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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

FEB 09 2016

Mr. Scott Glenn, Interim Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

Dear Mr. Glenn:

RECEIVED
16 FEB 24 P1:34
OFF. OF ENVIRONMENTAL
QUALITY CONTROL

**Draft Environmental Assessment
Proposed Division of Forestry and Wildlife Baseyard at Pulehunui
Maui, Hawaii
Tax Map Key: (2) 3-8-008:001 (por.)**

With this letter, the State of Hawai'i, Department of Land and Natural Resources hereby transmits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the Proposed Division of Forestry and Wildlife Baseyard at Pulehunui (preferred alternative), situated at TMK (2)3-8-008:001(por.), and the renovation of the Kahului Baseyard, situated at TMK (2)3-8-079:018 (por.) and (2)3-8-001:019 (por.) (secondary alternative), in the Wailuku District on the island of Maui for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two (2) copies of the DEA-AFONSI, an Adobe Acrobat 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 Mr. Carty Chang, Chief Engineer of our Engineering Division, at 587-0230.

Sincerely,

SUZANNE D. CASE
Chairperson

Enclosures

c: Tessa Munekiyo Ng, AICP, Munekiyo & Hiraga Inc.

MAR 08 2016

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AGENCY
PUBLICATION FORM

| | |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Name: | Proposed Division of Forestry and Wildlife Baseyard at Pulehunui |
| Project Short Name: | DLNR- DOFAW Baseyard at Pulehunui |
| HRS §343-5 Trigger(s): | Use of State Lands and Funds |
| Island(s): | Maui |
| Judicial District(s): | Wailuku |
| TMK(s): | (2)3-8-008:001(por.) |
| Permit(s)/Approval(s): | State Land Use Commission Special Use Permit, County Conditional Permit, Building Permits, Construction Permits (Grading, Electrical, Plumbing) |
| Proposing/Determining Agency: | State of Hawaii, Department of Land and Natural Resources |
| <i>Contact Name, Email, Telephone, Address</i> | 1151 Punchbowl Street, Room 221 Honolulu, Hawaii 96813 Contact: Gayson Ching, Project Engineer (808) 587-0232 or via Email: gayson.y.ching@hawaii.gov |
| Accepting Authority: | (for EIS submittals only) |
| <i>Contact Name, Email, Telephone, Address</i> | |
| Consultant: | Munekiyo Hiraga |
| <i>Contact Name, Email, Telephone, Address</i> | 305 High Street, Suite 104 Wailuku, Hawaii 96793 Contact: Tessa Munekiyo Ng, AICP (808) 983-1233 or via Email: planning@munekiyohiraga.com |

Status (select one) DEA-AFNSI**Submittal Requirements**

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.

 FEA-FONSI

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.

 FEA-EISPN

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.

 Act 172-12 EISPN
("Direct to EIS")

Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.

 DEIS

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.

 FEIS

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.

 FEIS Acceptance
Determination

The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the

FEIS; no comment period ensues upon publication in the Notice.

FEIS Statutory
Acceptance

Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.

___ Supplemental EIS
Determination

The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.

___ Withdrawal

Identify the specific document(s) to withdraw and explain in the project summary section.

___ Other

Contact the OEQC if your action is not one of the above items.

Project Summary

Provide a description of the proposed action and purpose and need in 200 words or less.

The State of Hawaii, Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) currently operates at an existing baseyard on 3.0 acres located on Kuleana Street in Kahului. DLNR is proposing the development of a new baseyard on 20.3 acres of a State owned parcel at Pulehunui, identified as TMK No. (2)3-8-008:001.

At full buildout, the Pulehunui Baseyard will include offices, warehouse, lab, parking and equipment storage, nursery, dryland forest restoration, training field, helicopter landing zone, and other ancillary uses. Buildings will not exceed one-story in height. The main vehicular access will be off of the existing Kama'aina Road with a secondary access off S. Firebreak Road.

While the proposed Pulehunui Baseyard is DLNR's preferred alternative for this project, renovation of the existing Kahului Baseyard may be considered if funding is not available to develop the Pulehunui Baseyard. Therefore, renovation of the Kahului Baseyard is also assessed in this Draft EA as a secondary alternative. The renovation would include upgrading the existing warehouse, employee support facilities, plant nursery, and covered parking, relocation of the existing auto repair shop, and development of additional parking and a new multi-story office building. The Kahului Baseyard renovation project would involve lands designated as TMK (2)3-8-079:018 and (2)3-8-001:019.

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16 FEB 24 P1:38
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QUALITY CONTROL

Draft Environmental Assessment

PROPOSED DIVISION OF FORESTRY AND WILDLIFE BASEYARD AT PULEHUNUI, MAUI, HAWAI'I

Prepared for:

**State of Hawai'i,
Department of Land and Natural Resources
Division of Forestry and Wildlife**

February 2016

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by Munekiyo Hiraga



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List of Acronyms

| | |
|----------|-----------------------------------------------------------------|
| AFONSI | Anticipated Finding of No Significant Impact |
| AAR | Archaeological Assessment Report |
| ALISH | Agricultural Lands of Importance to the State of Hawai‘i |
| AMSL | Above Mean Sea Level |
| BMP | Best Management Practice |
| CAA | Civil Aeronautics Administration |
| CIZ | Change in Zoning |
| CMWTL | Central Maui Water Transmission Line |
| CP | Conditional Permit |
| CPA | Community Plan Amendment |
| CWA | Clean Water Act |
| CZM | Coastal Zone Management |
| DA | U.S. Department of the Army |
| DAGS | Department of Accounting and General Services |
| DEM | Department of Environmental Management |
| DHHL | Department of Hawaiian Home Lands |
| DLIR | Department of Labor and Industrial Relations |
| DLNR | Department of Land and Natural Resources |
| DLNR-ENG | Department of Land and Natural Resources – Engineering Division |
| DOE | Department of Education |
| DOFAW | Division of Forestry and Wildlife |
| DOH | Department of Health |
| DOT | Department of Transportation |
| DPS | Department of Public Safety |
| DWS | Department of Water Supply |
| EA | Environmental Assessment |
| EaA | Ewa Silty Clay Loam, 0-3 Percent Slope |
| EcA | Ewa Cobbly Silty Clay Loam, 0-3 Percent Slope |
| EcB | Ewa Silty Clay Loam, 3-7 Percent Slope |
| EIS | Environmental Impact Statement |
| EPO | Environmental Planning Office |
| FAA | Federal Aviation Administration |
| FIRM | Flood Insurance Rate Map |
| GPD | Gallons per Day |
| GPM | Gallons per Minute |
| HAC | Hawai‘i Aeronautics Commission |

| | |
|-------|-------------------------------------------------|
| HAR | Hawai‘i Administrative Rules |
| HC&S | Hawai‘i Commercial & Sugar Company |
| HCZMP | Hawai‘i Coastal Zone Management Program |
| HRS | Hawai‘i Revised Statutes |
| IAL | Important Agricultural Land |
| ISWMP | Integrated Solid Waste Management Plan |
| IWS | Individual Wastewater System |
| KHS | Kihei High School |
| KWDP | Kihei Water Development Project |
| LOS | Level of Service |
| LSB | Land Study Bureau |
| LUC | State Land Use Commission |
| m | Meter |
| MECO | Maui Electric Company, Ltd |
| MIP | Maui Island Plan |
| MPD | Maui Police Department |
| NAS | Naval Air Station |
| NPDES | National Pollutant Discharge Elimination System |
| OHA | Office of Hawaiian Affairs |
| OP | Office of Planning |
| RGB | Rural Growth Boundary |
| SCS | Scientific Consultant Services, Inc. |
| SHPD | State Historic Preservation Division |
| SMA | Special Management Area |
| SUP | State Special Use Permit |
| TIAR | Traffic Impact Assessment Report |
| TMK | Tax Map Key |
| UGB | Urban Growth Boundary |
| WQC | Water Quality Certification |

Executive Summary

| | |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Name: | Division of Forestry and Wildlife Baseyard at Pulehunui |
| Type of Document: | Draft Environmental Assessment |
| Legal Authority: | Chapter 343, Hawai'i Revised Statutes |
| Anticipated Determination: | Anticipated Finding of No Significant Impact (AFONSI) |
| Applicable Environmental Assessment review "Trigger": | Use of State Lands and Funds |
| Location: | TMK: (2) 3-8-008:001 (por.) Wailuku District Pulehunui, Waikapū, Maui, Hawai'i |
| Applicant: | State of Hawai'i Department of Land and Natural Resources Division of Forestry and Wildlife 1151 Punchbowl Street, Room 325 Honolulu, Hawai'i 96813 Contact: Scott Fretz Phone: (808) 984-8107 |
| Proposing and Determining Agency: | State of Hawai'i Department of Land and Natural Resources 1151 Punchbowl Street Honolulu, Hawai'i 96813 Contact: Suzanne Case, Chairperson Phone: (808) 587-0400 |
| Consultant: | Munekiyo Hiraga 305 High Street, Suite 104 Wailuku, Hawai'i 96793 Contact: Tessa Munekiyo Ng, AICP Phone: (808) 983-1233 |
| Project Summary: | The State of Hawai'i, Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife |

(DOFAW) currently operates at an existing baseyard on three (3) acres located on Kuleana Street in Kahului. DLNR is proposing the development of a new baseyard on 20.3 acres of a State owned parcel at Pulehunui, identified as TMK No. (2)3-8-008:001.

At full buildout, the Pulehunui Baseyard will include offices, warehouse, lab, parking and equipment storage, nursery, dryland forest restoration, training field, helicopter landing zone, and other ancillary uses. Buildings will not exceed one story in height. The main vehicular access will be off of the existing Kama'aina Road with a secondary access off South Firebreak Road.

While the proposed Pulehunui Baseyard is DLNR's preferred alternative for this project, renovation of the existing Kahului Baseyard may be considered if funding is not available to develop the Pulehunui Baseyard. Therefore, renovation of the Kahului Baseyard is assessed in this Draft EA as a secondary alternative. The renovation would include upgrading the existing warehouse, employee support facilities, plant nursery, and covered parking, relocation of the existing auto repair shop, and development of additional parking and a new multi-story office building.

The proposed Pulehunui Baseyard project site is currently designated "Agricultural" by the State Land Use Commission, "Agriculture" by the Kīhei-Makena Community Plan, and "Agricultural" by Maui County Zoning. As such, the proposed project will require a State Land Use Special Use Permit (SUP) and County Conditional Permit (CP).

The need for the preparation of a Chapter 343, Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) is triggered by the use of State lands and funds. The EA will serve as the supporting document for the SUP and CP processes for the proposed project. This EA has been prepared to document the proposed project's technical characteristics, environmental impacts, mitigation measures, and alternatives. The DLNR will serve as the proposing and determination agency for the EA.

The Pulehunui Baseyard is located within a larger 285-acre master plan that the DLNR, Land Division is planning. The Pulehunui Master Plan will provide for small, medium, and large industrial and commercial lots for businesses, government agencies, and nonprofit organizations. The entire Pulehunui Master Plan is a longer-term planning effort. It is noted that a separate EA or Environmental Impact Statement (EIS) would be prepared for the entire Pulehunui Master Plan at a later date. DLNR-ENG is seeking to proceed with the new Pulehunui Baseyard ahead of the larger master plan, as the need for DOFAW facilities improvements are immediate.

I. PROJECT OVERVIEW

I. PROJECT OVERVIEW

A. PROJECT LOCATION, EXISTING USE, AND LAND OWNERSHIP

The State of Hawai‘i, Department of Land and Natural Resources-Engineering (DLNR-ENG) is proposing the development of a new baseyard for the DLNR-Division of Forestry and Wildlife (DOFAW) on State-owned land at Pulehunui (Pulehunui Baseyard). The proposed Pulehunui Baseyard is located on the east side of Mokulele Highway approximately half way between Kahului and Kīhei in the vicinity of the former Pu‘unēnē Airport, Maui, Hawai‘i. See **Figure 1**. The proposed project site covers an area of approximately 20.3 acres of a larger 398.1-acre parcel, identified by TMK (2) 3-8-008:001 (Parcel 001). See **Figure 2**. The project site is bounded by agricultural lands to the west and Kama‘aina Road to the north and South Firebreak Road to the east. The Hawai‘i Army National Guard Armory is located beyond to the southwest. Further to the southwest are lands that have been transferred by Executive Order to the County of Maui. These lands include the former Pu‘unēnē Airport runway which currently contains recreational uses such as the Maui Motor Sports Park. Parcel 001 is owned by DLNR and a portion is currently leased to Hawaiian Commercial & Sugar Company (HC&S) on a month-to-month basis for sugar cane cultivation.

B. BACKGROUND AND PROPOSED ACTION

DOFAW’s mission is to manage and protect watersheds, native ecosystems and cultural resources, and provide outdoor recreation and sustainable forest product opportunities while facilitating partnerships, community involvement, and education.

DOFAW currently operates from an existing baseyard located on Kuleana Street in Kahului (Kahului Baseyard). Refer to **Figure 1**. While the proposed Pulehunui Baseyard site is the preferred alternative, DOFAW’s assessment and planning for existing and future needs for baseyard expansion and improvements include the potential renovation and expansion of its existing baseyard facility in Kahului (Kahului Baseyard). The existing Kahului Baseyard is approximately 3.0 acres with about 30 percent of the site located within the tsunami evacuation zone. These site characteristics place limitations on the potential for future expansion and additional improvements on the Kahului Baseyard site. While the proposed Pulehunui Baseyard is the preferred alternative, the potential renovation to and expansion of the Kahului Baseyard is assessed in this Environmental Assessment (EA) as a secondary alternative in the event that the Pulehunui Baseyard is not developed. The Kahului Baseyard alternative is addressed in greater detail in Chapter IV, Alternatives to the Proposed Action.

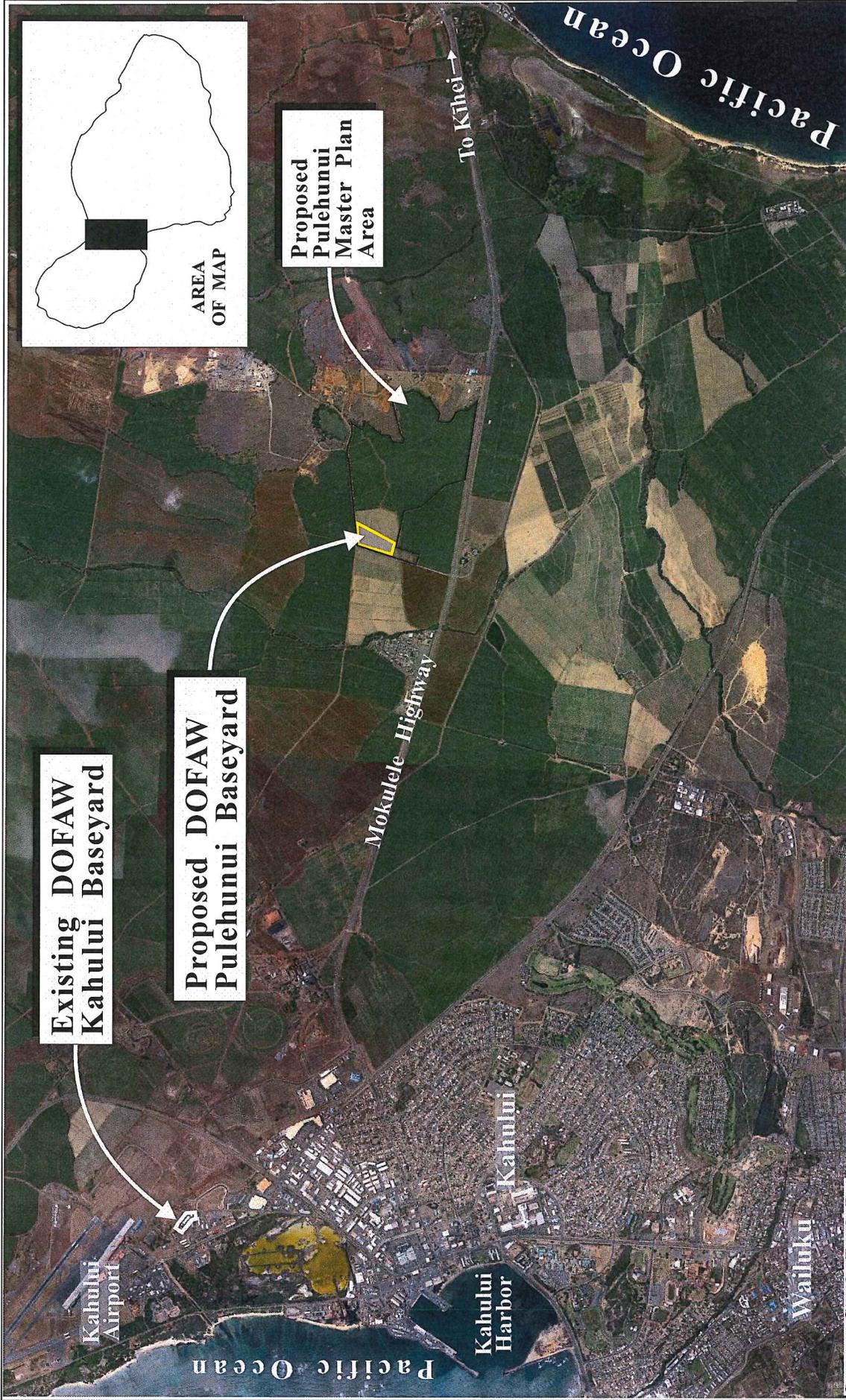


Figure 1 Proposed DOFAW Baseyard at Pulehunui
Regional Location Map

NOT TO SCALE



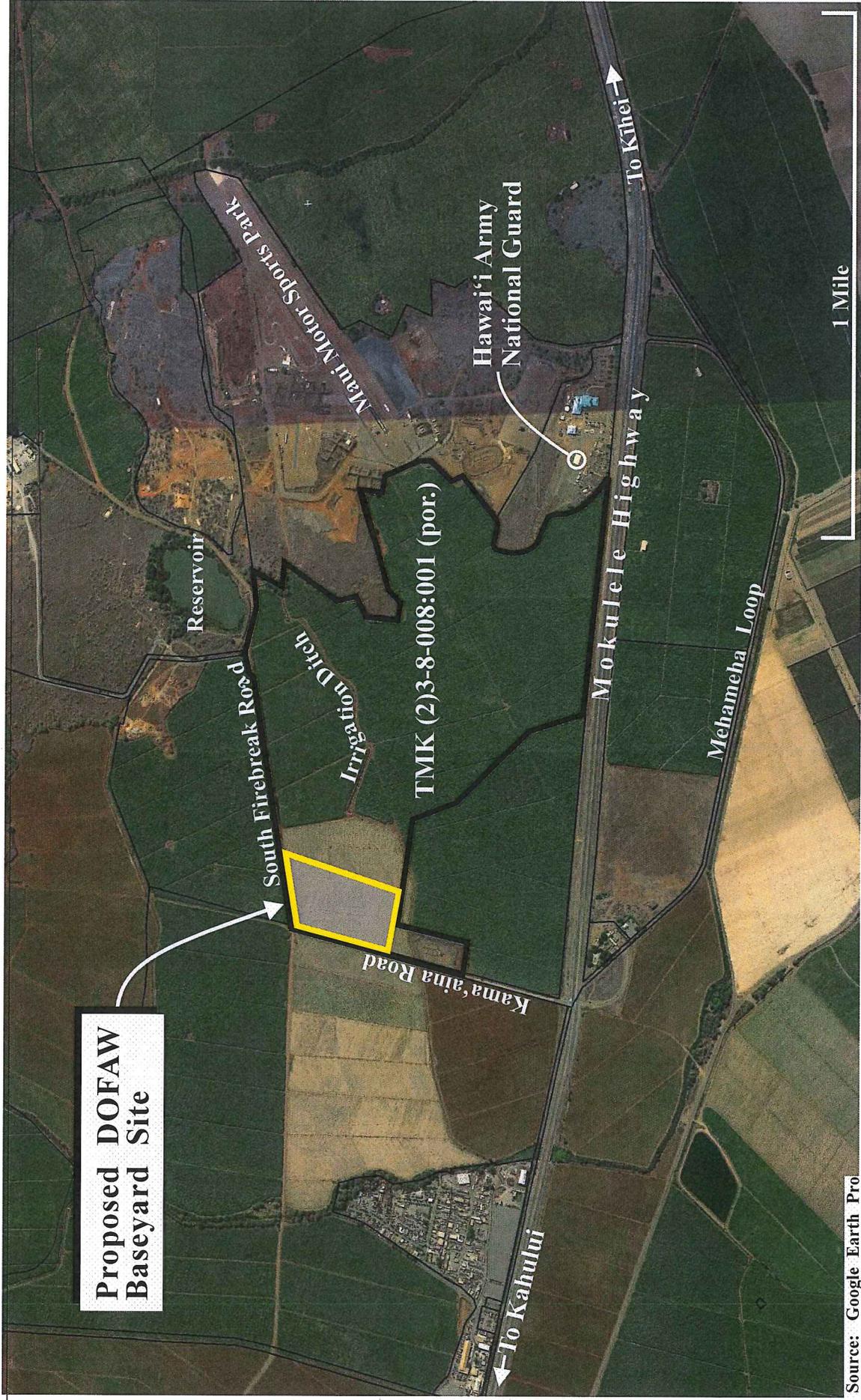


Figure 2 Proposed DOFAW Baseyard at Pulehunui
Property Location Map



Prepared for: State of Hawaii'i, Department of Land and Natural Resources



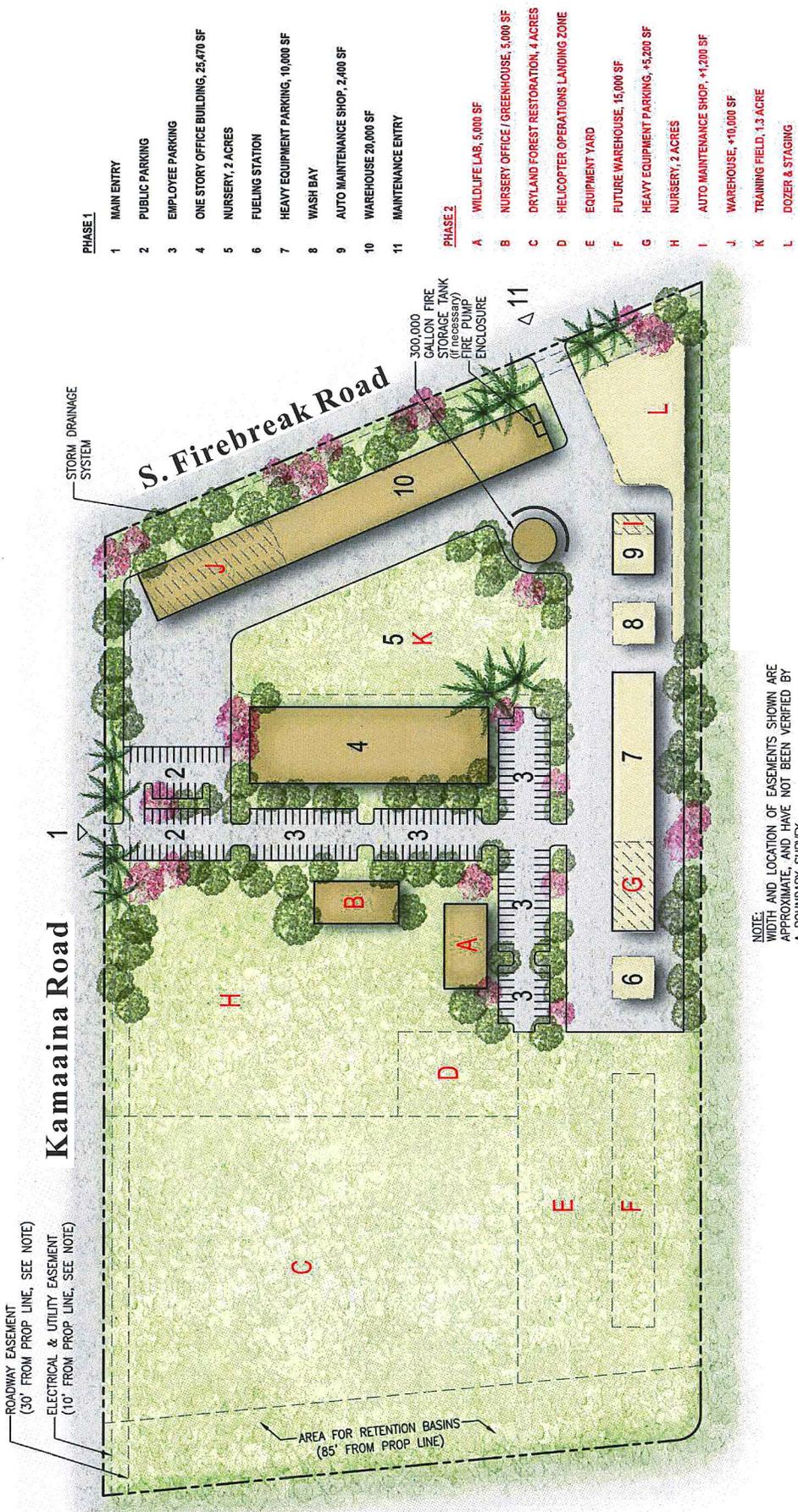
The proposed Pulehunui Baseyard, at full build-out, will consist of the following uses:

- One-story office building with meeting space, a fitness room, shower, locker room, and office space (25,470 square feet total)
- Wildlife lab (5,000 square feet)
- Warehouse (45,000 square feet)
- Nursery (2 acres)
- Nursery office/greenhouse (5,000 square feet)
- Dryland Forest Restoration (4 acres)
- Heavy Equipment Parking Area (5,200 square feet)
- Helicopter Operations Landing Zone
- Equipment Yard
- Auto Maintenance Shop (3,600 square feet)
- Fueling Station
- Wash Bay
- Training Field (1.3 acres)
- Dozer and Staging Area
- Public and Employee Parking

See **Figure 3**, **Figure 4**, and **Appendix “A”**.

The proposed project will occur in two (2) phases, Phase 1 would include the one-story 25,470 square feet office building, 20,000 square feet of warehouse space, a 2-acre nursery, heavy equipment parking, a 3,600 square feet auto maintenance shop, and other related uses. The remaining components of the baseyard would be developed as part of Phase 2. It is noted that the 2-acre nursery in Phase 1 will be converted to a training field and a new 2-acre nursery will be developed as part of Phase 2. Refer to **Figure 3**. Phase 1 and Phase 2 are planned for completion around 2020 and 2025, respectively, subject to the availability of funding.

The proposed Pulehunui Baseyard will feature buildings not exceeding one-story in height, in keeping with the buildings and structures in nearby locations. Refer to **Figure 4**. The project site, located near the western boundary of Pulehunui, is characterized by a number of land and topographic features which have inspired the design concept and architecture.



PHASE 1

- 1 MAIN ENTRY
- 2 PUBLIC PARKING
- 3 EMPLOYEE PARKING
- 4 ONE STORY OFFICE BUILDING, 25,470 SF
- 5 NURSERY, 2 ACRES
- 6 FUELING STATION
- 7 HEAVY EQUIPMENT PARKING, 10,000 SF
- 8 WASH BAY
- 9 AUTO MAINTENANCE SHOP, 2,400 SF
- 10 WAREHOUSE 20,000 SF
- 11 MAINTENANCE ENTRY

PHASE 2

- A WILDLIFE LAB, 5,000 SF
- B NURSERY OFFICE / GREENHOUSE, 5,000 SF
- C DRYLAND FOREST RESTORATION, 4 ACRES
- D HELICOPTER OPERATIONS LANDING ZONE
- E EQUIPMENT YARD
- F FUTURE WAREHOUSE, 15,000 SF
- G HEAVY EQUIPMENT PARKING, +5,200 SF
- H NURSERY, 2 ACRES
- I AUTO MAINTENANCE SHOP, +1,200 SF
- J WAREHOUSE, +10,000 SF
- K TRAINING FIELD, 1.3 ACRE
- L DOZER & STAGING

NOTE: WIDTH AND LOCATION OF EASEMENTS SHOWN ARE APPROXIMATE, AND HAVE NOT BEEN VERIFIED BY A BOUNDARY SURVEY

Source: Bowers + Kubota

Figure 3 Proposed DOFAW Baseyard at Pulehunui
 Site Plan-Phase I and Phase II



NOT TO SCALE



Prepared for: State of Hawai'i, Department of Land and Natural Resources



North Elevation



South Elevation



West Elevation

Source: Bowers + Kubota

Figure 4

**Proposed DOFAW Baseyard at Pulehunui
Building Elevations**

NOT TO SCALE

The land feature which the ancient Hawaiians used to locate the western boundary of Pulehunui was referred to as Kaopala, or place “where the water ran down and stood still”. The project site is located near the valley where Maui’s two (2) main mountain peaks converge; where the water from Haleakalā and Pu‘u Kukui meet before running to the ocean. The north-south axis of Kaopala is reflected in the architecture with glass curtain walls located on the northern and southern elevations, creating a visual portal that respects the flow of water and wind through this point of convergence.

Views to the east and west of the project site, are dominated by the mountain peaks of Pu‘u Kukui to the east, and Haleakalā to the west. Smaller window openings on the east and west facades allow views of the mountains while providing some sun protection from the rising and setting sun. Refer to **Figure 4**. Locating building entrances on the east and west facade guide the flow of foot traffic to mimic the flow of water as it travels along east-west axis from the mountains to the ocean, and reflects the axis created between the two (2) mountain peaks that dominate Maui’s landscape.

Vehicular access will be via a main entry off of the existing Kama‘aina Road and a secondary entry off the existing South Firebreak Road, both via Mokulele Highway.

The proposed Pulehunui Baseyard is located within a larger 285-acre master plan area that the DLNR, Land Division is planning. Refer to **Figure 1**. The Pulehunui Master Plan will provide for small, medium, and large industrial, and commercial lots for businesses, government agencies, and nonprofit organizations. While the entire Pulehunui Master Plan is a longer-term planning effort, DLNR-ENG is seeking to proceed with the new Pulehunui Baseyard ahead of the larger master plan, as the need for the DOFAW facilities improvements are immediate. It is noted that a separate EA or Environmental Impact Statement (EIS) would be prepared for the entire Pulehunui Master Plan at a later date.

C. LAND USE ENTITLEMENTS

The proposed Pulehunui Baseyard project site is currently designated “Agricultural” by the State Land Use Commission, “Agriculture” by the Kīhei-Makena Community Plan, and “Agricultural” by Maui County Zoning. The proposed project will require a State Land Use Commission Special Use Permit (SUP) and County Conditional Permit (CP). The EA will serve as the supporting document for the permitting processes for the proposed project.

D. CHAPTER 343, HAWAI‘I REVISED STATUTES REQUIREMENT

The proposed project will utilize State lands and funds, which are triggers for the preparation of an EA, pursuant to Chapter 343, Hawai‘i Revised Statutes (HRS). The DLNR will serve as the proposing and determination agency for the EA. As noted above, the EA will serve as the supporting document for the permitting processes for the project (i.e., SUP, CP).

It is noted that a helicopter operations landing zone is proposed at the Pulehunui Baseyard. Construction or expansion of helicopter facilities that may affect State Conservation District lands, shoreline areas, or historic sites designated in the National Register or Hawai‘i Register is also a trigger for preparation of an EA. Inasmuch as the proposed Pulehunui helicopter landing zone will not affect Conservation District lands, shoreline areas, or designated historic sites, this specific trigger does not apply to the proposed project.

This EA has been prepared pursuant to Chapter 343, HRS to enable DLNR to move forward with the development of the preferred DOFAW Pulehunui Baseyard alternative. The EA documents and evaluates the potential impacts of the proposed development, describes proposed mitigation measures, discloses cumulative and secondary impacts, and discusses alternatives to the proposed action (e.g. Kahului Baseyard).

As noted previously, a separate EA or EIS will be prepared for DLNR’s larger 285-acre Pulehunui Master Plan.

E. PROJECT COST AND TIME SCHEDULE

Construction of both phases of the proposed baseyard project is estimated at \$41.2 million. Phase 1 is planned for completion around 2020 while Phase 2 would follow around 2025. Project completion dates are subject to availability of funding.

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

A. PHYSICAL SETTING

1. Surrounding Land Uses

a. Existing Conditions

The project site is located approximately midway between Kahului and Kīhei, and situated on the eastern side of Maui's isthmus, approximately three (3) miles northeast of Mā'alaea Bay. The project site consists of approximately 20.3 acres on a larger State-owned parcel of 398.1 acres and is north of the abandoned landing strip of the previous air naval station used through World War II. The Department of Forestry and Wildlife (DOFAW) Pulehunui Baseyard site is located north of the Hawai'i Army National Guard Armory and east of Mokulele Highway. Proximate to the proposed DOFAW Pulehunui Baseyard site are State lands under the control of the Department of Land and Natural Resources (DLNR) and the Hawai'i Army National Guard Armory. Further south, approximately 220 acres were transferred from the State of Hawai'i to the County of Maui through an Executive Order. This land is currently used for recreational purposes such as the Maui Motor Sports Park (183 acres) and currently includes the Department of Public Safety (DPS) site (40 acres) for the proposed Maui Region Public Safety complex. Other lands in the area are owned by various private landowners. DLNR currently leases the lands to the south, east, and north of the project site to the Hawaiian Commercial & Sugar Company (HC&S) for sugar cane cultivation on a month-to-month basis. Lands to the west of Mokulele Highway are owned by State of Hawai'i Department of Hawaiian Home Lands (DHHL).

The project site is located east of Mokulele Highway and is accessed via Kama'aina Road which intersects Mokulele Highway. The project area is bounded on the east by the South Firebreak Road and to the south and west by sugar cane fields. Refer to **Figure 2**.

b. **Potential Impacts and Proposed Mitigation Measures**

The surrounding area is in transition from agricultural use to other uses, such as the Maui Humane Society animal shelter, Hawai'i Army National Guard Armory, and Maui Motor Sports Park. From a future land use perspective, portions of the surrounding lands as well as the project site are within the Urban Growth Boundary (UGB) of the Maui Island Plan (MIP). Development of the proposed project area will further transition the region to urban type uses (e.g., government, industrial, recreation), as envisioned by the MIP.

Portions of the project site such as the nursery (2 acres) and dry land forest restoration area (4 acres) will retain the agricultural character of the surrounding area. In addition, the proposed Pulehunui Baseyard Project includes mitigation measures, such as landscape buffers, open space areas, low rise buildings, and development standards, to reduce the visual impact on the surrounding land uses.

2. **Climate**

a. **Existing Conditions**

Like most areas of Hawai'i, Maui's climate is relatively uniform year-round. Maui is characterized by a semi-tropical climate containing a multitude of individual microclimates. Pulehunui (also referred to as Pu'unēnē) experiences mild and uniform temperatures, moderate humidity, and a relatively consistent trade wind. Temperatures (based on readings taken at Kahului Airport) range from an average daily low of 67.3 degrees Fahrenheit to an average daily high of 83.8 degrees. The warmest month is August while February is the coolest month. A high proportion of the rainfall that Maui receives each year falls on the northeast facing shores, leaving the central isthmus and southern coastal areas relatively dry. The annual average rainfall in the vicinity of the project site (based on readings taken at Kahului Airport) amounts to approximately 18.23 inches. In the Kahului region, January is historically the wettest month, while June is the driest. On average, there are 95 days per year with more than 0.22 inch of rain in Kahului (County of Maui, Office of Economic Development, 2013).

b. **Potential Impacts and Proposed Mitigation Measures**

From an environmental standpoint, replacement of vegetative surfaces with hardscapes associated with roadways, paved parking areas, and buildings may yield a tendency towards slightly increasing ambient air temperatures. To address this so-called “heat island” effect, proposed landscaping and landscaped buffers will be integrated into the proposed project. The landscape design and planting plan will provide shading to reduce the “heat island” effect. In addition, the proposed baseyard project will not entirely be developed with hardscapes. The project includes a nursery, a dryland forest restoration area, and a training field. As such, the proposed project is not anticipated to have an adverse effect on climate.

3. **Topography and Soil Characteristics**

a. **Existing Conditions**

The project site is located on the eastern side of Maui’s isthmus approximately three (3) miles northeast of Mā‘alaea Bay and between 123 and 143 feet above mean sea level (amsl). The project site slopes in a westerly direction. The project site has been heavily disturbed from decades of sugar cane cultivation.

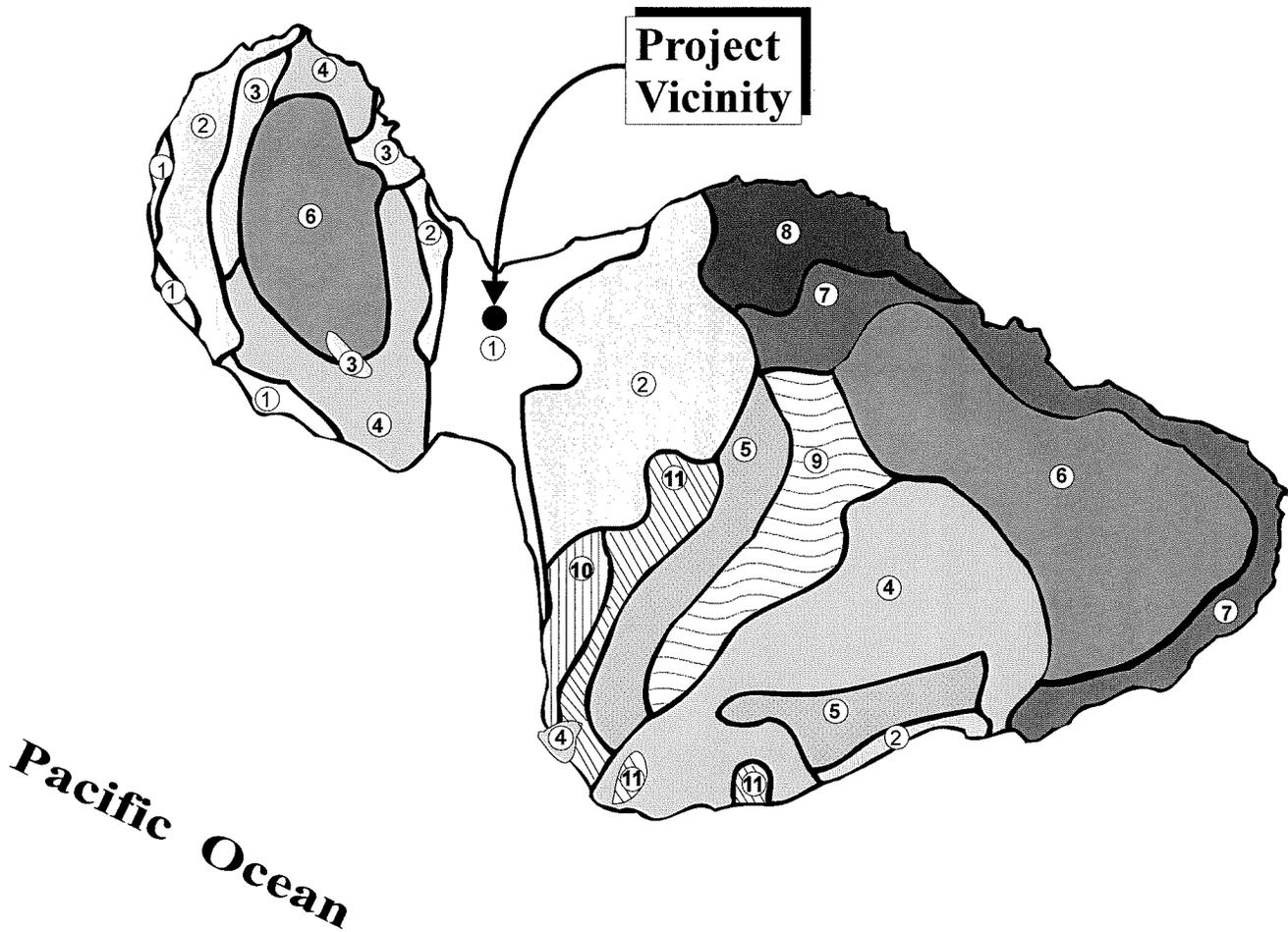
Underlying the project site and surrounding lands are soils belonging to the Pulehu-Ewa-Jaucas association. See **Figure 5**. According to the Soil Survey of the Islands of Kaua‘i, O‘ahu, Maui, Moloka‘i, and Lāna‘i, State of Hawai‘i, the soils of this association are characterized as deep and well drained, nearly level to moderate slope and located on alluvial fans and in basins (Foote et al, 1972).

The soils underlying the project site are in the Ewa series which is characterized by well drained soils in basins, and on alluvial fans. Soils are nearly level to moderately sloping with elevations ranging from near sea level to 150 feet. The project area is located on soils classified as Ewa silty clay loam (EaA), Ewa cobbly silty clay loam (EcA) and Ewa silty clay loam (EcB). See **Figure 6**.

EaA soil occurs on alluvial fans and terraces, the surface layer is dark reddish-brown silty clay loam with 0 to three (3) percent slopes. Runoff is very slow and the erosion hazard is no more than slight.

LEGEND

- | | |
|------------------------------------------------|-------------------------------------|
| ① Pulehu-Ewa-Jaucas association | ⑦ Hana-Makaalae-Kailua association |
| ② Waiakoa-Keahua-Molokai association | ⑧ Pauwela-Haiku association |
| ③ Honolua-Olelo association | ⑨ Laumaia-Kaipoi-Olinda association |
| ④ Rock land-Rough mountainous land association | ⑩ Keawakapu-Makena association |
| ⑤ Puu Pa-Kula-Pane association | ⑪ Kamaole-Oanapuka association |
| ⑥ Hydrandepts-Tropaquods association | |

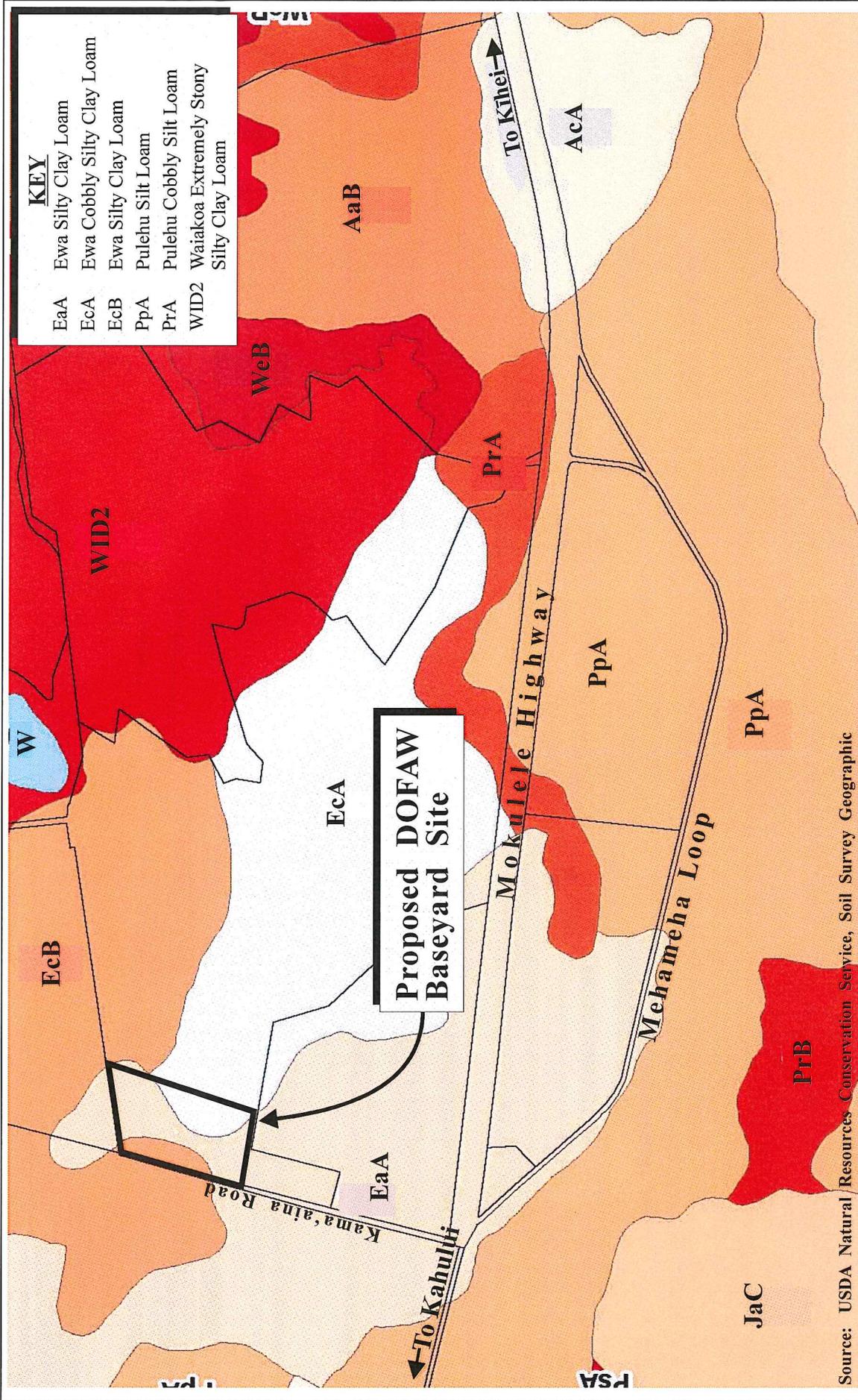


Map Source: USDA Soil Conservation Service

**Figure 5 Proposed DOFAW Baseyard at Pulehunui
Soil Association Map**

NOT TO SCALE





Source: USDA Natural Resources Conservation Service, Soil Survey Geographic

Figure 6 Proposed DOFAW Baseyard at Pulehunui
Soil Classification Map



NOT TO SCALE

EcA soil is characterized by 0 to three (3) percent slopes, and cobbly on the surface. Runoff is very slow and the erosion hazard is no more than slight.

EcB soil is characterized by three (3) to seven (7) percent slopes, and is cobbly on the surface with a few small stoney areas.

b. Potential Impacts and Proposed Mitigation Measures

The project site is relatively flat and level and will require minimal site work to develop. Appropriate Best Management Practices (BMPs) will be implemented during construction to mitigate any impacts from soil erosion resulting from wind and water (e.g. dust fence, watering for dust control).

As such, the proposed project is not anticipated to have any adverse impacts upon existing terrestrial conditions.

4. Agricultural Productivity Considerations

a. Existing Conditions

On the Island of Maui approximately 235,770 acres have been designated as “Agricultural” by the State Land Use Commission (LUC), representing just over 50 percent of the island.

In 1977, the State Department of Agriculture developed a classification system to identify Agricultural Lands of Importance to the State of Hawai‘i (ALISH). The classification system is based primarily, though not exclusively, upon the soil characteristics of the lands. The three (3) classes of ALISH lands are: “Prime”, “Unique”, and “Other Important” agricultural land, with all remaining lands termed “Unclassified”.

When utilized with modern farming methods, “Prime” agricultural lands have a soil quality, growing season, and moisture supply necessary to produce sustained crop yields economically. “Unique” agricultural lands possess a combination of soil quality, growing season, and moisture supply to produce sustained high yields of a specific crop. “Other Important” agricultural lands include those that have not been rated as “Prime” or “Unique” but are of state-wide or local importance for agricultural use.

Approximately 62,000 acres, or 26 percent, of Maui's 235,770 acres of State LUC designated "Agricultural" lands are characterized as "Prime" lands by the ALISH system. The proposed Pulehunui Baseyard project site is designated as "Prime" agricultural lands although the project's 20.3 acres represents a small percentage of State "Agricultural" lands on the island of Maui. See **Figure 7**.

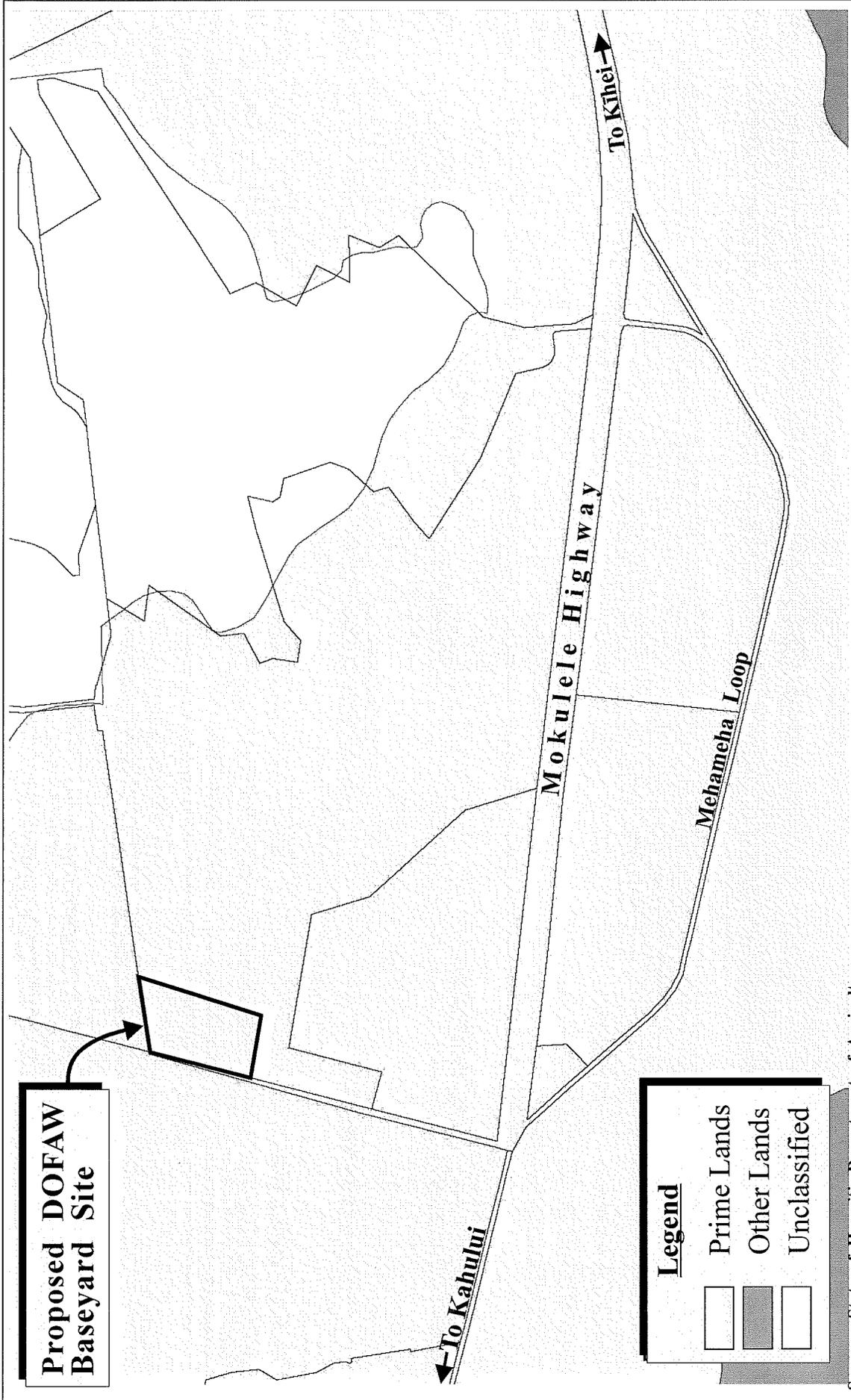
The University of Hawai'i, Land Study Bureau (LSB) developed the Overall Productivity Rating, which classified soils according to five (5) levels, with "A" representing the class of highest productivity soils and "E" representing the lowest. These letters are followed by numbers which further classify the soil types by conveying such information as texture, drainage, and stoniness. The ratings are based on soil properties, topography, climate, and other factors.

On the island of Maui, "A" and "B" designated lands comprise approximately 21 percent of the island's State Land Use "Agricultural" lands. The lands underlying the proposed project site is rated "E", the lowest productivity level, by the LSB. Lands to the north, east, and west are rated "A", while lands to the south are rated "E". See **Figure 8**.

The project site has been in sugar cultivation in the past; the last crop on the project site was harvested in 2014. Lands to the south and east of the project site are currently leased by DLNR to the Hawaiian Commercial and Sugar Company (HC&S) on a month-to-month basis for sugar cane cultivation. HC&S also cultivates sugar cane on lands to the north of the project site on lands owned by Alexander and Baldwin, Inc. (A&B). However, in January 2016, HC&S announced that it would be ending its sugar cane operations on Maui by the end of 2016.

b. Potential Impacts and Proposed Mitigation Measures

The proposed Pulehunui Baseyard project will repurpose 20.3 acres of agricultural lands. This change in use represents a very small portion of the State Land Use designated "Agricultural" lands on Maui. It is noted that the project site is not designated as Important Agricultural Lands pursuant to Chapter 205-42, Hawai'i Revised Statutes. Approximately six (6) acres on the 20.3-acre project site will be used to support agricultural and forestry uses (nursery and dry land forest restoration area). The proposed project area used for non-agricultural and non-forestry use



Source: State of Hawai'i, Department of Agriculture

Figure 7 Proposed DOFAW Baseyard at Pulehunui
Agricultural Lands of Importance to the State of Hawai'i



Prepared for: State of Hawai'i, Department of Land and Natural Resources

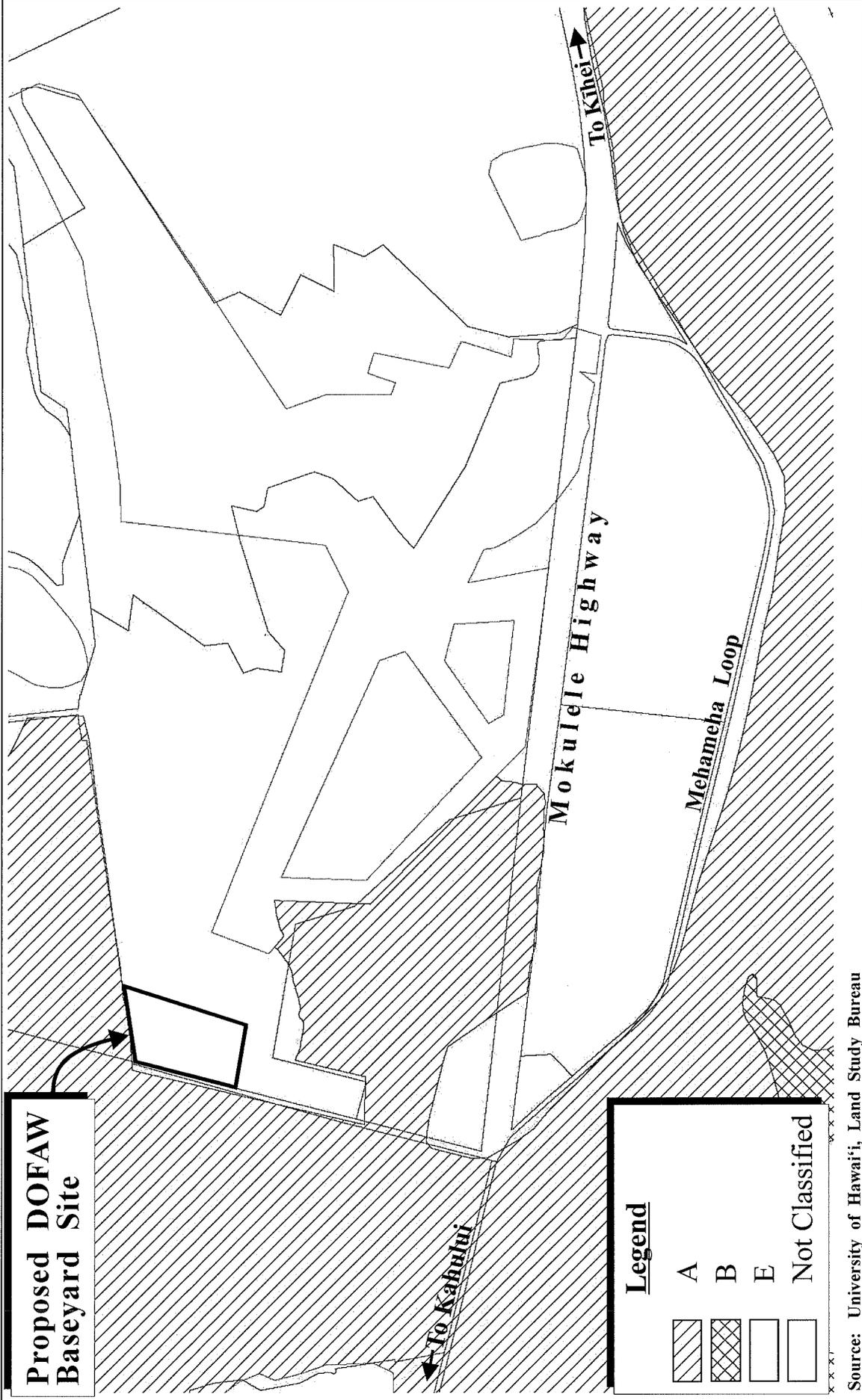
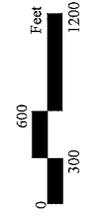


Figure 8 Proposed DOFAW Baseyard at Pulehunui
Land Study Bureau Classification



represents an insignificant percentage of the roughly 235,770 acres of “Agricultural” lands on the island. Furthermore, the project area has the lowest productivity rating designation according to the LSB. As such, the removal of 20.3 acres out of agricultural sugar cane production will not have a significant adverse impact on agricultural productivity.

As previously mentioned, HC&S recently announced it would be ending its sugar cane operations on Maui by the end of 2016 and transitioning to a diversified agricultural model. The proposed project will not adversely impact HC&S’ existing sugar cane operations in the vicinity, which would end prior to project construction. The proposed Pulehunui Baseyard is also not anticipated to impact future diversified agriculture activities that may occur on lands owned by A&B to the north. There are access roads that lead to the adjacent agricultural fields (e.g., Kama’aina Road and South Firebreak Road). Development of DOFAW’s Pulehunui Baseyard would not isolate these areas.

Prior to HC&S’s announcement that it is ceasing sugar cane operations, DLNR–Engineering (DLNR-ENG) and DOFAW consulted with HC&S regarding the proposed project and potential impacts related to adjacent sugar cane cultivation. It was discussed that HC&S implements measures to mitigate the effect of cane burning, such as burning small areas at a time and checking prevailing winds and conditions prior to burning. It was noted that potential nuisance problems are limited to specific periods within the two-year growing cycle. It should also be noted that other urban uses have co-existed with sugar cane fields in the area. In particular, the Maui Humane Society, located directly north of the project area, and the Hawai’i Army National Guard’s Pu’unēnē Armory, located to the south near Mokulele Highway, and the multi-family residences at Mā’alaea to the west are also located adjacent to sugar cane fields.

It is noted that land to the south and west of the DOFAW Pulehunui Baseyard project site are within the UGB of the Maui Island and may transition from agriculture to urban uses in the future. However, lands to the north of the project site have been designated as Important Agricultural Lands (IAL) by A&B and are anticipated to remain in agriculture use.

5. **Flood and Tsunami Hazards**

a. **Existing Conditions**

The Flood Insurance Rate Map (FIRM) indicates that the proposed project area is situated within Zone X (unshaded), an area outside the 0.2 percent annual chance flood plain. See **Appendix “B”**.

The subject project site is inland from the shoreline and outside of the tsunami inundation and evacuation zone.

b. **Potential Impacts and Proposed Mitigation Measures**

The project site is located outside of any flood hazard zone and outside of the tsunami hazard zone. Adverse impacts related to flood and tsunami hazards are not anticipated.

6. **Coastal Resources**

a. **Existing Conditions**

The project site is located midway between Kahului and Kīhei, approximately three (3) miles inland from the shoreline.

b. **Potential Impacts and Proposed Mitigation Measures**

The project site is not located near the shoreline and implementation of the project will not adversely impact coastal resources.

7. **Flora and Fauna**

a. **Existing Conditions**

A Biological Resources Survey was conducted on the project site by Robert W. Hobdy in October 2014. See **Appendix “C”**. The property has been in sugar cane cultivation since the late 1800s. During World War II, most of this area was developed with infrastructure for the adjacent Pu‘unēnē Military Airfield. After the war, the land was returned to sugar cane agriculture.

The survey found the project area as a dense growth of sugar cane and in the process of being harvested. The interior roadways and field margins maintained an assortment of agricultural weeds consisting of shrubs,

grasses, and hardy herbs. The most common species included sugar cane (*Saccharum officinarum*), swollen fingergrass (*Chloris barbata*), and koa haole (*Leucaena leucocephala*). The report noted that the project area was highly disturbed and covered by a dense layer of dry cane leaves and that a last crop of sugar cane was being harvested at the time of the survey.

A total of 39 plant species were recorded during the survey. Of these, just one (1) was a native species, the indigenous 'uhaloa (*Waltheria indica*) which is a hardy species found throughout Hawai'i in dry habitats. The remaining 38 species were common non-native species that do not present conservation interest or concern.

The survey included an evening visit to the project area to record crepuscular activities and vocalizations to see if there was any evidence of the Hawaiian hoary bat in the area. Also, a bat detection device was employed after dusk, set to the frequency of 27,000 Hertz which these bats are known to use for echolocation. No endangered Hawaiian hoary bats were detected during the survey. One (1) non-native mammal species was observed during two (2) site visits. Scat of the small Indian mongoose (*Herpestes auropunctatus*) was observed within the project area. Other non-native mammals observed included mice, rats, and feral cats.

Birdlife was observed as sparse with seven (7) bird species observed during the two (2) site visits, likely due to the cane harvesting disturbance occurring at the time. These included six (6) non-native species and one (1) native species. Two (2) common species included the zebra dove and the cattle egret which is attracted to cane harvesting activities. Four (4) native birds, being the nene, or Hawaiian goose (*Branta sandvicensis*), were observed flying across the project area, though not seen on the ground.

A moderate number of insect species were encountered in the project area. Fourteen (14) non-native species were identified, and no native species were observed. The dung fly, a species of common occurrence, was observed in the project area. The survey noted its special effort to look for the Endangered Blackburn sphinx moth (*Manduca blackburni*), and reported that none of its native host plants, 'aiea (*Nothoscestrum spp.*), or its non-native alternative host plant, the tree tobacco (*Nicotiana glauca*), were found in the project area. No adult moths, larvae, or eggs were found on the project area.

The non-native gecko was heard during the evening survey.

b. Potential Impacts and Proposed Mitigation Measures

The vegetation throughout the project area is dominated by a great variety of non-native plants. The only native species, the 'uhaloa, is both widespread and common and of no particular environmental concern. No Federally listed endangered or threatened native plant species were encountered during the survey, nor were any species that are candidates for this status observed. No special habitats or rare plant communities were seen on the property. As a result, the survey concludes that the proposed project is not expected to have a significant negative impact on the botanical resources in the area and that no recommendations are deemed necessary.

The fauna in the project area is strongly dominated by non-native species. Though a flock of the endangered nene goose was observed flying across the project area to an off-site destination, the survey noted that there is no suitable habitat for nene on the project site. The evening survey did not detect the endangered Hawaiian hoary bat and noted the nearly complete lack of trees or large shrubs in the project area make the area an unlikely habitat for these bats. Nevertheless, as recommended by the U.S. Fish and Wildlife Service, woody plants greater than 15 feet tall will not be trimmed or removed during the bat breeding season (June 1 to September 15) and barbed wire will not be used for fencing to prevent bats from becoming entangled.

The survey concludes that the habitat on the project site is not suitable for any of Hawai'i's native forest birds, water birds, or seabirds. The report noted that there are native seabirds, the endangered Hawaiian petrel (*Pterodroma phaeopygia*) and the threatened Newell's shearwater (*Puffinus puffinus*), that fly over these lowlands on the way to their burrows high in the mountains. The seabirds and fledglings are attracted to bright lights in the evenings and early dawn hours and can become disoriented. To minimize impact to these seabirds, consideration will be made to include the recommendation that any significant outdoor lighting in the proposed development on this property be shielded to direct the light downward to avoid the disorientation of these seabirds. The survey noted that no evidence of the Blackburn sphinx moth or their known host plants were found in the project area, and as there are no negative impact

to wildlife species expected from the project, no further recommendations are made.

Pursuant to recommendations by the U.S. Fish and Wildlife Service, a qualified individual will survey the area for nene goose (and nests) and Blackburn's sphinx moth and its host plants. Should a nene be observed within the project site, the construction work activities will be halted within 100 feet of the nene and work will resume when the nene leave the area of its own accord. During nene breeding season, manipulation or alteration of known nesting habitat will be avoided.

Although the proposed project is not anticipated to adversely impact existing flora and fauna resources, associated activities and use of the project area for a nursery and dry land forest restoration will have an overall beneficial impact on reestablishment of native dry land species at the project site and other areas of Maui.

8. Streams, Wetlands, and Reservoirs

a. Existing Conditions

There is an existing owned concrete irrigation ditch, Hai'kū Ditch, located west of the project site. The ditch, owned by A&B, runs in a north-south direction. Hai'kū Ditch terminates at a reservoir located approximately 0.5 mile south of the project area, beyond the Maui Motor Sports Park. Refer to **Figure 2**.

There are no major drainageways, wetlands or reservoirs within the project site.

b. Potential Impacts and Proposed Mitigation Measures

The project is not anticipated to have significant adverse effects on streams, wetlands, or reservoirs. Onsite drainage improvements, including open swales and retention basins will result in an overall net decrease in stormwater runoff. Best Management Practices will also be implemented to provide water quality treatment. As such, the proposed project is not anticipated to adversely impact downstream properties, including Hai'ku Ditch.

9. **Air Quality**

a. **Existing Conditions**

The Pulehunui area in general does not experience adverse air quality conditions. Notable point sources of air contaminants in the local area can be attributed to vehicle exhaust along Mokulele Highway and the occasional burning and cultivation of sugar cane by HC&S. All of the above sources are relatively intermittent, however, and the prevailing tradewinds disperse suspended particulates to maintain a relatively high level of air quality in and around the project area.

b. **Potential Impacts and Proposed Mitigation Measures**

While the proposed DOFAW Pulehunui Baseyard is not expected to interfere with surrounding agricultural uses, sugar cane cultivation on the adjacent lands has resulted in occasional nuisance issues. Dust, smoke, and particulates may lead to air quality nuisance problems due to the arid and windy conditions at the site.

HC&S recently announced that it is ceasing its sugar cane operations by the end of 2016. As such, adverse impacts from sugar cane burning is not expected to occur post-project construction.

10. **Noise Characteristics**

a. **Existing Conditions**

Existing background noise in the vicinity of the project site is principally attributed to vehicular traffic on Mokulele Highway. The noise from inter-island flight paths of arriving and departing aircraft at Kahului Airport, located to the north of the project site, represents another occasional source of noise. With the cessation of HC&S operations by the end of 2016, intermittent noise from sugar cane agricultural activity is not expected to occur.

b. **Potential Impacts and Proposed Mitigation Measures**

The DOFAW Pulehunui Baseyard includes a proposed helicopter use. Noise from the proposed helicopter operations will be intermittent and used approximately twice a month. Noise is transitory in nature lasting a

few minutes during takeoff and landing. Significant adverse impact to ambient noise levels is not anticipated as a result of the project.

11. Water Quality

a. Existing Conditions

There are no major drainageways, wetlands, or streams within the project area. As previously mentioned, the Hai‘kū Ditch runs to the west of the project site and terminates at a reservoir located approximately 0.5 mile to the south.

b. Potential Impacts and Proposed Mitigation Measures

The project is not anticipated to have significant adverse effects on water quality. During construction, BMPs will be implemented to avoid adverse impact to nearby properties. The project includes drainage system improvements to manage storm water runoff and minimize adverse impact to adjacent and downstream properties in the area.

12. Archaeological Resources

a. Existing Conditions

A portion of the sugar cane fields adjacent to the project area was turned into a civil airfield in 1937 and in subsequent years was used by Inter-Island Airways, the Navy during World War II, and was expanded and used by the Territory of Hawai‘i as an inter-island airport until about 1952. The landing strip was used by crop dusters and other smaller aircraft until abandoned sometime between 1961 and 1977. Abandoned military facilities remained on the property and the old air strip used for racing.

An Archaeological Assessment Report (AAR) of the project site was prepared by Scientific Consultant Services Inc. (SCS) based on inventory fieldwork surveys conducted from October 13 through 29 and 30, 2014. The report noted archival research on locations of previous archaeological projects conducted in the vicinity of the proposed project. SCS conducted a pedestrian survey supplemented by twenty (20) stratigraphic trenches mechanically excavated. No archaeological cultural materials or historic properties were identified within ground surface or subsurface contexts of the twenty (20) trenches. The trenches ranged in length from 5.0 to 8.0

meters (m) in length and from 1.0 to 2.0 m deep. All trenches were 0.75m in width. The upper portion of Layer 1, between 0 to 40 centimeters below surface (cmbs), in sixteen (16) trenches contained plastic fragments typically associated with modern commercial agriculture. No traditional or historic artifacts or deposits were encountered during the excavation. The absence of traditional and historic artifacts is not unusual given that the project area was previously under commercial agriculture for many years. Field notes and digital photographs were curated at SCS laboratory in Honolulu and no definitive archaeological deposits containing food midden or other evidence of human activity were found. See **Appendix “D”**.

b. Potential Impacts and Proposed Mitigation Measures

Based on the negative findings of the AAR, no further archaeological work is recommended for the current project area. In the event cultural or historical resources are encountered, work in the affected area will be stopped and State Historic Preservation Division (SHPD) will be contacted immediately.

13. Cultural Resources

a. Existing Conditions

The proposed project area is situated in the *ahupuaa*, traditional land district, of Pulehunui. Pulehunui encompasses roughly 16,700 acres of land stretching from the rim of Haleakalā crater to the shore of Mā‘alaea Bay. Literally translated, *pulehu* means to broil while *nui* has such meanings as large, immense, or huge (Pukui & Elbert 1986). Thus, the name Pulehunui signifies this vast, arid expanse of land.

The historic Pu‘unēnē Sugar Mill and surrounding plantation village are located to the north of the project area. Pu‘unēnē was originally the name of a *puu*, cinder cone that was situated to the north of the sugar mill site, overlooking Paia and Spreckelsville. Literally translated, *puu* signifies a volcanic cinder cone, while *nene* is the name of the indigenous Hawaiian goose. Thus, Pu‘unēnē is interpreted as “nene hill” or “nene on the hill”, as *nene* once passed over this *puu* when flying between Haleakalā and the Keālia Pond salt flats to the southwest.

The Pu'unēnē Sugar Mill was established by Henry P. Baldwin who borrowed the Pu'unēnē name. The Pu'unēnē Sugar Mill began processing cane for the HC&S in 1902, and the community that grew around the sugar mill became known by the Pu'unēnē name. By 1930, over 10,000 people resided in the plantation camps that surrounded the mill, making Pu'unēnē one of the largest towns on the island at that time. With such diverse names as McGerrow, Sam Sing, and Spanish Camp, the plantation camps reflected the multiracial work force of the plantation. Supporting the camp residents were a meat market, hospital, grade school, dairy, general store, and service station. Additional recreational facilities included a swimming pool, bowling alley, tennis courts, ball fields, and club houses (Bartholomew, 1994).

In 1939, a commercial airport was established at Pu'unēnē, and for a brief period of time, this facility served as the island's primary commuter airport. The location was chosen by representatives of Inter-Island Airways (now Hawaiian Airlines), the Civil Aeronautics Administration (CAA), HC&S, and Kahului Railroad Company for the favorable weather, terrain, and prevailing winds. Notably, the aforementioned Pu'unēnē cinder cone was mined to provide the base material for the airport runways and Pu'unēnē Road. Commercial flights continued into December 1941 when the facility was taken over by the U.S. Navy.

The Pu'unēnē Airport was identified as the most satisfactory airfield in the islands for military purposes, being regarded for superior meteorological conditions, proximity to Oahu, and convenience to fleet operation. Between 1940 and 1941, the Pu'unēnē Airport facility was enlarged and improved to become the Naval Air Station (NAS) Pu'unēnē. The NAS was initially utilized for training purposes and the advantages of the airfield became evident. Additional quarters were built, and runways were lengthened and paved. By mid-1942, the Navy had permission to control traffic on the section of the Pu'unēnē-Kīhei highway (now Mokulele Highway) that was located within the NAS. With respect to infrastructure, plans had been made for an adequate water supply, power supply, and sewage disposal, and material for 40,000 feet of fence to enclose the air station was requested. For the benefit of Navy personnel, a movie theater, picnic and recreation area, Navy Marketing Center, Shore Patrol, and chapel were built within the NAS. A dispensary, officers club, ship's service, laundry, bakery, photographic laboratory, supply department, and

post office were also established within the NAS, and many of these provided services to personnel stationed in other parts of the island. As of December 12, 1941, approximately one (1) month prior to commissioning, on board personnel at the Pu'unēnē NAS numbered seven (7) officers and 150 enlisted men. By July 1, 1945, the station on board count numbered a total of 565 officers and 2,798 men, and total aircraft on board numbered 271.

After World War II ended, the Federal Government no longer needed the Pu'unēnē NAS and the Territory of Hawai'i was eventually granted control of the facility. Commercial airline operations were relocated to Kahului Airport between 1951 and 1952. In 1952, the Hawai'i Aeronautics Commission (HAC) granted the Maui County Waterworks Board the use of the HAC's 500,000 gallon reservoir and waterlines at the Pu'unēnē facility in return for water service to users in the airport area. A few years thereafter, the Pu'unēnē Airport was closed to aeronautical activity in 1955 (Hawai'i DOT Airports Division 2011).

Today, the Pu'unēnē Sugar Mill is the last sugar mill in operation in Hawai'i. Over the past few decades, however, the plantation camps dissipated as the need for human laborers decreased and employees moved out to the growing town of Kahului and other parts of the island. While HC&S will continue active cultivation of sugar cane through the end of 2016, there are almost no physical remnants of the old plantation camps that once bustled with life.

Similar to the plantation camps, there are few visual reminders of the Pu'unēnē Naval Air Station and commercial airport as the vast majority of airport facilities were abandoned, torn down, or re-purposed. The air station roadways County Boulevard and Central Avenue are now Mehomeha Loop and the regional roadway Mokulele Highway, respectively. The Maui Humane Society animal shelter is now situated on the northernmost portion of the old air station. Still standing in the vicinity of the animal shelter are the shells of a storehouse, telephone exchange building, and transformer building (Frey & Fredericksen, 2008). The former airport runways and surrounding areas are now part of the 220-acre Maui Raceway Park and Drag Strip which is under the control and management of the County of Maui. The use of the former airport runways for drag races and time trials was approved in 1956 by the CAA and HAC. The park hosts drag races on a former runway, while go-kart

aces, moto-cross races, and races for radio-controlled models are held on adjacent tracks.

Cultural Interviews

Cultural interviews were carried out with three (3) individuals to gain a more in-depth cultural impact perspective of the proposed project. The interviews are summarized below. See **Appendix “E”**.

(1) Interview with Blossom Feiteira

Ms. Feiteira is a native Hawaiian and beneficiary of the Department of Hawaiian Home Lands who was born in 1959. She was raised in Lāhainā on Dickenson Street across from the Maria Lanakila Church. She currently lives in Wailuku. She is married to Matthew Feiteira and has four (4) children, three (3) boys and one (1) girl.

Her father was John Ah Heen Yap whose father, Siu Choi Yap, emigrated from China in 1895. Her father’s Hawaiian mother was Mary Kuhia who was born in Hana. Her mother was Theresa Kaaiawahia whose father was Albert Kaaiawahia who originally came from Kaupō. In 1800 her grandfather (Albert Kaaiawahia) moved to Lāhainā to work for AmFac to run the water system.

Ms. Feiteira has an interest in Hawaiian culture and serves as President of the Association of Hawaiians for Homestead Lands and Secretary of Na Poe Kokua.

Ms. Feiteira has no lineal connection to Pulehunui. But, she indicated that she conducted some research of the area and found that there was a case in the Supreme Court of the Hawaiian Kingdom in which a person who bought land in the area requested a court judgment on the metes and bounds description of the property. At that time three (3) men testified, who were the last generation to live in Pulehunui.

According to Ms. Feiteira the area originally belonged to the Alii. In the Great Mahele this ahupuaa was kept separate. Originally the area was to be developed as homestead lands. After the last families left the area it was actively used for sugar cane cultivation.

Due to the former sugar cane cultivation, artifacts that may have once been on the property were probably destroyed.

Ms. Feiteira notes that her family utilizes the Maui Raceway Park located south of the project site. She is not aware of any traditional cultural practices remaining in the area and expressed she has no concerns of adverse impacts by the project. No remnants of the Hawaiian culture remain since the area was used for sugar cane, the military (airport), and back to sugar cane.

She supports the proposed project and suggested that DOFAW conduct community consultation and meetings regarding the proposed project. Ms. Feiteira expressed a desire for a Master Plan effort for the general region.

(2) **Interview with Kehau Filimoeatu**

Ms. Filimoeatu is a native Hawaiian and beneficiary of the Department of Hawaiian Home Lands who was born in 1947 at the old hospital originally located on Baldwin Avenue in Paia, Maui. Her parents were Quong Gee Lum Ho who retired as a police officer for the Maui Police Department and Irene May Lum Ho (born Wahinekona) who was a kupuna who taught at Lihikai School for 20 years. Ms. Filimoeatu has a brother, Nathan who is an entertainer and a sister, Ada Lum Ho. She also has two (2) sons and a daughter.

Ms. Filimoeatu was educated mainly on Maui where she attended Kaunoa School which was an English standard school located in Spreckelsville and Baldwin High School. When she was 12-years old she attended one (1) year at Kamehameha School on Oahu as a boarder. She did not enjoy the school and being away from her family and returned to Maui.

Ms. Filimoeatu is a board member of the advocacy group, Hui Kako'o 'Āina Ho'opulapula which advocates the interest of applicants and native Hawaiians on the Hawaiian Home Lands wait list.

Because Ms. Filimoeatu is younger than many of the elders or kupuna she has very little memory or knowledge of the ancient

aspects of the area. She does remember that as a police officer her father patrolled the general area. As a child she remembers standing near the airport chain link fence to watch the planes on the old runway just south of the project area. She also remembers the area was always far out from Kahului and North Kīhei with nothing but the former airport and dry grasses. Besides being barren the area was also very windy.

Ms. Filimoeatu has very little knowledge of the airport area. She can't explain why but she had an uncomfortable feeling about the place name, Pu'unēnē (also known as Pulehunui) for the area. She and other beneficiaries visited the site to obtain spiritual guidance and a feeling for the place. According to Ms. Filimoeatu she learned that Pu'u on nēnē is actually in Spreckelsville and indicated there needs to be further research as to what actually was there before the war when the airport was constructed. She is not aware of any traditional or cultural practices and uses past or present in the project area due to disturbance (e.g. sugar cane cultivation) and other uses.

She expressed support for the project recognizing DOFAW's need and noted that the general area is an ideal site for the project given the nearby infrastructure and its distance away from Mokulele Highway.

(3) Interview with Randall Moore

Mr. Moore was born in Texas and moved to Pu'unēnē, Maui in 1974. After a couple of years of residing in the Pu'unēnē area, he moved to Kula where he built his home and currently resides. For 38 years, Mr. Moore was employed by HC&S until he retired. As an agricultural engineer, Mr. Moore's expertise included work on drip irrigation systems (e.g. irrigation installation and operations), knowledge of ditches, reservoirs, pumps and water resources on the island, including the Pulehunui area. While at HC&S, Mr. Moore was involved in land and property issues for the company on Maui, and he developed his knowledge of the proposed baseyard property as he worked in this area. During his years with HC&S, Mr. Moore dealt with the DLNR. He notes that some land was transferred to the Department of Hawaiian Home Lands and

the area of the drag strip was conveyed to the County of Maui and that adjacent to the property is the Department of Agriculture cattle quarantine station. The proposed baseyard site is under DLNR control and HC&S is farming the area under a revocable permit.

Mr. Moore noted that although the proposed baseyard would have good access via Kama‘aina Road from a signalized intersection at Mokulele Highway, the main cane haul road (South Firebreak Road) is a public road which experiences traffic from the quarry on State DLNR and Alexander & Baldwin, Inc. land. This cane road also experiences HC&S traffic during cane harvesting and year-round hauling of large trucks carrying heavy equipment, fertilizer, and weed control products. Kama‘aina Road is State owned and is currently maintained by Hawaiian Cement and he expressed concern as to who will maintain and improve the substandard roads.

Mr. Moore supports DOFAW’s proposed baseyard project, but noted that the surrounding area is cultivated by sugar cane and is characterized by occasional smoke during cane harvesting, the threat of unscheduled fires in the fields, and dust, wind, and noise from 24-hour operations (harvest, plowing, and planting). As the proposed location has been in cane cultivation, he expressed a preference for a location that is on unproductive land, closer to the existing Kahului DOFAW baseyard, or in the vicinity of the Hawai‘i Army Air National Guard Armory and drag strip.

As the subject property has been in sugar production for nearly 100 years and has a military history as a naval air station with bunkers during World War II, Mr. Moore is not aware of cultural practices in the area.

b. Potential Impacts and Proposed Mitigation Measures

From a recent historical perspective and cultural informant information, there are no indications of cultural practices, such as gathering, access, or religious traditions, known to be associated with the project site. As such, implementation of the proposed project is not anticipated to adversely impact cultural resources.

14. Scenic and Open Space Resources

a. Existing Conditions

The project site is located east of Mokulele Highway, an area currently utilized for sugar cane fields. As previously noted, HC&S recently announced it is ceasing its sugar cane operations on the island. Scenic resources in the vicinity of the project site include views of the western slope of Haleakalā and the eastern slopes of the West Maui Mountains. Open space resources around the project site include the expansive agricultural lands of the Central Plain.

b. Potential Impacts and Proposed Mitigation Measures

The views of Haleakalā and of the West Maui Mountains are the principal visual resources of the project site. The DOFAW Pulehunui Baseyard is located away from Mokulele Highway which serves as the main roadway connecting Kahului to Kīhei. The proposed action involves low profile features, such as the parking area, equipment yard, wash bays and buildings that will be limited to one-story. The fire storage tank would be limited to 16 to 21 feet in height and the fire pump system includes a pre-fabricated metal enclosure approximately 10 feet in height. If the Department of Water Supply (DWS) determines there is not enough fire protection capacity within their existing system for the proposed project, then a storage tank and fire pump system would be required for fire protection. See Section II.D.2 and refer to **Appendix “G”**. As such, significant adverse impacts to scenic or open space resources are not anticipated.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Land Use and Community Character

a. Existing Conditions

The proposed project site is located within the UGB designated in the MIP and from a regional standpoint is in the Kīhei-Makena Community Plan region which encompasses the area from Mā‘alaea to La Perouse Bay. The region includes a diverse range of physical and socio-economic environments. The proposed DOFAW Pulehunui Baseyard project is located outside of the shoreline dependent urban developments along the

coastline from Mā'alaea to Makena. The area surrounding the project site has begun to transition from agricultural use to other uses, such as the Maui Humane Society Animal Shelter, Hawai'i Army National Guard Pu'unēnē Armory, and Maui Motor Sports Park and proposed heavy industrial uses.

b. Potential Impacts and Proposed Mitigation Measures

From a future land use perspective, portions of the surrounding lands, including the project site, are within the UGB designated on the MIP. The long range objective of the UGB is to allow the development of urban uses (e.g., recreational, industrial, government uses). As the proposed project conforms with the growth policies of the County and is consistent with the transition from agricultural to other uses in the area, there is no significant adverse impact to the land use and community character in the region. See **Figure 9**.

