surveying
Dated: October 2010

Kaneohe Bay South Interceptor Sewer System,
Section 2 (As-Built Plan)
By: Wilson Associates, Inc.
Dated: November 9, 1964

Legend:

1 — Approximate PGE Boring Location and Number (2010)

I-3 — Approximate Location and Number of Previous Boring by Others (1964)

Scale 1"= 20' Feet (0, 10, 20, 40)

Note:
Pile locations based on 1964 as-built drawing.
Actual pile locations are unknown.

(Note: Boring ends at a depth of 59 ft. or at approximate elevation -52 ft.)

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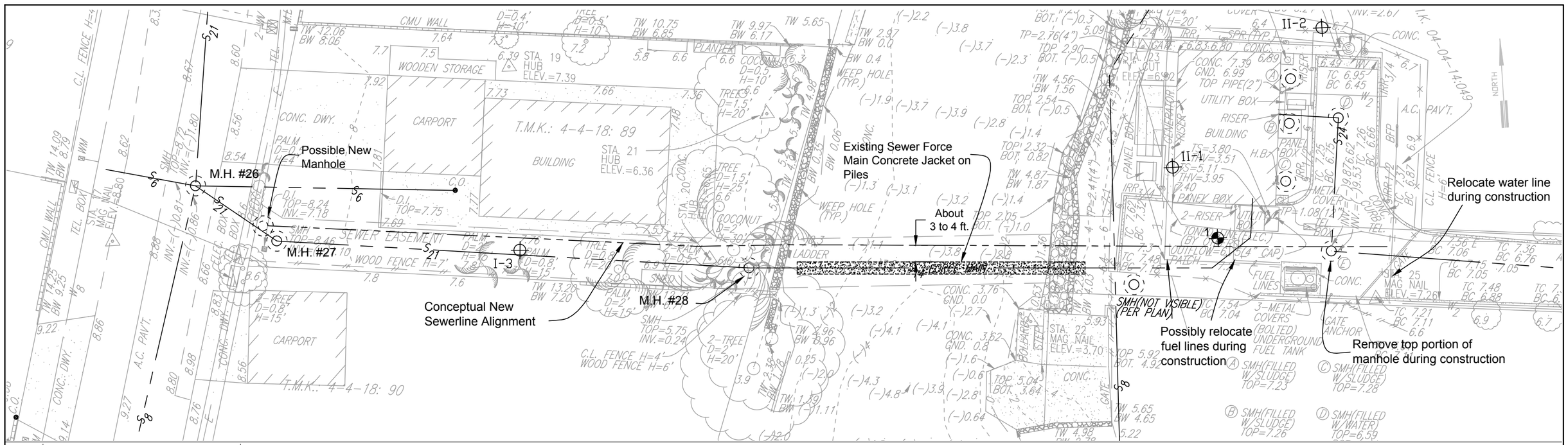
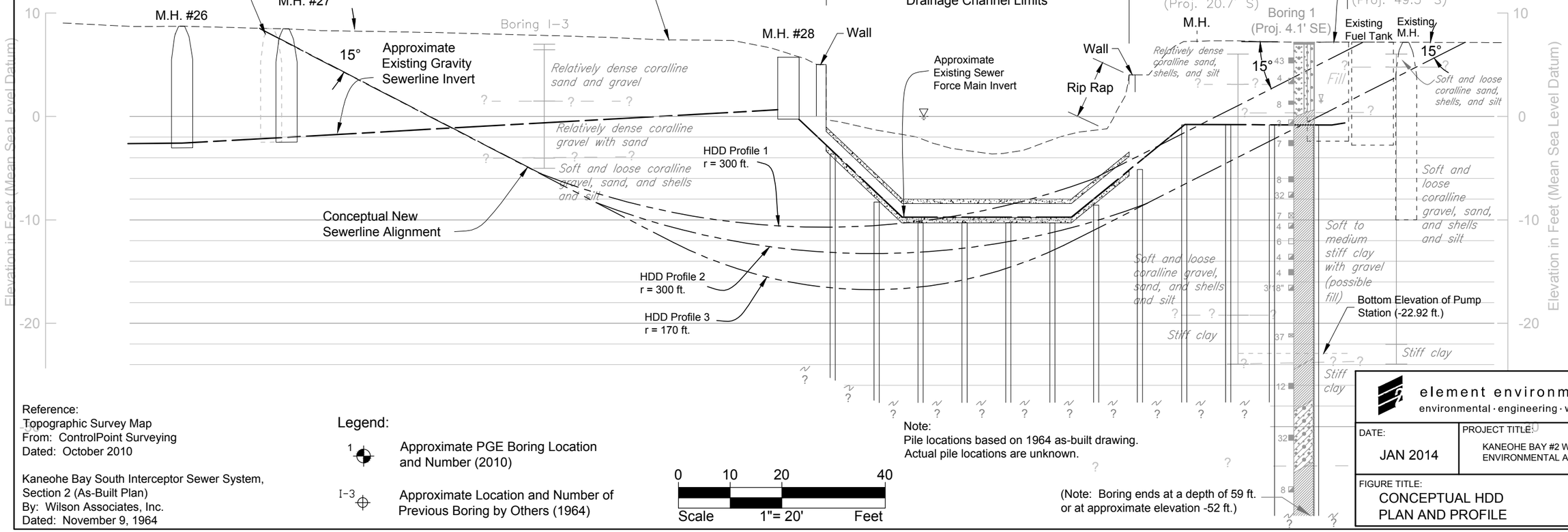
DATE: JAN 2014

PROJECT TITLE: KANEOHE BAY #2 WWPS FORCE MAIN ENVIRONMENTAL ASSESSMENT REPORT

FIGURE TITLE: EXISTING FORCE MAIN PLAN AND PROFILE

FIGURE NO.: 2-2





Reference:
Topographic Survey Map
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Kaneohe Bay South Interceptor Sewer System,
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Scale 1"= 20' Feet (0, 10, 20, 40)

Note:
Pile locations based on 1964 as-built drawing.
Actual pile locations are unknown.

(Note: Boring ends at a depth of 59 ft. or at approximate elevation -52 ft.)

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DATE:	PROJECT TITLE:
JAN 2014	KANEOHE BAY #2 WWPS FORCE MAIN ENVIRONMENTAL ASSESSMENT REPORT
FIGURE TITLE: CONCEPTUAL HDD PLAN AND PROFILE	FIGURE NO.: 2-3

2. The drill mud generated during HDD must be properly handled and disposed of.

3. The drill borehole diameter is typically 40-50 percent larger than the outside diameter of the pipe. This disturbs a greater volume of soil and increases the risk of encountering an obstruction during drilling.

4. The maximum HDD drilling angle is 15 degrees from horizontal. Steep entry and exit angles may be needed for this location because of the limited space available on either side of the drainage channel.

5. The pipe should be fully assembled prior to installation because pausing to fuse the pipe segments during pull back could affect the stability of the borehole, particularly where the overburden is very shallow (i.e., under the deepest portion of the drainage channel).

6. Locating a pipe laydown area along the existing residential streets (on the opposite side of the drainage channel from the drill rig work area) may be difficult without restricting access to numerous driveways.

7. Due to space constraints and existing underground obstructions, the locations for the entry and exit points of the borehole are limited.

8. Existing underground utilities and structures may need to be relocated, either temporarily during construction due to the risk of obstruction, spills, and/or damage during drilling, or permanently due to interference with the proposed pipe location. The fuel lines between the emergency generator and the diesel UST will need to be removed and replaced for the new HDD force main alignment. This will require the contractor to provide temporary emergency backup power during construction.

9. The soils are not ideal for HDD, and it is possible that the borehole could become obstructed, or the pressure within the borehole could exceed the overburden pressure, potentially resulting in ground heaving directly above the drill path and discharge of drilling fluid into the drainage channel, commonly referred to as hydraulic fracturing or frac-out. According to preliminary analysis, the potential for frac-out decreases with increasing overburden pressure (i.e., increasing cover).

10. There are no as-built plans for the existing force main foundation, which was constructed on piles. The exact locations, depths below ground surface, and angle of the piles are unknown. The easement across the stream is 10 feet wide, and the new alignment must fit within the three to four feet of space between the existing concrete jacket and piles and the edge of the easement. Interference by one of these existing piles within the drilling path could result in an obstruction and frac-out, or a deflection in the path that changes the alignment.

Preliminary HDD plan and profiles for the new force main were laid out as shown on Figure 2-3. Three HDD profiles were preliminarily examined. Of the three profiles analyzed,

Profile 3 appears to have a lower potential for frac-out. However, Profile 3 has the smallest radius of curvature, about 170 feet. This is less than the minimum allowable curvature for fusible PVC pipe. HDPE pipe is more flexible than fusible PVC and can make the relatively tight radius. Because HDPE is less strong than fusible PVC, an HDPE pipe with a smaller dimension ratio (DR) is needed. A 12" inner pipe diameter will suffice for the projected flows based on the pump hydraulic evaluation. The smaller inner pipe diameter allows for a manageable borehole size even with the thicker HDPE pipe.

2.2 Alternative Action: Pilot Tube Microtunneling New Alignment

PTMT is a trenchless technology that uses a remotely controlled microtunneling boring machine and pipe jacking to install pipes along a predetermined path underground (Figure 2-4). The borehole is drilled from the driving shaft to the receiving shaft by a steering head, followed by pilot tubes of smaller diameter than the diameter of the pipe to be installed. Once the steering head reaches the receiving shaft, the reamer and auger casing are attached to the pilot tube and the pilot borehole is enlarged. The new pipe is installed as a jacking frame pushes the casing toward the receiving shaft.

The advantages of PTMT include:

1. The drilling guidance system can allow for relatively higher accuracy in line and grade compared to HDD.

2. This technology uses augers for soil removal instead of pressurized drilling fluid. The potential for frac-out in PTMT is lower than in HDD.

3. The pipe can be installed in short sections, so the PTMT alternative does not require a large staging area for pipe assembly.

