ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

Chevron Pipeline Replacement Project

ʻEwa District,
Island of Oʻahu

Applicant:
Chevron USA

Accepting Authority:
State of Hawaiʻi Department of Land and Natural Resources

Prepared by:

Belt Collins Hawaii Ltd.

September 21, 2009

TABLE OF CONTENTS

FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AIS	Archaeological Inventory Survey
BCH	Belt Collins Hawaii Ltd.
BLNR	Board of Land and Natural Resources
BWS	Board of Water Supply
C&D	construction and demolition
CDUP	Conservation District Use Permit
CIA	Cultural Impact Assessment
CIP	Campbell Industrial Park
City	City and County of Honolulu
CO	carbon monoxide
CPL	Chevron Pipe Line Company
CUSA	Chevron U.S.A., Inc.
CZM	Coastal Zone Management
dBA	decibels on an A-weighted scale
DLNR	Department of Land and Natural Resources (State of Hawai‘i)
DOH	Department of Health
DOH-CAB	Department of Health-Clean Air Branch
DOT	Department of Transportation
DPP	Department of Planning and Permitting
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
H_2S	hydrogen sulfide
HAR	Hawaii Administrative Rules
HDD	Horizontal directional drilling
HECO	Hawaiian Electric Company
HFD	Honolulu Fire Department
HPD	Honolulu Police Department
HRS	Hawaii Revised Statutes
LUO	Land Use Ordinance
mg/L Cl^-	milligrams per liter chloride
mph	miles per hour

NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
OEQC	Office of Environmental Quality Control
O_3	ozone
parcel 2	TMK parcel 9-1-031:002
parcel 10	TMK parcel 9-1-014:010
Pb	lead
PLEM	pipeline end manifold
PM_{10}	particulate matter – aerodynamic diameter less than or equal to 10 micrometers
$PM_{2.5}$	particulate matter – aerodynamic diameter less than or equal to 2.5 micrometers
SHPD	State Historic Preservation Division
SMA	Special Management Area
SO_2	sulfur dioxide
SSA	Shoreline Setback Area
State	State of Hawai‘i
the harbor	Kalaeloa Barbers Point Harbor
the new pipeline	the replacement 30-inch crude oil pipeline
the original pipeline	the existing 30-inch crude oil pipeline
the refinery	Chevron Hawaiian Refinery
TMK	Tax Map Key
UBC	Uniform Building Code
UIC	Underground Injection Control
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

1 APPLICANT

The applicant for the proposed Pipeline Replacement Project is Chevron U.S.A., Inc. (CUSA). Chevron Pipe Line Company (CPL), acting as an agent for the applicant, has contracted a consultant, Belt Collins Hawaii Ltd. (BCH), to prepare the Environmental Impact Statement (EIS) in accordance with Hawaii Revised Statutes (HRS) Chapter 343, as amended, and Section 11-200, Hawaii Administrative Rules (HAR).

2 ACCEPTING AUTHORITY

The accepting authority for the Draft and Final EIS will be the State of Hawai‘i (State) Department of Land and Natural Resources (DLNR).

3 AGENCIES, CITIZEN GROUPS, AND INDIVIDUALS CONSULTED

The following agencies were consulted prior to this preparation notice:

- State Office of Environmental Quality Control (OEQC)
- State DLNR Office of Conservation and Coastal Lands (OCCL)
- City and County of Honolulu (City) Department of Planning and Permitting (DPP)
- Makakilo-Kapolei-Honokai Hale Neighborhood Board #34

Consultation with these agencies will continue during preparation of the Draft EIS, in addition to consultation with other agencies, citizens groups, and individuals.

4 PURPOSE OF THE DOCUMENT

The purpose of the EIS will be to comply with the requirements of HRS Chapter 343, as amended, and Section 11-200, HAR. This preparation notice, the initial step in the EIS process, is intended to inform interested parties of the proposed project and to seek public and agency input on issues or sources of concern that should be addressed in the forthcoming Draft EIS. The Draft EIS will identify and evaluate the potential impacts of the proposed action and the alternatives, and discuss mitigation measures to prevent or reduce any adverse impacts.

5 PROPOSED PROJECT OVERVIEW

The purpose of the proposed project is to replace two parallel marine pipelines (a 30-inch diameter pipeline currently used to offload crude oil and a 20-inch diameter pipeline currently used to load naphtha[1]) operated by CUSA. The pipelines extend from the shoreline on the southern coast of Campbell Industrial Park on the Island of O‘ahu, approximately 2.1 miles offshore in a southeasterly direction and terminate at an offshore anchorage area.

[1] “Naphtha” is a primary ingredient in gasoline. The 20-inch line is used to deliver naphtha to ships for transport to the neighbor islands.

Because the pipelines have been in continuous operation since they were first installed in 1960, CUSA believes that they need to be either repaired or replaced. The Draft EIS will describe the potential impacts associated with the replacement and/or repair of the pipelines.

The proposed project is to install a new 30-inch pipeline and/or a new 20-inch pipeline to replace the original pipelines. The portions of the pipelines that extend across the shoreline and into the ocean trigger an environmental assessment, pursuant to HRS Chapter 343, as amended, because they cross the Special Management Area (SMA), the Shoreline Setback Area (SSA), and the Conservation District, respectively.

5.1 HISTORICAL CONTEXT

In the early to mid-1950s, Chevron determined that a multi-buoy mooring system in the open ocean would be employed to berth tankers offshore for offloading crude oil by submerged pipeline. As vessel sizes increased, however, the design of the mooring system evolved into what is known as a combination anchorage-mooring buoy system. This system involves a vessel dropping its bow anchors and using its engines to maneuver the vessel into place so that mooring lines can be secured to nearby buoys (as opposed to a multi-buoy system where the vessel is secured to open ocean buoys, but no anchors are employed).

In the summer of 1957, mooring and anchoring tests were conducted by Chevron and it was determined that the hard flat coral bottom offshore of Barbers Point could not be depended upon to hold a tanker's anchors while it was maneuvering for buoy mooring. Based on analysis and field tests over the next two years, it was subsequently decided that explosives could be successfully used to break up the ocean bottom beneath the preferred mooring area by creating a series of parallel trenches that could catch and hold a tanker's anchors. Blasting was conducted in February 1960, and the anchorage area was completed in July 1960.

Blasting was also used to create the 4,000-foot long channel from the shoreline through the surf zone where the original pipelines were laid and then buried with rubble. The submarine easement that would eventually accommodate the original pipelines was also cleared by a tugboat dragging a submerged sled to clear off coral and smooth down high and low spots as much as possible. These historical activities account for the present conditions observed in the submerged project area.

5.2 PROJECT IMPLEMENTATION

The term "Proposed Action" will be used for the purposes of this document to mean the specific activities that are subject to a review and analysis in the EIS to be prepared.

The purpose of the proposed project is to replace both marine pipelines (30-inch pipeline and 20-inch pipeline). Because the two pipelines extend from the coast into the ocean, as briefly mentioned above, they are subject to the jurisdiction of multiple governmental agencies, potentially triggering a variety of permits and approvals for their replacement. The distinct elements of the project are summarized in Table 1 below. Due to the potential complexity of permits and approvals and the variety of jurisdictions involved, certain project elements may be able to be implemented while others await approval.