2. Population and Economy

a. Existing Conditions

In the year 2000, the population of Maui Island was 117,644, with 22,870 people (19.4 percent of the island's population) residing in the Kīhei-Makena Community Plan region (County of Maui, Office of Economic Development, 2010). The growth in population since 1970 has been considerable, with population increasing from 1,636 in 1970, to approximately 7,263 in 1980, and to 15,365 in 1990. Over the past 40 years, the Kīhei-Makena Community Plan region has experienced a 14-fold increase in resident population, and this growth is expected to continue. The resident population of Maui Island increased to 144,444 in the year 2010, with 27,244 people (18.9 percent) residing in the Kīhei-Makena area (U.S. Census, 2010).

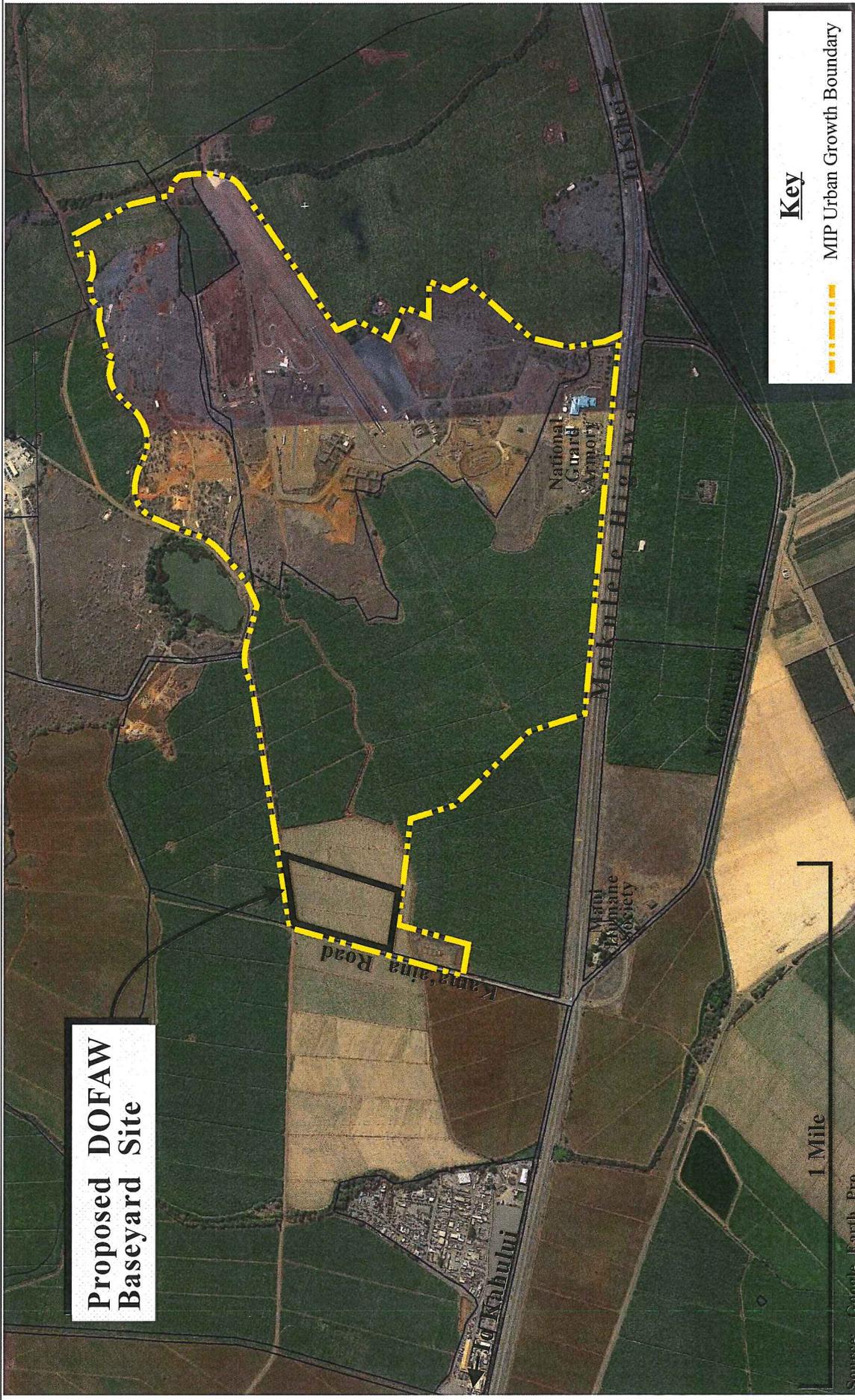


Figure 9 Proposed DOFAW Baseyard at Pulehunui
Maui Island Plan Urban Growth Boundary Map

NOT TO SCALE



Prepared for: State of Hawai'i, Department of Land and Natural Resources

The economy of Maui is heavily dependent upon the visitor industry, and the Kīhei-Makena area presents a fine illustration of this characteristic. Maui's south coast has grown to be one of the most popular resort-residential destinations in the State. The Wailea and Makena areas, located further south, again reaffirm the island's economic dependence on tourism, with the presence of a number of major luxury hotels, such as the Fairmont Kea Lani, Four Seasons Maui, Andaz, Grand Wailea, Wailea Marriott, and Makena Beach & Golf Resort, all of which are located amongst internationally renowned golf courses.

As of November 2015, the non-seasonally adjusted unemployment rates for Maui County and the island of Maui were 3.4 percent and 3.2 percent, respectively. This shows a decrease of 0.8 percent and 0.7 percent from the respective 2014 figures, which had unemployment rates at 4.2 percent and 3.9 percent, respectively (DLIR, December 2015).

b. Potential Impacts and Proposed Mitigation Measures

The proposed project represents a new baseyard location with some expanded facilities for DOFAW. As the DOFAW operations are currently located in Kahului, the proposed project is not expected to generate significant new population growth. During the construction period for the various proposed uses, the proposed project will benefit the local economy by providing construction-related jobs in the area. However, the proposed project is not anticipated to have significant adverse long-term impact to the population and economy.

C. PUBLIC SERVICES

1. Solid Waste Collection and Disposal

a. Existing Conditions

Single-family residential solid waste collection service is provided by the County of Maui on a weekly basis. Residential solid waste collected by County crews is disposed of at the County's 55-acre Central Maui Landfill facility, located 4.0 miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill also accepts waste from private collection companies that service certain residential areas and businesses. Privately owned facilities, such as the Maui Demolition and Construction Landfill and the Pohakulepo Concrete Recycling Facility,

accept solid waste and concrete from demolition and construction activities. These facilities are located at Mā‘alaea, near Honoapi‘ilani Highway’s junctions with North Kīhei Road and the Kuihelani Highway. A privately operated green waste recycling facility is located at the Central Maui Landfill.

Any solid waste generated by the commercial activities around the project area is collected and disposed of by construction and private collection companies.

b. Potential Impacts and Proposed Mitigation Measures

In 2007, the County of Maui’s Integrated Solid Waste Management Plan (ISWMP) estimated the existing Central Maui Landfill (Phases IV-VI) had remaining capacity of 780,000 tons. According to the ISWMP, the existing landfill has adequate capacity to accommodate residential and commercial waste needs through the year 2026. In the ISWMP, the Department of Environmental Management (DEM) anticipates that additional land can be acquired for future capacity at the landfill (Integrated Solid Waste Management Plan, 2009).

Solid waste that may be generated during construction will be disposed at facilities, such as the Maui Demolition and Construction Landfill and the Pohakulepo Concrete Recycling Facility. When the project is implemented and operational, solid waste resulting from the baseyard will be collected and disposed of by a private collection company for disposal at the Central Maui Landfill. The proposed project is not anticipated to adversely impact solid waste services nor facilities.

2. Medical Facilities, Police and Fire Protection Services

a. Existing Conditions

The only major medical facility on the island is Maui Memorial Medical Center, which is located in Kahului about eight (8) miles north of the project area. The 213-licensed bed facility provides general, acute, and emergency care services. Clinics and offices throughout the Kīhei and Kahului areas offer medical services on a lesser scale.

The project site is within the Maui Police Department’s (MPD) service area, the headquarters for which are located in Wailuku. The MPD

consists of several patrol, investigative, and administrative divisions. The project area falls within the District VI, Kīhei, MPD service that covers the Kīhei-Makena Community Plan region. The Kīhei District station is located on the eastern side of Pi'ilani Highway across the signalized intersection of the highway and Kanani Street.

The Maui County Department of Fire and Public Safety provides fire prevention, suppression, protection, and emergency services to the islands of Maui, Lāna'i, and Moloka'i from 14 fire stations and a fire prevention office. The project site is located midway between Kahului and Kīhei. The Kahului area is served by the Kahului Fire Station located on Dairy Road. The Department's Kīhei station, which services the Mā'alaea and Kīhei areas, is situated on South Kīhei Road adjacent to Kalama Park.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project is not anticipated to adversely impact the service capabilities for emergency, medical, police, and fire operations. The project is within the existing service area limits for these services.

3. Educational Facilities

a. Existing Conditions

The State Department of Education (DOE) operates several schools in the Kahului and Kīhei regions, as shown in the following **Table 1**.

Table 1. Educational Facilities

| Elementary Schools (Grades K through 5) | |
|--------------------------------------------------|-----------------|
| | Location |
| Kahului | Kahului |
| Kamali'i | Kīhei |
| Kīhei | Kīhei |
| Lihikai | Kahului |
| Pomaikai | Kahului |
| Intermediate Schools (Grades 6 through 8) | |
| Lokelani | Kīhei |
| Maui Waena | Kahului |
| High School (Grades 9 through 12) | |
| Maui High | Kahului |
| Charter Schools (Grades K through 12) | |
| Kīhei PC High School | Kīhei |

The DOE is currently undergoing the planning and design of the new Kīhei High School (KHS) which will be situated in North Kīhei, mauka of Pi'ilani Highway. The estimated build-out period for KHS is approximately five (5) years.

The University of Hawai'i-Maui College is the primary higher education institution serving the County with its main campus located in Kahului.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project supports the operations of the existing DLNR DOFAW in Maui County and does not place additional demand upon educational facilities in the Kahului and Kīhei regions.

4. Recreational Facilities

a. Existing Conditions

The County of Maui obtained State-owned land south of the project site containing the former Pu'unēnē airport runway through an Executive Order. The land is used for recreational purposes, such as the Maui Motor

Sports Park and motor bike racing and is located inland to the east of Mokulele Highway in proximity to the project site. Diverse recreational opportunities are available in the Kahului and Kīhei-Makena regions. Shoreline activities, such as fishing, surfing, jogging, camping, picnicking, snorkeling, swimming, and windsurfing, are available in the Kahului and Kīhei regions.

There are several public park facilities in the Kahului and Kīhei regions. Kahului includes Ke‘opuolani Park, Kanaha Beach Park, and the War Memorial Complex, as well as smaller parks. The Kīhei region includes several beach parks, such as Kalama and Kama‘ole I/II/III Beach Parks, located to the southeast along the Kīhei coastline. Additional recreational resources available in Kīhei include the Kīhei Community Center, South Maui Park, and various world-class golf courses and tennis centers.

b. Potential Impacts and Proposed Mitigation Measures

As the proposed project supports the government operations of DOFAW and its employees, significant adverse impacts on the recreational facilities in the Kahului and Kīhei regions are not anticipated.

D. INFRASTRUCTURE

1. Roadway Infrastructure

a. Existing Conditions

Mokulele Highway is the major roadway in the vicinity of the project site. Mokulele Highway is a State roadway that transitions into Pi‘ilani Highway, providing access to the residential and commercial areas of the south coast of Maui, namely Kīhei, Wailea, and Makena. Access to the project site is via Kama‘aina Road with a secondary access off of South Firebreak Road.

A description of existing roadways in the vicinity of the project site is provided below.

Mokulele Highway

Mokulele Highway is a four-lane, divided State highway that runs in a north-south direction between Pu‘unēnē Avenue in Central Maui and Pi‘ilani Highway in South Maui. The posted speed limit along this

roadway is 45 miles per hour (mph). In the vicinity of the proposed project area, Mokulele Highway has a signalized intersection at its intersection with Kama‘aina Road and the northern terminus of Mehameha Loop. Refer to **Figure 1**.

Kama‘aina Road

Kama‘aina Road is a roadway that runs in the east-west direction. Kama‘aina Road begins to the west at its intersection with Mokulele Highway, and terminates to the east at an intersection with South Firebreak Road. Kama‘aina Road primarily services traffic generated by the Hawaiian Cement Baseyard located further south of the roadway. Kama‘aina Road is currently unstriped but was observed to provide enough width to service two-way traffic. Refer to **Figure 1**.

South Firebreak Road

South Firebreak Road is a local road that facilitates transport for HC&S and Hawaiian Cement trucks in the north-south direction. South Firebreak Road generally begins to the south near the Hawaiian Cement Baseyard and terminates about 1.25 miles north of Haleakala Highway. Various intersection approaches along South Firebreak Road are gated.

Mehameha Loop

Mehameha Loop is a two lane, two-way roadway that generally runs parallel and to the west of Mokulele Highway before intersecting with Mokulele Highway, at two (2) locations approximately 1.3 miles apart, one of which intersects with the Mokulele Highway/Kama‘aina Road intersection. The posted speed limit along this roadway is 15 mph.

b. Potential Impacts and Proposed Mitigation Measures

A Traffic Impact Analysis Report was prepared for the Pulehunui Baseyard by Austin, Tsutsumi, & Associates, Inc. in September 2015. See **Appendix “F”**.

The TIAR assessed traffic conditions at three (3) intersections in the vicinity of the Pulehunui Baseyard:

- Mokulele Highway/Kama‘aina Road/Mehameha Loop (North) (signalized intersection)

- Mokulele Highway/Mehameha Loop (South)
- Kama'aina Road/South Firebreak Road

The TIAR examined existing and future traffic conditions with and without the proposed Pulehunui Baseyard project utilizing accepted methodological protocols for trip generation, traffic assignment, and level of service (LOS) analysis. LOS is a qualitative measure used to describe the conditions of traffic flow, with values ranging from free flow conditions at LOS A to congested conditions at LOS F.

Existing Conditions

The signalized Mokulele Highway/Kama'aina Road/Mehameha Loop (North) intersection currently operates overall at LOS A, with all movements operating at LOS D or better except the northbound and southbound left-turn movements, which currently operate at LOS E/F mainly due to low volumes that result in lengthier average vehicle delays. No significant queuing was observed during the weekday AM and PM peak hours of traffic. All movements at the two-way stop-controlled Mokulele Highway/Mehameha Loop (South) intersection currently operate at LOS C or better except for the low-volume westbound left-through movement, which operates at LOS F during the AM and PM peak hours of traffic.

Base Year 2025 without Project

Traffic volumes are anticipated to grow approximately 1.7 percent per year along Mokulele Highway. In addition, there are other projects within the vicinity that are forecast to generate traffic along Mokulele Highway, including the proposed Pu'unēnē Heavy Industrial Subdivision, located east of the proposed Pulehunui Baseyard.

By Year 2025 without the Project, all movements at the unsignalized Mokulele Highway/Mehameha Loop (South) intersection are forecast to operate similar to existing conditions during the AM and PM peak hours of traffic. At the Mokulele Highway/Kama'aina Road/Mehameha Loop (North) intersection, it is assumed that recommended roadway improvements will be implemented to provide for the Pu'unēnē Heavy Industrial Subdivision. As a result, all mainline through movements are forecast to operate at LOS C or better during the AM and PM peak hours

of traffic. Several minor movements are forecast to operate at LOS E. However, all movements are anticipated to operate under capacity.

Base Year 2025 with Project

The proposed project is forecast to generate approximately 124 AM and 123 PM peak hour trips, which were distributed throughout the study area based upon existing travel patterns within the vicinity of the Project and added to the forecast Base Year 2025 traffic volumes. Traffic volumes at the study intersections are anticipated to increase by approximately three (3) percent from Base Year 2025 conditions. With the recommended roadway improvements associated with the Pu‘unēnē Heavy Industrial Subdivision, all study intersection movements are forecast to operate with LOS similar to Base Year 2025 conditions and below capacity. All movements at the Project driveways are forecast to operate at LOS C or better during the AM and PM peak hours of traffic.

The TIAR recommends consideration of stop sign relocation at the Kama‘aina Road/South Firebreak Road intersection. Specifically, it is recommended that the existing stop sign from the eastbound approach be relocated along the northbound and southbound approach along South Firebreak Road.

2. Water

a. Existing Conditions

The County of Maui, Department of Water Supply (DWS) serves five (5) main regions within the County: Central Maui, Upcountry Maui, West Maui, East Maui, and Moloka‘i. The project site is located within the Central Maui service area. The water sources for the Central Maui System are the designated ‘Īao aquifer, the Waihe‘e aquifer, the ‘Īao tunnel, and ‘Īao-Waikapū Ditch. The project site is currently undeveloped and there is no water service to the project site.

The DWS has two (2) transmission waterlines in the Pulehunui area. These are the 18-inch Kīhei Water Development Project (KWDP) waterline and the 36-inch Central Maui Water Transmission System waterline.

The source water for the Central Maui Water Transmission System is groundwater wells in the Waiehu area, which draw water from the Iao Aquifer. Water is stored in a 1.0 million gallon (MG) reservoir in Waiehu, which has a top elevation of 511 feet mean sea level (msl) and a bottom elevation of 490.75 feet msl. Water from this reservoir flows by gravity to Kihei via the Central Maui Water Transmission System waterline.

The source water for the 18-inch KWDP is primarily the Mokuhaui Wells, which also draw water from the Iao Aquifer. The wells are located at the end of Mokuhaui Road, just north of Iao Stream.

There is a 12-inch waterline connecting to the 36-inch line near the north end of Mehamaha Loop, where there is a pressure reducing valve to reduce pressure within the 12-inch line.

Fronting the project site there is an existing 8-inch County waterline in Kama'aina Road which connects from the County's 12-inch waterline at the north intersection of Mokulele Highway and Mehamaha Loop. See **Appendix "G"**.

Within Mokulele Highway, there is an existing 12-inch ductile iron waterline that extends north from Kama'aina Road and a 6-inch cast iron waterline that extends south.

b. Potential Impacts and Proposed Mitigation Measures

Based on preliminary coordination with the DWS, it is anticipated that the project can connect to DWS's nearby water system to supply water for potable (domestic), non-potable, and fire suppression purposes. However, if DWS determines that there is not adequate storage in their existing reservoirs for the DOFAW project, then an onsite fire storage tank would be required. This onsite fire storage system is discussed further in this section. Refer to **Appendix "G"**.

The estimated water demands for Phase 1 and Phase 2 of the project were determined based on the DWS's Water System Standards (WSS), dated 2002. The demand of 140 gallons/1,000 square feet (sf) for the buildings is based on the WSS for "Commercial/Industrial Mix", which includes irrigation demand. The demand of 5,000 gallons per acre for the nursery is based on the WSS for "Agriculture", and the demand of 1,700 gallons per acre for the training field is based on the WSS for "Schools, Parks".

Table 2 shows the projected water demands.

Table 2. Estimated Water Demands

| Land Use Designation | Land Area (acres) | Building Area (sf) | Average Day Unit Demand (gpd/1000 sf) | Average Daily Demand (gpd) | Maximum Day Demand (gpd) |
|-------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|---------------------------------------|----------------------------|--------------------------|
| Phase 1 | | | | | |
| Office Building, including gym, shower and locker room | | 25,455 | 140 | 3,564 | 5,346 |
| Warehouse | | 20,000 | 140 | 2,800 | 4,200 |
| Auto Shop | | 2,400 | 140 | 336 | 504 |
| Nursery | 2.0 | | 5,000 | 10,000 | 15,000 |
| Phase 1 Total | | | | 16,700 | 25,000 |
| Phase 2 | | | | | |
| Training Field | 1.3 | | 1,700 | 2,210 | 3,315 |
| Wildlife Lab | | 5,000 | 140 | 700 | 1,050 |
| Nursery Office/Greenhouse | | 5,000 | 140 | 700 | 1,050 |
| Auto Shop Expansion | | 1,200 | 140 | 168 | 252 |
| Warehouse Expansion | | 10,000 | 140 | 1,400 | 2,100 |
| Warehouse New | | 15,000 | 140 | 2,100 | 3,150 |
| Wash Bay* | | 2,400 | | 300 | 300 |
| Phase 2 Total | | | | 7,600 | 11,200 |
| Total – Phase 1 and Phase 2 | | | | 24,300 | 36,200 |
| * Water demand for Wash Bay based on the assumption that 5 cars will be washed per day using 60 gallons per wash. | | | | | |

Refer to **Appendix “G”**.

DWS’s existing transmission and distribution lines will be utilized, to the extent possible, to convey water needed for the project. Service to the project site would be provided by connecting to either the existing 8-inch cast iron waterline in Kama’aina Road or a new 12-inch ductile iron waterline that would replace the existing 8-inch waterline.

Due to the relatively large size of the project site, it is expected that a separate fire line with fire hydrants will be required within the site to provide fire protection for the structures within the site. A double-detector check assembly within a meter box will be required for the fire line, and fire hydrants will be installed at a maximum of 250 foot intervals within the site.

Normally, the fire flow requirement for this project, based on the Water System Standards of “light industry”, would be 2,000 gallons per minute (gpm) for two (2) hours. However, DWS has indicated that the Fire Prevention Bureau (FPB) can impose a lesser fire flow requirement, which would be based on factors such as type of construction and building size. If the FPB imposes a lesser requirement, the project would be required to comply with the FPB’s requirement.

In a letter dated October 19, 2015, the FPB stated the following:

The fire flow for your proposed building will be 3,000 gpm for your office building and 3,750 gpm for your proposed warehouse building. This fire flow is based on type III construction type building with no sprinklers. If fire sprinklers will be provided for these buildings, the fire flow will be set at 1,000 gpm (reduce 75%).

The project includes the installation of fire sprinkler systems for the Office Building and Warehouse. The fire system will be sized to provide for a fire flow of 1,000 gpm plus the flow for the sprinkler system. The combined flow is expected to be approximately 1,500 gpm. Either 8-inch or 12- inch fire lines, or a combination of both, would be installed for the project.

If DWS determines that they do not have enough fire protection storage capacity within their existing system for the DOFAW project, then a storage tank and fire pump system would be required for fire protection.

The fire water storage tank would need to be sized to provide for the fire flow of 1,000 gpm plus the flow for the sprinkler system over a period of two (2) hours. The combined flow is expected to be approximately 1,500 gpm, which results in a storage requirement of 180,000 gallons. The height of the tank is expected to be between 16 feet and 21 feet.

The fire storage tank would be filled using the onsite domestic water system. The intent would be for the storage tank to supply the entire amount of water required to fight the fire, such that the domestic system would not be used to fight a fire. After a fire, the tank would then be filled again using the domestic system.

Water would be pumped from the fire storage tank into the fire distribution system using a fire pump. The fire pump system is expected to

be a package system that would include a skid-mounted fire pump with diesel engine, a jockey pump, fuel tank, electrical controls, and all associated piping within a pre-fabricated metal enclosure. The enclosure would be located within the warehouse a short distance from the fire storage tank. The enclosure is expected to be approximately 12-feet wide by 16 feet long by 10-feet high.

Details of the water system improvements will be determined in the final engineering design phase of the project. The Applicant, DLNR-DOFAW, will pay for the required on and offsite water service improvements.

As mentioned previously, the project site is located within the larger Pulehunui Master Plan area of approximately 285 acres that the DLNR's Land Division is in the process of planning for development. Since the entire Pulehunui Master Plan is a longer-term planning effort, DLNR is seeking water service for just this project ahead of the larger master plan. Water source, storage, and distribution and transmission systems will be explored separately for the Pulehunui Master Plan. Refer to **Appendix "G"**.

The following water conservation measures are being considered for the project.

Indoor Conservation Measures

- *EPA WaterSense labeled plumbing fixtures.*
- *Flow reducers and faucet aerators in plumbing fixtures wherever possible.*
- *Dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.*
- *Showerheads with a flow rate of 1.5 gallons per minute (gpm) at 60 pounds per square inch (psi).*
- *Bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines using Energy Star labeled washers.*

Outdoor Conservation Measures

- *Smart Approved WaterMark irrigation products (e.g., irrigation controllers, drip irrigation, and water saving spray heads).*
- *Avoiding plant fertilizing and pruning that would stimulate excessive growth.*
- *Time watering to occur in the early morning or evening to limit*

evaporation. Limit turf to as small an area as possible.

- *Use native climate-adapted plants for landscaping. Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species.*

The proposed water infrastructure will meet the needs of the project when implemented and is not anticipated to significantly adversely impact existing facilities and/or water service.

3. **Wastewater Systems**

a. **Existing Conditions**

There is currently no sewage collection infrastructure serving the Pulehunui area.

b. **Potential Impacts and Proposed Mitigation Measures**

Individual Wastewater Systems (IWSs) will be constructed onsite to treat wastewater generated by the project. The IWSs would involve septic tanks and leaching fields.

The anticipated wastewater flow from the project is estimated to be 2,200 gpd. Refer to **Appendix “G”**. Therefore, it is recommended that four (4) IWSs be installed to treat the anticipated wastewater flow from the project.

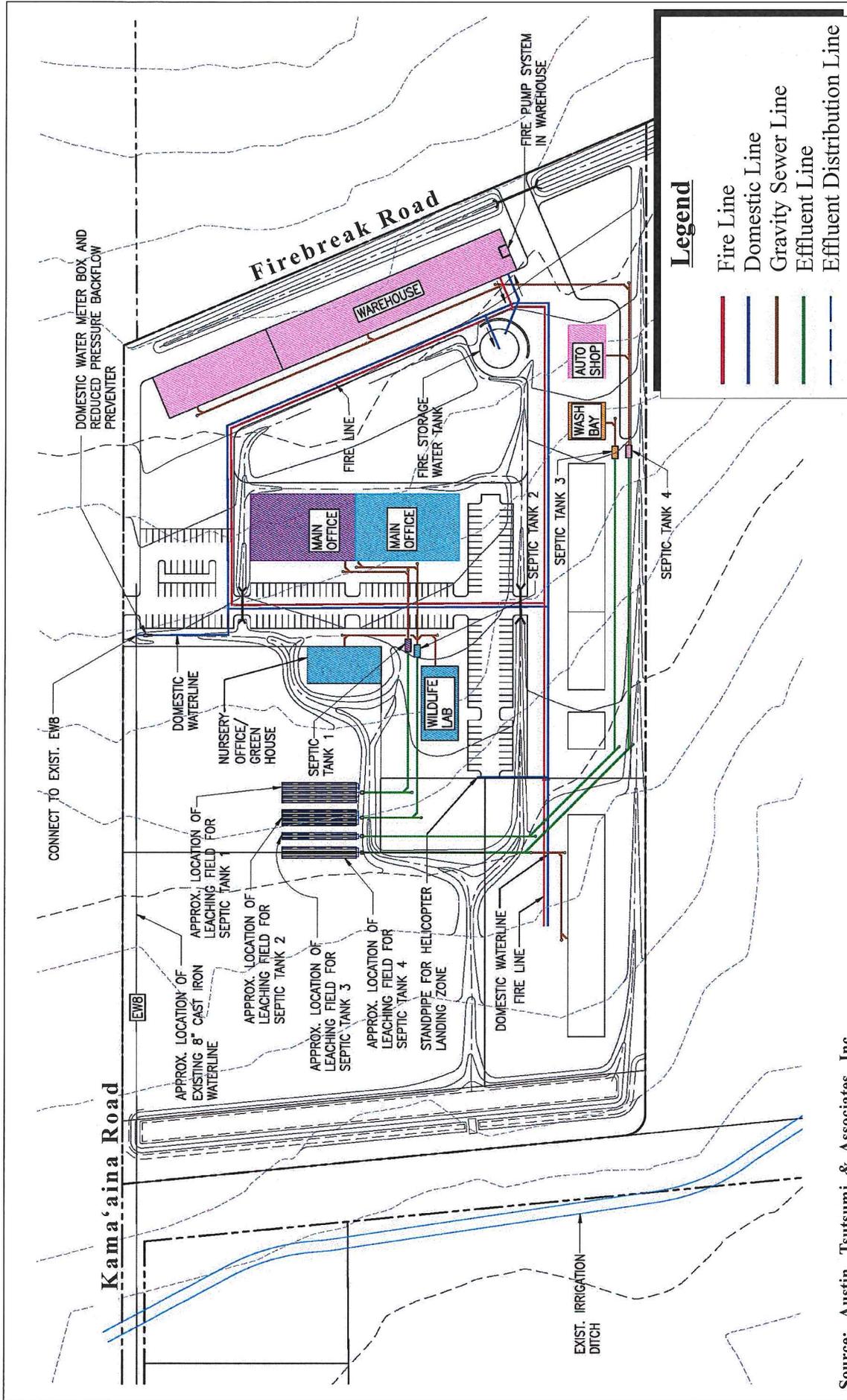
The project site is located below the Underground Injection Control line, below which leaching fields are generally allowed. Based on the Department of Health’s Hawai‘i Administrative Rules (HAR) Title 11, Chapter 62 entitled “Wastewater Systems”, the following rules are applicable to the proposed project’s IWSs.

1. *There shall be 10,000 sq. ft. of usable land area for each IWS*
2. *The total wastewater flow of the development shall not exceed 15,000 gpd*
3. *The total wastewater flow into each IWS shall not exceed 1,000 gpd.*

Based on the above criteria and the project parameters, it is anticipated that the project will utilize four (4) IWSs. See **Figure 10**. IWS No. 1 septic tank with a recommended size of 1,000 gallons would treat the wastewater from approximately one-half of the office building and the fitness room and showers with a combined flow of 800 gpd. IWS No. 2 septic tank would treat the wastewater from the other half of the office building, the Wildlife Lab, and the Nursery Office/Greenhouse with a combined flow of approximately 600 gpd. It is recommended that the septic tank size be 750 gallons. IWS No. 3 septic tank would treat the 300 gallons of wastewater from the Wash Bay. It is recommended to use a 500 gallon capacity septic tank to treat this facility. Since the Wash Bay will likely involve chemicals in the wash water, pre-treatment of the wash water prior to discharge into the septic tank will be required. IWS No. 4 septic tank would treat the 500 gallons of wastewater from the warehouse and auto shop. The recommended size of the septic tank is a 750 gallon tank. Pre-treatment of the wastewater to remove chemicals from the wastewater generated from the wash down of the building areas is recommended prior to entering the septic tank.

The proposed area of the project site for the leach fields is in the dry land forest restoration area. This area is below grade of the buildings and the wastewater can flow by gravity to the leach fields. The size of the leach fields for each of the IWSs will vary depending on the size of the septic tank and percolation rate of the soils under the leach fields. The size of each leach field will be determined during the design and permitting phase of the project and after percolation tests have been carried out in the proposed leach field sites.

The IWSs will not be located within 1,000 feet of any existing drinking water well. Also, the construction and discharge from the IWSs will not affect any public trust or Native Hawaiian resources or the exercise of traditional cultural practices in the vicinity. As such, the onsite wastewater treatment as proposed is not anticipated to adversely impact existing facilities, practices, or the surrounding environment. Refer to **Appendix "G"**.



Legend

- Fire Line
- Domestic Line
- Gravity Sewer Line
- Effluent Line
- - - Effluent Distribution Line

Source: Austin, Tsutsumi & Associates, Inc.

Figure 10 Proposed DOFAW Baseyard at Pulehunui
Individual Wastewater Systems Site Plan

NOT TO SCALE



Prepared for: State of Hawai'i, Department of Land and Natural Resources



SOH.DLNR/DOFAW by Pulehunui/TWS Site Plan

4. Drainage

a. Existing Conditions

The project site has previously been used for sugar cane cultivation. There are no onsite drainageways or stormdrain systems that carry concentrated stormwater runoff. Runoff sheet flows west toward an existing concrete irrigation ditch owned by A&B. A slight berm runs along the irrigation ditch, but it appears that the small berm and irrigation ditch would be exceeded during large storm events and that stormwater runoff would continue flowing over land in a westerly direction toward Mokulele Highway. Refer to **Appendix “G”**.

Upon reaching Mokulele Highway, the runoff enters a double 24-inch culvert which then discharges into a ditch along the west side of the highway. The drainage ditch follows Mokulele Highway south for about a mile before diverting in a southwesterly direction. From there it crosses agricultural land and continues to its final discharge point at Keālia Pond and Mā‘alaea Bay. Refer to **Appendix “G”**.

An offsite area east of the project also contributes runoff to the site. This offsite area is also currently being used for sugar cane cultivation. Runoff flows off the land, across South Firebreak Road, and into the site.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project will contain several unattached buildings, including an office building, lab, warehouse, equipment parking garage, and a maintenance shop. The site will also contain paved access driveways and parking areas. However, nearly half of the project site will remain as open space area, being used as a training field, nursery, and dry land forest reserve. The large amount of open space area will help lessen the project’s impact on stormwater runoff.

Runoff will be collected by open swales or storm drain systems and will be routed to a retention basin located on the western side of the project site. Refer to **Appendix “G”**.

Two (2) drainage basins are proposed to capture runoff from two (2) drainage areas. Drainage Area 1 is 20.291 acres and consists of the entire project site. Runoff will be collected by onsite open swales and conveyed

to a retention basin located on the western side of the site. Retention Basin 1 will have a storage capacity of 2.3 acre-feet.

Drainage Area 2 is 7.634 acres and consists of a portion of the cane fields east of the project site, as well as a portion of South Firebreak Road. Runoff from this area will be collected by an onsite interceptor swale located on the eastern side of the site. The swale diverts the offsite runoff in a southerly direction away from the site. The swale has a temporary endpoint which may be planned to be continued in the future as part of the DLNR Pulehunui Master Plan.

The proposed retention of the proposed site runoff results in an overall net decrease in runoff of 23.74 cfs. As such, the proposed drainage system improvements are anticipated to mitigate the stormwater runoff impacts from the proposed project. Refer to **Appendix “G”**.

5. **Stormwater**

a. **Existing Conditions**

The site slopes generally in a westerly direction towards Mokulele Highway and, as such, runoff sheetflows west toward Mokulele Highway. The total area contributing to the stormwater runoff onsite and offsite is estimated to be approximately 27.9 acres in area with an existing stormwater runoff of 36.24 cubic feet per second (cfs). Refer to **Appendix “G”**.

b. **Potential Impacts and Mitigation Measures**

In addition to reducing peak stormwater flow rates, the proposed stormwater management system will provide water quality treatment to reduce the discharge of pollutants to the maximum extent practicable. The goal will be to provide appropriate water quality treatment for 90 percent of the average annual rainfall. Treatment will also be targeted at the more common smaller storms, as well as managing the infrequent peak storm events.

The project will incorporate the following stormwater BMPs:

Grass Swales: Surface water runoff from developed areas will sheet flow to grass swales and landscaped areas. The grasses and other vegetation provide natural filtration while allowing percolation into the underlying

soil. The use of grass swales rather than a storm drain collection system increases the runoff time of concentration.

Open Space/Reduced Impervious Coverage: Approximately 48 percent of the developed project site will be reserved as open space and will be maintained with grass or other native vegetative cover. Reducing impervious coverage where possible promotes infiltration and maintains the natural hydrologic cycle.

Stormwater Retention/Infiltration: The entire water quality design volume will be retained in the proposed retention basin. The potential pollutants will be prevented from flowing to downstream areas such as the existing irrigations ditches and cane fields. Stormwater will be held for an extended period allowing suspended solids to settle out. Water will infiltrate into the soils gradually over 24 to 48 hours and recharge groundwater. The project site will contain industrial uses, such as an equipment maintenance shop, fueling station, and a wash bay. Runoff from these areas will be filtered by the grass swales prior to retention and infiltration at the basin.

Vegetated Filter Strips: There are several areas on the proposed site where stormwater runoff will sheet flow through and across open space areas. Filtering and percolation occur as the widely dispersed runoff flows over the grass or vegetated area.

A maintenance plan will be developed for management of the BMP's on the project site, and will include requirements for removing accumulated sediments and debris, maintaining vegetation, and performing regular inspections for efficiency of BMP operations. Refer to **Exhibit "G"**.

During project construction, temporary erosion control measures will be implemented to minimize soil loss and erosion. BMPs will include measures, such as berms and swales, silt fences, dust fences, check dams, slope protection, stabilized construction entrances and truck wash-down areas. Periodic water spraying to minimize airborne dirt particles from reaching adjacent properties will be implemented. An application for a National Pollution Discharge Elimination System (NPDES) permit will be submitted to the State Department of Health as may be applicable. At the end of construction, all disturbed areas of the project site will be

permanently stabilized. Permanent sediment controls measures, examples of which are noted in this section, will be implemented.

6. Electrical, Telephone Systems and Cable Television Services

a. Existing Conditions

Existing utility poles and overhead lines run along Kama‘aina Road and South Firebreak Road within an electrical easement. Overhead lines along the western side of Mokulele Highway to the west of the project site is available to provide electrical power to the area by Maui Electric Company, Ltd. There are currently no structures or electrical facilities within the project site. Refer to **Appendix “G”**. Pulehunui is within the cable television service and the telephone service area of Oceanic Time Warner Cable.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project will require electrical and telephone services; however, significant adverse impacts to these systems are not anticipated. The electrical and telephone lines will be extended overhead from the existing system.

E. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined by Title 11, Chapter 200, HAR, Environmental Impact Statement Rules as:

“the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”

A “secondary impact” or “indirect effect” from the proposed action are defined by Title 11, Chapter 200, HAR as

“effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”

In this case, the context for analyzing secondary and cumulative impacts is defined by the time horizon within which “reasonably foreseeable” conditions may occur. From a local

planning standpoint, the future context for development is established by the Maui County General Plan which defines parameters for growth. The Maui General Plan was updated in 2012 and plans for the horizon year 2030. Thus, “reasonably foreseeable” conditions may be considered within this future context.

The Maui County General Plan, as set forth in Chapter 2.80.B of the Maui County Code, provides for the update of the County General Plan. The General Plan is a long-term, comprehensive blueprint for the physical, economic, environmental development and cultural identity of the County through 2030. The components of the General Plan include the following:

- The Countywide Policy Plan provides broad policies and objectives which portrays the desired direction of the County’s future. It includes a countywide vision, statement of core principles, and objectives and policies for population, land use, the environment, the economy, and housing.
- The MIP provides a land use strategy, water assessment, nearshore ecosystem assessment, an implementation strategy, and milestone measurements. An essential element of the MIP is a Managed and Directed Growth Plan which identifies existing and future land use patterns and determines planned growth.
- The nine (9) Community Plans provide implementing actions based on consistency with the Countywide Policy Plan and MIP’s vision, goals, objectives, and policies.

A discussion of how the proposed project is consistent with specific goals, objectives, and policies of the Countywide Policy Plan, Maui Island Plan, and Kihei-Makena Community Plan are presented in Chapter III of this EA document.

Whereas the Countywide Policy Plan covers planning goals and objectives at the broadest levels, and the regional Community Plans consider specific regional needs and opportunities, the MIP addresses functional elements of the General Plan, and address islandwide growth parameters.

The MIP is used by the County Council, Maui Planning Commission, County administration and the community as a policy foundation for day-to-day decision making by doing the following:

- Providing direction for the development of future policies and regulations (for example, zoning and other ordinances, guidelines and area-specific plans that describe what kind of development can occur where);

- Providing policies to help determine the appropriateness of development proposals; and
- Assigning resource for capital investments and programmatic initiatives.

The Directed Growth Plan, which is a key element of the MIP, provides a framework for managing outcomes of growth based on analysis of natural hazards, sensitive lands, cultural resources, scenic corridors, and related environmental and human community parameters. An important component of the Directed Growth Plan are maps that delineate urban and rural growth areas. Referred to as UGB and Rural Growth Boundaries (RGB), these maps set the boundaries for the physical limits of development. In so doing, the Directed Growth Plan seeks to manage the use of non-urban and non-rural resources important in sustaining the island to the year 2030.

It is noted that other State agencies are planning development in the Pulehunui region. The 20.3-acre DOFAW baseyard project site is located within a larger 285-acre Pulehunui Master Plan proposed by DLNR. In addition, the State Department of Public Safety (PSD) is proposing the Maui Regional Public Safety Complex (MRPSC) at Pulehunui adjacent to the DLNR master plan area. DLNR's Pulehunui Master Plan, as well as the proposed MRPSC, are designated as areas within the UGB by the MIP. The Department of Hawaiian Home Lands (DHHL) owns lands in the Pulehunui region that are proposed for commercial and light industrial development. Future urbanization of these lands at Pulehunui will require environmental review and appropriate land entitlement approvals from the State Land Use Commission and Maui County Council. Review of impacts in the context of land use policies includes standards which identify key indicators which, when exceeded, would require special study or mitigation efforts. Through this process, long-term cumulative impacts will be identified and mitigated prior to land entitlement approvals.

III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawai'i Revised Statutes (HRS), relating to the Land Use Commission (LUC), establishes four (4) major land use districts in which all lands in the state are placed. These districts are designated as "Urban", "Rural", "Agricultural", and "Conservation". The proposed project is located within the State Land Use "Agricultural" district. See **Figure 11**. As the proposed Pulehunui Baseyard is not a permitted use in the State "Agricultural" District, a State Land Use Special Use Permit (SUP) will be required for the project. As the project area is over 15 acres, the County of Maui Planning Commission will submit its recommendation on the SUP and forward it to the State LUC for review and approval as per HRS, Chapter 205A. Pursuant to Section 15-15-95, Hawai'i LUC Rules, certain "unusual and reasonable" uses may be permitted within the "Agricultural" District. The proposed project is consistent with the guidelines for determining an "unusual and reasonable" use as follows:

1. *The use shall not be contrary to the objectives sought to be accomplished by Chapters 205 and 205A, HRS, and the rules of the Commission.*

Response: The general intent of the State Land Use law is "to preserve, protect and encourage the development of land in the State for those uses which are best suited for and in the interest of the public health and welfare of the State of Hawai'i". The proposed Division of Forestry and Wildlife (DOFAW) Pulehunui Baseyard project is contained within the Maui Island Plan's (MIP) designation of the Urban Growth Boundary (UGB) for directed urban growth. The project will support the government operations of DOFAW which serves the community, and is not contrary to Chapter 205 and 205A, HRS and the rules of the Commission.

Chapter 205A, HRS Coastal Zone Management Program, sets out to preserve, protect and where possible, restore the natural resources of the coastal zone of Hawai'i. The project site is located inland on the Island of Maui Isthmus and a distance away from the shoreline. As such the project is not expected to adversely impact coastal zone resources or access to the shoreline.

2. *The desired use would not adversely affect surrounding property.*

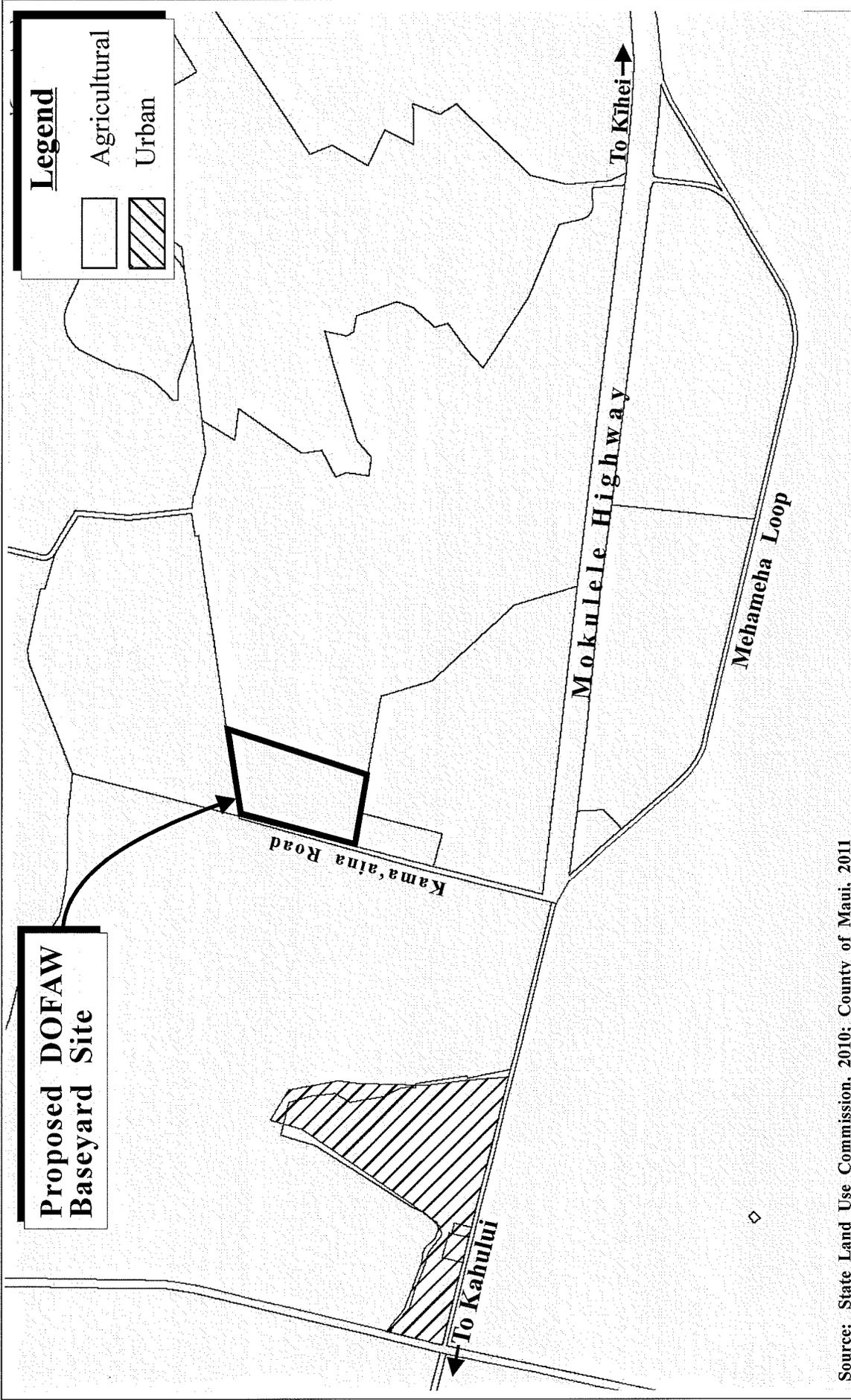


Figure 11 Proposed DOFAW Baseyard at Pulehunui
 State Land Use District Map

NOT TO SCALE



Prepared for: State of Hawai'i, Department of Land and Natural Resources



SOH/DLNR/DOFAW by Pulehunui/SLUD

Response: The proposed site is located north of the Hawai'i National Guard Armory facility and Maui Humane Society animal shelter, and is in proximity to the Maui Motor Sports Park. Sugar cane fields, which will cease operations by end of 2016, are also located in the nearby surrounding area. As previously noted, the Pulehunui region has been transitioning from agricultural uses to other industrial and government uses, which is consistent with the UGB of the MIP.

With implementation of measures for dust control and drainage systems, adverse impacts to surrounding properties are not anticipated from the proposed project. The proposed project is also not anticipated to adversely impact future diversified agriculture uses that may occur on neighboring lands in the future following the end of sugar cane cultivation.

3. *The use would not unreasonably burden public agencies to provide roads and streets, sewers, water, drainage and school improvements, and police and fire protection.*

Response: Access to the site will be provided by existing roadways. DLNR DOFAW will improve necessary infrastructure such as water, wastewater, and drainage facilities to service the proposed project. The proposed project is intended to support DOFAW operations and will not burden public services such as education, police, and fire protection.

4. *Unusual conditions, trends, and needs have arisen since the district boundaries and rules were established.*

Response: DOFAW's current mission is to manage and protect watersheds, native ecosystems and cultural resources, and provide outdoor recreation and sustainable forest product opportunities while facilitating partnerships, community involvement and education. The proposed project provides DOFAW with a location that allows development and expansion of its baseyard operations to meet its current objectives. The MIP, which was adopted by the County of Maui on December 28, 2012, includes the project area in the UGB.

5. *The land upon which the proposed use is sought is unsuited for the uses permitted within the district.*

Response: Uses in the area are trending away from agricultural use towards industrial and government use. The proposed use is compatible with the existing surrounding non-agricultural uses (e.g. Maui Motor Sports Park, Hawai'i Army National Guard Armory). As previously noted, the project area is within the MIP designated UGB and is consistent with the objective of industrial uses, including government uses.

As discussed previously in this report, the 20.3 acres Hawaiian Commercial & Sugar Company (HC&S) currently cultivates within the project area represents a small percentage of the company's total acreage in active sugar cane cultivation. HC&S recently announced the cessation of its sugar cane operations by the end of 2016. The development of the proposed project will not impair agricultural production on lands surrounding the project site. As such, the proposed project should not adversely impact surrounding agricultural lands.

The DLNR would seek a duration of ten (10) years for the SUP based on the level of investment and phasing of improvements for the project.

B. HAWAI'I STATE PLAN

Chapter 226, HRS, also known as the Hawai'i State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. Examples of State objectives and policies relevant to the proposed project are as follows:

1. Section 226-05. Objective and policies for population. It shall be the policies of the State to:

Policies:

- *Manage population growth statewide in a manner that provides increased opportunities for Hawai'i's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.*
- *Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.*
- *Promote increased opportunities for Hawai'i's people to pursue their socio-economic aspirations throughout the islands.*
- *Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.*

Response: The proposed project will support DOFAW's operations on Maui in an area identified for future growth by the Maui Island Plan. The Pulehunui Baseyard will provide existing and future DOFAW employees with an improved work facility.

2. **Section 226-6. Objective and policies for the economy. It shall be the objectives of the State to:**

Objectives:

- *Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.*
- *A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.*

Response: The proposed project will support DOFAW's existing and future employees on Maui by providing a new and expanded baseyard facility.

3. **Section 226-14. Objectives and policies for facilities systems. It shall be the objective of the State to:**

Objective:

- *Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.*

Policies:

- *Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.*
- *Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.*

Response: The proposed project will support DOFAW's operations on Maui in an area identified for future growth by the Maui Island Plan. A State Special Use Permit and County Conditional Permit will be required.

4. **Section 226-27. Objectives and policies for socio-cultural advancement--government. It shall be the objective and policies of the State to:**

Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:

Objectives:

- *Efficient, effective, and responsive government services at all levels in the State.*
- *Fiscal integrity, responsibility, and efficiency in the state government and county governments.*

Policies:

- *Provide for necessary public goods and services not assumed by the private sector.*
- *Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.*

Response: The proposed action would allow DOFAW to consolidate their administrative and field operations at a single, expanded baseyard facility and support DOFAW's mission of managing and protecting watersheds, native ecosystems and cultural resources and to facilitate partnerships, community involvement, and education.

The proposed Pulehunui Baseyard project is in consonance with the objectives and policies for preserving the quality of the physical environment and enhancing the quality of life within the community.

C. AGRICULTURE STATE FUNCTIONAL PLAN, 1991

The Agriculture State Functional Plan, adopted in 1991, is one of 12 State Functional Plans intended to further define the Hawai'i State Plan. One of the objectives of the Agriculture Functional Plan is "*achievement of productive agricultural use of lands most suitable and needed for agriculture.*" Specifically, it is a policy of the Functional Plan to "*conserve and protect important agricultural lands in accordance with the Hawai'i State Constitution*" (State of Hawai'i, Department of Agriculture, 1991). As previously mentioned, the proposed project is not located on lands designated as Important Agricultural Lands (IAL).

The Agriculture Functional Plan also supports a system of standards, criteria, and procedures “to redesignate parcels of ‘important agricultural lands’ to ‘urban’ or ‘other use’ upon a demonstrated change of economic or social conditions, where the requested redesignation will provide greater benefits to the public than its retention in the IAL district” (State of Hawai‘i, Department of Agriculture, 1991). The proposed project does not involve lands designated as IAL. Economic and social conditions have evolved over the past few decades, with the plantation agriculture declining in Hawai‘i. The proposed use of the lands for the DOFAW Pulehunui Baseyard would enable the agency to carry out its mission to protect native ecosystem through the establishment of a native plant nursery and dry land native forest. These uses would also provide long-term public benefit.

D. MAUI COUNTY GENERAL PLAN

As indicated by the Maui County Charter, the purpose of the general plan shall be to:

... indicate desired population and physical development patterns for each island and region within the county; shall address the unique problems and needs of each island and region; shall explain opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns and characteristics of future developments. The general plan shall identify objectives to be achieved, and priorities, policies, and implementing actions to be pursued with respect to population density; land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development.

Chapter 2.80B of the Maui County Code, relating to the General Plan and Community Plans, implements the foregoing Charter provision through enabling legislation which calls for a Countywide Policy Plan and a MIP. The Countywide Policy Plan was adopted as Ordinance No. 3732 on March 24, 2010.

Chapter 2.80B of the Maui County Code, relating to the General Plan and Community Plans, implements the foregoing Charter provision through enabling legislation which calls for a Countywide Policy Plan and a MIP. The Countywide Policy Plan was adopted as Ordinance No. 3732 on March 24, 2010, while the MIP, which delineates areas for future urban and rural growth as part of a Directed Growth Strategy, was adopted as Ordinance No. 4004 on December 28, 2012.

The following sections identify pertinent objectives, policies, implementing actions and related provisions set forth in the Countywide Policy Plan and the MIP. It is recognized

that both documents are comprehensive in nature and address a number of functional planning areas which apply to all programs, plans, and projects. However, for purposes of addressing General Plan compliance requirements, policy considerations which are deemed most relevant in terms of compatibility and consistency are addressed in this report section.

1. Countywide Policy Plan

With regard to the Countywide Policy Plan, Section 2.80B.030 of the Maui County Code states the following.

The countywide policy plan shall provide broad policies and objectives which portray the desired direction of the County's future. The countywide policy plan shall include:

1. *A vision for the County;*
2. *A statement of core themes or principles for the County; and*
3. *A list of countywide objectives and policies for population, land use, the environment, the economy, and housing.*

Core principles set forth in the Countywide Policy Plan are listed as follows:

1. *Excellence in the stewardship of the natural environment and cultural resources;*
2. *Compassion for and understanding of others;*
3. *Respect for diversity;*
4. *Engagement and empowerment of Maui County residents;*
5. *Honor for all cultural traditions and histories;*
6. *Consideration of the contributions of past generations as well as the needs of future generations;*
7. *Commitment to self-sufficiency;*
8. *Wisdom and balance in decision making;*
9. *Thoughtful, island appropriate innovation; and*
10. *Nurturance of the health and well-being of our families and our communities.*

Congruent with these core principles, the Countywide Policy Plan identifies goals objectives, policies and implementing actions for pertinent functional planning categories, which are identified as follows:

1. *Natural environment*
2. *Local cultures and traditions*
3. *Education*
4. *Social and healthcare services*
5. *Housing opportunities for residents*
6. *Local economy*
7. *Parks and public facilities*
8. *Transportation options*
9. *Physical infrastructure*
10. *Sustainable land use and growth management*
11. *Good governance*

With respect to the proposed DOFAW Pulehunui Baseyard project the following goals, objectives, policies, and implementing actions are illustrative of the project's compliance with the Countywide Policy Plan.

STRENGTHEN THE LOCAL ECONOMY

Goal:

Maui County's economy will be diverse, sustainable, and supportive of community values.

Objective:

Promote an economic climate that will encourage diversification of the County's economic base and sustainable rate of economic growth.

Policy:

- *Support economic decisions that create long-term benefits.*

IMPROVE PHYSICAL INFRASTRUCTURE

Goal:

Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies.

Objectives:

- *Direct growth in a way that makes efficient use of existing infrastructure and to areas where there is available infrastructure capacity.*
- *Improve water systems to assure access to sustainable, clean, reliable and affordable sources of water.*

Policy:

Promote land use patterns that can be provided with infrastructure and public facilities in a cost-effective manner.

In summary, the proposed project is consistent with the themes and principles of the Countywide Policy Plan.

2. Maui Island Plan

The MIP is applicable to the island of Maui only, providing more specific policy-based strategies for population, land use, transportation, public and community facilities, water and sewage systems, visitor destinations, urban design, and other matters related to future growth.

As provided by Chapter 2.80B, the MIP shall include the following components:

1. *An island-wide land use strategy, including a managed and directed growth plan*
2. *A water element assessing supply, demand and quality parameters*
3. *A nearshore ecosystem element assessing nearshore waters and requirements for preservation and restoration*
4. *An implementation program which addresses the County's 20-year capital improvement requirements, financial*

program for implementation, and action implementation schedule

5. *Milestone indicators designed to measure implementation progress of the MIP*

The MIP addresses a number of planning categories with detailed policy analysis and recommendations which are framed in terms of goals, objectives, policies and implementing actions. These planning categories address the following areas:

1. *Population*
2. *Heritage Resources*
3. *Natural Hazards*
4. *Economic Development*
5. *Housing*
6. *Infrastructure and Public Facilities*
7. *Land Use*

The proposed Pulehunui Baseyard project is located within the UGB established by the MIP. Refer to **Figure 9**.

The proposed project has been reviewed with respect to pertinent goals, objectives, policies and implementing actions of the MIP. A summary of these policy statements are provided below:

LAND USE

Goal:

Maui will have livable human-scale urban communities, an efficient and sustainable land use pattern, and sufficient housing and services for Maui residents.

Objective:

Facilitate and support a more compact, efficient, human-scale urban development pattern.

Policies:

- *Ensure higher-density compact urban communities, infill, and redevelopment of underutilized urban lots within Urban Growth Boundaries.*
- *Strengthen evaluation requirements for new urban expansion, new towns and major urban infill projects within urban growth areas. Tailor submittal requirements to reflect the impact or scale of different projects.*

INFRASTRUCTURE AND PUBLIC FACILITIES

Goal:

Maui will have adequate public facilities that meet the diverse needs of residents.

Objective:

More effective planning for public facilities to meet community needs.

Policy:

Ensure the development and update of island-wide public facilities functional plans that incorporate prioritized facilities, programs, and a financial component.

DIRECTED GROWTH PLAN

Goal:

Maui will have well-serviced, complete, and vibrant urban communities and traditional small towns through sound planning and clearly defined development expectations.

Policy:

The County, with public input, will be responsible for designating new growth areas where infrastructure and public facilities will be provided, consistent with the policies of the MIP and in accordance with State and County infrastructure plans.

E. KĪHEI-MAKENA COMMUNITY PLAN

Within Maui County, there are nine (9) community plan regions. From a General Plan implementation standpoint, each region is governed by a community plan which sets forth desired land use patterns, as well as goals, objectives, policies, and implementing actions for a number of functional areas including infrastructure-related parameters.

The project area is located within the Kīhei-Makena Community Plan region, a development plan area that is designated as Agriculture. See **Figure 12**.

The proposed project involves 20.3 acres which represent a small portion of “agricultural” lands on the island and is not anticipated to adversely impact existing agricultural uses or cultivation of surrounding areas. The project area represents a class of the lowest productivity of soils in the region and is within the UGB of the MIP. Nonetheless, portions of the project site will be used for nursery and dry land forest restoration. These uses will be beneficial to preserve and maintain future agricultural uses related to forestry resources.

The proposed project is in compliance with the following Kīhei-Makena Community Plan goals, objectives, and policies.

ECONOMIC ACTIVITY

Goal:

A diversified and stable economic base which serves resident and visitor needs while providing long-term resident employment.

Objectives and Policies:

- a. Establish a sustainable rate of economic development consistent with concurrent provision of needed transportation, utilities, and public facilities improvements.*
- d. Establish balance between visitor industry employment and non-visitor industry employment.*
- f. Increase the availability and variety of commercial services to provide for regional needs and strategically establish small scale commercial uses within, or in close proximity to, residential areas.*

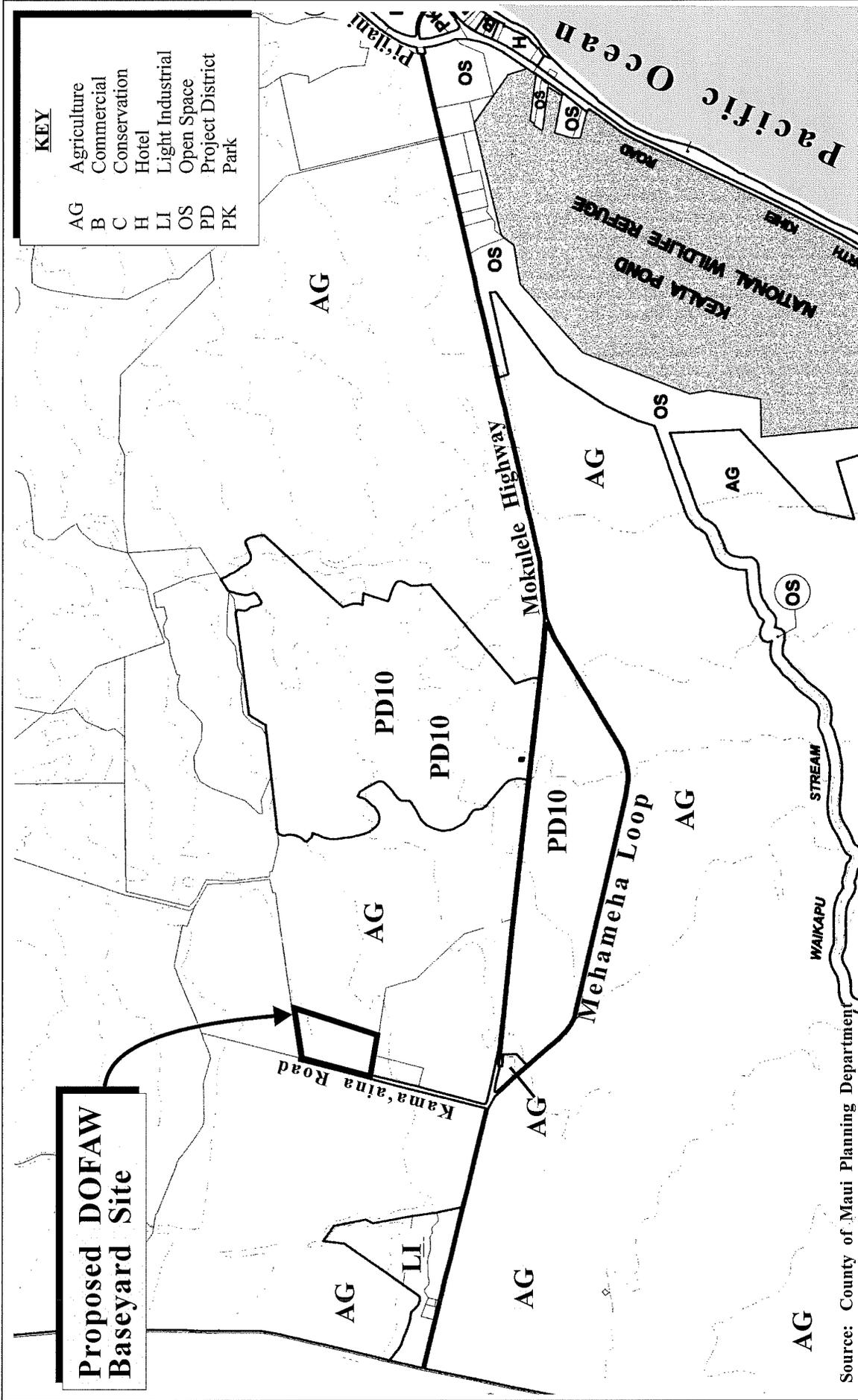
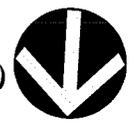


Figure 12 Proposed DOFAW Baseyard at Pulehunui
 Kīhei-Makena Community Plan Map

NOT TO SCALE



PHYSICAL AND SOCIAL INFRASTRUCTURE

Goal:

Provision of facility systems, public services and capital improvement projects in an efficient, reliable, cost effective, and environmentally sensitive manner which accommodates the needs of the Kihei-Makena community, and fully support present and planned land uses, especially in the case of project district implementation.

Allow no development for which infrastructure may not be available concurrent with the development's impacts.

GOVERNMENT

Goal:

Efficient, effective and responsive government services in the Kihei-Makena region.

Objective and Policy

- a. *Improve the delivery of services by government agencies to the Kihei-Makena region.*

F. COUNTY ZONING

The proposed DLNR DOFAW Pulehunui Baseyard Project area is zoned "Agricultural" District by the County of Maui. As a baseyard is not a permitted use, a County Conditional Permit (CP) will be required for the project. As set forth in Chapter 19.40 of the Maui County Code, the intent of the CP is to provide the opportunity to establish uses that are not specifically permitted within the agricultural zoning district where the proposed use is similar, related or compatible to those permitted uses and which has some special impact or uniqueness such that its effect on the surrounding environment cannot be determined in advance of the use being proposed for a particular location.

DOFAW's current mission is to manage and protect watersheds, native ecosystems and cultural resources and provide outdoor recreation and sustainable forest product opportunities while facilitating partnerships, community involvement, and education. The proposed location for the project allows DOFAW to expand its baseyard operations in order to continue to provide government services to the community, in the management and protection of environmental and cultural resources. The proposed baseyard use is compatible with the nearby permitted Hawai'i National Guard Armory

and the Maui Motor Sports Park and is in proximity to State lands under the control of DLNR. As previously discussed, the surrounding area is in transition from agricultural uses to industrial uses and the project site and its surrounding lands are within the UGB of the MIP.

The Maui Planning Commission may recommend approval for a CP if it finds that the proposed use would not be significantly detrimental to the public interest, convenience and welfare, and will be in harmony with the area in which it is to be located. The Maui County Council takes final action on the request for a CP.

The proposed project is not anticipated to adversely impact environmental, infrastructure and public service parameters, and is considered compatible with the surrounding uses and provides a benefit that is in the public's interest and welfare.

The proposed Pulehunui Baseyard is located within a larger master plan that the DLNR, Land Division will be preparing for approximately 285 acres. The entire Pulehunui Master Plan is a longer-term planning effort and it is noted that a separate Environmental Assessment or Environmental Impact Statement will be prepared at a later date. DLNR-ENG is seeking to proceed with the new Pulehunui Baseyard ahead of the larger master plan, as the need for DOFAW facilities improvements are immediate. During the longer-term planning effort of the Master Plan in the region, the option of pursuing a State Land Use District Boundary Amendment to reclassify the site for the proposed new Pulehunui Baseyard from "Agricultural" to "Urban" will be assessed. To address the immediate need for the proposed project, a CP is required.

The DLNR is seeking a duration of ten (10) years for the CP to coincide with the duration and timeframe of the SUP.

G. HAWAI'I COASTAL ZONE MANAGEMENT PROGRAM - OBJECTIVES AND ENFORCEABLE POLICIES

The project site is not within the County of Maui's Special Management Area (SMA). Nevertheless, an assessment of the development plan pursuant to the Hawai'i Coastal Zone Management Program (HCZMP) is provided as follows.

(1) Recreational Resources

Objective:

Provide coastal recreational opportunities accessible to the public.

Policies:

- a. *Improve coordination and funding of coastal recreational planning and management; and*
- b. *Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*
 - i. *Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
 - ii. *Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;*
 - iii. *Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
 - iv. *Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
 - v. *Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;*
 - vi. *Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;*
 - vii. *Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and*
 - viii. *Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.*

Response: The proposed action is located on the Central Maui isthmus inland of the ocean and is not anticipated to affect existing coastal recreational resources. Access to the shoreline areas will remain unaffected by the proposed project.

(2) **Historic Resources**

Objective:

Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

- a. *Identify and analyze significant archeological resources;*
- b. *Maximize information retention through preservation of remains and artifacts or salvage operations; and*
- c. *Support state goals for protection, restoration, interpretation, and display of historic resources.*

Response: Based on the negative findings of the Archaeological Assessment Report, no further archaeological work is recommended for the project area. Interviews with individuals knowledgeable with the area indicated no cultural practices are carried out at or near the project site. As such, it is anticipated the proposed project will not affect historic resources. Nevertheless, if cultural resources are uncovered during ground altering activities, all work will stop in the affected area and the State Historic Preservation Division (SHPD) will be contacted for appropriate protocols and evaluation for potential impact.

(3) **Scenic and Open Space Resources**

Objective:

Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

- a. *Identify valued scenic resources in the coastal zone management area;*

- b. *Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;*
- c. *Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and*
- d. *Encourage those developments that are not coastal dependent to locate in inland areas.*

Response: As an inland action, the proposed project is not anticipated to adversely impact coastal and scenic open space resources.

(4) **Coastal Ecosystems**

Objective:

Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

- a. *Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;*
- b. *Improve the technical basis for natural resource management;*
- c. *Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;*
- d. *Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and*
- e. *Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.*

Response: As an inland action, the proposed project is not anticipated to adversely impact coastal ecosystems. The proposed project includes drainage improvements to avoid significant adverse impacts to surrounding properties.

Best Management Practices (BMPs) to mitigate urban runoff set forth in the Hawai'i Watershed Guidance will be reviewed and, as appropriate, included in the implementation of the project.

(5) **Economic Uses**

Objective:

Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

- a. *Concentrate coastal dependent development in appropriate areas;*
- b. *Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and*
- c. *Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:*
 - i. *Use of presently designated locations is not feasible;*
 - ii. *Adverse environmental effects are minimized; and*
 - iii. *The development is important to the State's economy.*

Response: The proposed project will support short-term construction and construction-related jobs while in the long term provide support services to government.

(6) **Coastal Hazards**

Objective:

Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

Policies:

- a. *Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;*
- b. *Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;*
- c. *Ensure that developments comply with requirements of the Federal Flood Insurance Program; and*
- d. *Prevent coastal flooding from inland projects.*

Response: The project site is located within Zone “X”, areas determined to be outside the 0.2 percent annual chance floodplain of minimal flooding and is outside the tsunami evacuation zone. The proposed project includes drainage improvements to avoid significant adverse impacts to surrounding properties.

(7) **Managing Development**

Objective:

Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

- a. *Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;*
- b. *Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and*
- c. *Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.*

Response: The proposed project shall be reviewed and processed pursuant to Chapter 343, HRS, and through the SUP and CP permitting processes. Public review will be coordinated through this process. The DLNR-Engineering

(DLNR-ENG) has also met with surrounding landowners to discuss the scope of the proposed project.

(8) **Public Participation**

Objective:

Stimulate public awareness, education, and participation in coastal management.

Policies:

- a. *Promote public involvement in coastal zone management processes;*
- b. *Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and*
- c. *Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Response: As noted above, opportunity for public awareness, education and participation pertaining to significant resource attributes of the coastal zone is provided through Chapter 343, HRS procedures, and the SUP and CP review processes which provide for public review of the project. DLNR-ENG has met with surrounding landowners to discuss the scope of the project.

(9) **Beach Protection**

Objective:

Protect beaches for public use and recreation.

Policies:

- a. *Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;*
- b. *Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved*

aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

- c. Minimize the construction of public erosion-protection structures seaward of the shoreline.*

Response: As an inland action, the proposed project will not impact shoreline activities, and as such adverse impact to beach processes are not expected.

(10) Marine Resources

Objective:

Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;*
- c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- d. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*
- e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Response: As an inland action, the proposed project will not impact marine resources.

In addition to the foregoing objectives and policies and pursuant to Act 224 (2005):

No special management area use permit or special management area minor permit shall be granted for structures that allow artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:

- (1) Directly illuminates the shoreline and ocean waters; or*
- (2) Is directed to travel across property boundaries toward the shoreline and ocean waters.*

Further, this prohibition shall not apply to authorized users for government operations, security, public safety, or navigational needs; provided that a government agency or its authorized users shall make reasonable efforts to properly position or shield lights to minimize adverse impacts.

Response: The proposed project is located inland of the shoreline. The preliminary plans for the project will be designed to ensure that light fixtures shield to comply with the dark sky lighting requirements and are not directed across property boundaries.

IV. ALTERNATIVES TO THE PROPOSED ACTION

IV. ALTERNATIVES TO THE PROPOSED ACTION

A. CONTEXT FOR ALTERNATIVES ANALYSIS

Resource management responsibilities for DOFAW have increased over the years since its original baseyard was established in Kahului in the mid-1970s. New and expanded facilities are needed to meet demands of their mission and anticipated management purview. In this regard, the “No Action” alternative and the “Deferred Action” alternative are not considered appropriate as the “status quo” direction inferred by these alternatives would compromise DOFAW’s ability to meet their resource management mandates.

The Division of Forestry and Wildlife (DOFAW) has taken a comprehensive approach towards addressing options for current and future facility requirements for its Maui operations. The 20.3-acre site at Pulehunui provides space for offices, laboratory/warehouses, equipment storage, maintenance facilities, fueling station, parking, nursery operations, and a dryland forest restoration area. Therefore, the Pulehunui Baseyard location is DOFAW’s preferred choice for its new facility as it offers opportunity to meet the full range of the division’s operating needs, both for the short and long term.

While the Pulehunui Baseyard location is the preferred alternative, DOFAW is also considering the alternative of renovating the existing Kahului Baseyard, on TMK No. (2)3-8-079:018 (por.). Although the renovation of the existing Kahului Baseyard does not ideally address the long-term needs of the Division, it may be selected if funding levels are lower than required for the Pulehunui Baseyard alternative, but sufficient to enable a phased approach to develop the Kahului Baseyard for the shorter term. Therefore, the Kahului Baseyard Renovation is evaluated as a secondary option in this Environmental Assessment (EA).

To ensure that Chapter 343, Hawai‘i Revised Statutes (HRS) requirements for the Kahului Baseyard renovation alternative are also addressed, a detailed assessment of this alternative is presented herein. The assessment of the Kahului Baseyard renovation alternative addresses the environmental assessment content requirements of Hawai‘i Administrative Rules (HAR), Chapter 200 - Environmental Impact Statement Rules.

B. ASSESSMENT OF THE KAHULUI BASEYARD RENOVATION ALTERNATIVE

1. Description of the Kahului Baseyard Renovation Alternative

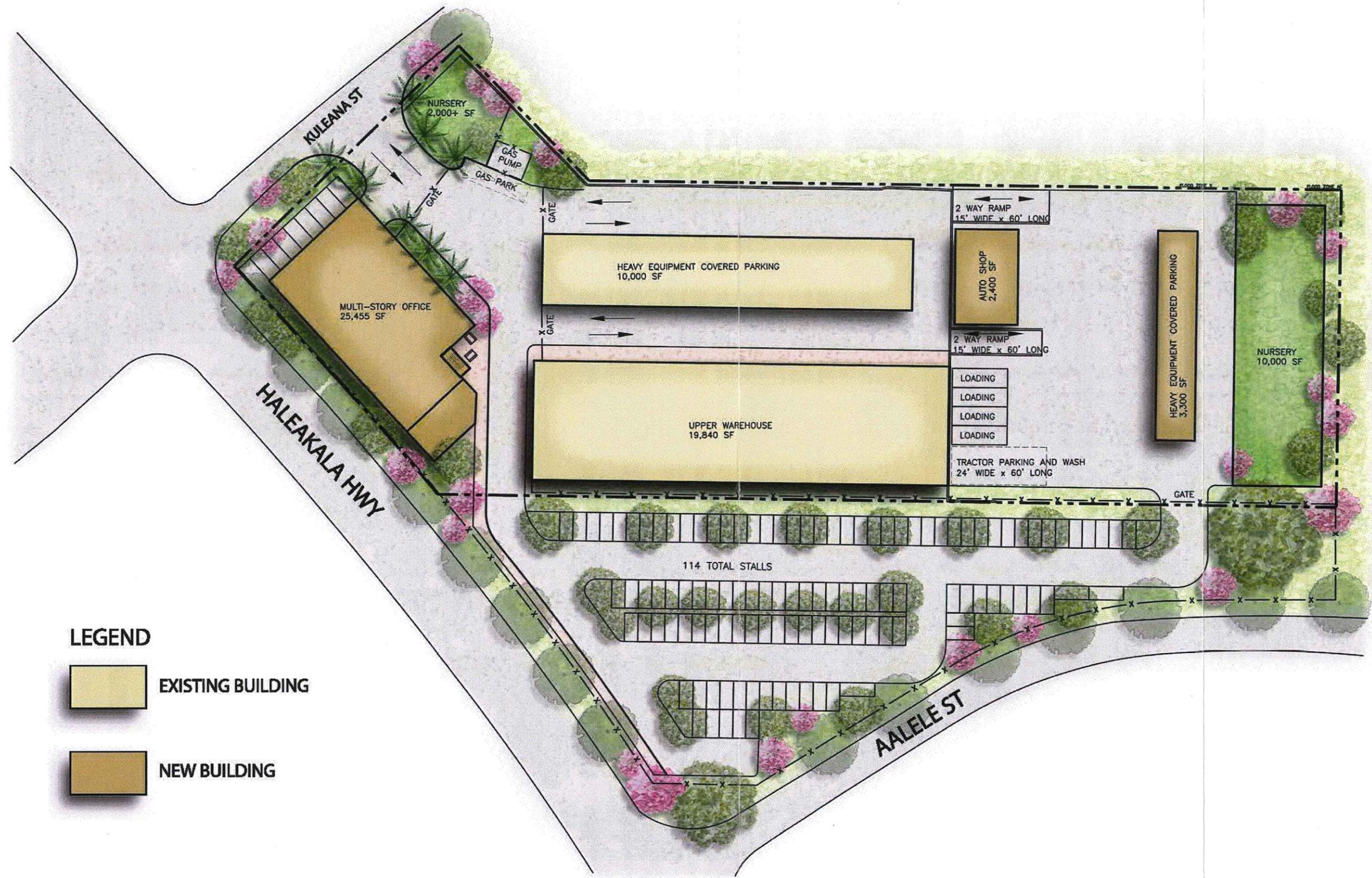
The existing Kahului Baseyard is almost 40 years old and does not currently have sufficient office space and support facilities to meet DOFAW's current and future needs. The proposed renovation action at the Kahului facility would include upgrading of the existing warehouse space, construction of a new multi-story office building, employee support facilities, plant nursery, covered parking, and relocation of the existing automotive repair shop on TMK (2) 3-8-079:018(por.) and proposed new parking and landscaping on TMK (2) 3-8-001:019(por.). See **Figure 13**.

Construction of the proposed renovation to and expansion of the existing Kahului Baseyard is estimated at \$24 million.

2. Summary of the Existing Environment, Potential Impacts, and Mitigation Measures

The existing Kahului Baseyard is located on three (3) acres of land, approximately 1,500 feet southwest of the Kahului Airport. It currently consists of a warehouse with minimal office space, showers, covered and uncovered parking areas, and an auto shop.

The potential impacts to the environment resulting from the proposed Kahului Baseyard renovations have been assessed and are summarized in **Table 3**.



LEGEND

- EXISTING BUILDING
- NEW BUILDING

Source: Bowers + Kubota

Figure 13

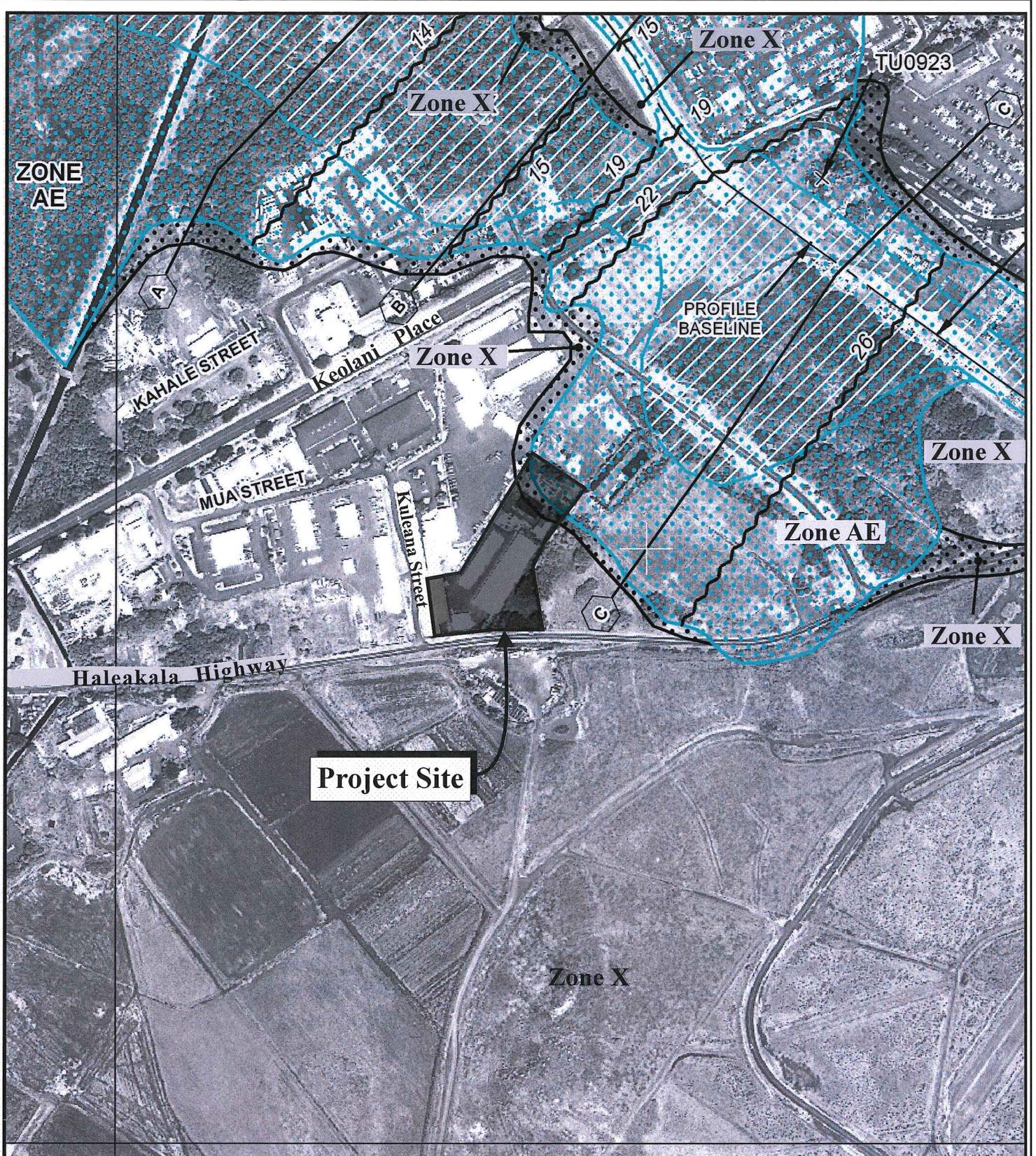
Proposed DOFAW Baseyard at Pulehunui
 Conceptual Site Plan for the Kahului Baseyard Renovation Alternative

NOT TO SCALE



Table 3. Assessment of Potential Impacts to the Environment

| Considerations | Existing | Impact/Mitigation |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surrounding Land Uses | Industrial and commercial activities, including the Kahului Airport, DAGS, DWS, and DOT baseyards, and car rental operations. | The proposed renovation alternative would result in a land use development plan consistent with surrounding uses. No adverse impacts are anticipated. |
| Climate, Topography, and Soils | Mild and uniform temperatures with moderate humidity, and tradewinds; onsite elevations ranging from 19 to 41 amsl; well-drained and excessively drained soils of the Pulehu-Ewa-Jaucas association. | No adverse impacts are anticipated. |
| Flood and Tsunami | The majority of proposed improvements are within Flood Zone X (unshaded), however, a small portion of the project area is located in Zones X (shaded) and AE with base flood elevations of 22-26 feet. See Figure 14 . The project is located within a tsunami evacuation zone. | The project consists of improvements to the existing DOFAW baseyard approximately 3,000 feet from the nearest coastline. A Special Flood Hazard Development Permit may be required for structures in the AE flood zone and will be obtained as applicable. DOFAW has Emergency Operations Procedures in place to ensure safe evacuation of employees during tsunami events. |
| Streams and Wetlands | Man-made drainage canals define the northeastern and northwestern borders of the project site. Kanahā Pond is located east of the project site beyond the drainage canal on the northeastern border. There are no streams or reservoirs in the vicinity of the project site. | The Kahului Baseyard is not contiguous to Kanahā Pond. Improvements to the baseyard will employ Best Management Practices (BMPs) to ensure that offsite environments, such as the pond, are not adversely affected. |
| Flora and Fauna | Flora observed at the project site include kiawe trees, patches of non-native grasses, and light landscaping. Several species of nonnative birds, animals, and insects are known to occur in the area. | No Federally listed endangered or threatened species of plants, animals, or birds are on site; therefore, no adverse impacts are anticipated. |
| Archaeological and Cultural Resources | According to SHPD's consultation comment letter dated February 26, 2015 and a cultural interview with Mr. Robert Hobdy conducted on February 6, 2015, no historic or cultural sites are located on the project site. | No adverse impacts to archaeological or cultural resources are anticipated. |
| Air and Noise | Air quality in the Wailuku-Kahului region is considered good. Noise quality at the project site is impacted by automotive and air traffic. | Temporary construction-related impacts will be mitigated through BMPs. No long-term impacts are anticipated. |



Source: National Flood Insurance Program Map No. 1500030411E

Figure 14 Proposed DOFAW Baseyard
at Pulehunui
Flood Insurance Rate Map for Kahului
Baseyard Renovation Alternative

NOT TO SCALE



Prepared for: State of Hawai'i, Department of Land and Natural Resources

SOH DLNR/DOFAW BY Pulehunui/FIRM

| Considerations | Existing | Impact/Mitigation |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scenic and Open Space | The project is located in a commercial and industrial area in Kahului and is not part of a designated scenic corridor. | No adverse impacts are anticipated. |
| Socio-Economic Environment | Maui's economy is relatively stable, with strong population growth over the last decade and a decreasing unemployment rate over the last year. | Short-term economic benefits associated with construction-related employment are anticipated. No adverse long-term economic impacts are associated with the project. |
| Public Services | There are currently recreational, police and fire protection, solid waste, healthcare, and educational facilities that serve the area. | The alternative of renovating the existing Kahului Baseyard will not extend service areas for emergency services, nor would it create added demands for educational, recreational, and healthcare facilities. |
| Infrastructure | There are existing roadway, water, wastewater, drainage, electrical, and communication infrastructure to serve the project area. | <p>The proposed renovation improvements, if implemented, will utilize existing infrastructure service currently serving the baseyard facility. The incremental demands generated by the proposed renovations are not anticipated to adversely affect wastewater, water, electrical, and communications systems.</p> <p>A Traffic Impact Analysis Report (TIAR) has been prepared for the Kahului Baseyard alternative. No roadway improvements are recommended as a result of this alternative. See Appendix "H".</p> |

3. Consistency with Plans, Policies, and Land Use Controls

The Kahului Baseyard is in the State Land Use "Urban" District, is zoned "Airport District" by Maui County, and is designated "Airport" by the Wailuku-Kahului Community Plan. Additionally, the Kahului Baseyard is located in the Special Management Area (SMA). The proposed renovations and uses are consistent with the current State Land Use, Countywide Policy Plan, and Maui Island Plan (MIP) designation.