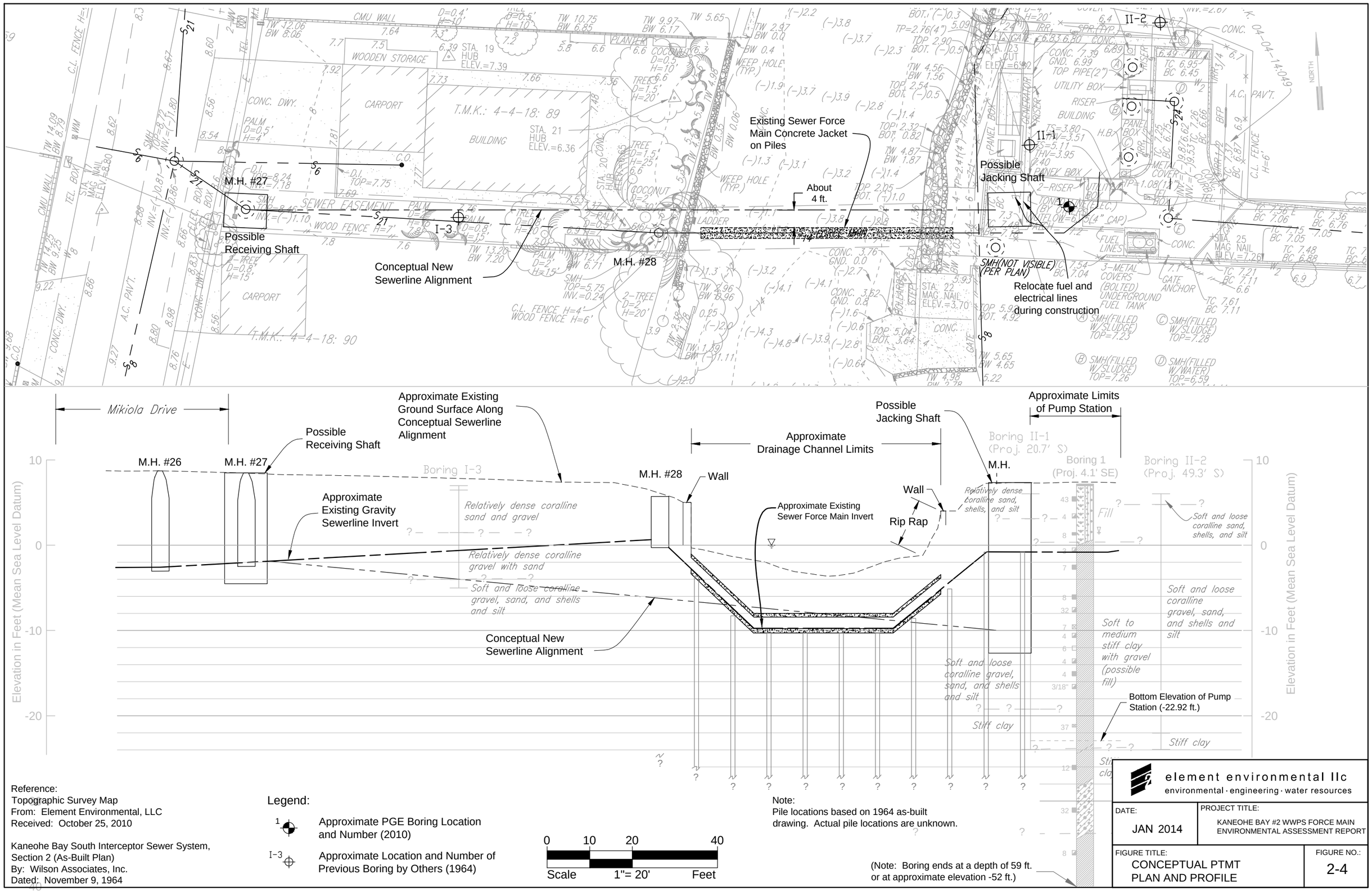
4. Work under the drainage way will not trigger any permits related to work in or over navigable waters.

5. As a trenchless technology, the project duration is generally shorter with fewer surface disruptions for the neighborhood residents than a traditional open cut and trench project.

6. A few local PTMT contractors are available.

If PTMT is selected, the following challenges must be considered:

1. This method requires relatively deep jacking and receiving shafts that will require dewatering. The jacking and receiving shafts may need to be grouted along the entry and exit points to reduce groundwater infiltration. Due to the depth required for the force main to clear beneath the drainage way, the borehole and shafts could be 10 feet



Reference:
Topographic Survey Map
From: Element Environmental, LLC
Received: October 25, 2010

Kaneohe Bay South Interceptor Sewer System,
Section 2 (As-Built Plan)
By: Wilson Associates, Inc.
Dated: November 9, 1964

Legend:

1 — Approximate PGE Boring Location and Number (2010)

I-3 — Approximate Location and Number of Previous Boring by Others (1964)

Scale 1"= 20' Feet (0, 10, 20, 40)

Note:
Pile locations based on 1964 as-built drawing. Actual pile locations are unknown.

(Note: Boring ends at a depth of 59 ft. or at approximate elevation -52 ft.)

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DATE:	PROJECT TITLE:
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FIGURE TITLE: CONCEPTUAL PTMT PLAN AND PROFILE	FIGURE NO.: 2-4

2. or more below the groundwater table. Based on feedback from a local PTMT contractor, a force main invert at -10 feet may be at the limit of what this technology may be able to handle due to risk of groundwater inflow into the shafts during the installation.

3. As with the HDD option, there is the potential for frac-out, particularly due to the back pressure into the drill hole. The microtunneling equipment lacks hydrostatic earth pressure balance capability, especially below the water table. In addition, the soil properties are not ideal, and there is little cover available at the channel crossing. Deepening or flattening the alignment may only result in nominal increase in soil cover along the channel crossing and would not significantly reduce the potential for frac-out.

4. Existing underground utilities, including the diesel fueling system for the WWPS emergency generator and other underground utilities (such as electrical, water, and drain lines) will need to be temporarily relocated during construction to install the shafts.

5. The replacement force main will need to be installed within the 10-foot wide easement, which may increase the potential risk of encountering the existing force main jacket and/or its piles. As previously mentioned for HDD, uncertainty in as-built conditions of the existing force main may increase the risk to the new force main installation due to potential for conflicts.

6. According to readily available subsurface information in the vicinity of the new force main, subsurface conditions along the alignment are anticipated to consist of soft and compressible lagoonal deposits. To provide more suitable support in the lagoonal deposits, a two pipe system consisting of a product pipe inside a permanent steel casing may need to be utilized for the new force main. For this pipe system, the annulus between the product pipe and steel casing would probably be backfilled with a cementitious grout. Suitable corrosion protection may need to be provided for the steel casing if it is used for support. Alternatively, ground improvement may need to be conducted prior to pipeline installation if a steel casing is not used. However, jet grouting within the channel may not be feasible due to permitting and water quality requirements.

7. Due to the presence of existing structures such as the pump station, houses, underground utilities, manholes, and the UST, it is anticipated that jacking and receiving shaft diameters or widths may have to be relatively small, on the order of approximately eight feet. This will limit the size of the PTMT equipment, pipe segment lengths, and drive lengths. Shaft construction is anticipated to be very difficult due to space constraints on the east and west sides of the channel and numerous above and below ground structures and utilities.

8. Based on available subsurface information, the shafts would likely need to be constructed using interlocking steel sheet piles or large diameter steel casing. To reduce the amount of dewatering, the shafts are envisioned to be excavated in the wet

and tremie concrete placed at the bottom. The excavation could then be dewatered and a final leveling slab constructed over the tremie slab. The thickness of the tremie slab will depend on the depth of the shafts below the groundwater table. It is anticipated that dewatering of the jacking and receiving shafts will probably be difficult due to the depth of shafts that are needed and the shallow groundwater table. After completion of the pipe installation, the jacking and receiving shafts could be converted into permanent manholes.

9. Assuming that the jacking shaft is located on the east bank of the channel next to the pump station, a staging area would need to be provided at the pump station for ancillary equipment, such as slurry tank, power packs, control room, pipe storage and handling, etc. The paved area and driveway at the pump station would probably have to be used for PTMT operations, which could limit access to the WWPS for daily operations. Alternately, if the jacking shaft is located on the Mikiola Drive end of the alignment, a section of this road could be used as a staging area for PTMT operations. This would require full road closure of Mikiola Drive at the work site.

A preliminary PTMT plan and profile for the new force main were laid out as shown on Figure 2-4. The considered alignment was developed to maximize the amount of cover below the channel bottom to reduce the potential for frac-out, while still intersecting the existing sewer manhole where the line discharges into a gravity line (sewer manhole [SMH] #27).

2.3 Alternative Action: Open Cut Trench New Alignment

This alternative proposes to replace the existing force main with one of two new alignments that do not cross the channel. The first option is a new 2,200-foot force main that runs from the WWPS to Kaimalu Place and Kaneohe Bay Drive and connects to the gravity sewer along Mikiola Drive at SMH #26. The second option is a new 1,500-foot force main that starts at the WWPS to Kaimalu Place, continues approximately 300 feet along Kaimalu Place, follows the easement for the existing 8-inch gravity sewer along 44-012 Kaimalu Place, continues on to Kaneohe Bay Drive and connects to the gravity sewer along Mikiola Drive at SMH #26. The two conceptual alignments for this alternative are shown on Figure 2-5.

Potential methods of installing the new force main for this option include open cut trenching or the two trenchless methods discussed for the other two alternatives.

The advantages of this alternative include:

1. The force main alignment does not cross the channel. The construction will not trigger any permits related to work in or over navigable waters. In addition, the force main will be accessible for maintenance in the future.