Table 1: Overview of Project Elements

Project Element	Agency Jurisdiction	Required Permit/Approval
Offshore portion	State Board of Land and Natural Resources (BLNR) – Conservation District	Conservation District Use Permit (CDUP)
	USACE – U.S. waters	Section 401
Onshore portion	State BLNR – portion seaward of certified shoreline	Shoreline Certification
	City DPP – portion in SSA	Shoreline Setback Variance
	City DPP – portion in SMA	SMA Use Permit

As the result of consultation with the City and State, CUSA will prepare an EIS, pursuant to HRS Chapter 343, as amended, which will describe the potential impacts associated with replacement of the marine pipelines that will be made to ensure long-term, reliable operating conditions. Because a portion of the pipelines cross the SMA and SSA before entering the ocean, CUSA together with the State OEQC, State DLNR and City DPP have agreed that the replacement of these portions should also be addressed in the EIS.

5.3 DESCRIPTION OF PIPELINE OPERATIONS

When the 30-inch and 20-inch pipelines were originally installed in 1960, they incorporated the use of a 6-inch and 4-inch diameter pipelines respectively (called "gut lines") contained inside the length of the larger pipelines. Hot water was pumped into the gut lines as a means of warming hydrocarbons to ensure that they remained fluid and would not harden due to the colder underwater temperature. This technology was operated successfully for several decades, but CUSA has concerns that leaks in the gut lines may have led to corrosion inside the larger pipelines. To date, leaks caused by internal corrosion have not manifested in offshore portions of the 20-inch and 30-inch pipelines.

The replacement of a pipeline over 2.1 miles in length, with the majority lying on the ocean bottom, is an extremely expensive undertaking. CUSA is presently determining the extent of possible deterioration or corrosion on the interior as well as on the exterior of its pipelines, if any, to determine if repairing the pipelines is a feasible alternative to their replacement. The repair of the pipelines would likely be much less expensive than replacing the entire pipeline. Once this determination has been made, the future use of the 20-inch pipeline can be determined.

As is evident from this discussion, the existing and future operations of the CUSA pipelines are complicated by a variety of jurisdictional and operational considerations. CUSA's current efforts will help clarify the project's feasible alternatives, and subsequently, the scope of the Draft EIS.

5.4 PURPOSE AND NEED FOR THE PROPOSED ACTION

The Proposed Action is intended to ensure long-term, optimal operating conditions for the marine pipelines. A number of potential scenarios are described below. For the purposes of the Draft EIS, these scenarios constitute the Proposed Action and the Alternatives to the Proposed Action.

6 PROPOSED ACTION

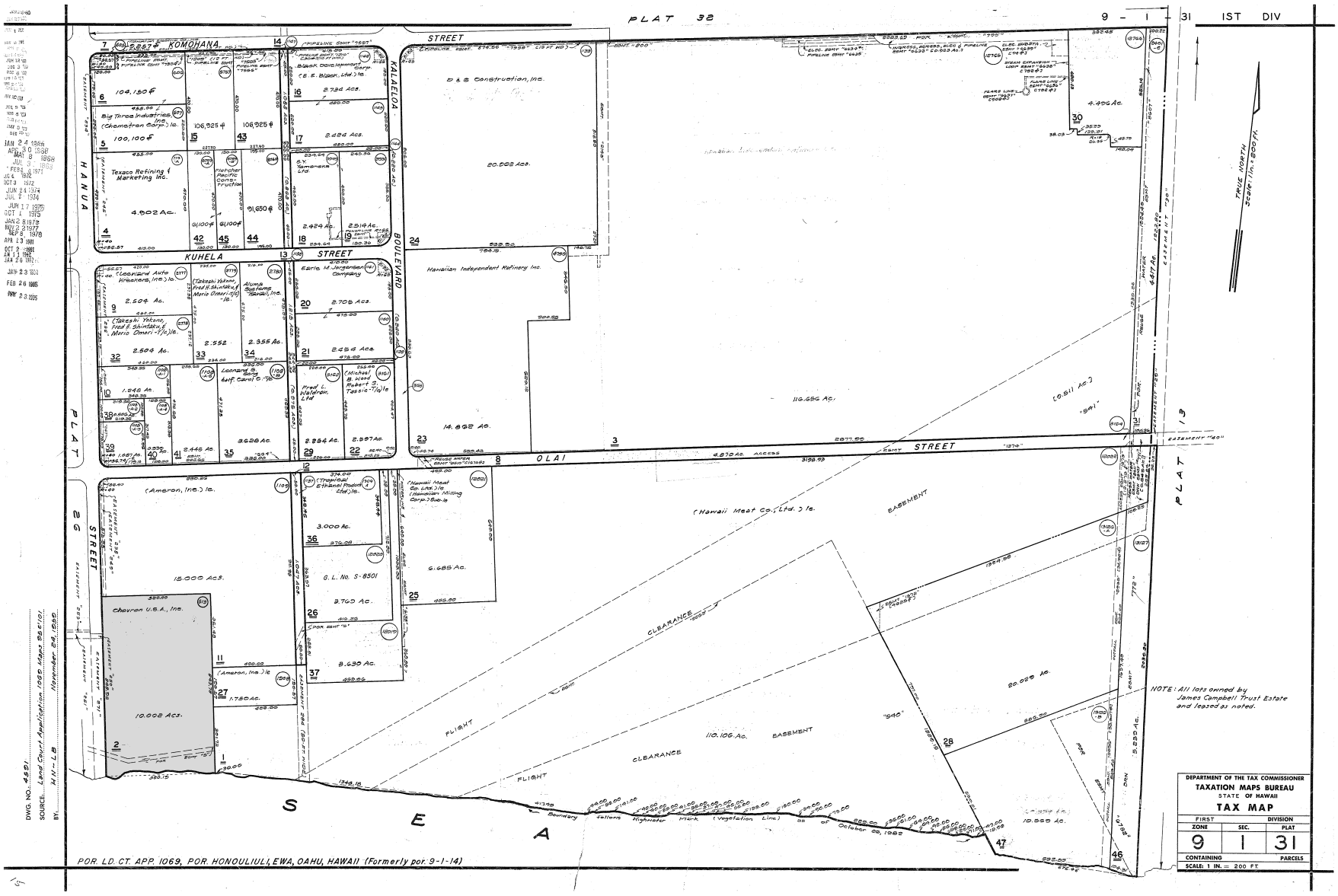
CPL, acting as an agent for the applicant (Chevron U.S.A., Inc.), proposes to perform the following (hereinafter, "the Proposed Action"):

Install a new 30-inch pipeline and/or a new 20-inch (or smaller diameter) pipeline to replace the original pipelines. The new pipeline(s) will generally extend southeast from the inland boundary of the SMA along the original pipelines' submarine easement, approximately 2.1 miles to an existing tanker mooring offshore. The original 30-inch pipeline will remain in service until its replacement is installed, at which point it will be decommissioned, cleaned, and idled-in-place. Once the integrity of the 20-inch pipeline is determined, the feasibility of it future use can be determined.

6.1 ONSHORE GENERAL SITE CONDITIONS

For the purposes of the Draft EIS, the onshore portion of the project is limited to that portion of the proposed pipeline alignment with in the SMA. The onshore portion of the Proposed Action will occur within tax map key parcel 9-1-031:002 (hereinafter, "parcel 2"), a 10-acre shoreline property (see Figures 1 and 2). Parcel 2 is zoned for industrial use. As parcel 2 abuts the shoreline, a certification of the shoreline location will be conducted prior to the preparation of permit applications.