In the event the Kahului Baseyard alternative is pursued in the future, a SMA Use Permit would be required from the Maui Planning Commission. Additionally, a Change in Zoning (CIZ) from "Airport" to "Public/Quasi-Public" and a Community Plan Amendment (CPA) would be required from the Maui County Council.

The proposed action is consistent with the following Hawai'i State Plan Objectives and Policies. See **Table 4**.

Table 4. Assessment of Compliance with Hawai'i State Plan Objectives and Policies

| Section No. | Policy/ Objective No. | Objective/Policy | Response |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 226-05. Objective and policies for population | (2) | <i>Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.</i> | The proposed action would create expanded employment opportunities and an improved work facility for existing and new DOFAW employees on Maui. |
| | (3) | <i>Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.</i> | |
| Section 226-6. Objective and policies for the economy | (1) | <i>Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.</i> | The proposed action would create expanded opportunities for gainful employment on Maui. The proposed action would provide improved working conditions and support facilities for existing and new DOFAW employees. |
| | (11) | <i>Maintain acceptable working conditions and standards for Hawaii's workers.</i> | |
| Section 226-11. Objectives and policies for the physical environment – land- based, shoreline, and marine resources | (4) | <i>Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.</i> | The proposed action would improve the usability of the lands underlying the existing DOFAW Baseyard without creating significant adverse impacts to natural resources. |
| | (8) | <i>Pursue compatible relationships among activities, facilities, and natural resources.</i> | |
| Section 226-14. Objective and policies for facility systems – in general | (1) | <i>Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.</i> | The proposed action would improve an existing facility that is in consonance with the State Land Use, Countywide Policy Plan, and Maui Island Plan designation. A County Change in Zoning and Community Plan Amendment would be required. |
| | (2) | <i>Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.</i> | |
| Section 226-27. Objectives and policies for socio-cultural advancement – government | (1) | <i>Efficient, effective, and responsive government services at all levels in the State.</i> | The proposed action would allow DOFAW to consolidate their administrative and field operations at their existing Baseyard. |

The proposed improvements are consistent with the SMA and Coastal Zone Management objectives and policies. See **Table 5**.

Table 5. Assessment of Compliance with Coastal Zone Management Program Objectives

| Considerations | Objective | Response |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recreational Resources | Provide coastal recreational opportunities accessible to the public. | The Kahului Baseyard site is located approximately 3,000 feet from the nearest coastline. The proposed renovation alternative will not affect nearby coastal recreational opportunities. |
| Historic Resources | Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture. | According to SHPD's consultation comment letter dated 2/26/15, no impacts to historic resources are anticipated as a result of this project. |
| Scenic and Open Space Resources | Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources. | DOFAW's Kahului Baseyard is located in a commercial and industrial area in Kahului and is not part of a designated scenic corridor. Therefore, no adverse impacts are anticipated. |
| Coastal Ecosystem | Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems. | Applicable BMPs and erosion-control measures would be implemented to mitigate runoff and minimize disruption of coastal water ecosystems during construction-related activities. Therefore, no adverse impacts are anticipated. |
| Economic Uses | Provide public or private facilities and improvements important to the State's economy in suitable locations. | In the long term, the renovated Baseyard facilities would co-locate DOFAW field and administrative staff and provide a safe and more efficient work environment for DOFAW employees, improving economic uses of the land. |
| Coastal Hazards | Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution. | The majority of the proposed improvements are located in Flood Zone X (unshaded), with a small portion located within Zones X (shaded) and AE with a base flood elevation between 22-26 feet. A Special Flood Hazard Development Permit may be required for structures in the AE flood zone and will be obtained as applicable. Given that the baseyard is located within a tsunami evacuation zone, DOFAW has an evacuation plan in place. |
| Managing Development | Improve the development review process, communication, and public participation in the management of coastal resources and hazards. | Opportunities for public understanding of the proposed project are provided for in accordance with Chapter 343, HRS notice and public review provisions. Opportunity for public review and participation may also |

| Considerations | Objective | Response |
|----------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| | | be provided pursuant to the SMA Use Permit, CIZ, and CPA review and approval process, should this alternative be pursued. |
| Public Participation | Stimulate public awareness, education, and participation in coastal management. | Public awareness and participation in coastal management are facilitated through the EA, SMA Use Permit, CIZ, and CPA review and approval process. |
| Beach Protection | Protect beaches for public use and recreation. | The Kahului Baseyard site is not located in proximity to shoreline areas, nor is it anticipated to impact shoreline activities or beach processes. |
| Marine Resources | Promote the protection, use, and development of marine and coastal resources to assure their sustainability. | The Kahului Baseyard site does not abut the shoreline and is not anticipated to impact marine or coastal resources in the Kahului area. |

4. List of Permits and Approvals

The following list of permits and approvals are anticipated for the Kahului Baseyard renovation alternative:

a. State of Hawai‘i

- (1) National Pollutant Discharge Elimination System (NPDES) Permits, as applicable
- (2) Noise Permit, as applicable
- (3) Work to Perform in State Right-of-Way, as applicable

b. County of Maui

- (1) SMA Use Permit
- (2) Change in Zoning
- (3) Community Plan Amendment
- (4) Construction Permits (Building Permit, Grading Permit, Flood Hazard Development Permit, as applicable, etc.)

5. Summary of Parties Consulted Regarding the Draft EA for the Kahului Baseyard Renovation

As part of the Kahului Baseyard’s alternative evaluation process, early consultation letters were sent to Federal, State, and County agencies. A summary

of consultation comments received and responses sent are included in this section. See **Table 6**.

Table 6. Consultation for the Kahului Baseyard Renovation Alternative

| Parties Consulted | | Response Received | Comments | Summary of Responses Provided |
|-------------------|----------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Federal | U.S. Department of Army | No | --- | --- |
| | U.S. Fish and Wildlife Service | No | --- | --- |
| State | Department of Accounting and General Services | Yes | <ul style="list-style-type: none"> Proposed project does not impact any of the DAGS projects or facilities. No further comments at this time. | <ul style="list-style-type: none"> Acknowledged DAGS comment that proposed project does not impact DAGS projects or facilities. Acknowledged that DAGS had no further comments. |
| | Department of Agriculture | No | --- | --- |
| | Department of Budget and Finance | Yes | <ul style="list-style-type: none"> No comments. | <ul style="list-style-type: none"> Acknowledged no comments from the department. |
| | Department of Business, Economic Development and Tourism | No | --- | --- |
| | Department of Health (Director) | No | --- | --- |
| | Department of Health Clean Water Branch | Yes | <ul style="list-style-type: none"> Noted that project and related potential impacts to State waters must meet criteria in the Antidegradation policy, designated uses, and water quality. Noted that NPDES permit coverage is required for pollutant discharges into State surface waters and for certain situations involving stormwater. Recommended that the Army Corp of Engineers, Regulatory Branch be contacted if the project involves work in, over, or under waters of the U.S. Noted that all discharges related to project construction or operation activities must comply with the State's Water Quality Standards. Recommended review of standard comments on the Department's website. | <ul style="list-style-type: none"> Applicant will review and adhere to criteria regarding potential impacts to State waters, as applicable. Applicant will adhere to NPDES permit coverage requirements, as applicable. The proposed project does not involve work in, over, or under waters of the U.S. Applicant will review and adhere to State's Water Quality Standards, as applicable. Applicant will review and adhere to applicable comments on the Department's website. |

| Parties Consulted | Response Received | Comments | Summary of Responses Provided |
|----------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Department of Health Maui Sanitation Branch | Yes | <ul style="list-style-type: none"> Noted that NPDES permit coverage may be needed. Recommended standard comments on Department's website be reviewed and applicable comments adhered to. | <ul style="list-style-type: none"> Applicant will adhere to NPDES permit coverage requirements, as applicable. Applicant will review standard comments on the Department's website and adhere to applicable comments. |
| Department of Health Environmental Planning Office | No | --- | --- |
| Department of Land and Natural Resources (Chair) | Yes | <p><u>Engineering Division comments:</u></p> <ul style="list-style-type: none"> Parts of the project site are located in Flood Zones AE and XS. Development in Zones AE and XS must comply with the rules and regulations of the NFIP presented in Title 44, CFR and the community's local flood ordinance. <p><u>Commission on Water Resource Management (CWRM) comments:</u></p> <ul style="list-style-type: none"> Recommend coordination with the Engineering Division to incorporate this project into the State Water Projects Plan. Recommend use of water efficient fixtures. Recommend use of BMPs for stormwater management. Recommend the use of alternative water sources where practicable. Recommend adoption of landscape irrigation conservation BMPs endorsed by the Landscape Industry Council of Hawai'i. Noted that they cannot determine what permits or petitions are required or whether there are potential impacts to water resources until a water source is identified for the project. The Draft EA should include a discussion of the water requirements for the potable and non-potable requirements for the project, calculations used to derive the projected water needs, water conservation and efficiency | <p><u>Responses to Engineering Division comments:</u></p> <ul style="list-style-type: none"> It is noted that parts of the project site are located in Flood Zones AE and XS. Applicant will comply with NFIP rules and regulations as presented in Title 44 of the CFR and the flood ordinance for Maui County, as applicable. <p><u>Responses to CWRM comments:</u></p> <ul style="list-style-type: none"> Applicant will coordinate with DLNR's Engineering Division to incorporate this project into the State's Water Plan, as appropriate. Applicant will consider water efficient fixtures and practices where feasible. Applicant will implement Stormwater BMPs as applicable. Applicant will consider alternative water sources where practicable. Applicant will consider landscape irrigation conservation as feasible. It is noted that DLNR did not comment on permits, petitions, or potential impacts to water resources, as a water source has not yet been identified for the proposed project. Water demand information will be developed as engineering for the project advances. |

| Parties Consulted | Response Received | Comments | Summary of Responses Provided |
|-------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | measures that will be implemented, proposed water sources including alternative sources for non-potable needs, and BMPs for stormwater management. | |
| Department of Land and Natural Resources State Historic Preservation Division | Yes | <ul style="list-style-type: none"> • SHPD believes no historic properties will be affected by the proposed project. • Requested that if historic resources are identified during construction, work should be stopped and SHPD should be notified. | <ul style="list-style-type: none"> • Acknowledged that SHPD believes no historic properties will be affected. • If historic resources are identified during construction, work will be stopped and SHPD notified. |
| Department of Transportation | Yes | <p><u>Highway Division comment:</u></p> <ul style="list-style-type: none"> • Traffic assessment should be prepared and submitted to DOT for review and acceptance. <p><u>Airport Division comments:</u></p> <ul style="list-style-type: none"> • Project is located ½ mile from the airport and will be exposed to aircraft noise and overflights. • FAA form 7460-1 “Notice of Proposed Construction of Alteration” should be submitted. • If a PV system is being considered, a glint and glare analysis should be prepared to ensure that hazardous conditions are not created for pilots. | <p><u>Responses to Highways Division comment:</u></p> <ul style="list-style-type: none"> • A preliminary assessment of traffic impacts has been prepared to assess impacts from this alternative. See Appendix “H”. No improvements were required as a result of this alternative. <p><u>Responses to Airport Division’s comments:</u></p> <ul style="list-style-type: none"> • Project location is exposed to aircraft noise and overflights. • FAA form 7460-1 will be submitted, as applicable. • Applicant will be notified that a glint and glare analysis is required for any PV system being considered. |
| Hawai‘i State Civil Defense | No | --- | --- |
| Office of Environmental Quality Control | No | --- | --- |
| Office of Hawaiian Affairs | No | --- | --- |
| Office of Planning | Yes | <ul style="list-style-type: none"> • Draft EA should include analysis on the project’s ability to meet the objectives and policies in the Hawai‘i State Plan, HRS Chapter 226. • Draft EA should include a section that addresses the proposed project’s ability to meet the | <ul style="list-style-type: none"> • Draft EA will address project’s ability to meet the objectives and policies listed in the Hawai‘i State Plan, HRS Chapter 226. • Draft EA will address project’s ability to meet the objectives and policies in HRS Section |

| Parties Consulted | | Response Received | Comments | Summary of Responses Provided |
|-------------------|------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | <p>objectives and policies in HRS Section 205A-2, Coastal Zone Management.</p> <ul style="list-style-type: none"> • Draft EA should include a list of Federal, State, or County permits required for the project. • The proposed project lies within the SMA. • Given the proximity of the proposed project to Kanahā Pond Wildlife Sanctuary, Kanahā Beach Park, and Kahului Bay, management measures to minimize coastal nonpoint pollution impacts should be reviewed. Please review the Hawai'i Watershed Guidance. • Consider using OP's Stormwater Impact Assessment as part of the development planning process. | <p>205A-2, Coastal Zone Management.</p> <ul style="list-style-type: none"> • Draft EA will include a list of Federal, State, and County permits required for the project. • It is noted that the project lies within the SMA. • Applicant will review the Hawai'i Watershed Guidance and implement BMPs to minimize coastal impacts as applicable. • OP's Stormwater Impact Assessment will be considered for the project. |
| County | Office of Economic Development | No | --- | --- |
| | Department of Environmental Management | Yes | <ul style="list-style-type: none"> • Construction and demolition waste should be disposed at the Maui Demolition and Construction Landfill. Recycle and reuse construction and demolition waste as feasible. • No County wastewater system in the immediate area of the project. | <ul style="list-style-type: none"> • Noted that construction and demolition waste will be recycled or reused as feasible or disposed at the Maui Demolition Construction Landfill. • Wastewater lines servicing the DOFAW Baseyard are owned by the State. |
| | Department of Fire and Public Safety | Yes | <ul style="list-style-type: none"> • No comments at this time. Reserved the right to comment during building permit review. | <ul style="list-style-type: none"> • Acknowledged no comments at this time. |
| | Department of Housing and Human Concerns | Yes | <ul style="list-style-type: none"> • Determined that the project is not subject to Chapter 2.96, Maui County Code. • No additional comments at this time. | <p>Noted the following:</p> <ul style="list-style-type: none"> • Project is not subject to Chapter 2.96, Maui County Code. • No additional comments at this time. |
| | Department of Parks and Recreation | Yes | <ul style="list-style-type: none"> • No comments. | <ul style="list-style-type: none"> • Acknowledged no comments from the department. |
| | Department of Planning | Yes | <ul style="list-style-type: none"> • Confirmed Zoning, Land Use, Maui Island Plan, and Flood Zone designations, and advised that Flood Development Permit will be required. • Requested copy of the Draft EA. | <ul style="list-style-type: none"> • Noted zoning land use and flood zone designations and confirmed that a Flood Development Permit will be secured as applicable. • Confirmed that a copy of the |

| Parties Consulted | | Response Received | Comments | Summary of Responses Provided |
|-------------------|------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | Draft EA will be provided to the Planning Department for review. |
| | Police Department | Yes | <ul style="list-style-type: none"> Recommended that the gate code be forwarded to MPD Central Dispatch. Requested a contact person for the property. No impacts to pedestrian or vehicular traffic are anticipated. Challenges to egress and ingress to the facility during construction should be considered and addressed. | <ul style="list-style-type: none"> The gate code will be forwarded to Maui Police Department Central Dispatch. A contact person for the property has been provided to the Police Department. Impacts to pedestrian or vehicular traffic are not anticipated. Egress and ingress to the facility during construction will be considered and addressed to ensure safe operations. |
| | Department of Public Works | Yes | <ul style="list-style-type: none"> Noted that Kuleana Street is a State Airports Road. Requested confirmation that the State has ownership/ maintenance of Haleakalā Highway adjacent to the project. Noted open permit B2011/1113. No inspections to date. | <ul style="list-style-type: none"> Acknowledged that Kuleana Street is a State Airports Road. Documentation relating to Haleakalā Highway ownership will be provided should this alternative be selected. Acknowledged open permit B2011/1113 with no inspections to date. |
| | Department of Transportation | Yes | <ul style="list-style-type: none"> No comments. | <ul style="list-style-type: none"> Acknowledged no comments from the department. |
| | Department of Water Supply | Yes | <ul style="list-style-type: none"> Noted that the project is serviced by an existing 1½-inch water meter, 8-inch waterline, and fire hydrant #69 and calculations stamped by a licensed engineer or architect will be required during the building permit process to ensure proper meter sizing. Provided a recommended list of indoor and outdoor conservation measures. | <ul style="list-style-type: none"> Applicant will submit certified calculations for meter sizing. Applicant will review and implement recommended indoor and outdoor conservation measures as applicable. |
| Utilities | Maui Electric Company, Ltd. | No | --- | --- |
| | Hawaiian Telcom | No | --- | --- |

Copies of the consultation comment letters and responses can be found in **Appendix “I”**.

6. Significance Criteria Assessment

The “significance criteria”, Section 12 of the Administrative Rules, Title 11, Chapter 200, “Environmental Impact Statement Rules”, were reviewed and analyzed to determine whether the proposed project will have significant impacts on the environment. The following criteria and preliminary analysis are provided in **Table 7**:

Table 7. Significance Criteria Assessment

| Criteria | Preliminary Analysis |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource. | According to the SHPD and the cultural interviews with Mr. Robert Hobby conducted on 2/6/15, no adverse effects to any natural or cultural resources are anticipated. |
| 2. Curtails the range of beneficial uses of the environment. | The proposed alternative involves improvements to DOFAW’s existing baseyard, therefore, it will not curtail the range of beneficial uses of the environment. |
| 3. Conflicts with the state’s long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders. | The proposed alternative does not conflict with Chapter 344 HRS and is consistent with the property’s underlying State land use designation. |
| 4. Substantially affects the economic welfare, social welfare, and cultural practices of the community or State. | Short-term economic benefits associated with construction-related employment are anticipated. Long-term benefits for DOFAW employees are expected from the improved workspace, equipment, facilities, and efficiencies resulting from consolidated field and administrative operations. |
| 5. Substantially affects public health. | No significant impacts on public health are anticipated. |
| 6. Involves substantial secondary impacts, such as population changes or effects on public facilities. | No adverse secondary impacts associated with population growth are expected. Infrastructure systems and services are available to serve the project. Impacts on other public services and facilities are not anticipated. |
| 7. Involves a substantial degradation of environmental quality. | No significant adverse impacts on environmental quality are anticipated. |
| 8. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions. | No adverse cumulative impacts on the environment are anticipated. The proposed project does not involve a commitment to larger actions. |
| 9. Substantially affects a rare, threatened, or endangered species, or its habitat. | No adverse impacts to rare, threatened, or endangered species or habitats are anticipated. |
| 10. Detrimentally affects air or water quality or ambient noise levels. | Temporary construction-related impacts will be mitigated through BMPs. No long-term impacts are anticipated. |

| Criteria | Preliminary Analysis |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters. | The proposed improvements are located within Flood Zone X (unshaded), X (shaded), and AE with a base flood elevation between 22-26 feet. Special Flood Hazard Development Permits may be required for structures in the AE flood zone and will be obtained as applicable. The Kahului Baseyard is also located within a tsunami evacuation zone. It is approximately 3,000 feet from the shoreline, therefore, no adverse impact upon coastal waters or resources are anticipated. Onsite detention basins will be used to ensure that there are no impacts on downstream properties or wetland resources nearby. |
| 12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies. | Adverse impacts to scenic or open space resources and viewplanes are not anticipated. |
| 13. Requires substantial energy consumption. | Coordination with Maui Electric Company, Ltd. (MECO) will be undertaken to ensure all operational parameters are addressed for the proposed project. Where feasible, energy saving measures will be incorporated into the project design. |

7. Summary of Unavoidable Environmental Impacts and Irreversible and Irretrievable Commitments of Resources

The proposed DOFAW Kahului Baseyard Renovations alternative would result in short-term impacts occurring during the construction period. Potential effects include temporary noise and air quality impacts generated by construction activities. Temporary noise impacts would arise from site preparation, heavy equipment usage, and other construction activities. Temporary air quality impacts would result from dust generated from construction activities and exhaust emissions discharged by construction equipment. This alternative is not anticipated to create any long-term adverse environmental effects.

The proposed DOFAW Kahului Baseyard Renovation alternative would result in the irreversible and irretrievable commitment of fiscal, energy, labor, and material resources. Impacts relating to the use of these resources are minimal, when weighed against the expected positive socio-economic benefits to be derived from the project, versus the consequences of taking no action.

In addition, the Kahului Baseyard Renovation alternative is not anticipated to require a substantial commitment of government services or facilities, nor is it anticipated to place additional demands on police, fire, medical, and social services.

8. Summary and Conclusion

The Kahului Baseyard site would be able to accommodate some of DOFAW's future needs, such as additional office space with a small gym and shower facilities. However, it does not provide the opportunity for expansion of DOFAW Baseyard operations and programs offered by the preferred Pulehunui Baseyard development. Nonetheless, the Kahului Baseyard Renovation alternative was assessed with respect to Chapter 343, HRS, Environmental Assessment content requirements given the possibility that this option is a possible secondary choice for addressing DOFAW's future needs.

Based on the foregoing analysis, it is anticipated that the secondary alternative for the Kahului Baseyard and project will result in a Finding of No Significant Impact (AFONSI).

As previously discussed, in the event the Kahului Baseyard alternative is pursued in the future, a SMA Use Permit would be required from the Maui Planning Commission and a Change in Zoning and Community Plan Amendment would be required from the Maui County Council.

**V. SUMMARY OF
UNAVOIDABLE
ENVIRONMENTAL IMPACTS
AND IRREVERSIBLE AND
IRRETRIEVABLE
COMMITMENT OF
RESOURCES**

V. SUMMARY OF UNAVOIDABLE ENVIRONMENTAL IMPACTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The development of the proposed DOFAW Pulehunui Baseyard will result in certain unavoidable construction-related impacts as outlined in Chapter II.

In the long term, construction associated with the proposed project will generate short-term noise impacts. These impacts will be limited to the immediate vicinity of the project construction area. Best Management Practices (BMPs) such as use of sound attenuating construction equipment, will be used, where practicable, to mitigate noise impacts caused by construction. When implemented, the project includes uses such as offices, lab, warehouses, nurseries, parking, auto maintenance shop, dryland forest restoration. Noise from the proposed helicopter operations will be intermittent and used approximately twice a month. Noise is transitory in nature lasting a few minutes during takeoff and landing. In the long term, ambient noise conditions of the baseyard would not significantly be adversely impacted by the proposed project.

Unavoidable air and water quality impacts will also arise as a result of construction activities, such as the generation of dust and other airborne pollutants and the increase in turbidity. To mitigate adverse impacts, appropriate BMPs including frequent watering of exposed surfaces and regular maintenance of construction equipment will be implemented during the construction period to minimize air quality construction-related impacts. Appropriate BMPs to contain silt plumes during construction, such as silt curtains around the construction zone, will be implemented to mitigate potential adverse water quality impacts.

Development of the proposed project will use existing land, energy and fiscal resources. The commitment of land, energy and fuel resources is justified by the public benefits of the proposed Division of Forestry and Wildlife (DOFAW) Baseyard project at Pulehunui.

VI. SIGNIFICANCE CRITERIA ASSESSMENT

VI. SIGNIFICANCE CRITERIA ASSESSMENT

The “Significance Criteria”, Section 12 of the Hawai‘i Administrative Rules (HAR), Title 11, Chapter 200, “Environmental Impact Statement Rules”, was reviewed and analyzed to determine whether the proposed project will have significant impacts on the environment. The following criteria and analysis are provided.

1. **Involves an irrevocable commitment to, loss, or destruction of any natural or cultural resource.**

A portion of the sugar cane fields adjacent to the project area was turned into a civil airfield for the Territory of Hawai‘i in 1937. Two (2) years later, Inter-Island Airways began service to Maui, landing at Pu‘unēnē Airport. With the onset of World War II, the Navy began using the old airport along with a small Army Air Corps support base at the airfield and the land, including the project area, was later condemned. The airport was expanded and commissioned as the Naval Air Station (NAS), lengthened and widened and renamed to NAS Pu‘unēnē. In 1947, the Navy released the airfield to the Territory of Hawai‘i and the facility was used as an inter-island airport until 1952. The landing strip was used by crop-dusters and other smaller aircraft until abandoned sometime between 1961 and 1977. Abandoned military facilities (e.g. bunkers, revetments) remained on the property and the old airstrip was used for racing. Due to ground altering activities in the project site and surrounding areas from government and military uses in this general area, significant adverse impact to known rare, endangered, or threatened species of flora, fauna, or avifauna are not anticipated.

Scientific Consultant Services, Inc. conducted an archaeological inventory survey of the project area, and found that no historic properties were identified on the surface or in subsurface contexts. Based on the negative findings of the survey, the report states that it is unlikely that new information would be gleaned from additional archaeological work in the project area and that no further archaeological work is recommended for the current project area.

Should any cultural artifacts or human remains be encountered during construction, work will stop in the immediate vicinity of the find, and the State Historic Preservation Division (SHPD) will be notified immediately to establish an appropriate mitigation strategy. Refer to **Appendix “D”**.

As such, the proposed Division of Forestry and Wildlife (DOFAW) Baseyard project at Pulehunui will not result in any adverse environmental impacts, and no natural, cultural, or archaeological resources will be adversely impacted by the proposed action.

2. **Curtails the range of beneficial uses of the environment.**

The proposed project supports the overall mission of DOFAW to manage and protect environmental and cultural resources and, as such, the project will not curtail the range of beneficial uses of the environment.

3. **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

The proposed project conforms with the State's Environmental Policy and Guidelines as set forth in Chapter 344, Hawai'i Revised Statutes (HRS) and supports the mission of DOFAW to manage and protect the environment and cultural resources.

4. **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.**

In the short term, the proposed project will directly benefit the local economy by providing construction-related employment. Over the long term, the proposed project supports DOFAW's mission to manage and protect the cultural resources and will have a positive effect on the social welfare and practices of the community.

5. **Substantially affects public health.**

No adverse impacts to public health and welfare are anticipated as a result of the proposed project.

6. **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

The proposed project is not a population generator and is not expected to significantly expand the service limits or requirements of public services such as police, fire, medical, educational, recreational, or solid waste collection services.

No substantial adverse secondary impacts are anticipated with the implementation of the proposed project.

7. **Involves a substantial degradation of environmental quality.**

Aside from the short-term impacts related to dust and noise generated during the construction phase, there will not be a substantial degradation of environmental quality. Potential dust, noise, and erosion impacts associated with construction activities will be mitigated through implementation of appropriate Best Management Practices (BMPs).

As previously noted, the proposed project supports the overall mission of DOFAW to manage and protect environmental resources such as watersheds and native ecosystems, and provide outdoor recreation and sustainable forest product opportunities.

8. **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.**

The surrounding area is in transition from agricultural use to other uses such as the Maui Humane Society Animal Shelter, Hawai'i Army National Guard Armory, and Maui Motor Sports Park. From a future land use perspective, portions of the surrounding lands as well as the project site are within the Urban Growth Boundary (UGB) of the Maui Island Plan (MIP). Development of the project area will further transition the region to urban type uses as envisioned by the MIP.

In general, appropriate mitigation measures and/or regulatory oversight processes have been identified to ensure cumulative impacts for each key issue is managed, such that adverse conditions affecting the natural and man-made environments are minimized.

9. **Substantially affects a rare, threatened, or endangered species or its habitat.**

The project site has been altered by years of sugar cane cultivation, and use by government and military interests. There are no known rare, threatened, or endangered species of flora, fauna, or avifauna found at or around the project site and the project site contains no critical habitat for such species. Given these conditions, significant adverse impacts to rare, threatened, or endangered species are not anticipated as a result of the proposed action.

10. **Detrimentially affects air or water quality or ambient noise levels.**

Construction activities will result in short-term air quality and noise impacts. Dust control measures such as regular watering and sprinkling, and installation of dust screens will be implemented to minimize wind-blown emissions. Noise impacts will occur primarily from the operation of construction equipment. Equipment mufflers or other noise attenuating equipment, as well as proper equipment and vehicle maintenance, will

be used during construction activities. Construction noise impacts will be mitigated through compliance with applicable provisions of the State of Hawai'i, Department of Health Administrative Rules (HAR) Title 11, Chapter 46, "Community Noise Control". These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels set forth in Chapter 46 HAR. In addition, no long-term air or water quality are anticipated. Noise from the proposed helicopter operations will be intermittent and used approximately twice a month. Noise is transitory in nature limited to periods during takeoff and landing.

11. **Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.**

Soils underlying the project site are not erosion-prone and there are no geologically hazardous lands or estuaries within or adjacent to the project site. The project site is located within Flood Zone X (shaded), an area with a 0.2 percent chance of annual flooding and is outside the tsunami zone.

The proposed project includes a drainage system, to mitigate runoff and impacts to surrounding properties. During construction, mitigation measures will be implemented as BMPs to avoid adverse impact to nearby areas.

Significant adverse environmental effects are not anticipated in conjunction with the proposed project.

12. **Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.**

Although there are views to Haleakalā and the West Maui Mountains, the project site has not been identified as a scenic vista or viewplane. As the proposed project includes elements that are low in profile (e.g. parking area, helicopter landing strip and one-story structures), scenic vistas and viewplanes are not expected to be substantially adversely affected by the proposed project.

13. **Requires substantial energy consumption.**

The proposed project will involve a commitment of fuel for construction equipment, vehicles, and machinery during construction and maintenance activities. Once completed, the DOFAW Pulehunui Baseyard operations will require a supply of energy and this usage is justified as it is anticipated that the benefits to the community in terms of the agency mission to protect the environment and cultural resources appears justified.

Based on the foregoing analysis, it is anticipated that the proposed action will result in a Finding of No Significant Impact (AFONSI).

VII. LIST OF PERMITS AND APPROVALS

VII. LIST OF PERMITS AND APPROVALS

The following Federal, State, and County permits and approvals may be required for project implementation:

State of Hawai'i

1. State Land Use Commission Special Use Permit
2. Noise Permit (as applicable for construction activities)
3. National Pollutant Discharge Elimination System (NPDES) Permit
4. State Department of Transportation Highways Division Permit, as applicable

County of Maui

1. County Conditional Permit
2. Building Permits
3. Construction Permits (i.e., grading, electrical, plumbing)

**VIII. AGENCIES CONSULTED
DURING THE PREPARATION
OF THE DRAFT
ENVIRONMENTAL
ASSESSMENT; LETTERS
RECEIVED AND RESPONSES
TO SUBSTANTIVE
COMMENTS**

VIII. AGENCIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were consulted during preparation of the Draft Environmental Assessment (EA). Agency comments and responses to substantive comments are included herein.

1. Larry Yamamoto, State Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
P.O. Box 50004
Honolulu, Hawai'i 96850-0001
2. Ranae Ganske-Cerizo, Soil Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
77 Hookele Street, Suite 202
Kahului, Hawai'i 96732
3. Shelly Lynch, Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Regulatory Branch, Building 230
Fort Shafter, Hawai'i 96858-5440
4. Loyal A. Mehrhoff, Field Supervisor
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122
Box 50088
Honolulu, Hawai'i 96813
5. Douglas G. Murdock, Acting Comptroller
Department of Accounting and General
Services
1151 Punchbowl Street, #426
Honolulu, Hawai'i 96813
6. Scott Enright, Chair
Department of Agriculture
1428 South King Street
Honolulu, Hawai'i 96814-2512
7. Wesley Machida, Acting Director
Department of Budget and Finance
P.O. Box 150
Honolulu, Hawai'i 96810
8. Luis P. Salaveria, Acting Director
State of Hawai'i
Department of Business, Economic
Development & Tourism
P.O. Box 2359
Honolulu, Hawai'i 96804
9. Kathryn Matayoshi, Superintendent
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, Hawai'i 96804
10. Virginia Pressler, M.D., Director
State of Hawai'i
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawai'i 96814
11. Alec Wong, P.E., Chief
Clean Water Branch
State of Hawai'i
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawai'i 96814
12. Patti Kitkowski
State of Hawai'i
Department of Health
Maui Sanitation Branch
54 South High Street, Room 300
Wailuku, Hawai'i 96793

13. Laura McIntyre, AICP
Environmental Planning Office
Department of Health
919 Ala Moana Blvd., Suite 312
Honolulu, Hawai'i 96814
14. Suzanne Case, Chairperson
State of Hawai'i
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawai'i 96809
15. Alan Downer, Administrator
State of Hawai'i
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawai'i 96707
16. Morgan Davis
State of Hawai'i
Department of Land and Natural Resources
State Historic Preservation Division
130 Mahalani Street
Wailuku, Hawai'i 96793
17. Ford Fuchigami, Interim Director
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813
18. Brigadier General Arthur "Joe" Logan
Adjutant General and Director
Hawai'i State Civil Defense
3949 Diamond Head Road
Honolulu, Hawai'i 96813-4495
19. Jobie Masagatani, Director
Hawaiian Home Lands Commission
P.O. Box 1879
Honolulu, Hawai'i 96805
20. Jessica Wooley, Director
Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawai'i 96813
21. Dr. Kamana`opono Crabbe, Chief Executive
Officer
Office of Hawaiian Affairs
560 North Nimitz Highway, Suite 200
Honolulu, Hawai'i 96817
22. Leo R. Asuncion, Jr., AICP, Acting Director
State of Hawai'i
Office of Planning
P. O. Box 2359
Honolulu, Hawai'i 96804
23. Dan Orodener, Executive Officer
State of Hawai'i
State Land Use Commission
P.O. Box 2359
Honolulu, Hawai'i 96804
24. University of Hawai'i at Manoa
Environmental Center
2500 Dole Street, Krauss Annex 19
Honolulu, Hawai'i 96822
25. Senator J. Kalani English
Hawai'i State Senate
Hawai'i State Capitol, Room 205
415 S. Beretania Street
Honolulu, Hawai'i 96813
26. Senator Rosalyn H. Baker
Hawai'i State Senate
Hawai'i State Capitol, Room 230
415 S. Beretania Street
Honolulu, Hawai'i 96813
27. Representative Angus L.K. McKelvey
House of Representatives
Hawai'i State Capitol, Room 320
415 S. Beretania Street
Honolulu, Hawai'i 96813
28. Representative Justin Woodson
House of Representatives
Hawai'i State Capitol, Room 305
415 S. Beretania Street
Honolulu, Hawai'i 96813
29. Representative Kyle T. Yamashita
House of Representatives
Hawai'i State Capitol, Room 422
415 S. Beretania Street
Honolulu, Hawai'i 96813
30. Mayor Alan Arakawa
County of Maui
200 South High Street
Wailuku, Hawai'i 96793

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>31. Teena Rasmussen County of Maui Office of Economic Development 2200 Main Street, Suite 305 Wailuku, Hawai'i 96793</p> | <p>40. Jo Anne Johnson Winer, Director County of Maui Department of Transportation 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>32. Anna Foust Maui Civil Defense Agency 200 South High Street Wailuku, Hawai'i 96793</p> | <p>41. David Taylor, Director County of Maui Department of Water Supply 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>33. Kyle Ginoza, Director County of Maui Department of Environmental Management 2050 Main Street, Suite 1C Wailuku, Hawai'i 96793</p> | <p>42. Honorable Don Couch Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>34. Jeffrey A. Murray, Chief County of Maui Department of Fire and Public Safety 200 Dairy Road Kahului, Hawai'i 96732</p> | <p>43. Honorable Don Guzman, Council Vice-Chair Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>35. Jo-Ann Ridao, Director County of Maui Department of Housing and Human Concerns One Main Plaza 2200 Main Street, Suite 546 Wailuku, Hawai'i 96793</p> | <p>44. Honorable Gladys Baisa Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>36. Ka'ala Buenconsejo, Director County of Maui Department of Parks and Recreation 700 Halia Nako Street, Unit 2 Wailuku, Hawai'i 96793</p> | <p>45. Honorable Robert Carroll Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>37. William Spence, Director County of Maui Department of Planning 2200 Main Street, Suite 315 Wailuku, Hawai'i 96793</p> | <p>46. Honorable Elle Cochran Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>38. Tivoli Faamu, Chief County of Maui Police Department 55 Mahalani Street Wailuku, Hawai'i 96793</p> | <p>47. Honorable Stacy Crivello Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| <p>39. David Goode, Director County of Maui Department of Public Works 200 South High Street Wailuku, Hawai'i 96793</p> | <p>48. Honorable G. Riki Hokama Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |
| | <p>49. Honorable Michael Victorino Maui County Council 200 South High Street Wailuku, Hawai'i 96793</p> |

50. Honorable Michael White, Council Chair
Maui County Council
200 South High Street
Wailuku, Hawai'i 96793
51. Mathew McNeff
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawai'i 96733
52. Hawaiian Telcom
60 South Church Street
Wailuku, Hawai'i 96793
53. Kihei Community Association
P. O. Box 662
Kihei, Hawai'i 96753

From: Frager, Rebecca M POH [mailto:Rebecca.M.Frager@usace.army.mil]
Sent: Friday, April 17, 2015 12:19 PM
To: Tessa Munekiyo Ng
Subject: RE: Proposed DOFAW Baseyard at Pulehunui (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Dear Ms. Munekiyo Ng:

We have received your letter dated March 23, 2015 requesting early consultation for the proposed Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) Baseyard at Pulehuni, Maui, Hawaii. We have assigned your project Department of the Army (DA) file number POH-2015-00066. Please reference this number in all future correspondence concerning this project.

We have reviewed your submittal pursuant to Section 404 of the Clean Water Act (Section 404). Section 404 requires that a DA permit be obtained for the discharge of dredged and/or fill material into waters of the U.S., including wetlands and navigable waters of the U.S, prior to conducting the work (33 U.S.C. 1344).

Based on our review of the information you furnished, and assuming DOFAW's project is conducted only as set forth in the information provided to our office on March 23, 2015(Enclosure 1), as well as the email correspondence dated April 6, 2015, this office has determined the proposed activity would not result in the discharge of dredged or fill material into waters of the U.S. as defined by Section 404. Therefore, a DA permit will not be required.

Although a permit is not required from this office, we recommend use of Best Management Practices to avoid and minimize adverse impacts to the aquatic resource. It is your responsibility to ensure that your project complies with all other Federal, State, or local statutes, ordinances and regulations.

Thank you for your cooperation with the Honolulu District Regulatory Program. Should you have any questions related to this determination, please contact me at 808-835-4307 or via e-mail at Rebecca.M.Frager@usace.army.mil. You are encouraged to provide comments on your experience with the Honolulu District Regulatory Office by accessing our web-based customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

Becca Frager
Biologist
U.S. Army Corps of Engineers
Honolulu District Regulatory Office
Building 230
Fort Shafter, HI 96858-5440
Phone: 808-835-4307

February 2, 2016

Rebecca Frager
U.S. Army Corps of Engineers
Honolulu District Regulatory Office
Building 230
Fort Shafter, HI 96858-5440

SUBJECT: Early Consultation Request for Proposed Division of Forestry and Wildlife Baseyard at Pulehunui (POH-2015-00066)

Dear Ms. Frager:

Thank you for your email dated April 17, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we provide the following responses in the order of the comments in your email.

COMMENT:

We have reviewed your submittal pursuant to Section 404 of the Clean Water Act (Section 404). Section 404 requires that a DA permit be obtained for the discharge of dredged and/or fill material into waters of the U.S., including wetlands and navigable waters of the U.S., prior to conducting the work (33 U.S.C. 1344).

Based on our review of the information you furnished and assuming DOFAW's project is conducted only as set forth in the information provided to our office on March 23, 2015 (Enclosure 1), as well as the email correspondence dated April 6, 2015, this office has determined the proposed activity would not result in the discharge of dredged or fill material into waters of the U.S. as defined by Section 404. There, a DA permit will not be required.

RESPONSE:

As noted in your email, the project is not anticipated to result in discharge of dredged or fill materials into U.S. waters per Section 404 and a DA permit is not required.

COMMENT:

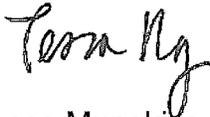
Although a permit is not required from this office, we recommend use of Best Management Practices to avoid and minimize adverse impacts to the aquatic resource. It is your responsibility to ensure that your project complies with all other Federal, State, or local statutes, ordinances and regulations.

RESPONSE:

The proposed project includes the implementation of appropriate Best Management Practices to contain stormwater runoff during construction, such as silt fences around construction zones to mitigate potential adverse impacts to adjacent properties and resources.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

TMN:yp

cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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APR 27 2015



United States Department of the Interior



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

In Reply Refer To:
01EPIF00-2015-TA-0214

Ms. Tessa Munekiyo Ng
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

APR 23 2015

Subject: Technical Assistance for the Proposed Construction of a Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) Wildlife Baseyard at Pulehunui, Maui, Hawaii

Dear Ms. Ng:

The U.S. Fish and Wildlife Service (Service) received your correspondence on March 26, 2015, requesting technical assistance regarding possible presence of endangered, threatened or protected flora and fauna within a 20.3-acre area on a portion of Tax Map Key (2)3-8-008:001 located east of Mokulele Highway off of Kamaaina Road, Maui. The parcel is State-owned land at Pulehunui, in the vicinity of the Old Puunene Airport (Pulehunui Baseyard). The proposed Pulehunui Baseyard will consist of the following uses: an office building with meeting space (40,000 square feet (sf)), wildlife laboratory (5,000 sf), warehouse (45,000 sf), nursery (2 acres (ac)), dryland forest restoration (5.5 ac), heavy equipment parking area (10,000 sf), and various other support facilities for wildlife operations including a helicopter operations landing zone, equipment yard, auto maintenance shop, fueling station, wash bay, training field, staging area, and public and employee parking. The proposed baseyard will feature low-lying buildings, with no building exceeding two stories in height.

Based on information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Project, there are four listed animals, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) and nene or Hawaiian goose (*Branta sandvicensis*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*), and one endangered insect, the Blackburn's sphinx moth (*Manduca blackburni*) in the vicinity of the project area. There is no proposed or final critical habitat within the described project footprint. To help you minimize potential impacts to listed species, the Service is providing you the following avoidance and minimization measures. Please note that implementation of these measures does not ensure that impacts to listed species can be avoided, and further coordination with the Service on compliance with the ESA may be required.

Hawaiian hoary bat

The Hawaiian hoary bat is known to occur across a broad range of habitats throughout the State of Hawaii. This bat roosts in both exotic and native woody vegetation and, while foraging,

leaves young unattended in “nursery” trees and shrubs. If trees or shrubs suitable for bat roosting are cleared during the Hawaiian hoary bat breeding season (June 1 to September 15), there is a risk that young bats that cannot yet fly on their own could inadvertently be harmed or killed. As a result, the Service recommends that woody plants greater than 15 feet tall should not be removed or trimmed during the Hawaiian hoary bat breeding season. Additionally, Hawaiian hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground. When barbed wire is used in fencing, Hawaiian hoary bats can become entangled. The Service, therefore, recommends that barbed wire not be used for fencing as part of this proposed action.

Seabirds

Hawaiian petrels and Newell’s shearwaters (collectively known as seabirds) may transit over the proposed project area when flying between the ocean and nesting sites in the mountains during their breeding season (March through November). Seabird fatalities resulting from collisions with artificial structures that extend above the surrounding vegetation have been documented in Hawaii where high densities of transiting seabirds occur. Additionally, artificial lighting, such as flood lighting for construction work and site security, can adversely impact seabirds by causing disorientation which may result in collision with utility lines, buildings, fences and vehicles. Fledgling seabirds are especially affected by artificial lighting and have a tendency to exhaust themselves while circling the light sources and become grounded. Too weak to fly these birds become vulnerable to depredation by feral predators such as cats (*Felis catus*), dogs (*Canis familiaris*), and small Indian mongoose (*Herpestes auropunctatus*). Therefore the Service recommends that night work requiring artificial illumination be avoided during the seabird fledging season (approximately September 15 through December 15). All project-related installed lighting should be minimized and shielded so the bulb is not visible at or above bulb-height.

Nene

Nene are known to occupy various habitat and vegetation community types ranging from coastal dune vegetation and non-native grasslands (such as golf courses, pastures, and rural areas) to sparsely vegetated low- and high-elevation lava flows, mid-elevation native and non-native shrubland, cinder deserts, native alpine grasslands and shrublands, and nonnative alpine shrubland-woodland community interfaces. There is the potential for the noise and disturbance of project activities or changes in water level associated with projects implemented in the vicinity of streams, rivers, marshes, ponds, reservoirs, fish ponds, impoundments, or other areas with standing water to reduce the reproductive success or survival of nene. Nene has an extended breeding season with eggs reported from all months except May, June, and July, although the majority of birds in the wild nest during the rainy (winter) season between October and March. Nesting peaks in December and most goslings hatch from December to January. Nene nest on the ground, in a shallow scrape in the dense shade of a shrub or other vegetation. Therefore the Service recommends that:

- A qualified individual conduct nene surveys at the proposed project site prior to project initiation and nest searches conducted if the project will occur during the nene breeding season.
- A 100-ft (30-m) buffer established and maintained around all active nests and broods until the goslings have fledged. No potentially disruptive activities (i.e., major construction, earth movement, use of large, noisy equipment) should occur within this buffer.

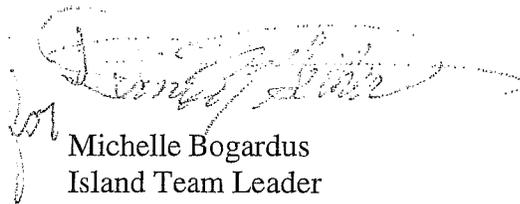
- If a nene is observed within the project site, or flies into the site while activities are occurring, all activities be halted within 100-ft (30 m) of the individual(s). Work should not resume until the individual(s) leave the area on their own accord.
- Any manipulation or alteration of known nene nesting habitat not occur during the breeding season.

Blackburn's sphinx moth

Blackburn's sphinx moths feed on nectar from native plants, including beach morning glory (*Ipomoea pes-caprae*), iliee (*Plumbago zeylanica*), and maiapilo (*Capparis sandwichiana*); larvae feed upon non-native tree tobacco (*Nicotiana glauca*) and native aiea (*Nothocestrum latifolium*). Tree tobacco is a weed species that grows rapidly and inhabits disturbed places, roadsides, urban waste areas, gravel quarries, landscaped sites, and natural communities, including riparian areas, grassland, and woodland. Due to the invasive nature and rapid growth of tree tobacco, it is possible that it may be at the site. We recommend that a qualified biologist survey the project area for the presence of Blackburn's sphinx moth and its host plants prior to construction. We further recommend that these surveys be conducted during the wettest portion of the year (usually November-April) and approximately four to eight weeks following a significant rainfall event. Surveys should include looking for eggs, larvae, and signs of larval feeding (chewed stems, frass, or leaf damage).

Thank you for your efforts to conserve listed species and native habitats. Please contact Fish and Wildlife Biologist Jay Nelson (808-792-9441) if you have any questions or for further guidance.

Sincerely,



Michelle Bogardus
Island Team Leader
Maui Nui and Hawaii Island



MUNEKIYO HIRAGA

Planning, Project Management, Sustainable Solutions.

Michael T. Munekiyo
PRESIDENT

Karlynn K. Fukuda
EXECUTIVE VICE PRESIDENT

Mark Alexander Roy
VICE PRESIDENT

Tessa Munekiyo Ng
VICE PRESIDENT

February 2, 2016

Michelle Bogardus
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

SUBJECT: Early Consultation Request for proposed Division of Forestry and Wildlife Baseyard at Pulehunui (Ref 01EPIF00-2015-TA-0214)

Dear Ms. Bogardus:

Thank you for your letter dated April 23, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we provide the following responses in the order of your comments.

COMMENT:

*Based on information you provided and pertinent information in our files, including data compiled by the Hawai'i Biodiversity and Mapping Project, there are four listed animals, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) and nene or Hawaiian goose (*Branta sandvicensis*), and the threatened Newell's shearwater (*Puffinus auricularis newellii*), and one endangered insect, the Blackburn's sphinx moth (*Manduca blackburni*) in the vicinity of the project area. There is no proposed or final critical habitat within the described project footprint. To help you minimize potential impacts to listed species, the Service is providing you the following avoidance and minimization measures. Please note that implementation of these measures does not ensure that impacts to listed species can be avoided, and further coordination with the Service on compliance with the ESA may be required.*

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyoHIRAGA.com

Response:

To minimize impacts to the listed species noted in your comment, the following measures will be implemented for the project and there will be coordination with the Service.

Hawaiian hoary bat

During project construction trees or shrubs greater than 15 feet tall will not be removed or trimmed during the Hawaiian hoary bat breeding season (June 1 to September 15) and barbed wire will not be used for fencing.

Seabirds (Hawaiian petrels and Newell's shearwaters)

Should the project involve night work, artificial illumination will not be used during the seabird fledging season (approximately September 15 through December 15). Lighting for the project will be minimized and shielded so the bulb is not visible at or above bulb-height.

Nene

A qualified individual will conduct nene surveys at the proposed project site prior to project initiation and if the project occurs during breeding season, nest searches will be conducted. A 100-foot (30-m) buffer will be established and maintained around active nests and broods until the goslings have fledged and disruptive activities such as major construction, earth movement and use of large noisy equipment will be avoided in this buffer area. Should a nene be observed within the project site or fly into the site where there are activities, the construction work activities will be halted within 100-foot (30-m) of the nene and work will resume when the nene leave the area of its own accord. During nene breeding season, manipulation or alteration of known nesting habitat will be avoided.

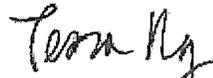
Blackburn's sphinx moth

Prior to construction, a qualified biologist will survey the project area for the presence of Blackburn's sphinx moth and its host plants. Such survey will include looking for eggs, larvae, and signs of larval feeding (chewed stems, frass, or leaf damage) and be conducted during the wettest portion of the year (generally November – April) and approximately four (4) to eight (8) weeks following a significant rainfall event.

Michelle Bogardus
February 2, 2016
Page 3

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,



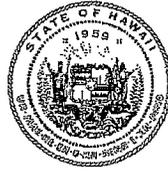
Tessa Munekyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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DAVID Y. IGE
GOVERNOR



APR 21 2015

DOUGLAS MURDOCK
Comptroller

AUDREY HIDANO
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)1077.5

APR 17 2015

Ms. Tessa Munekiyo Ng, Vice President
Munekiyo Haraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Ng:

Subject: Early Consultation Request for
Proposed Division of Forestry and Wildlife Baseyard
Pulehunui, Maui
TMK: (2) 3-8-008: 001 (por)

Thank you for the opportunity to comment on the subject project. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities and, we have no comments to offer at this time.

If you have any questions, your staff may call Ms. Christine Kinimaka of the Public Works Division at 586-0584.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas Murdock".

DOUGLAS MURDOCK
Comptroller

c: Mr. Scott Fretz, DLNR DOFAW
Mr. Wade Shimabukuro, DAGS Maui



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Michael T. Munekiyo
PRESIDENT

Karlynn K. Fukuda
EXECUTIVE VICE PRESIDENT

Mark Alexander Roy
VICE PRESIDENT

Tessa Munekiyo Ng
VICE PRESIDENT

February 2, 2016

Douglas Murdock, Comptroller
State of Hawai'i
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawai'i 96810-0119

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui, Reference: (P)1077.5

Dear Mr. Murdock:

Thank you for your letter dated April 17, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge that the State of Hawai'i, Department of Accounting and General Services has no comments at this time as the proposed project does not impact any of its projects or existing facilities.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,

Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW
Wade Shimabukuro, DAGS Maui

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Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyo-hiraga.com

MAY 04 2015

DAVID Y. IGE
GOVERNOR



WESLEY K. MACHIDA
DIRECTOR

RODERICK K. BECKER
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE

P.O. BOX 150
HONOLULU, HAWAII 96810-0150

EMPLOYEES' RETIREMENT SYSTEM
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND
OFFICE OF THE PUBLIC DEFENDER
PUBLIC UTILITIES COMMISSION

ADMINISTRATIVE AND RESEARCH OFFICE
BUDGET, PROGRAM PLANNING AND
MANAGEMENT DIVISION
FINANCIAL ADMINISTRATION DIVISION
OFFICE OF FEDERAL AWARDS MANAGEMENT (OFAM)

April 29, 2015

Ms. Tessa Munekiyo Ng
Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Ng:

This is to acknowledge receipt of your letter dated March 23, 2015, soliciting comments on the Draft Environmental Assessment for the Proposed Division of Forestry and Wildlife Baseyard at Pulehunui, Maui.

We have no comments at this time.

Aloha,

WESLEY K. MACHIDA
Director of Finance



MUNEKIYO HIRAGA

Planning. Project Management. Sustainable Solutions.

Michael T. Munekiyo
PRESIDENT

Karlynn K. Fukuda
EXECUTIVE VICE PRESIDENT

Mark Alexander Roy
VICE PRESIDENT

Tessa Munekiyo Ng
VICE PRESIDENT

February 2, 2016

Wesley K. Machida, Director
State of Hawai'i
Department of Budget and Finance
P.O. Box 150
Honolulu, Hawai'i 96810-0150

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui

Dear Mr. Machida:

Thank you for your letter dated April 29, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge that the State Department of Budget and Finance has no comments at this time.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,

Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching, P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyo-hiraga.com

MAY 04 2015

DAVID Y. IGE
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

05001PNN.15

May 1, 2015

Ms. Tessa Munekiyo Ng, AICP
Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Munekiyo Ng:

SUBJECT: Comments on the Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard Project Pulehunui, Island of Maui, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated March 23, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: <http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf>.

1. Any project and its potential impacts to State waters must meet the following criteria:
 - a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
 - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
 - c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).
2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee (\$1,000 for an individual NPDES permit or \$500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: <https://eha-cloud.doh.hawaii.gov/epermit/>. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.
5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:
 - a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like

community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

- b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.
- c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.
- d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.
- e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at:
<http://health.hawaii.gov/cwb>, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,


ALEC WONG, P.E., CHIEF
Clean Water Branch

NN:ay

February 2, 2016

Alec Wong, P.E., Chief
Clean Water Branch
Department of Health
State of Hawai'i
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui (EMD/CWB 05001PNN.15)

Dear Mr. Wong:

Thank you for your letter dated May 1, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we provide the following responses in the order of the Department of Health (DOH), Clean Water Branch's comments.

COMMENT:

You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: <http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf>.

RESPONSE:

The comments noted on the DOH website will be reviewed and applicable requirements will be adhered to.

COMMENT:

1. *Any project and its potential impacts to State waters must meet the following criteria:*
 - a. *Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.*
 - b. *Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.*
 - c. *Water quality criteria (HAR, Sections 11-54-4 through 11-54-8)*

RESPONSE:

There are no State waters within the project site.

COMMENT:

2. *You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including stormwater runoff, into State surface waters (HAR, Chapter 11-55)*

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NO1 Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee (\$1,000 for an individual NPDES permit or \$500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: <https://eha-cloud.doh.hawaii.gov/epermit/>. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

RESPONSE:

As the project involves approximately 20.3 acres, an NPDES permit application will be submitted to DOH in accordance with the department's permit submittal requirements.

COMMENT:

3. *If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel:835-4303) regarding their permitting requirements.*

*Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..."(emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.*

RESPONSE:

The U.S. Army Corps of Engineers was consulted as part of the early consultation process for the proposed baseyard project. The project does not involve work that affects waters of the United States.

COMMENT:

4. *Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.*

RESPONSE:

As previously noted, the project does not involve work that affects water bodies. As may be applicable, the project will comply with State's Water Quality Standards in the event there is discharge.

COMMENT:

5. *It is the State's position that all project must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:*

- a. *Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste produce of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.*
- b. *Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.*
- c. *Consider stormwater Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.*
- d. *Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.*
- e. *Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.*

RESPONSE:

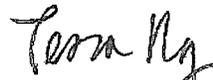
The opportunities to reduce, reuse and recycle will be evaluated for integration into the project and implemented if practicable. This includes Best Management Practices

Alec Wong, P.E., Chief
February 2, 2016
Page 5

(BMPS) to manage stormwater as a water source for irrigation, energy conservation, BMPs to reduce excessive runoff and use of native vegetation.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,



Tessa Munekyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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DAVID Y. IGE
GOVERNOR OF HAWAII



APR 10 2015

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M.D., M.P.H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, HAWAII 96793-3378

April 8, 2015

Ms. Tessa Munekiyo Ng
Vice President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Munekiyo Ng:

**Subject: Early Consultation Request for Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui, Maui, Hawaii
TMK: (2) 3-8-008:001**

Thank you for the opportunity to review this project. We have the following comments to offer:

1. National Pollutant Discharge Elimination System (NPDES) permit coverage may be required for this project. The Clean Water Branch should be contacted at 808 586-4309.
2. Please provide the wastewater disposal method for the proposed building. We need this information in order to proceed with this review.

It is strongly recommended that the Standard Comments found at the Department's website: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/> be reviewed and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please contact me at 808 984-8230.

Sincerely,

Patti Kitkowski
District Environmental Health Program Chief

c EPO



February 2, 2016

Patti Kitkowski
District Environmental Health Program Chief
State of Hawai'i
Department of Health
Maui District Health Office
54 South High Street
Wailuku, Hawai'i 96793

SUBJECT: Early Consultation Request for Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui

Dear Ms. Kitkowski:

Thank you for your letter dated April 8, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we provide the following responses in the order of the Department of Health, Maui District Health Office comments.

COMMENT:

1. National Pollutant Discharge Elimination System (NPDES) permit coverage may be required for this project. The Clean Water Branch should be contacted at 808 586-4309.

RESPONSE:

As this proposed project will involve grading work over one (1) acre, an NPDES application submittal will be made to the Clean Water Branch.

COMMENT:

2. Please provide the wastewater disposal method for the proposed building. We need this information in order to proceed with this review.

RESPONSE:

Discussion of proposed wastewater disposal methods will be included in the Draft EA.

COMMENT:

It is strongly recommended that the Standard Comments found at the Department's website: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/> be reviewed and any comments specifically applicable to this project should be adhered to.

RESPONSE:

The standard comments on the Department's website will be reviewed and adhered to by the propose project as may be applicable.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours;



Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching, P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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DAVID Y. IGE
GOVERNOR OF HAWAII



MAY 18 2015

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

**STATE OF HAWAII
DEPARTMENT OF HEALTH**

P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 15-074

May 12, 2015

Ms. Tessa Munekiyo Ng, AICP
Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Aloha Ms. Munekiyo Ng:

SUBJECT: Early Consultation (EC) Request for Proposed Division of Forestry and Wildlife Baseyard at Pulehunui, Maui
TMK: (2) 3-8-008:001 (por)

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your EC to our office. Thank you for allowing us to review and comment on the proposed Division of Forestry and Wildlife Baseyard project.

The EC was routed to various branches. The various branches will provide specific comments to you if necessary. EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/>. Projects are required to adhere to all applicable standard comments.

We encourage you to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: <https://eha-cloud.doh.hawaii.gov>

You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at: <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/>.

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa?

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

c: DHO Maui (via email only)

February 2, 2016

Laura Leialoha Phillips McIntyre, AICP
State of Hawai'i
Department of Health
Environmental Planning Office
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui (EPO 15-074)

Dear Ms. McIntyre:

Thank you for your letter dated May 12, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we provide the following responses in the order of the Department of Health Environmental Planning Office (DOH-EPO) comments.

COMMENT:

EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/>. Projects are required to adhere to all applicable standard comments.

Response:

The standard comments and strategies provided at the website noted in your comment will be reviewed for applicability to the proposed project

COMMENT:

We encourage you to examine and utilize the Hawai'i Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawai'i Emergency Response Exchange, Hawai'i State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: <https://eha-cloud.doh.hawaii.gov>

Response:

The Hawai'i Environmental Health Portal will be reviewed for applicability to the proposed project.

COMMENT:

You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at: <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/>.

Response:

The proposed project site is located inland and is not expected to affect water bodies governed by the State's water quality standards.

COMMENT:

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and health design.

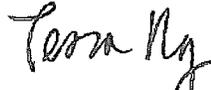
Response:

The information provided in your letter will be reviewed for applicability to the proposed project.

Laura Leialoha Phillips McIntyre, AICP
February 2, 2016
Page 3

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

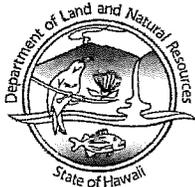
TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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MAY 21 2015

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

May 18, 2015

Tessa Munekiyo Ng, Vice President
Munekiyo Hiraga
305 High Street, Suite 104

LOG NO: 2015.01193
DOC NO: 1504JP10
Archaeology

Aloha Ms. Munekiyo,

**SUBJECT: Chapter 6E-8 Historic Preservation Review – Maui County
Early Consultation Request for Proposed Division of Forestry and Wildlife Baseyard
Pūlehu Nui Ahupua‘a, Wailuku District, Island of Maui
TMK: (2) 3-8-008:001 (por.)**

Thank you for the opportunity to provide early consultation comments on the submittal received by our office on March 27, 2015. The Department of Land and Natural Resources (DLNR) Engineering Division is proposing the development of a new baseyard for the DLNR Division of Forestry and Wildlife (DOFAW). We understand that DOFAW and DLNR Engineering Division have been exploring this as an alternative location that will allow the development and expansion of the baseyard operations. The subject area consists of 20.3 acres.

The Pulehunui Baseyard is located within a larger master plan involving the DLNR Land Division and approximately 285 acres of land. The Pulehunui Master Plan will provide for small, medium, and large industrial and commercial lots for businesses, government agencies, and non-profit organizations. While the entire Pulehunui Master Plan is a long-term planning effort, the applicant is seeking to proceed with the new Pulehunui Baseyard ahead of the larger master plan, which defines the subject area of potential effect as 20.3 acres.

Proposed plans include the construction of an office building with meeting space, a gym, shower, and locker room on the first floor and office space on the second floor (40,000 square feet); wildlife lab (5,000 square feet); warehouse (45,000 square feet); nursery (2 acres); dryland forest restoration (5.5 acres); heavy equipment parking area (10,000 square feet); helicopter operations landing zone; equipment yard; auto maintenance shop; fueling station; wash bay; training field; staging area; and public and employee parking. The baseyard will feature low-lying buildings, with no buildings exceeding two stories in height. Vehicular access will be provided via a main entry off the existing Kamaaina Road and a secondary entry off the existing South Firebreak Road.

A search of our records indicates that archaeological surveys have been conducted for the subject parcel. Most recently, an archaeological survey report was submitted to our office for review (Dagher and Dega March 2015 *Log 2015.00930*). The report was prepared for the subject Pulehunui Baseyard project. The subject area was included during a prior archaeological and architectural study conducted for a much larger area by International Archaeological Research Institute Inc. (Tomonari-Tuggle, *et. al* 2001). Cultural Surveys Hawaii has also conducted archaeological investigations on portions of Parcel 001 for the larger Pulehunui Master Plan. Many historic properties were documented during prior surveys on sections within the area and mitigation recommendations were complete.

Munekiyo Hiraga
May 18, 2015
Page 2

We anticipate the completion of the subject archaeological assessment review in the very near future. We look forward to working with you on this project throughout the duration of the historic preservation process. Please contact Jenny Pickett at (808) 243-5169 or Jenny.L.Pickett@hawaii.gov if you have any questions or concerns about this letter.

Mahalo,



Morgan E. Davis
Lead Archaeologist, Maui Section

cc: County of Maui
Department of Planning
Planning@co.maui.hi.us

County of Maui
Department of Public Works – DSA
Renee.Segundo@co.maui.hi.us

County of Maui
Cultural Resources Commission
Annalise.Kehler@co.maui.hi.us



February 2, 2016

Morgan E. Davis
State of Hawai'i
Department of Land and Natural Resources
State Historic Preservation Division
Kakuhihewa Building
601 Kamokila Blvd, Ste 555
Kapolei, Hawai'i 96707

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui; (LOG NO: 2015.01193, DOC NO:
1504JP10)

Dear Ms. Davis:

Thank you for your letter dated May 18, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge your comment that the State Historic Preservation Division (SHPD) is in the process of completing its review of the archaeological survey report for the proposed project.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,

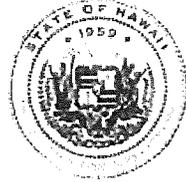
Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW
Jenny Pickett, State Historic Preservation Division

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DAVID Y. IGE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

May 20, 2015

JUN 01 2015

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
STP 8.1799

Ms. Tessa Munekiyo Ng, AICP
Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Ng:

Subject: Department of Land and Natural Resources
Division of Forestry and Wildlife New Baseyard
Early Consultation for Environmental Assessment
Pulehunui, Maui, Hawaii
TMK: (2) 3-8-008:001 (por.)

Our State Department of Transportation (DOT) comments are as follows:

Airports Division

The Department of Land and Natural Resources (DLNR) should file a Federal Aviation Administration (FAA) Form 7480-1 Notice of Landing Area Proposal, for the proposed DLNR Baseyard/Helicopter Landing Area. The form can be accessed at the following website:
<http://www.faa.gov/forms/>

Highways Division

1. A Traffic Impact Analysis Report (TIAR) should be prepared and submitted to DOT for review and acceptance.
2. Given that the subject project is part of a 285-acre master plan with various uses, the preparation of a traffic master plan should be considered.

Ms. Tessa Munekiyo Ng
May 20, 2015
Page 2

STP 8.1799

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

A handwritten signature in black ink, appearing to read "FORD N. FUCHIGAMI". The signature is stylized with a large, sweeping initial "F" and a long horizontal stroke extending to the right.

FORD N. FUCHIGAMI
Director of Transportation



February 2, 2016

Ford N. Fuchigami, Director
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui, Reference (STP 8.1799)

Dear Mr. Fuchigami:

Thank you for your letter dated May 20, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we provide the following responses in the order of the comments in your letter.

AIRPORTS DIVISION

Comment:

The Department of Land and Natural Resources (DLNR) should file a Federal Aviation Administration (FAA) Form 7480-1 Notice of Landing Area Proposal, for the proposed DLNR Baseyard/Helicopter Landing Area. The form can be accessed at the following website: <http://www.faa.gov/forms/>.

Response:

A Form 7480-1 will be submitted to the FAA for processing for the proposed DLNR helicopter landing area.

HIGHWAYS DIVISION

Comment:

1. A Traffic Impact Analysis Report (TIAR) should be prepared and submitted to DOT for review and acceptance.

Response:

A TIAR has been prepared and is included in the Draft EA.

Comment:

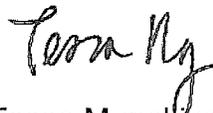
2. Given that the subject property is part of a 285-acre master plan with various uses, the preparation of a traffic master plan should be considered.

Response:

The preparation of a traffic master plan will be considered for the 285 acre master plan. The preparation of a traffic master plan for the proposed master plan will be assessed by DLNR during the land entitlement process.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching, P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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MAY 08 2015

PHONE (808) 594-1888

FAX (808) 594-1938



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAII 96817

HRD15/7439

May 1, 2015

Ms. Tessa Munekiyo Ng, Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawai'i 96793

Re: Early Consultation Request for Proposed Division of Forestry and Wildlife Baseyard
Pūlehunui Ahupua'a, Kula Moku, Maui
TMK: (2) 3-8-008:001, por.

Aloha Ms. Munekiyo Ng:

The Office of Hawaiian Affairs (OHA) is in receipt of your letter of March 23, 2015, requesting early consultation for the proposed Division of Forestry and Wildlife (DOFAW) Baseyard. The use of State lands and funds triggered the need for the preparation of an environmental assessment in accordance with Chapter 343, Hawai'i Revised Statutes. OHA notes that the parcel is listed as having 5(a) trust land status.

At this time, OHA has no specific comments on the proposed DOFAW Baseyard, but we look forward to reviewing the draft EA.

Thank you for the opportunity to comment. Should you have any questions, please contact Everett Ohta at 594-0231 or by email at everetto@oha.org.

'O wau iho nō me ka 'oia 'i'o,

A handwritten signature in cursive script, appearing to read "Kamano M. Crabbe".

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:jbn/eo



February 2, 2016

Kamana'opono M. Crabbe, Ph.D
Ka Pouhana, Chief Executive Officer
State of Hawai'i
Office of Hawaiian Affairs
560 N. Nimitz Highway, Suite 200
Honolulu, Hawai'i 96817

**SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui, HRD 15/7439**

Dear Dr. Crabbe:

Thank you for your letter dated May 1, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge that the State Office of Hawaiian Affairs has no comments at this time.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment.

In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,

Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

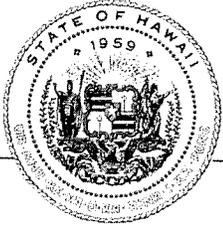
cc: Paul Fasi, Department of Planning
Gayson Ching, P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyo-hiraga.com



**OFFICE OF PLANNING
STATE OF HAWAII**

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: <http://planning.hawaii.gov/>

Ref. No. P-14718

April 20, 2015

Ms. Tessa Munekiyo Ng, AICP
Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Munekiyo Ng:

Subject: Pre-Assessment Consultation for Proposed Division of Forestry and Wildlife Baseyard at Pulehunui, Maui, Hawaii; TMK: (2) 3-8-008:001 (por)

Thank you for the opportunity to provide comments on the pre-consultation request for a Draft Environmental Assessment (Draft EA) on the Division of Forestry and Wildlife (DOFAW) Baseyard at Pulehunui. The pre-consultation review request was transmitted to our office by letter, dated March 23, 2015.

The parcel in question is located mauka of Mokulele Highway, near Kahului, Maui. Based on the project description, the Department of Land and Natural Resources (DLNR) proposes to build a baseyard for DOFAW operations. This baseyard will consist of office space, a wildlife lab, a warehouse, plant nursery, and have space for heavy equipment parking, a helicopter landing zone, auto maintenance, and a fueling station. The baseyard at Pulehunui is the preferred site being considered by DLNR in addition to the alternative baseyard site in Kahului. The Kahului site was previously reviewed by our office in a pre-consultation letter sent to you (Reference Number P-14614) dated December 22, 2014.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. OP provides technical assistance to state and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of resources throughout the State. The Hawaii State Plan includes diverse policies and objectives of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.

The Draft EA should include an analysis that addresses whether the proposed project conforms or is in conflict with the objectives, policies, and priority guidelines listed in the Hawaii State Plan.

2. The coastal zone management area is defined as “all lands of the State and the area extending seaward from the shoreline to the limit of the State’s police power and management authority, including the U.S. territorial sea” see HRS § 205A-1 (definition of "coastal zone management area").

HRS Chapter 205A requires all State and county agencies to enforce the coastal zone management (CZM) objectives and policies. The Draft EA should include an assessment as to how the proposed project conforms to the CZM objectives and its supporting policies set forth in HRS § 205A-2. The assessment on compliance with HRS Chapter 205A is an important component for satisfying the requirements of HRS Chapter 343. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

3. According to our data sources, it appears this parcel lies within the Waiakoa watershed. This central Maui watershed is exposed to a range of human activities from agriculture, urban development, and activity along the shoreline in Kahului and Maalaea Bay. The Draft EA should consider watershed protection and management. OP has created the Hawaii Watershed Guidance to provide direction on methods to safeguard Hawaii’s watersheds and implement watershed plans. This guidance provides a number of management measures that address polluted runoff. Although this area is zoned agriculture in the State Land Use District, because of the planned development of this parcel, the runoff from this project may effect urban areas near Kahului and coastal areas near Maalaea Bay. OP’s watershed guidance provides a number of management measures that address polluted runoff from urban activities, and a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. Specifically, please examine Section B – Management Measures/Urban Runoff, pages 120-122. The document can be viewed or downloaded from the Office of Planning website at [http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI_Watershed_Guidance_Final.pdf).
4. We have reviewed the maps transmitted to us in the pre-consultation letter and compared them to known coastal resources in the area. The parcel is approximately a half mile from Mokulele Highway and 200 feet from Kamaaina Road; located in

Flood Hazard Zone – X; and the project site appears to be heavily vegetated, zoned for agriculture, with little to no drainage infrastructure aside for the irrigation channels intended for agricultural use. As previously stated, the vision for this parcel is to develop it for urban uses that include an administrative office, a storage area, and industrial activities such as an auto maintenance facility, a fueling center, storage, and parking for heavy equipment. Therefore, a stormwater impact evaluation should be included in the Draft EA. Development and land use activities can create erosion, increased stormwater runoff, and pollution that cause direct, secondary, and cumulative impacts to Hawaii's resources.

Please consider OP's Stormwater Impact Assessment in your stormwater impact evaluation for this project. This document can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff occurrences. Mitigation measures and best management practices (BMP) listed in this document can be applied to water runoff strategies to prevent damage to coastal ecosystems. This document will assist in integrating stormwater impact assessment within the planning and environmental review process of a project. The document can be found at http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_impact/final_stormwater_impact_assessments_guidance.pdf.

5. The review material declares that the plan for this site is for the development of a baseyard for urbanized activities. As previously stated, this land is heavily vegetated, with agricultural activity nearby to the parcel. Construction of a baseyard would introduce development, hardened impervious surfaces, and would require drainage infrastructure to be built. Please consider Low-Impact Development (LID) design practices in the planning process for this project. LID techniques promote a range of structural BMP's for stormwater control management and urban layout that minimizes negative environmental impact.

LID design concepts and BMP's that should be considered include: the preservation of natural features and conservation design; the reduction of impervious cover; and utilizing natural features and source control for stormwater management. These methods are listed in OP's Low Impact Development, A Practitioners Guide. For more information on LID – BMP's, please examine Section 1.7, pgs. 1-4 to 1-11. This guidance can be viewed or downloaded from the OP website at: http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

6. The intention to seek a State Special Permit for the Pulehunui baseyard will require the demonstration of the "unusual and reasonable" nature of this industrial use within

Ms. Tessa Munekiyo Ng, AICP
April 20, 2015
Page 4

the State Agricultural District. The Draft EA should discuss how the project meets the guidelines for determining such use. Given the project area is greater than 15 acres, the Special Permit will require the approval of County Planning Commission as well as the State Land Use Commission. Included in the discussion on Special Permit guidelines, the Draft EA should discuss the option of eventually pursuing a State Land Use District Boundary Amendment to reclassify the site from the State Agricultural District to the Urban District, particularly given the intention to pursue urban uses pursuant to the greater Pulehunui Master Plan. The proposed duration(s) of the Special Permit could be useful information for this analysis.

If you have any questions regarding this comment letter, please contact Josh Hekeka of our CZM Program at 587-2845 or Lorene Maki of our Land Use Division at 587-2888.

Sincerely,



Leo R. Asuncion
Acting Director

- c: Grayson Ching – Department of Land and Natural Resources, Engineering Division
Scott Fretz, Department of Land and Natural Resources, Division of Forestry and Wildlife

February 2, 2016

Leo R. Asuncion, Acting Director
State of Hawai'i
Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, Hawai'i 96813

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui (Ref. No. P-14718)

Dear Mr. Asuncion:

Thank you for your letter dated April 20, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we provide the following responses in the order of the State of Hawai'i, Office of Planning's comments.

COMMENT:

1. *OP provides technical assistance to state and county agencies in administering the statewide planning system in Hawai'i Revised Statutes (HRS) Chapter 226, the Hawai'i State Plan. The Hawai'i State Plan provides goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of resources throughout the State. The Hawai'i State Plan includes diverse policies and objectives of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.*

The Draft EA should include an analysis that addresses whether the proposed project conforms or is in conflict with the objectives, policies, and priority guidelines listed in the Hawai'i State Plan.

RESPONSE:

The Draft EA includes an analysis that addresses the proposed project and its conformity with objectives, policies, and priority guidelines listed in the Hawai'i State Plan.

COMMENT:

2. *The coastal zone management area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" see HRS § 205A-1 (definition of "coastal zone management area").*

HRS Chapter 205A requires all State and county agencies to enforce the coastal zone management (CZM) objectives and policies. The Draft EA should include an assessment as to how the proposed project conforms to the CZM objectives and its supporting policies set forth in HRS § 205A-2. The assessment on compliance with HRS Chapter 205A is an important component for satisfying the requirements of HRS Chapter 343. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

RESPONSE:

The Draft EA includes an assessment of the proposed project development plan pursuant to the Hawai'i Coastal Zone Management Program per Hawai'i Revised Statutes, Chapter 205A. It is noted that the project site is not within the County of Maui's Special Management Area (SMA).

COMMENT:

3. *According to our data sources, it appears this parcel lies within the Waiakoa watershed. This central Maui watershed is exposed to a range of human activities from agriculture, urban development, and activity along the shoreline in Kahului and Mā'alaea Bay. The Draft EA should consider watershed protection and management. OP has created the Hawai'i Watershed Guidance to provide direction on methods to safeguard Hawai'i's watersheds and implement watershed plans. This guidance provides a number of management measures that address polluted runoff. Although this area is zoned agriculture in the State Land Use District, because of the planned development of this parcel, the runoff from this project may effect urban areas near Kahului and coastal areas near Maalaea Bay. OP's watershed guidance provides a number of management*

measures that address polluted runoff from urban activities, and a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. Specifically, please examine Section B - Management Measures/Urban Runoff, pages 120-122. The document can be viewed or downloaded from the Office of Planning website at [http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI_Watershed_Guidance_Final.pdf).

RESPONSE:

The management measures to mitigate urban runoff set forth in the Hawai'i Watershed Guidance will be reviewed and, as appropriate, included in the implementation of the proposed project.

COMMENT:

4. *We have reviewed the maps transmitted to us in the pre-consultation letter and compared them to known coastal resources in the area. The parcel is approximately a half mile from Mokulele Highway and 200 feet from Kama'aina Road; located in Flood Hazard Zone - X; and the project site appears to be heavily vegetated, zoned for agriculture, with little to no drainage infrastructure aside for the irrigation channels intended for agricultural use. As previously stated, the vision for this parcel is to develop it for urban uses that include an administrative office, a storage area, and industrial activities such as an auto maintenance facility, a fueling center, storage, and parking for heavy equipment. Therefore, a stormwater impact evaluation should be included in the Draft EA. Development and land use activities can create erosion, increased stormwater runoff, and pollution that cause direct, secondary, and cumulative impacts to Hawai'i's resources.*

Please consider OP's Stormwater Impact Assessment in your stormwater impact evaluation for this project. This document can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff occurrences. Mitigation measures and best management practices (BMP) listed in this document can be applied to water runoff strategies to prevent damage to coastal ecosystems. This document will assist in integrating stormwater impact assessment within the planning and environmental review process of a project. The document can be found at [http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater impact/final stormwater impact assessments guidance.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_impact/final_stormwater_impact_assessments_guidance.pdf).

RESPONSE:

The Stormwater Impact Assessment will be reviewed and, as appropriate, suggested mitigation measures and BMPs listed in that document will be considered for implementation with the proposed project. A discussion evaluating the stormwater impact evaluation is included in the Draft EA.

COMMENT:

5. *The review material declares that the plan for this site is for the development of a baseyard for urbanized activities. As previously stated, this land is heavily vegetated, with agricultural activity nearby to the parcel. Construction of a baseyard would introduce development, hardened impervious surfaces, and would require drainage infrastructure to be built. Please consider Low-Impact Development (LID) design practices in the planning process for this project. LID techniques promote a range of structural BMP's for stormwater control management and urban layout that minimizes negative environmental impact.*

*LID design concepts and BMP's that should be considered include: the preservation of natural features and conservation design; the reduction of impervious cover; and utilizing natural features and source control for stormwater management. These methods are listed in OP's Low Impact Development, A Practitioners Guide. For more information on LID – BMP's, please examine Section 1.7, pgs. 1-4 to 1-11. This guidance can be viewed or downloaded from the OP website at:
http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf*

RESPONSE:

The Low Impact Development, A Practitioners Guide, will be reviewed and, as appropriate, concepts will be considered for implementation with the proposed project.