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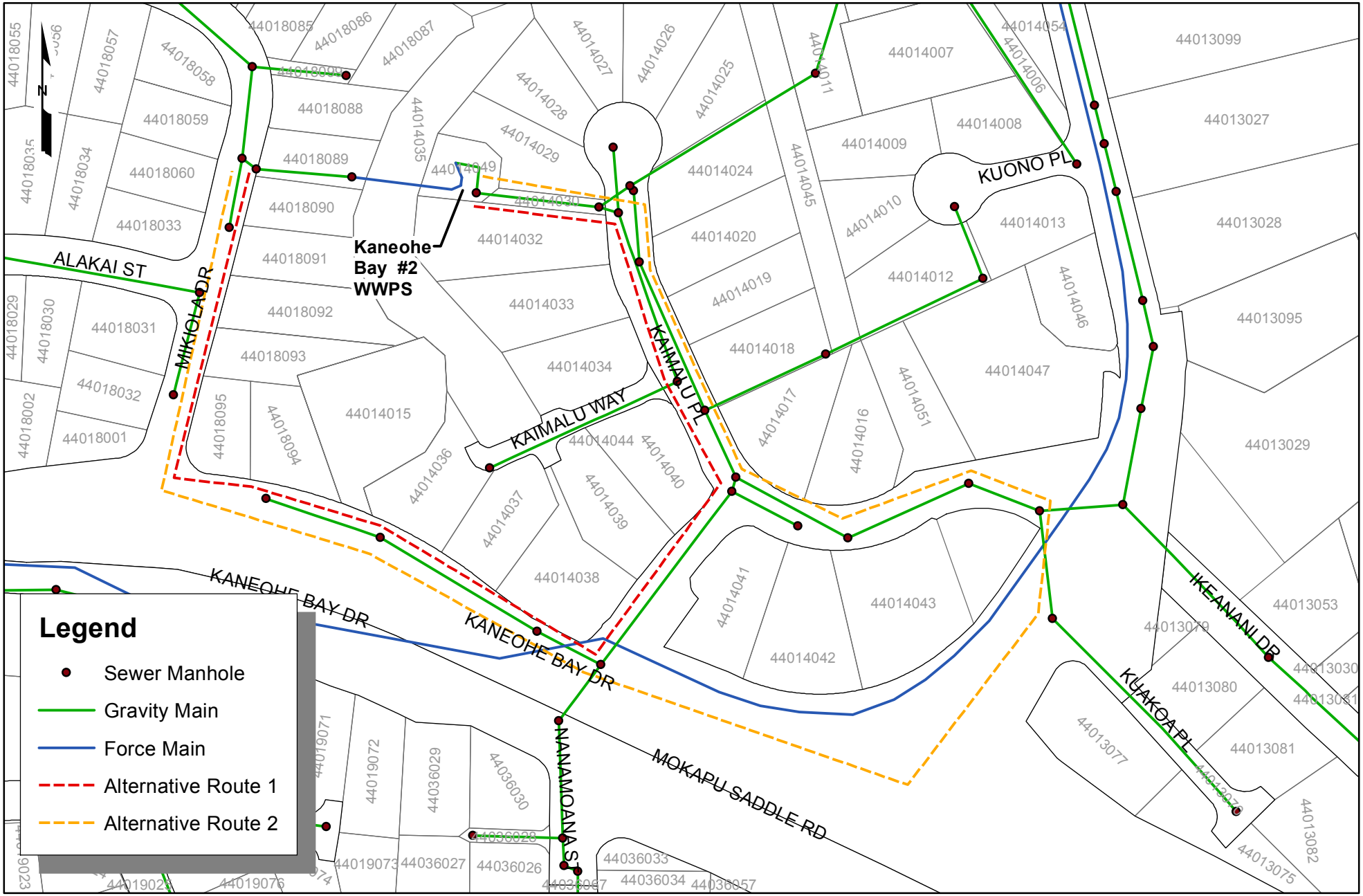

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Conceptual Open Cut Trench Alternatives

Figure 2-5

2. When compared to HDD and PTMT across the channel, there is less risk involved with the construction (i.e., no frac-out concerns in the channel). Traditional open cut construction methods can be used for the new alignment.

If open cut trenching methods are used for this new alignment, the following challenges must be considered:

1. Excavations along Kaimalu Place, a portion of Kaneohe Bay Drive, and Mikiola Drive are anticipated to encounter variable amounts of fill at the surface, underlain by weak and compressible deposits. These deposits may not be suitable for force main support. To provide for more uniform pipe support, a portion of the subsurface material below the pipe bedding may need to be over excavated and replaced with crushed rock sub-bedding wrapped in a geotextile fabric.

2. A relatively shallow groundwater table is anticipated along low-lying areas, such as portions of Kaimalu Place and Mikiola Drive. It is assumed that some amount of dewatering may be needed if inverts extend below the water table. Large drawdowns of the groundwater table outside of the trenches during dewatering operations may result in ground settlement and movement, and distress and damage to existing on-grade structures, utilities, slabs, and pavements. To reduce the potential amount of drawdown of the groundwater table, ground settlement, and distress, trenching and excavating in the wet, and installing concrete mud slabs at the bottom of excavations and trenches may be needed for excavations that extend below the water table. Alternately, trenchless methods, such as HDD or PTMT, may be utilized to install the new force main along the streets.

3. Available record drawings and a topographic map for this project indicate that there are numerous underground utilities, such as sewer lines, water lines, and telephone lines in the vicinity of the proposed alignments. These alignments will need to be carefully planned and selected to reduce the potential for conflicts with existing lines. In addition, Kaneohe Bay Drive is a State Right of Way, which will require establishment of an easement for the new alignment.

4. Readily available subsurface information indicates weathered basaltic cobbles and boulders may be encountered in the subsurface along Kaneohe Bay Drive between Mokapu Saddle Road and Mikiola Drive. This may result in a generally wider and deeper excavation if boulders are encountered and need to be removed from the trench. The presence of basaltic cobbles and boulders may also increase the difficulty of trenching and may require the use of suitable excavation equipment, such as hydraulic hoe rams. Installing temporary sheet piles, if needed, into boulder material may also be difficult.

5. During construction, trenching and staging locations may interfere with local pedestrian and bicycle traffic, vehicle access and parking spaces. Neighboring residents may be subjected to noise and dust for the duration of the project. Temporary closure of roads

will likely be needed during construction. To reduce the amount of potential disruption to the residents, installation of the replacement force main by trenchless methods can be considered.

6. The new alignment will be significantly longer, which may require a greater amount of maintenance.

2.4 No Action

This alternative would maintain the same force main at Kaneohe Bay #2 WWPS with no upgrades. Current conditions would remain unchanged. This action is not a viable option because the Consent Decree requires that a new force main be designed and construction completed by the compliance milestone of December 31, 2016.

Section 3 Affected Environment

This section describes the environment of the project area. Impacts of the Proposed Action and the Alternative Actions on existing environmental conditions are presented in Section 4.

3.1 General Site Description

The Kaneohe Bay #2 WWPS has been in operation since 1965. It is a wet pit/dry pit type that consists of a pump room with an underground dry pit that houses three pumps and a two-compartment wet well that receives incoming wastewater from a 24-inch reinforced concrete pipe (RCP) influent line (Figure 3-1). In 1987, the WWPS was expanded to include a new retaining wall, emergency generator, and UST. After being pumped through a 14-inch cast iron force main into the gravity trunk line, the wastewater discharges to the Kaneohe Wastewater Pretreatment Facility (WWPTF) prior to being pumped to the Kailua Regional Wastewater Treatment Plant (WWTP) for secondary treatment and disposal.

The WWPS consists of three centrifugal, vertical, non-clog pumps, which were installed in 2012. Pump operation is dependent on the level of wastewater in the wet well. Each pump is controlled individually. The 60-kilowatt (kW) on-site emergency generator is used to provide backup power to the three pumps in the event that normal power service fails and is powered by Diesel No. 2 fuel. This generator automatically shuts down when the power is restored. The generator is connected to the lead and lag pumps, lighting, ventilation, instrumentation and alarms, and the supervisory control and data acquisition (SCADA) system.

3.2 Land Use

3.2.1 Existing Communities and Land Uses

The Kaneohe Bay #2 WWPS is located in a residential neighborhood at 44-029 Kaimalu Place, Kaneohe, Oahu, Hawaii. The existing sewer service area consists mainly of single-family dwellings located on both sides of Kaneohe Bay Drive and covers approximately 300 acres. This service area is zoned almost exclusively for residential use, including R-5, and R-7.5, and R-10 zones. One land parcel is zoned for general preservation district, P-2.

The existing sewer system includes approximately 1,124 linear feet (LF) of 15”, 18”, 21” and 24” gravity trunk sewer lines between the Kaneohe Bay #3 WWPS and Kaneohe Bay #2 WWPS.

3.2.2 Development Trends and Proposed Land Uses

There are no plans to change the land use of the site or surrounding areas, which will remain primarily residential neighborhoods.

3.2.3 Government Plans, Policies, and Controls

3.2.3.1. Hawaii State Land Use Controls

According to the State Land Use Ordinance, Lands within the State have been classified into four categories of land use districts: urban, rural, agricultural, and conservation (Chapter 205, HRS; Chapter 15-15, HAR). The State Land Use classification of the site is urban, as shown on Figure 3-2 (State of Hawaii, 2013a).

3.2.3.2. Oahu General Plan

The proposed project is in agreement with the stated policies under Objectives B, C, and D under Section V. Transportation and Utilities of the City's General Plan. These policies include: "provide safe, efficient, and environmentally sensitive wastewater collection and waste disposal services", "maintain existing utility systems in order to avoid major breakdowns", "provide improvement to utilities in existing neighborhoods to reduce substandard conditions", and "give primary emphasis in the capital improvement program to the maintenance and improvement of existing roads and utilities".

3.2.3.3. City and County of Honolulu Zoning

The CCH zoning designations for the project area properties include R-5, and R-7.5 residential zones. Sewer systems are considered "public use" and are found in all zoning districts. Figure 3-3 shows the zoning of the subject property and in the vicinity (CCH, 2013).

3.2.3.4. Koolaupoko Sustainable Communities Plan

The Koolaupoko Sustainable Communities Plan is the development plan for the Koolaupoko District that was adopted under Ordinance 00-47 by the CCH. The proposed project is consistent with applicable provisions under section 3.3 *Wastewater Treatment* of the Koolaupoko Sustainable Communities Plan. The proposed project would provide improvements to the Kanehoe Bay #2 WWPS by replacement of the force main and the assessment of the pumps and its motors, piping and valves within the pump station. These improvements are compatible with the statement in the subsection titled *Collection System* under *4.3.1 Kailua-Kaneohe-Kahaluu Wastewater Service Area*, which states: "Improvements to the collection system include the provision of relief lines through the Kailua and Kaneohe basins, the replacement of deteriorating sewer lines, increasing pump station capacities, and adding storage capacity for wet-weather flows." The proposed project is consistent with, and does not conflict with any of the policies in the Koolaupoko Sustainable Communities Plan.