Parcel 2 is generally described as an industrial property that is frequently used for the temporary storage of a variety of equipment and vehicles owned by CUSA. It is presently vacant with improvements limited to a chain link security fence and the above-ground portions of the two pipelines discussed above. The surface consists of hard-packed coral and sand, and the perimeter consists of an irregular border of scrub vegetation.



BELT COLLINS

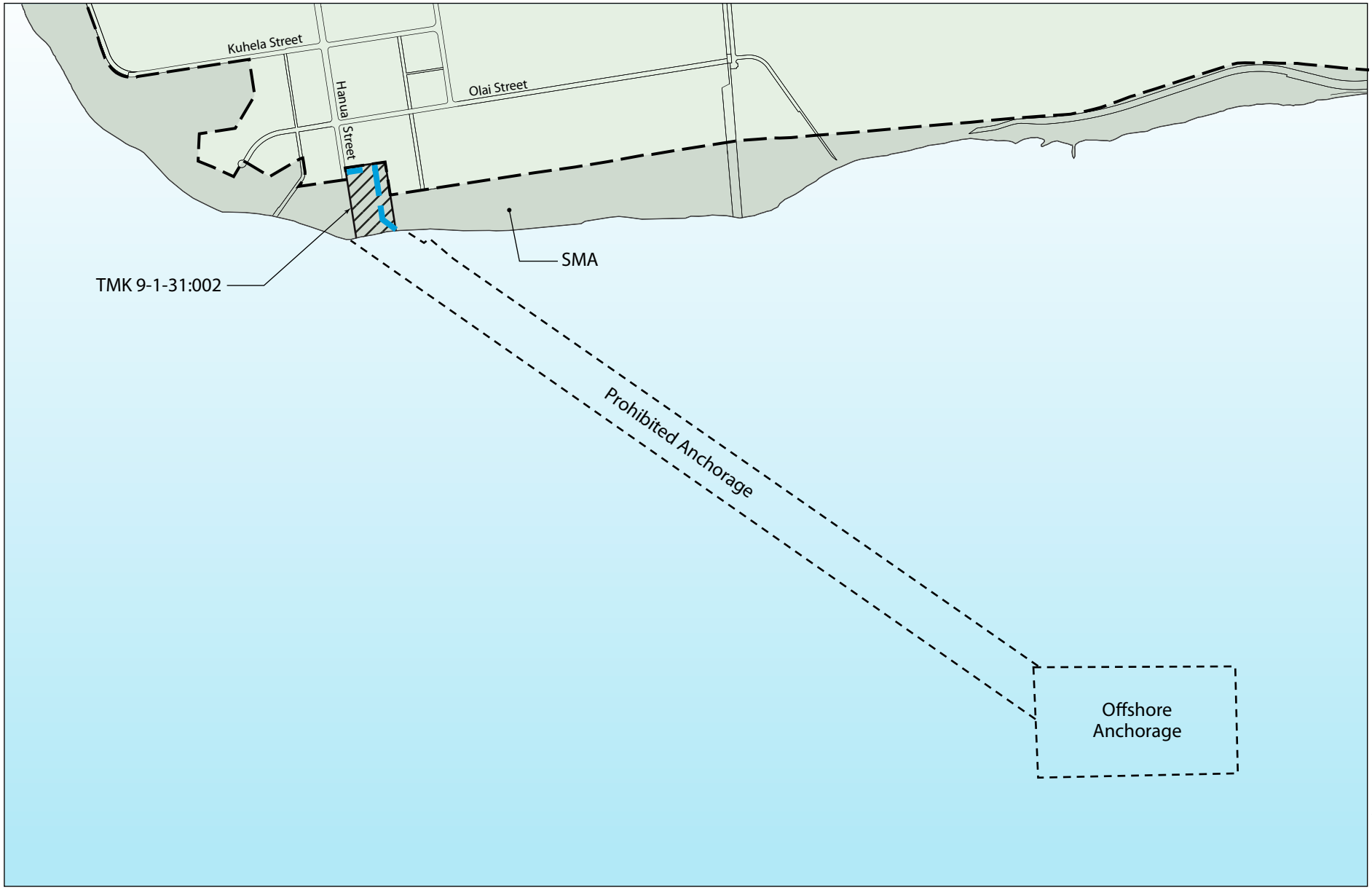
NORTH

0 350 700

SCALE IN FEET

Figure 1
TMK 9-1-31:002

Chevron Replacement Pipeline EISPN
September 2009



BELT COLLINS

NORTH

0 900 1800

SCALE IN FEET

LEGEND

Above-Grade Portion of Pipeline

Figure 2
PROJECT LOCATION

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September 2009

6.2 OFFSHORE GENERAL SITE CONDITIONS

The offshore portion of the Proposed Action will occur in the Pacific Ocean extending southeast from the shoreline at parcel 2 to the tanker mooring. In this area, the Pacific Ocean is considered navigable waters of the United States and is classified as Class A marine waters by the State Department of Health (DOH).

The approximate 2.1 miles of ocean bottom that will be impacted by the new pipeline(s) consists of four distinct zones. The first is generally characterized as a coral reef surf zone, approximately 4,000-feet wide, extending from the shoreline to a depth of approximately 60 to 65 feet. Seaward of the surf zone, the ocean floor is largely devoid of coral for approximately 2,200 feet, consisting of an ancient coral shelf with outcroppings of sandstone and occasional basaltic rock. This barren zone then yields to an approximately 2,800-foot wide zone of intermittent coral and sandy areas with some large coral heads. The fourth zone is approximately 2,200-feet wide and contains heavy windrows of coral and coral rubble.

The ocean bottom is neither flat nor smooth. There are many small ridges and valleys averaging three feet in height or depth, respectively. There are also numerous cracks zigzagging across the bottom, joined together by smaller cracks and an occasional crater 5 to 10 feet in diameter and 1 to 2 feet deep.

6.3 ALIGNMENT

The intention of the Proposed Action is to install the new pipeline(s) adjacent to the original pipelines within the existing easements. If a pending reconnaissance of the original pipeline alignment reveals impediments to that strategy, the alignment of the new pipeline will be adjusted accordingly and new easements will be secured wherever necessary. A possible impediment includes the physical alignment of the original pipelines. If they have shifted from their alignment within the existing submarine easement due to the effects of storm surge (e.g. if the original pipelines have shifted in such a manner that the new pipeline(s) would have to cross over the existing pipelines to stay within the existing easement), then a new easement may be necessary. Extensive coral growth within the existing offshore easement or adjacent to the original pipeline alignment might preclude the installation of the new pipeline(s) as well. The alignment of the original pipeline easement is depicted in Figure 2.

Beginning at the inland boundary of the SMA, the original pipelines emerge from underground and extend to the northeastern corner of the property on approximately 24-inch high concrete footings (see Photo Plate 1). Near the southeastern corner of the property, the 30-inch and 20-inch pipelines transition again to a below-grade alignment that extends across the beach to the shoreline where they enter Easement A, a 15-foot wide submarine easement extending from the shoreline in a southeasterly direction offshore.

Beginning at the shoreline, the original pipelines extend underground beneath the surf zone, a distance of approximately 4,000 feet, to a point where they emerge on the seafloor and continue another approximately 7,220 feet along the ocean floor to the tanker anchorage, a 1,300-foot by 1,300-foot area. The depth of the ocean at the inland side of the tanker anchorage is approximately 58 feet. The ocean depth at the southeastern corner of the tanker anchorage is about 92 feet.