COMMENT:

6. *The intention to seek a State Special Permit for the Pulehunui baseyard will require the demonstration of the "unusual and reasonable" nature of this industrial use within the State Agricultural District. The Draft EA should discuss how the project meets the guidelines for determining such use. Given the project area is greater than 15 acres, the Special Permit will require the approval of County Planning Commission as well as the State Land Use Commission. Included in the discussion on Special Permit guidelines, the Draft EA should discuss the option of eventually pursuing a State Land Use District Boundary*

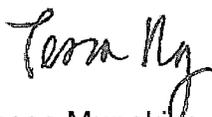
Amendment to reclassify the site from the State Agricultural District to the Urban District, particularly given the intention to pursue urban uses pursuant to the greater Pulehunui Master Plan. The proposed duration(s) of the Special Permit could be useful information for this analysis.

RESPONSE:

The Draft EA includes discussion on the “unusual and reasonable” nature of this proposed industrial use in the State Land Use “Agricultural” District. As noted in your comment there is a future larger Pulehunui Master Plan that the State Department of Land and Natural Resources (DLNR)-Land Division is pursuing as a longer term planning effort. A separate Environmental Assessment or Environmental Impact Statement would be prepared for the entire Pulehunui Master Plan at a later date. DLNR-Engineering is seeking to proceed with the proposed new DOFAW Baseyard at Pulehunui ahead of the larger master plan, as the need for DOFAW facilities improvements are immediate. The requested duration of the Special Use Permit is 10 years and will be noted in the Draft EA. For the longer term planning effort of the Master Plan for the region, DLNR will assess and may consider the option of a State Land Use District Boundary Amendment to reclassify the project site to Urban District.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes (HRS) review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,

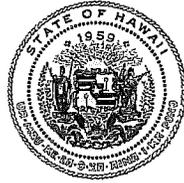


Tessa Munekiyo Ng, AICP

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW
Wade Shimabukuro, DAGS Maui

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APR 02 2015

The Senate

STATE CAPITOL
HONOLULU, HAWAII 96813

March 30, 2015

Tessa Munekiyo Ng, Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Munekiyo Ng:

I am writing in support of the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife.

As noted in the consultation request, a significant portion of the existing Kahului Baseyard is located in a tsunami evacuation zone, and thus is limited in its potential for expansion and improvements. I agree with the Engineering Division and the Division of Forestry and Wildlife that the proposed Pulehunui Baseyard is a preferable alternative to Kahului Baseyard. It is important that we consider the increasing impacts of climate change as we determine how and where we develop.

I also continue to support the Pulehunui Master Plan. We need to optimize our land use so that our choices have the greatest benefit for our community and county while taking into account responsible stewardship of our resources. The Department of Land and Natural Resources, Department of Hawaiian Homelands, Department of Public Safety and Department of Accounting and General Services have worked cooperatively in this effort. Most importantly, members of our community have been involved through public meetings and community outreach, and I expect we will continue this transparency, information sharing and solicitation for questions and feedback as the plan develops.

Me ke aloha pumehana,

Rosalyn H. Baker
SENATOR
6TH District South and West Maui



February 2, 2016

Senator Rosalyn H. Baker
The Senate
Hawai'i State Capitol, Room 230
Honolulu, Hawai'i 96813

**SUBJECT: Early Consultation Request for Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui**

Dear Senator Baker:

Thank you for your letter dated March 30, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we note your support for the proposed Pulehunui Baseyard as a preferable alternative to the Kahului Baseyard. In regards to your comment that climate change impacts be considered, as may be feasible, this will be included as a consideration in determining the location and design of the project. While this proposed project is proceeding ahead of the longer-term planning effort for the region, your support for the development of the Pulehunui Master Plan is also noted and appreciated.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at 983-1233.

Very truly yours,

Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching, P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW



DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

APR 10 2015 LAN M. ARAKAWA

Mayor

JO-ANN T. RIDAO
Director

JAN SHISHIDO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

April 6, 2015

Ms. Tessa Munekiyo Ng
Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Ng:

Subject: Early Consultation Request for Proposed Division of Forestry and Wildlife Baseyard at Pulehunui, Maui, Hawaii (TMK (2) 3-8-008:001 por.)

The Department has reviewed the request for Early Consultation for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. At the present time, the Department has no additional comments to offer.

Please call Mr. Veranio Tongson Jr. of our Housing Division at (808) 270-1741 if you have any questions.

Sincerely,

WAYDE T. OSHIRO
Housing Administrator

cc: Director of Housing and Human Concerns



February 2, 2016

Carol Reimann, Director
County of Maui
Department of Housing and Human Concerns
2200 Main Street, Suite 546
Wailuku, Hawai'i 96793

**SUBJECT: Early Consultation Request for Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui**

Dear Ms. Reimann:

Thank you for your letter dated April 6, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we note the Department of Housing and Human Concerns' comment that the subject project is not subject to Chapter 2.96, Maui County Code and that your office has no additional comments.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,

Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching, P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyo-hiraga.com

ALAN M. ARAKAWA
Mayor



APR 21 2015
KA'ALA BUENCONSEJO
Director

BRIANNE L. SAVAGE
Deputy Director

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nako'a Street, Unit 2, Wailuku, Hawaii 96793

(808) 270-7230
FAX (808) 270-7934

April 9, 2015

Tessa Munekiyo Ng, AICP
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Ng:

**SUBJECT: Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard at Pulehunui, Maui, Hawaii
TMK: (2) 3-8-008:001 por**

Thank you for the opportunity to review and comment on the proposed Division of Forestry and Wildlife Baseyard at Pulehunui. The Department has no objections to the proposed action, but would like to review the project as it develops. In accordance with the requirements of Chapter 343, Hawaii Revised Statutes (HRS) and Section 11-2-00-6, Hawaii Administrative Rules (HAR) please provide a copy of the Draft Environmental Assessment (EA).

Feel free to contact me or Karla Peters, Chief of Planning and Development, TA at 270-7981, should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Karla Peters".

KA'ALA BUENCONSEJO
Director of Parks and Recreation

c: Karla Peters, Chief of Planning and Development, TA

KB:KP:do

February 2, 2016

Ka'ala Buenconsejo, Director
County of Maui
Department of Parks & Recreation
700 Hali'a Nakoa Street, Unit 2
Wailuku, Hawai'i 96793

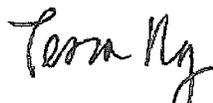
**SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui**

Dear Mr. Buenconsejo:

Thank you for your letter dated April 9, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge that the County of Maui, Department of Parks and Recreation has no objections at this time and would like to review the project as it develops.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW
Karla Peters, Department of Parks and Recreation

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Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyoHIRAGA.com

APR 16 2015

ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director



COUNTY OF MAUI
DEPARTMENT OF PLANNING

April 13, 2015

Ms. Tessa Munekiyo Ng, Vice President
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Ng:

**SUBJECT: COMMENTS ON A DRAFT ENVIRONMENTAL ASSESSMENT (EA)
EARLY CONSULTATION NOTICE FOR THE PROPOSED STATE OF
HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE BASEYARD AT
PULEHUNUI, MAUI, HAWAII; TMK: (2) 3-8-008:001 (RFC 2015/0041)**

The Department of Planning (Department) is in receipt of an early consultation request in preparation of the Draft EA for the above-referenced project. The Department understands the proposed action includes the following:

- The Proposing Agency for the project is the State of Hawaii Department of Land and Natural Resources (DLNR), Engineering Division, that is proposing a new baseyard for the DLNR Division of Forestry and Wildlife.
- The project will consist of a Baseyard with a two (2) story office building, wildlife lab, warehouse, nursery, dryland forest restoration area, heavy equipment parking area, helicopter operations landing zone, equipment yard, auto maintenance shop, fueling station, wash bay, training field, staging area, and parking area, on approximately 20.3 acres.
- The project proposes using State or County lands or funds and proposes the construction of a helicopter facility and operations landing zone and thereby triggers compliance with Hawaii Revised Statutes (HRS), Chapter 343, and preparation of an environmental document.
- The EA will serve as a supplemental document for review in the entitlement process for the project that will require a County Conditional Permit and a State Land Use Commission Special Permit.

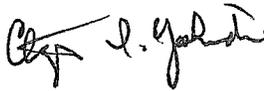
Based on the foregoing, the Department provides the following comments for early consultation on the Draft EA:

Ms. Tessa Munekiyo Ng, Vice President
April 13, 2015
Page 2

1. Please include a Zoning and Flood confirmation form from the Department's Zoning Administration and Enforcement Division;
2. Please consult with the Department's Maui Island Plan Implementation Division regarding this project and its compliance with the Maui Island Plan;
3. Please describe in detail each of the proposed components of the project so that the Maui Planning Commission, Maui County Council, and State of Hawaii Land Use Commission will be able to clearly see the multiple components of this important Maui Island project; and,
4. Please provide the Department with one (1) hard copy and one (1) electronic copy of the Draft EA.

Thank you for the opportunity to comment. Should you require further clarification, please contact Staff Planner Kurt Wollenhaupt at kurt.wollenhaupt@mauicounty.gov or at (808) 270-1789.

Sincerely,



CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

xc: John S. Rapacz, Planning Program Administrator (PDF)
John F. Summers, Planning Program Administrator (PDF)
Kurt F. Wollenhaupt, Staff Planner (PDF)
Project File
General File

WRS:CIY:KFW:sn

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February 2, 2016

William Spence, Director
County of Maui
Department of Planning
2200 Main Street, Suite 315
Wailuku, Hawai'i 96793

SUBJECT: Early Consultation Request for proposed Division of Forestry and
Wildlife Baseyard at Pulehunui

Dear Mr. Spence:

Thank you for your letter dated April 13, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we provide the following responses in the order of the Department of Planning comments.

COMMENT:

1. *Please include a Zoning and Flood confirmation form from the Department's Zoning Administration and Enforcement Division;*

RESPONSE:

A Zoning and Flood confirmation form will be included in the Draft EA for the proposed project.

COMMENT:

2. Please consult with the Department's Maui Island Plan implementation Division regarding this project and its compliance with the Maui Island Plan;

RESPONSE:

The proposed project's compliance with the Maui Island Plan will be discussed in the Draft EA, and there will be consultation with the Department's Maui Island Plan Implementation Division.

COMMENT:

3. *Please describe in detail each of the proposed components of the project so that the Maui Planning Commission, Maui County Council, and State of Hawai'i Land Use Commission will be able to clearly see the multiple components of this important Maui Island project; and*

RESPONSE:

A detailed description of the proposed project components will be included in the Draft EA.

COMMENT:

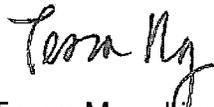
4. *Please provide the Department with one (1) hard copy and one (1) electronic copy of the Draft EA.*

RESPONSE:

The Department will be provided one (1) hard copy and one (1) electronic copy of the Draft EA for further review and comment.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. If there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,

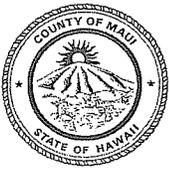


Tessa Munekiyo Ng, AICP
Senior Associate

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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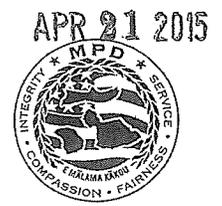
ALAN M. ARAKAWA
MAYOR

OUR REFERENCE
YOUR REFERENCE

POLICE DEPARTMENT

COUNTY OF MAUI

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411



TIVOLI S. FAAUMU
CHIEF OF POLICE

DEAN M. RICKARD
DEPUTY CHIEF OF POLICE

April 15, 2015

Ms. Tessa Munekiyo Ng, AICP
Vice President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Munekiyo:

SUBJECT: Early Consultation Request for the Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui – TMK (2) 3-8-008:001 (por)

Thank you for your letter of March 23, 2015, requesting comments on the above
subject.

We have reviewed the information submitted and have no comments or
recommendations to make at this time. Thank you for giving us the opportunity to
comment on this project.

Very truly yours,

Assistant Chief Victor K. Ramos
for: Tivoli S. Faamu
Chief of Police

c: William Spence, Planning Department



MUNEKIYO HIRAGA

Planning, Project Management, Sustainable Solutions.

Michael T. Munekiyo
PRESIDENT

Karlynn K. Fukuda
EXECUTIVE VICE PRESIDENT

Mark Alexander Roy
VICE PRESIDENT

Tessa Munekiyo Ng
VICE PRESIDENT

February 2, 2016

Chief Tivoli S. Faamu
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawai'i 96793

SUBJECT: Early Consultation Request for proposed Division of Forestry and Wildlife Baseyard at Pulehunui

Dear Chief Faamu:

Thank you for your letter dated April 15, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge that the County of Maui, Police Department has no comments at this time.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,

Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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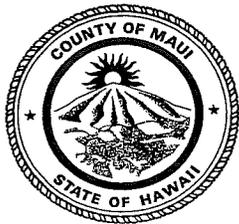
Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyoHIRAGA.com

ALAN M. ARAKAWA
Mayor
KYLE K. GINOZA, P.E.
Director
MICHAEL M. MIYAMOTO
Deputy Director

MICHAEL RATTE
Solid Waste Division
ERIC NAKAGAWA, P.E.
Wastewater Reclamation Division



**COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT**

2050 MAIN STREET, SUITE 1C
WAILUKU, MAUI, HAWAII 96793

April 2, 2015

Ms. Tessa Munekiyo Ng
Munekiyo Hiraga
305 High Street, Suite 104
Wailuku, Hawaii 96793

**SUBJECT: DIVISION OF FORESTRY AND WILDLIFE BASEYARD
EARLY CONSULTATION REQUEST
TMK (2) 3-8-008:POR. OF 001, PULEHUNUI**

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:
 - a. Include a plan for the management of construction waste.
2. Wastewater Reclamation Division (WWRD) comments:
 - a. There is no County wastewater system in the area of the subject project.

If you have any questions regarding this memorandum, please contact Michael Miyamoto at 270-8230.

Sincerely,



KYLE K. GINOZA, P.E.
Director of Environmental Management

February 2, 2016

Stuart Stant, Director
County of Maui
Department of Environmental Management
2050 Main Street, Suite 1C
Wailuku, Hawai'i 96793

SUBJECT: Early Consultation Request for Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui

Dear Mr. Stant:

Thank you for your letter dated April 2, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we provide the following responses in the order of the Department of Environmental Management (DEM) comments in your letter.

1. **Solid Waste Division comments:**

- a. Include a plan for the management of construction waste.

Response :

DLNR will prepare a construction waste management plan which will be submitted to DEM.

2. **Wastewater Reclamation Division (WRRD) comments:**

- a. There is no County wastewater system in the area of the subject property.

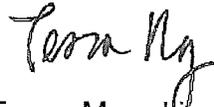
Response:

We understand that there is no County wastewater service to the subject property. Discussion of proposed wastewater infrastructure will be included in the Draft EA.

Stuart Stant, Director
February 2, 2016
Page 2

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

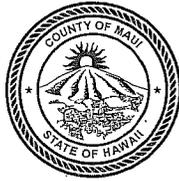
TMN:tn

Cc: Paul Fasi, Department of Planning
Grayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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MAY 01 2015

ALAN M. ARAKAWA
Mayor



JO ANNE JOHNSON-WINER
Director
MARC I. TAKAMORI
Deputy Director
Telephone (808) 270-7511

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

April 27, 2015

Ms. Tessa Munekiyo
Munekiyo & Hiraga Inc.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

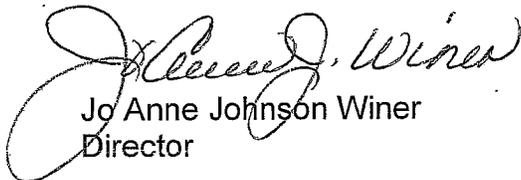
Subject: Proposed Division of Forestry and Wildlife Baseyard at Pulehunui, Maui

Dear Ms. Munekiyo,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,


Jo Anne Johnson Winer
Director

February 2, 2016

Don Medeiros, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawai'i 96793-2155

SUBJECT: Early Consultation Request for proposed Division of Forestry and Wildlife Baseyard at Pulehunui

Dear Mr. Medeiros:

Thank you for your letter dated April 27, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR) we acknowledge that the County of Maui, Department of Transportation has no comments at this time.

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729

Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233

www.munekiyoHIRAGA.com

APR 13 2015

ALAN M. ARAKAWA
Mayor



DAVID TAYLOR, P.E.
Director

PAUL J. MEYER
Deputy Director

**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI**

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

April 1, 2015

Munekiyo & Hiraga, Inc.
Attention: Tessa Munekiyo Ng, Vice-President
305 High Street, Ste. 104
Wailuku, HI 96793

Dear Ms. Munekiyo:

RE: Project: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard in Pulehunui, Maui, Hawaii
Applicant: State Department of Land and Natural Resources
Address: Kamaaina Road, Pulehunui, Maui, Hawaii
Description: Construction of 1) new office building with meeting space, a gym, shower, and locker room on the first floor and office space on the second floor (40,000 square feet total); 2) Wildlife Lab (5,000 square feet); 3) Warehouse (45,000 square feet); 4) Nursery (2 acres); 5) Dryland Forest Restoration (5.5 acres); 6) Heavy Equipment Parking Area (10,000 square feet); 7) Helicopter Operations Landing Zone; 8) Equipment Yard; 9) Auto Maintenance Shop; 10) Fueling Station; 11) Wash Bay; 12) Training Field; 13) Staging Area; and 14) Public and Employee Parking.
TMK: (2) 3-8-079:018 (por.)

Thank you for the opportunity to provide the following comments on the referenced project.

The referenced project has an existing 8-inch waterline serving the project site. The site does not have a water meter and fire hydrant serving the site. Water system improvements will be required and will be determined during the building permit process.

The Department of Water Supply recommends that the applicant include the following conservation measures in the Environmental Assessment and implement them in the project:

"By Water All Things Find Life"



Ms. Tessa Munekiyo
April 1, 2015
Page 2

Indoor Conservation Measures

- Use EPA WaterSense labeled plumbing fixtures.
- Install flow reducers and faucet aerators in all plumbing fixtures wherever possible.
- Install dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.
- Install showerheads with a flow rate of 1.5 gallons per minute (gpm) at 60 pounds per square inch (psi).
- Install bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines must use Energy Star labeled washers.

Outdoor Conservation Measures

- Use Smart Approved WaterMark irrigation products. Examples include ET irrigation controllers, drip irrigation, and water saving spray heads.
- Avoid plant fertilizing and pruning that would stimulate excessive growth. Time watering to occur in the early morning or evening to limit evaporation. Limit turf to as small an area as possible.
- Use native climate-adapted plants for landscaping. Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species.
- Dust control: Reclaimed water for dust control is available from the Kihei and Kahului sewage treatment plants at a reasonable cost. It should be considered as an alternative source of water for dust control during construction.

Should you have any questions, please contact Arnold Y. Imae, Staff Planner, at Arnold.Imae@co.maui.hi.us or at (808) 463-3110.

Sincerely,



Dave Taylor, P.E., Director

ayi

c: DWS Engineering Division
DWS Water Resources & Planning Division files



February 2, 2016

Dave Taylor, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawai'i 96793

SUBJECT: Early Consultation Request for Proposed Division of Forestry and
Wildlife Baseyard at Pulehunui

Dear Mr. Taylor:

Thank you for your letter dated April 1, 2015 responding to our request for early consultation in preparation of a Draft Environmental Assessment (EA) for the proposed Baseyard at Pulehunui for the Division of Forestry and Wildlife (DOFAW) project. On behalf of the Department of Land and Natural Resources (DLNR), we provide the following responses in the order of the Department of Water Supply comments.

COMMENT:

The referenced project has an existing 8-inch waterline serving the project site. The site does not have a water meter and fire hydrant serving the site. Water system improvements will be required and will be determined during the building permit process.

RESPONSE:

We understand that the project site does not have a water meter and fire hydrant and that the required water system improvements will be determined during the building permit process. DLNR is coordinating with the Department of Water Supply to discuss water system improvements to serve this project. Project infrastructure and utilities requirements will be assessed and presented in the Draft EA.

COMMENT:

The Department of Water Supply recommends that the applicant include the following conservation measures in the Environmental Assessment and implement them in the project:

Indoor Conservation Measures

- *Use EPA WaterSense labeled plumbing fixtures.*
- *Install flow reducers and faucet aerators in all plumbing fixtures wherever possible.*
- *Install dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.*
- *Install showerheads with a flow rate of 1.5 gallons per minute (gpm) at 60 pounds per square inch (psi).*
- *Install bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines must use Energy Star labeled washers.*

Outdoor Conservation Measures

- *Use Smart Approved WaterMark irrigation products. Examples include ET irrigation controllers, drip irrigation, and water saving spray heads.*
- *Avoid plant fertilizing and pruning that would stimulate excessive growth. Time watering to occur in the early morning or evening to limit evaporation. Limit turf to as small an area as possible.*
- *Use native climate-adapted plants for landscaping. Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species.*
- *Dust control: Reclaimed water for dust control is available from the Kihei and Kahului sewage treatment plants at a reasonable cost. It should be considered as an alternative source of water for dust control during construction.*

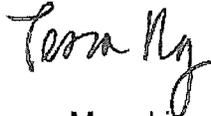
RESPONSE:

The indoor and outdoor conservation measures noted in your letter will be considered for the proposed project, as may be feasible. A discussion of the conservation measures will be included in the Draft EA.

Dave Taylor, Director
February 2, 2016
Page 3

Thank you for your participation in the Chapter 343, Hawai'i Revised Statutes review process. A copy of your letter will be included in the Draft EA. A copy of the Draft EA will be sent to your office for further review and comment. In the meantime, if there are any questions or if additional information is needed, please feel free to contact me at (808) 983-1233.

Very truly yours,



Tessa Munekiyo Ng, AICP
Vice President

TMN:tn

Cc: Paul Fasi, Department of Planning
Gayson Ching P.E., DLNR Engineering
Scott Fretz, DLNR DOFAW

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IX. REFERENCES

IX. REFERENCES

Bartholomew, Gail, Maui Remembers: a local history, Honolulu: Mutual Publishing, 1994.

County of Maui, Department of Environmental Management, Integrated Solid Waste Management Plan, 2009.

County of Maui, General Plan of the County of Maui, 1990 Update.

County of Maui, Office of Economic Development, Maui County Data Book 2013.

County of Maui, Department of Planning, Kihei-Makena Community Plan, 1998.

County of Maui, Department of Planning, Socio-Economic Forecast The Economic Projections For The Maui County General Plan 2030, June 2006.

Federal Emergency Management Agency, Flood Insurance Rate Map Community/Panel No. 1500030560E and 1500030411E, September 2009.

Foot et al, U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Moloka'i and Lāna'i, State of Hawai'i, 1972.

Frey, Jennifer J. and Fredericksen, Erik M., *An Archaeological Inventory Survey of an 80 Acre Portion of Land Along Mokulele Highway, Located in Pulehunui and Waikapū Ahupua'a, Wailuku District, Maui, Hawaii TMK (2)3-8-08:036 (portion)*, Pukalani: Xamanek Researches, LLC, 2008.

Handy, E.S. Craighill, Hawaiian Planter Vol.1: His Plants, Methods, and Areas of Cultivation, Honolulu: Bishop Museum Press, 1940.

Handy, E.S. Craighill and Elizabeth Green Handy, Native Planters in Old Hawai'i: Their Life, Lore, and Environment, Honolulu: Bishop Museum Press, 1972.

PBR, Hawai'i, Maui Island Plan, prepared for State of Hawai'i, Department of Hawaiian Home Lands, September 2004.

Pukui, M. K. and Elbert, S. H., Hawaiian Dictionary, Honolulu: University of Hawai'i Press, 1986.

Pukui, Mary Kawena et. al., Place Names of Hawai'i, Honolulu: University of Hawai'i Press, 2nd ed., 1974.

Speakman, Commins E. Jr., Mowee: An Informal History of the Hawaiian Island, Salem: Peabody Museum of Salem, 1978.

State of Hawai‘i, Department of Agriculture, “The Hawai‘i State Plan – Agriculture – State Functional Plan”, 1991.

State of Hawai‘i, Department of Business, Economic Development & Tourism (DBEDT), “Residential Population by Race for the State of Hawai‘i, by Island and Census Designated Place: 2010”, Available at http://Hawaii.gov/dbedt/info/census/census_2010/PL94-171/index_html, Accessed 14 October 2011.

State of Hawai‘i, Department of Education (DOE), “Official 2011-12 Public and Charter School Enrollment”, January 2012.

State of Hawai‘i, Department of Labor and Industrial Relations, www.labor.hawaii.gov/blog/news/hawaiis-unemployment-rate-drops-to-3-2-in-november (January 2016).

State of Hawai‘i, Department of Transportation, Airports Division, *Maui Airport (Pu‘unēnē)*, Available at: <http://Hawaii.gov/Hawaiiaviation/Hawaii-airfields-airports/maui/maui-airport-Pu‘unēnē>, Accessed 28 December 2011.

State of Hawai‘i, Hawai‘i Revised Statutes, <http://www.capitol.Hawaii.gov/hrscurrent/>.

State of Hawai‘i, Land Use Commission, <http://luc.state.hi.us/>, November 2009.

U.S. Census Bureau, [2010 Census Summary File 1](#), Accessed August 2011.

U.S. Census Bureau, [2000 Census Summary File 1](#), Accessed August 2011.

U.S. Naval Air Station, *History, Naval Air Station Pu‘unēnē, T.H.*, Available at: <http://Hawaii.gov/Hawaiiaviation/Hawaii-airfields-airports/maui/NAS%2030%20Pu‘unēnē.pdf>, Accessed 28 December 2011.

University of Hawai‘i, Department of Geography, [Atlas of Hawai‘i](#), Third Edition, 1998.

University of Hawai‘i, [Land Study Bureau, Detailed Land Classification, Island of Maui](#), May 1967.

APPENDIX A.
Conceptual Project Plans



DOFAW Maui Baseyard Renovation Design Concept

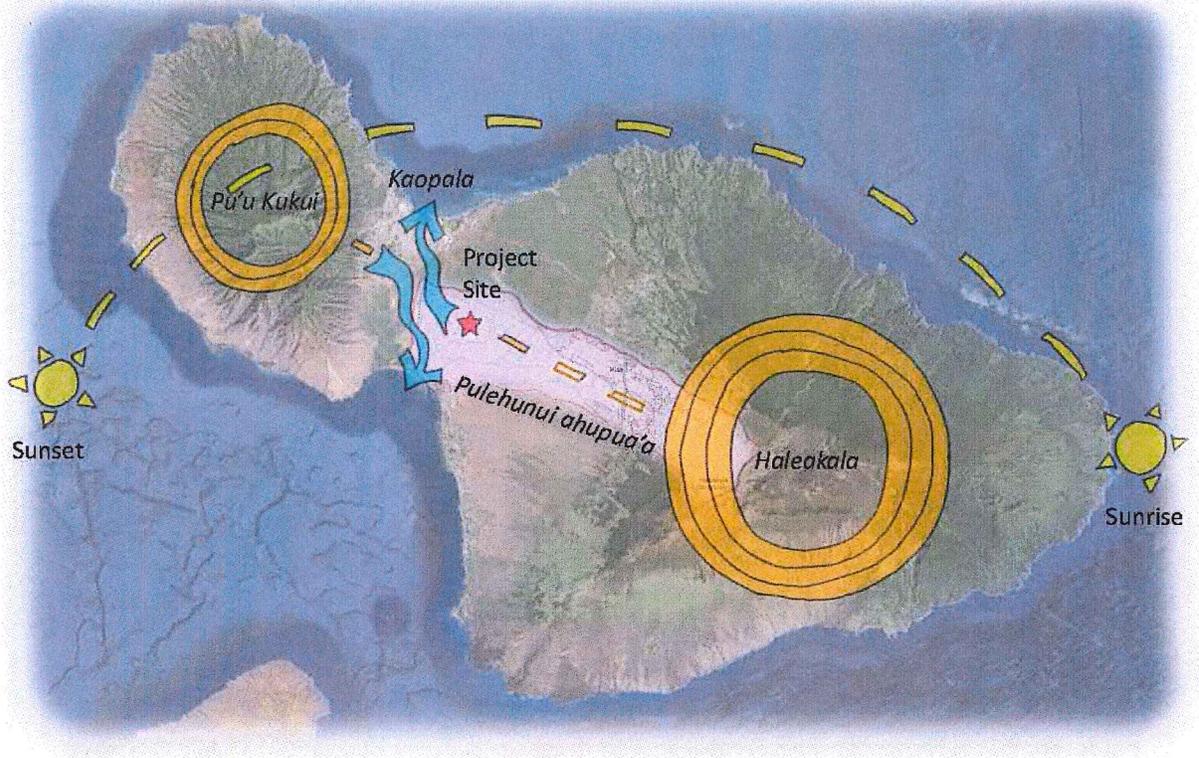


Figure A: Concept Diagram

Pulehunui is an ancient Hawaiian *ahupua'a*, or land division that usually extends from the mountains to the sea¹, as indicated by the area shaded white in Figure A. Located on the island of Maui, its English translation means "Grand Waterspout"¹. Our project site, as shown by the red star in Figure A, is located near the western boundary of *Pulehunui*, where a number of land and topographic features have inspired our design concept and architecture.

The land feature which the ancient Hawaiians used to locate western boundary of *Pulehunui* was referred to as *Kaopala*, or place "where the water ran down and stood still."² Indeed our project site is located near the valley where Maui's two main mountain peaks converge; where the water from *Haleakala* and *Pu'u Kukui* meet before running to the ocean. The north-south axis of *Kaopala* is reflected in our architecture with glass curtain walls located on the northern and southern elevations, creating a visual portal that respects the flow of water and wind through this point of convergence.



Views to the east and west of our project site, as shown in Figure B, are dominated by the mountain peaks of *Pu'u Kukui* to the east, and *Haleakala* to the west. Smaller window openings on the east and west facades allow users to appreciate these views of the mountains while providing some sun protection from the rising and setting sun. Locating building entrances on the east and west facade guide the flow of foot traffic to mimic the flow of water as it travels along east-west axis from the mountains to the ocean, and reflects the axis created between the two mountain peaks that dominate Maui's landscape.

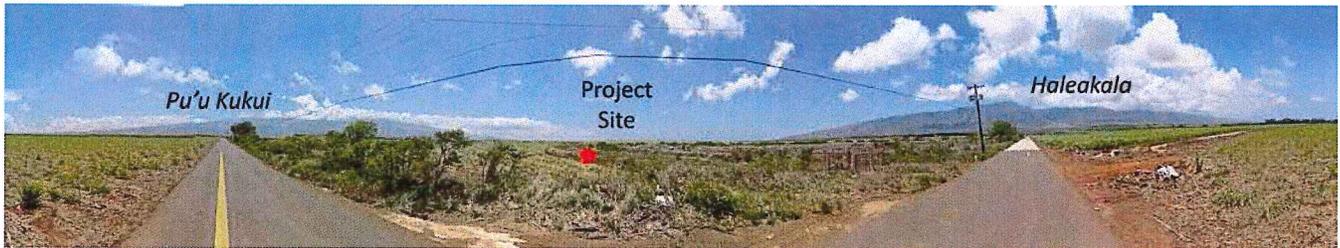


Figure B: Site Panoramic

Finally, examples of *pani'olo*¹ or cowboy-style architecture are ubiquitous in Maui's public spaces, as well as private residences, as shown in Figure C. Similarly, wood-style construction & trim detailing, x-bracing, and a colorful palette, are incorporated in this design, allowing it blend harmoniously with Maui's local architecture. However, glass curtain walls to provide ample daylight and a light, airy feel, clean lines and simple forms, and over-sized x-brace detailing provide a modern twist to the classic *pani'olo* architecture.



Figure C: Paia Town (upper left), Lahaina Front Street (upper right), Residence in Kula (bottom)

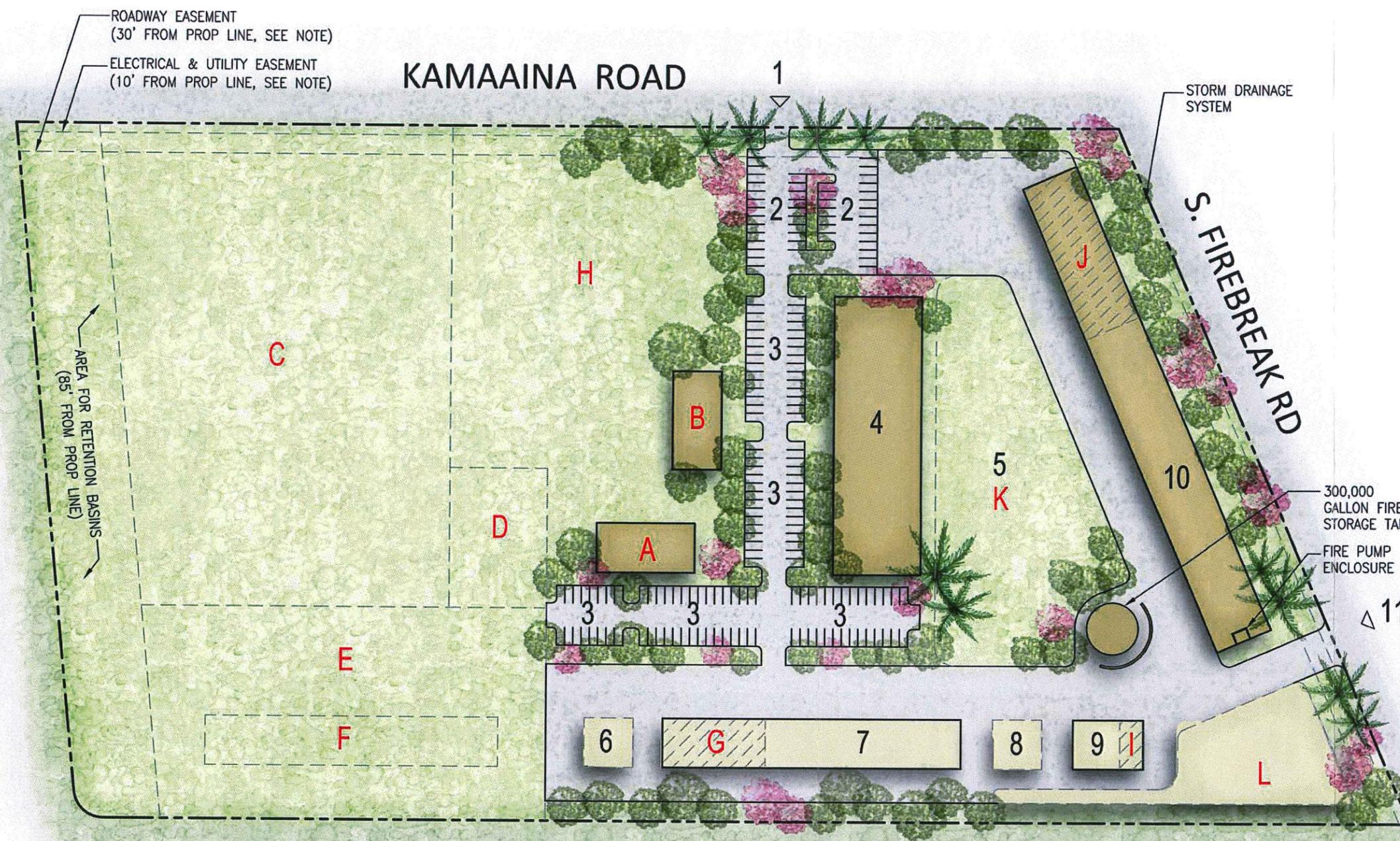


DOFAW MAUI BASEYARD RENOVATION
Design Concept
Job No. D00CM68A
Prepared by: Bowers + Kubota Consulting

References

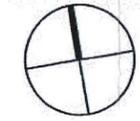
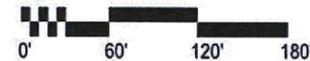
¹ "Na Puke Wehewehe Olelo Hawaii." Ulukau Hawaiian Electronic Library. 2003. Ka puke wehewehe a Pukui/Elbert. Web. 6 August 2015. <http://wehewehe.org/>

²⁴ Hawaiian Reports 239. "In the Matter of the Boundaries of Pulehunui Supreme Court of the Hawaiian Kingdom, dated October 1879, Decided" *Hawaiian Journal of Law & Politics* 2 (2006): 195-206. Web.



- PHASE 1**
- 1 MAIN ENTRY
 - 2 PUBLIC PARKING
 - 3 EMPLOYEE PARKING
 - 4 ONE STORY OFFICE BUILDING, 25,470 SF
 - 5 NURSERY, 2 ACRES
 - 6 FUELING STATION
 - 7 HEAVY EQUIPMENT PARKING, 10,000 SF
 - 8 WASH BAY
 - 9 AUTO MAINTENANCE SHOP, 2,400 SF
 - 10 WAREHOUSE 20,000 SF
 - 11 MAINTENANCE ENTRY
- PHASE 2**
- A WILDLIFE LAB, 5,000 SF
 - B NURSERY OFFICE / GREENHOUSE, 5,000 SF
 - C DRYLAND FOREST RESTORATION, 4 ACRES
 - D HELICOPTER OPERATIONS LANDING ZONE
 - E EQUIPMENT YARD
 - F FUTURE WAREHOUSE, 15,000 SF
 - G HEAVY EQUIPMENT PARKING, +5,200 SF
 - H NURSERY, 2 ACRES
 - I AUTO MAINTENANCE SHOP, +1,200 SF
 - J WAREHOUSE, +10,000 SF
 - K TRAINING FIELD, 1.3 ACRE
 - L DOZER & STAGING

NOTE:
 WIDTH AND LOCATION OF EASEMENTS SHOWN ARE APPROXIMATE, AND HAVE NOT BEEN VERIFIED BY A BOUNDARY SURVEY

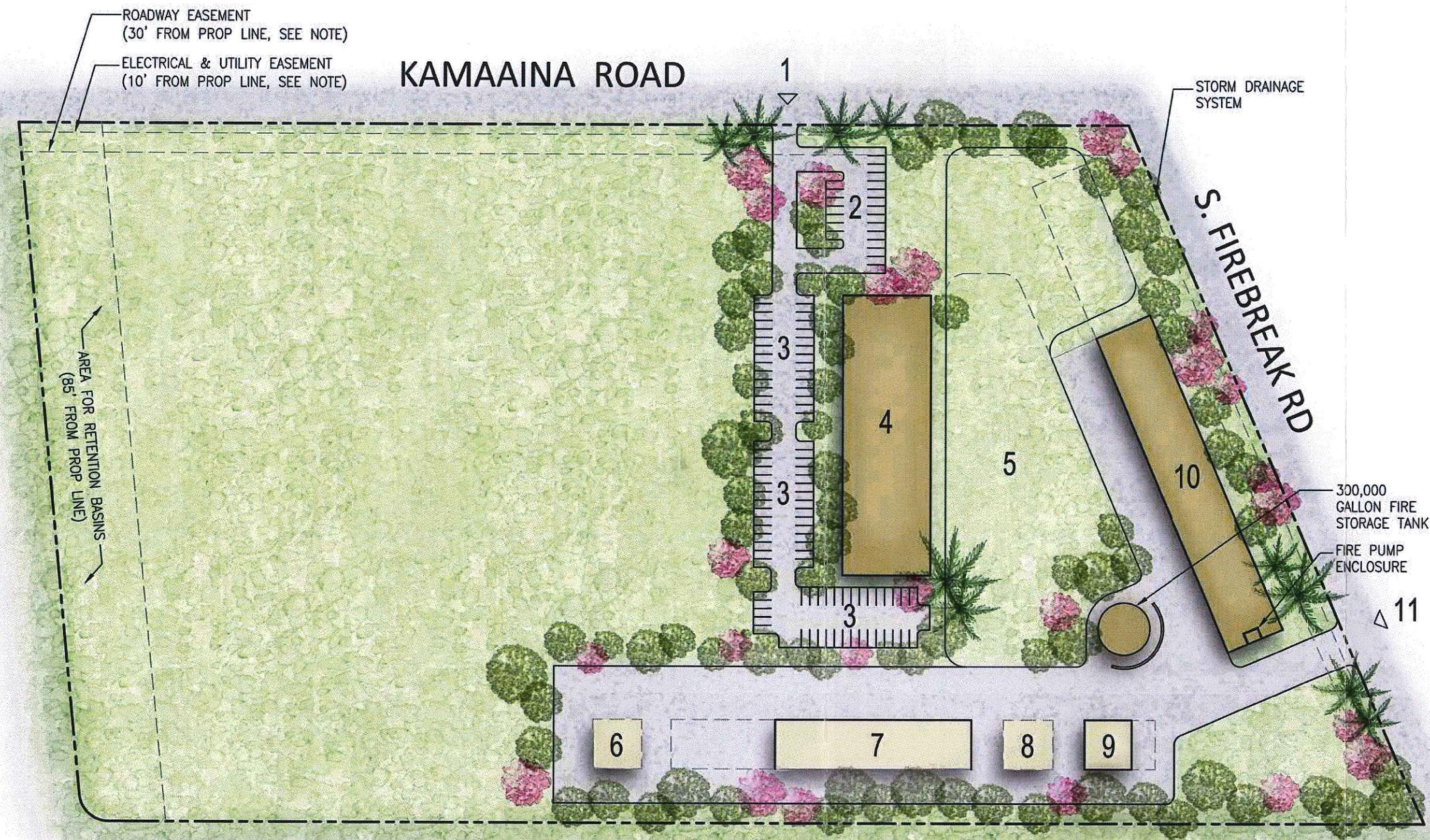


Title: **DOFAW BASEYARD AT PULEHUNUI - MASTER CONCEPT**

Date: 08.19.15 Scale: SEE GRAPHIC SCALE

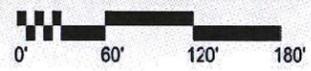
SK-1

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- LEGEND**
- 1 MAIN ENTRY
 - 2 PUBLIC PARKING
 - 3 EMPLOYEE PARKING
 - 4 ONE STORY OFFICE BUILDING, 25,455 SF
 - 5 NURSERY, 2 ACRES
 - 6 FUELING STATION
 - 7 HEAVY EQUIPMENT PARKING, 10,000 SF
 - 8 WASH BAY
 - 9 AUTO MAINTENANCE SHOP, 2,400 SF
 - 10 WAREHOUSE 20,000 SF
 - 11 MAINTENANCE ENTRY

NOTE:
 WIDTH AND LOCATION OF EASEMENTS SHOWN ARE APPROXIMATE, AND HAVE NOT BEEN VERIFIED BY A BOUNDARY SURVEY



Title: **DOFAW BASEYARD AT PULEHUNUI - INITIAL PHASE**

Date: 9/29/15 Scale: SEE GRAPHIC SCALE

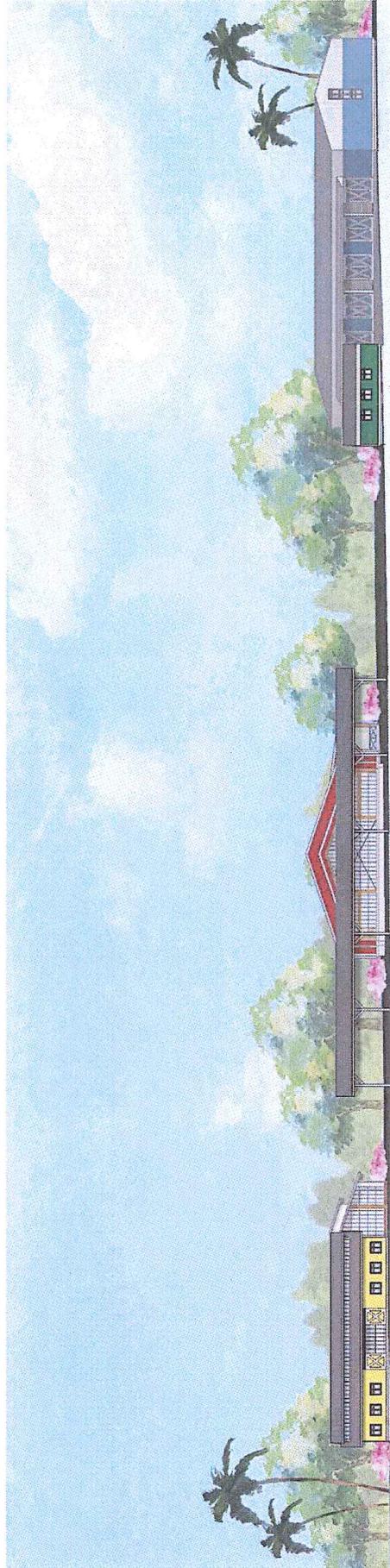
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ELEVATIONS



NORTH ELEVATION



SOUTH ELEVATION

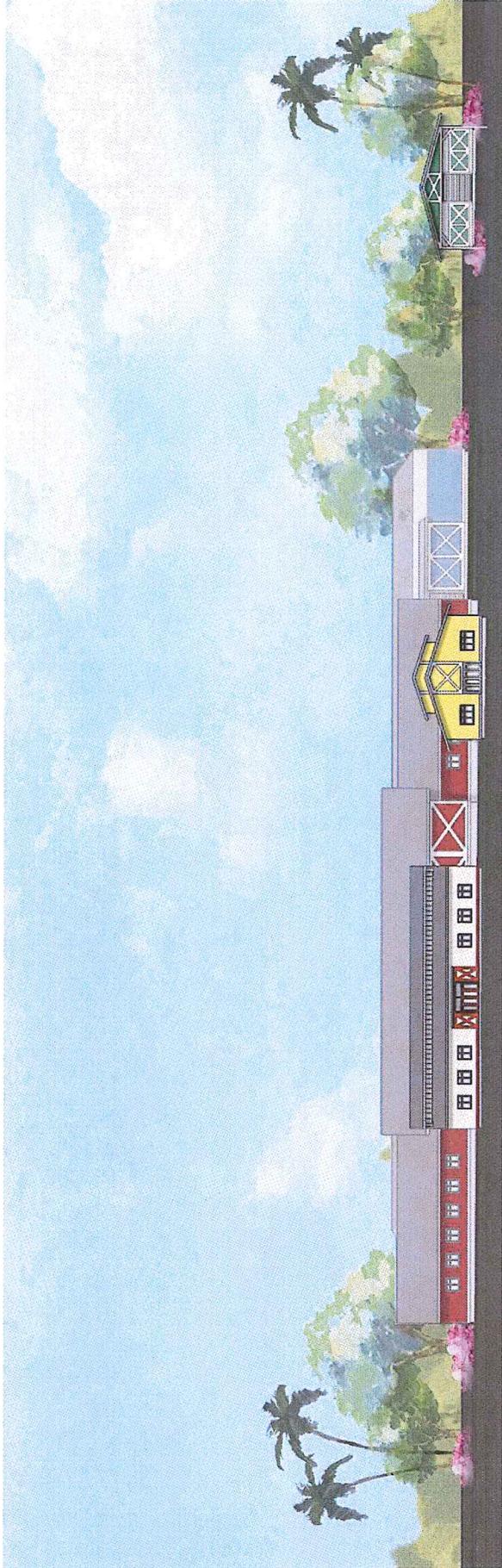


THE DOFAW BASEYARD AT PULEHUNUI - ELEVATIONS

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SK-3



WEST ELEVATION

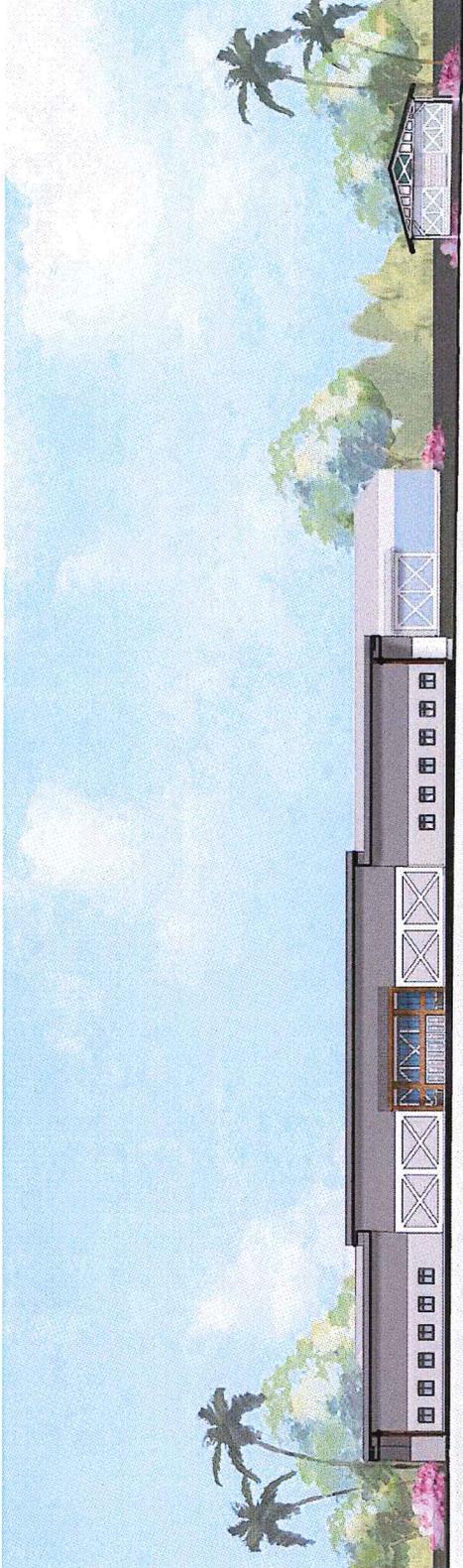


THE DOFAW BASEYARD AT PULEHUNUI - ELEVATIONS

Date: 8/20/15 Scale: NTS

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SK-4



CROSS SECTION - A



LONGITUDINAL SECTION - B



THE DOFAW BASEYARD AT PULEHUNUI - SECTIONS

Date: 8/20/15 Scale: NTS

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APPENDIX B.

**Zoning and Flood Confirmation
Form**

COUNTY OF MAUI
DEPARTMENT OF PLANNING
One Main Plaza Building
2200 Main Street, Suite 335
Wailuku, Hawaii 96793



Zoning Administration and Enforcement Division (ZAED)
Telephone: (808) 270-7253
Facsimile: (808) 270-7634
E-mail: planning@mauicounty.gov
JUN 23 P 3:47
COUNTY OF MAUI
DEPARTMENT OF PLANNING
ZONING ADMINISTRATION

15/1398 CAN

ZONING AND FLOOD CONFIRMATION FORM

(This section to be completed by the Applicant)

APPLICANT NAME Munekiyo Hiraga on behalf of Department of Land and Natural Resources **TELEPHONE** 244-2015
PROJECT NAME Division of Forestry and Wildlife Baseyard at Pulehunui **E-MAIL** planning@munekiyohiraga.com
PROPERTY ADDRESS Vicinity of Kamaaina Road and Firebreak Road **TAX MAP KEY** (2)3-8-008:001 (por.) See attachment.

Yes No Will this Zoning & Flood Confirmation Form be used with a Subdivision Application?
IF YES, answer questions A and B below and comply with instructions 2 & 3 below:
A) Yes No Will it be processed under a consistency exemption from Section 18.04.030(B), MCC?
IF YES, which exemption? (No. 1, 2, 3, 4 or 5) _____
B) State the purpose of subdivision and the proposed land uses (ie 1-lot into 2-lots for all land uses allowed by law): _____

- INSTRUCTIONS:**
- 1) Please use a separate Zoning & Flood Confirmation Form for each Tax Map Key (TMK) number.
 - 2) If this will be used with a subdivision application AND the subject property contains multiple districts/designations of (1) State Land Use Districts, (2) Maui Island Plan Growth Boundaries, (3) Community Plan Designations, or (4) County Zoning Districts; submit a signed and dated Land Use Designations Map, prepared by a licensed surveyor, showing the metes & bounds of the subject parcel and of each district/designation including any subdistricts.
 - 3) If this will be used with a subdivision application AND the subject property contains multiple State Land Use Districts; submit an approved District Boundary Interpretation from the State Land Use Commission.

(This section to be completed by ZAED)

LAND USE DISTRICTS/DESIGNATIONS (LUD) AND OTHER INFORMATION: ¹

STATE DISTRICT: Urban Rural Agriculture Conservation (SMA) Special Management Area

MAUI ISLAND Growth Boundary: ² Urban Small Town Rural Planned Growth Area Outside Growth Boundaries

PLAN Protected Area: ² Preservation Park Greenbelt Greenway Sensitive Land Outside Protected Areas

COMMUNITY PLAN: ² AG - Agriculture (PD) Planned Development

COUNTY ZONING: AG - Agriculture (PH) Project District

OTHER/COMMENTS: Zoning is based on area notes on attached page. See Additional Comments (Pg.2)

FEMA FLOOD INFORMATION:

FLOOD HAZARD AREA ZONES ³ X See Attached LUD Map

FEMA DESIGNATED FLOODWAY For Flood Zone AO, FLOOD DEPTH: _____

FLOOD DEVELOPMENT PERMIT REQUIRED (Zones V, VE, A, AO, AE, AH, D, & Floodways)

SUBDIVISION LAND USE CONSISTENCY: Not Consistent, (LUDs appear to have NO permitted uses in common).

(Signature) Not Applicable, (Due to processing under consistency exemption No. 1, 2, 3, 4, 5).

Interim Zoning, (The parcel or portion of the parcel that is zoned interim shall not be subdivided).

⁴ Consistent, (LUDs appear to have ALL permitted uses in common).

⁴ Consistent, upon obtaining an SMA, PD, or PH subdivision approval from Planning.

⁴ Consistent, upon recording a permissible uses unilateral agreement processed by Public Works (See Pg.2).

- NOTES:**
- 1 The conditions and/or representations made in the approval of a State District Boundary Amendment, Community Plan Amendment, County Change In Zoning, SMA Permit, Planned Development, Project District and/or a previous subdivision, may affect building permits, subdivisions, and uses on the land.
 - 2 Please review the Maui Island Plan and the Community Plan document for any goals, objectives, policies or actions that may affect this parcel.
 - 3 Flood development permits might be required in zones X and XS for any work done in streams, gulches, low-lying areas, or any type of drainageway; Flood development permits are required for work in all other zones. Subdivisions that include/adjoin streams, gulches, low-lying areas, or any type of drainageway might require the following designations to be shown on the subdivision map: 100-year flood inundation limits; base flood elevations; drainage reserves.
 - 4 Subdivisions will be further reviewed during the subdivision application process to verify consistency, unilateral agreement requirements, and the conditions associated with a unilateral agreement [Section 18.04.030.D, Maui County Code].

REVIEWED & CONFIRMED BY:

John S. Rapacz (Signature) 3/24/15 (Date)

For: John S. Rapacz, Planning Program Administrator, Zoning Administration and Enforcement Division

APPENDIX C.
Biological Resources Survey

BIOLOGICAL RESOURCES SURVEY

for the

**Division of Forestry and Wildlife Baseyard Project
Pūlehunui, Maui**

by

**Robert W. Hobdy
Environmental Consultant
Kokomo, Maui
October 2014**

**Prepared for:
Division of Forestry and Wildlife
Department of Land & Natural Resources
State of Hawai'i**

BIOLOGICAL RESOURCES SURVEY
Division of Forestry and Wildlife Baseyard Project
Pūlehunui, Maui

INTRODUCTION

The Division of Forestry and Wildlife Baseyard project in Pulehunui, Maui is situated on approximately 20.3 acres TMK (2) 3-8-008:001 (por.) of land on the central Maui plain and along Kamaaina Road to the east of Mokulele Highway (see Figure 1 & 2). This biological resources study was initiated in compliance with environmental requirements of the planning process.

SITE DESCRIPTION

This project area consists of gently sloping lands of Maui's central isthmus. It lies on the east side of Mokulele Highway about halfway between Pu'unēnē and Kīhei. The elevation is about 120 feet above sea level. Soils are made up of deep silty clay loams of the 'Ewa soil series with 0% to 7% slopes (Foote et al, 1972). Rainfall averages 13 inches to 15 inches per year with most of it occurring during one to three winter storms (Armstrong, 1983). Vegetation consists of sugar cane crops and agricultural weeds.

BIOLOGICAL HISTORY

During pre-contact times the central Maui isthmus was vegetated with low growing, hardy native plants that could survive in this dry windy environment. Typical species included 'ilima (*Sida fallax*), 'a'ali'i (*Dodonaea viscosa*), ma'o hauhele (*Hibiscus brackenridgei*), naio (*Myoporum sandwicense*), *Bonamia menziesii* (no common name), pā'ū o Hi'iaka (*Jacquemontia ovalifolia* subsp. *sandwicense*) and scattered wiliwili trees (*Erythrina sandwicensis*). Over the past 200 years most of these species have become rare here or have disappeared, primarily through the effects of agriculture, fires and grazing animals.

This land was converted to sugar cane agriculture in the late 1800s and was plowed, cultivated, burned and harvested in continuous cycles. During World War II most of this area was developed with infrastructure for the adjacent Pu'unēnē Military Airfield. Following the war this land was returned to sugar cane agriculture.

Today this project area is being converted from sugar cane agriculture to a DOFAW baseyard complex. A last crop of seed cane was being harvested at the time of the survey. The area was highly disturbed and covered by a dense layer of dry cane leaves.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the proposed Division of Forestry & Wildlife Baseyard project in Pulehunui, Maui which was conducted in October 2014.

The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used following routes to ensure maximum coverage of this project area. Areas most likely to harbor native or rare plants such as undisturbed areas were more intensively examined. Notes were made on plant species, distribution and abundance as well as terrain and substrate.

DESCRIPTION OF THE VEGETATION

The project area has been a dense growth of sugar cane but was in the process of being harvested in a final crop. The fields were covered with dried cane leaves about a foot deep from the process. Interior road ways and field margins maintained an assortment of agricultural weeds consisting of shrubs, grasses and hardy herbs. The most common species included sugar cane (*Saccharum officinarum*), swollen fingergrass (*Chloris barbata*) and koa haole (*Leucaena leucocephala*). A total of 39 plant species were recorded during the survey. Of these just one was a native species, the indigenous 'uhaloa (*Waltheria indica*) which is a hardy species found throughout Hawaii in dry habitats as well as in many tropical countries worldwide. The remaining 38 species were common non-native species that are of no particular conservation interest or concern.

DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the project area is dominated by a great variety of non-native plants. The only native species 'uhaloa is both widespread and common and of no particular environmental concern.

No federally listed Endangered or Threatened native plant species (USFWS, 2014) were encountered during the course of the survey, nor were any species that are candidate for such status seen. No special habitats or rare plant communities were seen on the property.

As a result of these above conditions there is little of botanical concern on this property and the proposed land use changes are not expected to have a significant negative impact on the botanical resources in this part of Maui.

No recommendations are deemed necessary or appropriate regarding the botanical resources on this property.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within each of two groups: Monocots and Dicots. Taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

abundant = forming a major part of the vegetation within the project area.

common = widely scattered throughout the area or locally abundant within a portion of it.

uncommon = scattered sparsely throughout the area or occurring in a few small patches.

rare = only a few isolated individuals within the project area.

| SCIENTIFIC NAME | COMMON NAME | STATUS | ABUNDANCE |
|---------------------------------------------------|---------------------|------------|-----------|
| MONOCOTS | | | |
| CYPERACEAE | | | |
| <i>Cyperus rotundus</i> L. | nut sedge | non-native | uncommon |
| POACEAE (Grass Family) | | | |
| <i>Cenchrus ciliaris</i> L. | buffelgrass | non-native | uncommon |
| <i>Chloris barbata</i> (L.) Sw. | swollen fingergrass | non-native | common |
| <i>Cynodon dactylon</i> (L.) Pers. | Bermuda grass | non-native | uncommon |
| <i>Megathyrsus maximus</i> (Jacq.) Simon & Jacobs | Guinea grass | non-native | uncommon |
| <i>Melinis repens</i> (Willd.) Zizka | Natal redtop | non-native | rare |
| <i>Saccharum officinarum</i> L. | sugar cane | non-native | abundant |
| <i>Setaria verticillata</i> (L.) P. Beauv. | bristly foxtail | non-native | rare |
| DICOTS | | | |
| AMARANTHACEAE (Amaranth Family) | | | |
| <i>Amaranthus spinosus</i> L. | spiny amaranth | non-native | rare |
| <i>Atriplex suberecta</i> Verd. | saltbush | non-native | rare |
| APOCYNACEAE (Dogbane Family) | | | |
| <i>Asclepias physocarpa</i> (E. Mey.) Schlect. | balloon plant | non-native | rare |
| ASTERACEAE (Sunflower Family) | | | |
| <i>Conyza bonariensis</i> (L.) Cronq. | hairy horseweed | non-native | rare |
| <i>Lactuca sativa</i> L. | prickly lettuce | non-native | rare |
| <i>Sonchus oleraceus</i> L. | pualele | non-native | rare |
| <i>Tridax procumbens</i> L. | coat buttons | non-native | uncommon |
| CLEOMACEAE (Cleome Family) | | | |
| <i>Cleome gynandra</i> L. | wild spider flower | non-native | uncommon |
| CONVOLVULACEAE (Morning Glory Family) | | | |
| <i>Ipomoea obscura</i> (L.) Ker. Gawl. | ----- | non-native | uncommon |
| <i>Ipomoea triloba</i> L. | little bell | non-native | uncommon |
| CUCURBITACEAE (Gourd Family) | | | |
| <i>Momordica charantia</i> L. | bitter melon | non-native | rare |
| EUPHORBIACEAE (Spurge Family) | | | |
| <i>Euphorbia heterophylla</i> L. | kaliko | non-native | rare |
| <i>Euphorbia hirta</i> L. | hairy spurge | non-native | uncommon |
| <i>Euphorbia hypericifolia</i> L. | graceful spurge | non-native | rare |

| SCIENTIFIC NAME | COMMON NAME | STATUS | ABUNDANCE |
|----------------------------------------------------------|--------------------|------------|-----------|
| <i>Ricinus communis</i> L. | Castor bean | non-native | uncommon |
| FABACEAE (Pea Family) | | | |
| <i>Chamaecrista nictitans</i> (L.) Moench | partridge pea | non-native | rare |
| <i>Crotalaria incana</i> L. | fuzzy rattlepod | non-native | uncommon |
| <i>Crotalaria retusa</i> L. | rattlepod | non-native | rare |
| <i>Desmanthus pernambucanus</i> (L.) Thellung | slender mimosa | non-native | uncommon |
| <i>Leucaena leucocephala</i> (Lam.) de Wit | koa haole | non-native | common |
| <i>Macroptilium atropurpureum</i> (DC.) Urb. | siratro | non-native | rare |
| <i>Macroptilium lathyroides</i> (L.) Urb. | wild bean | non-native | rare |
| <i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth | kiawe | non-native | rare |
| MALVACEAE (Mallow Family) | | | |
| <i>Abutilon grandifolium</i> (L.) Sweet | hairy abutilon | non-native | rare |
| <i>Malva parviflora</i> L. | cheese weed | non-native | uncommon |
| <i>Sida rhombifolia</i> L. | arrowleaf sida | non-native | rare |
| <i>Waltheria indica</i> L. | 'uhaloa | indigenous | uncommon |
| NYCTAGINACEAE (Four-o'clock Family) | | | |
| <i>Boerhavia coccinea</i> Mill. | scarlet spiderling | non-native | uncommon |
| PAPVERACEAE (Poppy Family) | | | |
| <i>Argemone mexicana</i> L. | Mexican poppy | non-native | rare |
| SOLANACEAE (Nightshade Family) | | | |
| <i>Solanum lycopersicum</i> L. | cherry tomato | non-native | rare |
| ZYGOPHYLLACEAE (Creosote Bush Family) | | | |
| <i>Tribulus terrestris</i> L. | puncture vine | non-native | rare |

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through fauna survey method was conducted in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area.

RESULTS

MAMMALS

Just one non-native mammal species was observed during two site visits. Taxonomy and nomenclature follow Tomich (1986). Scat of the small Indian mongoose (*Herpestes auropunctatus*) was observed within the project area.

Other non-native mammals one would expect to see in this habitat include mice (*Mus domesticus*), rats (*Rattus* spp.) and feral cats (*Felis catus*). The rodents feed on seeds, fruits, insects, eggs and herbaceous vegetation and are prey for the cats and mongoose.

A special effort was made to look for the native Hawaiian hoary bat by making an evening survey at two sites in the area. When present in an area these bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. No evidence of such activity was observed though visibility was excellent and plenty of flying insects were seen. In addition, a bat-detecting device (Batbox IIID) was employed after dusk, set to the frequency of 27,000 Hertz which these bats are known to use for echolocation. No bats were detected at either site using this device.

BIRDS

Birdlife was rather sparse, due no doubt to the cane harvesting disturbances taking place. Just 7 bird species were observed during the two site visits. These included six non-native species and one native species. Taxonomy and nomenclature follow American Ornithologists' Union (2013). Two common species included the zebra dove (*Geopelia striata*) and the cattle egret (*Bubulcus ibis*) which is attracted to cane harvesting activities taking advantage of feeding opportunities. The native bird was the endemic and Endangered nēnē or Hawaiian goose (*Branta sandvicensis*). Four of these nēnē were seen flying together across the project area but were not seen on the ground.

Other non-native bird species one might expect to see here include the spotted dove (*Streptopelia chinensis*), gray francolin (*Francolinus pondicerianus*), common myna (*Acridotheres tristis*), chestnut mannikin (*Lonchura malacca*), northern cardinal (*Cardinalis cardinalis*) and, seasonally, the migratory kolea or Pacific golden-plover (*Pluvialis fulva*).

INSECTS

There were moderate numbers of insect species encountered in this project area. A total of 14 non-native species were identified within 6 insect Orders (See Fauna Inventory). Taxonomy and nomenclature follow Nishida et al (1992). No native species were seen. Just one species was of common occurrence in the project area, the dung fly (*Musca sorbens*).

A special effort was made to look for the Endangered Blackburn's sphinx moth (*Manduca blackburni*) (USFWS 2008). None of its native host plants, 'aiea (*Nothoecstrum* spp.), or its non-native alternative host plant, the tree tobacco (*Nicotiana glauca*), were found in the project area. No adult moths, their larvae or their eggs were found.

REPTILES

One non-native reptile, the mourning gecko (*Lepidodactylus lugubris*), was heard calling during the evening survey.

DISCUSSION AND RECOMMENDATIONS

The fauna on this project area is strongly dominated by non-native species. Of all of the mammals, birds, insects, and reptiles observed, only one small flock of the endemic and endangered nēnē goose was seen flying across the area toward an off-site destination. There is presently no suitable habitat for nēnē on this project area.

No Endangered Hawaiian hoary bats were detected during the survey, and the nearly complete lack of trees or large shrubs in the project area makes this area unlikely habitat for them.

The habitat in this project area is not suitable for any of Hawai'i's native forest birds, water birds or seabirds. Nonetheless, there are native seabirds, the Endangered Hawaiian petrel (*Pterodroma phaeopygia*) and the Threatened Newell's shearwater (*Puffinus puffinus*) that fly over these lowlands on the way to their burrows high in the mountains. These seabirds, and especially the fledglings, are attracted to bright lights in the evenings and early dawn hours and can become disoriented and crash. They are then vulnerable to injury, vehicle strikes and predators. It is recommended that any significant outdoor lighting in the proposed development on this property be shielded to direct the light downward to minimize disorientation of these protected seabirds.

No Blackburn's sphinx moths, their eggs or larvae were found in the project area, nor were any of their known host plants present in the area.

No other issues with wildlife species are anticipated and no further recommendations are offered.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within four groups: Mammals, Birds, Reptiles and Insects. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:

endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.

4. Abundance of each species within the project area:

abundant = many flocks or individuals seen throughout the area at all times of day.

common = a few flocks or well scattered individuals throughout the area.

uncommon = only one flock or several individuals seen within the project area.

rare = only one or two seen within the project area.

| SCIENTIFIC NAME | COMMON NAME | STATUS | ABUNDANCE |
|-------------------------------------------------|-----------------------|------------|-----------|
| MAMMALS | | | |
| <i>Herpestes auropunctatus</i> Hodgson | small Indian mongoose | non-native | rare |
| BIRDS | | | |
| <i>Bubulcus ibis</i> L. | cattle egret | non-native | common |
| <i>Geopelia striata</i> L. | zebra dove | non-native | common |
| <i>Lonchura cantans</i> Gmelin | African silverbill | non-native | rare |
| <i>Francolinus francolinus</i> L. | black francolin | non-native | rare |
| <i>Branta sandvicensis</i> Vigors | nēnē, Hawaiian goose | endemic | rare |
| <i>Lonchura punctulata</i> L. | nutmeg mannikin | non-native | rare |
| <i>Tyto alba</i> Scopoli | barn owl | non-native | rare |
| REPTILES | | | |
| <i>Lepidodactylus lugubris</i> Dumeril & Bibron | mourning gecko | non-native | rare |

| SCIENTIFIC NAME | COMMON NAME | STATUS | ABUNDANCE |
|--------------------------------------------------|--------------------------------|------------|-----------|
| INSECTS | | | |
| Order BLATTODEA - cockroaches | | | |
| BLATTELLIDAE (Wood Cockroach Family) | | | |
| <i>Blattella germanica</i> L. | German roach | non-native | rare |
| Order DIPTERA - flies | | | |
| CULICIDAE (Mosquito Family) | | | |
| <i>Culex quinquefasciatus</i> Say | southern house mosquito | non-native | rare |
| MUSCIDAE (Housefly Family) | | | |
| <i>Musca sorbens</i> Wiedemann | dung fly | non-native | common |
| Order HYMENOPTERA - bees and wasps | | | |
| AMPULICIDAE (Cockroach Wasp Family) | | | |
| <i>Ampulex compressa</i> Fabricius | jewel wasp | non-native | rare |
| APIDAE (Honey Bee Family) | | | |
| <i>Apis mellifera</i> L. | honey bee | non-native | uncommon |
| <i>Xylocopa sonora</i> Smith | Sonoran carpenter bee | non-native | uncommon |
| Order LEPIDOPTERA - butterflies, moths | | | |
| LYCAENIDAE (Gossamer-winged Butterfly Family) | | | |
| <i>Lampides boeticus</i> L. | long tail blue butterfly | non-native | uncommon |
| NOCTUIDAE (Owlet Moth Family) | | | |
| <i>Helicoverpa zea</i> Boddie | corn earworm | non-native | rare |
| <i>Melipotis indomita</i> Walker | indomitable melipotis | non-native | uncommon |
| PIERIDAE (White and Sulphur Butterfly Family) | | | |
| <i>Phoebis agarithe</i> Boisduval | large orange sulphur butterfly | non-native | rare |
| <i>Pieris rapae</i> L. | cabbage butterfly | non-native | rare |
| Order ODONATA - dragonflies, damselflies | | | |
| LIBELLULIDAE (Skimmer Dragonfly Family) | | | |
| <i>Orthemis ferruginea</i> Fabricius | roseate skimmer | non-native | rare |
| Order ORTHOPTERA - grasshoppers, crickets | | | |
| ACRIDIDAE (Grasshopper Family) | | | |
| <i>Oedaleus abruptus</i> Thunberg | short-horned grasshopper r | non-native | uncommon |
| <i>Schistocerca nitens</i> Thunberg | graybird grasshopper | non-native | rare |

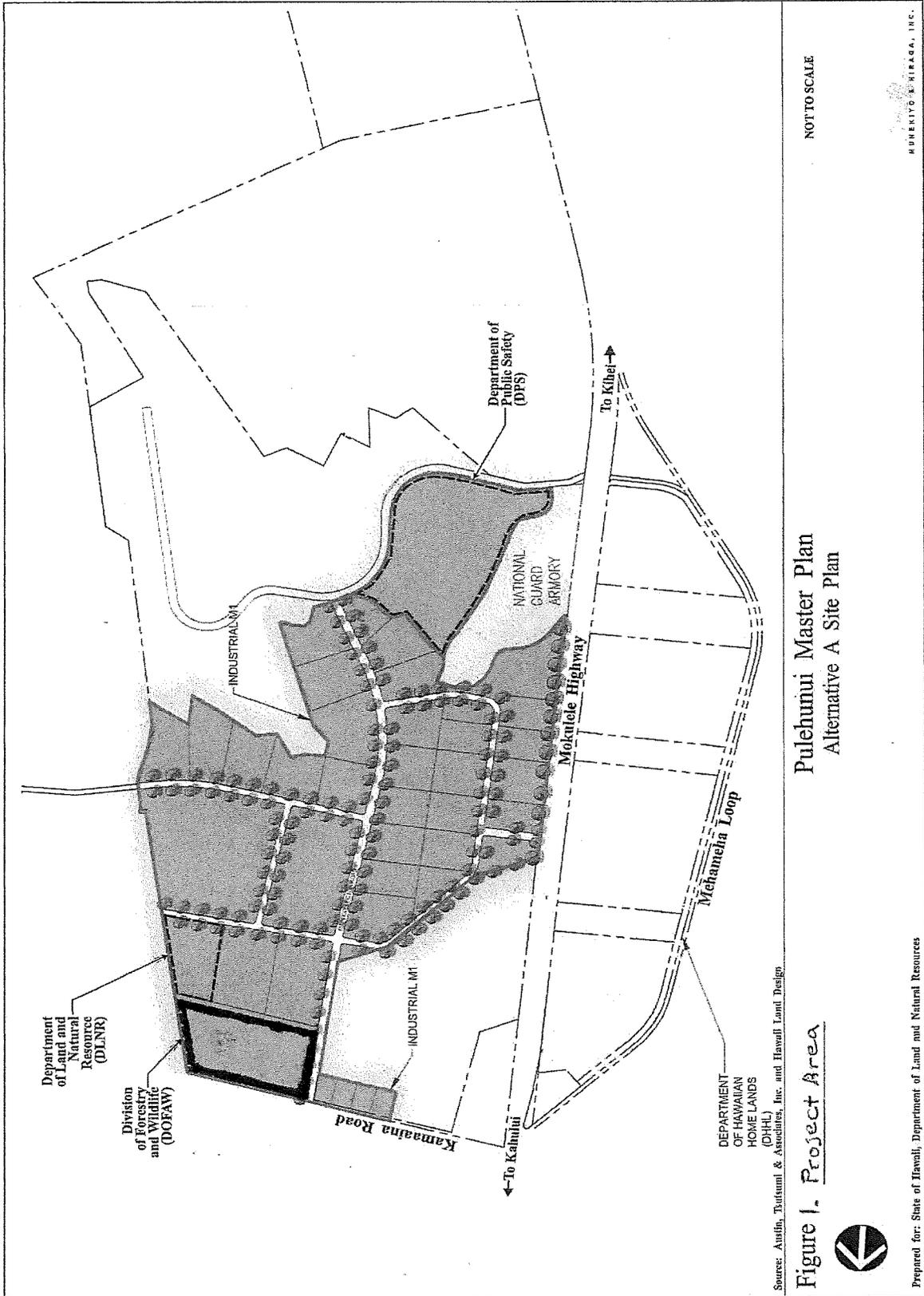


Figure 1. Project Area

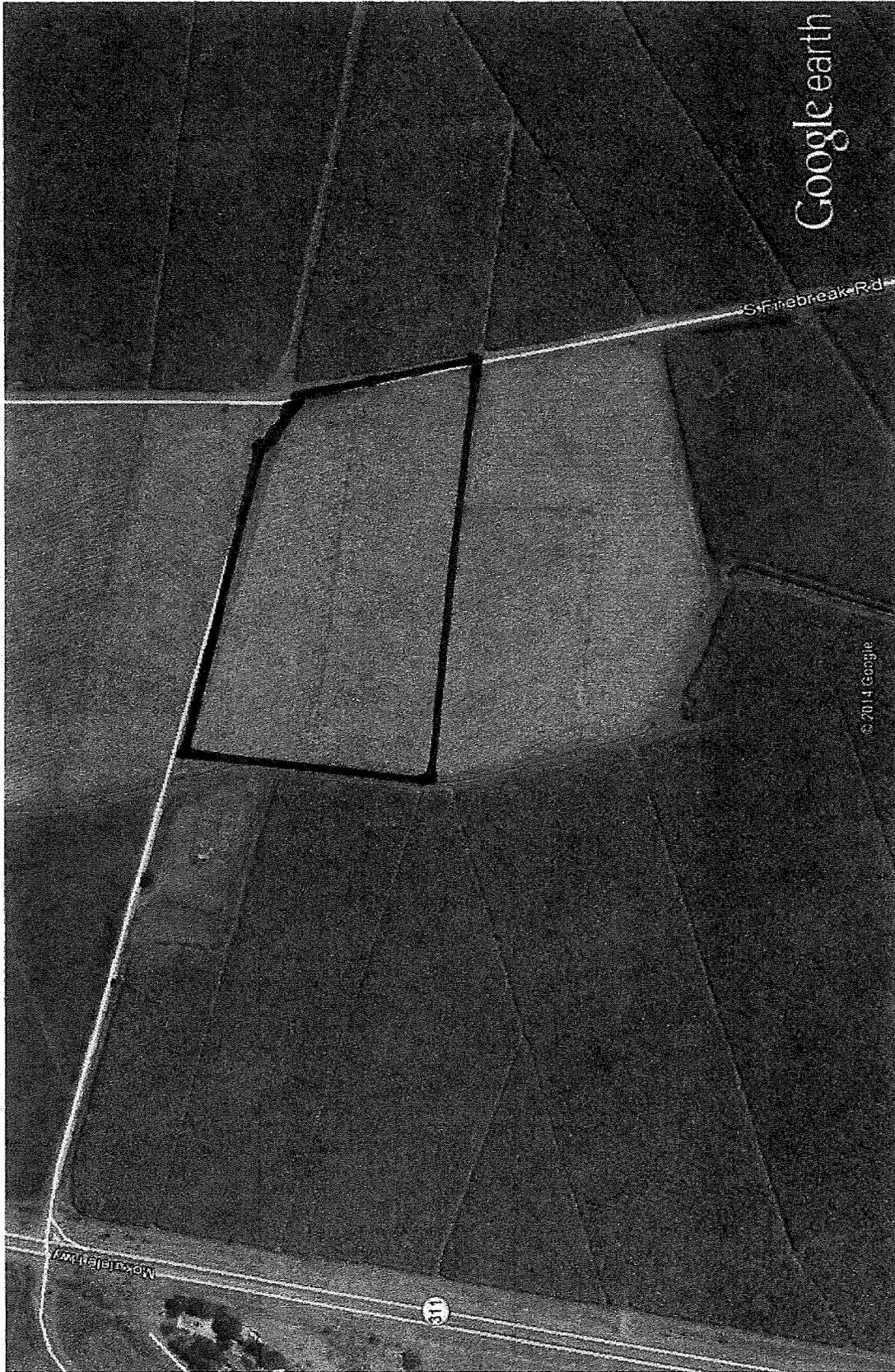


Figure 2. Project Area



Figure 3. Project area view west from Kamaaina Road showing recently harvested cane field.

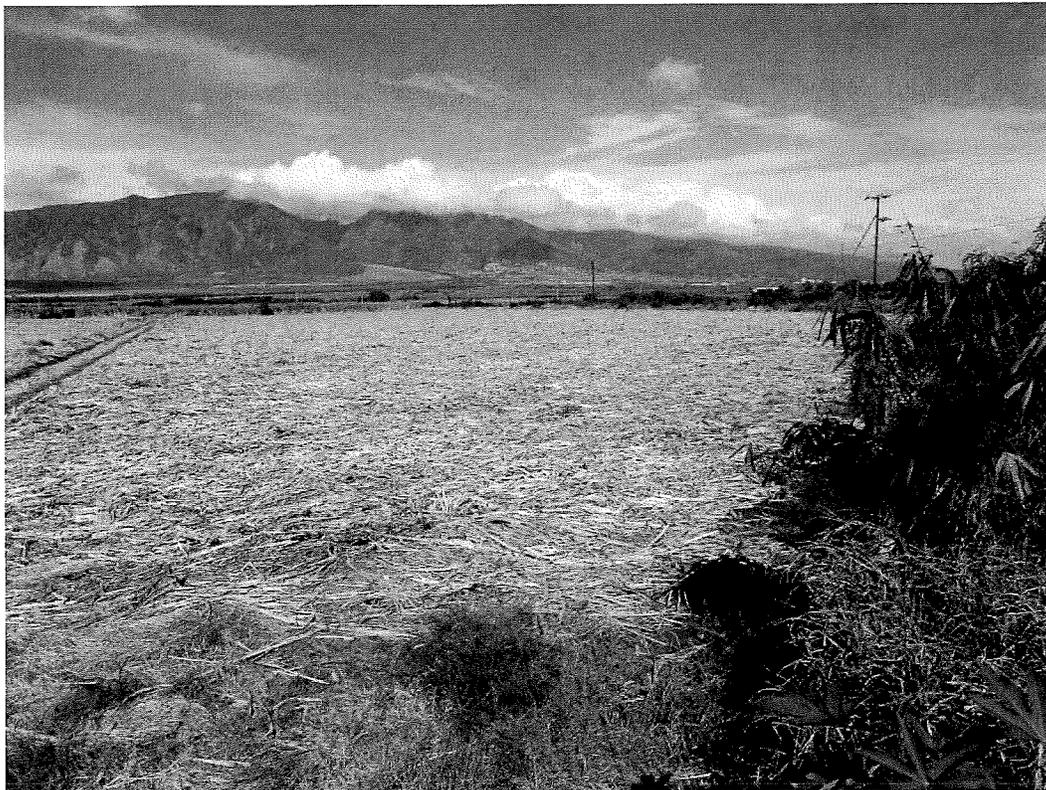


Figure 4. View northwest from Kamaaina Road showing the recently harvested cane field and field margin.

Literature Cited

- American Ornithologists' Union 2013. Check-list of North American Birds.
7th edition. American Ornithologists' Union. Washington D.C.
- Armstrong, R. W. (ed.) 1983. Atlas of Hawaii. (2nd. ed.)
University of Hawaii Press.
- Foote, D.E. , E.L. Hill, S. Nakamura, and F. Stephens. 1972.
Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.
U.S. Dept. of Agriculture, Soil Conservation Service. Washington, D.C.
- Nishida, G.N., G.A. Samuelson, J.S. Strazanac and K.S. Kami, 1992.
Hawaiian Terrestrial Arthropod Checklist.
Hawaiian Biological Survey. Honolulu.
- Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.
- U.S. Fish and Wildlife Service. 2009. Endangered and Threatened Wildlife and Plants.
Listings and Occurrences for Hawaii. www.fws.gov/endangered
- U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants:
determination of endangered status for Blackburn's sphinx moth from Hawaii.
Federal Register 65(21): 4770-4779.
- Wagner, W. L., D.R. Herbst, and S. H. Sohmer. 1999. Manual of the flowering plants of Hawai'i.
University of Hawai'i Press and Bishop Museum Press. Honolulu.

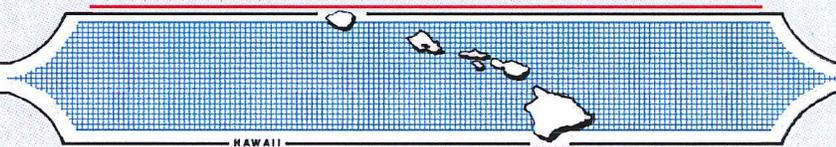
APPENDIX D.
Archaeological Assessment

**AN ARCHAEOLOGICAL ASSESSMENT FOR THE
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE (DOFAW)
BASEYARD PROJECT PUUNENE, PŪLEHU NUI AHUPUA`A, WAILUKU
DISTRICT, ISLAND OF MAUI, HAWAII
[TMK: (2) 3-8-008: 001 POR.]**

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DRAFT

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ABSTRACT

At the request of Munekiyo and Hiraga, Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Assessment (Archaeological Inventory Survey-level study with negative findings) of a property located in Pu`unēnē, Pūlehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: (2) 3-8-008:001 por.]. The 20.3-acre project area is owned by the State of Hawai`i, Department of Land and Natural Resources.