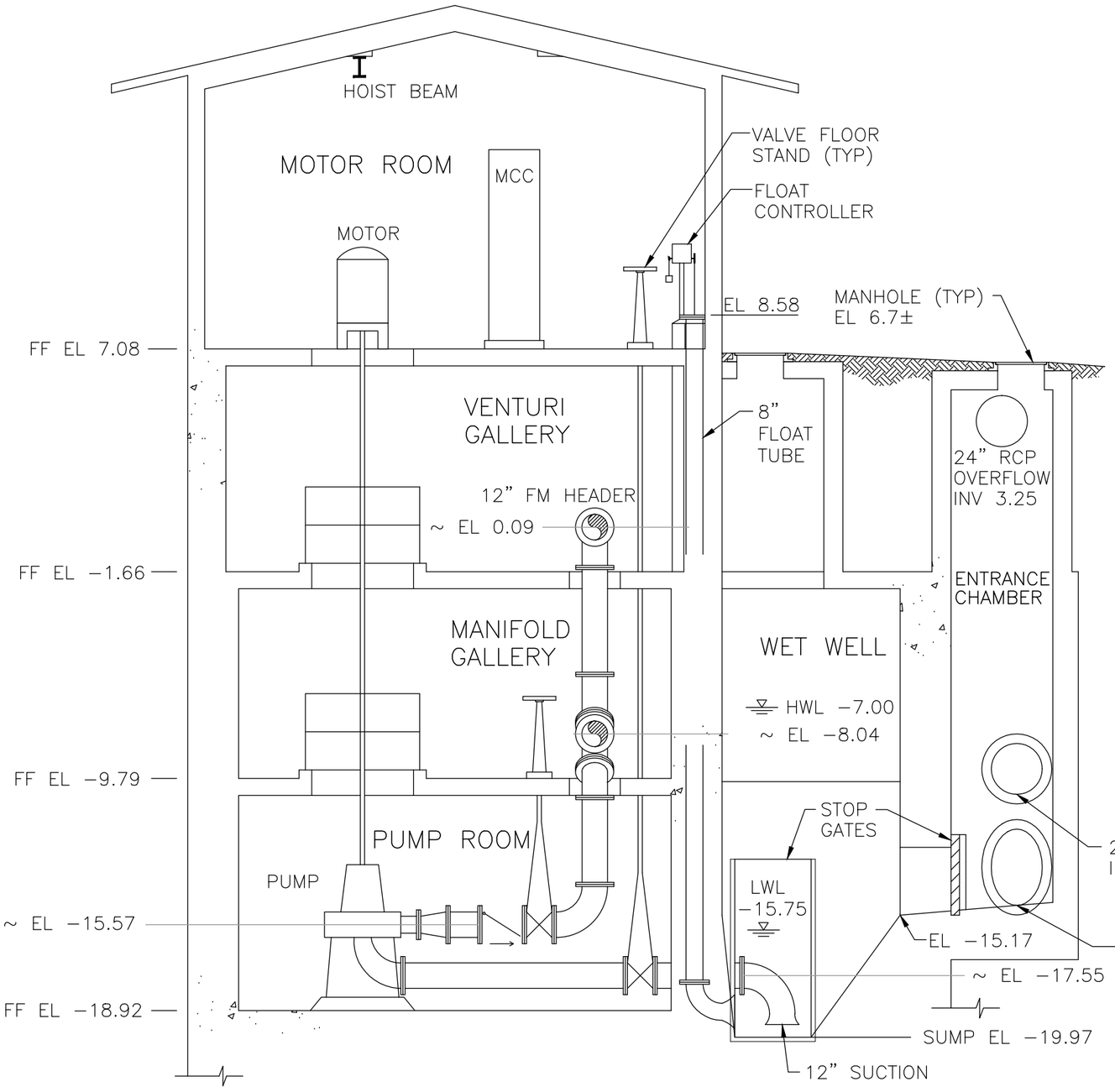
3.2.3.5. Hawaii State Coastal Zone Management

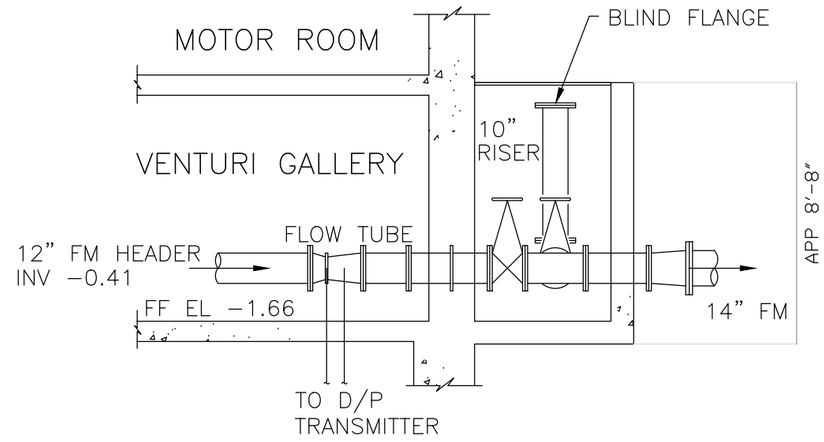
The site is not located in the Hawaii Coastal Zone Management (CZM) Program (Chapter 205A, HRS) area; therefore an application for a CZM Federal Consistency Review is not required.

3.2.3.6. Special Management Area

The site is located in the Special Management Area (SMA, State of Hawaii, 2010b), as shown in Figure 3-4 (State of Hawaii, 2013b). Because the recommended repairs will only include the replacement of the force main and the flow meter, an SMA permit is not required, pursuant to Section 25-1.3(2) (D), Revised Ordinances of Honolulu (ROH), "Installation of underground

TRUE NORTH
SCALE: 1"=5'





FLOW TUBE BOX – SECTION

2.5' 0 2.5' 5'
SCALE: 1" = 5'

REFERENCE: O&M MANUAL, RMTC, 1997

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PROJECT TITLE:
KANEOHE BAY #2 WWPS Force Main
ENVIRONMENTAL ASSESSMENT REPORT

FIGURE TITLE:
PUMP STATION AND
FLOW TUBE BOX SECTION

DATE: JAN 2014

FIGURE NO.: 3-1

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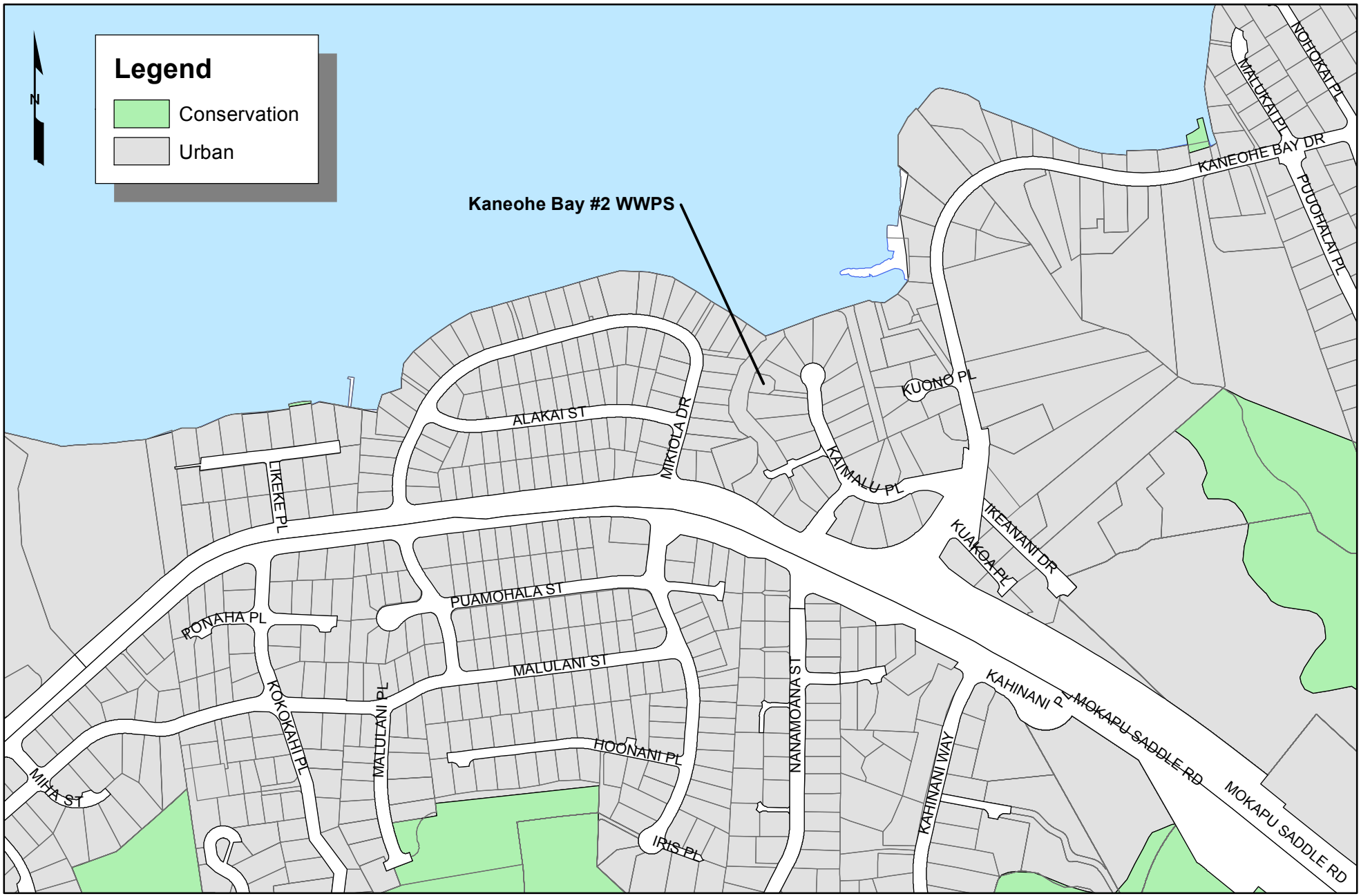