CUSA intends to lay the new pipelines in the existing submarine easement because by doing so impacts upon live coral will be minimized. Spanning support will not be necessary in places where the pipeline crosses voids, as no voids exceeding 30 feet are expected. If it is later

BELT COLLINS

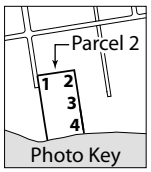

Photo Plate 1
PORTION OF PIPELINES ON PARCEL 2

Chevron Replacement Pipeline EISPN
September 2009

determined that spanning support is required, fill or concrete will be placed in the voids to provide support to the pipelines.

A survey of the existing submarine easement will be conducted by divers prior to finalizing the pipeline installation strategy. If it is determined that coral growth within the easement will constrain installation of the new pipelines, then an alternate strategy may need to be considered. Pipeline installation options may include the selective relocation of live coral by hand or the creation of a new easement that avoids live coral.

6.4 DESIGN SPECIFICATIONS

The onshore portions of the new 20-inch and 30-inch pipelines will be constructed of 0.375 steel,. The offshore portions will be constructed of one-inch steel and encased in a two-inch concrete jacket to increase negative buoyancy. Both the onshore and offshore portions of the pipelines will be manufactured on the U.S. mainland and shipped to Hawai‘i in 40 to 60-foot long segments for fabrication and installation.

The seaward end of the new pipelines will be attached to a pipeline end manifold (PLEM), which is a gravity-base structure constructed of steel that will function as a manifold to which flexible hoses will be attached for connecting moored vessels to the pipeline so that they can off-load their cargo. The steel manifold will be anchored on the seafloor by concrete weights.

6.5 ONSHORE INSTALLATION

The onshore pipeline segments within the SMA will be joined by in-field welding and welding joints will be coated with epoxy. For the above-grade alignment, the new pipelines will be mounted on concrete supports standing approximately 24 inches above-grade. At the point near the shoreline where the pipeline transitions to below-grade, a back-hoe will excavate an approximately five-foot wide trench in approximately 100-foot long segments within the existing easement. The new pipeline(s) will be buried in an approximately eight-foot deep trench so that the installed pipeline(s) will be approximately three feet below the surface. Excavated material will be stockpiled temporarily beside the trench and used to backfill the trench once the pipeline(s) is installed. The bottom of the excavated trench is anticipated to be approximately two feet above the level of subterranean groundwater. The installed pipelines will be pressure tested prior to back filling the trench.

6.6 OFFSHORE INSTALLATION

Installation of the offshore portion of the new pipelines will be divided into three phases. The first phase will employ horizontal directional drilling (HDD) to excavate an approximately 40-inch diameter (depending on the size of the new pipelines) bore hole from parcel 2 seaward under the surf zone. The spoils (mud) extracted from the bore hole during drilling will be stockpiled and dewatered within parcel 2 prior to disposal. It is recognized at this stage of the preliminary planning process that the dewatering process will be conducted in accordance with rules of the State DOH and that all applicable permits must be approved prior to the commencement of dewatering activities. After the mud has been dewatered it will be disposed of at the Nanakuli construction and demolition (C&D) landfill or sold to private interests for use as fill material.

Staging of the HDD will occur on parcel 2. The equipment needed to excavate a trench and drill the tunnel, together with the area needed for a temporary stockpile of the excavated material, will require approximately one acre within the 10-acre property. The first phase will require six to nine months to complete.

The ultimate length of the bore hole will be determined by a marine survey conducted by a marine biologist. The marine survey will determine the current seaward extent of live coral. A marine survey conducted in 1960, prior to the installation of the original pipelines, characterized the seafloor as a "barren ocean bottom" extending approximately 2,200 feet seaward from the end of the surf zone (which extends approximately 4,000 feet seaward from the shoreline). The excavated bore hole will need to extend to a point where it will emerge on the ocean bottom without impacting live coral. Its estimated length will be determined once the marine survey is completed.

The second phase will involve a process of assembling 60-foot long pipeline sections within the Kalaeloa Barbers Point Harbor and then towing the assembled floating pipelines with marine vessels out to sea where they will be submerged and guided into the proper alignment by divers. A polyethylene pipe will be connected to the new pipelines in order to provide the buoyancy needed to float the pipelines. Once in its proper location, both pipes will be filled with water to achieve neutral buoyancy and then additional water will be allowed in to slowly submerge the pipelines. Once the new pipelines are in place, the polyethylene pipe will be unlashed, returned to the surface, and disassembled for reuse elsewhere by CUSA.

The second phase also includes pulling the assembled and submerged pipelines through the bore hole so that they can be connected to the onshore portion of the pipelines. The pulling action is accomplished by securing the landward end of the pipelines to the drilling head and then pulling the drilling head back towards the rig on shore. The second phase will require approximately two weeks to complete, and ideally would be conducted during the winter months when south shore surf conditions are the most benign.

The third and final phase will require pressure testing of the pipelines and connection to the PLEM.

6.7 DECOMMISSIONING OF THE ORIGINAL PIPELINE

After the original pipelines are taken out of service, the crude oil remaining in the pipeline will be removed and returned to the refinery. Any crude oil residue will be purged using residue purging liquid or cutter stock (a petroleum stock which is used to reduce the viscosity of a heavier residual stock by dilution). The purged pipeline will then be inspected to determine its overall integrity, after which it will be sealed off by welding on end caps at each end. The purged and sealed pipeline will then be filled with pressurized inert nitrogen gas or other inert material and will be left in place along its entire length. The inert gas pressure in the decommissioned pipeline would be monitored annually for any loss of pressure which would indicate a leak.

6.8 ALTERNATIVES TO THE PROPOSED ACTION

The activities associated with replacing the offshore portion of the 30-inch and 20-inch pipelines will be evaluated in the Draft EIS because they would likely involve the greatest quantifiable impacts to the environment. However, CUSA may be able to implement a project of lesser scale and impact.

A marine reconnaissance survey will be conducted prior to publication of the Draft EIS. It is intended that the reconnaissance survey will determine the extent of coral growth on and around the existing pipelines since they were originally installed. This information is vital to determining:

a. the best methods to be employed if it is determined that one or both of the pipelines can be repaired rather than replaced;

b. whether additional anchoring of the pipelines is warranted once repair or replacement is completed and where that possible anchoring system would be best employed to ensure that no coral is damaged; and/or

c. the optimal location for the replacement pipelines to avoid impacting existing coral growth.

For the purposes of this Preparation Notice, the following Alternatives will likely be addressed in the Draft EIS, notwithstanding the outcome of the two aforementioned studies.

6.8.1 No Action Alternative

In the event that CUSA determines that the pipelines are neither in need of replacement nor repair, no further action will be warranted and operation of the pipelines will continue for the foreseeable future.

6.8.2 Alternative 1: Repair Rather Than Replace the Existing Pipelines

As an alternative to replacing the 20-inch and 30-inch pipelines, it may be possible to repair the onshore portions (within the SMA) and/or offshore portions of the pipelines. Because the majority of the onshore pipelines within the SMA are constructed above ground, onshore repairs would generally consist of simply isolating sections of the pipeline and repairing them, or potentially replacing discrete sections of pipelines.