The Archaeological Inventory Survey (AIS) was performed in order to identify and document historic properties, to gather sufficient information on these properties, to evaluate the significance of any newly identified historic properties, to determine the project effect on these properties, and to make mitigation recommendations to address possible adverse impacts to identified historic properties, pursuant to Hawaii Administrative Rules (HAR) § 13-284 and HAR § 13-276. The current project area was included in a larger study previously conducted by International Archaeological Research Institute Inc. (Tomonari-Tuggle *et al.* 2001).

To supplement the surface pedestrian survey, a total of twenty (20) stratigraphic trenches (ST-1 through ST-20) were mechanically excavated. No new historic properties were identified on the ground surface or in subsurface contexts, during the current study. Based on the current findings, no further archaeological work is recommended.

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INTRODUCTION

At the request of Munekiyo and Hiraga, Scientific Consultant Services, Inc. (SCS), conducted an Archaeological Assessment (Archaeological Inventory Survey-level study with negative findings) of a property located in Pu`unēnē, Pūlehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: (2) 3-8-008:001 por.] (Figures 1 through 3). The 20.3-acre subject property is owned by the State of Hawai`i, Department of Land and Natural Resources. The current project area was included in a larger study previously conducted by International Archaeological Research Institute Inc. (Tomonari-Tuggle *et al.* 2001).

The Archaeological Inventory Survey-level fieldwork was conducted from October 13 through 29, and 30, 2014, by SCS archaeologists Ian Bassford, B.A., Philip Smith, B.A., and David Perzinski, B.A., under the direction of Michael F. Dega, Ph.D., Principal Investigator. The Archaeological Inventory Survey (AIS) was performed in order to identify and document historic properties, to gather sufficient information on these properties, to evaluate the significance of any newly identified historic properties, to determine the project effect on these properties, and to make mitigation recommendations to address possible adverse impacts to identified historic properties, pursuant to Hawaii Administrative Rules (HAR) § 13-284 and HAR § 13-276.

GEOGRAPHIC SETTING

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. Pu`u Kukui, forming the west end of the island (1,215 m above mean sea level), is composed of large, heavily eroded amphitheater valleys that contain well-developed permanent stream systems that watered fertile agricultural lands extending to the coast. The deep valleys of West Maui and their associated coastal regions have been witness to many battles in ancient times and were coveted productive landscapes. These are joined together by an isthmus containing dry, open country (*kula*), and the land of Pūlehu Nui, among others.

PROJECT AREA

The project area is located in Pūlehu Nui Ahupua`a, on the southwestern side of Maui in the modern districts of both Wailuku and Makawao. Traditionally, the District of Makawao was known as Kula District. The proposed project area would have been partially within the

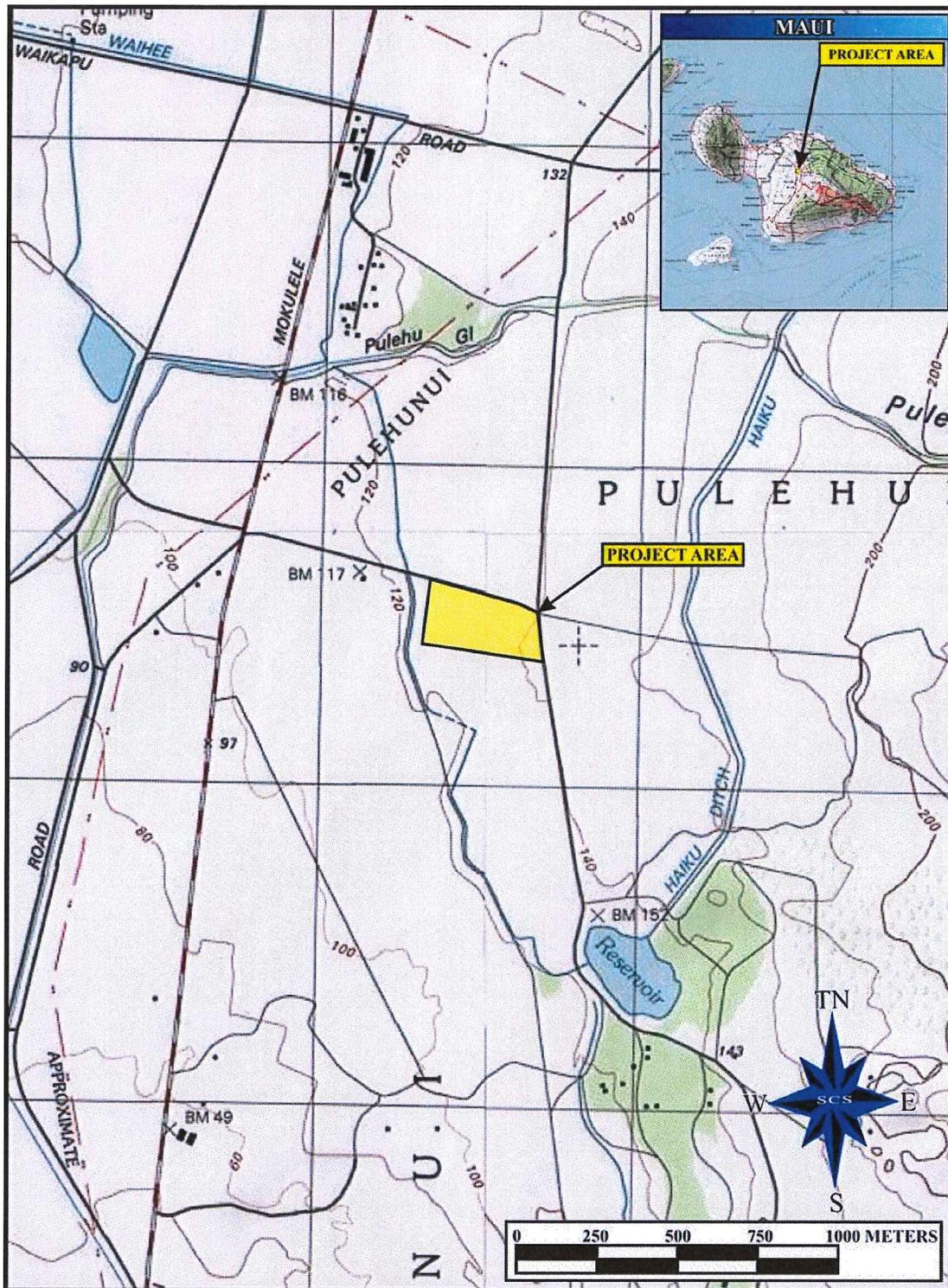


Figure 1: USGS (Puu O Kali 1992) Quadrangle Map Showing the Project Area Location.

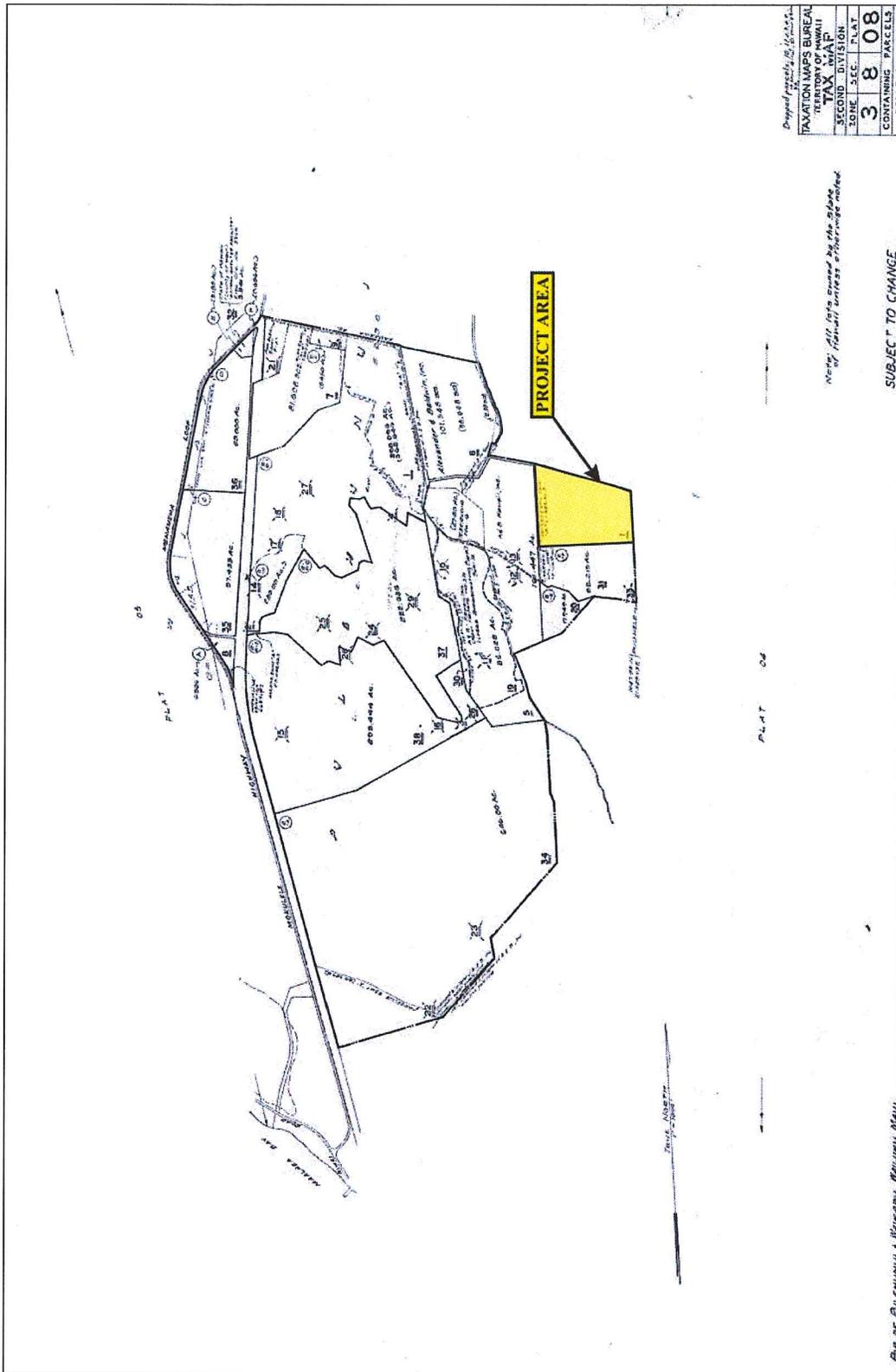


Figure 2: Tax Map Key [TMK: (2) 3-8-008] Showing the Project Area Location.

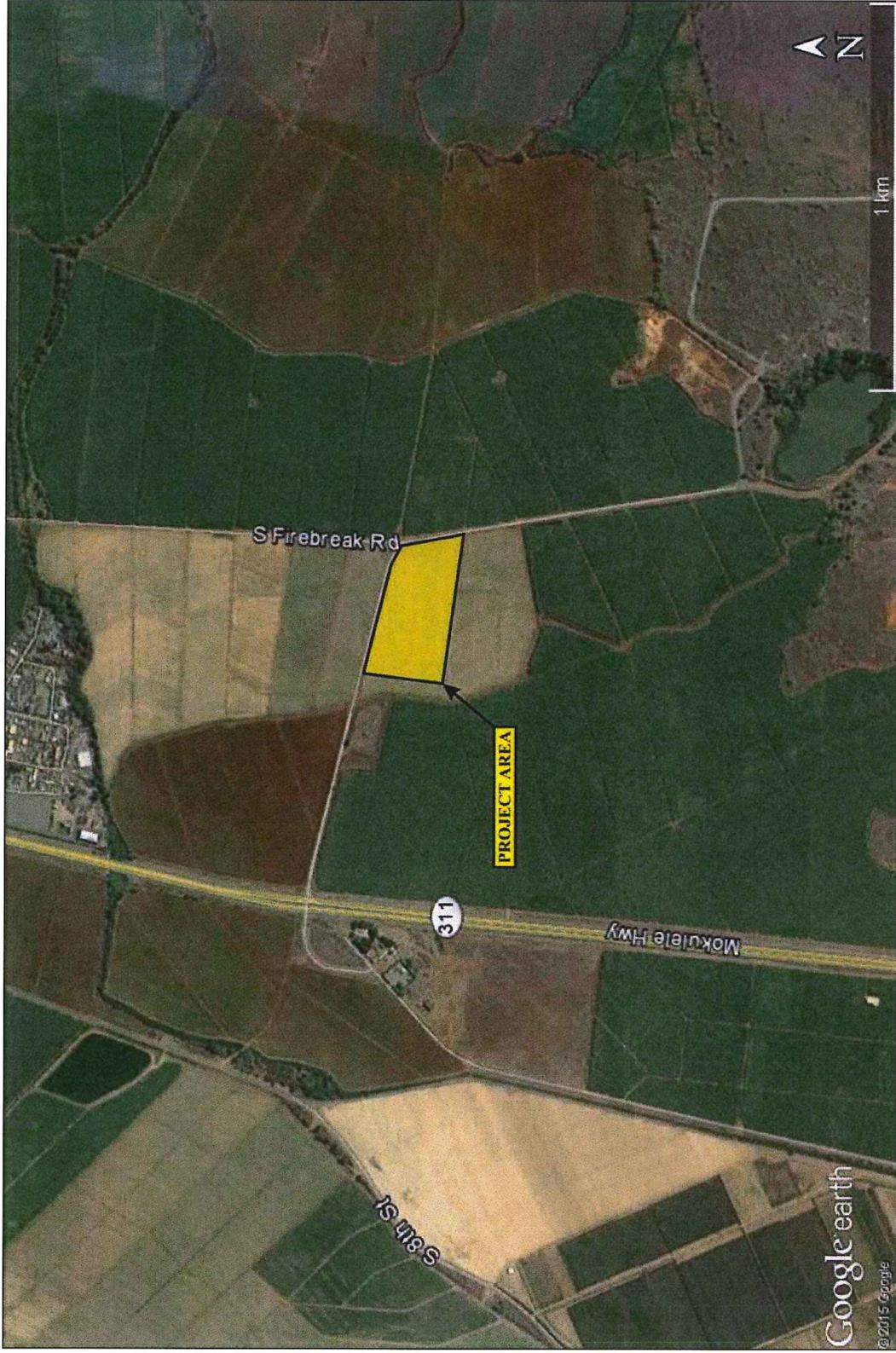


Figure 3: Google Earth (2011) Image Showing the Project Area Location.

traditional District of Kula. As such, the proposed project area's traditional and historic settings will be highlighted with events that occurred in the traditional District of Kula rather than in the modern District of Wailuku.

The project area is situated on the eastern side of the isthmus, approximately 3.0 miles northeast of Mā`alaea Bay, between 120 and 140 feet above mean sea level (amsl), and immediately north of the abandoned landing strip of the Puunene Naval Air Station.. The project area is located within an abandoned sugarcane field, approximately 0.3 miles (1,772.87 ft) east of Mokulele Highway. The project area is bound on the west by a firebreak road, on the north by a cane haul road, and on the south and east by fields.

SOILS

The United States Department of Agriculture soil analysis is presented in Appendix A (www.nrcs.usda.gov/wps/porta/main/soils/health).

CLIMATE

The project area lies near the dry, arid region of Maui's southwest coast. Rainfall indicators, according to Price (1983:62), show that the project area receives no more than five inches per year, with accumulations occurring mostly during the months of December and January. Unlike lower, coastal elevations, higher elevations of Pūlehu Nui Ahupua`a receive more precipitation due to fog drip and lower temperature climates. The frequency of the project area receiving upland wash is based on the amount of water accumulated upslope and the available water drainages created within or near the project area.

Given the lack of constant water resources within the proposed project area, Traditional-type (*i.e.*, pre-1778 A.D.) crops such as dryland sweet potato may have been the only feasible subsistence resource planted in the area prior to the advent of large-scale plantation-type irrigation systems. Of the twenty (20) stratigraphic trenches excavated during the current survey, only three (3) trenches revealed no more than a single soil layer. The windy conditions of the proposed project area suggest soils within the proposed project area may have been adversely affected. Upland, gravitational wash also may have contributed to soil movement through the proposed project area environs during the pre-Contact Period.

TRADITIONAL AND HISTORIC SETTING

Traditionally, the division of Maui Island into districts (*moku*) and sub-districts was performed by a *kahuna* (priest, expert) named Kalaiha`ōhia, during the time of the *ali`i* Kaka`alaneo (Beckwith 1940:383). Fornander (1919-20, Vol. 6:248) places Kaka`alaneo at the end of the 15th century or the beginning of the 16th century. Land was considered the property of the king or *ali`i`ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i`ai moku* ensured rights and responsibilities pertaining to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku*, *ahupua`a*, *`ili* or *`ili`āina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*) which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili`āina* or *`ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*:33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *`ili*. The land holding of a tenant or *hoa`āina* residing in a *ahupua`a* was called a *kuleana* (Lucas 1995:61). The project area is located in the lands of Pūlehu Nui which translated literally means “large pūlehu,” but since *pūlehu* means “broiled”, it might refer to the degree of broiling one could receive from the sun in this area (Pukui *et al.* 1974:193).

TRADITIONAL SETTLEMENT PATTERNS

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua`a*. During the pre-Contact Period, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinaruma*) and *mai`a* (banana, *Musa* sp.), were also grown and, where

appropriate, such crops as *ʻuala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). It must be noted that Handy (1940:105) stated that,

“ . . . the bounds of cultivation . . . were strictly drawn by limitation of water for irrigation.” The word “*kula*” meant “open country, or plain”, according to Handy and Handy, and was often used to differentiate between dry, or *kula* land, and wet-taro land. The height and size of Haleakalā to the east, prevents moisture from reaching its southern and western flanks, causing and desert-like conditions throughout the region (Handy and Handy 1972:486).

Handy and Handy (1972: 105), further state that:

[This is an essential characteristic of Kula, the central plain of Maui which is practically devoid of streams. Kula was always an arid region, throughout its long, low seashore, vast stony *kula* lands, and broad uplands [*ibid*:510]

As to the occupation of this vast plain, Handy and Handy (1972: 511) stated:

Both on the coast, where fishing was good, and on the lower westward slopes of Haleakala a considerable population existed. So far as we could learn Kula supported no Hawaiian taro, and the fishermen in this section must have depended for vegetable food mainly on *poi* brought from the wet lands of Waikapu and Wailuku to westward across the plain to supplement their usual sweet-potato diet.

An early witness to its lack of productivity was George Vancouver. During Vancouver’s second visit to Hawai`i in 1793, as a Captain, he anchored in Mā`alaea Bay. Vancouver (1984:852) provided the following descriptive over-view of the southern coast of Maui:

The appearance of this side of Mowee was scarcely less forbidding than that of its southern parts, which we had passed the preceding day. The shores, however, were not so steep and rocky, and were mostly composed of a sandy beach; the land did not rise so very abruptly from the sea towards the mountains, not was its surface so much broken with hills and deep chasms; yet the soil had little appearance of fertility, and no cultivation was to be seen. A few habitations were promiscuously scattered near the water side, and the inhabitants who came off to us, like those seen the day before, had little to dispose of.

Not much had changed 24 years later (1817) when Peter Corney sailed this way, bound for O`ahu. Coney (1965:70-71) made special reference to Keālia Pond (now the Keālia Pond and Wildlife Refuge), a short distance southwest of the project area:

. . . Next morning we passed Morokenee (Molokini), and made sail up Mackerey (Maalaea) bay. . . This bay is very deep and wide, and nearly divides the island, there being but a narrow neck of land and very low, keeping the two parts of the island together. . . On this neck of land are their principal salt-pans, where they make most excellent salt.

EARLY HISTORY

The Wailuku District was a center of political power often at war with its rival in Hana. Between 1775 and 1779, there was almost continual fighting between Kahekili, chief of Maui, and Kalani`ōpu`ū, chief from Hawai`i Island, who was often in residence at Hana (Kamakau 1961). After several skirmishes in which Kalani`ōpu`ū had been defeated by the warriors of Kahekili, Kalani`ōpu`ū retired to Hawai`i Island. He spent the next year gathering men from each of the six districts on the island, forming six divisions of warriors. His prize troops consisted of chiefs from his own group of attendants, which were named the `Ālapa and Pi`ipi`i. Leaving nothing to chance, Kalani`ōpu`ū then built *heiau* for his war gods, assuring success, and when all was ready (1776), he and his men returned to Maui (*ibid*).

Rather than landing at Hana on the east side, the warriors came around the southern coast of Maui. They first landed at Keone`ō`io Bay and ravaged the country side giving Kahekili notice and time to prepare his fighting men (*ibid*). Kalani`ōpu`ū's men traveled up the coast by sea and landed at Kīheipuko`a at Keālia, confident that the victory was to be theirs (*ibid*) The 800 `Ālapa and Pi`ipi`i warriors marched across the plain to Wailuku where Kahekili and his warriors were waiting. Kamakau (1961:85-89) stated:

They slew the Alapa on the sand hills at the southeast of Kalua. There the dead lay in heaps strewn like *kukui* branches; corpses lay heaped in death; they were slain like fish enclosed in a net....

An interesting anecdote is recounted by George W. Bates (in *Sandwich Island Notes*, 309) during his journey from Wailuku to Kahului in 1854 states:

Leaving Wai-lu-ku [town], and passing along toward the village Kahului, a distance of three miles, the traveler passes over the old battle-ground named after the village. It is distinctly marked by moving sand-hills, which owe their formation to the action of the northeast trades. Here these winds blow almost with the violence of a sirocco, and clouds of sand are carried across the northern side of the isthmus to a height of several hundred feet. These sand-hills constitute a huge “Golgotha” for thousands of warriors who fell in ancient battles. In places laid bare by the action of the winds, there were human skeletons projecting, as if in the act of struggling for resurrection from their lurid sepulchers. In many portions of the plain who cart-loads were exposed in this way. Judging of the numbers of the dead, the contest of the old Hawaiians must have been exceedingly bloody. . . .

The 1776 encounter between Kahekili and Kalani`ōpu`ū resulted in a temporary truce which was broken in 1790 by the battle of Kepaniwai, when Kamehameha I consolidated his control over Maui Island.

THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169-70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I:145). The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were thus made available and private ownership was instituted, the *maka`āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, *ʻokipū* (on O`ahu), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16).

The *ahupua`a* of Pūlehu Nui extended across the Kula plain up through Makawao, to the edge of Haleakalā and would have included fruitful sections, not just the arid plains (Figure 4). There were 13 *kuleana* claimed in the *ahupua`a* of Pūlehu Nui. According to the Waihona `Aina

Database (2015), LCA 05230 (Royal Land Patent No. 8140), consisting of the *ahupua`a* of Pūlehu Nui (16,687.78 acres), in its entirety, was claimed by, and awarded to, Keaweamahi.

HISTORIC LAND USE

SUGAR YEARS

As the sugar industry developed in the mid-1800s, more and more land was leased or purchased for what had become an intensely profitable endeavor. Water was an issue, but in 1876, the Hamakua Ditch Company (Alexander and Baldwin) was formed and within two years was bringing water from the streams of Haleakalā to four plantations in East Maui (Dorrance and Morgan 2000:180).

Also in 1876, the Reciprocity Treaty's ratification notice arrived by steamer, along with Claus Spreckles, California's sugar magnate, who viewed the sugar situation and decided two years later to turn the dry plains of Maui into a garden of cultivated cane (Van Dyke 2008). By various questionable means, he was able to acquire half interest in 16,000 acres of land in Waikapū commons and was able to lease 24,000 acres of Crown Lands on the Wailuku plains in central Maui for \$1,000 (*ibid*). Figure 4 above, shows the survey line of the property extending across Pūlehu Nui, Claus Spreckles obtained from Henry Cornwell.

Having seen the success of the recently completed Hamakua Ditch now bringing mountain water to the otherwise dry, and unproductive East Maui fields, and having lost his battle to control this ditch water, Spreckles formed the Hawaiian Commercial Company and decided to construct a ditch system of his own on East Maui above the Hamakua Ditch, for his newly acquired land (Wilcox 1996). Spreckles' Haiku Ditch extended 30 miles, from Honomanu Stream to the Kīhei boundary and the water was used to irrigate his cane lands in the central Maui plains (*ibid*). Presently, the Haiku Ditch ends at the Haiku reservoir abutting the project area to the north (see Figure 1).

In 1882, Spreckles reorganized his company into a California corporation, called Hawaiian Commercial and Sugar Company, or HC&S (Wilcox 1996). Later he constructed another water system known as the Waihee Ditch in West Maui. It brought water from 15 miles away, starting at an elevation of 435 feet, to Kalua where it emptied into HC&S Waiale reservoir (*ibid*).

The ensuing years brought trials and tribulations between Spreckles, his associates, and the Maui sugar planters, resulting finally in the 1898 sale of his HC&S stock, at an all time low, to James Castle in partnership with Alexander and Baldwin, and the departure of Claus Spreckles from Hawai`i (Dorrance and Morgan 2000; Wilcox 1996).

Henry Baldwin and Lorrin Thurston formed the Kihei Sugar Company in 1899, to grow cane on their ranch lands in south central Maui, which included the project area (Dorrance and Morgan 2000). It was sent to the mill at Pu`unēnē to be ground, but, although production was high, it was not enough to cover the costs (*ibid*).

After the annexation in 1898, some of the planters on Maui, including Alexander and Baldwin, had decided to combine plantations to reap maximum profit. They formed the Maui Agricultural Company, a co-partnership that initially encompassed seven plantations and two mills. In 1904, five new plantations became part of the Maui Agricultural Company, as Kula Plantation Company, Makawao Plantation Company, Pulehu Plantation Company, Kailua Plantation and Kaliaui Plantation Company were newly formed by carving up the unprofitable Kihei Plantation land (Dorrance and Morgan 2000). Figure 5 shows the lands in Kula, previously Kihei Plantation Company, which became the “five companies” of the Maui Agricultural Company surveyed in 1904 by Arthur Alexander. The newly formed Makawao Plantation is shown in Figure 6. Maui Agricultural Company merged with HC&S in 1948 (Dorrance and Morgan 2000).

WORLD WAR II

A portion of the cane fields adjacent to the project area was turned into a civil airfield for the Territory of Hawai`i in 1937, as the one located at Ma`alaea had become too small to accommodate (www.airfields-freeman.com/HI/Airfields_HI_Maui.htm :2011). Two years later, Inter-Island Airways began service to Maui, conveniently landing at Puunene Airport. As war loomed on the horizon (1940), the Navy began using the airport, along with a small Army Air Corps support base at the airfield (*ibid*). At this time, the air station was being used to support Squadron VU-3, to tow targets and operate drones for the fleet. Shortly after the United States entered WWII, land in the area of the airport was condemned (1942), including the project parcel listed as parcel 2-C in the Declaration of Taking filed with the District Court of the United States for the District of Hawaii (on file Bureau of Conveyances, Honolulu). The airport was expanded and commissioned as Naval Air Station Maui (NAS). The Navy lengthened and widened the runways and added Link trainers, as well as changing its name to NAS Puunene. One hundred

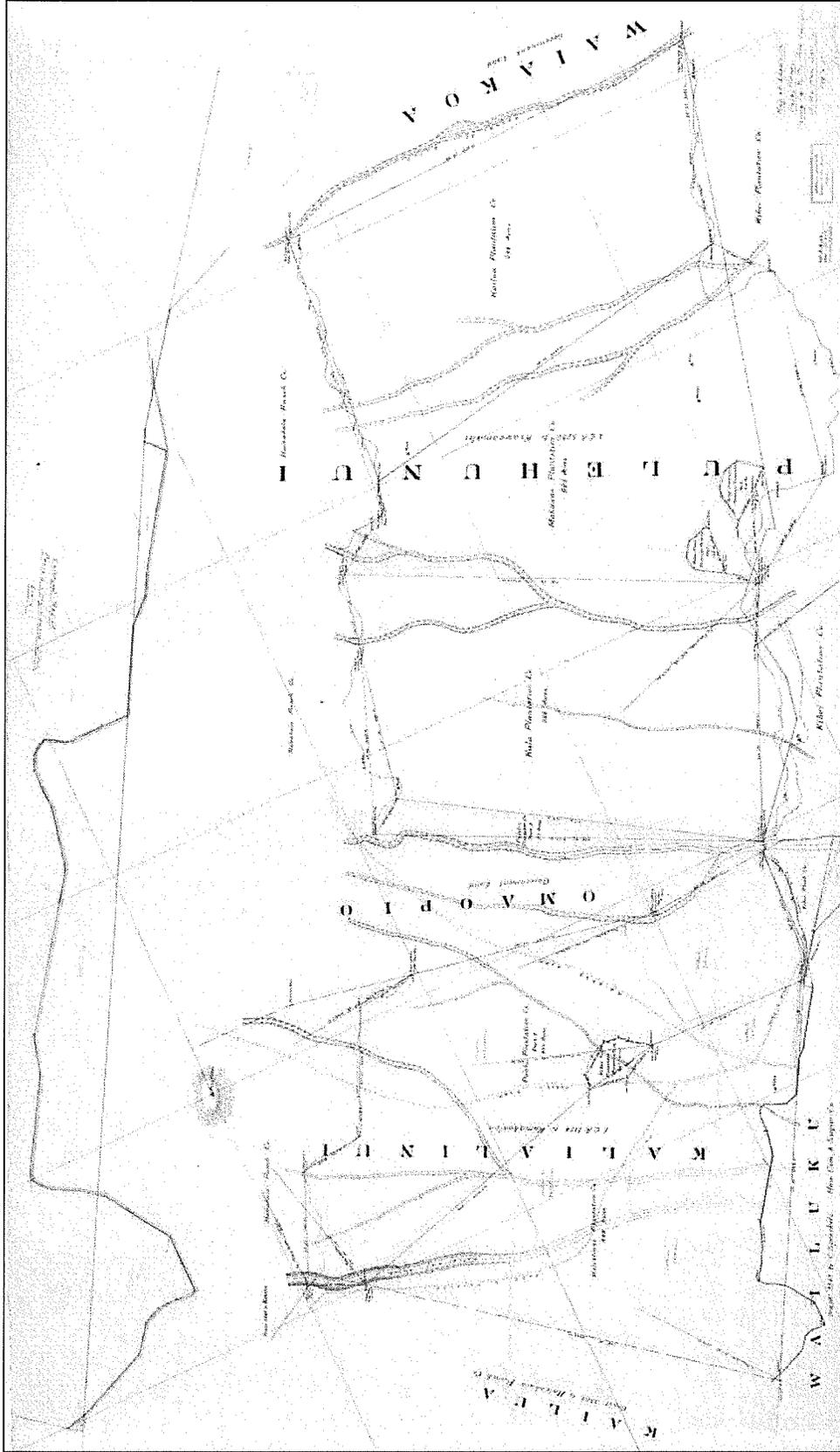


Figure 5: “Kihei Plantation Co. [crossed out], Map of Lands in Kula, Maui Belonging to the “Five Companies” of the Maui Ag. Co., July 1904” (State Survey Office, Reg. Map #1770).

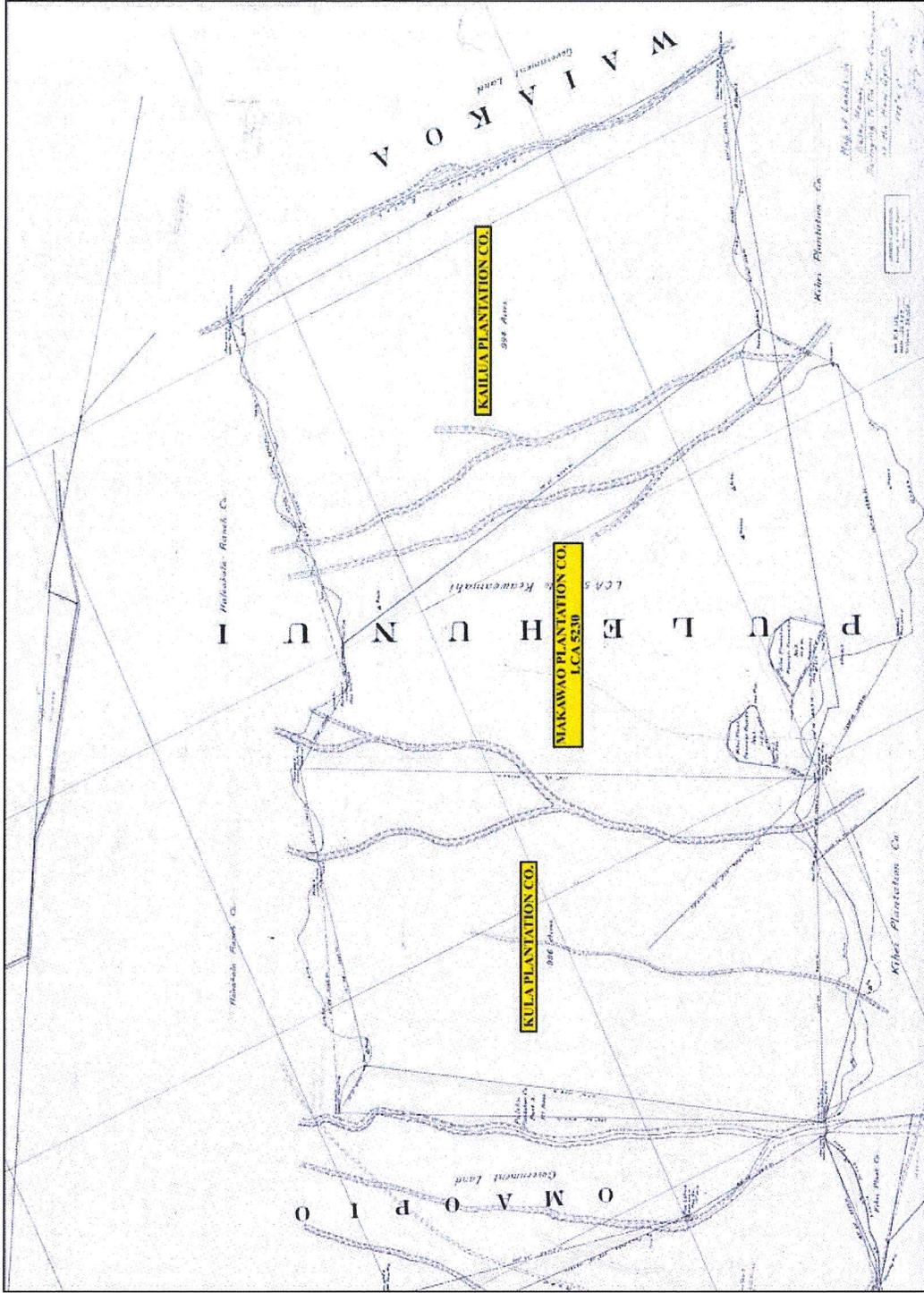


Figure 6: Close-up of Makawao Plantation Lands in Pūlehu Nui Ahupua`a (State Survey Office, Reg. Map #1770).

and six squadrons and carrier groups passed through the NAS during WWII (www.airfields-freeman.com/HI/Airfields_HI_Maui.htm :2015). By 1945, the base consisted of a total of 2,202 acres, supporting over 3,300 personnel, and 271 aircraft. There were two paved runways, taxiways, ramps, hangers, and auxiliary buildings (*ibid*).

The airfield was released by the Navy back to the Territory of Hawai`i in 1947 and was apparently used as the official inter-island Airport until at least 1952 when the Kahului Airport was available for civil use (*ibid*). However, the Maui/Pu`unēnē airstrip, as it was known, serviced crop-dusters and other smaller aircraft and wasn't abandoned as a landing strip until sometime between 1961 and 1977 (*ibid*). Over-grown military facilities were left in the area, including bunkers, revetments, and other bits and pieces. This is when the old airstrips were used for impromptu racing. All the land, except 222 acres, was sold back to HC&S by the State of Hawai`i. The 222 acres were deeded to the Maui County and the 2002 master plan for this land, included a raceway park, county fairgrounds, Hawai`i National Guard, Maui Correctional Center and 3.5 (at the northeast end of the drag strip acres set aside for a naval memorial park at the northeast end of the drag strip (*ibid*). Management is provided by the County Parks and Recreation Department and a portion of the airstrip is presently being used by the Maui Raceway Park Drag Strip, the Paradise Speedway Dirt Track, and the Maui Remote Airplane Club (*ibid*).

PREVIOUS ARCHAEOLOGY

Archaeological studies in the greater area began in the early 20th Century by T. Thrum (1909), J. Stokes (1909–1916), and W. M. Walker (1931). These surveys included areas of leeward Maui and inventoried both coastal and upland sites of the Kula District. In the *ahupua`a* of Pūlehu Nui Walker (1933 in Sterling 1998:253) listed two sites identified as Haleokane Heiau and Nininiwai Heiau.

Archival research indicates few archaeological projects have been conducted near the proposed project area. Although these projects occurred some distance from the subject parcel they are directly relevant. These studies provide background information to the current study area. The reader is referred to Tomonari-Tuggle *et al.* (2001:61-63) which provides a succinct summary of these studies. The locations of selected previous archaeological projects conducted in the vicinity of the current project area are presented in Figure 7.

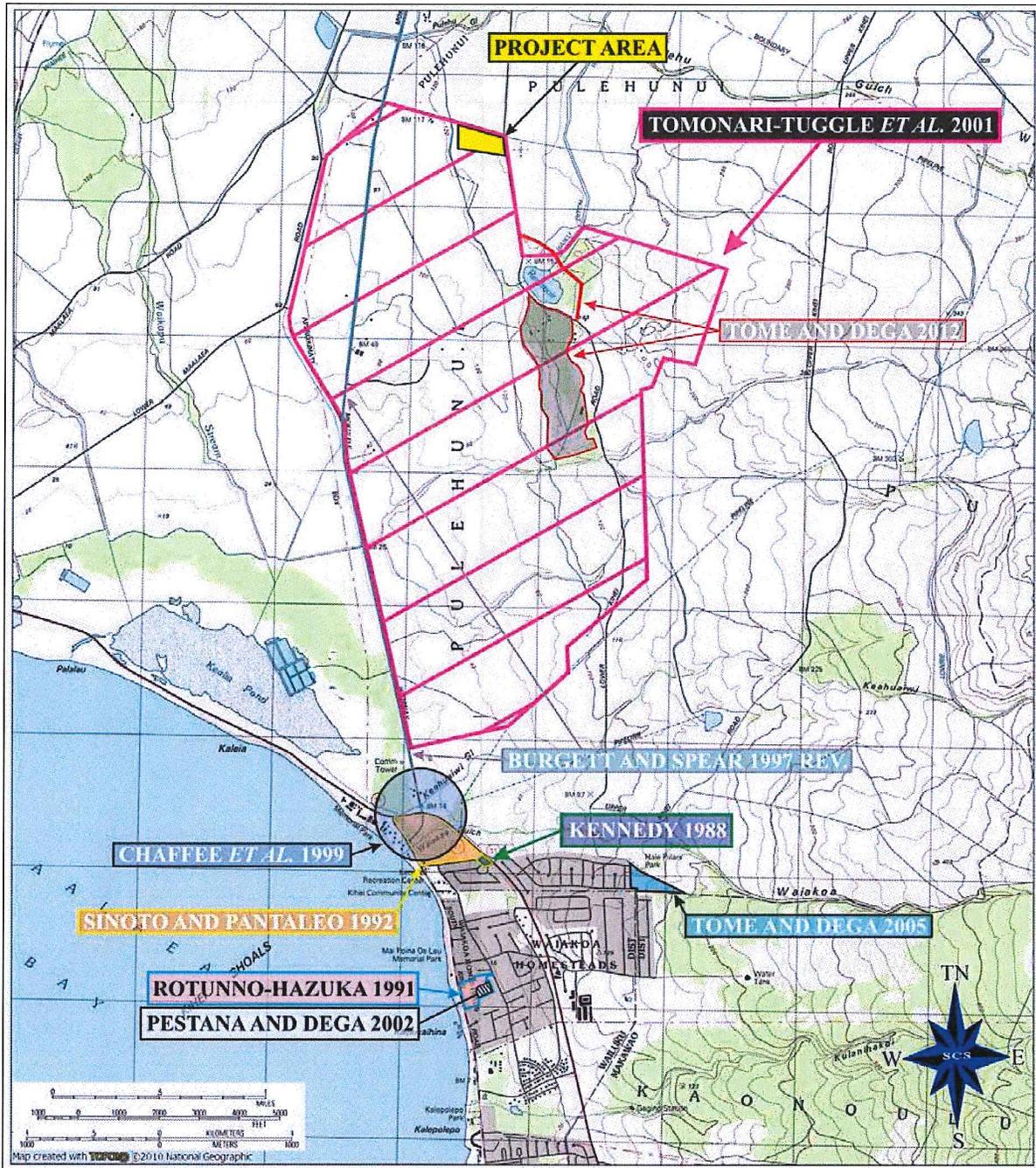


Figure 7: USGS (Puu O Kali 1992) Quadrangle Map Showing the Locations of Previous Archaeological Projects in the Vicinity of the Current Project Area.

Kennedy (1988) conducted a visual inspection of TMK: (2) 3-8-004:029 that did not identify archaeological sites. The absence of sites was attributed to prior development of the area for a construction baseyard with an installation of a large concrete culvert. In 1991 the Bishop Museum conducted an Archaeological Inventory Survey for the Kai Makani project that produced negative findings on the ground surface or subsurface contexts (Rotunno-Hazuka (1991).

In 1992 Aki Sinoto Consulting conducted an Archaeological Inventory Survey of the proposed location for the Kihei Gateway Complex which led to the identification of State Site 50-50-09-31, a remnant, historic concrete bridge (crossing Waiakoa Stream. It was suggested that the bridge was probably related to a narrow gauge cane railroad that operated through the area and may have serviced Kihei Camp 1 (Sinoto and Pantaleo 1992).

Between 1995 and 1999 Scientific Consultant Services, Inc. conducted an Archaeological Inventory Survey (followed by two addendums) for the Puunene Bypass/ Mokulele Highway Improvements Corridor located in TMK: (2) 3-8:-04, 05, 06, and 079 (Burgett and Spear 1997; Chaffee *et al.* 1999). No additional archaeological sites were identified. However, one previously recorded site was relocated and identified as the Naval Air Station Puunene Dump Site (State Site 50-50-09-4164). Scientific Consultant Services, Inc. conducted an Archaeological Inventory Survey of TMK: (2) 3-9-041:027, which included excavation of nine stratigraphic trenches. No new sites were identified (Pestana and Dega 2002).

International Archaeological Research Institute Inc. (IARII) conducted an Archaeological Inventory Survey of the former Naval Air Station located in Puunene, Pūlehu Nui Ahupua`a Former Naval Air Station Puunene, State Site 50-50-09-4164 (Tomonari-Tuggle *et al.* 2001). During the survey 3 sites were identified (State Site 50-50-09-4800 through State Site 50-80-09-4802). State Site 50-50-09-4800 consisted of seven features associated with the Plantation-Era and two complexes of corrals, fences, troughs associated with Post-World War II ranching. State Site 50-50-09-4801 consisted of a post-World War II cattle ranching site. State Site 50-50-09-4802 consisted of the Old Kihei Railroad Bed (State Site 50-50-09-4802 and 5 features associated with the Haiku Ditch and Reservoir. The current project area was included in this larger study previousl conducted by International Archaeological Research Institute Inc. (Tomonari-Tuggle *et al.* 2001).

In 2005 Scientific Consultant Services, Inc. conducted an Archaeological Inventory Survey, including limited subsurface testing, was conducted on a 9.289-acre property in North

Kīhei, Maui, Hawai`i [TMK: (2) 3-8-004:028] (Tome and Dega 2005). The project area, located immediately adjacent and abutting the southern boundary of the Hale Piilani Park, had been partially modified by illegal dumping, utilization as an informal dirt bike course, and ranching activities. Two archaeological sites comprising four structural features were newly identified during this Inventory Survey. The sites were interpreted respectively as a World War II-related site (State Site 50-50-09-5801, WW II training site) and a traditional Hawaiian site (State Site No. 50-50-09-5802, pre-Contact agricultural/habitation complex). The two sites date utilization of the subject parcel from the pre-Contact Period (*i.e.*, pre-1778) to the United States Marine Corps' 4th U.S. Marine Division training during the closing years of World War II.

In 2011 Scientific Consultant Services, Inc. (SCS), conducted an Archaeological Inventory Survey for the Puunene Heavy Industrial Subdivision Project on an approximately 917 meter (3,007.8 feet) long alternate access road [TMK: (2) 3-8-008: pors. 005 and 006] and on 86.029-acres of land [TMK: (2) 3-8-008: 019] within Pūlehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i (Tome and Dega 2012). A portion of the Puunene Naval Air Station was located within the project area. Thus, portions of the former Puunene Naval Air Station (State Site 50-50-09-4164) and a post-World War II cattle ranching site (State Site 50-50-09-4801) were re-located during the survey.

SETTLEMENT PATTERN

Numerous settlement models for the traditional district of Honua`ula (and its Kula extent such as the current project area) have been proposed by researchers, including those by Kirch (1970), Barrera (1974), Cleghorn (1975), Cordy (1977), Cordy and Athens (1988), and Gosser *et al.* (1993 and Gosser *et al.* 1995). Parallels may be drawn between the studies above with the project area based physiographic and archaeological characteristics.

Cordy and Athens (1988) suggested that although the traditional district of Honua`ula seems to have had a fairly harsh environment; people settled in this district and coped successfully with the elements, both on the coast and inland. Early surveys indicated that the region between the coast and inland farming areas have been labeled the 'barren zone,' which was used for temporary or seasonal habitation and agriculture. Cordy and Athens (1998) agreed that major land use patterns, initially generated by archaeologists in the 1970s, indicated that inland areas where rainfall was adequate were primarily farming zone. Permanent habitation and intensity of settlement correlated to rainfall amounts (Cordy and Athens 1988:23–24, 100–103; Gosser *et al.* 1993).

Prehistorically, crops in the inland areas were dryland taro, sweet potato, and banana (Barrera 1974; Cordy and Athens 1988:18). More relevant to the proposed project area is Handy and Handy's description of environmental conditions on the leeward side of Haleakala.

The great bulk and altitude of Haleakalā makes its southern flank practically a water less desert, and the southeast and west flanks relatively dry, so that there were no *lo`i* (pond fields) cultivation at all. The arid country below the west and south slopes of Haleakalā, including Kula, Honua`ula, Kahikinui, and Kaupo, were dependent on sweet potato (Handy and Handy 1972:488).

Irish potato became an important crop in the mid-1800s. Ranching became a significant enterprise in the uplands during historic times.

EXPECTED FINDINGS

Based on a synthesis of previous archaeological work in the intermediate or barren zone of the Kula District, the landscape was expected to contain a few pre-Contact sites, such as scattered temporary or seasonal habitations and associated dryland agricultural sites. Site density in this area is likely very low. Farther inland in this region sites might include field shelters and special activity areas represented by small C-shaped structures, terraces, platforms, rock mounds, and caves. Construction of these features is expected to be less formal and more random than those along the coast (Gosser *et al.* 1993). Historic Period features have been recorded with perhaps more frequency in the barren zone, given limited habitation through time, making this an ideal training area. Historic period sites may include features related to WW II training such as c-shaped structures and concrete encasements/foundations, among others. Walls and enclosures representing the ranching era were also thought possible.

METHODOLOGY

FIELD METHODOLOGY

The Archaeological Inventory Survey-level fieldwork was conducted from October 13 through 29, and 30, 2014, by SCS archaeologists Ian Bassford, B.A., Philip Smith, B.A., and David Perzinski, B.A., under the direction of Michael F. Dega, Ph.D., Principal Investigator. Multiple field tasks were completed during the Archaeological Inventory Survey-level study. First, a systemic pedestrian survey was conducted in order to identify archaeological surface

architecture, archaeological features on the ground surface, and to assess the proposed project area geographical/physiographical features. Transect spacing of twenty meters (65.62 feet) intervals was employed when surface visibility was high, primarily in the mechanically altered areas. Interval spacing of ten meters (32.81 feet) or less between SCS personnel was employed within the dried vegetation areas to ensure adequate area coverage during the survey.

To supplement the surface pedestrian survey, a total of twenty (20) stratigraphic trenches (ST-1 through ST-20) were mechanically excavated in order to locate any associated subsurface cultural deposits or features. Soil stratigraphy encountered during excavation was documented utilizing metric graph paper and United States Department of Agriculture (USDA) Munsell soil color charts. No portable archaeological cultural materials were found within subsurface contexts within the stratigraphic trenches.

LABORATORY METHODOLOGY

All field notes and digital photographs were curated at the SCS laboratory in Honolulu. Stratigraphic profiles documenting the stratigraphy of the twenty mechanically excavated trenches have been drafted for presentation within this report. No definitive archaeological deposits containing food midden or other evidence of human activity.

INVENTORY SURVEY RESULTS

An Archaeological Inventory Survey-level study, including limited subsurface testing, was conducted on the 20.3-acre subject property located in Pu`unēnē, Pūlehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: (2) 3-8-008: 001 por.] (see Figures 1 and 2). To supplement the surface pedestrian survey, a total of twenty (20) stratigraphic trenches were mechanically excavated across the larger portion of the proposed project area (Table 1; Figure 8). No historic properties were identified on the ground surface or in subsurface contexts within any of the 20 stratigraphic trench excavations.

STRATIGRAPHIC EXCAVATIONS

To supplement the surface pedestrian survey, a total of twenty (20) stratigraphic trenches were mechanically excavated across the larger portion of the proposed project area (Table 1; see Figure 8). No traditional or historic artifacts or deposits were encountered during excavations.

Table 1: Stratigraphic Trenching Data

| Stratigraphic Trench Identification | GPS Coordinates | Long Axis Orientation (Degrees and North-type) | Dimensions (meters; L x W x Max. Depth) | Exposed Strata Amount | Cultural Material Observed in Stratum | Stratum Interpretation |
|-------------------------------------|------------------------------|------------------------------------------------|-----------------------------------------|-----------------------|---------------------------------------|-------------------------|
| ST-1 | East 764662 North 2305503 | 170/350° True | 5.5 x 0.75 x 2.0 | 1 | Modern Plastic | I-Natural |
| ST-2 | East 764631 North 2305540 | 105/285° True | 5.5 x 0.75 x 1.2 | 1 | Modern Plastic | I-Natural |
| ST-3 | East 764619 North 2305513 | 110/290° True | 7.0 x 0.75 x 1.5 | 1 | Modern Plastic | Natural |
| ST-4 | East 764607 North 2305551 | 120/300° True | 6.0 x 0.75 x 1.4 | 1 | Modern Plastic | Natural |
| ST-5 | East 764576 North 2305539 | 110/290° True | 7.0 x 0.75 x 1.4 | 2 | Modern Plastic | I-Natural II-Natural |
| ST-6 | East 764539 North 2305552 | 120/300° True | 8.0 x 0.75 x 1.6 | 1 | Modern Plastic | Natural |
| ST-7 | East 764519 North 2305568 | 100/280° True | 5.0 x 0.75 x 1.5 | 1 | Modern Plastic | Natural |
| ST-8 | East 764485 North 2305531 | 100/280° True | 6.0 x 0.75 x 1.2 | 2 | None | I-Natural II-Natural |
| ST-9 | East 764455 North 2305561 | 120/300° True | 5.0 x 0.75 x 1.4 | 1 | None | Natural |
| ST-10 | East 764419 North 2305535 | 100/280° True | 5.0 x 0.75 x 1.4 | 1 | Modern Plastic | Natural |
| ST-11 | East 764397 North 2305598 | 90/290° True | 5.0 x 0.75 x 1.4 | 1 | Modern Plastic | Natural |
| ST-12 | East 764335 North 2305507 | 120/300° True | 6.0 x 0.75 x 1.4 | 2 | None | I-Natural II-Natural |
| ST-13 | East 764379 North 2305465 | 100/280° True | 5.0 x 0.75 x 1.2 | 1 | Modern Plastic | Natural |
| ST-14 | East 764426 North 2305496 | 100/280° True | 5.0 x 0.75 x 1.4 | 1 | None | Natural |
| ST-15 | East 764458 North 2305453 | 100/280° True | 5.0 x 0.75 x 1.2 | 1 | None | Natural |
| ST-16 | East 764500 North 2305476 | 120/300° True | 5.0 x 0.75 x 1.2 | 1 | Modern Plastic | Natural |
| ST-17 | East 764534 North 2305431 | 100/280° True | 5.0 x 0.75 x 1.2 | 1 | Modern Plastic | Natural |
| ST-18 | East 764578 North 2305469 | 120/300° True | 5.0 x 0.75 x 1.0 | 1 | Modern Plastic | Natural |
| ST-19 | East 764613 North 2305424 | 100/280° True | 5.0 x 0.75 x 1.1 | 1 | Modern Plastic | Natural |
| ST-20 | East 764649 North 2305436 | 100/280° True | 5.0 x 0.75 x 1.2 | 1 | Modern Plastic | Natural |

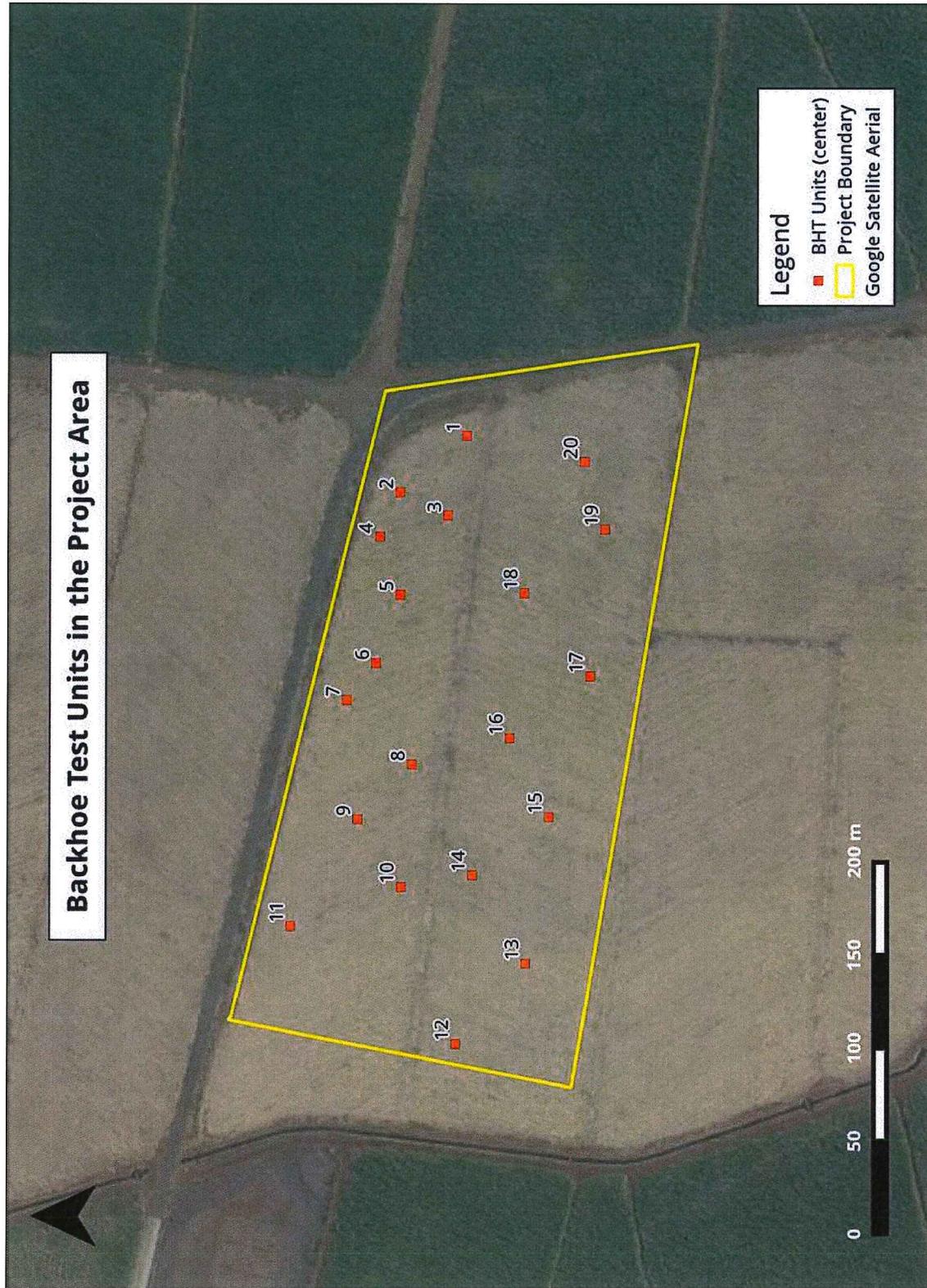


Figure 8: Google Earth (2011) Image Showing the Distribution of the Stratigraphic Trenches Across the Project Area.

STRATIGRAPHIC TRENCH 1 (ST-1)

Stratigraphic Trench 1 (ST-1) (5.5 x 0.75 x 2.0 m) was oriented on a south/north (170/350°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-1 was topographically flat, which suggested the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered in ST-1 (Figures 9 and 10). Fragments of plastic associated with modern commercial agriculture were observed, not collected, within the upper portion of Layer I, between 0 and 40 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-1, and that Layer I was interpreted as a slightly disturbed, naturally occurring deposit, excavation of ST-1 was terminated.

Layer I (0-200 cmbs) consisted of dusky red (7.5YR 3/3, moist) sandy silty clay with few small cobbles and coarse gravels throughout the deposit. The upper portion of the deposit (0-40 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. No Traditional or Historic cultural materials were encountered in Layer I. Layer I was interpreted as a slightly disturbed natural stratum.

STRATIGRAPHIC TRENCH 2 (ST-2)

Stratigraphic Trench 2 (ST-2) (5.5 x 0.75 x 1.2 m) was oriented on a southeast/northwest (105/285°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-2 was topographically flat, which suggested the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-2 (Figures 11 and 12). Fragments of plastic, associated with modern commercial agriculture, were observed, not collected, within the upper portion of Layer I, between 0 and 20 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-2, and that Layer I was interpreted as a slightly disturbed, naturally occurring deposit, excavation of ST-2 was terminated.

Layer I (0-120 cmbs) consisted of very dusky red (2.5YR 2.5/2, moist) sandy silty clay with gravel and cobbles throughout the deposit. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. No Traditional or Historic cultural materials were encountered in Layer I. Layer I was interpreted as a slightly disturbed natural stratum.

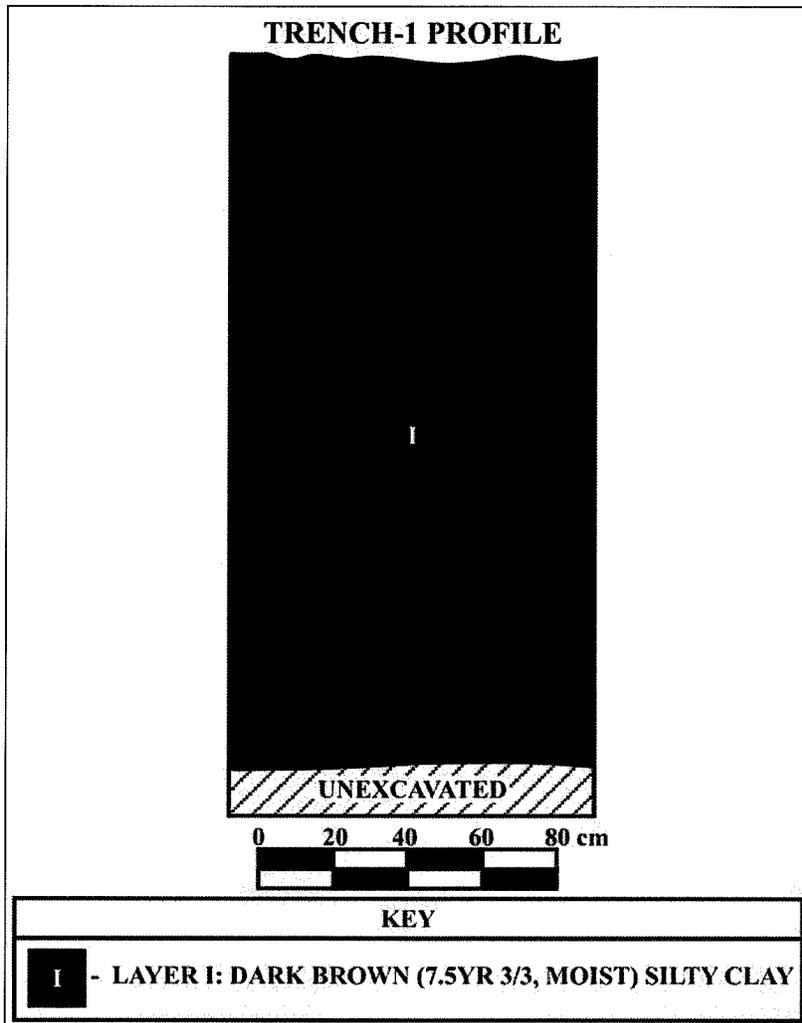


Figure 9: Profile Drawing of Stratigraphic Trench 1, South Wall.



Figure 10: Photographic View of Stratigraphic Trench 1 Profile, South Wall, View to South.

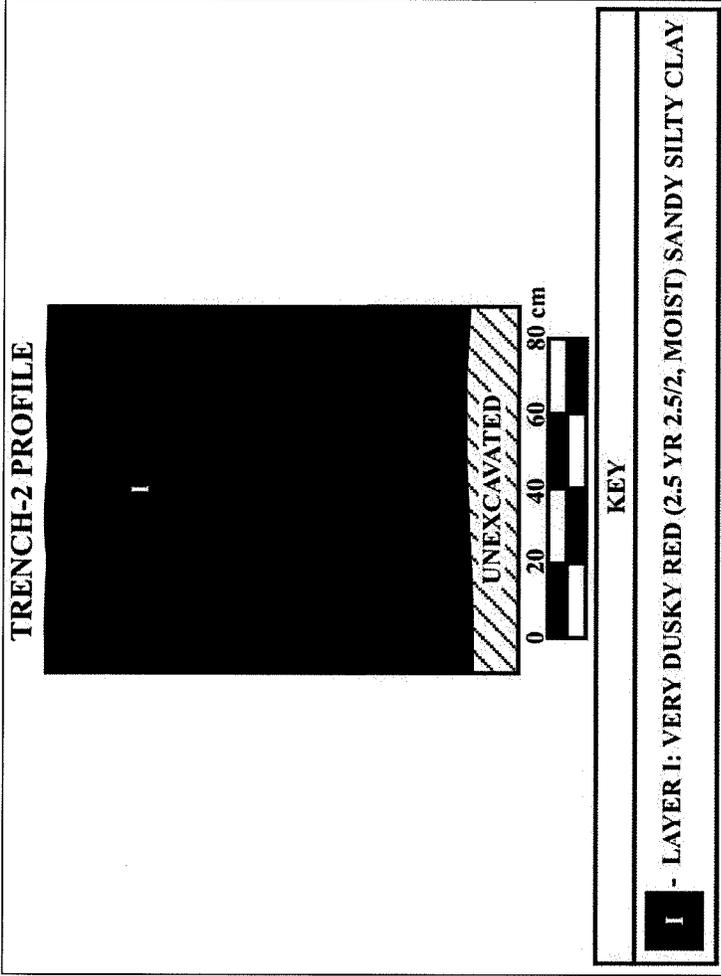


Figure 11: Profile Drawing of Stratigraphic Trench 2, Southeast Wall.



Figure 12: Photographic View of Stratigraphic Trench 2, Southeast Wall. View to East.

STRATIGRAPHIC TRENCH 3 (ST-3)

Stratigraphic Trench 3 (ST-3) (7.0 x 0.75 x 1.5 m) was oriented on a southeast/northwest (110/290°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-3 was topographically flat, which suggested the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-3 (Figure 13; see Figure 12). Fragments of plastic, associated with modern commercial agriculture, were observed, not collected, within the upper portion of Layer I, between 0 and 20 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-3, and that Layer I was interpreted as a slightly disturbed, naturally occurring deposit, excavation of ST-3 was terminated.

Layer I (0-150 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with few small pebbles throughout the deposit. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. No Traditional or Historic cultural materials were encountered in Layer I. Layer I was interpreted as a slightly disturbed natural stratum.

STRATIGRAPHIC TRENCH 4 (ST-4)

Stratigraphic Trench 4 (ST-4) (6.0 x 0.75 x 1.4 m) was oriented on a southeast/northwest (120/300°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-4 was topographically flat, which suggested the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-4 (Figure 14; see Figure 12). Fragments of plastic, associated with modern commercial agriculture, were observed, not collected, within the upper portion of Layer I, between 0 and 20 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-4, and that Layer I was interpreted as a slightly disturbed, naturally occurring deposit, excavation of ST-4 was terminated.

Layer I (0-140 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with coarse sand. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. No Traditional or Historic cultural materials were encountered in Layer I. Layer I was interpreted as a slightly disturbed natural stratum.

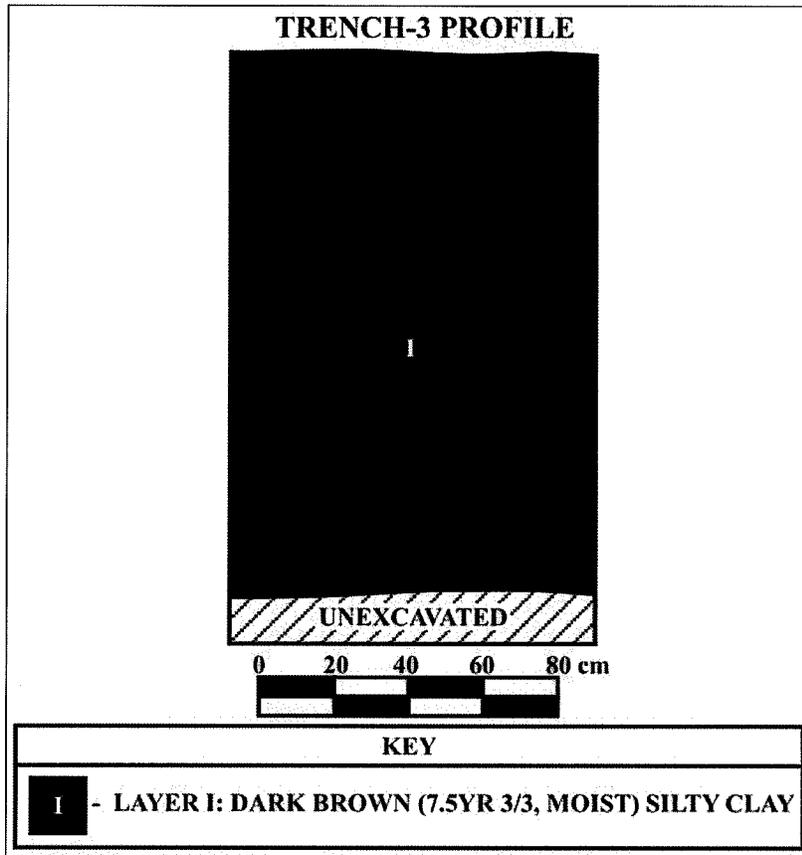


Figure 13: Profile Drawing of Stratigraphic Trench 3, Southeast Wall.

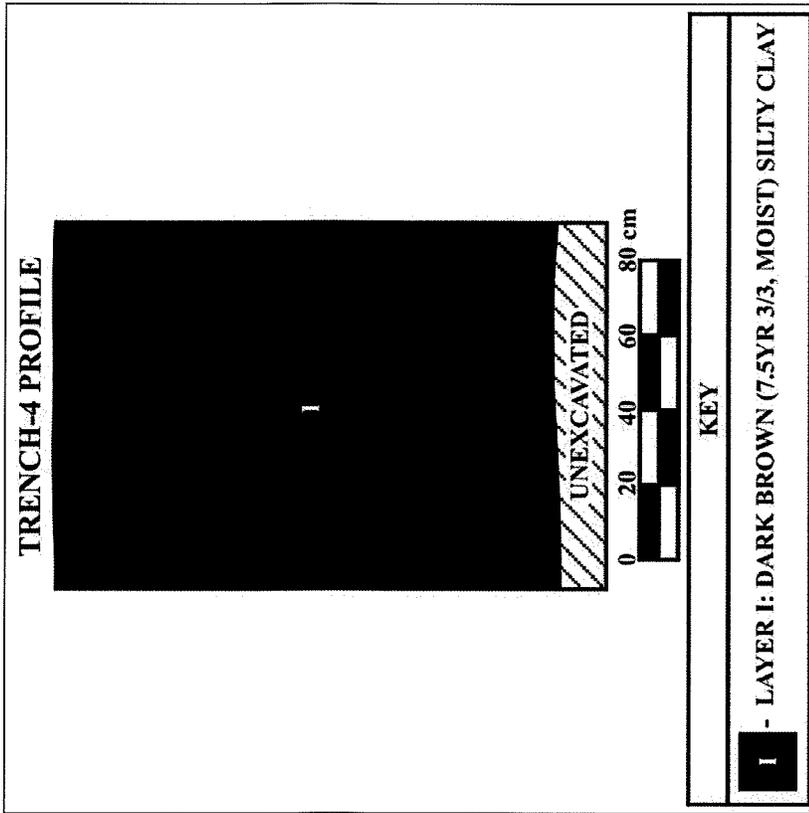


Figure 14: Profile Drawing of Stratigraphic Trench 4, Southeast Wall.

STRATIGRAPHIC TRENCH 5 (ST-5)

Stratigraphic Trench 5 (ST-5) (7.0 x 0.75 x 1.4 m) was oriented on an east/west (110/290°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-5 was slightly sloped, topographically, but still suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). Two stratigraphic layers were encountered within ST-5 (Figures 15 and 16). Fragments of plastic, associated with modern commercial agriculture, were observed, not collected, within the upper portion of Layer I, between 0 and 20 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-5, and that Layer I and Layer II were interpreted as naturally occurring deposits, excavation of ST-5 was terminated.

Layer I (0-96/132 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with coarse sand and gravel. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I exhibited a diffuse, wavy lower boundary. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

Layer II (96/132-140 cmbs) consisted of very dusky red (2.5YR 2.5/3, moist) silty clay with coarse sand and gravel. No Traditional or Historic cultural materials were encountered in Layer II. Layer II was interpreted as a natural stratum.

STRATIGRAPHIC TRENCH 6 (ST-6)

Stratigraphic Trench 6 (ST-6) (8.0 x 0.75 x 1.6 m) was oriented on a southeast/northwest (120/300°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-6 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-6 (Figures 17 and 18). Fragments of plastic, associated with modern commercial agriculture, were observed, not collected, within the upper portion of Layer I, between 0 and 30 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-6, and that Layer I was interpreted as a slightly disturbed, naturally occurring deposit, excavation of ST-6 was terminated.

Layer I (0-160 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with sand. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically

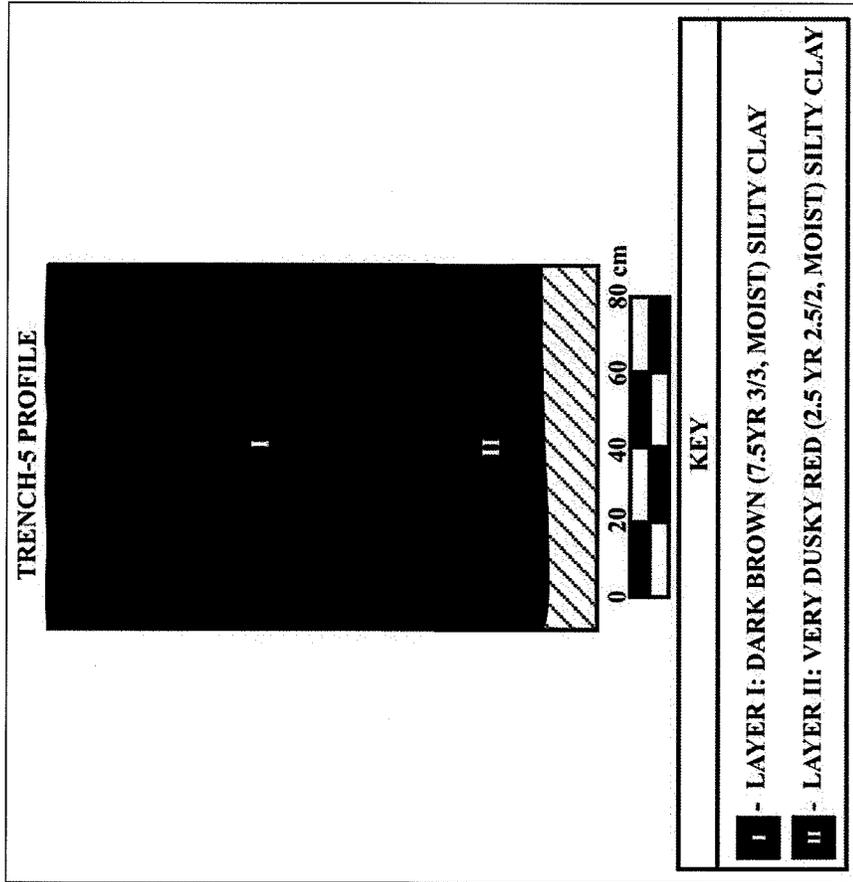


Figure 15: Profile Drawing of Stratigraphic Trench 5, East Wall.

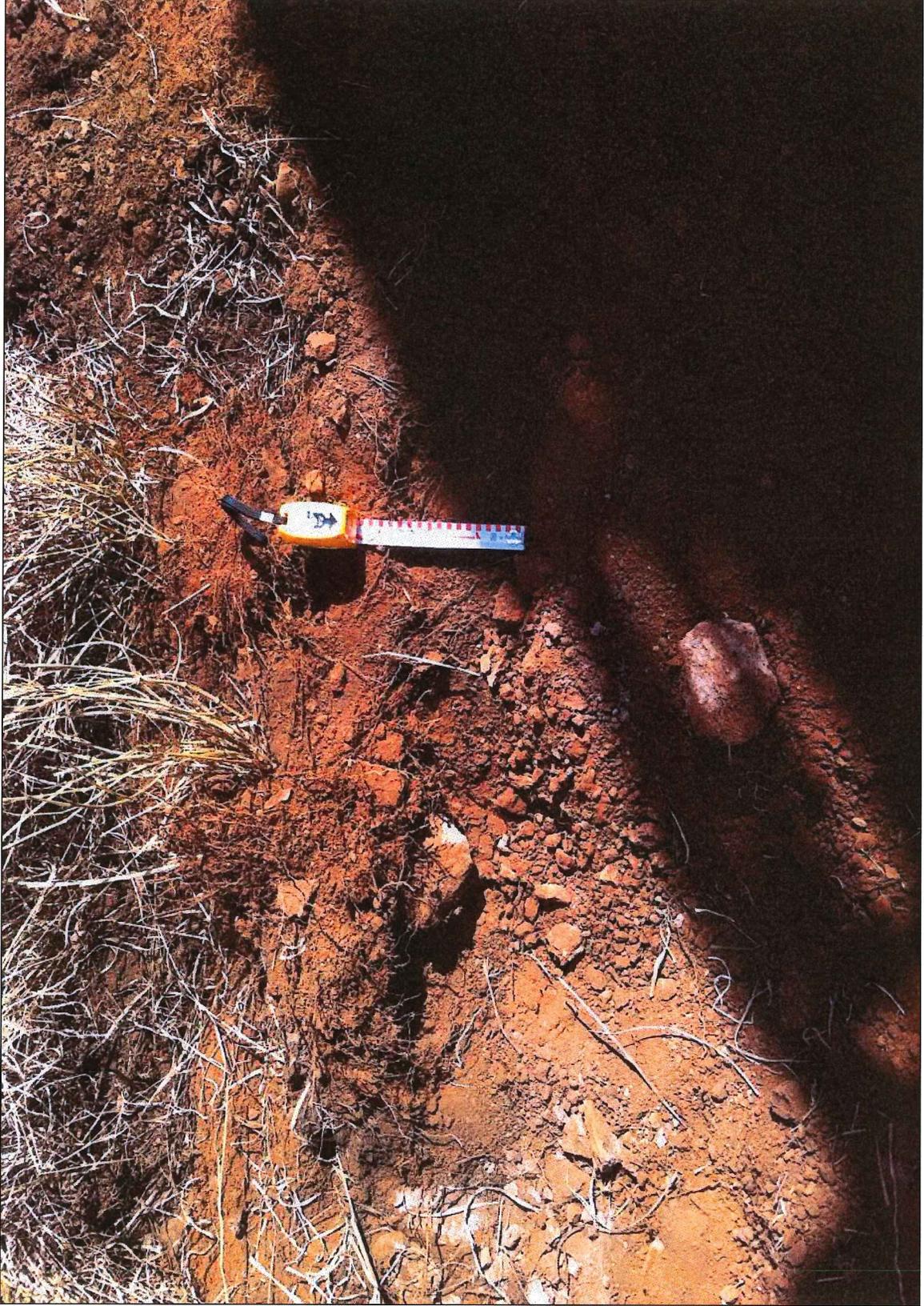


Figure 16: Photographic View of Stratigraphic Trench 5, East Wall. View to Southeast.

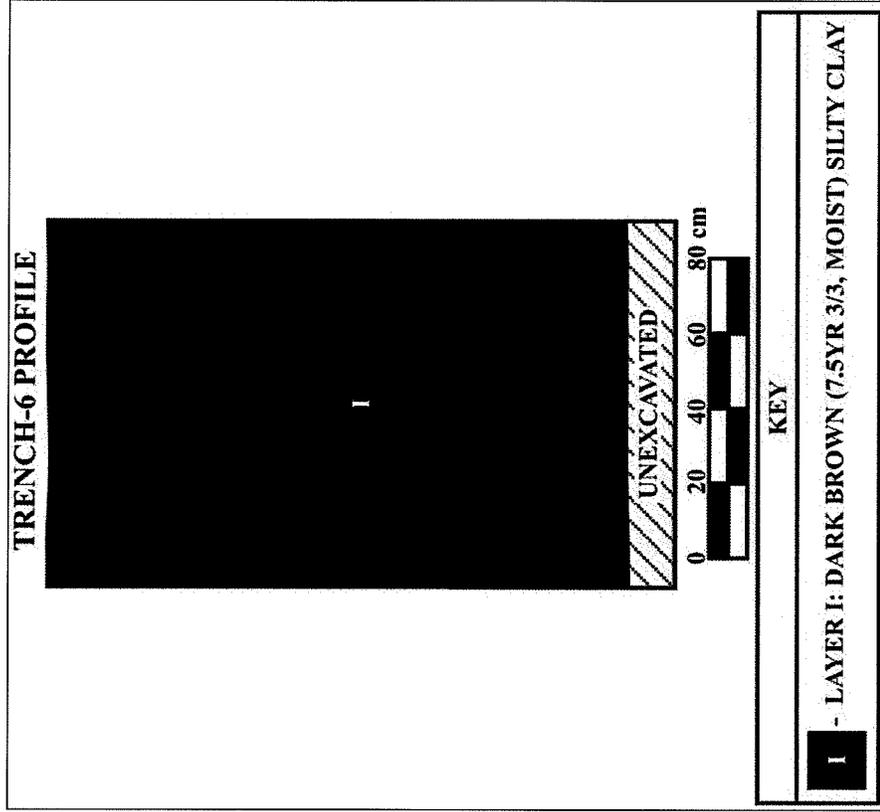


Figure 17: Profile Drawing of Stratigraphic Trench 6, East Wall.



Figure 18: Photographic View of Stratigraphic Trench 6, East Wall. View to Southeast.

associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 7 (ST-7)

Stratigraphic Trench 7 (ST-7) (5.0 x 0.75 x 1.5 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-7 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-7 (Figures 19 and 20). Fragments of plastic, associated with modern commercial agriculture, were observed, not collected, within the upper portion of Layer I, between 0 and 5 cmbs. Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-7, and that Layer I was interpreted as a slightly disturbed, naturally occurring deposit, excavation of ST-7 was terminated.

Layer I (0-160 cmbs) consisted of dusky red (7.5YR 3/3) silty clay with medium sand and small gravels. The upper portion of the deposit (0-5 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 8 (ST-8)

Stratigraphic Trench 8 (ST-8) (6.0 x 0.75 x 1.2 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-8 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). Two stratigraphic layers were encountered within ST-8 (Figures 21 and 22). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-8, and that Layers I and II were interpreted as naturally occurring deposits, excavation of ST-8 was terminated.

Layer I (0-60 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with coarse sand. Layer I was interpreted as a natural stratum. No Traditional or Historic cultural materials were encountered in Layer I. Layer I exhibited a diffuse and wavy lower boundary.

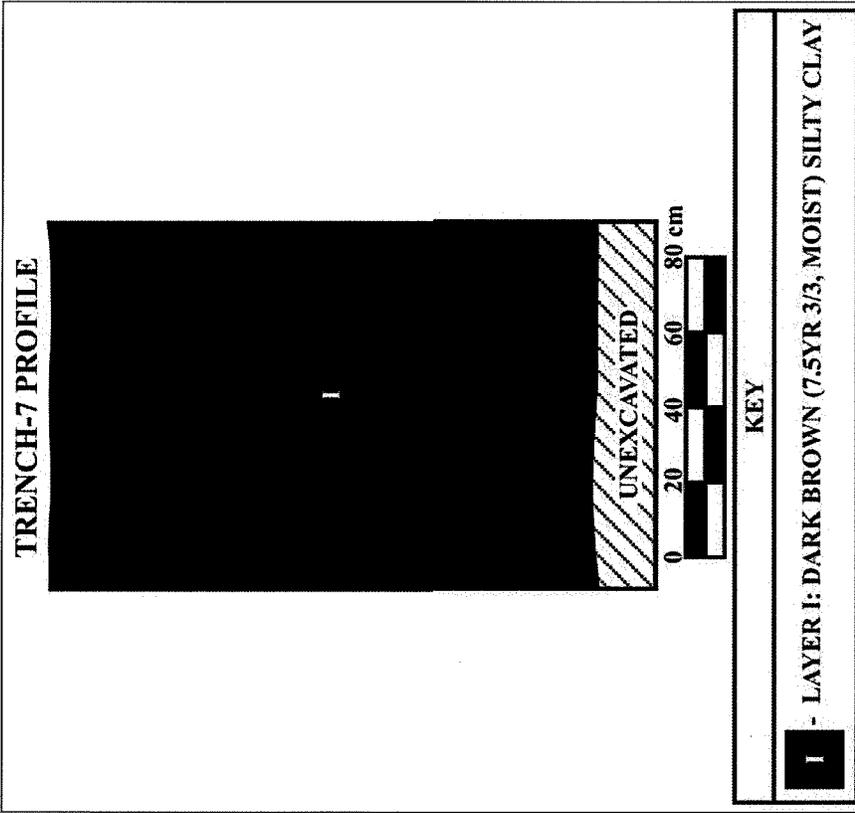


Figure 19: Profile Drawing of Stratigraphic Trench 7, East Wall.