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State Land Use Map

Figure 3-2

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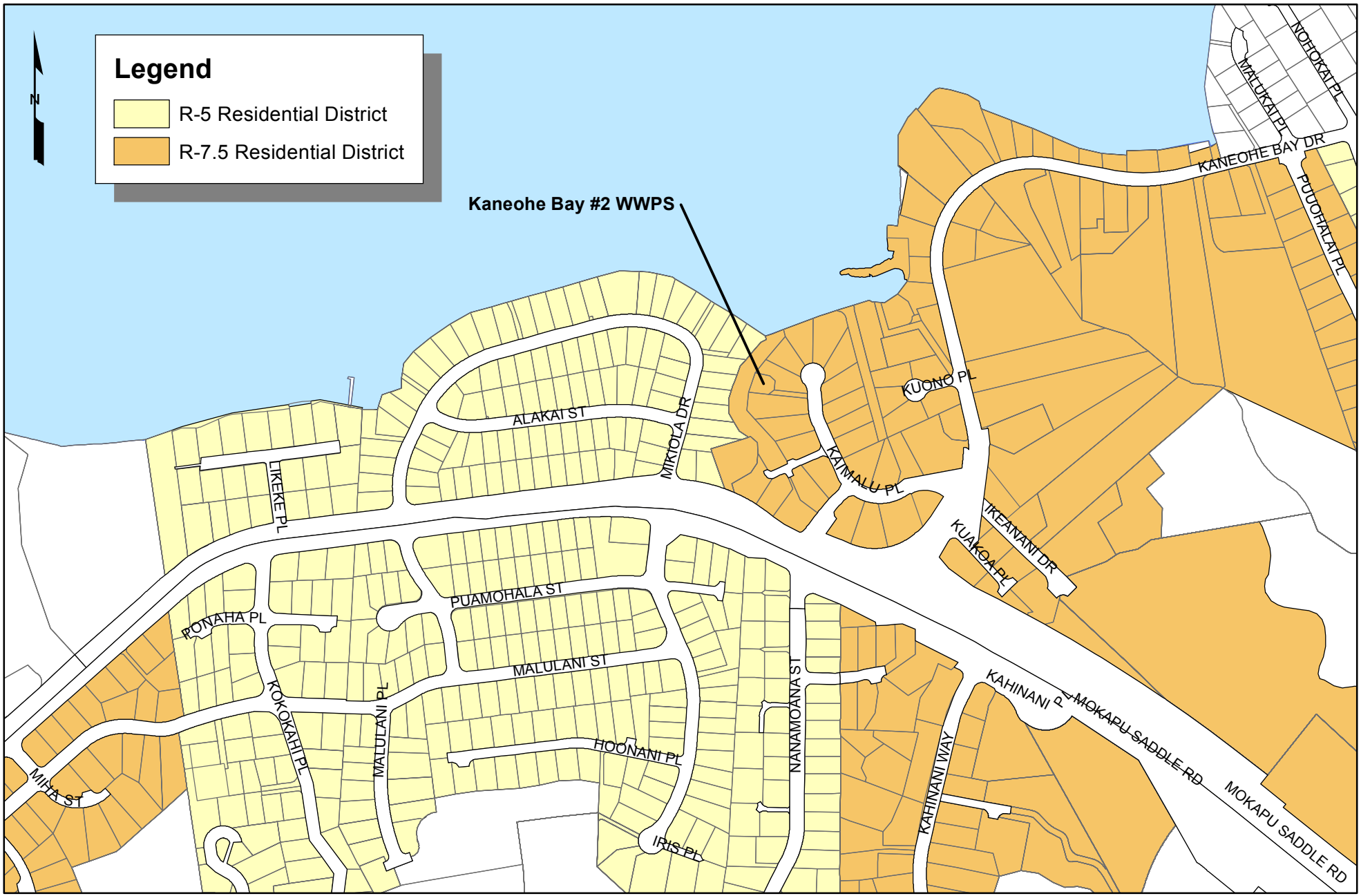

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Kaneohe Bay #2 WWPS Force Main Environmental Assessment Report
City and County of Honolulu Zoning Map
Figure 3-3

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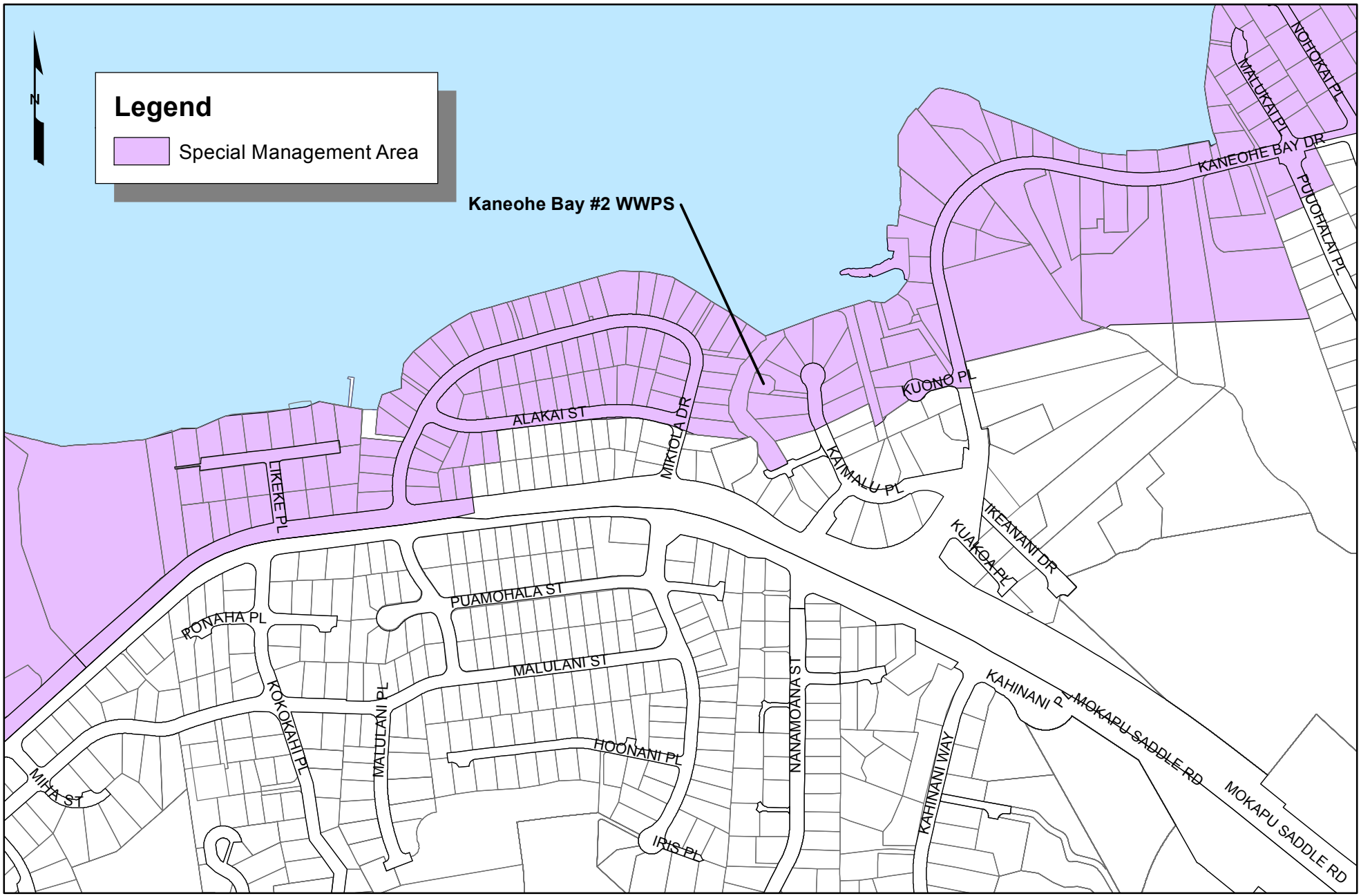

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Special Management Area Map

Figure 3-4

utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors."

3.3 Transportation

The subject property is located at 44-029 Kaimalu Place. Kaimalu Place is an asphalt-paved, light-duty, two-way, two-lane road within the City of Kaneohe. It is the single route that leads into and out of the immediate area of the WWPS on the same side of the unnamed and unlined channel. The WWPS can also be accessed from across the channel via Mikiola Drive. Mikiola Drive is also an asphalt-paved, light-duty, two-way, two lane road. There are no signalized intersections on either Kaimalu Place or Mikiola Drive. Both Mikiola Drive and Kaimalu Place intersect with Kaneohe Bay Drive. The other side streets within the project area are all two-lane, two-way roads. Mokapu Saddle Road is stop-controlled at its intersection with Kaneohe Bay Drive.

3.4 Social and Economic Conditions

In 2010, the population of Kaneohe was 34,597 with a median age of 41.9. Between 2000 and 2010, the population in the Kaneohe area decreased by about 1.1 percent. The median annual household income is approximately $82,686 per year (US Census Bureau website, 2013).

The Kaneohe public school system includes eight elementary, one intermediate, and one high school, which are operated by Hawaii Department of Education. The nearest of these to the site is Castle High School, approximately 1.5 miles to the southwest of the site, along Kaneohe Bay Drive. Kalaheo High School, part of the neighboring Kailua school district, is located approximately 0.8 miles to the east of the WWPS site (US Census Bureau website, 2013).

Kaneohe was historically an agricultural area, but today is primarily a residential community. Consequently, many employment opportunities are in service-related industries (US Census Bureau website, 2013).

3.5 Climate and Air Quality

The overall climate on Oahu is warm and humid year round. The average daily temperature on Oahu ranges between 65 and 85 degrees Fahrenheit (°F) with relative humidity ranging from 30 to 90% (Juvik and Juvik 1998). On the windward side of the island, rainfall varies greatly within short distances with the mean annual rainfall being approximately 150 inches near the summit of the Koolau Range, roughly only 4 miles from the WWPS and an average annual rainfall of 38.9 inches at the nearby Marine Corps Base Hawaii (MCBH) (Harding Lawson and Associates [HLA] 1999). Average temperatures range from 71°F to 77.5°F in Kaneohe.

Northeasterly tradewinds prevail over Oahu approximately 80% of the time, with average wind speeds ranging from 10 to 15 miles per hour. The tradewinds blow most strongly and consistently from April through November. Southerly or "Kona" winds occur roughly less than half the time during the months of December through March. The northeasterly tradewinds carry a large quantity of moisture from the Pacific Ocean to the island. Orographic lifting as the tradewinds encounter the Koolau mountain range causes the air temperature to drop and air moisture to precipitate. The orographic effect also tends to produce most of the precipitation in the form of passing showers in the evenings and early mornings.

3.6 Noise

The primary factor affecting noise levels in the site vicinity is traffic along Kaneohe Bay Drive. Other noise sources include wind, birds, military aircraft, and small planes. The site is approximately three miles south of the Marine Corps Air Station (MCAS) which results in more air traffic noise than other parts of the island.

3.7 Flora and Fauna

There are no threatened or endangered endemic Hawaiian species plants known to be located within the vicinity of Kaneohe Bay #2 WWPS (Fukunaga, 2007). This project would be limited to the existing road right of ways. The roadways in the vicinity of the project have no concrete curbs, no sidewalks, and are typically bordered by asphalt shoulders, concrete or asphalt driveways, or wayside weeds. The area is primarily residential, and many of the plants observed in the neighborhoods include African tulip trees, Bermuda grass lawns, Christmas berry, coconut trees, mock orange, octopus trees, oleander, panax hedges, plumeria trees, and other ornamental plants.

The primary animals encountered in the area of the project are feral cats, feral dogs, mongooses, rats, and mice. All of these are introduced mammals; there are no known endemic mammals within the project area. Various birds may be found within the area; including bulbuls, cardinals, cattle egrets, doves, finches, mynahs, and sparrows. During the winter, migratory golden plovers may be observed. Endemic rare or endangered Hawaiian forest birds or water birds would not be found in this area (Fukunaga, 2007). Some species of endangered water birds may be found on wetlands within two miles of the project site, such as Nuupia Ponds (adjacent to MCBH) to the northeast, and Kawainui Marsh (adjacent to Kailua), to the east of the site over Mokapu Ridge.