There are several repair methods that would be considered to make the necessary repairs to the offshore portion of the pipelines. A common repair technique for offshore pipelines is performed by elevating the pipelines from the ocean floor to the ocean surface to be repaired on a barge which will provide the necessary equipment and materials to perform the necessary repairs. Once the repairs are made the pipeline is then lowered back to the ocean floor. This process involves sealing the marine pipeline, decoupling it from its anchor supports, and then injecting it with air to create enough buoyancy to float the entire length of the pipeline to the surface. Once repairs are completed, the pipeline would be slowly flooded with seawater to achieve neutral buoyancy. Then, enough additional seawater is added to carefully control its descent as the pipeline is submerged and guided back into its original position on the ocean floor.

Another technique uses mechanical clamps that mount to the pipeline at the locations where the anomaly has been identified. A third technique is to perform repairs subsea. This scenario will employ divers that have the training and certification to perform the necessary repairs.

6.8.3 Alternative 2: Replace Only One Pipeline

If it is determined that only one of the two pipelines warrants replacement, the overall project will be reduced in scope and limited to a single replacement project.

6.8.4 Alternative 3: Replace the Existing 30-inch Pipeline with a Smaller Diameter Line

As discussed above in the Section 6.3 (Alignment) above, due to the presence of the parallel 20-inch pipeline and the 30-inch pipeline, there is a finite amount of space within the existing marine easement to accommodate a new replacement pipeline (if replacement is implemented, the existing line must be abandoned in place in lieu of costly and potentially adverse environmental impacts associated with its removal). If it is determined that the 30-inch pipeline must be replaced, results of hydraulic modeling could indicate that a smaller diameter pipeline may be sufficient to handle the volume of hydrocarbons. Additionally, if is determined that due to the existence of extensive coral growth in all of the portions of the existing marine easement, it may

become necessary to utilize a smaller diameter pipeline in the replacement project because there is only limited available space within the existing marine easement. Thus, in this alternative a 24-inch pipeline or a 20-inch pipeline might be installed as a replacement to the 30-inch pipeline. Similarly, a smaller diameter pipeline might also be considered as a replacement for the 20-inch pipeline.

6.8.5 Alternative 4: Construct the Replacement Pipelines in a New Marine Location

If it is determined that one or both of the pipelines must be replaced, and that there is no available room within the existing easement or substantial portions of the existing easement due to extensive coral growth to accommodate the replacement lines, then a new alternative alignment may be identified for aligning the replacement pipeline on the sea floor. In anticipation of this possibility, the marine biologist conducting the recon survey will study an area several hundred feet wide within which an alternative alignment might be established. If this alternative is employed, it will become necessary to secure approvals of the new easement from the State prior to the project being implemented.

6.8.6 Alternative 5: Implement a Combination of Alternatives 1, 2, 3 and 4

In an effort to reduce potential adverse environmental impacts and minimize the cost of the undertaking, it may be possible to implement an alternative that constitutes a combination of one or more of the above alternatives.

7 TIME FRAME

The first phase of the project, onshore installation of the new 30-inch pipeline is expected to take approximately three to six months, after which offshore repair and/or installation of the new pipeline(s) is expected to take approximately six to nine months. Decommissioning of the original pipeline will take approximately several weeks, once the new 30-inch pipeline is in operation (after installation and testing). Thus, the overall project will require up to nine months to complete, subsequent to all necessary permits and approvals.

8 FUNDING SOURCE

The construction of the onshore and offshore elements of the project will employ approximately 30 full-time construction workers. The total cost for the project, including entitlements, materials, and labor, will be privately funded. No public funding will be required.

9 REQUIRED PERMITS AND APPROVALS

The Proposed Action will include either repairing or replacing the existing offshore pipelines, which would include the HDD and the offshore installation and anchoring of the new pipelines. Because parcel 2 is located entirely within the SMA and because all of the work seaward of the certified shoreline will require a CDUP, the Proposed Action triggers an environmental assessment pursuant to HRS Chapter 343, as amended. The applicant will perform the necessary environmental assessments, and will prepare an EIS to ensure full disclosure to the general public, interested parties, and decision makers.

Table 2: Permits and Approvals Necessary for the Proposed Action

Permit/Approval	Regulatory Agency	Anticipated Timeline
Environmental Impact Statement	State Department of Land and Natural Resources	9-12 months
Shoreline Certification	State Board of Land and Natural Resources	5 months following EIS
Conservation District Use Permit	State Board of Land and Natural Resources	8 months following publication of Draft EIS
Section 10/Section 404 Department of Army Nationwide Permit	U.S. Army Corps of Engineers	3 months following approval of CDUP
Section 401 Water Quality Certification	State Department of Health Clean Water Branch	12 months following submittal of nationwide permit applications
Coastal Zone Management (CZM) Certificate of Consistency	State Office of Planning	3 months following submittal of CDUP application
Special Management Area Use Permit/Shoreline Setback Variance	City Department of Planning and Permitting	4 months following publication of Draft EIS
Lease of Submerged Land (if necessary)	State Legislature	3 months following acquisition of all permits
Grading/Stockpiling/Trenching/Dewatering Permits	City Department of Planning and Permitting	1 month
National Pollutant Discharge Elimination System (NPDES) Permit(s)	State Department of Health Clean Water Branch	3 months

10 SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT

10.1 STATE LAND USE AND COUNTY ZONING DESIGNATIONS

The State Land Use designation for the onshore portion of the project site (i.e., parcel 2) is Urban District.[2] The Urban District generally includes lands characterized by "city-like" concentrations of people, structures, and services, and also includes vacant land for future development. Jurisdiction of this district lies primarily with the county in which the Urban District is situated. In general, lot sizes and uses permitted in this district are established by ordinances or regulations of the respective county.[3]

[2] City and County of Honolulu Department of Planning and Permitting. http://gis.hicentral.com/ (accessed February 3, 2009).

[3] HRS §205-2(b).

The City Land Use Ordinance (LUO) Zoning map identifies the onshore project site as Intensive Industrial District (I-2).[4] According to the City LUO, petroleum processing is permitted under Conditional Use, Type 1.[5]

10.2 CLIMATE AND AIR QUALITY

The climate of Hawai‘i is generally characterized by mild temperatures throughout the year, moderate humidity, and persistent northeasterly trade winds. The National Weather Service operates a meteorological station at the Honolulu International Airport approximately 12 miles east of Campbell Industrial Park (CIP). The normal daily maximum and minimum temperatures reported for the airport are 84.7 degrees Fahrenheit (°F) and 70.2°F, respectively, and the normal annual precipitation is 18.29 inches, where normal values represent 30-year averages (1971 – 2000).[6]

Ambient concentrations of air pollutants are regulated by U.S. Environmental Protection Agency (USEPA)-established National Ambient Air Quality Standards (NAAQS) in order to protect public health and welfare from the harmful effects of certain commonly occurring pollutants. NAAQS have been set for the following “criteria” air pollutants: sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), airborne lead (Pb), and particulate matter.[7] In addition to these pollutants, the State DOH Clean Air Branch (DOH-CAB) has also established a standard for hydrogen sulfide (H_2S). The island of O‘ahu is in attainment of Federal and State standards for all criteria air pollutants.