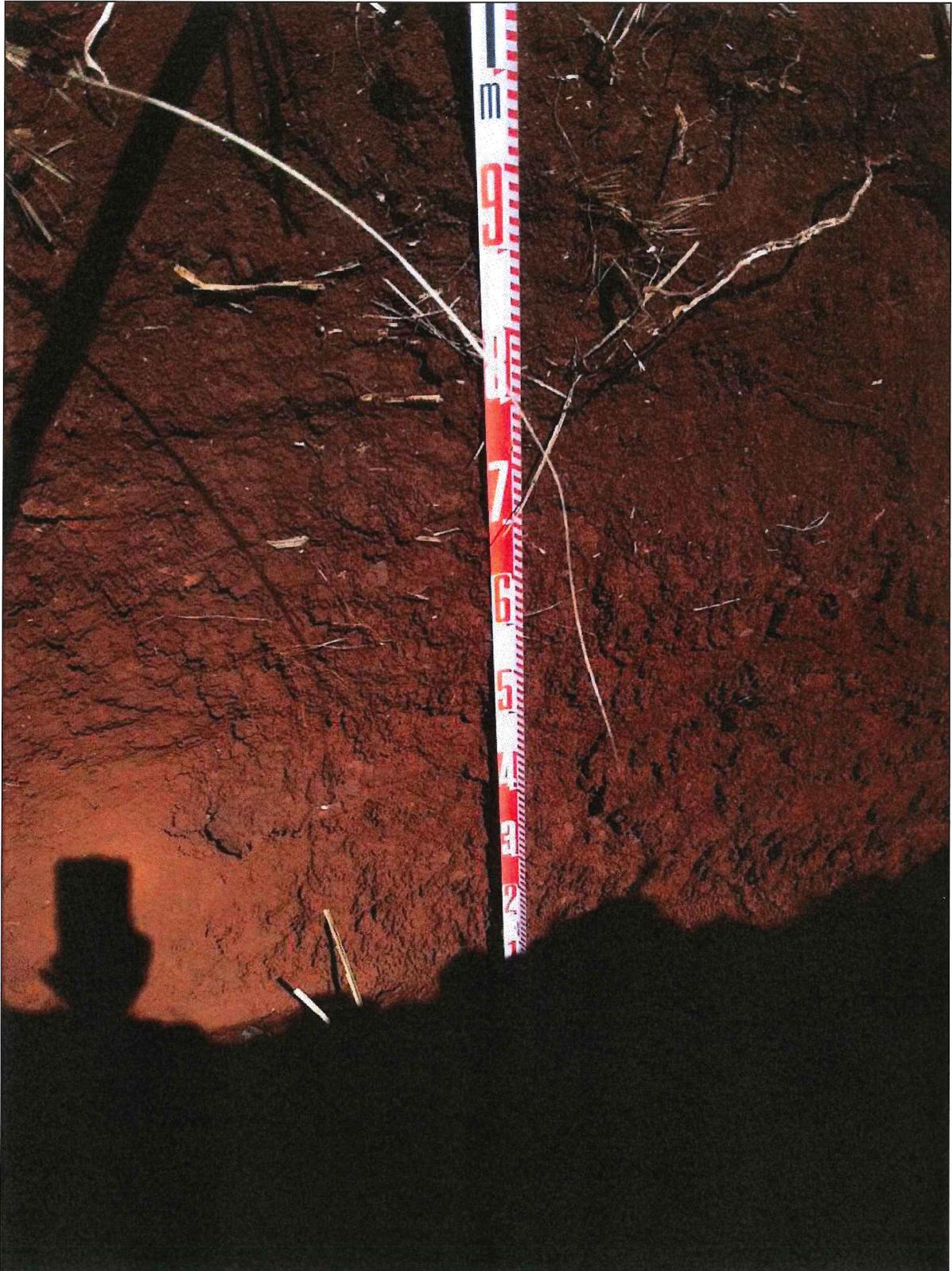


Figure 20: Photographic View of Stratigraphic Trench 7, East Wall. View to Southeast.

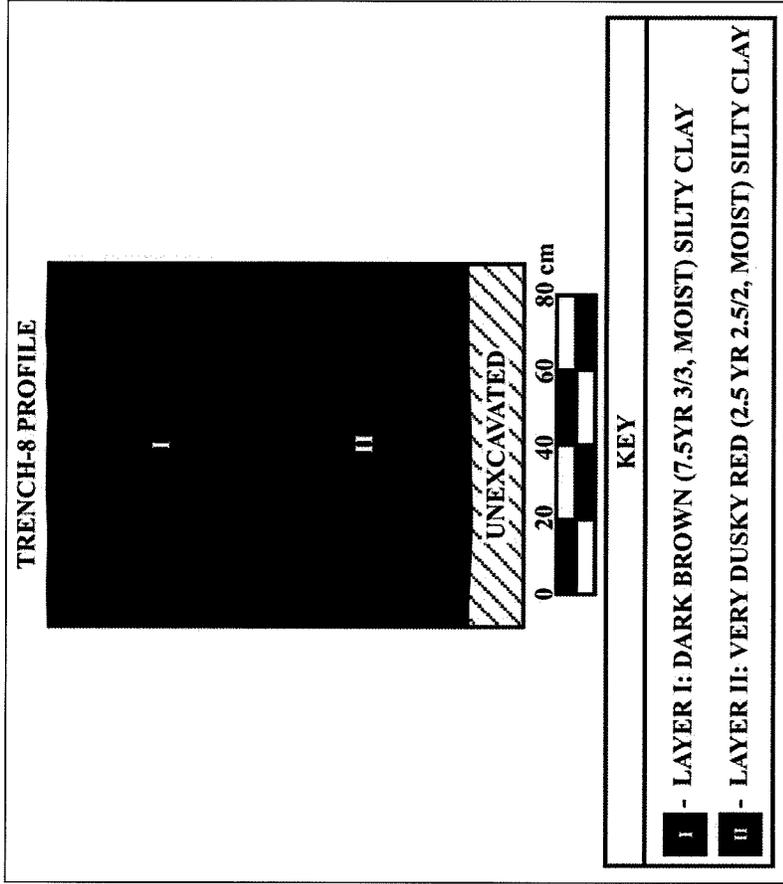


Figure 21: Profile Drawing of Stratigraphic Trench 8, East Wall.



Figure 22: Photographic View of Stratigraphic Trench 8, East Wall. View to East.

Layer II (60-120 cmbs) consisted of very dusky red (2.5YR 2.5/3) rocky silty clay with sand and gravel. No Traditional or Historic cultural materials were encountered in Layer II. Layer II was interpreted as a natural stratum

STRATIGRAPHIC TRENCH 9 (ST-9)

Stratigraphic Trench 9 (ST-9) (5.0 x 0.75 x 1.4 m) was oriented on a southeast/northwest (120/300°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-9 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-9 (Figures 23 and 24). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-9, and that Layer I was interpreted as a naturally occurring deposit, excavation of ST-9 was terminated.

Layer I (0-60 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with coarse sand. Layer I was interpreted as a natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 10 (ST-10)

Stratigraphic Trench 10 (ST-10) (5.0 x 0.75 x 1.4 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-10 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-10 (Figures 25 and 26). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-10, and that Layer I was interpreted as a naturally occurring deposit, excavation of ST-10 was terminated.

Layer I (0-140 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with sorted sand. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 11 (ST-11)

Stratigraphic Trench 11 (ST-11) (5.0 x 0.75 x 1.4 m) was oriented on an east/west (90/290°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-11 was topographically flat, suggesting the

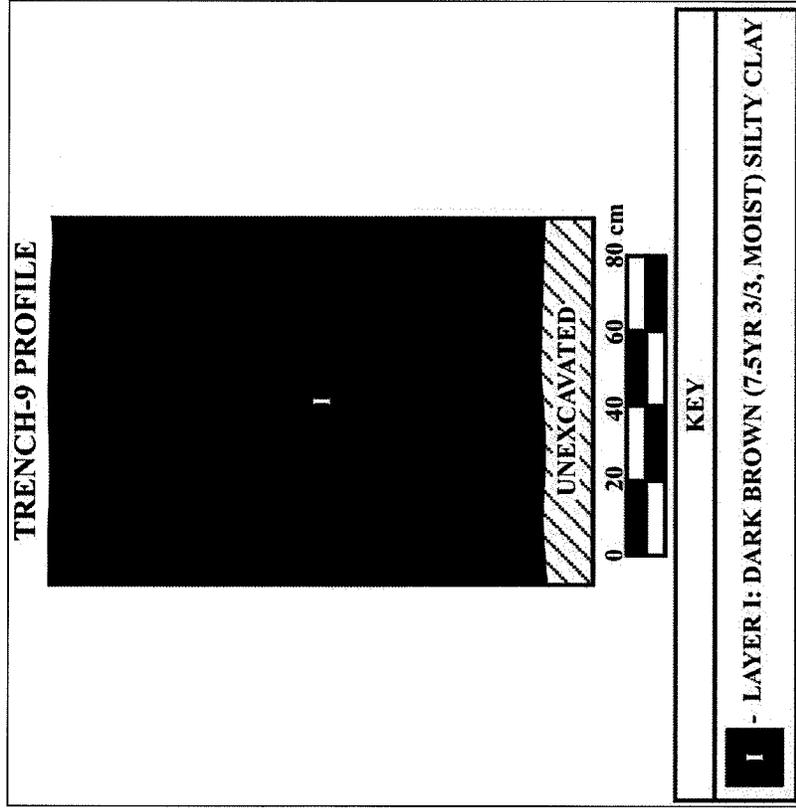


Figure 23: Profile Drawing of Stratigraphic Trench 9, East Wall.

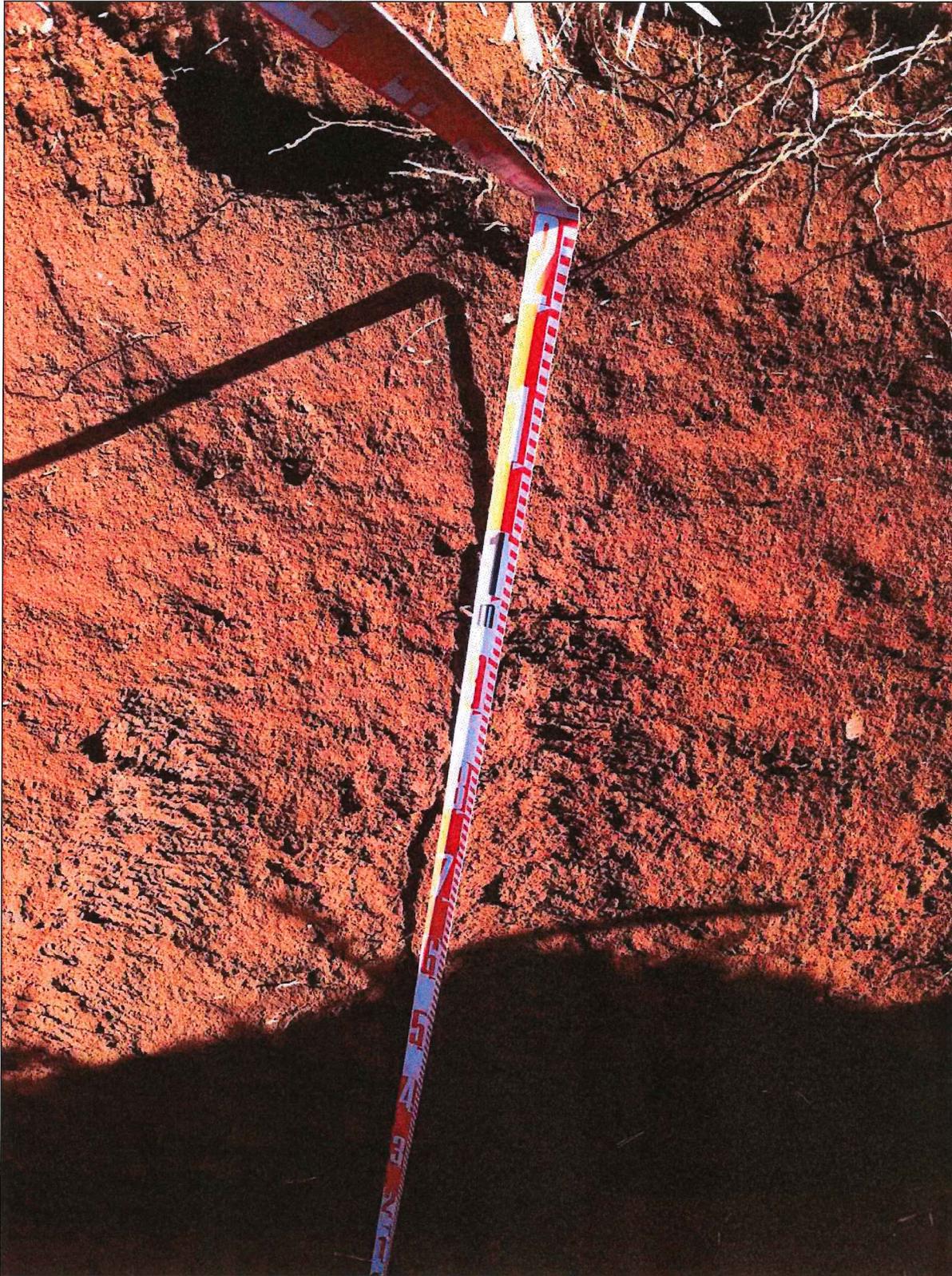


Figure 24: Photographic View of Stratigraphic Trench 9, East Wall. View to East.

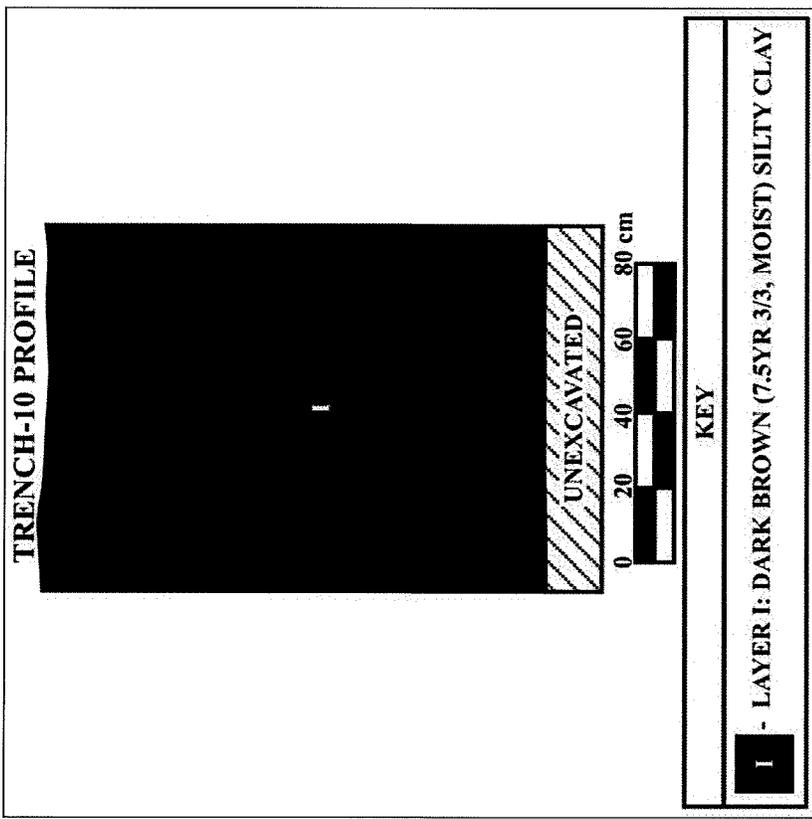


Figure 25: Profile Drawing of Stratigraphic Trench 10, East Wall.

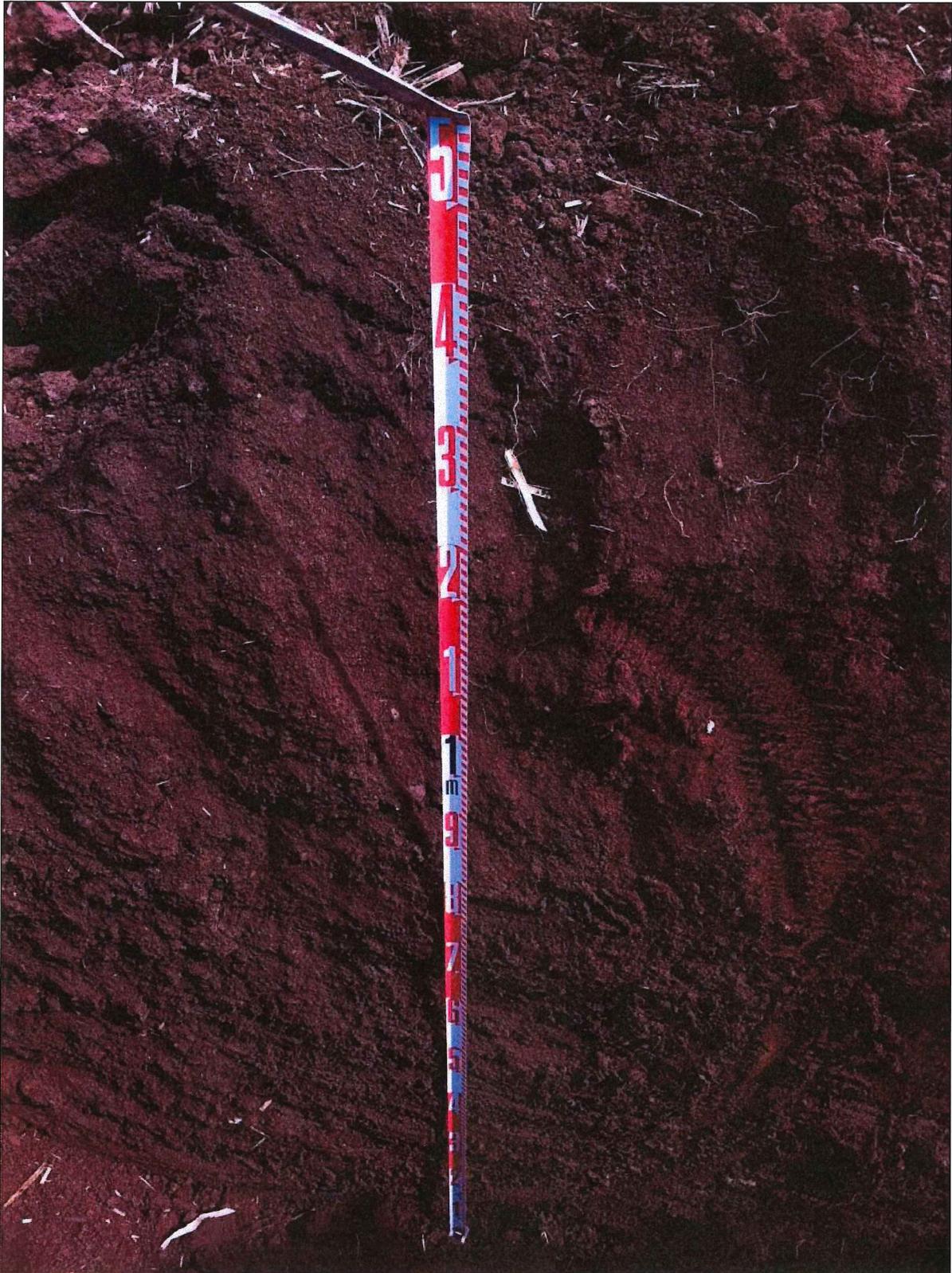


Figure 26: Photographic View of Stratigraphic Trench 10, East Wall. View to East.

possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-11 (Figures 27 and 28). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-11, and that Layer I was interpreted as a naturally occurring deposit, excavation of ST-11 was terminated.

Layer I (0-140 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with coarse sand. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 12 (ST-12)

Stratigraphic Trench 12 (ST-12) (6.0 x 0.75 x 1.4 m) was oriented on a southeast/northwest (120/300°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-12 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). Two stratigraphic layers were encountered within ST-12 (Figure 29; see Figure 22). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-12, and that Layers I and II were interpreted as naturally occurring deposits, excavation of ST-12 was terminated.

Layer I (0-84 cmbs) consisted of dusky red (7.5YR 3/3, moist) silty clay with coarse sand and few small cobbles. The upper portion of the deposit (0-10 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I. Layer I exhibited an abrupt, wavy lower boundary.

Layer II (84-140 cmbs) consisted of very dusky red (2.5YR 2.5/3, moist) rocky silty clay with sand and gravel. No Traditional or Historic cultural materials were encountered in Layer II. Layer II was interpreted as a natural stratum

STRATIGRAPHIC TRENCH 13 (ST-13)

Stratigraphic Trench 13 (ST-13) (5.0 x 0.75 x 1.2 m) was oriented on a southeast/northwest (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-13 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.*

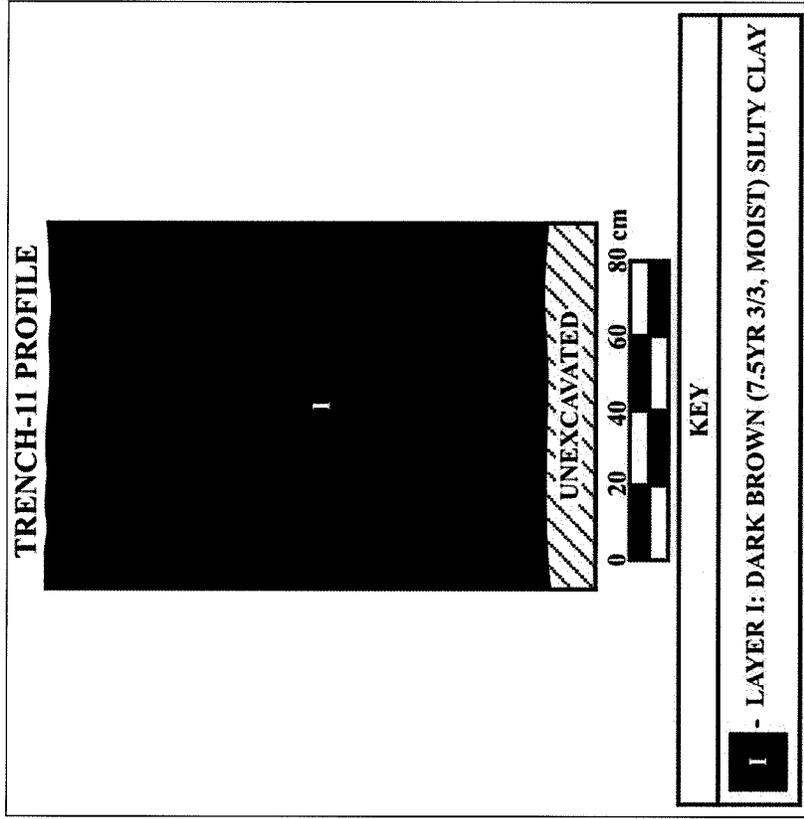


Figure 27: Profile Drawing of Stratigraphic Trench 11, East Wall.

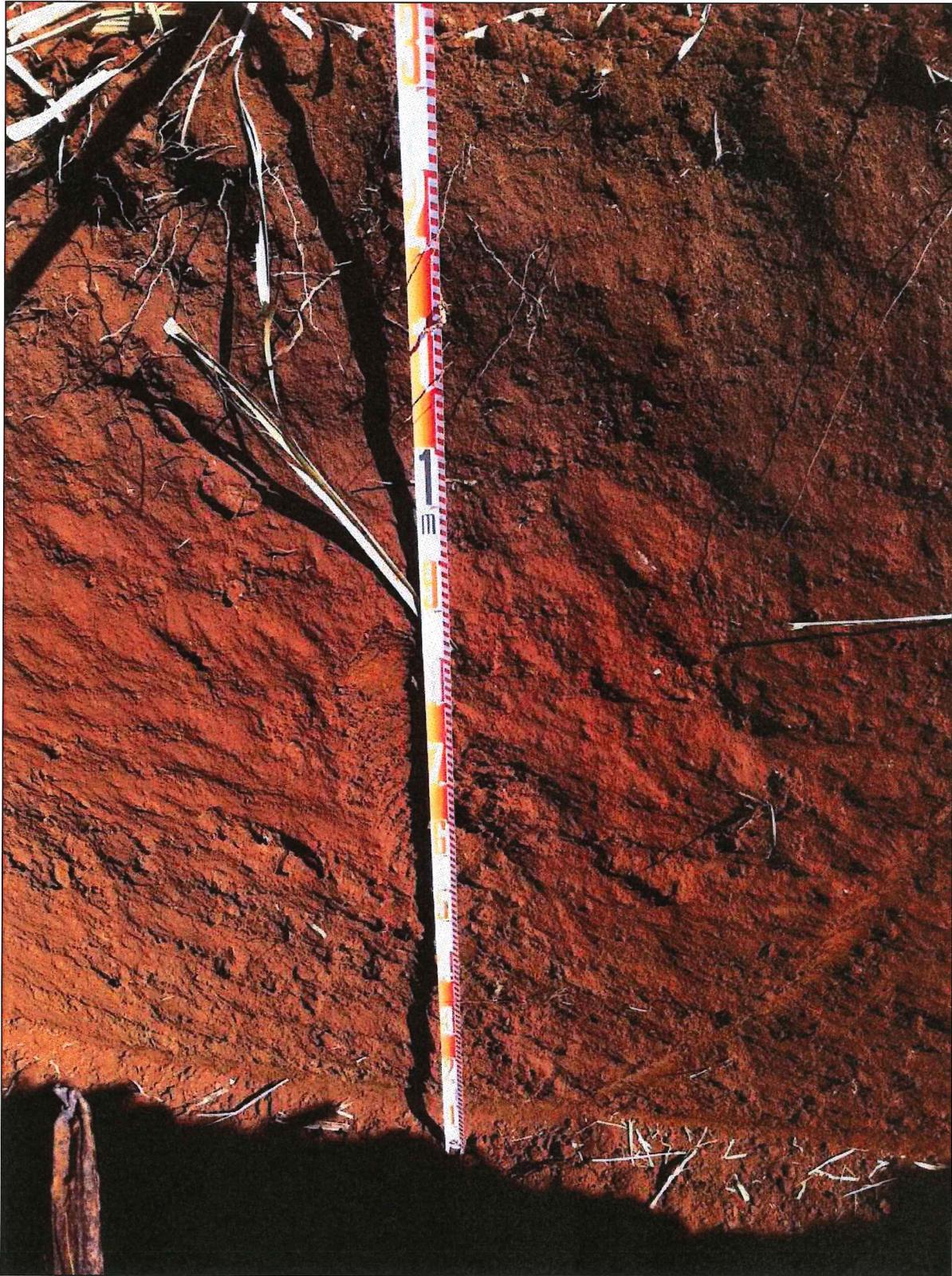


Figure 28: Photographic View of Stratigraphic Trench 11, East Wall. View to East.

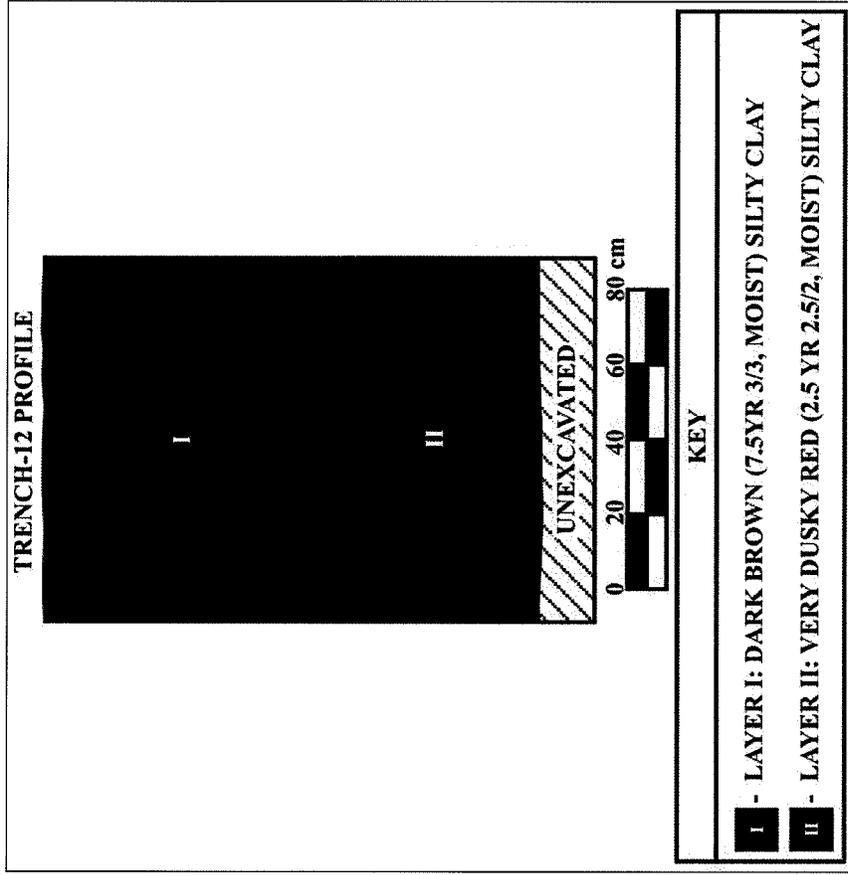


Figure 29: Profile Drawing of Stratigraphic Trench 12, East Wall.

midden, charcoal, etc.). One stratigraphic layer was encountered within ST-13 (Figures 30 and 31). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-13, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-13 was terminated.

Layer I (0-120) consisted of very dusky red (2.5YR 2.5/3, moist) rocky silty clay with fine sand. The upper portion of the deposit (0-10 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 14 (ST-14)

Stratigraphic Trench 14 (ST-14) (5.0 x 0.75 x 1.4 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-14 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-14 (Figures 32 and 33). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-14, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-14 was terminated.

Layer I (0-120) consisted of very dusky red (7.5YR 3/3, moist) silty clay with coarse sand. The upper portion of the deposit (0-20 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 15 (ST-15)

Stratigraphic Trench 15 (ST-15) (5.0 x 0.75 x 1.2 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-15 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-15 (Figures 34 and 35). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-15, and that Layer I was interpreted as a naturally occurring deposit, excavation of ST-15 was terminated.

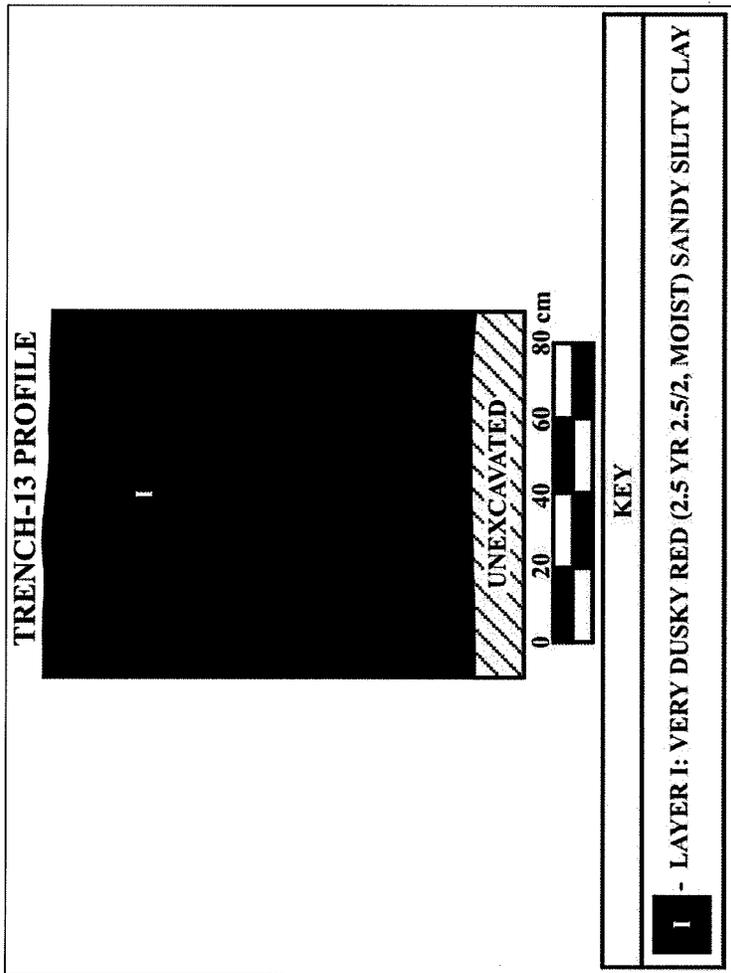


Figure 30: Profile Drawing of Stratigraphic Trench 13, East Wall.

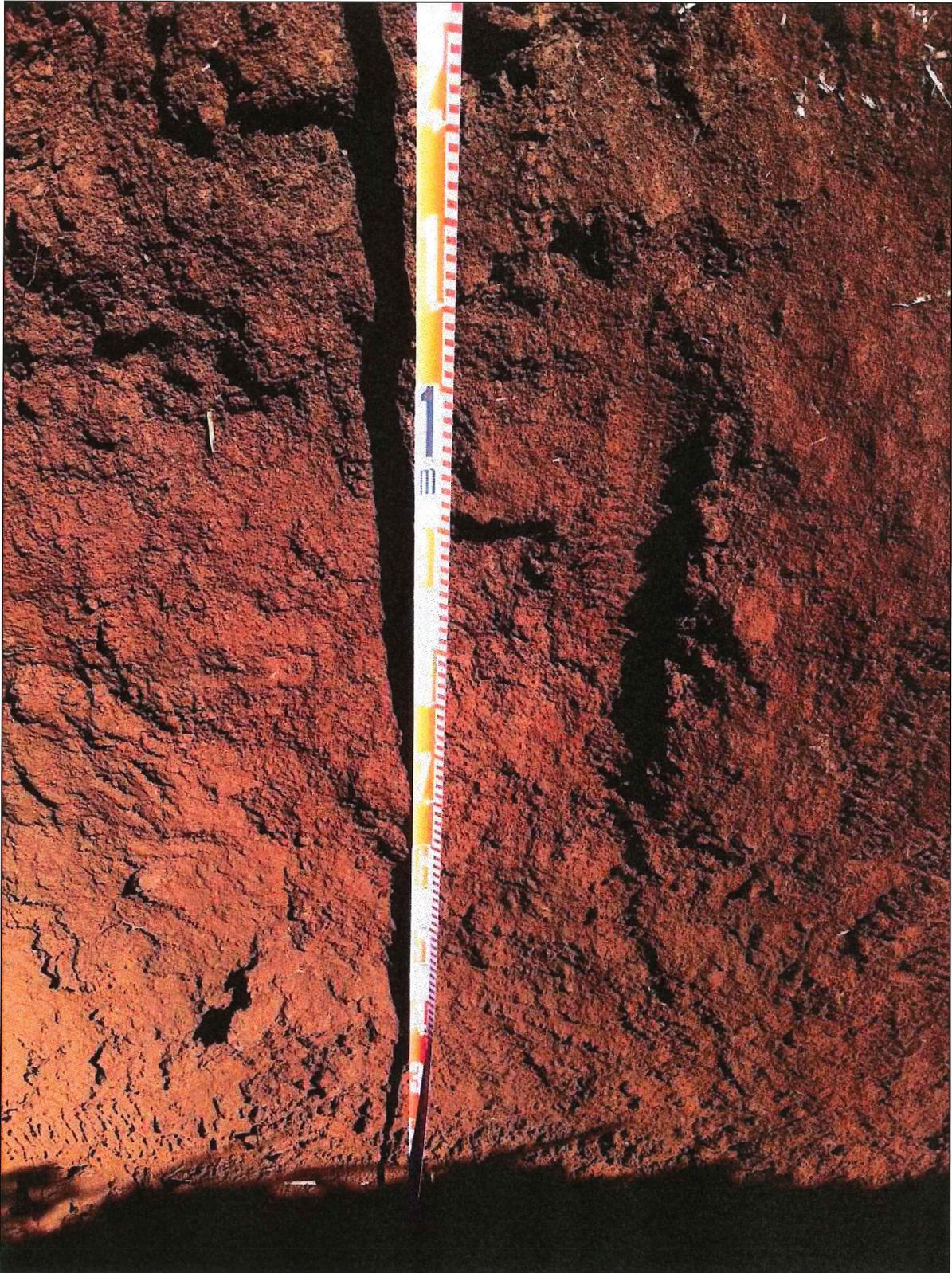


Figure 31: Photographic View of Stratigraphic Trench 13, East Wall. View to East.

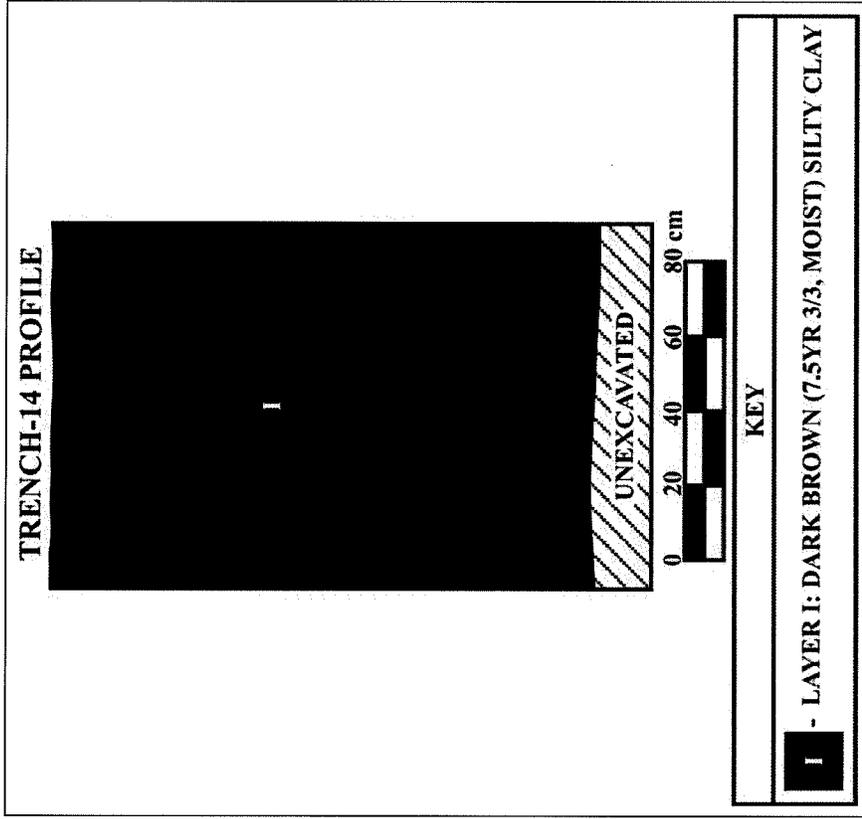


Figure 32: Profile Drawing of Stratigraphic Trench 14, East Wall.

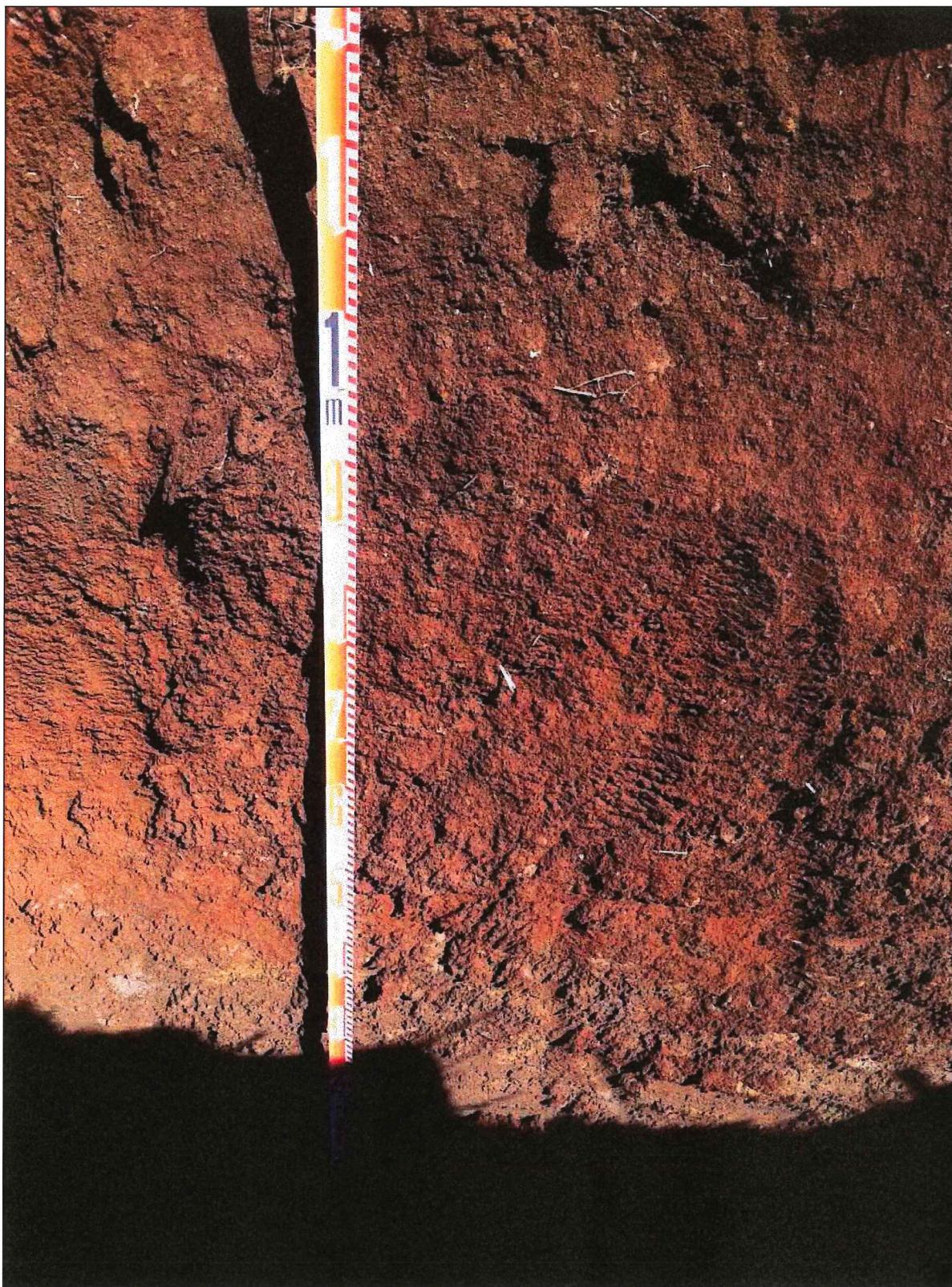


Figure 33: Photographic View of Stratigraphic Trench 14, East Wall. View to East.

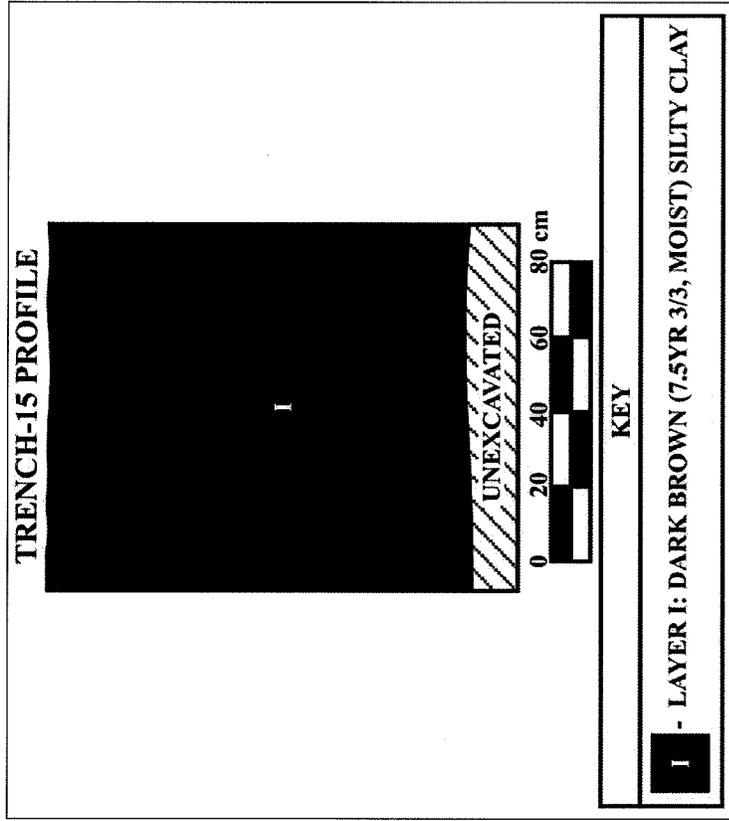


Figure 34: Profile Drawing of Stratigraphic Trench 15, East Wall.

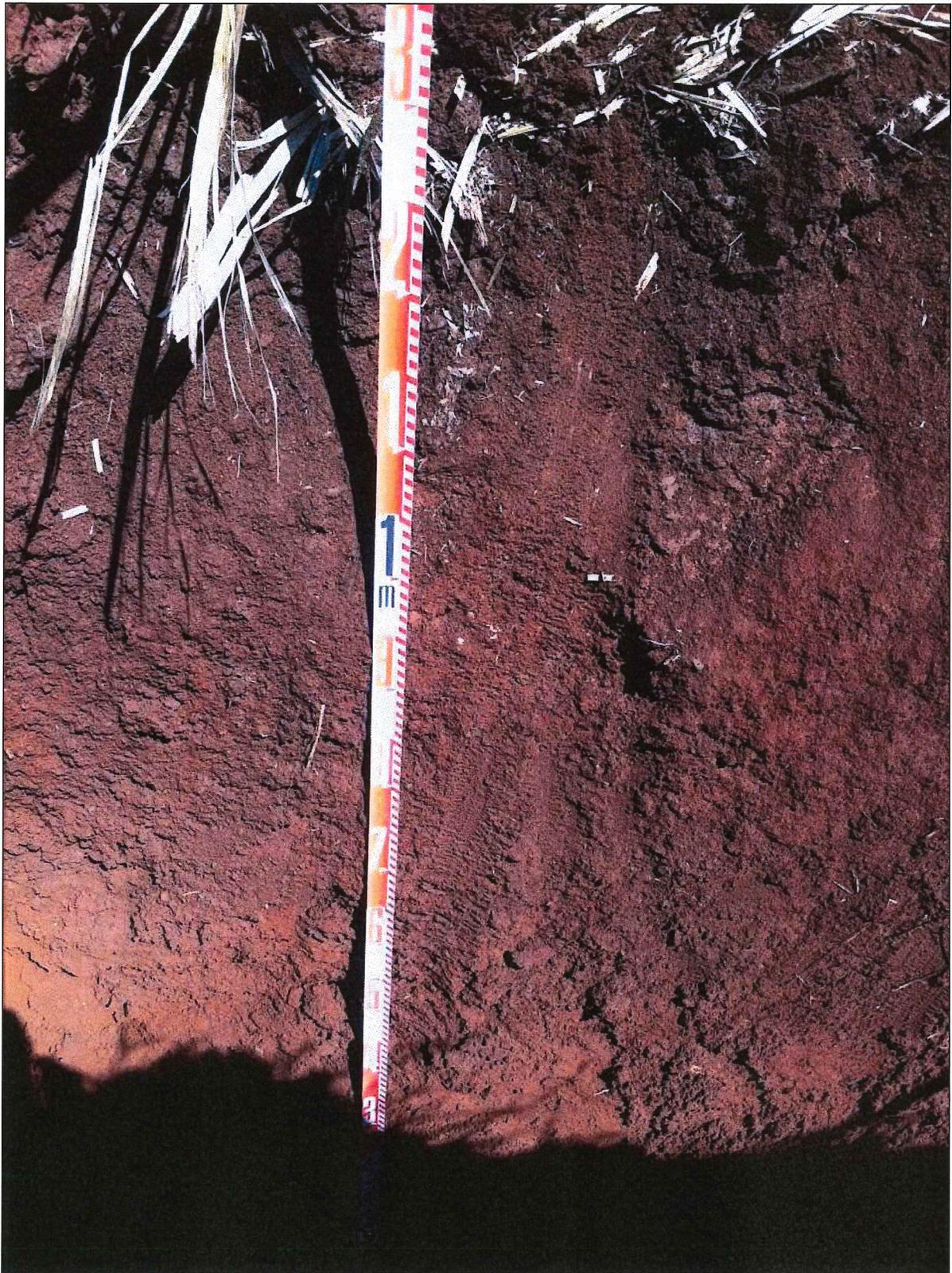


Figure 35: Photographic View of Stratigraphic Trench 15, East Wall. View to East.

Layer I (0-120) consisted of very dusky red (7.5YR 3/3, moist) silty clay with fine sand. Layer I was interpreted as a natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 16 (ST-16)

Stratigraphic Trench 16 (ST-16) (5.0 x 0.75 x 1.2 m) was oriented on a southeast/northwest (120/300°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-16 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-16 (Figures 36 and 37). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-16, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-16 was terminated.

Layer I (0-120) consisted of very dusky red (7.5YR 3/3, moist) silty clay with coarse sand and gravel. The upper portion of the deposit (0-10 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 17 (ST-17)

Stratigraphic Trench 17 (ST-17) (5.0 x 0.75 x 1.2 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-17 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-17 (Figures 38 and 39). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-17, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-17 was terminated.

Layer I (0-120) consisted of very dusky red (7.5YR 3/3, moist) silty clay with coarse sand and small gravel. The upper portion of the deposit (0-15 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

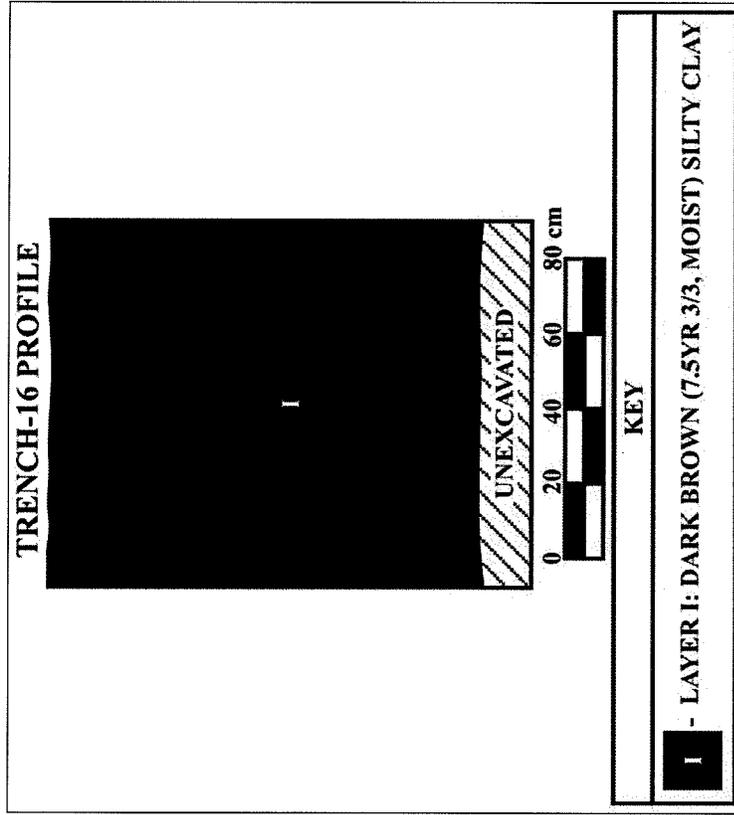


Figure 36: Profile Drawing of Stratigraphic Trench 16, East Wall.



Figure 37: Photographic View of Stratigraphic Trench 16, East Wall. View to East.

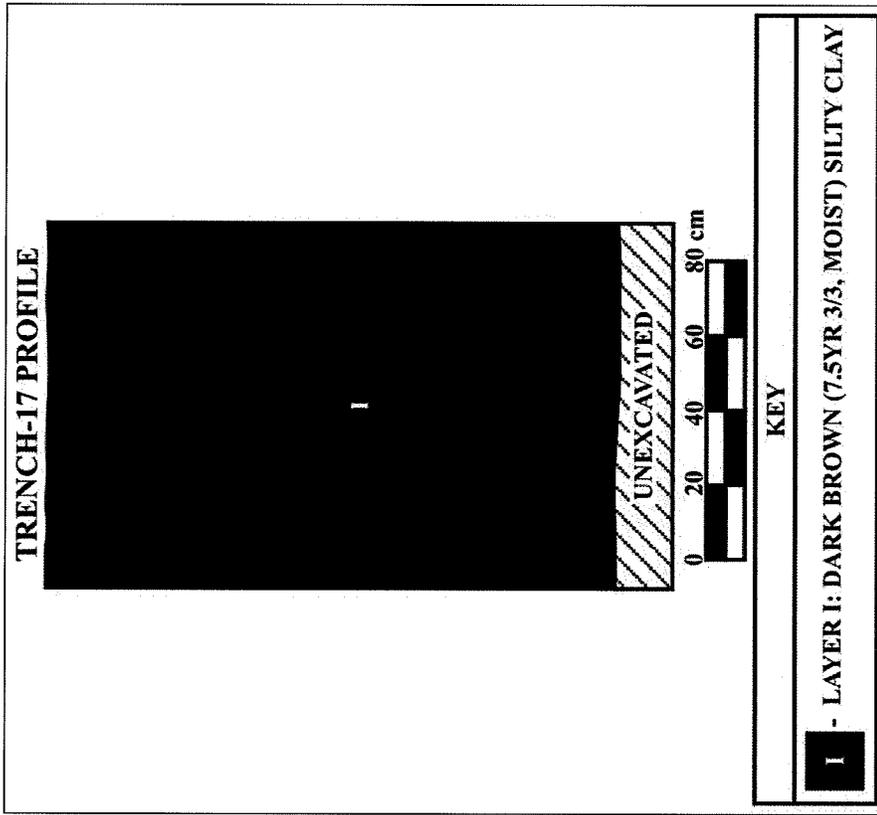


Figure 38: Profile Drawing of Stratigraphic Trench 17, East Wall.



Figure 39: Photographic View of Stratigraphic Trench 17, East Wall. View to Southeast.

STRATIGRAPHIC TRENCH 18 (ST-18)

Stratigraphic Trench 18 (ST-18) (5.0 x 0.75 x 1.0 m) was oriented on a southeast/northwest (120/300°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-18 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-18 (Figure 40; see Figure 20). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-18, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-18 was terminated.

Layer I (0-100) consisted of very dusky red (7.5YR 3/3, moist) silty clay with fine sand and gravel. The upper portion of the deposit (0-5 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 19 (ST-19)

Stratigraphic Trench 19 (ST-19) (5.0 x 0.75 x 1.1 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-19 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.). One stratigraphic layer was encountered within ST-19 (Figures 41 and 42). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-19, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-19 was terminated.

Layer I (0-110) consisted of very dusky red (7.5YR 3/3, moist) silty clay with coarse sand. The upper portion of the deposit (0-10 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

STRATIGRAPHIC TRENCH 20 (ST-20)

Stratigraphic Trench 20 (ST-20) (5.0 x 0.75 x 1.2 m) was oriented on an east/west (100/280°) axis with the archaeological purpose of identifying historic properties in subsurface context. The location selected as the locus of ST-20 was topographically flat, suggesting the possibility that subsurface deposits may contain habitation remnants (*i.e.* midden, charcoal, etc.).

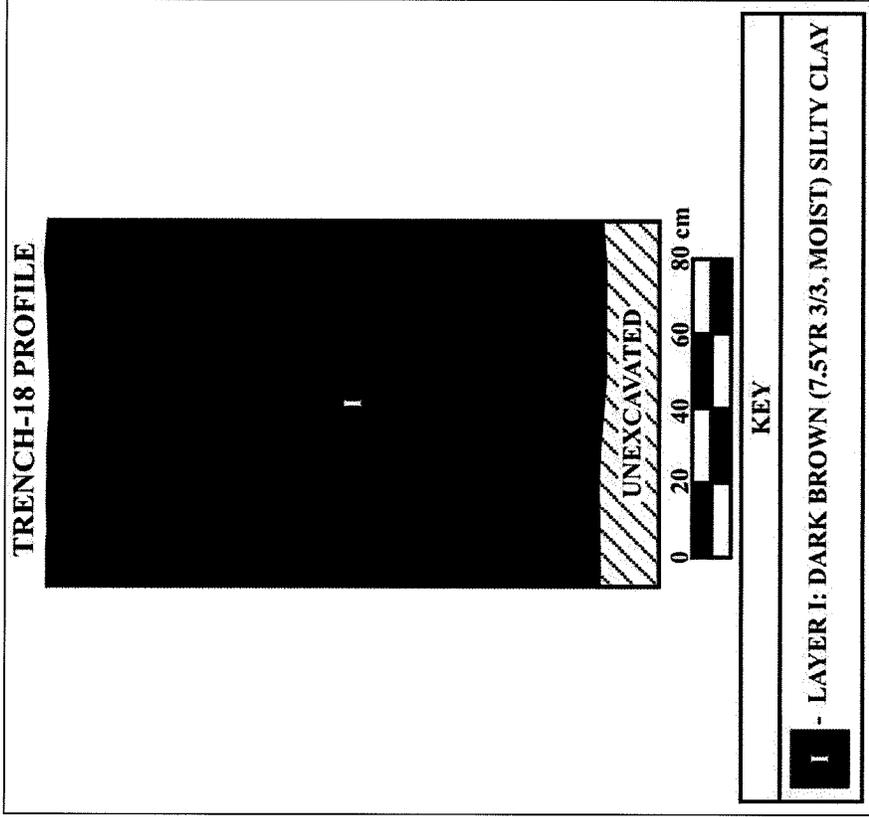


Figure 40: Profile Drawing of Stratigraphic Trench 18, East Wall.

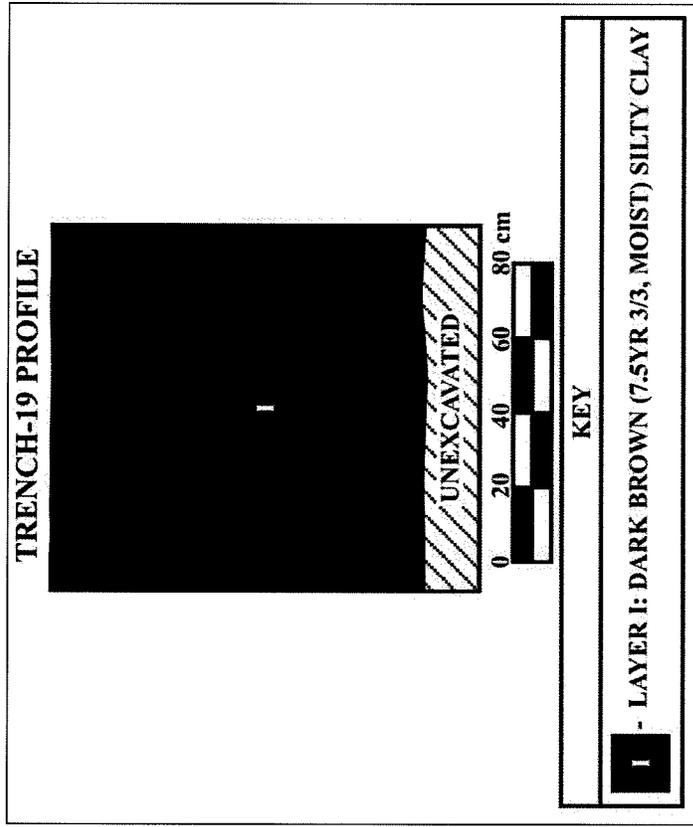


Figure 41: Profile Drawing of Stratigraphic Trench 19, East Wall.

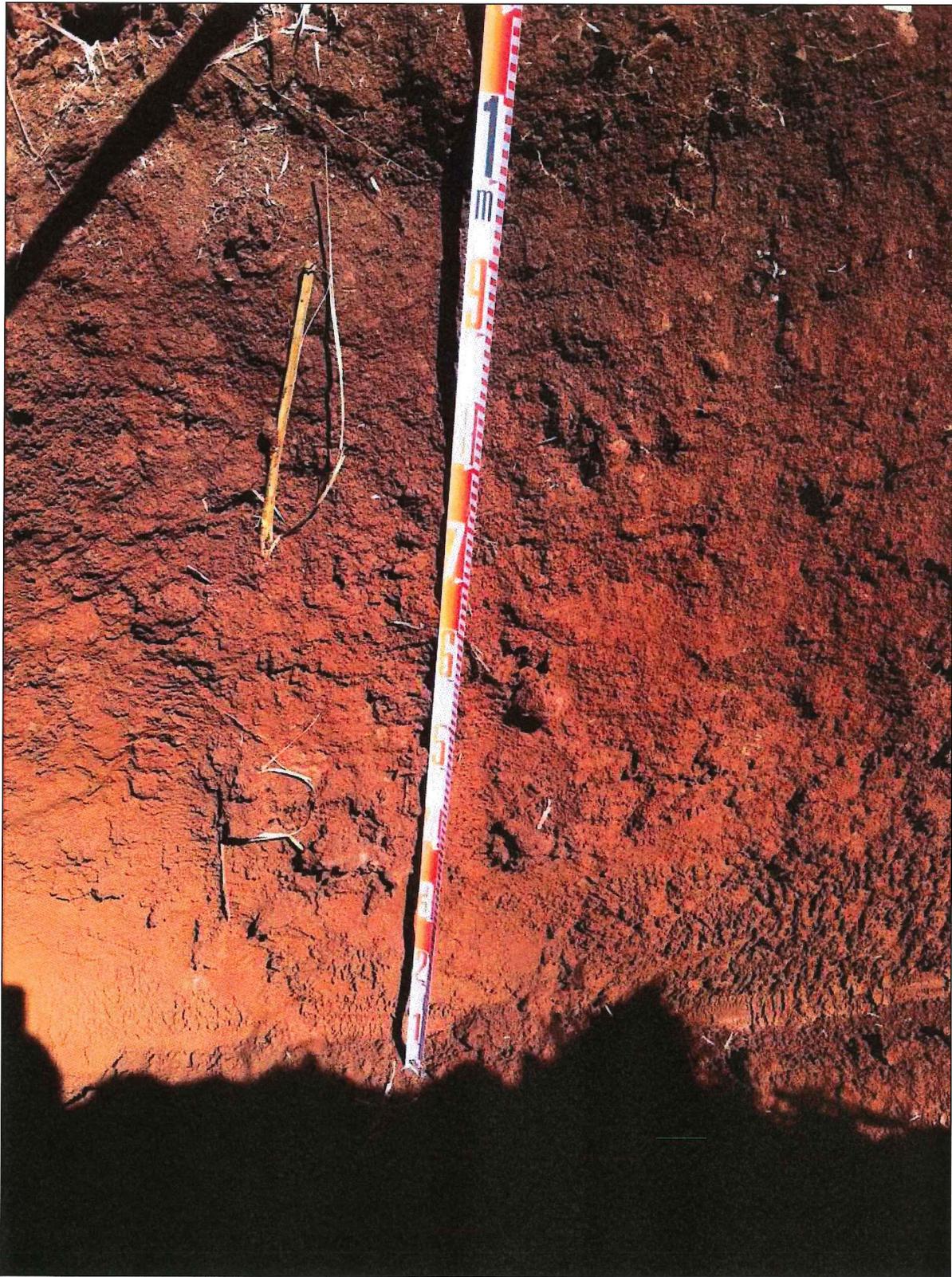


Figure 42: Photographic View of Stratigraphic Trench 19, East Wall. View to Southeast.

One stratigraphic layer was encountered within ST-20 (Figures 43 and 44). Given the depth of the excavation, the absence of pre- and post-Contact cultural materials throughout ST-20, and that Layer I was interpreted as a slightly disturbed naturally occurring deposit, excavation of ST-20 was terminated.

Layer I (0-120) consisted of very dusky red (7.5YR 3/3, moist) silty clay with small cobbles and coarse unsorted gravels throughout. The upper portion of the deposit (0-10 cmbs) contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth suggests the prior disturbance of the deposit. Layer I was interpreted as a slightly disturbed natural stratum. No Traditional or Historic cultural materials were encountered in Layer I.

SUMMARY AND RECOMMENDATIONS

Scientific Consultant Services, Inc. conducted Archaeological Inventory Survey of a 20.3-acre property located in Pu`unēnē, Pūlehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: (2) 3-8-008:001 por.]. No historic properties were identified on the surface or in subsurface contexts during the survey.

To supplement the surface pedestrian survey, a total of twenty (20) stratigraphic trenches (ST-1 through ST-20) were mechanically excavated. The trenches ranged in length from 5.0 to 8.0 m in length and from 1.0 to 2.0 m deep. All trenches were 0.75m in width. Deposits throughout the project area were fairly consistent. Seventeen (ST-1 through ST-4, ST-6, ST-7, ST-9 through ST-11, and ST-13 through ST-20) of the trenches contained one stratigraphic layer and three trenches (ST-5, ST-8, and ST-12) contained 2 stratigraphic layers. Layer I ranged from 0.60 m to 2.0 m in thickness and consisted primarily of dusky red (7.5YR 3/3, moist) silty clay. Layer II ranged from 0.40 to 0.60 m in thickness and was consistently comprised of very dusky red (7.5YR 3/3, moist) silty clay. The upper portion of Layer I, between 0 to 40 cmbs, in sixteen (16) of the trenches contained plastic fragments typically associated with Modern commercial agriculture. The presence of the plastic at this depth and the absence of traditional and historic artifacts suggests the prior disturbance of the deposit. However, this is not unusual given that the project area was under commercial agriculture for many years.

Based on the negative findings of the current Archaeological Inventory Survey, it is unlikely that new information would be gleaned from additional archaeological work in the project area. Thus, no further archaeological work is recommended for the current project area.

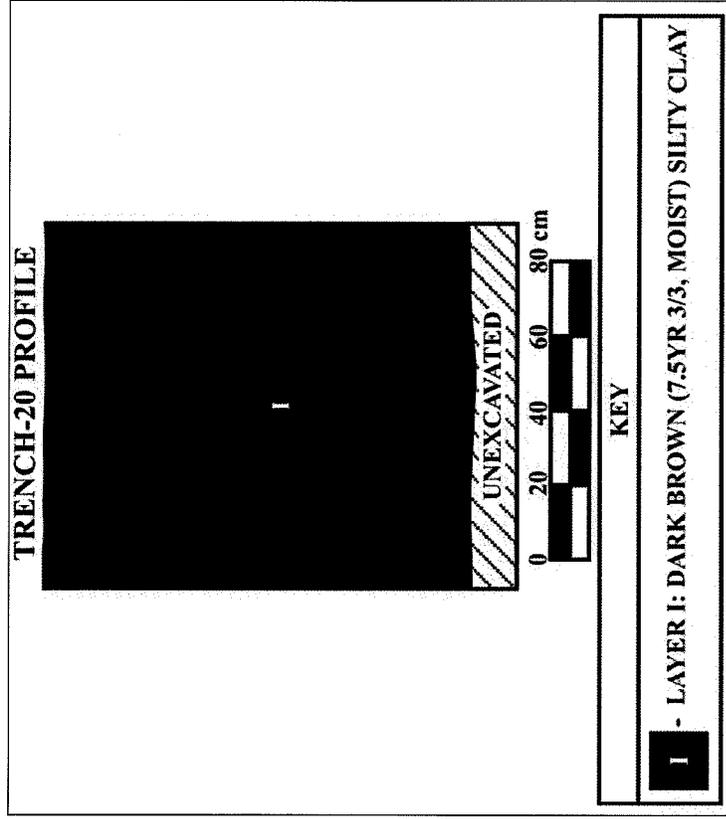


Figure 43: Profile Drawing of Stratigraphic Trench 20, East Wall.

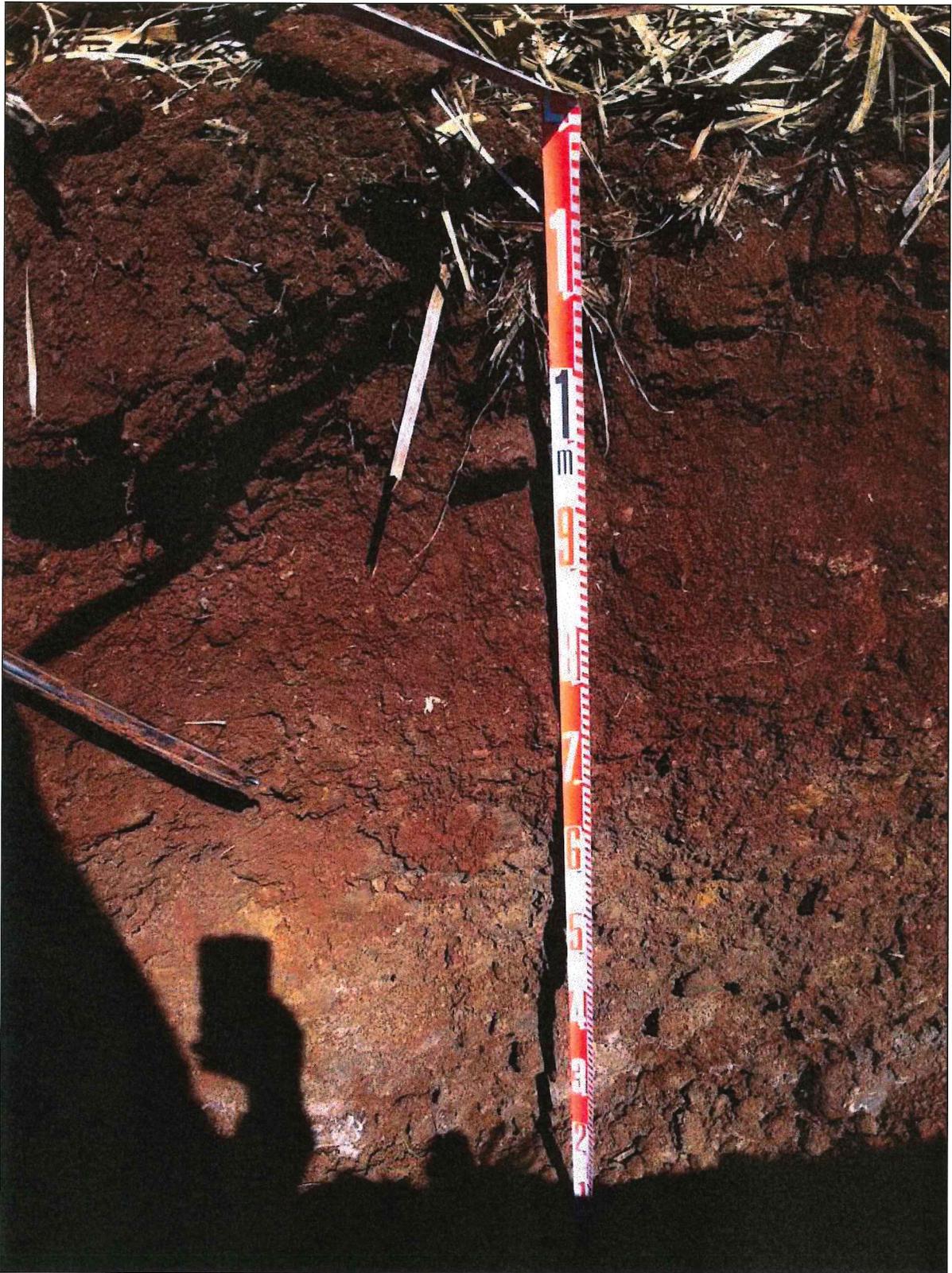


Figure 44: Photographic View of Stratigraphic Trench 20, East Wall. View to East.

REFERENCES

- Barrera, W. J.
1974 *An Archaeological Phase I Survey of Wailea, Kāhehi, Maui*. Manuscript on file, Department of Anthropology, B. P. Bishop Museum, Honolulu.
- Beckwith, Martha
1940 *Hawaiian Mythology*. The University of Hawaii. Honolulu.
- Burgett, Berdena and Robert L. Spear
1997 *Inventory Survey of Puunene Bypass/ Mokulele Highway Improvements Corridor Pulehu Nui, and Wailuku Ahupua`a Wailuku District, Island of Maui, Hawai`i [TMK: 3-8:04, 05, 06, and 07]*. Revised. Prepared for PBR Hawai`i. Manuscript on file, Scientific Consultant Services, Inc., Honolulu.
- Chaffee, D.B., B. Burgett, and R.L. Spear
1999 *Addendum II: Inventory Survey of Puunene ByPass/ Mokulele Highway Improvements Corridor Pulehu Nui, and Wailuku Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: 3-8:04, 05, 06, and 07]*. Prepared for Chris Hart and Partners. Manuscript of file, Scientific Consultant Services, Inc., Honolulu.
- Chinen, Jon
1961 Original Land Titles in Hawaii. Copyright 1961 Jon Jitsuzo Chinen. Library of Congress Catalogue Card No. 61-17314.
- Cleghorn, P.
1975 *Phase II, Part 2: Archaeological Salvage Operations at Site 50-Ma-B10-1, Wailea, Maui*. Department of Anthropology, B. P. Bishop Museum, Honolulu.
- Cordy, R.
197 *Kihei Flood Control Project: Archaeological Reconnaissance and Literature Search*. U.S. Army Corps of Engineers, Honolulu.
- Cordy, R. and J.S. Athens
1988 *Archaeological Survey and Excavation, Seibu Sites 1916 and 2101, Makena, Honuaula, Maui (TMK 2-1-05:108)*. Manuscript on file, International Archaeological Research Institute Incorporated, Honolulu.
- Daws, G.
1968 *Shoal of Time: History of the Hawaiian Islands*. University of Hawai`i Press. Honolulu.
- Department of Land and Natural Resources/State Historic Preservation Division
2002 *Hawaii Administrative Rules: Rules Governing Standards for Archaeological Inventory Surveys and Reports. (HRS 13-275)*.

- Dorrance, William H. and Francis Morgan
2000 *Sugar Islands*. Mutual Publishing. Honolulu.
- Foote, D.E., E. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Oahu, Maui, Molokai, and Lanai, State of Hawaii*.
U.S. Department of Agriculture Soil Conservation Service, Washington, D.C.
- Fornander, Abraham
1919 *Hawaiian Antiquities and Folklore*. Bishop Museum Press: Honolulu.
- Gosser, D., S. Clark, and B. Dixon
1993 *Na Lawai`a O `Ao`ao Kona O ka Moku: Excavations at the Southern Acreage
and Lot 15, Wailea, Maui*. Department of Anthropology. B. P. Bishop Museum,
Honolulu.
- Gosser, D., M. Roe, St. Clark, B. Dixon
1995 *An Archaeological Inventory Survey of Parcel MF-11, Wailea, Maui*. Department
of Anthropology. B. P. Bishop Museum. Honolulu.
- Handy, Craighill
1940 *The Hawaiian Planter, Vol 1*. Bishop Museum Press: Honolulu.
- Handy, E.S.C. and D.G. Handy
1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. B. P. Bishop
Museum Bulletin 233. Bishop Museum Press, Honolulu.
- Kamakau, Samuel
1961 *Ruling Chiefs of Hawaii*. The Kamehameha Schools Press: Honolulu.
- Kame`eleihiwa, Lilikalā
1992 *Native Land and Foreign Desires: Pehea La E Pono Ai?* Bishop Museum Press.
Honolulu.
- Kelly, Marion
1983 *Nā Māla o Kona: Gardens of Kona*. Dept. of Anthropology Report Series 83-2.
Bishop Museum. Honolulu.
- 1998 A Gunboat Diplomacy, Sandalwood Lust and National Debt. In *Ka Wai Ola o
OHA*, Vol. 15, No. 4, April 1998.
- Kennedy, Joseph
1988 Letter Report. *Inspection of TMK 3-8-4:29*. Prepared for John
Kean. Manuscript on file, Archaeological Consultants of Hawaii, Haleiwa.

- Kirch, P.V.
 1970 *Archaeology in the Ahupua`a of Palauea, Southeast Maui*. Manuscript on file, Department of Anthropology. B. P. Bishop Museum, Honolulu.
- 1985 *Feathered Gods and Fishhooks*. University of Hawaii Press, Honolulu.
- Kirch, Patrick and Marshal Sahlins
 1992 *Anahulu: The Anthropology of History in the Kingdom of Hawaii*. 2 volumes. University of Chicago Press, Chicago.
- Kuykendall, R.S.
 1938 *The Hawaiian Kingdom*. Vol. 1. University of Hawai`i Press. Honolulu.
- Lucas, Paul F. Nahoia
 1995 *A Dictionary of Hawaiian Legal Land-terms*. Native Hawaiian Legal Corporation. University of Hawai`i Committee for the Preservation and Study of Hawaiian Language, Art and Culture.. University of Hawai`i Press.
- Lyons, C.J.
 1875 Land Matters in Hawaii. *The Islander*, Vol. I. Honolulu.
- Pestana, E. and M. Dega
 2002 *Archaeological Inventory Survey for the Proposed Kai Makani Condominium Project, Waiakoa Ahupua`a, Kula District, Maui Island, Hawai`i [TMK (2) 3-9-041:027]*. Prepared for Chris Hart and Partners, Inc. Manuscript on file, Scientific Consultant Services, Inc., Honolulu.
- Price, S.
 1983 Climate. In *Atlas of Hawaii*, ed. by W. Armstrong, pp. 56-57. Department of Geography. University of Hawaii Press, Honolulu.
- Pukui, M.K., S. Elbert, and E.T. Mookini
 1974 *Place Names of Hawaii*. Revised and Expanded Edition. University of Hawaii Press, Honolulu.
- Rotunno-Hazuka, L.
 1991 *Archaeological Inventory Survey of the Kai Makani Project Parcel*. Manuscript on file, B. P. Bishop Museum, Honolulu.
- Sinoto, A. and J. Pantaleo
 1992 *Archaeological Inventory Survey of the Proposed Kihei Gateway Complex*. Manuscript on file, Aki Sinoto Consulting, Honolulu.

- Sterling, E.P.
1998 *Sites of Maui*. Bishop Museum Press, Honolulu.
- Stokes, J.F.G.
1909–1916 *Maui Heiau*. Manuscript on file, B. P. Bishop Museum, Honolulu.
- Thrum, T.G.
1909 *Heiau of Maui*. In *Hawaiian Annual*. Compilation at State Historic Preservation Division, Kapolei.
- Tome, G. and M. Dega
2004 *An Archaeological Inventory Survey Report on an 8.407-Acre Property in Wailea, Paeahu Ahupua`a, Makawao District, Island of Maui, Hawai`i [TMK (2) 2-1-08:112]*. Prepared for Pacific Land and Homes, LLC. Manuscript on file, Scientific Consultant Services, Inc., Honolulu.
2005 *Archaeological Inventory Survey of a 9.289-Acre Property in North Kihei, Pulehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: (2) 3-8-004:028]*. Scientific Consultant Services, Inc., Honolulu.
2012 *An Archaeological Inventory Survey of an Approximate 917 Meter (3,007.8 Feet) Long Alternate Access Road and an 86.029-Acre Property in Puunene, Pulehu Nui Ahupua`a, Wailuku District, Island of Maui, Hawai`i [TMK: (2) 3-8-008: Por. 005, POR. 006, and 019]*. Scientific Consultant Services, Inc., Honolulu.
- Tomonari-Tuggle, M.J., H.D. Tuggle, D.E. Duensing, C. Magnusen, and U. Prasad
2001 *Fire on the Land: Archaeology, Architecture, and Oral History of Former Naval Air Station Puunene, Pulehunui, Maui*. International Archaeological Research Institute, Honolulu.
- United States Department of Agriculture Website
2015 *United States Department of Agriculture Database*
www.nrcs.usda.gov/wps/porta/main/soils/health. (Accessed February 2015).
- Walker, W.
1931 *Archaeology of Maui*. Department of Anthropology, B. P. Bishop Museum, Honolulu.
- Waihona `Aina Corporation
2015 *Māhele Database*. www.waihona.com. Accessed February 2015. Kailua, Hawaii.
- Wilcox, Carol
1996 *Sugar Water: Hawaii's Plantation Ditches*. University of Hawai`i Press. Honolulu.

Vancouver, George

- (1) *A Voyage of Discovery to the North Pacific Ocean and Round the World 1791-1795*.
Kaye Lamb, ed. The Hakluyt Society. Cambridge University Press: London.

Van Dyke, Jon

- 2008 *Who Owns the Crown Lands of Hawai`i?* University of Hawai`i Press. Honolulu.

APPENDIX A: USDA SOILS SURVEY ANALYSIS



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Island of Maui, Hawaii



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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| EcA—Ewa cobbly silty clay loam, 0 to 3 percent slopes..... | 12 |
| EcB—Ewa cobbly silty clay loam, 3 to 7 percent slopes..... | 13 |
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

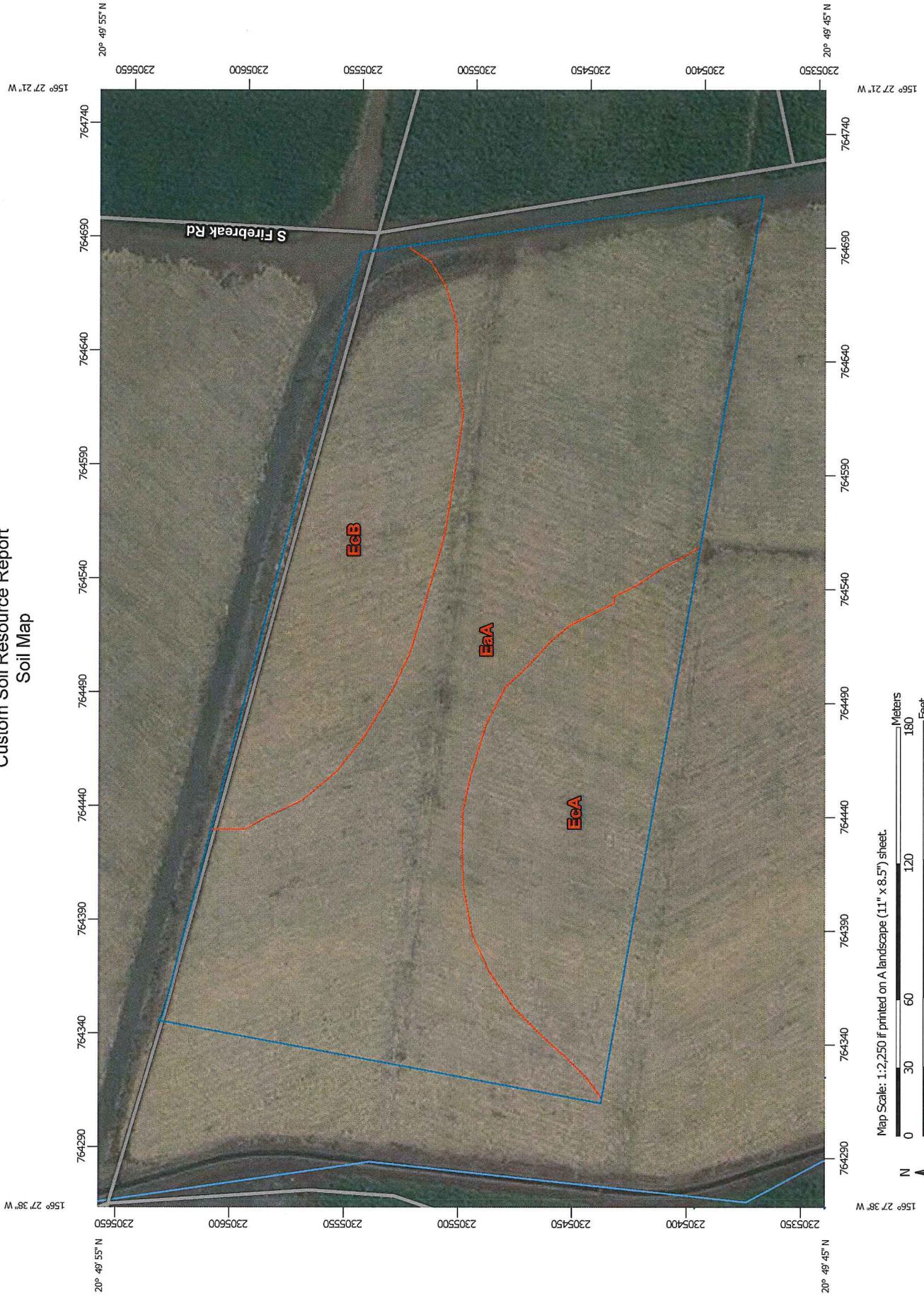
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:2,250 if printed on A landscape (11" x 8.5") sheet.