3.8 Water Resources

3.8.1 Surface Water and Drainage

The channel adjacent to the pump station lies above the proposed force main alignment and is connected to Kaneohe Bay. However, the Proposed Action will not require in-water work in the channel. Kaneohe Bay is located approximately 125 feet north of the WWPS.

The Oahu Water Quality Map published in October 1987 by the DOH, Office of Environmental Planning and HAR Chapter 11-54, Water Quality Standards classifies Kaneohe Bay as a Class AA marine water. Designated Class AA marine waters are protected waters that are intended to remain in their natural pristine state as nearly possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions.

3.8.2 Groundwater

The groundwater beneath the project site consists of a basal, unconfined sedimentary aquifer that is currently used, is ecologically important, is low in salinity (i.e., between 250 to 1,000 milligrams per liter [mg/L] chloride), is irreplaceable, and has a high vulnerability to

contamination (Mink and Lau, 1990). A deeper aquifer (located several hundred feet below sea level at the project site) is designated a basal, confined, dike/flank lava aquifer that is currently used for drinking water and is considered to be replaceable with a moderate vulnerability to contamination (Mink and Lau, 1990). However, the project site does not contain a drinking water resource because it is located seaward of the Underground Injection Control (UIC) line. The UIC line was established by the DOH and delineates the boundary between non-drinking water aquifers and sources of drinking water aquifers throughout the state. Areas seaward of the UIC line are considered to be located above non-drinking water aquifers and areas inside the UIC line (mauka of the UIC line) are considered to be located above drinking water sources.

3.8.3 Floodplains

Flood Hazard Districts are delineated on Flood Boundary and Floodway Maps and the Federal Insurance Rate Maps (FIRM) prepared by the Federal insurance Administration and Federal Emergency Management Agency (FEMA). The site is located on the FIRM Community Panel number 150001 0060 B, in an area designated Zone D, with undetermined flood hazards. The project work should not be affected by flood zones.

3.9 Geographic Setting

3.9.1 Geology

The WWPS project area is located on the windward coastal area of the island of Oahu. The Koolau Range is the dominant geological feature of windward Oahu and is the eroded remnant of a volcano dome. The Koolau Range is approximately 37 miles long and runs in a northwest to southeast direction. The windward coastal area was formed through the deposition of lava, volcanic ash, and cinders from the Koolau Volcano and these events were followed with erosion and the deposition of alluvium. Over a long period of time, the rise and fall of the seas has led to lagoonal, marine, and younger alluvium. Low-lying lands near the project site have been altered over time by the placement of man-made fill.

3.9.2 Soils

According to the US Soil Conservation Service (Foote et al., 1972), the soils present at the WWPS site are of two different soil types: Kokokahi clay (6 to 12 percent slopes) and Kawaihapai stony clay loam (2 to 6 percent slopes). The dominant soil type at the project site is Kokokahi clay (KtC). This soil is found on talus slopes and alluvial fans. The surface layer is typically dark grey over another layer of dark grayish-brown clay with a subangular blocky structure. These soils are very sticky and plastic and crack widely upon drying. The permeability is slow to moderately slow, with a medium runoff and slight to moderate erosion hazard. Workability with this soil is difficult because of the because of its sticky plastic nature and the small range of moisture content within which the soil can be cultivated. The shrink-swell potential is high. Kawaihapai stony clay loam (KlaB) could also be encountered, especially to the west of the channel. This soil is found on smooth slopes. The surface layer is dark brown clay loam, over another layer of dark brown stratified sandy loam over a stony and gravelly substratum. Permeability of this soil is moderate, runoff is slow, and erosion hazard is slight.

Pacific Geotechnical Engineers conducted a geotechnical survey of the subject property. A soil boring at the pump station indicated that the top seven feet of material is basaltic gravel fill.

Clay underlain by clayey coralline gravel was encountered from seven to 36 feet below surface grade (E2, 2013).

3.9.3 Topography

The project site is relatively flat approximately 5 feet above mean sea level (amsl).

3.9.4 Earthquakes and Tsunami

The Uniform Building Code (UBC) contains six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10% chance of severe shaking in a 50-year interval). Except for the island of Hawaii, the Hawaiian Islands are not a highly seismic area (Armstrong, 1973). The seismic zone for the island of Oahu is Zone 1.

According to the Tsunami Evacuation Zone Map provided by the Oahu Civil Defense Agency, the project site is not located within the tsunami evacuation zone.

3.9.5 Radon

There is low potential for concerns related to radon exposure. The island of Oahu is in Zone 3, meaning this location has a predicted average indoor radon screen level less than the US Environmental Protection Agency (EPA) threshold of 2 picocuries per liter (USEPA, 2010).

3.10 Hazardous Materials

Hazardous materials, other than fuel to power equipment, will not be used for the Proposed Action. It is possible during project work for hazardous materials to be encountered, as there is a UST on-site that is used to store diesel fuel for the emergency generator. Due to the age of the existing pipe, lead based paint may be present on the exterior of exposed piping. Any wastes generated on the site will be properly disposed of or recycled.

3.11 Historic and Archaeological Resources

A data search of the National and State Register of Historic Places shows that no historic sites are located within the project area. However, during the 2007 trunk sewer project conducted by Fukunaga and Associates, Inc., the State Historic Preservation Division (SHPD) was consulted and it was discovered that three historic fishponds had been located in the project area prior to the area being filled. One of those fishponds, Mahinui, was located in the vicinity of the WWPS (Figure 3-5). SHPD has stated that the fish ponds and their surrounding areas could yield significant historic information and recommended in 2007 that archaeological monitoring be conducted during all trench excavations for sewer lines in the trunk sewer project area (Fukunaga, 2007). This potential for significant historic information remains for the Kaneohe Bay WWPS #2 project site. Further information is provided in the *Final Environmental Assessment for Kaneohe Bay Drive Trunk Sewer Reconstructio*n (Fukunaga, 2007b).

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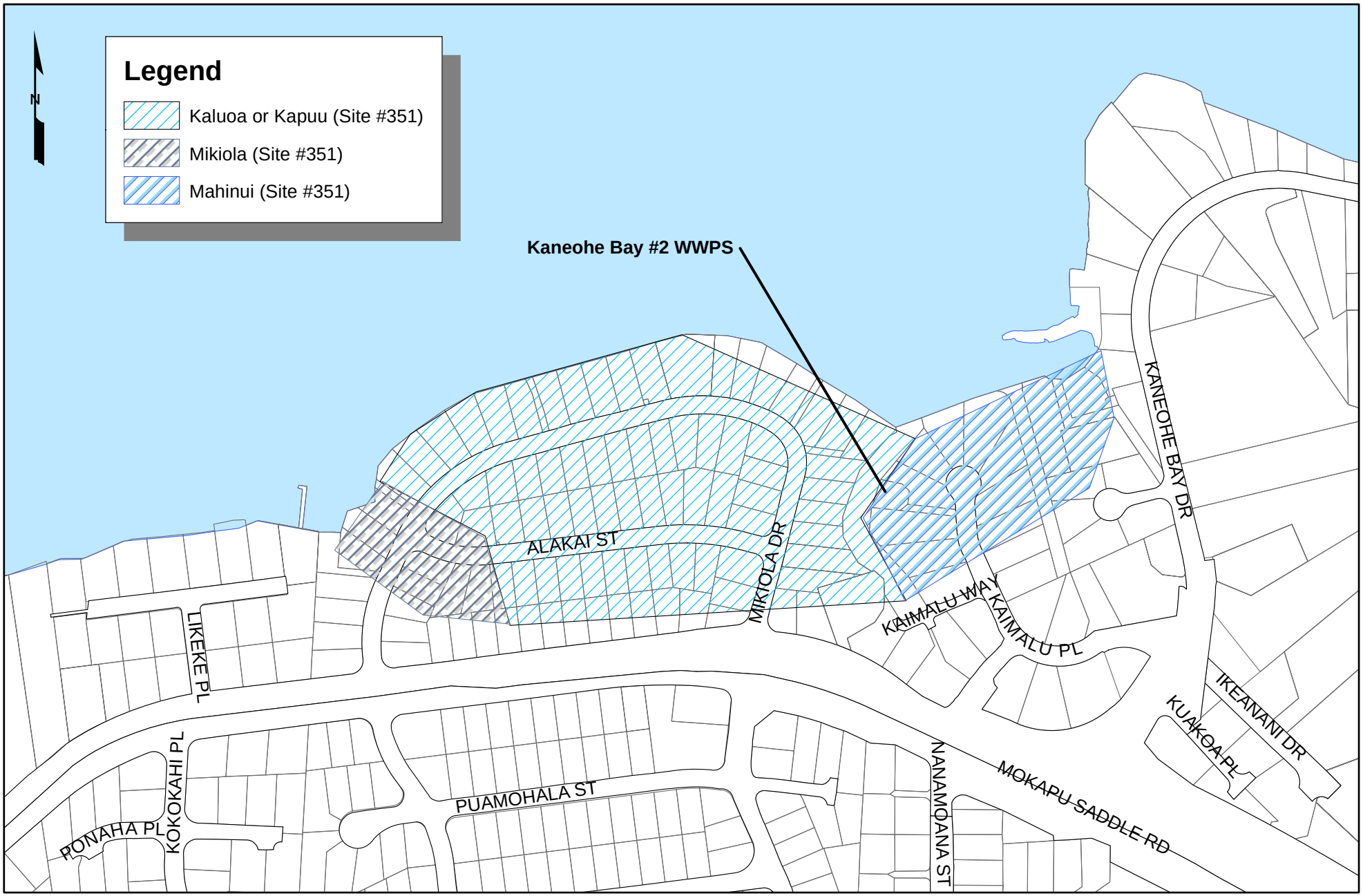

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Miles

January 2014
Kaneohe Bay #2 WWPS Force Main Environmental Assessment Report
Historical Fishpond Locations
Figure 3-5

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3.12 Recreational Resources

Ocean and hiking activities are the predominate form of recreation in the Kaneohe area. There are no official County or local recreation facilities in the immediate proposed project area. Approximately one mile west of the project site is Kaneohe Beach Park, one mile northeast is Keaalau Neighborhood Park and one mile east is Kawainui Park.

3.13 Visual Environment

Kaneohe is an urban environment, with the location of the project site being in a primarily residential area. The development is typically single-family one-story and two-story residences abutting Kaneohe Bay. The landscape is dramatic, with vista toward the bay and also towards the Koolau Range.

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Section 4 Potential Environmental Impacts and Minimization Measures

This section describes the impacts of the Proposed Action, the Alternative Actions, and the No Action Alternative on the resource areas presented in Section 3.