The State DOH-CAB operates a network of air quality monitoring stations throughout the state, including three stations in the vicinity of the project area: West Beach, Kapolei, and Maka‘iwa stations. Sampling equipment at these three stations collectively sample for SO_2, CO, NO_2, particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). According to the *2008 Annual Report on Air Emissions from Facilities at Campbell Industrial Park,*[8] levels of the criteria air pollutants measured in the CIP area are consistently below the Federal and State standards.

10.3 GEOLOGY, TOPOGRAPHY, AND SOILS

The project is located on the western portion of the ‘Ewa plain, which is composed of layers of coral reef formations, marine sediments, and alluvium overlying a basement complex of basaltic lavas from the Wai‘anae Volcanic Series. Sinkholes formed by the dissolution of limestone are abundant in the project vicinity.

Topographic coverage of the onshore project site is provided by the U.S. Geological Survey (USGS) ‘Ewa Quadrangle at a scale of 1:24,000.[9] Regional topography of the area gently slopes down to the southwest, towards the coast. Base elevation of parcel 2 ranges from approximately five-feet above mean sea level at the northern boundary to mean sea level along the shoreline. A shoreline survey will be conducted and submitted to the State DLNR for certification.

4 City and County of Honolulu, Department of Planning and Permitting. http://gis.hicentral.com/ (accessed February 3, 2009).

5 City and County of Honolulu. *Revised Ordinances of Honolulu, Chapter 21, Land Use Ordinance.*

6 State of Hawai‘i Department of Business, Economic Development and Tourism. August 2008. *The State Of Hawaii Data Book 2007.*

7 42 USC §7409, 40 CFR §50.2.

8 State DOH-CAB, November 2008.

9 USGS, 1998.

Soil at the onshore project site is predominantly designated as coral outcrop (CR), with beaches (BS) occurring along the coastline.[10] Coral outcrop consists of coral or cemented calcareous sand typically covering about 80 to 90 percent of the surface; the remainder is covered by a thin layer of friable, red soil material that has accumulated in cracks, crevices and depressions within the coral outcrop. Beaches are sandy, gravelly, or cobbly areas that are washed and rewashed by ocean waves, and consist mainly of light-colored sands derived from coral and seashells.

10.4 GROUNDWATER RESOURCES

Groundwater resources beneath the onshore project site are classified as part of the 'Ewa aquifer system of the Pearl Harbor aquifer sector.[11] Both the upper and underlying aquifers are characterized as basal (fresh water in contact with seawater).

The upper aquifer is classified as unconfined (where the water table is the upper surface of the saturated aquifer) and occurs in sedimentary (non-volcanic) deposits. This aquifer is a currently developed groundwater source that is neither used for drinking nor ecologically important. This aquifer is listed as having moderate salinity (1,000 to 5,000 milligrams per liter chloride [mg/L Cl^-]), being replaceable, and being highly vulnerable to contamination.

The lower aquifer is classified as confined (bounded by impermeable or poorly permeable formations) and occurs in flank deposits (horizontally extensive lavas). This aquifer is a currently developed groundwater source that is neither used for drinking nor ecologically important. This aquifer is listed as having low salinity (250 to 1,000 mg/L Cl^-), being irreplaceable, and having low vulnerability to contamination.

The depth of groundwater at the onshore project site is presently unknown. The direction of groundwater flow beneath the project location is not definitively known, as characterization would require subsurface exploration, installation of groundwater monitoring wells, and surveys of groundwater elevations. In the Hawaiian Islands, groundwater is generally assumed to flow down gradient and toward the ocean. Due to proximity to the ocean, however, localized flow direction may vary from this pattern as a result of tidal influences. Heterogeneous subsurface conditions may also influence groundwater flow direction.

The Underground Injection Control (UIC) program was established by the State DOH to protect the quality of underground sources of drinking water from pollution by subsurface disposal of fluids.[12] The UIC line is the boundary between aquifers that supply drinking water (generally *mauka* of the UIC line) and exempted aquifers that do no supply drinking water and can accept spent fluids (generally *makai* of the UIC line). Review of the UIC map indicates that the project is located approximately 1.2 miles *makai* of the UIC line which traces Malakole Road.[13]

An analysis of groundwater conditions in the vicinity of the project area will be conducted for inclusion in the Draft EIS.

10.5 TERRESTRIAL FLORA AND FAUNA

The onshore project site is highly industrialized and is largely devoid of vegetation and wildlife. Botanical, mammalian, and avian surveys will be conducted prior to preparation of the Draft EIS

[10] U.S. Department of Agriculture, Soil Conservation Service. 1972. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

[11] Mink and Lau. 1990. *Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii Technical Report No. 179.*

[12] HAR 11-23. November 12, 1992.

[13] State of Hawai'i Department of Health. 1983. *Underground Injection Control Map, Ewa Quadrangle.*

to characterize the existing flora and fauna and determine if Federal- or State-listed endangered, threatened, proposed, or candidate species are present on or in the immediate vicinity of parcel 2.

10.6 SURFACE WATERS

The offshore portion of the Proposed Action will occur in navigable waters of the United States, classified as Class A marine waters by the State DOH. The Pacific Ocean is classified as Class A marine waters.[14] As defined in HAR 11-54, it is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Other uses are permitted as long as they are compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters.

A water quality survey of the nearshore waters in the vicinity of the offshore pipeline alignment will be conducted prior to preparation of the Draft EIS to: (1) depict the water chemistry composition in both time (seasonal) and space (distance from shore) in terms of existing State DOH Water Quality Standards; (2) determine the contribution of groundwater and surface flow that enter the marine environment; and (3) determine if there are any residual petroleum products from past onshore pipeline compromises detectable in nearshore waters.

10.7 NEARSHORE MARINE ENVIRONMENT

The ocean bottom along the offshore pipeline alignment generally consists of four distinct zones. The first zone, which extends approximately 4,000 feet from the shoreline to a depth of approximately 60 to 65 feet, is generally characterized as a coral reef surf zone. Extending approximately 2,200 feet seaward of the surf zone, the second zone of ocean floor is largely devoid of coral, consisting of an ancient coral shelf with outcroppings of sandstone and occasional basaltic rock. This barren zone yields to the third zone of intermittent coral and sandy areas with some large coral heads, which extends approximately 2,800 feet. The fourth zone, extending approximately 2,200 feet, contains heavy windrows of coral and coral rubble.

A survey will be conducted prior to preparation of the Draft EIS to more precisely characterize the physical oceanography and topographic structure of the nearshore marine environment. In addition, a marine biologist will conduct an evaluation of the existing marine biota and community structure on the pipelines and in the project vicinity.

10.8 NATURAL HAZARDS

Natural hazards that could potentially affect the project site are described below.

Hurricanes. Tropical cyclones are storm systems characterized by cyclonic circulation (counterclockwise in the Northern Hemisphere) around a low-pressure center, typically forming in the doldrums near the equator. Tropical cyclones are categorized based on windspeed: tropical depression (below 39 miles per hour [mph]), tropical storm (between 39 and 73 mph), and hurricane (74 mph or greater).

Hurricane season in Hawai‘i begins in June and lasts through November. Hazards associated with hurricanes include high winds, heavy rainfall, flooding, storm surge, and high surf. During the last 50 years, many tropical storms and hurricanes have come close to the Hawaiian Islands, but there have only been three direct hits, all of which made first landfall on the island of Kaua‘i.