Meters
0 30 60 120 180
Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 4N WGS84

MAP LEGEND

| | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|  Area of Interest (AOI) |  Spoil Area |
|  Soils |  Stony Spot |
|  Soil Map Unit Polygons |  Very Stony Spot |
|  Soil Map Unit Lines |  Wet Spot |
|  Soil Map Unit Points |  Other |
|  Special Point Features |  Special Line Features |
|  Blowout |  Streams and Canals |
|  Borrow Pit |  RAILS |
|  Clay Spot |  Interstate Highways |
|  Closed Depression |  US Routes |
|  Gravel Pit |  Major Roads |
|  Gravelly Spot |  Local Roads |
|  Landfill |  Background |
|  Lava Flow |  Aerial Photography |
|  Marsh or swamp | |
|  Mine or Quarry | |
|  Miscellaneous Water | |
|  Perennial Water | |
|  Rock Outcrop | |
|  Saline Spot | |
|  Sandy Spot | |
|  Severely Eroded Spot | |
|  Sinkhole | |
|  Slide or Slip | |
|  Sodic Spot | |

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Island of Maui, Hawaii
 Survey Area Data: Version 12, Sep 25, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

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

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

Map Unit Legend

| Island of Maui, Hawaii (HI980) | | | |
|------------------------------------|---------------------------------------------------|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| EaA | Ewa silty clay loam, 0 to 3 percent slopes | 9.9 | 58.5% |
| EcA | Ewa cobbly silty clay loam, 0 to 3 percent slopes | 3.4 | 20.4% |
| EcB | Ewa cobbly silty clay loam, 3 to 7 percent slopes | 3.6 | 21.1% |
| Totals for Area of Interest | | 16.9 | 100.0% |

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments

Custom Soil Resource Report

on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Island of Maui, Hawaii

EaA—Ewa silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hq7d
Elevation: 0 to 150 feet
Mean annual precipitation: 15 to 30 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ewa

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear

Typical profile

H1 - 0 to 18 inches: silty clay loam
H2 - 18 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B

EcA—Ewa cobbly silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hq7f
Elevation: 0 to 150 feet
Mean annual precipitation: 15 to 30 inches

Custom Soil Resource Report

Mean annual air temperature: 73 to 75 degrees F

Frost-free period: 365 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ewa, cobbly, and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ewa, Cobbly

Setting

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Linear

Typical profile

H1 - 0 to 18 inches: cobbly silty clay loam

H2 - 18 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B

EcB—Ewa cobbly silty clay loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: hq7g

Elevation: 0 to 150 feet

Mean annual precipitation: 15 to 30 inches

Mean annual air temperature: 73 to 75 degrees F

Frost-free period: 365 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ewa, cobbly, and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Custom Soil Resource Report

Description of Ewa, Cobbly

Setting

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Linear

Typical profile

H1 - 0 to 18 inches: cobbly silty clay loam

H2 - 18 to 60 inches: silty clay loam

Properties and qualities

Slope: 3 to 7 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX E.
Cultural Interviews

**PROPOSED DIVISION OF FORESTRY AND WILDLIFE (DOFAW)
BASEYARD AT PULEHUNUI**

Interview with: *Randall Moore*

Interview Date: *April 10, 2015*

Interviewed By: *Cheryl K. Okuma, Senior Associate
Munekiyo Hiraga*

The interview with Randall Moore took place at his home in Kula on April 10, 2015. Mr. Moore was born in Texas and moved to Puunene, Maui in 1974. After a couple of years of residing in the Puunene area, he moved to Kula where he built his home and currently resides. For 38 years, Mr. Moore was employed by Hawaiian Commercial & Sugar Company (HC&S) until he retired. As an agricultural engineer, Mr. Moore's expertise included work on drip irrigation systems (e.g. irrigation installation and operations), knowledge of ditches, reservoirs, pumps and water resources on the island, including the Pulehunui area. While at HC&S, Mr. Moore was involved in land and property issues for the company on Maui, and he developed his knowledge of the proposed baseyard property as he worked in this area. During his years with HC&S, Mr. Moore dealt with the Department of Land and Natural Resources (DLNR), an agency which had a long term lease with HC&S until it expired. He notes that some land was transferred to Department of Hawaiian Home Lands and the area of the drag strip was conveyed to the County of Maui and that adjacent to the property is the Department of Agriculture cattle quarantine station. The proposed baseyard is under DLNR control and HC&S is farming the area under a revocable permit.

Mr. Moore noted that although the proposed baseyard would have good access via Kamaaina Road from a signalized intersection at Mokulele Highway, the main cane haul road (S. Firebreak Road) is a public road which experiences traffic from the quarry on State DLNR and Alexander & Baldwin Inc. land. This cane road also experiences HC&S traffic during cane harvesting and year-round hauling of large trucks carrying heavy equipment, fertilizer, and weed control products. Kamaaina Road is State owned and is currently maintained by Hawaiian Cement and he expressed concern as to who will maintain and improve the substandard roads.

Mr. Moore supports DOFAW's proposed baseyard project, but noted that the surrounding area is cultivated by sugar cane and is characterized by occasional smoke during cane harvesting, the threat of unscheduled fires in the fields, and dust and wind noise from 24-hour operations (harvest plowing and planting). As the proposed location has been in cane cultivation, he expressed a preference for a location that is on unproductive land, closer to the existing Kahului DOFAW baseyard, or in the vicinity of the Hawaii Army National Guard Armory and drag strip.

As the subject property has been in sugar production for nearly 100 years and has a military history as a naval air station with bunkers during World War II, Mr. Moore is not aware of cultural practices in the area.

**PROPOSED DIVISION OF FORESTRY AND WILDLIFE
BASEYARD AT PULEHUNUI**

Interview with: Blossom Feiteira

Interview Date: March 26, 2015

Interviewed By: Cheryl K. Okuma, Senior Associate
Munekiyo Hiraga

The interview with Blossom Feiteira took place at the offices of Munekiyo Hiraga on March 26, 2015. Ms. Feiteira is a native Hawaiian and beneficiary of the Department of Hawaiian Home Lands who was born in 1959. She was raised in Lahaina on Dickenson Street across from the Maria Lanakila Church. She currently lives in Wailuku. She is married to Matthew Feiteira and has four (4) children, three (3) boys and one (1) girl.

Her father was John Ah Heen Yap whose father, Siu Choi Yap, emigrated from China in 1895. Her father's Hawaiian mother was Mary Kuhia who was born in Hana. Her mother was Theresa Kaaiawahia whose father was Albert Kaaiawahia who originally came from Kaupo. In 1800 her grandfather (Albert Kaaiawahia) moved to Lahaina to work for AmFac to run the water system.

Ms. Feiteira has an interest in Hawaiian culture and serves as President of the Association of Hawaiians for Homestead Lands and Secretary of Na Poe Kokua.

Ms. Feiteira has no lineal connection to Pulehunui. But, she indicated that she conducted some research of the area and found that there was a case in the Supreme Court of the Hawaiian Kingdom in which a person who bought land in the area requested a court judgment on the metes and bounds description of the property. At that time three (3) men testified, who were the last generation to live in Pulehunui.

According to Ms. Feiteira the area originally belonged to the Ali'i. In the Great Mahele this *ahupua`a* was kept separate. Originally the area was to be developed as homestead lands. After the last families left the area it was actively used for sugar cane cultivation. Due to the former sugar cane cultivation, artifacts that may have once been on the property were probably destroyed.

Ms. Feiteira notes that her family utilizes the Maui Raceway Park located south of the project site. She is not aware of any traditional cultural practices remaining in the area and expressed she has no concerns of adverse impacts by the project. No remnants of the Hawaiian culture remain since the area was used for sugar cane, the military (airport) and back to sugar cane.

She supports the proposed project and suggested that DOFAW conduct community consultation and meetings regarding the proposed project. Ms. Feiteira expressed a desire for a Master Plan effort for the general region.

**PROPOSED DIVISION OF FORESTRY AND WILDLIFE
BASEYARD AT PULEHUNUI**

Interview with: *Kehau Filimoeatu*

Interview Date: *March 26, 2015*

Interviewed By: *Cheryl K. Okuma, Senior Associate
Munekiyo Hiraga*

The interview with Kehau Filimoeatu took place at the offices of Munekiyo Hiraga on March 26, 2015. Ms. Filimoeatu is a native Hawaiian and beneficiary of the Department of Hawaiian Home Lands who was born in 1947 at the old hospital originally located on Baldwin Avenue in Paia, Maui. Her parents were Quong Gee Lum Ho who retired as a police officer for the Maui Police Department and Irene May Lum Ho (born Wahinekona) who was a kupuna who taught at Lihikai School for 20 years. Ms. Filimoeatu has a brother, Nathan who is an entertainer and a sister, Ada Lum Ho. She also has two (2) sons and a daughter.

Ms. Filimoeatu was educated mainly on Maui where she attended Kaunoa School which was an English standard school located in Spreckelsville and Baldwin High School. When she was 12-years old she attended one (1) year at Kamehameha School on Oahu as a boarder. She did not enjoy the school and being away from her family and returned to Maui.

Ms. Filimoeatu is a board member of the advocacy group, Hui Kako'o 'Āina Ho'opulapula which advocates the interest of applicants and native Hawaiians on the Hawaiian Home Lands wait list.

Because Ms. Filimoeatu is younger than many of our elders or kupuna she has very little memory or knowledge of the ancient aspects of the area. She does remember that as a police officer her father patrolled the general area. As a child she remembers standing near the airport chain link fence to watch the planes on the old runway just south of the project area. She also remembers the area was always far out from Kahului and North Kihei with nothing but the former airport and dry grasses. Besides being barren the area was also very windy.

Ms. Filimoeatu has very little knowledge of the airport area. She can't explain why but she had an uncomfortable feeling about the place name, Pu'unēnē (also known as Pulehunui) for the area. She and other beneficiaries visited the site to obtain spiritual guidance and a feeling for the place. According to Ms. Filimoeatu she learned that Pu'u on nēnē is actually in Spreckelsville and indicated there needs to be further research as to what actually was there before the war when the airport was constructed. She is not

aware of any traditional or cultural practices and uses past or present in the project area due to disturbance (e.g. sugar cane cultivation) and other uses.

She expressed support for the project recognizing Division of Forestry and Wildlife's (DOFAW) need and noted that the general area is an ideal site for the project given the nearby infrastructure and its distance away from Mokulele Highway. Ms. Filimoeatu mentioned that there are economies of scale if the other divisions' operational needs are also addressed. She expressed a desire that there be a Master Plan for the region.

Ms. Filimoeatu wondered about the reason DOFAW chose the project site and if staffing is increasing. She concluded the interview by stating that she did not feel there will be adverse impacts in the area from the proposed project.

APPENDIX F.

Traffic Impact Assessment Report for Pulehunui Baseyard

TRAFFIC IMPACT ANALYSIS REPORT DIVISION OF FORESTRY & WILDLIFE BASEYARD

Puunene, Maui, Hawaii

DRAFT FINAL

September 22, 2015

Prepared for:

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TRAFFIC IMPACT ANALYSIS REPORT
DIVISION OF FORESTRY & WILDLIFE BASEYARD
Puunene, Maui, Hawaii

DRAFT FINAL

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September 22, 2015

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TRAFFIC IMPACT ANALYSIS REPORT

DIVISION OF FORESTRY AND WILDLIFE BASEYARD

Puunene, Maui, Hawai‘i

1. INTRODUCTION

This report documents the findings of a traffic study conducted by Austin, Tsutsumi & Associates, Inc. (ATA) to evaluate the potential traffic impacts resulting from the proposed Division of Forestry and Wildlife (DOFAW) Baseyard (hereinafter referred to as the “Project”).

1.1 Location

The Project is located in Puunene on the island of Maui on a 20.3-acre parcel of land more specifically identified as TMK: (2) 3-8-008:001. The Project site is located east of Mokulele Highway, with Kamaaina Road to the north and South Firebreak Road to the east, within the Pulehunui Master Planned Development. Figure 1.1 shows the Project location.

1.2 Project Description

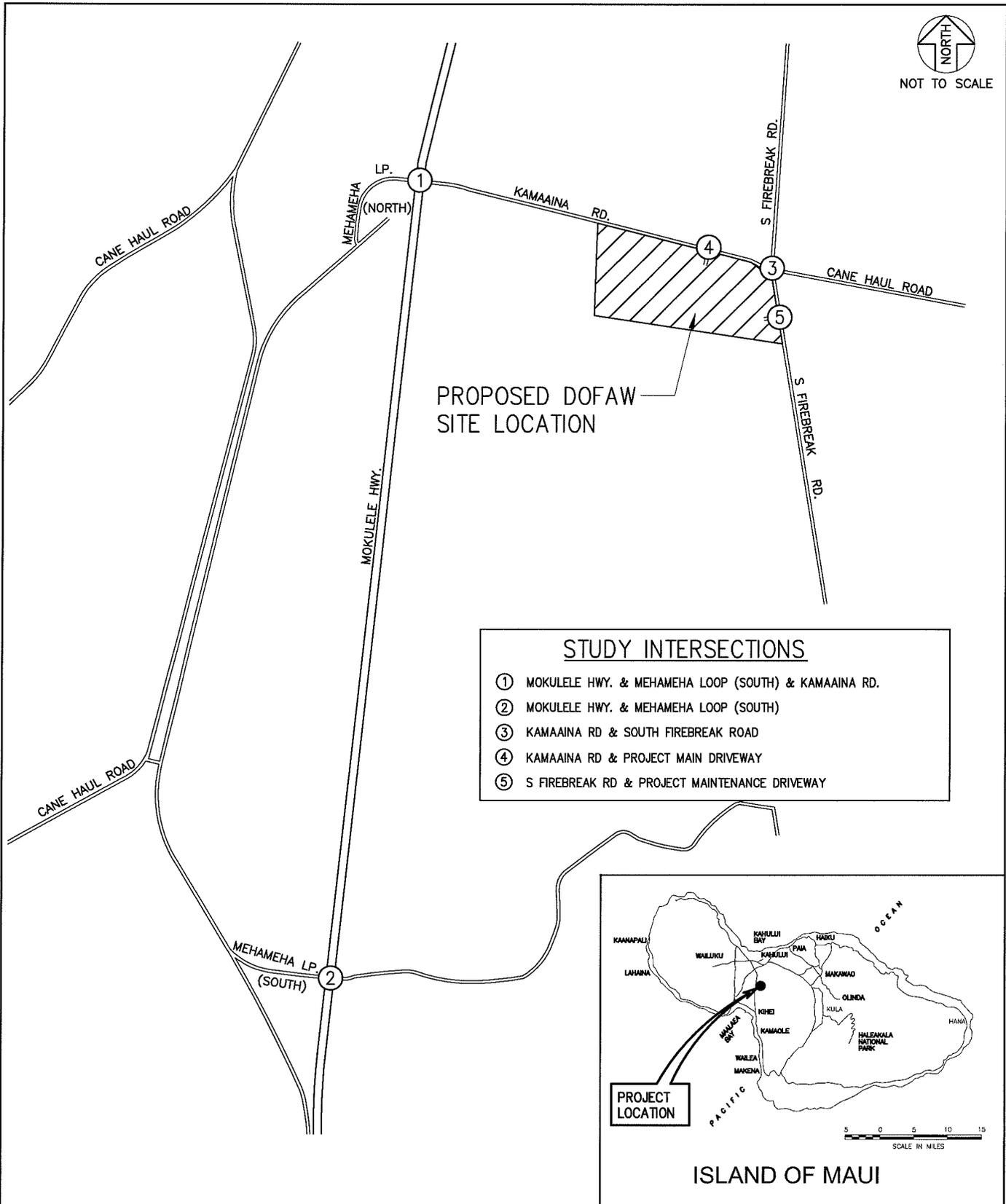
The Project is part of a larger 285-acre Department of Land and Natural Resources (DLNR) master plan and proposes to be constructed in two (2) phases, with completion of both phases subject to available funding for the DOFAW that is determined on an annual basis. This TIAR conservatively assumes that both Phases 1 and 2 of the Project will be completed by Year 2025. Upon full build-out, the Project proposes the following:

- One-story, 25,455 square feet (SF) Office Building
- 5,000 SF Wildlife Lab
- 2-acre Nursery with a 5,000 SF Nursery Office and Greenhouse
- Two (2) Warehouse Buildings totaling 45,000 SF

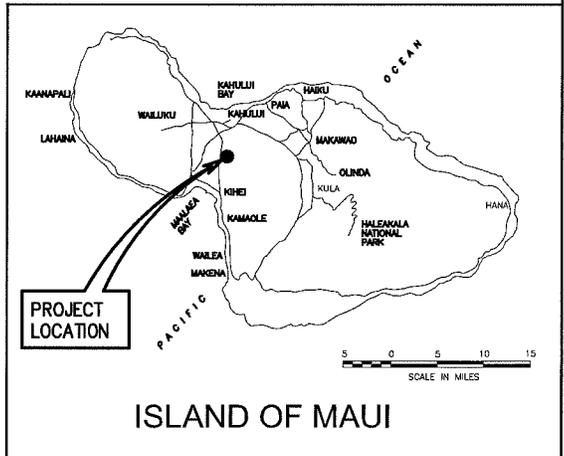
In addition to the above land uses, the Project proposes to designate areas within the site to service their heavy vehicles/equipment, such as an area for heavy vehicle/equipment parking, equipment yard, Dozer and staging area, fueling station, wash bay and auto maintenance shop. A helicopter operations landing zone and training field are the remaining spaces that do not anticipate vehicular traffic impacts. Figure 1.2 shows the Project site plan.



NOT TO SCALE



- STUDY INTERSECTIONS**
- ① MOKULELE HWY. & MEHAMEHA LOOP (SOUTH) & KAMAAINA RD.
 - ② MOKULELE HWY. & MEHAMEHA LOOP (SOUTH)
 - ③ KAMAAINA RD & SOUTH FIREBREAK ROAD
 - ④ KAMAAINA RD & PROJECT MAIN DRIVEWAY
 - ⑤ S FIREBREAK RD & PROJECT MAINTENANCE DRIVEWAY

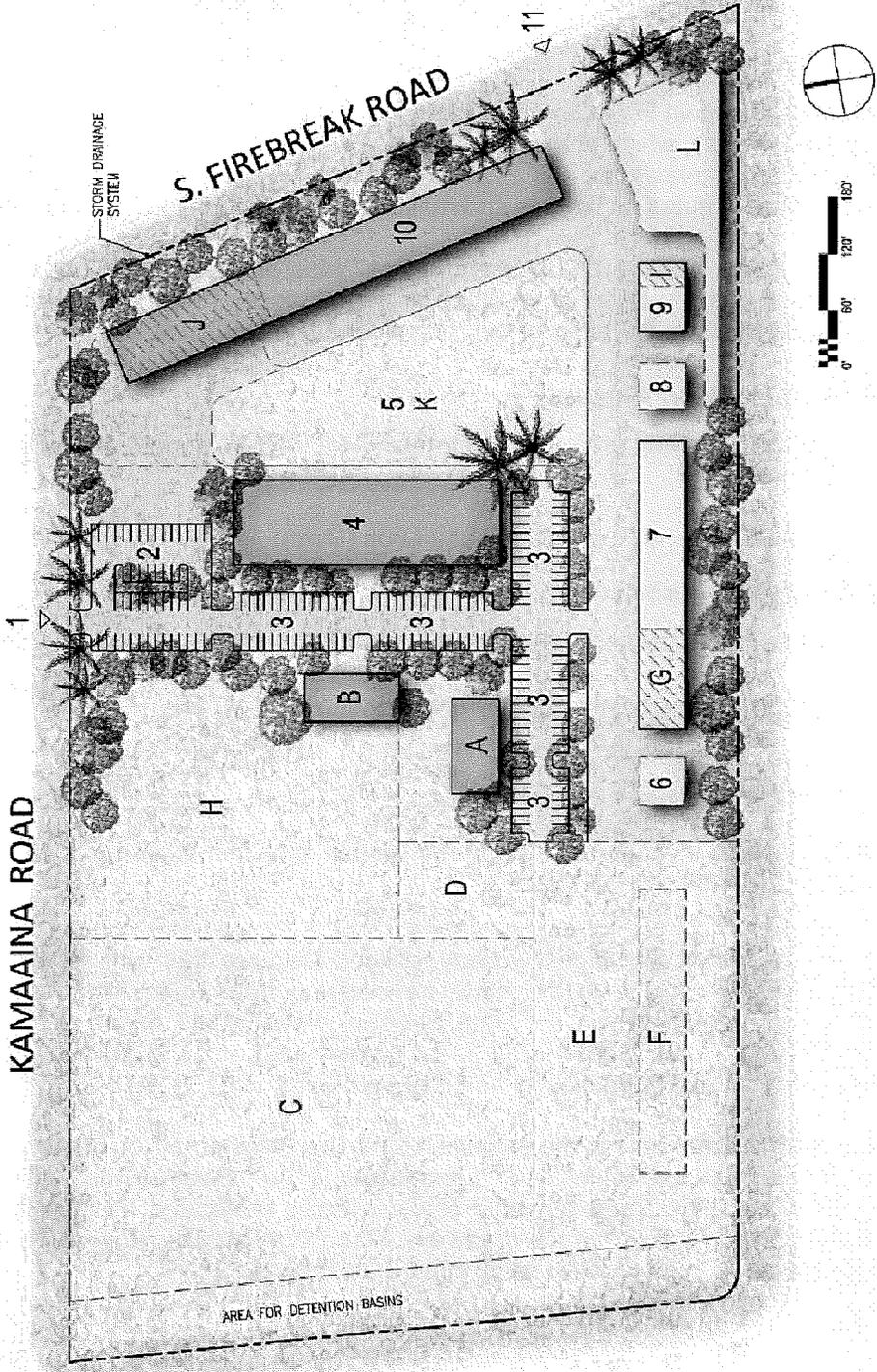


DIVISION OF FORESTRY
AND WILDLIFE (DOFAW)
BASEYARD TIAR

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS HONOLULU, HAWAII

LOCATION MAP

FIGURE
1.1



PHASE 1

- 1 MAIN ENTRY
- 2 PUBLIC PARKING
- 3 EMPLOYEE PARKING
- 4 ONE STORY OFFICE BUILDING, 23,455 SF
- 5 NURSERY, 2 ACRES
- 6 FUELING STATION
- 7 HEAVY EQUIPMENT PARKING, 10,000 SF
- 8 WASH BAY
- 9 AUTO MAINTENANCE SHOP, 7,409 SF
- 10 WAREHOUSE 20,000 SF
- 11 MAINTENANCE ENTRY

PHASE 2

- A WILDLIFE LAB, 5,000 SF
- B NURSERY OFFICE / GREENHOUSE, 5,000 SF
- C DRYLAND FOREST RESTORATION, 4 ACRES
- D HELICOPTER OPERATIONS LANDING ZONE
- E EQUIPMENT YARD
- F FUTURE WAREHOUSE, 15,000 SF
- G HEAVY EQUIPMENT PARKING, +6,200 SF
- H NURSERY, 2 ACRES
- I AUTO MAINTENANCE SHOP, +1,200 SF
- J WAREHOUSE, +10,000 SF
- K TRAINING FIELD
- L DOZER & STAGING

FIGURE

1.2

AJA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

PROJECT SITE PLAN

DIVISION OF FORESTRY AND WILDLIFE (DOFAW) BASEYARD TIAR



2. STUDY METHODOLOGY

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), dated 2010, methodology for calculating volume to capacity ratios, delays and corresponding Levels of Service was utilized in this study. LOS definitions for signalized and unsignalized intersections are provided in Appendix B.

2.1 Intersection Analysis

For applicable intersections shown in Section 2.2, intersection analysis was performed using the traffic analysis software Synchro, which prepares Highway Capacity Manual (HCM) reports. The reports contain quantitative delay results, as based on intersection lane geometry, signal timing (including coordination and actuated minimums and maximums), and hourly traffic volume.

Based on the vehicular delay, reserve capacity and critical gaps at the intersection, a LOS is assigned (see Appendix B) as a qualitative measure of performance. These results constitute the technical analysis that will form the basis of the recommendations outlined in this report.

2.2 Study Area Intersection Analysis

Intersection analysis within the study area was performed on the following intersections due to their proximity to the Project:

- Mokulele Highway/Kamaaina Road/Mehameha Loop (North)
- Mokulele Highway/Mehameha Loop (South)
- Kamaaina Road/South Firebreak Road

3. EXISTING TRAFFIC CONDITIONS

3.1 Roadway Network

The existing conditions scenario represents the traffic conditions within the Project area as it currently stands, with no build-out of the Project.

Mokulele Highway is a generally four lane, two-way, divided roadway that runs in the north-south direction. This roadway begins to the north transitioning from Puunene Avenue into Mokulele Highway at its intersection with Hookele Street and terminates to the south at its intersection with North Kihei Road, where it continues further south as Piilani Highway. The posted speed limit in the vicinity of the project is 45 miles per hour (mph).

Kamaaina Road is a roadway that runs in the east-west direction. Kamaaina Road begins to the west at its intersection with Mokulele Highway, and terminates to the east at an intersection with South Firebreak Road. Kamaaina Road primarily services traffic generated by the Hawaiian Cement Baseyard located further south of the roadway. Kamaaina Road is currently unstriped but was observed to provide enough width to service two-way traffic.



Mehameha Loop is a two lane, two-way roadway that generally runs parallel and to the west of Mokulele Highway before intersecting with Mokulele Highway, at two locations approximately 1.3 miles apart, one of which intersects with the Mokulele Highway/Kamaaina Road intersection. The posted speed limit along this roadway is 15 mph.

South Firebreak Road is a local road that facilitates transport for HC&S and Hawaiian Cement trucks in the north-south direction. South Firebreak Road generally begins to the south near the Hawaiian Cement Baseyard and terminates about 1.25 miles north of Haleakala Highway. Various intersection approaches along South Firebreak Road are gated.

3.2 Existing Traffic Volumes

The existing traffic volume data at the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection were collected on Thursday, September 10, 2015 and Tuesday, September 15, 2015. Turning movement traffic at the Mokulele Highway/Mehameha Loop (South) intersection was collected in November 2014. Based on this traffic count data, the weekday AM peak hour of traffic was determined to be from 7:15 AM to 8:15 AM and the PM peak hour of traffic was determined to be from 3:30 PM to 4:30 PM. All traffic at the Kamaaina Road/South Firebreak Road intersection was assumed to be generated by the Hawaiian Cement baseyard located south of the intersection, based on weekday observations conducted in August and September 2015. No vehicles traversed the north leg or east leg of the intersection. See the traffic count data provided in Appendix A for the existing intersections studied.

3.3 Existing Traffic Conditions Analysis and Observations

Mokulele Highway/Kamaaina Road/Mehameha Loop (North) is a signalized intersection with exclusive left-turn and right-turn lanes on the northbound and southbound approaches. This intersection currently operates at overall LOS A with all movements operating at LOS D or better during the AM and PM peak hours of traffic except the northbound and southbound left-turn movements, which currently operate at LOS E/F primarily due to low volumes that result in lengthier average vehicle delays. No significant queuing was observed during the weekday AM and PM peak hours of traffic, with all movements clearing within a single signal cycle.

It was observed that a number of turning movement vehicles at the intersection consisted of heavy vehicle (HV) trucks generated by the Hawaiian Cement Baseyard. Consistent with HCM and American Association of State Highway and Transportation Officials (AASHTO) guidance, HV trucks are defined as vehicles that have more than four tires touching the pavement, which included vehicles with dual tires on at least one axle. Due to its potential impact on existing and future projections, HV trucks were accounted for and utilized in the analysis. The following shows the percentages of turning movement HV trucks at this intersection:

- AM Peak (eastbound onto Kamaaina Road) – 35% HV Trucks
- AM Peak (westbound onto Mokulele Highway) – 90% HV Trucks
- PM Peak (eastbound onto Kamaaina Road) – 72% HV Trucks
- PM Peak (westbound onto Mokulele Highway) – 21% HV Trucks

Mokulele Highway/Mehameha Loop (South) is a two-way stop-controlled (TWSC) intersection with exclusive left-turn lanes on the northbound and southbound approaches as well as exclusive right-turn lanes on the westbound and northbound approaches. All movements



currently operate at LOS C or better except the low-volume westbound left/through movement, which operates at LOS F with only 2 westbound left-turns during the AM(PM) peak hours of traffic.

Kamaaina Road/South Firebreak Road is a stop-controlled intersection with all shared left-turn/through/right-turn approaches. As Kamaaina Road approaches South Firebreak Road in the eastbound direction, it meanders southward, before approaching a stop sign, which at the time was attached to a utility pole. As mentioned in Section 3.1, both Kamaaina Road and South Firebreak Road are currently unstriped with no intersection pavement markings, designating travel lanes or stop bars. In addition, the north and east legs of the intersection are gated roads that primarily service HC&S Trucks. Based on observations, no HC&S trucks traveled through the intersection during the AM and PM peak hours of traffic and the only traffic that occurred was on the eastbound right-turn and northbound left-turn movements, most likely generated by the Hawaiian Cement Baseyard. As a result of the two (2) non-conflicting intersection movements, no LOS was provided based on HCM 2010 methodology.

Existing traffic volumes, lane configuration and movement LOS are illustrated in Figure 3.1. Table 3.1 shows the existing delay, v/c ratio, and LOS for the study intersections, with the full LOS summary tables provided in Appendix C.

Table 3.1: Existing Conditions LOS

| Intersection | Existing Conditions | | | | | |
|-----------------------------------------------------------------|---------------------|-----------|-----|-----------|-----------|-----|
| | AM | | | PM | | |
| | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| Mokulele Highway & Mehamaha Loop North/Kamaaina Road | | | | | | |
| EB LT/TH/RT | 41.8 | 0.03 | D | 43.8 | 0.30 | D |
| WB LT/TH/RT | 42.2 | 0.07 | D | 42.3 | 0.10 | D |
| NB LT | 88.6 | 0.41 | F | 56.1 | 0.46 | E |
| NB TH | 4.3 | 0.51 | A | 4.9 | 0.53 | A |
| SB LT | 65.5 | 0.69 | E | 103.4 | 0.77 | F |
| SB TH | 3.5 | 0.46 | A | 4.8 | 0.50 | A |
| SB RT | 2.2 | 0.02 | A | 2.9 | 0.01 | A |
| <i>Overall</i> | 4.6 | -- | A | 6.1 | -- | A |
| Mokulele Highway & Mehamaha Loop South | | | | | | |
| WB LT/TH | 61.4 | 0.03 | F | 66.2 | 0.04 | F |
| WB RT | 14.1 | 0.01 | B | 14.4 | 0.01 | C |
| NB LT | 11.5 | 0.01 | B | 12.0 | 0.01 | B |
| SB LT | 12.1 | 0.01 | B | 12.4 | 0.01 | B |



4. BASE YEAR 2025 TRAFFIC CONDITIONS

4.1 Defacto Growth Rate

Projections for Base Year 2025 traffic were based upon the Maui Regional Traffic Demand Model (MRTDM). The growth rate along Mokulele Highway was determined to be approximately 1.7 percent per year. This growth rate was applied to the mainline through volumes along Mokulele Highway.

4.2 Traffic Forecasts for Known Developments

By the year 2025, numerous known developments in the vicinity of the Project as well as the nearby Kihei are planned to be completed with forecast traffic volumes generated along Mokulele Highway. These known developments are described below. The associated forecast traffic volumes for each known development traveling through the study intersections were added to the forecast Base Year 2025 traffic volumes.

- Puunene Heavy Industrial Subdivision – This project is proposed to be located approximately 1.4 miles east of Mokulele Highway and will include approximately 65.92 acres of heavy industrial space. This development is anticipated to generate approximately 472 trips during the AM peak hour and 471 trips during the PM peak hour, 25 percent of which was anticipated to be heavy vehicle trucks, based on the Puunene Heavy Industrial Subdivision TIAR, dated January, 24, 2012, prepared by Phillip Rowell & Associates. Vehicular access to the Project from the main thoroughfare will be provided via the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection.
- Kihei High School - This proposed project will be located east of the Piilani Highway/Kulanihakoi Street intersection. The project is currently proposed to be completed in two phases. Based on the latest projections, it is assumed that the design, funding and construction of Phase 1 will be pushed back from its original anticipated completion date of 2016, to now occur in Year 2020 and accommodate approximately 800 students. It should be noted that based on the Kihei High School TIAR, dated September 2011, prepared by Wilson Okamoto Corporation, it stated that 704 public students from the Kihei area currently attend high schools in Kahului and Wailuku; it is anticipated that these students will transfer to the proposed Kihei High School, producing a net increase of only 96 new students during phase 1. Since full enrollment of 1,650 students was expected by Year 2025, this TIAR conservatively assumes Phases 1 and 2 of Kihei High School will be completed by Year 2025.
- Piilani Promenade – This proposed project will be located east of the Piilani Highway/Kaonoulu Street intersection. Upon full buildout the project proposed approximately 460,000 square feet of commercial/retail space, light industrial space and an outdoor garden by Year 2018 based on the Piilani Promenade TIAR, dated June, 6, 2014, prepared by Phillip Rowell & Associates. This report conservatively assumes that the Piilani Promenade development will be 100 percent complete by the Year 2025.
- Kihei Residential – This project is proposed to be located east of the Piilani Highway/Kaiwahine Street/Uwapo Road intersection in Kihei. The project plans to



develop residential home, a small private recreational center and community park space. It was assumed that this project would be complete by Year 2025.

- Kaiwahine Villages – This proposed project is located at the east end of Kaiwahine Street, adjacent and to the south of the Kihei Residential Project. This development proposes to construct approximately 120 multi-family units. For purposes of this study, it was assumed that this project would be complete by Year 2025.
- Maui Bay Villas (formerly Maui Lu) – This proposed project is located on the corner of the South Kihei Road/Kaonoulu Street intersection. This development proposes to construct 388 residential units and various associated uses to service these residents. For purposes of this study, it was assumed that this project would be complete by Year 2025.
- Downtown Kihei (Krausz) – This proposed project will be located west of the Piilani Village Shopping Center and adjacent to Piikea Avenue. Upon full build-out the project proposes approximately 250,000 square feet of commercial space, approximately 18,500 square feet of general office space and a 150-room hotel. For purposes of this study, it was assumed that this project would be complete by Year 2025.

It should be noted that as part of the larger 285-acre DLNR master plan, a Maui Regional Public Safety Complex may be built within the vicinity of the Project, east of Mokulele Highway and the National Guard Armory. In addition, the proposed DHHL parcel adjacent to the DLNR master planned parcel and west of Mokulele Highway is anticipated to be developed in the future. However, since it is unknown as to what will be developed and when these developments would be constructed, they were not included in this study.

Table 4.1 shows the total AM and PM peak hour traffic volumes forecast to be generated by each of the seven (7) developments discussed above. Of these known developments assumed to be completed by Year 2025, only the Puunene Heavy Industrial Subdivision is proposed to generate traffic that will directly access Kamaaina Road at the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection, with heavy vehicle trucks consisting of 25% of trips generated by that development. All other known developments are located further north and south of the Project and will only generate regional throughput traffic along Mokulele Highway at the study intersections. In addition, due to numerous traffic patterns and routes for each of the above developments, only a portion of the total trips generated, shown on Table 4.1, will actually traverse the study intersections. In total, the Base Year 2025 projection anticipates an average increase of about 51 percent in combined traffic traveling through the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection during the AM and PM peak hours of traffic.

4.3 Planned Roadway Projects

At the signalized Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection, the proposed Puunene Heavy Industrial Subdivision will have the greatest impact on traffic operations at the intersection, with significant increases to both vehicular and heavy vehicle truck turning movements. The southbound left-turn movement is anticipated to increase by an additional 245 vehicles during the heavier AM peak hour, while the westbound approach is anticipated to increase by approximately 375 vehicles during the heavier PM peak hour. In addition, 25 percent of all vehicular increases generated by the Puunene Heavy Industrial Subdivision are expected to be heavy vehicle trucks, which will further impact traffic operations from a queuing and capacity standpoint.



In order to accommodate the projected increases in passenger vehicle and heavy vehicle traffic at the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection, the Puunene Heavy Industrial Subdivision TIAR, dated January, 24, 2012, recommended that various roadway improvements be implemented as a result of the Puunene Heavy Industrial Subdivision. Specific to this TIAR, it was assumed that all Base Year 2025 mitigative measures documented in Table 4.2 are implemented by Year 2025 without Project scenario.

4.4 Base Year 2025 Analysis

By year 2025 without the Project, all movements at the unsignalized Mokulele Highway/Mehameha Loop (South) intersection are forecast to operate similar to existing conditions. The westbound left-through movement will continue operating at LOS F with low side street and turning movement volumes.

With the recommended improvements at the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection, all mainline through movements are forecast to operate at LOS C or better, with all movements operating below capacity with vehicle/capacity (v/c) ratios < 1.0 during the AM and PM peak hours of traffic. The low-volume northbound left-turn movement is forecast to operating at LOS E. However, this movement is not anticipated to experience vehicular increases for Year 2025, remaining at 15 vehicles or less. The more critical westbound left-through movement and southbound left-turn movement are forecast to operate at LOS E during the PM and AM peak hours of traffic. Projected delays indicate that each movement should clear within a single signal cycle.

As discussed in Section 3.3, the majority of traffic along Kamaaina Road and South Firebreak Road is currently generated by the Hawaiian Cement Baseyard, totaling a relatively low throughput volume of approximately 100 vehicles in both directions during both the AM and PM peak hours of traffic. As such, both Kamaaina Road and South Firebreak Road currently lack any roadway striping and adequate signage. With the Puunene Heavy Industrial Subdivision, throughput volume along Kamaaina Road and South Firebreak Road is anticipated to increase tenfold to approximately 1,000 vehicles in both directions during both the AM and PM peak hours of traffic. With significant increases in both passenger vehicle and heavy vehicle truck traffic, it is recommended that both the Kamaaina Road and South Firebreak Road thoroughfares and Kamaaina Road/South Firebreak Road intersection, be upgraded to provide adequate roadway geometrics, striping, signage, sight distance and traffic control measures, as recommended in the Puunene Heavy Industrial Subdivision TIAR.

Figure 4.1 illustrates the forecast traffic volumes, recommended lane configuration and movement LOS for Base Year 2025 conditions with mitigation. Table 4.3 shows the Base Year 2025 LOS at the study intersections with the mitigation recommended in the Puunene Heavy Industrial Subdivision TIAR, with the full LOS summary tables provided in Appendix C.



Table 4.1: Total Trips Generated by Known Developments in the Area ¹

| Known Development | Land Use | Units | AM Peak Hour | | | PM Peak Hour | | |
|--------------------------------------|-------------------------|----------------------------------|--------------|------|-------|--------------|-------|-------|
| | | | Enter | Exit | Total | Enter | Exit | Total |
| Puunene Heavy Industrial Subdivision | Heavy Industrial Park | 65.92 acres | 392 | 80 | 472 | 99 | 372 | 471 |
| Maui Bay Villas | Residential | 388 Units | 110 | 60 | 210 | 136 | 183 | 319 |
| Kihei High School (Ph. 1 & 2) | Students | 946 New Students; 1,650 Total | 270 | 127 | 397 | 58 | 65 | 123 |
| Piilani Promenade | Commercial | 470,000 SF | 361 | 300 | 661 | 1,199 | 1,273 | 2,472 |
| Kihei Residential | Residential & Rec. Ctr. | 94 acres | 93 | 290 | 383 | 311 | 178 | 489 |
| Kaiwahine Villages | Multi-Family | 120 Units | 10 | 50 | 60 | 32 | 23 | 55 |
| Downtown Kihei (Krausz) | Hotel & Commercial | 150 Units & 250,000 SF | 230 | 133 | 363 | 393 | 416 | 809 |

Note:

1. Table 4.1 shows total trips generated by each development. Generally, only a portion of these trips traverse the study intersections, with the exception of the Puunene Heavy Industrial Subdivision.

Table 4.2: Recommended Base Year 2025 Roadway Improvements

| Intersection OR Roadway | Location | Mitigation proposed via: <u>Puunene Heavy Industrial Subdivision TIAR</u> dated January, 24, 2012. |
|---------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection</p> | <p>North Leg</p> | <p>1. <u>Northbound Acceleration Lane</u> - Provide an acceleration lane for westbound right-turns from Kamaaina Road going onto northbound Mokulele Highway.</p> |
| | | <p>2. <u>Southbound Left-Turn Lane</u> - Lengthen to provide a 1,015 ft. left-turn storage lane (includes taper, deceleration & storage).</p> |
| | <p>East Leg</p> | <p>1. <u>Westbound Right-Turn Lane</u> - Modify/widen to provide a separate westbound right-turn lane.</p> |
| <p>Kamaaina Road AND South Firebreak Road thoroughfares</p> | <p>--</p> | <p>1. Because of the increased traffic volumes along Kamaaina Road and South Firebreak Road, these roadways should be striped and signed per County of Maui Standards. The high proportion of traffic that will be heavy vehicles should be considered in the design and installation of traffic control devices, especially the longer stopping distances required for the heavy vehicles.</p> |
| | <p>--</p> | <p>2. The areas adjacent to Kamaaina Road and South Firebreak Road should be monitored to ensure sugar cane growth does not impede sight distances and that visibility of traffic control devices is maintained.</p> |

Table 4.3: Base Year 2025 Conditions LOS

| Intersection | Base Year 2025 Conditions | | | | | |
|-----------------------------------------------------------------|---------------------------|-----------|-----|-----------|-----------|-----|
| | AM | | | PM | | |
| | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| Mokulele Highway & Mehamaha Loop North/Kamaaina Road | | | | | | |
| EB LT/TH/RT | 51.9 | 0.08 | D | 49.8 | 0.13 | D |
| WB LT/TH | 55.0 | 0.36 | E | 59.0 | 0.68 | E |
| NB LT | 77.7 | 0.43 | E | 79.1 | 0.53 | E |
| NB TH | 23.6 | 0.85 | C | 21.1 | 0.83 | C |
| SB LT | 51.5 | 0.91 | D | 78.2 | 0.84 | E |
| SB TH | 4.6 | 0.59 | A | 13.9 | 0.75 | B |
| SB RT | 2.4 | 0.02 | A | 6.2 | 0.01 | A |
| <i>Overall</i> | 17.7 | -- | B | 20.9 | -- | C |
| Mokulele Highway & Mehamaha Loop South | | | | | | |
| WB LT/TH | 215.8 | 0.25 | F | 319.1 | 0.34 | F |
| WB RT | 18.7 | 0.02 | C | 19.4 | 0.02 | C |
| NB LT | 14.4 | 0.01 | B | 25.0 | 0.02 | C |
| SB LT | 16.3 | 0.02 | C | 17.1 | 0.02 | C |



5. FUTURE YEAR 2025 TRAFFIC CONDITIONS

The future traffic conditions scenario represents the traffic conditions within the Project study area with the full build-out of the Project. According to the current Project plan, this will occur in Year 2025.

5.1 Background

As previously mentioned in Section 1, the Project currently plans to construct a new DOFAW Baseyard within the Pulehunui Master Planned Development on a vacant lot on the southwest corner of the Kamaaina Road/South Firebreak Road intersection. Vehicular access to the Project from the main thoroughfare will be provided via the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection. The Project proposes two (2) driveway accesses; the Project Main Driveway for employees/guest parking via Kamaaina Road and a secondary Project Maintenance Driveway primarily for heavy vehicle/equipment access via South Firebreak Road.

Upon full build-out, the Project proposes the following:

- One-story, 25,455 square feet (SF) Office Building
- 5,000 SF Wildlife Lab
- 2-acre Nursery with a 5,000 SF Nursery Office and Greenhouse
- Two (2) Warehouse Buildings totaling 45,000 SF

In addition to the above land uses, the Project proposes to designate areas within the site to service their heavy vehicles/equipment, such as an area for heavy vehicle/equipment parking, equipment yard, dozer and staging area, fueling station, wash bay and auto maintenance shop. These uses are not anticipated to generate passenger vehicles traffic, but based on current estimates could generate two (2) heavy vehicles entering and exiting the site on a daily basis, subject to various needs and incidents off-site. This study conservatively assumed these heavy vehicle trips would occur during the AM and PM peak hours of traffic. The Project also proposes a helicopter operations landing zone and training field that is not anticipated to generate any additional vehicular trips on top of what is proposed above.

5.2 Travel Demand Estimations

5.2.1 Trip Generation

The Institute of Transportation Engineers (ITE) publishes a book based on empirical data compiled from a body of more than 4,250 trip generation studies submitted by public agencies, developers, consulting firms, and associations. This publication, titled Trip Generation Manual, 9th Edition, provides trip rates and/or formulae based on graphs that correlate vehicular trips with independent variables. See Tables 5.1 and 5.2 for Trip Generation formulae and projections for the Project.

5.2.2 Trip Distribution

Trips generated by the Project were distributed throughout the study area based upon existing travel patterns within the vicinity of the Project. The traffic generated by the Project was added to the forecast Base Year 2025 traffic volumes within the vicinity of the Project to constitute the



traffic volumes for the future Year 2025 traffic conditions. All Project-generated trips are anticipated to access the site via Kamaaina Road from Mokulele Highway. With no direct link to the site from the unsignalized Mokulele Highway/Mehameha Loop (South) intersection, no significant Project-generated traffic volumes are anticipated utilize this intersection. Figure 5.1 illustrates the Project-generated trip distribution.

Table 5.1: Project Trip Generation Rates

| Land Use Type (ITE Code) | Independent Variable | AM Peak Hour | | PM Peak Hour | |
|-----------------------------------------|----------------------|--------------|---------|--------------|---------|
| | | Rate | % Enter | Rate | % Enter |
| Government Office Complex (ITE 733) | 1,000 SF | 2.21 | 89% | 2.85 | 31% |
| Warehouse (ITE 150) | 1,000 SF | a. | 79% | b. | 25% |
| Research & Development Center (ITE 760) | 1,000 SF | c. | 83% | d. | 15% |
| Nursery – Wholesale (ITE 818) | Acres | 0.26 | 43% | 0.45 | 49% |

Notes:

a. $\ln(T) = 0.55 \cdot \ln(X) + 1.88$

b. $\ln(T) = 0.64 \cdot \ln(X) + 1.14$

c. $\ln(T) = 0.87 \cdot \ln(X) + 0.86$

d. $\ln(T) = 0.83 \cdot \ln(X) + 1.06$

SF = Square Feet

Source: Institute of Transportation Engineers, Trip Generation Manual, 9th Edition

Table 5.2: New Project Generated Trips

| Land Use Type (ITE Code) | Quantity | AM Peak Hour | | | PM Peak Hour | | |
|-------------------------------------|------------|--------------|-----------|------------|--------------|-----------|------------|
| | | Enter | Exit | Total | Enter | Exit | Total |
| One-Story Office Building (ITE 733) | 25,455 SF | 51 | 6 | 57 | 23 | 50 | 73 |
| Warehouse (ITE 150) | 45,000 SF | 43 | 11 | 54 | 9 | 27 | 36 |
| Wildlife Lab (ITE 760) | 5,000 SF | 8 | 2 | 10 | 2 | 9 | 11 |
| Nursery & Greenhouse (ITE 818) | 2.12 Acres | 1 | 0 | 1 | 0 | 1 | 1 |
| Heavy Vehicle/Equipment Use | -- | 1 | 1 | 2 | 1 | 1 | 2 |
| Total New Trips | -- | 104 | 20 | 124 | 35 | 88 | 123 |



5.3 Future Year 2025 Analysis

Upon completion of the Project, with the recommended Base Year 2025 improvements, all movements at the Mokulele Highway/Kamaaiana Road/Mehameha Loop (North) intersection are forecast to operate with LOS similar to Base Year 2025 conditions. Due to relatively low volume increases generated by the Project, all LOS E/F movements in the Base year 2025 scenario will continue operating with the same LOS and below capacity conditions, maintaining vehicle to capacity (v/c) ratios below 1.0.

Based on the anticipated trips generated by the Project, traffic volumes at the Mokulele Highway/Kamaaiana Road/Mehameha Loop (North) intersection will modestly increase by approximately three (3) percent from Base Year 2025 conditions. More specifically, critical turning movement increases will be relatively low, with the southbound left-turn movement increasing by only 52 vehicles during the heavier AM peak hour and 44 westbound left-turn vehicles during the heavier PM peak hour, both translating to less than 1 additional left-turn vehicle per minute. Heavy vehicle increases will also be low, with conservative projections of only 1 entering/exiting heavy vehicle during the AM and PM peak hours. Future Year 2025 movement LOS and delays at the intersection will generally be maintained from Base Year 2025 conditions, with only the low volume northbound left-turn movement worsening to LOS F. However, it will continue to service under 15 vehicles per hour. As a result, no additional widening improvements are recommended at the Mokulele Highway/Kamaaiana Road/Mehameha Loop (North) intersection.

At the Mokulele Highway/Mehameha Loop (South) intersection, all movements are forecast to operate at LOS D or better with the exception of the westbound left-through movement, which is forecast to continue operating at LOS F during the AM and PM peak hours of traffic. Current westbound left-through volumes are below five (5) vehicles per hour and are not forecast to increase significantly by Year 2025. In addition, traffic simulations do not indicate that significant vehicle queuing at this low-volume movement will occur. Due to these low traffic volumes, no roadway improvements are currently recommended for this intersection.

At the Kamaaina Road/South Firebreak Road intersection, in order to provide better sight distance for exiting vehicles at the Project Main Driveway, it is recommended that the existing stop sign be relocated from the eastbound approach to instead be placed along the northbound and southbound approach along South Firebreak Road, to allow eastbound vehicles on Kamaaina Road to clear the intersection unimpeded, reducing potential eastbound queues from spilling back and blocking the line of sight for exiting Project traffic.

All movements at the two (2) Project driveways are forecast to operate at LOS C or better during the AM and PM peak hours of traffic. Figure 5.2 illustrates the forecast traffic volumes, lane configuration, and LOS for Future Year 2025 conditions. Table 5.3 summarizes the delay, V/C, and LOS at the study intersections for the Future Year 2025 conditions. Full LOS summary tables are provided in Appendix C.

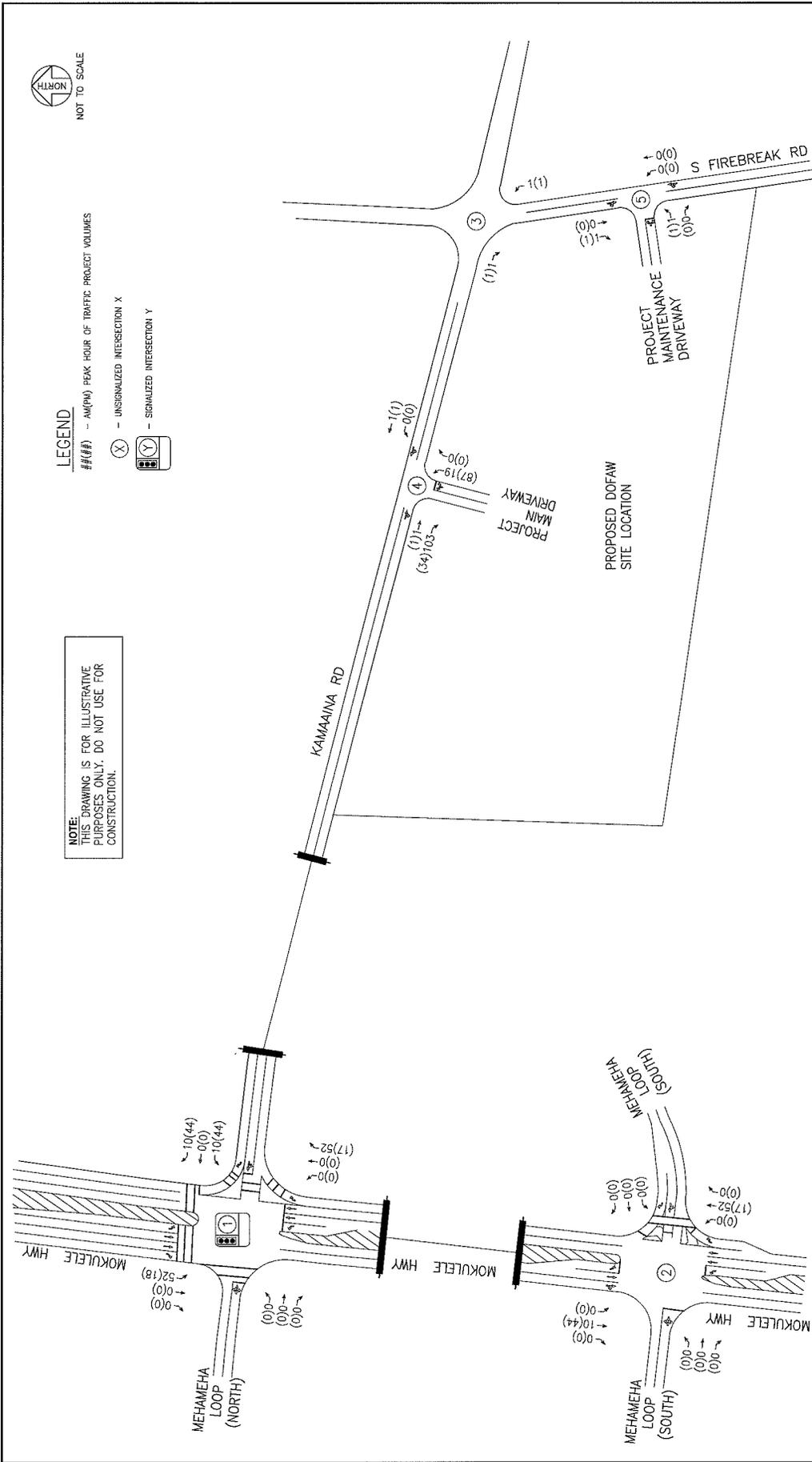


FIGURE 5.1

AUSTIN TSUTSUMI & ASSOCIATES, INC.
ENGINEERS/SURVEYORS • HONOLULU, HAWAII

DIVISION OF FORESTRY AND WILDLIFE (DOFAW) BASEYARD TIAR

PROJECT GENERATED TRAFFIC VOLUMES

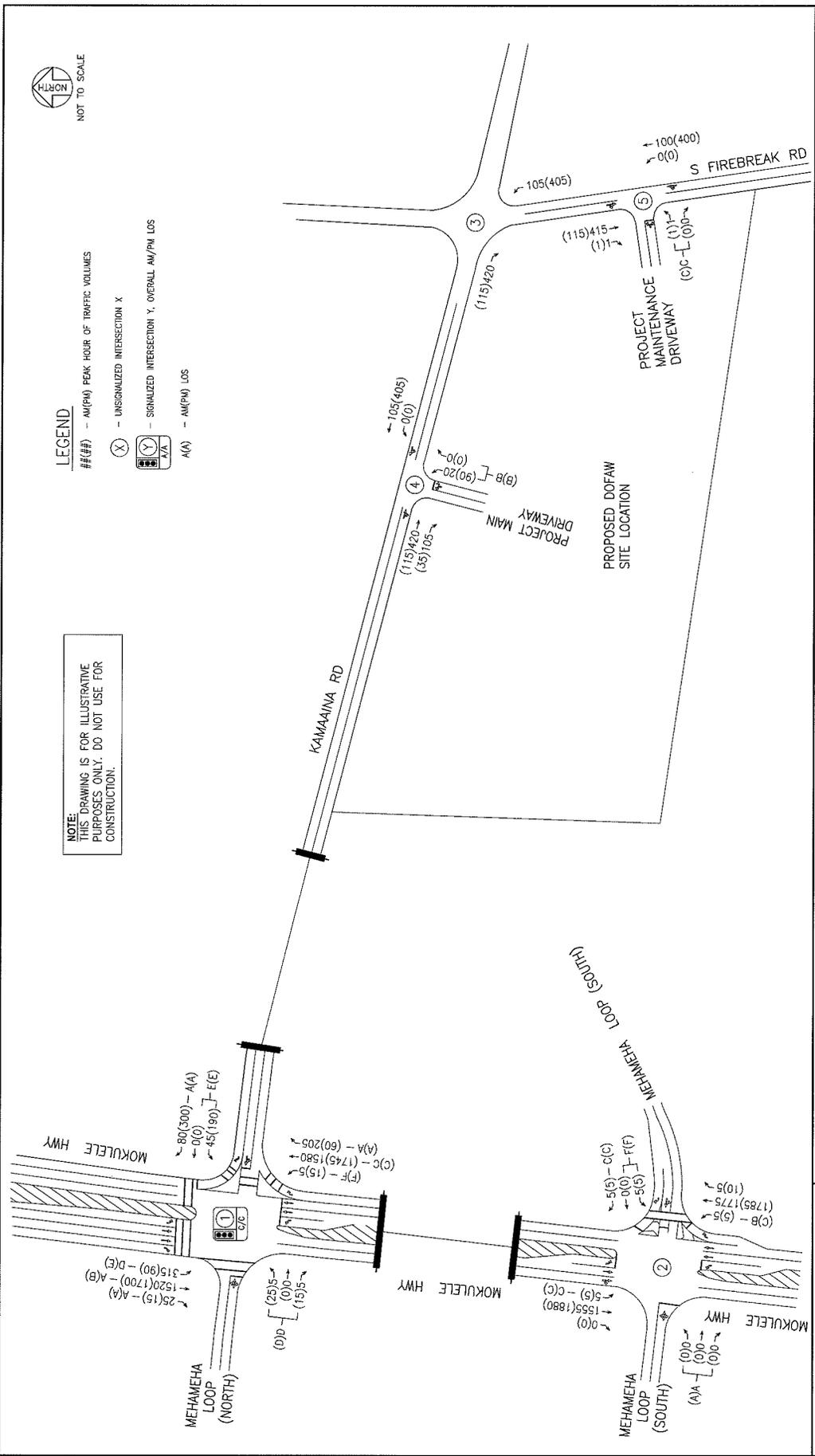


FIGURE 5.2

FUTURE YEAR 2025 WITH PROJECT LANE CONFIGURATION, TRAFFIC VOLUMES AND LOS

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
 ENGINEERS/SURVEYORS • HONOLULU, HAWAII

DIVISION OF FORESTRY AND WILDLIFE (DOFAW) BASEYARD TIAR

Table 5.3: Future Year 2025 Conditions LOS

| Intersection | Base Year 2025 Conditions | | | | | | Future Year 2025 Conditions | | | | | |
|------------------------------------------------------------------------|---------------------------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|
| | AM | | | PM | | | AM | | | PM | | |
| | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <u>Mokulele Highway & Mehameha Loop North/Kamaaina Road</u> | | | | | | | | | | | | |
| EB LT/TH/RT | 51.9 | 0.08 | D | 49.8 | 0.13 | D | 54.2 | 0.07 | D | 48.0 | 0.11 | D |
| WB LT/TH | 55.0 | 0.36 | E | 59.0 | 0.68 | E | 58.2 | 0.42 | E | 62.5 | 0.74 | E |
| NB LT | 77.7 | 0.43 | E | 79.1 | 0.53 | E | 81.9 | 0.43 | F | 82.4 | 0.53 | F |
| NB TH | 23.6 | 0.85 | C | 21.1 | 0.83 | C | 30.7 | 0.90 | C | 28.1 | 0.88 | C |
| SB LT | 51.5 | 0.91 | D | 78.2 | 0.84 | E | 53.6 | 0.92 | D | 78.4 | 0.84 | E |
| SB TH | 4.6 | 0.59 | A | 13.9 | 0.75 | B | 4.9 | 0.59 | A | 17.3 | 0.78 | B |
| SB RT | 2.4 | 0.02 | A | 6.2 | 0.01 | A | 2.5 | 0.02 | A | 7.6 | 0.01 | A |
| Overall | 17.7 | -- | B | 20.9 | -- | C | 21.9 | -- | C | 26.5 | -- | C |
| <u>Mokulele Highway & Mehameha Loop South</u> | | | | | | | | | | | | |
| WB LT/TH | 215.8 | 0.25 | F | 319.1 | 0.34 | F | 242.2 | 0.27 | F | 345.9 | 0.36 | F |
| WB RT | 18.7 | 0.02 | C | 19.4 | 0.02 | C | 19.2 | 0.02 | C | 19.5 | 0.02 | C |
| NB LT | 14.4 | 0.01 | B | 25.0 | 0.02 | C | 14.5 | 0.01 | B | 18.5 | 0.02 | C |
| SB LT | 16.3 | 0.02 | C | 17.1 | 0.02 | C | 16.8 | 0.02 | C | 17.3 | 0.02 | C |
| <u>Kamaaina Road & Project Main Driveway</u> | | | | | | | | | | | | |
| NB LT/RT | - | - | - | - | - | - | 13.5 | 0.05 | B | 14.4 | 0.20 | B |
| <u>S. Firebreak Road & Project Maintenance Driveway</u> | | | | | | | | | | | | |
| EB LT/RT | - | - | - | - | - | - | 15.3 | 0.01 | C | 15.4 | 0.02 | C |



6. CONCLUSIONS

Existing Conditions

Heavy vehicle trucks currently represent approximately 60(39) percent of the AM(PM) peak hour traffic volumes along Kamaaina Road.

The signalized Mokulele Highway/Kamaaiana Road/Mehameha Loop (North) intersection currently operates at overall LOS A with all movements operating at LOS D or better except the northbound and southbound left-turn movements, which currently operate at LOS E/F mainly due to low volumes that result in lengthier average vehicle delays. No significant queuing was observed during the weekday AM and PM peak hours of traffic.

All movements at the two-way stop-controlled Mokulele Highway/Mehameha Loop (South) intersection currently operate at LOS C or better except for the low-volume westbound left-through movement, which operates at LOS F during the AM and PM peak hours of traffic.

Base Year 2025 WITHOUT the Project

Traffic volumes are anticipated to experience approximately 1.7 percent growth per year along Mokulele Highway based on the MRTDM. In addition, numerous other known developments within the vicinity of the Project are forecast to generate traffic along Mokulele Highway.

- Puunene Heavy Industrial Subdivision
- Maui Bay Villas (formerly Maui Lu)
- Kihei High School
- Piilani Promenade
- Kihei Residential
- Kaiwahine Village
- Downtown Kihei (Krausz)

By Year 2025 without the Project, all movements at the unsignalized Mokulele Highway/Mehameha Loop (South) intersection are forecast to operate similar to existing conditions during the AM and PM peak hours of traffic. The low-volume westbound left-through movement is forecast to continue operating at LOS F.

At the Mokulele Highway/Kamaaina Road/Mehameha Loop (North) intersection, it's assumed that recommended roadway improvements will be implemented to provide for the Puunene Heavy Industrial Subdivision. As a result, all mainline through movements are forecast to operate at LOS C or better during the AM and PM peak hours of traffic. Several minor movements are forecast to operate at LOS E. However, all movements are anticipated to operate under capacity, with a v/c ratio below 1.0 and projected delays indicate that each movement should clear within a single signal cycle.



Future Year 2025 WITH the Project

The Project currently plans to construct a new DOFAW Baseyard within the Pulehunui Master Planned Development. Upon full build-out, the Project proposes to construct approximately 25,455 SF of office space, a 5,000 SF wildlife lab, a 2-acre nursery with a 5,000 SF nursery office/greenhouse, 45,000 SF of warehouse space, in addition to other specialized land uses that do not anticipate increasing traffic. These land uses are forecast to generate approximately 124 AM and 123 PM peak hour trips, which were distributed throughout the study area based upon existing travel patterns within the vicinity of the Project and added to the forecast Base Year 2025 traffic volumes.

Upon completion of the Project in Year 2025, traffic volumes at the study intersections are anticipated to increase by approximately three (3) percent from Base Year 2025 conditions. With the recommended roadway improvements for Base Year 2025, all study intersection movements are forecast to operate with LOS similar to Base Year 2025 conditions and below capacity with v/c ratios below 1.0. All movements at the Project driveways are forecast to operate at LOS C or better during the AM and PM peak hours of traffic.



7. RECOMMENDATIONS

7.1 Base Year 2025 without the Project

- As recommended in the Puunene Heavy Industrial Subdivision TIAR, upgrade to Maui County standards, both the Kamaaina Road and South Firebreak Road thoroughfares and Kamaaina Road/South Firebreak Road intersection to provide adequate roadway geometrics, striping, signage, sight distance and traffic control measures. In addition, based on the Puunene Heavy Industrial Subdivision TIAR, implement the following:

Mokulele Highway/Kamaaina Road/Mehameha Loop (North)

- Lengthen to provide a 1,015 feet southbound left-turn lane.
- Provide a northbound acceleration lane to facilitate westbound right-turning traffic from Kamaaina Road onto Mokulele Highway.
- Widen westbound approach to provide an exclusive westbound right-turn lane.
- Maintain the existing bike path along the east side of Mokulele Highway and provide adequate buffer space from the vehicular travel lanes.

7.2 Future Year 2025 WITH the Project

Kamaaina Road/South Firebreak Road

- Consider relocating the existing stop sign from the eastbound approach to instead be placed along the northbound and southbound approach along South Firebreak Road.



8. REFERENCES

1. Austin, Tsutsumi & Associates, Inc., Traffic Impact Analysis Report for Kihei Residential Project, January 22, 2013.
2. Austin, Tsutsumi & Associates, Inc., Traffic Impact Analysis Report for Maui Bay Villas (Formerly Maui Lu), April 23, 2015.
3. Austin, Tsutsumi & Associates, Inc., Traffic Impact Analysis Report for Krausz Companies Commercial Mixed-Use Development (Downtown Kihei), April 7, 2014.
4. Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.
5. Phillip Rowell and Associates, Traffic Impact Analysis Report for Puunene Heavy Industrial Subdivision, January 12, 2012.
6. Phillip Rowell and Associates, Traffic Impact Analysis Report for Piilani Promenade, June 06, 2014.
7. Transportation Research Board, Highway Capacity Manual, 2010.
8. Wilson Okamoto Corporation, Traffic Impact Report for Kihei High School, September 2011.



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APPENDICES



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APPENDIX A

TRAFFIC COUNT DATA

Austin Tsutsumi & Associates

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Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Mokulele Hwy - Mehameha Lp_Kamaaina Rd (N)

Site Code : 00000000

Start Date : 9/15/2015

Page No : 1

Groups Printed- Unshifted

| Start Time | MEHAMEHA LP Eastbound | | | | | KAMAAINA RD Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
|-------------|--------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|----------------------------|------|-------|------|------------|----------------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| 06:30 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:45 AM | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 3 | 1 | 267 | 0 | 0 | 268 | 9 | 223 | 4 | 0 | 236 | 509 |
| Total | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 3 | 0 | 3 | 1 | 267 | 0 | 0 | 268 | 9 | 223 | 4 | 0 | 236 | 510 |
| 07:00 AM | 1 | 0 | 1 | 0 | 2 | 4 | 0 | 1 | 0 | 5 | 0 | 300 | 6 | 0 | 306 | 3 | 258 | 1 | 0 | 262 | 575 |
| 07:15 AM | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 4 | 0 | 5 | 0 | 336 | 0 | 0 | 336 | 3 | 273 | 5 | 0 | 281 | 624 |
| 07:30 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 3 | 1 | 373 | 0 | 0 | 374 | 8 | 316 | 1 | 0 | 325 | 703 |
| 07:45 AM | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 7 | 2 | 11 | 1 | 279 | 3 | 0 | 283 | 5 | 292 | 5 | 0 | 302 | 597 |
| Total | 4 | 0 | 2 | 0 | 6 | 7 | 0 | 14 | 3 | 24 | 2 | 1288 | 9 | 0 | 1299 | 19 | 1139 | 12 | 0 | 1170 | 2499 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 274 | 1 | 0 | 275 | 3 | 286 | 10 | 0 | 299 | 578 |
| 08:15 AM | 2 | 0 | 1 | 0 | 3 | 2 | 1 | 2 | 0 | 5 | 3 | 255 | 3 | 0 | 261 | 6 | 272 | 3 | 0 | 281 | 550 |
| 08:30 AM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 3 | 2 | 260 | 2 | 0 | 264 | 2 | 246 | 6 | 0 | 254 | 523 |
| Grand Total | 9 | 1 | 4 | 0 | 14 | 9 | 1 | 25 | 4 | 39 | 8 | 2344 | 15 | 0 | 2367 | 39 | 2166 | 35 | 0 | 2240 | 4660 |
| Apprch % | 64.3 | 7.1 | 28.6 | 0 | | 23.1 | 2.6 | 64.1 | 10.3 | | 0.3 | 99 | 0.6 | 0 | | 1.7 | 96.7 | 1.6 | 0 | | |
| Total % | 0.2 | 0 | 0.1 | 0 | 0.3 | 0.2 | 0 | 0.5 | 0.1 | 0.8 | 0.2 | 50.3 | 0.3 | 0 | 50.8 | 0.8 | 46.5 | 0.8 | 0 | 48.1 | |

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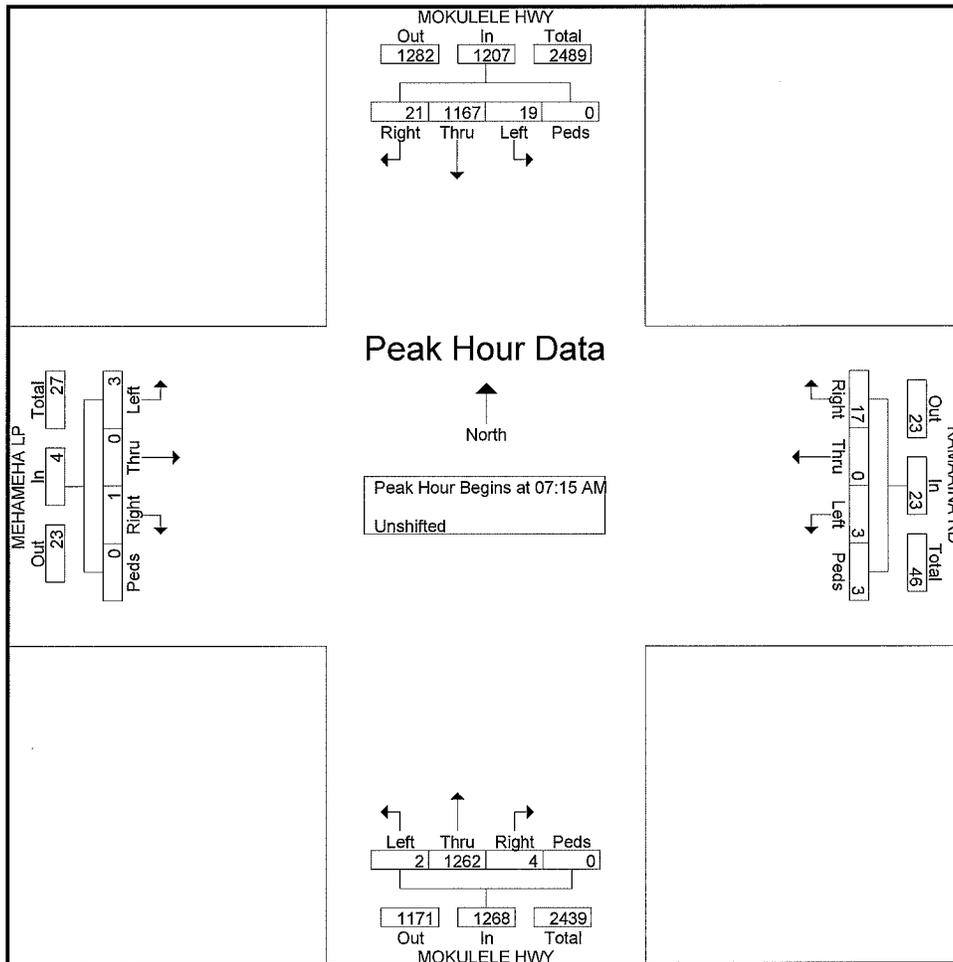
File Name : AM_Mokulele Hwy - Mehameha Lp_Kamaaina Rd (N)

Site Code : 00000000

Start Date : 9/15/2015

Page No : 2

| Start Time | MEHAMEHA LP Eastbound | | | | | KAMAAINA RD Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
|------------------------------------------------------------|-----------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:15 AM | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 4 | 0 | 5 | 0 | 336 | 0 | 0 | 336 | 3 | 273 | 5 | 0 | 281 | 624 |
| 07:30 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 3 | 1 | 373 | 0 | 0 | 374 | 8 | 316 | 1 | 0 | 325 | 703 |
| 07:45 AM | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 7 | 2 | 11 | 1 | 279 | 3 | 0 | 283 | 5 | 292 | 5 | 0 | 302 | 597 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 274 | 1 | 0 | 275 | 3 | 286 | 10 | 0 | 299 | 578 |
| Total Volume | 3 | 0 | 1 | 0 | 4 | 3 | 0 | 17 | 3 | 23 | 2 | 1262 | 4 | 0 | 1268 | 19 | 1167 | 21 | 0 | 1207 | 2502 |
| % App. Total | 75 | 0 | 25 | 0 | | 13 | 0 | 73.9 | 13 | | 0.2 | 99.5 | 0.3 | 0 | | 1.6 | 96.7 | 1.7 | 0 | | |
| PHF | .375 | .000 | .250 | .000 | .500 | .375 | .000 | .607 | .375 | .523 | .500 | .846 | .333 | .000 | .848 | .594 | .923 | .525 | .000 | .928 | .890 |



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Site Code : 00000000

Start Date : 9/15/2015

Page No : 1

Groups Printed- Unshifted

| Start Time | MEHAMEHA LP Eastbound | | | | | Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
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| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| 06:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:45 AM | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 266 | 1 | 0 | 267 | 0 | 223 | 0 | 0 | 223 | 492 |
| Total | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 266 | 1 | 0 | 267 | 0 | 223 | 0 | 0 | 223 | 492 |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 299 | 0 | 0 | 300 | 0 | 258 | 0 | 0 | 258 | 558 |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 335 | 1 | 0 | 336 | 1 | 272 | 0 | 0 | 273 | 612 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 372 | 0 | 0 | 373 | 1 | 315 | 0 | 0 | 316 | 690 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 278 | 1 | 0 | 279 | 0 | 292 | 0 | 0 | 292 | 573 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 6 | 2 | 1284 | 2 | 0 | 1288 | 2 | 1137 | 0 | 0 | 1139 | 2433 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 271 | 2 | 0 | 274 | 1 | 285 | 0 | 0 | 286 | 561 |
| 08:15 AM | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 252 | 1 | 0 | 255 | 1 | 271 | 0 | 0 | 272 | 530 |
| 08:30 AM | 0 | 2 | 0 | 0 | 2 | 0 | 3 | 0 | 1 | 4 | 7 | 252 | 1 | 0 | 260 | 1 | 245 | 0 | 0 | 246 | 512 |
| Grand Total | 0 | 2 | 5 | 0 | 7 | 2 | 3 | 2 | 4 | 11 | 12 | 2325 | 7 | 0 | 2344 | 5 | 2161 | 0 | 0 | 2166 | 4528 |
| Apprch % | 0 | 28.6 | 71.4 | 0 | | 18.2 | 27.3 | 18.2 | 36.4 | | 0.5 | 99.2 | 0.3 | 0 | | 0.2 | 99.8 | 0 | 0 | | |
| Total % | 0 | 0 | 0.1 | 0 | 0.2 | 0 | 0.1 | 0 | 0.1 | 0.2 | 0.3 | 51.3 | 0.2 | 0 | 51.8 | 0.1 | 47.7 | 0 | 0 | 47.8 | |

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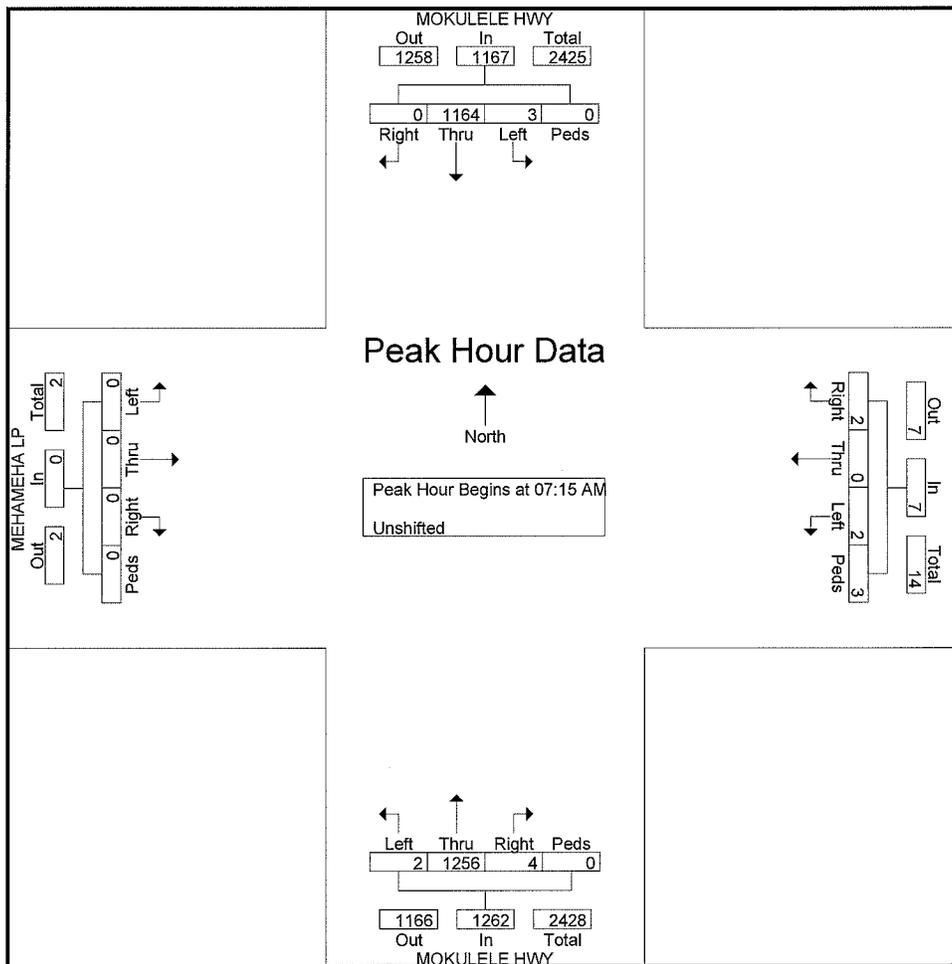
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Site Code : 00000000

Start Date : 9/15/2015

Page No : 2

| Start Time | MEHAMEHA LP Eastbound | | | | | Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
|------------------------------------------------------------|-----------------------|------|-------|------|------------|-----------|------|-------|------|------------|-------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 335 | 1 | 0 | 336 | 1 | 272 | 0 | 0 | 273 | 612 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 372 | 0 | 0 | 373 | 1 | 315 | 0 | 0 | 316 | 690 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 278 | 1 | 0 | 279 | 0 | 292 | 0 | 0 | 292 | 573 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 271 | 2 | 0 | 274 | 1 | 285 | 0 | 0 | 286 | 561 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 7 | 2 | 1256 | 4 | 0 | 1262 | 3 | 1164 | 0 | 0 | 1167 | 2436 |
| % App. Total | 0 | 0 | 0 | 0 | 0 | 28.6 | 0 | 28.6 | 42.9 | | 0.2 | 99.5 | 0.3 | 0 | | 0.3 | 99.7 | 0 | 0 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .500 | .000 | .250 | .375 | .583 | .500 | .844 | .500 | .000 | .846 | .750 | .924 | .000 | .000 | .923 | .883 |



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File Name : PM_Mokulele Hwy - Mehameha Lp_Kamaaina Rd (N)

Site Code : 00000000

Start Date : 9/10/2015

Page No : 1

Groups Printed- Unshifted

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|--------------------|--------------------------|----------|-----------|----------|------------|--------------------------|----------|-----------|----------|------------|----------------------------|-------------|----------|----------|-------------|----------------------------|-------------|-----------|----------|-------------|-------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| 02:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 02:45 PM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 13 | 0 | 0 | 13 | 0 | 27 | 0 | 0 | 27 | 42 |
| Total | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 13 | 0 | 0 | 13 | 0 | 27 | 0 | 0 | 27 | 43 |
| 03:00 PM | 4 | 0 | 1 | 0 | 5 | 1 | 0 | 17 | 0 | 18 | 1 | 270 | 1 | 0 | 272 | 5 | 324 | 2 | 0 | 331 | 626 |
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| 03:30 PM | 6 | 0 | 1 | 0 | 7 | 0 | 0 | 4 | 1 | 5 | 5 | 310 | 1 | 0 | 316 | 4 | 338 | 4 | 0 | 346 | 674 |
| 03:45 PM | 6 | 0 | 2 | 0 | 8 | 1 | 0 | 7 | 0 | 8 | 2 | 327 | 2 | 0 | 331 | 1 | 274 | 5 | 0 | 280 | 627 |
| Total | 16 | 0 | 6 | 0 | 22 | 4 | 1 | 32 | 1 | 38 | 12 | 1201 | 5 | 0 | 1218 | 12 | 1233 | 13 | 0 | 1258 | 2536 |
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| 04:30 PM | 5 | 0 | 2 | 0 | 7 | 1 | 0 | 3 | 0 | 4 | 0 | 351 | 1 | 0 | 352 | 1 | 287 | 2 | 0 | 290 | 653 |
| 04:45 PM | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 5 | 0 | 6 | 0 | 284 | 1 | 0 | 285 | 2 | 300 | 1 | 0 | 303 | 595 |
| Total | 16 | 1 | 13 | 0 | 30 | 2 | 0 | 20 | 0 | 22 | 4 | 1280 | 3 | 0 | 1287 | 8 | 1197 | 7 | 0 | 1212 | 2551 |
| Grand Total | 33 | 1 | 19 | 0 | 53 | 7 | 1 | 53 | 1 | 62 | 16 | 2494 | 8 | 0 | 2518 | 20 | 2457 | 20 | 0 | 2497 | 5130 |
| Apprch % | 62.3 | 1.9 | 35.8 | 0 | | 11.3 | 1.6 | 85.5 | 1.6 | | 0.6 | 99 | 0.3 | 0 | | 0.8 | 98.4 | 0.8 | 0 | | |
| Total % | 0.6 | 0 | 0.4 | 0 | 1 | 0.1 | 0 | 1 | 0 | 1.2 | 0.3 | 48.6 | 0.2 | 0 | 49.1 | 0.4 | 47.9 | 0.4 | 0 | 48.7 | |