- The Proposed Action consists of installing a new force main under the channel using Horizontal Directional Drilling (HDD). HDD involves drilling a horizontal bore path that is steered and tracked from the surface. The bore path is first drilled and then the new pipe is pulled through the boring with the drill rig. No drilling shafts are required for this alternative.

- Alternative Action #1 consists of installing a new force main under the channel using Pilot Tube Microtunneling (PTMT). PTMT uses a remotely controlled microtunneling boring machine and pipe jacking to install the pipe segments along a predetermined path underground. The borehole is drilled from the driving shaft to the receiving shaft, which are installed at the upgradient and downgradient ends of the new force main alignment.

- Alternative Action #2 consists of installing a new force main using open cut trenching construction. The new force main would be installed along one of two potential alignments, neither of which crosses the channel.

- The No Action Alternative would maintain the status quo. This action is not a viable option based on the CCH Consent Decree which requires the design and complete construction of a new force main by December 31st, 2016.

4.1 Land Use

4.1.1 Potential Impacts on Land Use in the Project Area

For the Proposed Action of HDD and the Alternative Action of PTMT, the overall impact on land use will remain neutral. The new force main will cross under the channel and future maintenance activities will still require access through the residential properties. For the Open Cut Trenching Alternative Action, the overall impact on land use will be beneficial because the new alignment would not cross the channel and would allow access to the force main through public right-of-ways for future maintenance activities. The No Action Alternative provides no potential impacts on land use in the project area.

4.1.2 Government Plans, Policies and Controls

4.1.2.1. Hawaii State Land Use Controls

The Proposed Action, the Alternative Actions, and the No Action Alternative will not impact the Hawaii State Land Use controls. The Urban land use in the area will not change.

4.1.2.2. The Oahu General Plan

The Proposed Action and the Alternative Actions uphold the applicable objectives and policies of the Oahu General Plan because it updates the wastewater collection and waste disposal services and provides for the improvement of existing utilities. The No Action Alternative does not provide updated wastewater management or improvement to the utility.

4.1.2.3. City and County of Honolulu Zoning

The proposed improvements included in the Proposed Action and the Alternative Actions are consistent with the zoning requirements of the CCH. The current area is zoned R-10.

4.1.2.4. Koolaupoko Sustainable Communities Plan

The proposed improvements included in the Proposed Action and the Alternative Actions are consistent with the provisions of the Koolaupoko Sustainable Communities plan. The No Action alternative is not consistent with the Plan's provisions as it does not provide improvements to or provide increased capacity for the WWPS.

4.1.2.5. Hawaii State Coastal Zone Management

The proposed improvements included in the Proposed Action and the Alternative Actions are consistent with the objectives and policies of the State's CZM Program. The proposed improvements will not have any impacts on recreational resources, coastal ecosystems, economic uses, coastal hazards, management development, beach protection, and marine resources. Discussions on the remaining areas of the State's CZM Program are presented in other sections of the EA. They are as follows:

- Historic and Archeological Resources – see Section 4.10
- Visual Environment – see Section 4.12
- Public Participation – see Section 7.2

An application for a CZM Federal Consistency Review is not required since the project site is not located in the CZM area.

4.1.2.6. Special Management Area

The site is located in the SMA, however because the Proposed Action and the Alternative Actions both only include the replacement of the force main and the flow meter, an SMA permit is not required.

4.1.2.7. Easements and Restrictions

No easements or restrictions will be affected by the Proposed Action or PTMT Alternative Action, or the No Action Alternative. There is potential that the Open Cut Trenching Alternative Action will require the acquisition of easements.

4.1.2.8. Occupational Safety and Health

Impacts of the Proposed Action or Alternative Actions on the safety and health of site employees may include air emissions, noise exposure, contaminant exposure, and other hazards associated with drilling activities. Temporary changes in work practices include

protective measures such as dust control, avoidance of site activities, and/or use of personal protective equipment (PPE), in order to limit exposures and maintain an adequate level of health and safety for site personnel.

4.1.2.9. Activities in Waterways (Federal Permitting)

Permitting will be required for the Proposed Action and PTMT Alternative Action because the alignment requires drilling under the unnamed channel. The Proposed Action and PTMT Alternative Action will likely require a Department of Army (DA) Nationwide Permit #3 (NWP-3) for maintenance activities under a waterway. The Open Cut Trenching Alternative Action does not require federal permitting as the trenching changes the alignment and does not cross the channel.

4.2 Transportation

Minor delays will occur in the residential areas of Kaimalu Place and Mikiola Drive due to staging concerns with the Proposed Action and PTMT Alternative Action. Traffic is not expected to increase significantly as a result of the force main replacement work since the work will be conducted onsite, very little traffic exists in the immediate vicinity, and the site and neighboring residences can be accessed by more than one route. Traffic increases will occur during initial staging operations. Upon completion of the proposed improvements, traffic flow is expected to return to preconstruction conditions. For the Open Cut Trench Alternative Action, trenching along Kaneohe Bay Drive is expected to cause increased traffic during construction. However, upon completion of construction, traffic flow is expected to return to preconstruction conditions. Therefore, the Proposed Action and the Alternative Actions will not have overall long-term detrimental impacts to the traffic in the project area. The No Action Alternative will have no impact on traffic.

4.3 Social and Economic Conditions

The Proposed Action and the Alternative Actions would have no significant effect on population and employment in Kaneohe.

The No Action Alternative could have social or economic impacts due to incurred costs and fines. In the event that the existing force main ruptured, the CCH would be required to fix and pay for emergency repairs. The CCH would also be responsible for paying for associated fines for sanitary sewer overflows and effluent discharges. In addition, the CCH would be held liable for not complying with the Consent Decree which would result in civil penalties.

4.4 Climate and Air Quality

The climate should not be affected by the Proposed Action, the Alternative Actions, or the No Action Alternative. No significant changes to the landscape will be made and the amount of paved surface will not increase. The factors that can cause higher surface temperatures will remain fundamentally unchanged upon completion of the project.

A temporary reduction in air quality will occur during force main replacement activities. The primary effects on air quality will come from construction equipment exhaust and the movement of soil during drilling activities, in general. Best management practices (BMPs) such as spraying

with a water mist will be used to control dust. No violations of Federal or State air quality standards are expected. In the No Action Alternative, there will be no change in air quality.

4.5 Noise

The Proposed Action and the Alternative Actions will have temporary adverse impacts to the noise levels in the area due to construction activities. Proposed improvements at the site will involve excavation and grading. The various phases of the project may generate the occasional significant amount of noise. This will affect surrounding residential properties along Kaimalu Place and Mikiola Drive due to their location adjacent to the project.

The actual noise levels produced during construction will be a function of the methods used during each stage of the construction process. Earthmoving equipment, such as tractors and backhoes, cause some of the highest noise levels, ranging from approximately 72 decibels (dBA) to more than 95 dBA at 50 feet.

When construction noise exceeds, or is expected to exceed, the State of Hawaii, Department of Health's (DOH's) "maximum permissible" property line noise levels, a permit must be obtained from the DOH. The permit will only allow construction between the hours of 7:00 AM and 6:00 PM Monday through Friday, and 9:00 AM to 6:00 PM on Saturdays. The permit does not limit the level of noise generated by construction.

During construction, the contractor will use reasonable and standard practices, which include limited construction hours, to minimize noise impacts. However, the DOH may require additional noise minimization treatments if they consider the proposed measures sub-standard. After the replacement work is completed, noise levels will return to preconstruction levels.

The No Action Alternative will have no noise impacts.

4.6 Flora and Fauna

No threatened or endangered plant species and no plant species of concern were identified by the USFWS. Furthermore, no sensitive or otherwise regulated habitats (e.g., wetlands) occur on the project site (Fukunaga, 2007). Mowing of grasses and residential landscaping has occurred around the residences. Therefore, the Proposed Action and the Alternative Actions, which will primarily affect already highly disturbed areas, are expected to have no impacts on the botanical or faunal resources. The No Action Alternative will also have no impact.

4.7 Water Resources

4.7.1 Surface Water and Drainage

Construction activities are limited to removing the existing force main and replacing it with the Proposed Action and the PTMT Alternative Action. The Proposed Action and the PTMT Alternative Action will result in drilling boreholes underneath the unnamed and unlined channel and does not entail significant grading that would change the drainage patterns at the site. For the Proposed Action and PTMT Alternative Action, the contractor will be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge from a construction site if the construction site exceeds one acre. Based on the preliminary

plans, the construction site may not exceed one acre. The Proposed Action and PTMT Alternative Action will likely require a Department of Army (DA) Nationwide Permit #3 (NWP-3) for maintenance activities under a waterway. Both the NPDES and the NWP-3 would require implementation of standard Best Management Practices (BMPs). The BMPs may include silt barriers and fabric bags, and vegetation to prevent erosion from wind and rain. The Proposed Action and PTMT Alternative Action assume that no additional off-site flows or discharge into a water body are required to be managed. The proposed improvements will have limited impacts on hydrology.

The Open Cut Trenching Alternative Action would require more trenching and grading and would exceed the one-acre limit that would require an NPDES Permit. Due to the larger disturbed area, there are more possibilities for this Alternative Action to affect drainage conditions. The NWP-3 would not be required for the Open Cut Trenching Alternative Action because there would not be work over or under a waterway. BMPs would be required by the NPDES permit that would help minimize negative affects to surface water and from drainage from construction activities.

The No Action Alternative will have no surface water or drainage impacts due to construction. However, impacts would occur if the force main ruptured and there were inadvertent discharges and emergency repairs required.

4.7.2 Groundwater

Since the proposed improvements require excavation in an area roughly 5 feet amsl, it is likely that groundwater will be encountered during drilling and/or excavation for the Proposed and Alternative Actions; however, no significant impact to groundwater is anticipated. The No Action Alternative will have no groundwater impacts.

4.7.3 Floodplains

Hazards to surrounding residential properties due to flooding will not be increased due to construction proposed in the Proposed Action and the Alternative Actions. The elevation of the project site will not be significantly changed after construction, and hazard levels will be unchanged. The No Action Alternative will have no flooding impacts.

4.8 Geographic Setting

4.8.1 Geology

Because the proposed construction lies within the project site, negative environmental impacts to the geological setting of the Kaimalu Place and Mikiola Drive area by the Proposed Action and the Alternative Actions are not expected. Drilling or trenching will take place with each of the possible alternatives; however, the terrain will remain essentially the same on the project site long term once the project is complete. The No Action Alternative will have no impacts on project site geology.