[14] State of Hawai‘i Department of Health. October 1987. *Water Quality Standards Map of the Island of Oahu.*

The principal hazards associated with tropical cyclones are high winds and storm surges (the onshore run-up of wind driven waves).

Tsunami. A tsunami is characterized by very long wavelengths that are typically generated by seismic events such as earthquakes, landslides, or volcanism. The sudden movement associated with these events causes a rapid displacement of water which forms high-energy waves that can travel long distance while retaining most of that energy. Tsunami in the deep waters of the open ocean have a small amplitude, then as tsunami reach shallower waters approaching land, the wave's energy is translated into a much higher amplitude resulting in a surge of fast moving water that can quickly inundate a coastline. The project is located within a designated tsunami evacuation zone.

Floods. The Federal Emergency Management Agency (FEMA) designates zones based on the risk of flooding. The Special Flood Hazard Area is the area subject to flooding by a 1 percent annual chance flood (100-year flood). According to the Flood Insurance Rate Map (FIRM) issued by FEMA, the majority of the onshore project site is located within Zones A and AE, which are both included the Special Flood Hazard Area.[15]

Earthquakes. Most earthquakes in Hawai'i are directly related to volcanic activity. While Hawai'i Island experiences thousands of earthquakes each year, most are so small they can only be detected by instruments; however, some are strong enough to be felt, and a few can cause minor-to-moderate property damage. The Uniform Building Code (UBC) seismic provisions contain six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10 percent chance of severe shaking in a 50-year interval), which are used to determine the strengths of various components of a building required to resist earthquake damage. The island of O'ahu is designated in UBC Seismic Zone 2A, indicating a relatively low seismic hazard.

10.9 ARCHAEOLOGICAL AND CULTURAL RESOURCES

The project is located within the traditional land division, or *ahupua'a*, of Honouliuli in the district of 'Ewa. The project vicinity contains many archaeological features, including sinkholes which formed in the soluble limestone of the exposed reef and became important resources to avian populations (prior to human settlement) and later for early Hawaiian populations. Previous surveys of the 'Ewa plain have documented archaeological artifacts of extinct birds and evidence of early Hawaiian settlement.

An archaeological survey and Cultural Impact Assessment (CIA) will be conducted prior to preparation of the Draft EIS to evaluate the archaeological and cultural resources, respectively, associated with parcel 2. In addition, consultation with the State Historic Preservation Division (SHPD) and other culturally or historically knowledgeable parties will occur.

10.10 SOCIOECONOMIC CONDITIONS

The major industry sectors for the island of O'ahu include tourism, military and government, and agriculture. In the vicinity of the project, however, industrial activities are the primary focus. The major employers in CIP include refineries, power generation facilities, waste management, and construction-related supply storage and distribution, including nearly 250 businesses that

[15] Federal Emergency Management Agency. September 30, 2004. *Flood Insurance Rate Map, City and County of Honolulu, Map Number 15003C0315F.*

employ approximately 4,000 people. Currently, the state of Hawai'i is experiencing a high unemployment rate of over seven percent.[16]

Over 90 percent of O'ahu's electrical generation is derived from crude oil delivered to the island's two refineries before being processed as fuel oil for use at the island's electrical generating plants. Although there is a uniform and concentrated effort statewide to reduce the State's dependency upon fossil fuels, imported crude oil will be vital to the State's economy for many years to come. Thus, the safe, efficient and dependable delivery of petroleum products is critical to the quality of life for virtually every resident of the State.

10.11 TRAFFIC

The onshore project site is accessed via Hanua Street, a paved two-lane roadway which runs north-south through CIP. The majority of traffic on Hanua Street consists of trucks transporting materials to and from businesses in CIP and employee vehicles. Weekday commuter peak traffic typically occurs in the morning between 6:00 a.m. and 8:00 a.m., and in the afternoon between 3:00 p.m. and 5:00 p.m. Truck delivery traffic to and from businesses in CIP varies throughout the day.

10.12 NOISE

The State DOH sets maximum permissible sound levels and provides for protection, control, and abatement of noise pollution from excessive noise sources (i.e., stationary noise sources and equipment related to agricultural, construction, and industrial activities).[17] As defined in HAR 11-46, noise is any sound that may produce adverse physiological or psychological effects or interfere with individual or group activities, including but limited to communication, work, rest, recreation, or sleep. Noise pollution occurs when the noise emitted from any excessive noise source is in excess of the maximum permissible sound levels. Maximum permissible sound levels are set in decibels on an A-weighted scale (dBA) for excessive noise within different zoning districts. For industrial areas, identified as Class C zoning, the maximum permissible sound level is 70 dBA for day and night at the property line where the activity occurs. Maximum permissible sound levels are not to be exceeded more than ten percent of the time in a 20-minute period without a permit or variance.

The onshore portion of the project is located within CIP and the existing noise environment is typical of an industrial setting. There are currently no sensitive noise receptors, such as residences, schools, or hospitals, in the vicinity.

10.13 PUBLIC SERVICES AND INFRASTRUCTURE

The public services and utilities generally available in the vicinity of the project are described below.

Emergency Response. The Honolulu Police Department (HPD) and Honolulu Fire Department (HFD) serve the entire island of O'ahu, with stations designated to serve smaller districts. The nearest HPD and HFD stations are both located in Kapolei. The nearest medical facility with emergency services is the Hawai'i Medical Center West, located in 'Ewa Beach.

[16] U.S. Department of Labor, Bureau of Labor Statistics. June 19, 2009. *Regional and State Employment and Unemployment: May 2009.*

[17] HAR 11-46. September 23, 1996.

Electrical. Hawaiian Electric Company (HECO) provides electricity to the majority of O'ahu's electrical users. In the vicinity of the project, electricity is distributed via overhead transmission lines along Hanua Street.

Communications. Communications infrastructure consists of telephone, low-speed data, broadband data, fiber optic cable, and television cable lines. These services are provided by private companies, such as Hawaiian Telcom and Oceanic Time Warner Cable. In the vicinity of the project, communications services are transmitted via overhead utility lines along Hanua Street.

Potable Water System. The Board of Water Supply (BWS) is a semi-autonomous City agency which constructs, operates, and maintains the potable and firefighting water systems on O'ahu, including supply wells, reservoirs, pumping stations, and pipelines. The project is located in the region served by the 'Ewa-Waianae-Waipahu water system.

Wastewater System. CIP is not serviced by the City sanitary sewer system, and wastewater is captured by private on-site septic systems.

Solid Waste. All municipal solid waste generated on O'ahu, except hazardous waste and construction and demolition materials, is collected by either the City Department of Environmental Services, Refuse Division or private haulers, and is transported to the H-POWER waste-to-energy facility or the Waimanalo Gulch Landfill, or recycled when possible. Construction and demolition materials and other specific materials are collected and disposed of separately at the privately-owned PVT Landfill located in Nanakuli.

10.14 VISUAL RESOURCES

Visual resources include scenic vistas, scenic overlooks, unique topography, or visual landmarks having scenic value. The City's Development Plan defines public views as "views along streets and highways, mauka-makai view corridors, panoramic and significant landmark views from public places, views of natural features, heritage resources, and other landmarks, and view corridors between significant landmarks."[18]

The onshore portion of the project is located within CIP and due to the fact that the pipelines are either subterranean or elevated just slightly above-grade, they have minimal effect on the developed and industrial appearance of the surroundings.

10.15 RECREATIONAL RESOURCES

The principal recreational resource in the vicinity of the project is the Pacific Ocean. There is public use of the shoreline and waters in the vicinity of the project for a range of recreational uses (e.g., fishing, diving) and other seaside activities.

11 IDENTIFICATION AND SUMMARY OF POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES

Potential impacts upon the following resources will be identified and evaluated in the Draft EIS based on the significance criteria set forth in HAR §11-200-12. If it is determined that the proposed action may have adverse impacts, mitigation measures will be discussed.

[18] City and County of Honolulu. *Revised Ordinances of Honolulu, Chapter 24, Development Plans.*

11.1 STATE LAND USE AND COUNTY ZONING DESIGNATIONS

No impacts associated with land use and zoning are anticipated, as changes to the existing designations are not required for the proposed project. Conformance to State and City plans will be discussed in the Draft EIS.

11.2 CLIMATE AND AIR QUALITY

Construction-related activities are expected to have only temporary impacts on air quality. The impact of the proposed project on climate and air quality will be discussed in the Draft EIS. Significant impacts are not anticipated, as emissions of air pollutants from construction-related activities would be temporary and construction equipment would be operated in compliance with existing State and Federal regulations governing emission controls.

11.3 GEOLOGY, TOPOGRAPHY, AND SOILS

Potential impacts of the proposed project on geology, topography, and soils will be evaluated in the Draft EIS.

11.4 GROUNDWATER RESOURCES

Potential impacts of the proposed project on groundwater resources will be evaluated in the Draft EIS. Significant impacts are not anticipated, as groundwater is not expected to be encountered during construction activities.

11.5 TERRESTRIAL FLORA AND FAUNA

The botanical, mammalian, and avian assessments will evaluate potential impacts to any terrestrial flora and fauna that may be identified at the onshore project site, and the findings of these studies will be presented in the Draft EIS. Significant impacts are not anticipated, as the onshore project site is located in a highly industrialized area and appears largely devoid of vegetation and wildlife.

11.6 SURFACE WATERS

The results of the water quality survey, including any potential impacts of the proposed project on the water quality of the Pacific Ocean in the vicinity, will be presented in the Draft EIS.

11.7 NEARSHORE MARINE ENVIRONMENT

The biological assessment will evaluate potential impacts to any marine biota that may be identified in the nearshore marine environment, and the findings will be presented in the Draft EIS.

11.8 NATURAL HAZARDS

Potential impacts of the proposed project as they relate to natural hazards will be evaluated in the Draft EIS.

11.9 ARCHAEOLOGICAL AND CULTURAL RESOURCES

The Archaeological Inventory Survey (AIS) and CIA studies will evaluate potential impacts to any archaeological sites and cultural resources that may be identified in the vicinity of the project, and the findings of these reports will be presented in the Draft EIS.

11.10 SOCIOECONOMIC CONDITIONS

Potential impacts of the proposed project as they relate to socioeconomic conditions will be evaluated in the Draft EIS.

11.11 ROADWAYS AND TRAFFIC

Potential impacts of the proposed project on roadways and traffic will be discussed in the Draft EIS. Significant impacts are not anticipated, as construction of the proposed project will not occur in roadway rights-of-way and additional trips generated by construction vehicles along access roadways would be temporary.

11.12 NOISE

Potential impacts of the proposed project on noise will be discussed in the Draft EIS. Significant impacts are not anticipated, as construction-related noise generation would be temporary and construction activities would be conducted in compliance with State noise control rules. In addition, as the project is located within the industrial noise environment of CIP, there are no sensitive noise receptors in the vicinity that will be impacted.

11.13 PUBLIC SERVICES AND UTILITIES

Potential impacts of the proposed project on the demand for public services and utilities will be evaluated in the Draft EIS.

11.14 VISUAL RESOURCES

Potential impacts of the proposed project on visual resources will be evaluated in the Draft EIS. Significant impacts are not anticipated, as the proposed project is consistent with the developed and industrial appearance of its surroundings and will not block any scenic views of ocean or mountain resources.

11.15 RECREATIONAL RESOURCES

Potential impacts of the proposed project on recreational resources will be evaluated in the Draft EIS.

12 AGENCIES AND PARTIES TO RECEIVE PREPARATION NOTICE

The following agencies, citizens groups, and individuals will be provided a copy of this preparation notice:

Federal Government

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

State Government

- Office of the Governor
- Department of Health
- Department of Land and Natural Resources
- Office of Environmental Quality Control
- Office of Planning
- Department of Accounting and General Services
- Department of Business, Economic Development and Tourism

City and County of Honolulu

- Office of the Mayor
- Department of Planning and Permitting

Citizen Groups

- Makakilo-Kapolei-Honokai Hale Neighborhood Board #34

Libraries and Depositories

- Hawai‘i State Library
- Department of Business, Economic Development and Tourism (DBEDT) Library
- Legislative Reference Bureau

News Media

- Honolulu Advertiser
- Honolulu Star Bulletin

Elected Officials

- U.S. Senator Daniel Inouye
- U.S. Senator Daniel Akaka
- U.S. Representative Neil Abercrombie
- U.S. Representative Mazie Hirono
- State Senator Colleen Hanabusa, District 21
- State Senator Will Espero, District 20
- State Representative Karen Leinani Awana, District 44
- State Representative Kymberly Marcos Pine, District 43
- State Representative Maile S.L. Shimabukuro, District 45

- Honolulu City Councilmember Todd Apo, District 1

Local Utilities

- Hawaiian Electric Company
- Hawaiian Telcom
- Oceanic Time Warner Cable

13 REFERENCES

City and County of Honolulu. *Revised Ordinances of Honolulu, Chapter 21, Land Use Ordinance.*

City and County of Honolulu. *Revised Ordinances of Honolulu, Chapter 24, Development Plans.*

City and County of Honolulu, Department of Planning and Permitting. *Zoning & Regulatory, State Land Use District, Zoning.* http://gis.hicentral.com/ (accessed February 3, 2009).

Federal Emergency Management Agency. September 30, 2004. *Flood Insurance Rate Map, City and County of Honolulu, Map Number 15003C0315F.*

Mink and Lau. 1990. *Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii Technical Report No. 179.*

State of Hawai'i. September 23, 1996. *Hawaii Administrative Rules, Department of Health, Chapter 46 Community Noise Control.*

State of Hawai'i. November 12, 1992. *Hawaii Administrative Rules, Title 11, Department of Health, Chapter 23 Vector Control.*

State of Hawai'i, Department of Business, Economic Development and Tourism. August 2008. *The State Of Hawaii Data Book 2007.*

State of Hawai'i, Department of Health. October 1987. *Water Quality Standards Map of the Island of Oahu.*

State of Hawai'i, Department of Health. 1983. *Underground Injection Control Map, Ewa Quadrangle.*

State of Hawai'i, Department of Health, Clean Air Branch, November 2008. *2008 Annual Report on Air Emissions from Facilities at Campbell Industrial Park.*

U.S. Department of Agriculture, Soil Conservation Service. 1972. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

U.S. Department of Labor, Bureau of Labor Statistics. June 19, 2009. *Regional and State Employment and Unemployment: May 2009.*

U.S. Environmental Protection Agency. *1990 Amendments to the Clean Air Act.* 42 USC §7409, 40 CFR §50.2.

U.S. Geological Survey. 1998. Topographic maps. "Ewa Quadrangle."