4.8.2 Soils

The proposed construction is not expected to significantly impact soils in the long-term. Drilling or trenching will occur within the project site, within an already highly disturbed area. This may

result in some soil erosion, the severity of which will be dependent on weather conditions. If possible, construction will not take place during the rainy season (i.e., the winter months) in order to minimize site erosion and sediment runoff during excavation and grading activities. Drainage will remain fundamentally the same. Therefore, the Proposed Action and the Alternative Actions will not have any adverse impacts to the soils in the project area. The No Action Alternative will have no impacts on project site soils.

4.8.3 Topography

Earth moving will take place to a limited extent; however, the terrain will remain essentially the same. Therefore, the Proposed Action and the Alternative Actions will not have any adverse impacts to the topography in the project area. The No Action Alternative will have no impacts on project site topography.

4.8.4 Earthquakes and Tsunami

Neither the Proposed Action, the Alternative Action, nor the No Action Alternative will increase hazards to the surrounding residential properties due to seismic activity.

4.8.5 Radon

Neither the Proposed Action, the Alternative Actions, nor the No Action Alternative will increase hazards to the surrounding residential properties due to radon exposure.

4.9 Hazardous Materials

Hazardous materials are not a direct concern of the Proposed Action or the Alternative Actions because the project work does not involve the direct use or removal of hazardous materials. It is possible during project work for hazardous materials to be encountered, as there is a UST used to store diesel for the backup generator for the WWPS. Any wastes generated on the site will be properly disposed of or recycled, if appropriate. The Proposed Action, Alternative Actions, and No Action Alternatives will have little to no impacts to hazardous materials.

4.10 Historic and Archaeological Resources

In 2007, Fukunaga performed a data search of the National and State Registers of Historic Places for the trunk sewer replacement. This data search determined that no historic places in the register were located in the area of the Kaneohe Bay #2 WWPS. For the same trunk sewer replacement project the State Historic Preservation Division (SHPD) in the Department of Land and Natural Resources was also consulted. It was concluded that three historic fishponds were located in the area. One of these fishponds could potentially be affected by the current force main replacement project. SHPD stated that the fishpond sites and surrounding areas could potentially yield historically significant information and archaeological monitoring was recommended (Fukunaga, 2007).

The Proposed Action and Alternative Actions could have impacts on historic or cultural resources. An archaeological monitoring plan will be developed prior to the construction phase of the project. During earthwork activities, archaeological monitoring by a qualified monitor shall be conducted in accordance with the approved archaeological monitoring plan as recommended

by SHPD. The No Action Alternative will have no impacts on project site historic or archaeological resources.

4.11 Recreational Resources

No local recreation resources will be affected by the Proposed Action, PTMT Alternative Action, or No Action Alternative. Access to the channel will not be affected and recreational use will not be obstructed by any of the Proposed or Alternative Actions. Recreational uses on roadways may be temporarily affected by the Open Cut Trenching Alternative Action due to work along roadways.

4.12 Visual Environment

Neither the Proposed Action, the Alternative Actions, nor the No Action Alternative will impact the visual environment.

4.13 Construction

During drilling and trenching activities, public health and safety will be protected. The contractor will be required to use and maintain barricades, signs, lights and other safety equipment in order to eliminate dangerous conditions. To minimize traffic impacts, project work will not take place during peak traffic times, and flagmen and other traffic control measures will be necessary to direct traffic. Potential noise impacts will be minimized by limiting work hours. The use of barriers and regular wetting down of problem areas will minimize the potential air quality impacts during work activities within the project area. Management of hazardous materials, if encountered, will be coordinated with applicable agencies.

Solid waste generated during drilling and trenching activities will be properly disposed of in a landfill or recycled, if appropriate.

The Proposed Action and the Alternative Actions will have minimal impacts to the project area during drilling and trenching activities. The No Action Alternative will not require any action, since no construction actions will be implemented.

4.14 Permits and Approvals

The Proposed Action and the Alternative Actions may require the approvals and permits presented in Table 4-1. The No Action alternative is not expected to require any of these approvals.

Table 4-1: Potential Permits and Approvals Required

Permit or Approval	Agency
Federal	
Department of Army Permit	Corps of Engineers, US Army
State of Hawaii	
Community Noise Control/Variance	DOH, Indoor and Radiological Health Branch
Construction in State Highway Right-of-Way*	Department of Transportation

Environmental Assessment	DOH OEQC
NPDES Permit – Dewatering*	DOH CWB
NPDES Permit -- Construction	DOH CWB
Water Quality Certification	DOH CWB
Stream Channel Alteration Permit	Commission on Water Resource Management
Historic Site Review	State Historic Preservation Division
City and County of Honolulu	
Construction Dewatering**	Department of Planning and Permitting
Excavation in Public Right-of-Way	Department of Planning and Permitting
Grubbing, Grading, Stockpiling, and Erosion Control	Department of Planning and Permitting
Street Usage Permit	Department of Transportation Services
Traffic Control	Department of Transportation Services
Land Acquisition*	Department of Design and Construction

* Applicability is based on Open Pit Trenching Alternative Action
** Applicability is based on PTMT Alternative Action and Open Pit Trenching Alternative Action

4.15 Cumulative Impacts

The Proposed Action and the Alternative Actions would have short-term environmental and economic losses, and long-term economic and social gains. The short-term adverse impacts include impacts to existing traffic flow, air quality, noise, and soils during construction activities. The long-term beneficial impacts include:

1. Realization of the 2012 Consent Decree; and
2. Improvement of the reliability of the Kaneohe #2 WWPS Force Main.

Considering the short-term adverse impacts and the long-term beneficial impacts, the proposed improvements are beneficial to the community and to the present and future land uses in the project area.

The No Action Alternative will have no short-term impacts to the project area. However, this alternative will have adverse long-term impacts to the project area as the condition of the force main may deteriorate considerably. Other long-term adverse impacts of the No Action Alternative include potential failure of the force main and a lapse on the conditions of the Consent Decree.

In summary, there are no anticipated significant cumulative impacts upon the environment as detailed in this EA, resulting in a proposed FONSI.

4.16 Irreversible and Irretrievable Commitments of Resources

The implementation of the proposed improvements under the Proposed Action and Alternative Actions would require a commitment of natural, physical, human, and fiscal resources as follows:

- Ground cover at the project site will be lost due to grubbing and grading activities for removal of the site infrastructure.

- Fossil fuels will be consumed during drilling and trenching activities.
- Labor required for construction, planning, engineering design, purchasing, and services will be utilized.
- Construction materials will be committed.
- Construction would result in a one-time expenditure of government funds that would be irretrievably lost.

The commitment of these resources would be appropriate because residents and visitors would benefit from the completion of the proposed improvements as follows:

- Realization of the 2012 Consent Decree; and
- Improvement of the reliability of the Kaneohe #2 WWPS Force Main.

These benefits are anticipated to overcome the commitment of resources.

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Section 5 Anticipated Determination

This section summarizes the potential impacts of the Proposed Action. The purpose of and need for the Proposed Action is presented in Section 1. The definition of the Proposed Action is presented in Section 2. Section 3 evaluates the existing affected environment of the project area. The analysis of the impacts of the Proposed Action, the Alternative Actions, and the No Action Alternative is presented in Section 4.

It is anticipated that the force main replacement through HDD a new force main alignment (the Proposed Action) would not have a significant impact on the environment for the following reasons:

1. There would be no irrevocable loss or destruction of any natural or cultural resource. The impact on flora and fauna and other natural resources is minimal considering the area is already highly disturbed. In addition, a historic biological survey found no threatened or endangered species occurring onsite (Fukunaga, 2007b). No native plant species were encountered in the survey, and every effort will be made during construction so that only non-native plant species will be removed. The project site is potentially located over a historic fishpond, as discussed in Section 3. An archaeological monitoring plan should be prepared and implemented during drilling and trenching activities.

2. The range of beneficial uses of the environment would not be curtailed. The current use of the environment for residential use and adjacent areas for recreation would remain unchanged by the Proposed Action.

3. The Proposed Action is consistent with State and Federal environmental and planning policies, as specified in Section 4.

4. Economic and social welfare of nearby communities and the State of Hawaii would not be adversely affected. The Proposed Action would improve the reliability of the wastewater force main, and therefore, the social welfare of Kaneohe and consequently the State of Hawaii.

5. The Proposed Action would enhance public health and safety by minimizing potential failure of the force main and wastewater spills within the project area.

6. The Proposed Action will not involve secondary impacts, such as population changes or effects on public facilities.

7. There is no degradation of environmental quality. The Proposed Action is within the project site; therefore, the environmental quality of the area should remain unchanged.

8. Cumulative impacts upon the environment are not significant; nor does it involve a commitment for larger actions. Construction will be organized in such a manner as to limit impacts on the surrounding area.

9. Air quality, ambient noise levels, and water quality will not be adversely affected. The Proposed Action will not violate State or National Ambient Air Quality Standards. Noise levels during construction will be within allowable standards. Upon project completion, air, noise, and water quality are expected to remain at current levels.

10. Environmentally sensitive areas will not be affected by the Proposed Action. There are no environmentally sensitive areas, such as floodplains, tsunami zones, beaches, erosion-prone areas, geologically hazardous land, estuary, or coastal waters, in the project site.

12. The Proposed Action will not substantially increase energy consumption.

Based on the information within this document, a FONSI is expected. The Proposed Action is not anticipated to negatively impact environmental, cultural, social, or economic resources in the project area.

Section 6 List of Preparers

City and County of Honolulu
Department of Design and Construction

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Section 7 Organizations and Agencies Consulted

7.1 Agency Consultation and Coordination

The agencies and organizations listed below will be given the opportunity to submit comments on the Proposed Action during the 30-day comment period for the Draft EA. The project description will be published in the Department of Health, Office of Environmental Quality Control's (OEQC) "The Environmental Notice". The Main Honolulu Public Libraries also will receive copies of the Draft EA for public review.

Federal Agencies
Department of the Army
U.S. Army Engineer District, Honolulu
Directorate of Information Management

State Agencies
Department of Health
Environmental Management Division
Department of Land and Natural Resources
State Historic Preservation Division
Department of Transportation
Highways Division

City and County of Honolulu
Department of Design and Construction
Department of Environmental Services
Department of Parks and Recreation
Department of Planning and Permitting
Department of Transportation Services

The information obtained from consulting these agencies will include guidelines for environmental assessment, and requirements for environmental clearances and permits. Agency consultation response letters are included in Appendix A.

7.2 Public Involvement Activities

Public notice will made to present the scope of the Proposed Action and to discuss its expected effects and ramifications, as discussed within this EA. Public comments will be solicited, but none have been received to date.

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Appendix A

Agency Consultation Response Letters

Note: Agency consultation response letters have not yet been received.

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