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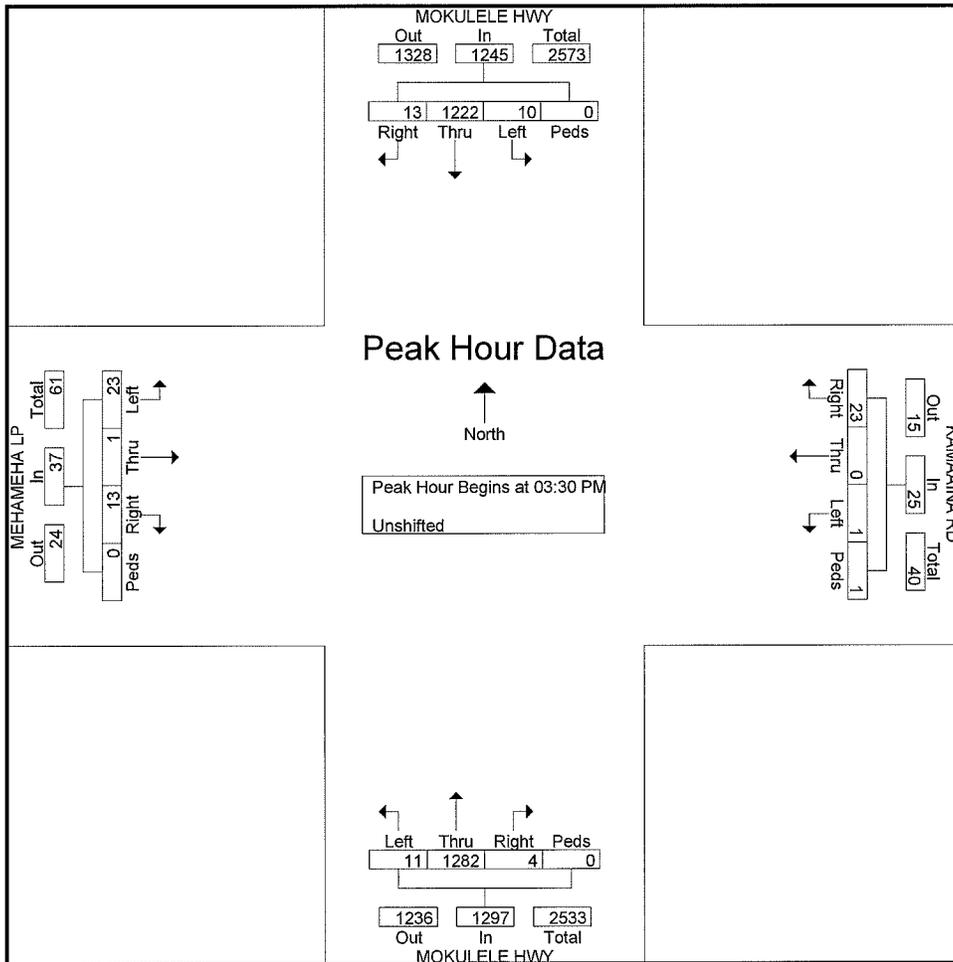
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Site Code : 00000000

Start Date : 9/10/2015

Page No : 2

| Start Time | MEHAMEHA LP Eastbound | | | | | KAMAAINA RD Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
|------------------------------------------------------------|-----------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| Peak Hour Analysis From 02:30 PM to 04:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | | | | | | | | | | | | |
| 03:30 PM | 6 | 0 | 1 | 0 | 7 | 0 | 0 | 4 | 1 | 5 | 5 | 310 | 1 | 0 | 316 | 4 | 338 | 4 | 0 | 346 | 674 |
| 03:45 PM | 6 | 0 | 2 | 0 | 8 | 1 | 0 | 7 | 0 | 8 | 2 | 327 | 2 | 0 | 331 | 1 | 274 | 5 | 0 | 280 | 627 |
| 04:00 PM | 6 | 0 | 7 | 0 | 13 | 0 | 0 | 9 | 0 | 9 | 0 | 267 | 0 | 0 | 267 | 4 | 304 | 2 | 0 | 310 | 599 |
| 04:15 PM | 5 | 1 | 3 | 0 | 9 | 0 | 0 | 3 | 0 | 3 | 4 | 378 | 1 | 0 | 383 | 1 | 306 | 2 | 0 | 309 | 704 |
| Total Volume | 23 | 1 | 13 | 0 | 37 | 1 | 0 | 23 | 1 | 25 | 11 | 1282 | 4 | 0 | 1297 | 10 | 1222 | 13 | 0 | 1245 | 2604 |
| % App. Total | 62.2 | 2.7 | 35.1 | 0 | | 4 | 0 | 92 | 4 | | 0.8 | 98.8 | 0.3 | 0 | | 0.8 | 98.2 | 1 | 0 | | |
| PHF | .958 | .250 | .464 | .000 | .712 | .250 | .000 | .639 | .250 | .694 | .550 | .848 | .500 | .000 | .847 | .625 | .904 | .650 | .000 | .900 | .925 |



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Site Code : 00000000

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Page No : 1

Groups Printed- Unshifted

| Start Time | MEHAMEHA LP Eastbound | | | | | Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
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| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| 02:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 13 | 0 | 27 | 0 | 0 | 27 | 40 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 13 | 0 | 27 | 0 | 0 | 27 | 40 |
| 03:00 PM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 269 | 0 | 0 | 270 | 1 | 323 | 0 | 0 | 324 | 595 |
| 03:15 PM | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 293 | 0 | 0 | 294 | 2 | 295 | 0 | 0 | 297 | 595 |
| 03:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 308 | 2 | 0 | 310 | 0 | 338 | 0 | 0 | 338 | 648 |
| 03:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 324 | 2 | 0 | 327 | 1 | 273 | 0 | 0 | 274 | 601 |
| Total | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 1194 | 4 | 0 | 1201 | 4 | 1229 | 0 | 0 | 1233 | 2439 |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 4 | 1 | 265 | 1 | 0 | 267 | 1 | 303 | 0 | 0 | 304 | 575 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 375 | 3 | 0 | 378 | 1 | 305 | 0 | 0 | 306 | 686 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 349 | 1 | 0 | 351 | 0 | 287 | 0 | 0 | 287 | 640 |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 282 | 2 | 0 | 284 | 2 | 298 | 0 | 0 | 300 | 586 |
| Total | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 0 | 10 | 2 | 1271 | 7 | 0 | 1280 | 4 | 1193 | 0 | 0 | 1197 | 2487 |
| Grand Total | 0 | 0 | 5 | 0 | 5 | 2 | 0 | 8 | 0 | 10 | 5 | 2478 | 11 | 0 | 2494 | 8 | 2449 | 0 | 0 | 2457 | 4966 |
| Apprch % | 0 | 0 | 100 | 0 | | 20 | 0 | 80 | 0 | | 0.2 | 99.4 | 0.4 | 0 | | 0.3 | 99.7 | 0 | 0 | | |
| Total % | 0 | 0 | 0.1 | 0 | 0.1 | 0 | 0 | 0.2 | 0 | 0.2 | 0.1 | 49.9 | 0.2 | 0 | 50.2 | 0.2 | 49.3 | 0 | 0 | 49.5 | |

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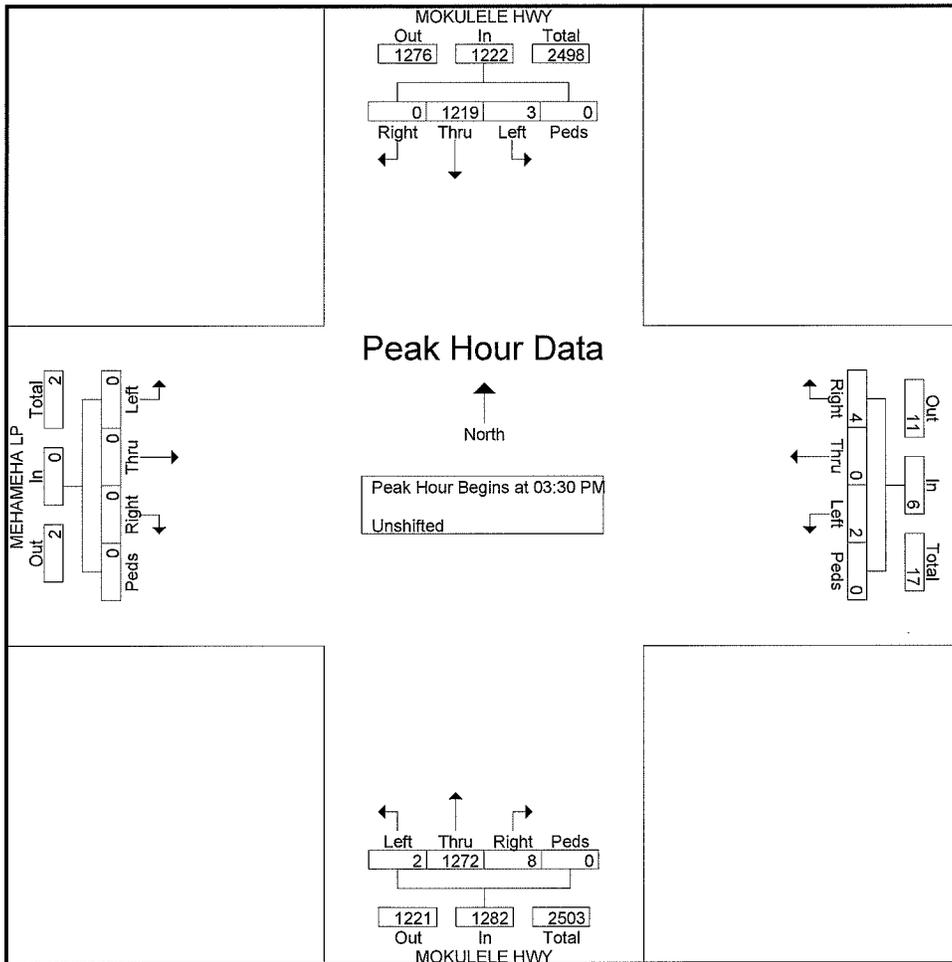
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Site Code : 00000000

Start Date : 9/10/2015

Page No : 2

| Start Time | MEHAMEHA LP Eastbound | | | | | Westbound | | | | | MOKULELE HWY Northbound | | | | | MOKULELE HWY Southbound | | | | | Int. Total |
|------------------------------------------------------------|-----------------------|------|-------|------|------------|-----------|------|-------|------|------------|-------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| Peak Hour Analysis From 02:30 PM to 04:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | | | | | | | | | | | | |
| 03:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 308 | 2 | 0 | 310 | 0 | 338 | 0 | 0 | 338 | 648 |
| 03:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 324 | 2 | 0 | 327 | 1 | 273 | 0 | 0 | 274 | 601 |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 4 | 1 | 265 | 1 | 0 | 267 | 1 | 303 | 0 | 0 | 304 | 575 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 375 | 3 | 0 | 378 | 1 | 305 | 0 | 0 | 306 | 686 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 6 | 2 | 1272 | 8 | 0 | 1282 | 3 | 1219 | 0 | 0 | 1222 | 2510 |
| % App. Total | 0 | 0 | 0 | 0 | 0 | 33.3 | 0 | 66.7 | 0 | 0 | 0.2 | 99.2 | 0.6 | 0 | 0 | 0.2 | 99.8 | 0 | 0 | 0 | 0 |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .500 | .000 | .375 | .500 | .848 | .667 | .000 | .848 | .750 | .902 | .000 | .000 | .904 | .915 |





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APPENDIX B

LEVEL OF SERVICE CRITERIA

APPENDIX B – LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 2010)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

| Level of Service | Control Delay per Vehicle (sec./veh.) |
|------------------|---------------------------------------|
| A | < 10.0 |
| B | >10.0 and ≤ 20.0 |
| C | >20.0 and ≤ 35.0 |
| D | >35.0 and ≤ 55.0 |
| E | >55.0 and ≤ 80.0 |
| F | > 80.0 |

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 2010)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

| Level of Service | Average Control Delay (sec/veh) |
|------------------|---------------------------------|
| A | ≤ 10 |
| B | >10 and ≤15 |
| C | >15 and ≤25 |
| D | >25 and ≤35 |
| E | >35 and ≤50 |
| F | > 50 |



AUSTIN, TSUTSUMI & ASSOCIATES, INC.
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APPENDIX C

LEVEL OF SERVICE CALCULATIONS



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing AM Peak
-

HCM 2010 Signalized Intersection Summary
 1: Mokulele Hwy & Mehamaha Lp North/Kamaaina Rd

9/16/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | | ↖ | ↗ | ↗ | ↖ | ↗ | ↖ |
| Traffic Volume (veh/h) | 3 | 0 | 1 | 3 | 0 | 17 | 2 | 1262 | 4 | 19 | 1167 | 21 |
| Future Volume (veh/h) | 3 | 0 | 1 | 3 | 0 | 17 | 2 | 1262 | 4 | 19 | 1167 | 21 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1900 | 1900 | 1900 | 999 | 1900 | 1900 | 1863 | 1520 | 1387 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 3 | 0 | 0 | 3 | 0 | 2 | 2 | 1372 | 0 | 21 | 1268 | 20 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 2 | 25 | 37 | 2 | 0 |
| Cap, veh/h | 102 | 0 | 0 | 73 | 0 | 3 | 5 | 2671 | 975 | 30 | 2743 | 1252 |
| Arrive On Green | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.75 | 0.00 | 0.02 | 0.78 | 0.78 |
| Sat Flow, veh/h | 1655 | 0 | 0 | 492 | 0 | 328 | 1810 | 3539 | 1292 | 1321 | 3539 | 1615 |
| Grp Volume(v), veh/h | 3 | 0 | 0 | 5 | 0 | 0 | 2 | 1372 | 0 | 21 | 1268 | 20 |
| Grp Sat Flow(s),veh/h/ln | 1655 | 0 | 0 | 821 | 0 | 0 | 1810 | 1770 | 1292 | 1321 | 1770 | 1615 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.1 | 13.2 | 0.0 | 1.3 | 10.7 | 0.2 |
| Cycle Q Clear(g_c), s | 0.1 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.1 | 13.2 | 0.0 | 1.3 | 10.7 | 0.2 |
| Prop In Lane | 1.00 | | 0.00 | 0.60 | | 0.40 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 102 | 0 | 0 | 76 | 0 | 0 | 5 | 2671 | 975 | 30 | 2743 | 1252 |
| V/C Ratio(X) | 0.03 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.41 | 0.51 | 0.00 | 0.69 | 0.46 | 0.02 |
| Avail Cap(c_a), veh/h | 494 | 0 | 0 | 292 | 0 | 0 | 299 | 3921 | 1431 | 218 | 3921 | 1789 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.6 | 0.0 | 0.0 | 41.8 | 0.0 | 0.0 | 42.2 | 4.2 | 0.0 | 41.1 | 3.3 | 2.2 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 46.4 | 0.2 | 0.0 | 24.4 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 6.3 | 0.0 | 0.7 | 5.2 | 0.1 |
| LnGrp Delay(d),s/veh | 41.8 | 0.0 | 0.0 | 42.2 | 0.0 | 0.0 | 88.6 | 4.3 | 0.0 | 65.5 | 3.5 | 2.2 |
| LnGrp LOS | D | | | D | | | F | A | | E | A | A |
| Approach Vol, veh/h | | 3 | | | 5 | | | 1374 | | | 1309 | |
| Approach Delay, s/veh | | 41.8 | | | 42.2 | | | 4.4 | | | 4.4 | |
| Approach LOS | | D | | | D | | | A | | | A | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.0 | 70.0 | | 6.9 | 6.2 | 71.8 | | 6.9 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 14.0 | 94.0 | | 24.0 | 14.0 | 94.0 | | 24.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.3 | 15.2 | | 2.1 | 2.1 | 12.7 | | 2.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 48.9 | | 0.0 | 0.0 | 49.8 | | 0.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 4.6 | | | | | | | | | |
| HCM 2010 LOS | | | A | | | | | | | | | |

HCM 2010 TWSC
2: Mehameha Loop S & Mokulele Hwy

9/16/2015

Intersection

Int Delay, s/veh 0.1

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Traffic Vol, veh/h | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 1256 | 4 | 3 | 1164 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 1256 | 4 | 3 | 1164 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Stop | - | - | Yield | - | - | None |
| Storage Length | - | - | - | - | - | 100 | 525 | - | 425 | 625 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 1365 | 4 | 3 | 1265 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|----------------------|--------|------|------|--------|------|-----|--------|---|---|--------|---|---|
| Conflicting Flow All | 1959 | 2642 | 633 | 2009 | 2642 | 683 | 1265 | 0 | 0 | 1365 | 0 | 0 |
| Stage 1 | 1272 | 1272 | - | 1370 | 1370 | - | - | - | - | - | - | - |
| Stage 2 | 687 | 1370 | - | 639 | 1272 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | 6.94 | 6.5 | 6.54 | 6.9 | 4.1 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.5 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.5 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | 3.32 | 3 | 4.02 | 3.3 | 2.2 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 38 | 23 | 422 | 66 | 23 | 396 | 556 | - | - | 510 | - | - |
| Stage 1 | 177 | 237 | - | 170 | 212 | - | - | - | - | - | - | - |
| Stage 2 | 403 | 212 | - | 488 | 237 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | | | | | |
| Mov Cap-1 Maneuver | 38 | 23 | 422 | 66 | 23 | 396 | 556 | - | - | 510 | - | - |
| Mov Cap-2 Maneuver | 38 | 23 | - | 66 | 23 | - | - | - | - | - | - | - |
| Stage 1 | 176 | 236 | - | 169 | 211 | - | - | - | - | - | - | - |
| Stage 2 | 399 | 211 | - | 485 | 236 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|------|----|----|
| HCM Control Delay, s | 0 | 37.8 | 0 | 0 |
| HCM LOS | A | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h) | 556 | - | - | - | 66 | 396 | 510 | - | - |
| HCM Lane V/C Ratio | 0.004 | - | - | - | 0.033 | 0.005 | 0.006 | - | - |
| HCM Control Delay (s) | 11.5 | - | - | 0 | 61.4 | 14.1 | 12.1 | - | - |
| HCM Lane LOS | B | - | - | A | F | B | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 | 0 | 0 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing PM Peak
-
-

HCM 2010 Signalized Intersection Summary
 1: Mokulele Hwy & Mehameha Lp North/Kamaaina Rd

9/16/2015

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕ | ↗ | ↗ | ↕ | ↗ |
| Traffic Volume (veh/h) | 23 | 0 | 13 | 1 | 0 | 23 | 11 | 1282 | 4 | 10 | 1222 | 13 |
| Future Volume (veh/h) | 23 | 0 | 13 | 1 | 0 | 23 | 11 | 1282 | 4 | 10 | 1222 | 13 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1900 | 1900 | 1900 | 1568 | 1900 | 1900 | 1863 | 1086 | 1118 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 25 | 0 | 13 | 1 | 0 | 9 | 12 | 1393 | 0 | 11 | 1328 | 11 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 75 | 70 | 2 | 0 |
| Cap, veh/h | 106 | 0 | 21 | 48 | 2 | 49 | 26 | 2646 | 690 | 14 | 2642 | 1206 |
| Arrive On Green | 0.04 | 0.00 | 0.04 | 0.04 | 0.00 | 0.04 | 0.01 | 0.75 | 0.00 | 0.01 | 0.75 | 0.75 |
| Sat Flow, veh/h | 1021 | 0 | 531 | 92 | 47 | 1252 | 1810 | 3539 | 923 | 1064 | 3539 | 1615 |
| Grp Volume(v), veh/h | 38 | 0 | 0 | 10 | 0 | 0 | 12 | 1393 | 0 | 11 | 1328 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1552 | 0 | 0 | 1392 | 0 | 0 | 1810 | 1770 | 923 | 1064 | 1770 | 1615 |
| Q Serve(g_s), s | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 14.7 | 0.0 | 0.9 | 13.7 | 0.2 |
| Cycle Q Clear(g_c), s | 2.1 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.6 | 14.7 | 0.0 | 0.9 | 13.7 | 0.2 |
| Prop In Lane | 0.66 | | 0.34 | 0.10 | | 0.90 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 127 | 0 | 0 | 98 | 0 | 0 | 26 | 2646 | 690 | 14 | 2642 | 1206 |
| V/C Ratio(X) | 0.30 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.46 | 0.53 | 0.00 | 0.77 | 0.50 | 0.01 |
| Avail Cap(c_a), veh/h | 466 | 0 | 0 | 398 | 0 | 0 | 282 | 3700 | 965 | 166 | 3700 | 1688 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.5 | 0.0 | 0.0 | 41.8 | 0.0 | 0.0 | 44.0 | 4.7 | 0.0 | 44.2 | 4.6 | 2.9 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 12.1 | 0.2 | 0.0 | 59.1 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.4 | 7.0 | 0.0 | 0.5 | 6.5 | 0.1 |
| LnGrp Delay(d),s/veh | 43.8 | 0.0 | 0.0 | 42.3 | 0.0 | 0.0 | 56.1 | 4.9 | 0.0 | 103.4 | 4.8 | 2.9 |
| LnGrp LOS | D | | | D | | | E | A | | F | A | A |
| Approach Vol, veh/h | | 38 | | | 10 | | | 1405 | | | 1350 | |
| Approach Delay, s/veh | | 43.8 | | | 42.3 | | | 5.3 | | | 5.6 | |
| Approach LOS | | D | | | D | | | A | | | A | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 7.2 | 73.2 | | 9.5 | 7.3 | 73.1 | | 9.5 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 14.0 | 94.0 | | 24.0 | 14.0 | 94.0 | | 24.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.9 | 16.7 | | 4.1 | 2.6 | 15.7 | | 2.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 50.5 | | 0.2 | 0.0 | 50.9 | | 0.2 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 6.1 | | | | | | | | | |
| HCM 2010 LOS | | | A | | | | | | | | | |

HCM 2010 TWSC
2: Mehameha Loop S & Mokulele Hwy

9/16/2015

| Intersection | | | | | | | | | | | | |
|------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Int Delay, s/veh | 0.1 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Traffic Vol, veh/h | 0 | 0 | 0 | 2 | 0 | 4 | 2 | 1272 | 8 | 3 | 1219 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 2 | 0 | 4 | 2 | 1272 | 8 | 3 | 1219 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Stop | - | - | Yield | - | - | None |
| Storage Length | - | - | - | - | - | 100 | 525 | - | 425 | 625 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 2 | 0 | 4 | 2 | 1383 | 9 | 3 | 1325 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|----------------------|--------|------|------|--------|------|------|--------|---|---|--------|---|---|
| Conflicting Flow All | 2028 | 2719 | 663 | 2056 | 2719 | 691 | 1325 | 0 | 0 | 1383 | 0 | 0 |
| Stage 1 | 1332 | 1332 | - | 1387 | 1387 | - | - | - | - | - | - | - |
| Stage 2 | 696 | 1387 | - | 669 | 1332 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | 6.94 | 6.5 | 6.54 | 6.94 | 4.14 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | 3.32 | 3 | 4.02 | 3.32 | 2.22 | - | - | 2.22 | - | - |
| Pot Cap-1 Maneuver | 34 | 20 | 404 | 61 | 20 | 387 | 517 | - | - | 491 | - | - |
| Stage 1 | 163 | 222 | - | 163 | 208 | - | - | - | - | - | - | - |
| Stage 2 | 398 | 208 | - | 464 | 222 | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 33 | 20 | 404 | 61 | 20 | 387 | 517 | - | - | 491 | - | - |
| Mov Cap-2 Maneuver | 33 | 20 | - | 61 | 20 | - | - | - | - | - | - | - |
| Stage 1 | 162 | 221 | - | 162 | 207 | - | - | - | - | - | - | - |
| Stage 2 | 392 | 207 | - | 461 | 221 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|------|----|----|
| HCM Control Delay, s | 0 | 31.7 | 0 | 0 |
| HCM LOS | A | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h) | 517 | - | - | - | 61 | 387 | 491 | - | - |
| HCM Lane V/C Ratio | 0.004 | - | - | - | 0.036 | 0.011 | 0.007 | - | - |
| HCM Control Delay (s) | 12 | - | - | 0 | 66.2 | 14.4 | 12.4 | - | - |
| HCM Lane LOS | B | - | - | A | F | B | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 | 0 | 0 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2025 AM Peak
-

HCM 2010 Signalized Intersection Summary

1: Mokulele Hwy & Mehamaha Lp North/Kamaaina Rd

9/16/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|-------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | ↗ | ↖ | ↕ | ↗ | ↖ | ↕ | ↗ |
| Traffic Volume (veh/h) | 5 | 0 | 5 | 35 | 0 | 70 | 5 | 1580 | 155 | 265 | 1520 | 25 |
| Future Volume (veh/h) | 5 | 0 | 5 | 35 | 0 | 70 | 5 | 1580 | 155 | 265 | 1520 | 25 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1900 | 1900 | 1900 | 1473 | 1357 | 1900 | 1863 | 1520 | 1429 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 5 | 0 | 4 | 38 | 0 | 0 | 5 | 1717 | 0 | 288 | 1652 | 24 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 2 | 25 | 33 | 2 | 0 |
| Cap, veh/h | 77 | 9 | 29 | 107 | 0 | 42 | 12 | 2014 | 735 | 316 | 2812 | 1283 |
| Arrive On Green | 0.04 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.01 | 0.57 | 0.00 | 0.23 | 0.79 | 0.79 |
| Sat Flow, veh/h | 735 | 261 | 797 | 1152 | 0 | 1154 | 1810 | 3539 | 1292 | 1361 | 3539 | 1615 |
| Grp Volume(v), veh/h | 9 | 0 | 0 | 38 | 0 | 0 | 5 | 1717 | 0 | 288 | 1652 | 24 |
| Grp Sat Flow(s),veh/h/ln | 1794 | 0 | 0 | 1152 | 0 | 1154 | 1810 | 1770 | 1292 | 1361 | 1770 | 1615 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 3.1 | 0.0 | 0.0 | 0.3 | 44.9 | 0.0 | 22.8 | 19.9 | 0.3 |
| Cycle Q Clear(g_c), s | 0.5 | 0.0 | 0.0 | 3.6 | 0.0 | 0.0 | 0.3 | 44.9 | 0.0 | 22.8 | 19.9 | 0.3 |
| Prop In Lane | 0.56 | | 0.44 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 116 | 0 | 0 | 107 | 0 | 42 | 12 | 2014 | 735 | 316 | 2812 | 1283 |
| V/C Ratio(X) | 0.08 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.43 | 0.85 | 0.00 | 0.91 | 0.59 | 0.02 |
| Avail Cap(c_a), veh/h | 513 | 0 | 0 | 399 | 0 | 344 | 229 | 2050 | 748 | 677 | 3363 | 1535 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.6 | 0.0 | 0.0 | 53.0 | 0.0 | 0.0 | 54.7 | 19.9 | 0.0 | 41.3 | 4.4 | 2.4 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 23.0 | 3.7 | 0.0 | 10.2 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.2 | 22.7 | 0.0 | 9.5 | 9.5 | 0.2 |
| LnGrp Delay(d),s/veh | 51.9 | 0.0 | 0.0 | 55.0 | 0.0 | 0.0 | 77.7 | 23.6 | 0.0 | 51.5 | 4.6 | 2.4 |
| LnGrp LOS | D | | | E | | | E | C | | D | A | A |
| Approach Vol, veh/h | | 9 | | | 38 | | | 1722 | | | 1964 | |
| Approach Delay, s/veh | | 51.9 | | | 55.0 | | | 23.7 | | | 11.4 | |
| Approach LOS | | D | | | E | | | C | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 31.6 | 68.9 | | 10.0 | 6.7 | 93.8 | | 10.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 55.0 | 64.0 | | 33.0 | 14.0 | 105.0 | | 33.0 | | | | |
| Max Q Clear Time (g_c+l1), s | 24.8 | 46.9 | | 2.5 | 2.3 | 21.9 | | 5.6 | | | | |
| Green Ext Time (p_c), s | 0.8 | 16.0 | | 0.2 | 0.0 | 62.9 | | 0.2 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 17.7 | | | | | | | | |
| HCM 2010 LOS | | | | B | | | | | | | | |

HCM 2010 TWSC
 2: Mokulele Hwy & Mehameha Loop S

9/16/2015

| Intersection | | | | | | | | | | | | |
|------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Int Delay, s/veh | 0.4 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Traffic Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1725 | 5 | 5 | 1545 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1725 | 5 | 5 | 1545 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Stop | - | - | Yield | - | - | None |
| Storage Length | - | - | - | - | - | 100 | 525 | - | 425 | 625 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1875 | 5 | 5 | 1679 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|----------------------|--------|------|------|--------|------|-----|--------|---|---|--------|---|---|
| Conflicting Flow All | 2638 | 3576 | 840 | 2737 | 3576 | 938 | 1679 | 0 | 0 | 1875 | 0 | 0 |
| Stage 1 | 1690 | 1690 | - | 1886 | 1886 | - | - | - | - | - | - | - |
| Stage 2 | 948 | 1886 | - | 851 | 1690 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | 6.94 | 6.5 | 6.54 | 6.9 | 4.1 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.5 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.5 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | 3.32 | 3 | 4.02 | 3.3 | 2.2 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 11 | 5 | 309 | 22 | 5 | 269 | 387 | - | - | 325 | - | - |
| Stage 1 | 97 | 148 | - | 79 | 118 | - | - | - | - | - | - | - |
| Stage 2 | 280 | 118 | - | 360 | 148 | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 11 | 5 | 309 | 22 | 5 | 269 | 387 | - | - | 325 | - | - |
| Mov Cap-2 Maneuver | 11 | 5 | - | 22 | 5 | - | - | - | - | - | - | - |
| Stage 1 | 96 | 146 | - | 78 | 116 | - | - | - | - | - | - | - |
| Stage 2 | 271 | 116 | - | 354 | 146 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-------|----|-----|
| HCM Control Delay, s | 0 | 117.3 | 0 | 0.1 |
| HCM LOS | A | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h) | 387 | - | - | - | 22 | 269 | 325 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | - | - | 0.247 | 0.02 | 0.017 | - | - |
| HCM Control Delay (s) | 14.4 | - | - | 0 | 215.8 | 18.7 | 16.3 | - | - |
| HCM Lane LOS | B | - | - | A | F | C | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.7 | 0.1 | 0.1 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2025 PM Peak
-
-

HCM 2010 Signalized Intersection Summary
 1: Mokulele Hwy & Mehameha Lp North/Kamaaina Rd

9/16/2015

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 25 | 0 | 15 | 145 | 0 | 255 | 15 | 1745 | 45 | 75 | 1700 | 15 |
| Future Volume (veh/h) | 25 | 0 | 15 | 145 | 0 | 255 | 15 | 1745 | 45 | 75 | 1700 | 15 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1900 | 1900 | 1900 | 1532 | 1520 | 1900 | 1863 | 1473 | 1450 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 27 | 0 | 15 | 158 | 0 | 0 | 16 | 1897 | 0 | 82 | 1848 | 13 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 0 | 0 | 25 | 0 | 2 | 29 | 31 | 2 | 0 |
| Cap, veh/h | 208 | 10 | 96 | 232 | 0 | 195 | 30 | 2281 | 807 | 98 | 2473 | 1128 |
| Arrive On Green | 0.15 | 0.00 | 0.15 | 0.15 | 0.00 | 0.00 | 0.02 | 0.64 | 0.00 | 0.07 | 0.70 | 0.70 |
| Sat Flow, veh/h | 1088 | 63 | 639 | 1187 | 0 | 1292 | 1810 | 3539 | 1252 | 1381 | 3539 | 1615 |
| Grp Volume(v), veh/h | 42 | 0 | 0 | 158 | 0 | 0 | 16 | 1897 | 0 | 82 | 1848 | 13 |
| Grp Sat Flow(s),veh/h/ln | 1790 | 0 | 0 | 1187 | 0 | 1292 | 1810 | 1770 | 1252 | 1381 | 1770 | 1615 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 14.7 | 0.0 | 0.0 | 1.2 | 55.2 | 0.0 | 7.9 | 44.2 | 0.3 |
| Cycle Q Clear(g_c), s | 2.7 | 0.0 | 0.0 | 17.4 | 0.0 | 0.0 | 1.2 | 55.2 | 0.0 | 7.9 | 44.2 | 0.3 |
| Prop In Lane | 0.64 | | 0.36 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 314 | 0 | 0 | 232 | 0 | 195 | 30 | 2281 | 807 | 98 | 2473 | 1128 |
| V/C Ratio(X) | 0.13 | 0.00 | 0.00 | 0.68 | 0.00 | 0.00 | 0.53 | 0.83 | 0.00 | 0.84 | 0.75 | 0.01 |
| Avail Cap(c_a), veh/h | 456 | 0 | 0 | 341 | 0 | 317 | 121 | 2281 | 807 | 236 | 2634 | 1202 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.6 | 0.0 | 0.0 | 55.6 | 0.0 | 0.0 | 65.5 | 18.3 | 0.0 | 61.6 | 12.8 | 6.1 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 3.5 | 0.0 | 0.0 | 13.5 | 2.8 | 0.0 | 16.6 | 1.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 0.7 | 27.5 | 0.0 | 3.5 | 21.7 | 0.1 |
| LnGrp Delay(d),s/veh | 49.8 | 0.0 | 0.0 | 59.0 | 0.0 | 0.0 | 79.1 | 21.1 | 0.0 | 78.2 | 13.9 | 6.2 |
| LnGrp LOS | D | | | E | | | E | C | | E | B | A |
| Approach Vol, veh/h | | 42 | | | 158 | | | 1913 | | | 1943 | |
| Approach Delay, s/veh | | 49.8 | | | 59.0 | | | 21.6 | | | 16.6 | |
| Approach LOS | | D | | | E | | | C | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 15.5 | 92.6 | | 26.2 | 8.2 | 99.9 | | 26.2 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 23.0 | 86.0 | | 33.0 | 9.0 | 100.0 | | 33.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 9.9 | 57.2 | | 4.7 | 3.2 | 46.2 | | 19.4 | | | | |
| Green Ext Time (p_c), s | 0.1 | 27.1 | | 1.1 | 0.0 | 47.6 | | 0.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 20.9 | | | | | | | | |
| HCM 2010 LOS | | | | C | | | | | | | | |

HCM 2010 TWSC
2: Mokulele Hwy & Mehamaha Loop S

9/16/2015

| Intersection | | | | | | | | | | | | |
|------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Int Delay, s/veh | 0.5 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Traffic Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1770 | 10 | 5 | 1840 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1770 | 10 | 5 | 1840 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Stop | - | - | Yield | - | - | None |
| Storage Length | - | - | - | - | - | 100 | 525 | - | 425 | 625 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1924 | 11 | 5 | 2000 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|----------------------|--------|------|------|--------|------|------|--------|---|---|--------|---|---|
| Conflicting Flow All | 2984 | 3946 | 1000 | 2946 | 3946 | 962 | 2000 | 0 | 0 | 1924 | 0 | 0 |
| Stage 1 | 2011 | 2011 | - | 1935 | 1935 | - | - | - | - | - | - | - |
| Stage 2 | 973 | 1935 | - | 1011 | 2011 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | 6.94 | 6.5 | 6.54 | 6.94 | 4.14 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | 3.32 | 3 | 4.02 | 3.32 | 2.22 | - | - | 2.22 | - | - |
| Pot Cap-1 Maneuver | 6 | 3 | 241 | 16 | 3 | 256 | 283 | - | - | 303 | - | - |
| Stage 1 | 61 | 102 | - | 72 | 111 | - | - | - | - | - | - | - |
| Stage 2 | 271 | 111 | - | 283 | 102 | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 6 | 3 | 241 | 16 | 3 | 256 | 283 | - | - | 303 | - | - |
| Mov Cap-2 Maneuver | 6 | 3 | - | 16 | 3 | - | - | - | - | - | - | - |
| Stage 1 | 60 | 100 | - | 71 | 109 | - | - | - | - | - | - | - |
| Stage 2 | 261 | 109 | - | 278 | 100 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-------|-----|----|
| HCM Control Delay, s | 0 | 169.3 | 0.1 | 0 |
| HCM LOS | A | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h) | 283 | - | - | - | 16 | 256 | 303 | - | - |
| HCM Lane V/C Ratio | 0.019 | - | - | - | 0.34 | 0.021 | 0.018 | - | - |
| HCM Control Delay (s) | 18 | - | - | 0.3 | 319.1 | 19.4 | 17.1 | - | - |
| HCM Lane LOS | C | - | - | A | F | C | C | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.9 | 0.1 | 0.1 | - | - |



APPENDIX C LEVEL OF SERVICE CALCULATIONS

- Future Year 2025 AM Peak
-

HCM 2010 Signalized Intersection Summary

1: Mokulele Hwy & Mehamaha Lp North/Kamaaina Rd

9/16/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|-------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↗ | ↖ | ↑↑ | ↗ | ↖ | ↑↑ | ↗ |
| Traffic Volume (veh/h) | 5 | 0 | 5 | 45 | 0 | 80 | 5 | 1580 | 205 | 315 | 1520 | 25 |
| Future Volume (veh/h) | 5 | 0 | 5 | 45 | 0 | 80 | 5 | 1580 | 205 | 315 | 1520 | 25 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1900 | 1900 | 1900 | 1557 | 1397 | 1900 | 1863 | 1597 | 1484 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 5 | 0 | 4 | 49 | 0 | 0 | 5 | 1717 | 0 | 342 | 1652 | 24 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 2 | 19 | 28 | 2 | 0 |
| Cap, veh/h | 82 | 12 | 37 | 118 | 0 | 56 | 12 | 1907 | 731 | 370 | 2811 | 1283 |
| Arrive On Green | 0.05 | 0.00 | 0.05 | 0.05 | 0.00 | 0.00 | 0.01 | 0.54 | 0.00 | 0.26 | 0.79 | 0.79 |
| Sat Flow, veh/h | 735 | 251 | 789 | 1208 | 0 | 1188 | 1810 | 3539 | 1357 | 1414 | 3539 | 1615 |
| Grp Volume(v), veh/h | 9 | 0 | 0 | 49 | 0 | 0 | 5 | 1717 | 0 | 342 | 1652 | 24 |
| Grp Sat Flow(s),veh/h/ln | 1776 | 0 | 0 | 1208 | 0 | 1188 | 1810 | 1770 | 1357 | 1414 | 1770 | 1615 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 4.2 | 0.0 | 0.0 | 0.3 | 51.4 | 0.0 | 27.9 | 21.3 | 0.4 |
| Cycle Q Clear(g_c), s | 0.6 | 0.0 | 0.0 | 4.7 | 0.0 | 0.0 | 0.3 | 51.4 | 0.0 | 27.9 | 21.3 | 0.4 |
| Prop In Lane | 0.56 | | 0.44 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 131 | 0 | 0 | 118 | 0 | 56 | 12 | 1907 | 731 | 370 | 2811 | 1283 |
| V/C Ratio(X) | 0.07 | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.43 | 0.90 | 0.00 | 0.92 | 0.59 | 0.02 |
| Avail Cap(c_a), veh/h | 482 | 0 | 0 | 391 | 0 | 331 | 214 | 1916 | 735 | 658 | 3143 | 1434 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.9 | 0.0 | 0.0 | 55.9 | 0.0 | 0.0 | 58.5 | 24.4 | 0.0 | 42.5 | 4.7 | 2.5 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 23.3 | 6.3 | 0.0 | 11.1 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 0.2 | 26.7 | 0.0 | 12.0 | 10.2 | 0.2 |
| LnGrp Delay(d),s/veh | 54.2 | 0.0 | 0.0 | 58.2 | 0.0 | 0.0 | 81.9 | 30.7 | 0.0 | 53.6 | 4.9 | 2.5 |
| LnGrp LOS | D | | | E | | | F | C | | D | A | A |
| Approach Vol, veh/h | | 9 | | | 49 | | | 1722 | | | 2018 | |
| Approach Delay, s/veh | | 54.2 | | | 58.2 | | | 30.9 | | | 13.1 | |
| Approach LOS | | D | | | E | | | C | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 37.0 | 69.7 | | 11.6 | 6.8 | 99.9 | | 11.6 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 55.0 | 64.0 | | 33.0 | 14.0 | 105.0 | | 33.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 29.9 | 53.4 | | 2.6 | 2.3 | 23.3 | | 6.7 | | | | |
| Green Ext Time (p_c), s | 1.1 | 10.3 | | 0.3 | 0.0 | 68.6 | | 0.2 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 21.9 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |

HCM 2010 TWSC
 2: Mehamaha Loop S & Mokulele Hwy

9/16/2015

| Intersection | | | | | | | | | | | | |
|------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Int Delay, s/veh | 0.4 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Traffic Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1775 | 5 | 5 | 1555 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1775 | 5 | 5 | 1555 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Stop | - | - | Yield | - | - | None |
| Storage Length | - | - | - | - | - | 100 | 525 | - | 425 | 625 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1929 | 5 | 5 | 1690 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|----------------------|--------|------|------|--------|------|-----|--------|---|---|--------|---|---|
| Conflicting Flow All | 2677 | 3641 | 845 | 2796 | 3641 | 965 | 1690 | 0 | 0 | 1929 | 0 | 0 |
| Stage 1 | 1701 | 1701 | - | 1940 | 1940 | - | - | - | - | - | - | - |
| Stage 2 | 976 | 1940 | - | 856 | 1701 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | 6.94 | 6.5 | 6.54 | 6.9 | 4.1 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.5 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.5 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | 3.32 | 3 | 4.02 | 3.3 | 2.2 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 11 | 5 | 306 | 20 | 5 | 259 | 383 | - | - | 310 | - | - |
| Stage 1 | 95 | 146 | - | 73 | 111 | - | - | - | - | - | - | - |
| Stage 2 | 270 | 111 | - | 358 | 146 | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 11 | 5 | 306 | 20 | 5 | 259 | 383 | - | - | 310 | - | - |
| Mov Cap-2 Maneuver | 11 | 5 | - | 20 | 5 | - | - | - | - | - | - | - |
| Stage 1 | 94 | 144 | - | 72 | 110 | - | - | - | - | - | - | - |
| Stage 2 | 261 | 110 | - | 352 | 144 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-------|----|-----|
| HCM Control Delay, s | 0 | 130.7 | 0 | 0.1 |
| HCM LOS | A | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h) | 383 | - | - | - | 20 | 259 | 310 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | - | - | 0.272 | 0.021 | 0.018 | - | - |
| HCM Control Delay (s) | 14.5 | - | - | 0 | 242.2 | 19.2 | 16.8 | - | - |
| HCM Lane LOS | B | - | - | A | F | C | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.8 | 0.1 | 0.1 | - | - |

HCM 2010 TWSC
 3: Project Main Drwy & Kamaaina Rd

9/16/2015

Intersection

Int Delay, s/veh 0.4

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h | 420 | 105 | 0 | 105 | 20 | 0 |
| Future Vol, veh/h | 420 | 105 | 0 | 105 | 20 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 16 | 0 | 0 | 35 | 0 | 0 |
| Mvmt Flow | 457 | 114 | 0 | 114 | 22 | 0 |

| Major/Minor | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0 | 0 | 571 |
| Stage 1 | - | - | 514 |
| Stage 2 | - | - | 114 |
| Critical Hdwy | - | 4.1 | 6.4 |
| Critical Hdwy Stg 1 | - | - | 5.4 |
| Critical Hdwy Stg 2 | - | - | 5.4 |
| Follow-up Hdwy | - | 2.2 | 3.5 |
| Pot Cap-1 Maneuver | - | 1012 | 450 |
| Stage 1 | - | - | 605 |
| Stage 2 | - | - | 916 |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 1012 | 450 |
| Mov Cap-2 Maneuver | - | - | 450 |
| Stage 1 | - | - | 605 |
| Stage 2 | - | - | 916 |

| Approach | EB | WB | NB |
|----------------------|----|----|------|
| HCM Control Delay, s | 0 | 0 | 13.4 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|-----------------------|-------|-----|-----|------|-----|
| Capacity (veh/h) | 450 | - | - | 1012 | - |
| HCM Lane V/C Ratio | 0.048 | - | - | - | - |
| HCM Control Delay (s) | 13.4 | - | - | 0 | - |
| HCM Lane LOS | B | - | - | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 0 | - |

HCM 2010 TWSC
 4: S Firebreak Rd & Project Maintenance Drwy

9/16/2015

| Intersection | |
|------------------|-----|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h | 5 | 0 | 0 | 100 | 415 | 5 |
| Future Vol, veh/h | 5 | 0 | 0 | 100 | 415 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 100 | 0 | 0 | 38 | 17 | 100 |
| Mvmt Flow | 5 | 0 | 0 | 109 | 451 | 5 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 563 | 454 | 457 0 |
| Stage 1 | 454 | - | - |
| Stage 2 | 109 | - | - |
| Critical Hdwy | 7.4 | 6.2 | 4.1 - |
| Critical Hdwy Stg 1 | 6.4 | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - |
| Follow-up Hdwy | 4.4 | 3.3 | 2.2 - |
| Pot Cap-1 Maneuver | 356 | 610 | 1114 - |
| Stage 1 | 476 | - | - |
| Stage 2 | 720 | - | - |
| Platoon blocked, % | | | - |
| Mov Cap-1 Maneuver | 356 | 610 | 1114 - |
| Mov Cap-2 Maneuver | 356 | - | - |
| Stage 1 | 476 | - | - |
| Stage 2 | 720 | - | - |

| Approach | EB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 15.3 | 0 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h) | 1114 | - | 356 | - | - |
| HCM Lane V/C Ratio | - | - | 0.015 | - | - |
| HCM Control Delay (s) | 0 | - | 15.3 | - | - |
| HCM Lane LOS | A | - | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2025 PM Peak
-
-

HCM 2010 Signalized Intersection Summary
 1: Mokulele Hwy & Mehameha Lp North/Kamaaina Rd

9/16/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|-------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↗ | ↖ | ↗ | ↖ | ↖ | ↗ | ↗ |
| Traffic Volume (veh/h) | 25 | 0 | 15 | 190 | 0 | 300 | 15 | 1745 | 60 | 90 | 1700 | 15 |
| Future Volume (veh/h) | 25 | 0 | 15 | 190 | 0 | 300 | 15 | 1745 | 60 | 90 | 1700 | 15 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1900 | 1900 | 1900 | 1610 | 1570 | 1900 | 1863 | 1557 | 1496 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 27 | 0 | 15 | 207 | 0 | 0 | 16 | 1897 | 0 | 98 | 1848 | 13 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 0 | 0 | 21 | 0 | 2 | 22 | 27 | 2 | 0 |
| Cap, veh/h | 245 | 9 | 118 | 278 | 0 | 245 | 30 | 2147 | 803 | 116 | 2377 | 1085 |
| Arrive On Green | 0.18 | 0.00 | 0.18 | 0.18 | 0.00 | 0.00 | 0.02 | 0.61 | 0.00 | 0.08 | 0.67 | 0.67 |
| Sat Flow, veh/h | 1108 | 50 | 643 | 1239 | 0 | 1335 | 1810 | 3539 | 1324 | 1425 | 3539 | 1615 |
| Grp Volume(v), veh/h | 42 | 0 | 0 | 207 | 0 | 0 | 16 | 1897 | 0 | 98 | 1848 | 13 |
| Grp Sat Flow(s),veh/h/ln | 1801 | 0 | 0 | 1239 | 0 | 1335 | 1810 | 1770 | 1324 | 1425 | 1770 | 1615 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 20.2 | 0.0 | 0.0 | 1.2 | 63.7 | 0.0 | 9.5 | 50.3 | 0.4 |
| Cycle Q Clear(g_c), s | 2.7 | 0.0 | 0.0 | 22.9 | 0.0 | 0.0 | 1.2 | 63.7 | 0.0 | 9.5 | 50.3 | 0.4 |
| Prop In Lane | 0.64 | | 0.36 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 372 | 0 | 0 | 278 | 0 | 245 | 30 | 2147 | 803 | 116 | 2377 | 1085 |
| V/C Ratio(X) | 0.11 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.53 | 0.88 | 0.00 | 0.84 | 0.78 | 0.01 |
| Avail Cap(c_a), veh/h | 450 | 0 | 0 | 341 | 0 | 314 | 90 | 2147 | 803 | 275 | 2576 | 1175 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.8 | 0.0 | 0.0 | 55.8 | 0.0 | 0.0 | 68.4 | 23.4 | 0.0 | 63.5 | 15.8 | 7.6 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 6.8 | 0.0 | 0.0 | 14.0 | 4.8 | 0.0 | 14.9 | 1.5 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 0.0 | 8.4 | 0.0 | 0.0 | 0.7 | 32.2 | 0.0 | 4.2 | 24.9 | 0.2 |
| LnGrp Delay(d),s/veh | 48.0 | 0.0 | 0.0 | 62.5 | 0.0 | 0.0 | 82.4 | 28.1 | 0.0 | 78.4 | 17.3 | 7.6 |
| LnGrp LOS | D | | | E | | | F | C | | E | B | A |
| Approach Vol, veh/h | | 42 | | | 207 | | | 1913 | | | 1959 | |
| Approach Delay, s/veh | | 48.0 | | | 62.5 | | | 28.6 | | | 20.2 | |
| Approach LOS | | D | | | E | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 17.4 | 91.0 | | 31.7 | 8.3 | 100.1 | | 31.7 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 27.0 | 82.0 | | 33.0 | 7.0 | 102.0 | | 33.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 11.5 | 65.7 | | 4.7 | 3.2 | 52.3 | | 24.9 | | | | |
| Green Ext Time (p_c), s | 0.2 | 15.7 | | 1.5 | 0.0 | 41.9 | | 0.8 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 26.5 | | | | | | | | |
| HCM 2010 LOS | | | | C | | | | | | | | |

HCM 2010 TWSC
 2: Mehameha Loop S & Mokulele Hwy

9/16/2015

Intersection

Int Delay, s/veh 0.5

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| Traffic Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1785 | 10 | 5 | 1880 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1785 | 10 | 5 | 1880 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Stop | - | - | Yield | - | - | None |
| Storage Length | - | - | - | - | - | 100 | 525 | - | 425 | 625 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 1940 | 11 | 5 | 2043 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|----------------------|--------|------|------|--------|------|------|--------|---|---|--------|---|---|
| Conflicting Flow All | 3035 | 4005 | 1022 | 2984 | 4005 | 970 | 2043 | 0 | 0 | 1940 | 0 | 0 |
| Stage 1 | 2054 | 2054 | - | 1951 | 1951 | - | - | - | - | - | - | - |
| Stage 2 | 981 | 1951 | - | 1033 | 2054 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.54 | 6.54 | 6.94 | 6.5 | 6.54 | 6.94 | 4.14 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.54 | 5.54 | - | 6.54 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 4.02 | 3.32 | 3 | 4.02 | 3.32 | 2.22 | - | - | 2.22 | - | - |
| Pot Cap-1 Maneuver | 6 | 3 | 233 | 15 | 3 | 253 | 272 | - | - | 299 | - | - |
| Stage 1 | 57 | 97 | - | 70 | 109 | - | - | - | - | - | - | - |
| Stage 2 | 268 | 109 | - | 274 | 97 | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 6 | 3 | 233 | 15 | 3 | 253 | 272 | - | - | 299 | - | - |
| Mov Cap-2 Maneuver | 6 | 3 | - | 15 | 3 | - | - | - | - | - | - | - |
| Stage 1 | 56 | 95 | - | 69 | 107 | - | - | - | - | - | - | - |
| Stage 2 | 257 | 107 | - | 269 | 95 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-------|-----|----|
| HCM Control Delay, s | 0 | 182.7 | 0.1 | 0 |
| HCM LOS | A | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|-----------------------|------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h) | 272 | - | - | - | 15 | 253 | 299 | - | - |
| HCM Lane V/C Ratio | 0.02 | - | - | - | 0.362 | 0.021 | 0.018 | - | - |
| HCM Control Delay (s) | 18.5 | - | - | 0 | 345.9 | 19.5 | 17.3 | - | - |
| HCM Lane LOS | C | - | - | A | F | C | C | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1 | 0.1 | 0.1 | - | - |

HCM 2010 TWSC
 3: Project Main Drwy & Kamaaina Rd

9/16/2015

Intersection

Int Delay, s/veh 2

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h | 115 | 35 | 0 | 400 | 90 | 0 |
| Future Vol, veh/h | 115 | 35 | 0 | 400 | 90 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 30 | 0 | 0 | 24 | 0 | 0 |
| Mvmt Flow | 125 | 38 | 0 | 435 | 98 | 0 |

| Major/Minor | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0 | 0 | 163 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | - | 4.1 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | - | 2.2 |
| Pot Cap-1 Maneuver | - | - | 1428 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | - | 1428 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | WB | NB |
|----------------------|----|----|------|
| HCM Control Delay, s | 0 | 0 | 14.4 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|-----------------------|-------|-----|-----|------|-----|
| Capacity (veh/h) | 481 | - | - | 1428 | - |
| HCM Lane V/C Ratio | 0.203 | - | - | - | - |
| HCM Control Delay (s) | 14.4 | - | - | 0 | - |
| HCM Lane LOS | B | - | - | A | - |
| HCM 95th %tile Q(veh) | 0.8 | - | - | 0 | - |

Intersection

Int Delay, s/veh 0.1

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h | 5 | 0 | 0 | 400 | 120 | 5 |
| Future Vol, veh/h | 5 | 0 | 0 | 400 | 120 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 100 | 0 | 0 | 25 | 33 | 100 |
| Mvmt Flow | 5 | 0 | 0 | 435 | 130 | 5 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 568 | 133 | 136 0 |
| Stage 1 | 133 | - | - - |
| Stage 2 | 435 | - | - - |
| Critical Hdwy | 7.4 | 6.2 | 4.1 - |
| Critical Hdwy Stg 1 | 6.4 | - | - - |
| Critical Hdwy Stg 2 | 6.4 | - | - - |
| Follow-up Hdwy | 4.4 | 3.3 | 2.2 - |
| Pot Cap-1 Maneuver | 353 | 922 | 1461 - |
| Stage 1 | 700 | - | - - |
| Stage 2 | 487 | - | - - |
| Platoon blocked, % | | | - - |
| Mov Cap-1 Maneuver | 353 | 922 | 1461 - |
| Mov Cap-2 Maneuver | 353 | - | - - |
| Stage 1 | 700 | - | - - |
| Stage 2 | 487 | - | - - |

| Approach | EB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 15.4 | 0 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h) | 1461 | - | 353 | - | - |
| HCM Lane V/C Ratio | - | - | 0.015 | - | - |
| HCM Control Delay (s) | 0 | - | 15.4 | - | - |
| HCM Lane LOS | A | - | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0 | - | - |

APPENDIX G.

Preliminary Engineering and Drainage Report

PRELIMINARY ENGINEERING AND DRAINAGE REPORT FOR DIVISION OF FORESTRY AND WILDLIFE BASEYARD AT PULEHUNUI

Pulehunui, Maui, Hawai'i

January 18, 2016

Prepared for:

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**PRELIMINARY ENGINEERING AND
DRAINAGE REPORT FOR
DIVISION OF FORESTY AND WILDLIFE
BASEYARD AT PULEHUNUI
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**PRELIMINARY ENGINEERING AND DRAINAGE REPORT
FOR
DIVISION OF FORESTRY AND WILDLIFE
BASEYARD AT PULEHUNUI**

I. INTRODUCTION

The purpose of this report is to provide an overview of the preliminary civil engineering and drainage design related to the Division of Forestry and Wildlife (DOFAW) Baseyard at Pulehunui. This report evaluates the existing site conditions and presents proposed drainage, water, wastewater, roadway, and other related site improvements.

II. PROPOSED PROJECT

A. LOCATION

The proposed DOFAW Baseyard is located in Pulehunui, Maui, Hawaii on a portion of Tax Map Key (TMK): (2) 3-8-008:001. The project area comprises approximately 20.29 acres and is bordered by Kamaaina Road to the north; South Firebreak Road to the east; and sugar cane fields to the south and west. The project site is located approximately a half mile east of Mokulele Highway and is roughly three (3) miles north of the Mokulele Highway/ Piilani Highway intersection. The project area is owned by the Department of Land and Natural Resources (DLNR). (See Exhibit 1, Location and Vicinity Map, and Exhibit 2, General Site Plan and TMK Map.)

B. PROJECT DESCRIPTION

DOFAW currently has a baseyard on Kuleana Street in Kahului. However, the existing facility does not meet DOFAW's existing and anticipated future needs due to the size of the baseyard and the fact that thirty percent of the

site is located within the tsunami evacuation zone. Therefore, DOFAW is pursuing development of the proposed baseyard in Pulehunui. The proposed location for the baseyard offers a relatively large area (20.29 acres) that meets DOFAW's current spatial needs, and also provides room for future expansion. The baseyard will be developed over two phases, as summarized below:

Phase 1 (Completed in 2020, subject to funding):

- Parking for employees and the public (116 spaces)
- Office Building: one story with offices, a public meeting space, a gym, shower and locker room (25,455 square feet (sf))
- Nursery (2 acres)
- Fueling Station
- Heavy equipment parking (10,000 sf)
- Wash Bay
- Auto Maintenance Shop (2,400 sf)
- Warehouse (20,000 sf)

Phase 2 (Completed in 2025, subject to funding):

- Parking for employees and the public (60 additional spaces)
- Wildlife Lab (5,000 sf)
- Nursery (2 acres) - relocated
- Nursery Office/Greenhouse (5,000 sf)
- Dryland Forest Restoration Area (4 acres)
- Helicopter Operations Landing Zone
- Equipment Yard
- Warehouses (10,000 sf expansion of existing and potential 15,000 sf new warehouse)
- Heavy equipment parking (5,200 sf expansion)

- Auto Maintenance Shop (1,200 sf expansion)
- Dozer and Staging Area
- Training Field (at location of Phase 1 nursery)

Vehicular access will be provided via a main entry off of the existing Kamaaina Road and a secondary maintenance entry off of the existing South Firebreak Road. (See Exhibit 3A, Site Plan - Phase 1, and Exhibit 3B, Site Plan – Phases 1 and 2.)

The DOFAW Baseyard at Pulehunui is located within the larger Pulehunui Master Plan area of approximately 285 acres that the DLNR's Land Division is in the process of planning for development. The Pulehunui Master Plan will provide for small, medium, and large industrial and commercial lots for businesses, government agencies, and nonprofit organizations. Since the entire Pulehunui Master Plan is a longer-term planning effort, DLNR is seeking to proceed with the new DOFAW Baseyard ahead of the larger master plan.

III. EXISTING CONDITIONS

A. TOPOGRAPHY AND SOIL CONDITIONS

The project area is undeveloped and was formally used for sugar cane cultivation. The majority of the groundcover is made up of thick sugar cane residuals with the exception of a few areas of bare soil. As you get closer to the north and west boundaries of the project site, the groundcover becomes more overgrown with weeds and tall grass that overlay two existing berms alongside Kamaaina Road and an irrigation ditch.

The project site generally slopes in a westerly direction toward Mokulele Highway, with an average slope of one to two percent. Elevations range from approximately 123 to 143 feet mean sea level (msl).

The soil types found in the proposed project area include Ewa Silty Clay Loam (EaA) and Ewa Cobbly Silty Clay Loam (EcA and EcB). (See Exhibit 4, Soils Map.)

The Ewa Soil Series (EaA, EcA, EcB) consists of well-drained soils that are found in basins and on alluvial fans. The soils developed in alluvium derived from basic igneous rock and are typically used for sugarcane, truck crops, and pasture. The natural vegetation generally consists of finergrass, kiawe, koa haole, klu, and uhaloa. On this soil, runoff is typically very slow and the erosion hazard is no more than slight. The Hydrologic Soil Group is “B” and the Saturated Hydraulic Conductivity (Ksat) is 1.3 inches per hour.

Soil classifications and descriptions are taken from the Natural Resources Conservation Service publication, *Soil Survey of the Islands of Kauai, Oahu, Molokai, Maui, and Lanai* as well as the online Web Soil Survey.

B. CLIMATE AND RAINFALL

Pulehunui’s climate is relatively uniform and sunny throughout the year, with temperatures varying from a low of 63 degrees to a high of 87 degrees Fahrenheit. Pulehunui is generally exposed to prevailing tradewinds coming from the northeast. The tradewinds occur mainly through the dry season months of May through September. Rainy season months of October through April often produce stronger wind conditions, varying from prevailing tradewinds to southerly winds known as “Kona winds”. The climate is arid with an average annual rainfall of around 13.6 inches. The 50-year, 1-hour rainfall is 2.35 inches and the 50-year, 24-hour rainfall is 7.8 inches.

C. INFRASTRUCTURE

1. Roadways and Electrical

As mentioned previously, Kamaaina Road runs along the northern edge of the project and South Firebreak Road runs along the eastern edge. Both roadways are rural in character with no curbs or sidewalks. They are asphalt cement (a.c.) paved in the vicinity of the project and are between 24 and 28 feet wide. The site can be accessed from either Kamaaina Road or South Firebreak Road.

The project site itself contains two existing dirt cane haul roads that were used to provide access to the sugar cane crops in years past.

Existing utility poles and overhead lines run along Kamaaina Road and South Firebreak road within an electrical easement. There are currently no structures or electrical facilities within the project site.

2. Drainage

The site slopes generally in a westerly direction towards Mokulele Highway. There are no onsite drainage-ways or stormdrain systems that carry concentrated stormwater runoff. Runoff sheet flows west toward an existing concrete irrigation ditch owned by Alexander & Baldwin, Inc. A slight berm runs along the irrigation ditch, which may keep minor overland runoff from entering the ditch. But the small berm and the irrigation ditch would be exceeded during large storm events and stormwater runoff would continue flowing overland in a westerly direction toward Mokulele Highway.

Upon reaching Mokulele Highway, runoff is collected by a double 24-inch culvert which flows under the highway and then discharges into a ditch that runs along the west side of the highway. The drainage ditch follows Mokulele Highway south for about a mile before diverting away in a southwesterly direction. After it leaves the highway, the ditch crosses agricultural land and continues to its final discharge point at Kealia Pond and Maalaea Bay.

A mauka offsite area east of the project also contributes runoff to the site. This offsite area is currently being used for sugar cane cultivation. Runoff flows off the land, across South Firebreak Road, and into the site.

A berm runs along the site's northern edge and a short portion of the eastern edge. This berm prevents runoff from Kamaaina Road and a small portion of South Firebreak Road from entering the site. Runoff in these areas is forced to flow along the Kamaaina Road shoulder toward Mokulele Highway.

The County of Maui stormwater rules state that drainage areas under 100 acres are to be designed and analyzed for the 10 or 50-year storm. Since the project drainage areas are less than 100 acres, the 50-year storm is used for design of the retention system and comparison of existing and proposed site runoff. The 10-year design storm can be used to design the swale conveyance systems. The results of the existing conditions hydrologic analysis are summarized in Table 1. (See Exhibit 5, Drainage Area Map – Existing Conditions, and see Appendix A for Drainage Calculations.)

Table 1: Existing Conditions, 50-Year Runoff

| Drainage Area | Contributing Area (ac) | Existing Q 50 (cfs) | Flows To |
|----------------------------------|-------------------------------|----------------------------|------------------|
| Drainage Area 1 | 20.291 | 23.74 | Offsite Ag. Land |
| Drainage Area O-1 | 7.634 | 12.50 | Offsite Ag. Land |
| TOTAL TO OFFSITE AG. LAND | 27.925 | 36.24 | |

3. Water

The project area is currently undeveloped and there is no water service to the project site. However, the County of Maui, Department of Water Supply (DWS) has an existing 8-inch cast iron waterline in Kamaaina Road fronting the property.

DWS has two transmission waterlines in the vicinity of the project. These are the 18-inch Kihei Water Development Project (KWDP) waterline and the 36-inch Central Maui Water Transmission System (C.M.W.T.S.) waterline. (See Exhibit 6, Existing Water Map.) There is a 12-inch waterline connected to the 36-inch C.M.W.T.S. waterline near the north end of Mehamaha Loop where there is a pressure reducing valve (PRV) to reduce the pressure within the 12-inch waterline. The 12-inch waterline extends to the northern intersection of Mokulele Highway and

Mehameha Loop. The 8-inch cast iron waterline in Kamaaina Road connects to this 12-inch waterline at this northern intersection, and traverses approximately 2,800 feet eastward along Kamaaina Road to the project location.

Within Mokulele Highway, there is an existing 12-inch ductile iron waterline that extends north from Kamaaina Road and a 6-inch cast iron waterline that extends south

The source water for the C.M.W.T.S. is groundwater wells in the Waiehu area, which draw water from the Iao Aquifer. Water is stored in a 1.0 million gallon (MG) reservoir in Waiehu, which has a top elevation of 511 feet mean sea level (msl) and a bottom elevation of 490.75 feet msl. Water from this reservoir flows by gravity to Kihei via the C.M.W.T.S. waterline.

The source water for the 18-inch KWDP is primarily the Mokuahu Wells, which also draw water from the Iao Aquifer. The wells are located at the end of Mokuahu Road, just north of Iao Stream.

4. Wastewater

The project site currently generates no wastewater flow. The County does not have a sewer collection system in the vicinity of the project. Therefore, existing developed lots in the vicinity have their own onsite individual wastewater systems for treatment and disposal of their wastewater.

D. FLOOD ZONE

The project area is not near any floodway and lies within Flood Zone X (unshaded), which are areas determined to be outside the 0.2 percent annual chance floodplain.

Flood zone classifications are based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) numbers 1500030580F and 1500030557F, effective September 19, 2012.

IV. PROPOSED IMPROVEMENTS

A. GRADING PLAN

The proposed grading improvements described herein are based on a preliminary civil engineering evaluation. A more detailed engineering design and analysis will be undertaken during the design phase of the project.

The proposed project will require both excavation and embankment for the construction of the new roadways, parking lots, building pad areas, and the open swale drainage systems. The existing site is lightly sloped and uniformly graded, so the proposed grading and drainage design will not require excessive cuts or fills. The site will be graded to drain to open grass swales with the prevailing slope toward Mokulele Highway. Excavations and embankments will have a maximum slope of two feet horizontal to one foot vertical. No retaining walls are planned to be used.

B. DRAINAGE PLAN

The drainage design for the project will be based on the planned Phase 2 development (ultimate conditions) of the project site. The proposed retention basin will be built to full capacity in Phase 1.

The proposed project will contain several un-attached buildings, including an office building, wildlife lab, nursery office and greenhouse, warehouses, and an auto maintenance shop. The site will also contain paved access drives and parking areas, concrete pads for the fueling station and wash bay, and a covered equipment parking garage. Nearly half of the project site will remain as open space area, being used as a training field, nursery, and dryland forest reserve. The large amount of open space area will help lessen the project's impact on stormwater runoff.

Runoff will be collected by open swales or culvert stormdrain systems and will be routed to a retention basin located on the western side of the project site. (See Exhibit 7, Drainage Area Map – Proposed Conditions) A description of the individual drainage areas follows:

DA 1: Drainage Area 1 is 20.291 acres and includes the entire project site. Runoff will be collected by onsite open swales and conveyed to a retention basin located on the western side of the site. Retention Basin 1 will have a storage capacity of 2.3 acre-feet (ac-ft), which is enough to fully retain the 50-year, 1-hour runoff volume. Full retention of the design storm is desired because a future roadway may be planned for construction immediately downstream of the site. While the pond will have no outflow for the 50-year, 1-hour storm, an emergency overflow spillway will be provided in case larger storms occur. In the future when the roadway is built makai of the retention basins, a storm drain inlet headwall will collect overflows and convey them within the future roadway storm drain system.

DA O-1: Drainage Area O-1 is 7.634 acres and consists of a portion of the cane fields east of the project site as well as a portion of South Firebreak Road. Runoff from this area will be collected by an onsite interceptor swale located on the eastern side of the site. The swale will divert the offsite runoff in a southerly direction away from the site. The swale has a temporary endpoint which is planned to be continued in the future as part of the Department of Land and Natural Resources subdivision. In the interim conditions, the swale will act as a mini-retention basin, filling to elevation 137, before releasing runoff to the cane fields south of the site. Runoff leaving the swale will flow overland toward Mokulele Highway, similarly to existing conditions.

The proposed conditions runoff is summarized in Table 2.

Table 2: Proposed Conditions, 50-Year Runoff

| Drainage Area | Contributing Area (ac) | Existing Q 50 (cfs) | Flows To |
|----------------------------------|------------------------|---------------------|-----------------------------|
| Drainage Area 1 | 20.291 | 51.13 | Basin 1 (Retained) |
| Drainage Area O-1 | 7.634 | 12.50 | Offsite Ag. Land |
| TOTAL TO OFFSITE AG. LAND | | 12.50 | (23.74 cfs Decrease) |

Note: Proposed Conditions is based on the planned Phase 2 development (ultimate conditions) of the project site.

As shown in Table 2, the retention of the proposed site runoff results in an overall net decrease in runoff of 23.74 cfs. Therefore, the Maui Storm Drainage requirement of having no increase in stormwater runoff from existing to proposed conditions is met. (See Appendix A for Drainage Calculations.)

C. RUNOFF WATER QUALITY

In addition to reducing peak flow rates, the proposed stormwater management system will provide water quality treatment to reduce the discharge of pollutants to the maximum extent practicable. The goal will be to provide appropriate water quality treatment for 90 percent of the average annual rainfall. Instead of just managing the infrequent peak storm events, treatment will also be targeted at the more common smaller storms.

The project will incorporate the following stormwater Best Management Practices (BMPs) for runoff water quality:

Grass Swales

Surface stormwater runoff from developed areas will sheet flow to grass swales and landscaped areas. The grasses and other vegetation provide natural filtration while allowing percolation into the underlying soil.

The use of grass swales rather than a storm drain collection system also increases the runoff time of concentration.

Open Space/ Reduced Impervious Coverage

Approximately 48 percent of the developed project site will be reserved as open space and will be maintained with grass or other native vegetative cover. Reducing impervious coverage where possible promotes infiltration and maintains the natural hydrologic cycle.

Stormwater Retention/ Infiltration

The entire water quality design volume will be retained in the proposed retention basin. The potential pollutants will be prevented from flowing to downstream areas such as the existing irrigations ditches and cane fields. Stormwater will be held for an extended period allowing suspended solids to settle out. Water will infiltrate into the soils gradually over 24 to 48 hours and recharge groundwater. The project site will contain industrial uses such as an equipment maintenance shop and fueling station. Runoff from these areas will be filtered by the grass swales prior to retention and infiltration at the basin. Runoff and wastewater from the wash bay will be routed to an onsite septic tank, which is discussed further in Section F.

Vegetated Filter Strips

There are several areas on the proposed site where stormwater runoff will sheet flow through and across open space areas. Filtering and percolation occur as the widely dispersed runoff flows over the grass or vegetated area.

The preliminary Maui County Form B (Site Specific BMP Plan) and the applicable standard BMP maintenance checklists are included in the appendix of this report. The checklists specify the requirements for removing accumulated sediments and debris, maintaining vegetation, and performing regular inspections so that the water quality BMPs operate effectively into the future. See Appendix A for the water quality calculations and the maintenance checklists.

D. EROSION CONTROL PLAN

Temporary erosion control measures will be incorporated during the construction period to minimize soil loss and erosion hazards. Temporary Best Management Practices will include diversion berms and swales, silt fences, dust fences, check dams, slope protection, stabilized construction entrances and truck wash-down areas. Periodic water spraying on loose soils will take place to minimize airborne dirt particles from reaching adjacent properties. An application for a National Pollution Discharge Elimination System (NPDES) permit for discharges during construction will be submitted to the State Department of Health for review and approval.

At the end of construction, all disturbed areas of the site will be permanently stabilized. Permanent sediment control measures, such as those listed in the previous “Runoff Water Quality” section” will be used once construction is completed.

E. WATER SYSTEM PLAN

Based on preliminary coordination with the County of Maui, Department of Water Supply (DWS), it is anticipated that the project can connect to DWS’s nearby water system to supply water for potable (domestic), non-potable, and fire suppression purposes. However, if DWS determines that there is not adequate storage in their existing reservoirs for the DOFAW project, then an on-site fire storage tank would be required. This on-site fire storage system is discussed further in Section E.3.

DWS indicated that water requirements for the larger DLNR Pulehunui Master Plan will be assessed further as information pertaining to that project becomes available and that additional infrastructure improvement requirements may be necessary as the project moves forward.

1. Water Demand

The estimated water demands for Phase 1 and Phase 2 of the project were determined based on the DWS’s Water System Standards, dated 2002 (WSS). The demand of 140 gallons/1,000 square feet (sf) for

the buildings is based on the WSS for “Commercial/Industrial Mix”, which includes irrigation demand. The demand of 5,000 gallons per acre for the nursery is based on the WSS for “Agriculture”, and the demand of 1,700 gallons per acre for the training field is based on the WSS for “Schools, Parks”. Table 3 shows the projected water demands.

Table 3: Projected DOFAW Water Demands

| Land Use Designation | Land Area (acres) | Building Area (sf) | Average Day Unit Demand (gpd/1000 sf) | Average Daily Demand (gpd) | Maximum Day Demand (gpd) |
|--------------------------------------------------------|-------------------|--------------------|---------------------------------------|----------------------------|--------------------------|
| Phase 1 | | | | | |
| Office Building, including gym, shower and locker room | | 25,455 | 140 | 3,564 | 5,346 |
| Warehouse | | 20,000 | 140 | 2,800 | 4,200 |
| Auto Shop | | 2,400 | 140 | 336 | 504 |
| Nursery | 2.0 | | 5,000 | 10,000 | 15,000 |
| Phase 1 Total | | | | 16,700 | 25,000 |
| Phase 2 | | | | | |
| Training Field | 1.3 | | 1,700 | 2,210 | 3,315 |
| Wildlife Lab | | 5,000 | 140 | 700 | 1,050 |
| Nursery Office/ Greenhouse | | 5,000 | 140 | 700 | 1,050 |
| Auto Shop Expansion | | 1,200 | 140 | 168 | 252 |
| Warehouse Expansion | | 10,000 | 140 | 1,400 | 2,100 |
| Warehouse New | | 15,000 | 140 | 2,100 | 3,150 |
| Wash Bay* | | 2,400 | | 300 | 300 |
| Phase 2 Total | | | | 7,600 | 11,200 |
| Total – Phase 1 and Phase 2 | | | | 24,300 | 36,200 |

*Water demand for Wash Bay based on the assumption that 5 cars will be washed per day using 60 gallons per wash.

2. Water System

DWS’s existing transmission and distribution lines will be utilized, to the extent possible, to convey water needed for the project. Service to the project site would be provided by connecting to either the existing 8-inch cast iron waterline in Kamaaina Road or a new 12-inch ductile iron

waterline that would replace the existing 8-inch waterline. (See Exhibit 8, Proposed Water and Wastewater Systems.)

Due to the relatively large size of the project site, it is expected that a separate fire line with fire hydrants will be required within the site to provide fire protection for the structures within the site. A double-detector check assembly within a meter box will be required for the fire line, and fire hydrants will be installed at a maximum of 250 foot intervals within the site.

Normally, the fire flow requirement for this project, based on the WSS of “light industry”, would be 2,000 gallons per minute (gpm) for two hours. However, DWS has indicated that the Fire Prevention Bureau (FPB) can impose a lesser fire flow requirement, which would be based on factors such as type of construction and building size. If the FPB imposes a lesser requirement, the project would comply with the FPB’s requirement.

In a letter dated October 19, 2015, the FPB stated the following:

“The fire flow for your proposed building will be 3,000 gpm for your office building and 3,750 gpm for your proposed warehouse building. This fire flow is based on type III construction type building with no sprinklers. If fire sprinklers will be provided for these buildings, the fire flow will be set at 1,000 gpm (reduce 75%).”

DOFAW has indicated that fire sprinkler systems will be installed for the Office Building and Warehouse. Therefore, the fire system will be sized to provide for a fire flow of 1,000 gpm plus the flow for the sprinkler system. The combined flow is expected to be approximately 1,500 gpm.

The WSS state that for fire lines, the maximum velocity within the fire line shall be 13 feet per second (fps). At a fire flow of 1,500 gpm, the velocity in an 8-inch line would be about 9.6 fps, which is significantly less than the maximum allowable velocity of 13 fps. Either 8-inch or 12-inch fire lines, or a combination of both, would be installed for the project.

The sizing of the fire lines is dependent on the pressure in the existing system, which is not available at this time. Further analysis of the fire system will be undertaken as part of the detailed engineering design process for this project.

A separate on-site distribution system will be required for the domestic and irrigation demands. The on-site waterlines will be sized to provide water for domestic and irrigation purposes. Near the connection the existing 8-inch waterline, a water meter within a meter box, followed by a reduced pressure backflow preventer, will be required for the domestic/irrigation system.

Further analysis of the water transmission and on-site distribution system will be undertaken as part of the detailed engineering design process for this project.

As mentioned previously, the project site is located within the larger Pulehunui Master Plan area of approximately 285 acres that the DLNR's Land Division is in the process of planning for development. Since the entire Pulehunui Master Plan is a longer-term planning effort, DLNR is seeking water service for just this project ahead of the larger master plan. Water source, storage, and distribution and transmission systems will be explored separately for the Pulehunui Master Plan.

3. On-site Fire Storage Tank (If Required by DWS)

If DWS determines that they do not have enough fire protection storage capacity within their existing system for the DOFAW project, then a storage tank and fire pump system would be required for fire protection.

The fire water storage tank would need to be sized to provide for the fire flow of 1,000 gpm plus the flow for the sprinkler system over a period of two hours. The combined flow is expected to be approximately 1,500 gpm, which results in a storage requirement of 180,000 gallons. The height of the tank is expected to be between 16 feet and 21 feet.

The fire storage tank would be filled using the on-site domestic water system. The intent would be for the storage tank to supply the entire amount of water required to fight the fire, such that the domestic system would not be used to fight a fire. After a fire, the tank would then be filled again using the domestic system.

Water would be pumped from the fire storage tank into the fire distribution system using a fire pump. The fire pump system is expected to be a package system that would include a skid-mounted fire pump with diesel engine, a jockey pump, fuel tank, electrical controls, and all associated piping within a pre-fabricated metal enclosure. The enclosure would be located within the warehouse a short distance from the fire storage tank. The enclosure is expected to be approximately 12 feet wide by 16 feet long by 10 feet high.

F. WASTEWATER SYSTEM

1. General

Since there is no existing wastewater collection system within the vicinity of the project site, Individual Wastewater Systems (IWSs) will be constructed onsite to treat the wastewater generated by the project. The IWSs would be septic tank and leaching field systems.

The project site is located below the Underground Injection Control Line, below which leaching fields are generally allowed. (See Exhibit 9, Underground Injection Control Map) The leaching fields would not be located within 1,000 feet of any existing drinking water wells. Therefore, it is anticipated that the Department of Health will allow the use of IWSs for the project.

Further analysis of the wastewater system will be undertaken as part of the detailed engineering design process for this project. Soils tests will be required for the final design of the IWSs and an application for the IWSs will need to be submitted to DOH.

2. Wastewater System

The Department of Health's (DOH's) Hawaii Administrative Rules (HAR), Title 11, Chapter 62, entitled "Wastewater Systems", includes rules regarding the use and disposal of wastewater and wastewater sludge from wastewater systems, including IWSs. Chapter 62, Subchapter 3, Section 31.1 states the following:

(2) Developments involving buildings other than dwellings:

- A. There shall be 10,000 square feet of usable land area for each individual wastewater system. Usable land area shall not include the area under buildings;
- B. The total wastewater flow of the development shall not exceed 15,000 gallons per day;
- C. Area of the lot shall not be less than 10,000 square feet except for lots created and recorded before August 30, 1991. For lots less than 10,000 square feet which were created and recorded before August 30, 1991, only one individual wastewater system shall be allowed; and
- D. The total wastewater flow into each individual wastewater system shall not exceed one thousand gallons per day.

3. Wastewater Flows

The expected number of day-time workers at the project site is approximately 80 employees. Based on the County of Maui, Wastewater Reclamation Division, Wastewater Flow Standards, 2006, the wastewater contribution for an Industrial Shop (warehouse) worker is 25 gallons per day (gpd) per capita (gpcd). The wastewater contribution for an Office Building worker is 20 gpcd. An assumption was made that there would be approximately 60 office workers and 20 warehouse workers. Therefore, the anticipated average daily wastewater flow for the office

workers would be 1,200 gpd and 500 gpd for the warehouse workers. (See Appendix B, Wastewater Calculations)

In addition, there will be wastewater flows from the gym, showers and locker areas within the Office Building. Per Chapter 11-62, Appendix F, Table 1, the wastewater per person for “Swimming pools and bathhouses” is 10 gpd. An assumption was made that a maximum of 20 people per day would be using the gym and showers, which results in a wastewater flow of 200 gpd.

There will also be wastewater generated from the washing of vehicles at the Wash Bay. The anticipated wastewater contribution from the Wash Bay is estimated to be 300 gpd, which is based on the washing of 5 vehicles per day, with each wash using 60 gallons.

The total anticipated wastewater flow is expected to be approximately 2,200 gpd, which is more than twice the 1,000 gpd that is allowed to be treated by a single septic tank. Therefore, the recommendation is to utilize multiple IWSs. DOH requires that each IWS be an independent system with all of its components separate from any other wastewater system.

4. Septic Tanks

Septic Tank 1: This tank would treat the wastewater from approximately half of the Office Building and the gym and showers – with a combined flow of approximately 800 gpd. The recommendation is to use a 1,000-gallon septic tank.

Septic Tank 2: This tank would treat the wastewater from the other half of the Office Building. After Phase 2 is constructed, wastewater generated by the Wildlife Lab, and the Nursery Office/Greenhouse would also be conveyed to Septic Tank 2. The combined flow would be approximately 600 gpd, thus the recommendation is to use a 750-gallon septic tank.

Septic Tank 3: This tank would treat the 300 gallons of wastewater from the Wash Bay. The recommendation is to use a 500-gallon septic tank. Although the flows are relatively small from the Wash Bay, it is recommended that a separate septic tank be utilized, since there will likely be chemicals in the wash water. Also, the wastewater from the Wash Bay is expected to be variable, depending on the wash schedule of the vehicles, and have a different chemical composition than the wastewater from the office areas. Pre-treatment of the wash water prior to discharge into the septic tank may be required.

Septic Tank 4: This tank would treat the 500 gallons of wastewater from the Warehouse and the Auto Shop. The recommendation is to use a 750-gallon septic tank. Pre-treatment to help remove chemicals from the wastewater generated from washdown of the buildings areas may be required.

5. Leaching Fields

The soil at the site has a percolation rate of approximately 47 minutes per inch, based on information obtained from the Web Soil Survey, National Cooperative Soil Survey. Per Chapter 11-62, Appendix F, Table III, for a percolation rate of 47 minutes per inch, the required absorption area for 200 gallons of septic tank effluent is 304 square feet (sf). The size of the leaching fields will vary for each septic tank. (Refer to Appendix B for sizes of leaching fields.) The leaching field would likely be comprised of trenches. According to DOH, the maximum size of each trench would be 3 feet wide by 100 feet long. The leaching fields would be located in the Dryland Forest area. (Refer to Exhibit 8, Proposed Water and Wastewater Systems)

V. CONCLUSION

The proposed improvements for this project will be designed in accordance with the applicable rules and regulations of the County of Maui and the State of Hawaii. The Department of Public Works (DPW) Storm Drainage Rules require mitigation of the

increase in stormwater runoff between the pre and post-development conditions. The DOFAW Baseyard at Pulehunui project will reduce and manage stormwater runoff to meet the DPW requirements. Erosion control and water quality measures will be provided to minimize pollution during and after construction. The project will also comply with the County's recently adopted "Rules for the Design of Storm Water Treatment Best Management Practices".

It is anticipated that the project's water system will connect to DWS's nearby water system which will supply water for potable, non-potable and fire protection purposes. An onsite fire storage tank will be required. Also, new fire lines and domestic waterlines will be required within the site to service the proposed project facilities. The project will comply with the County of Maui's Water System Standards and the Fire Prevention Bureau's requirements.

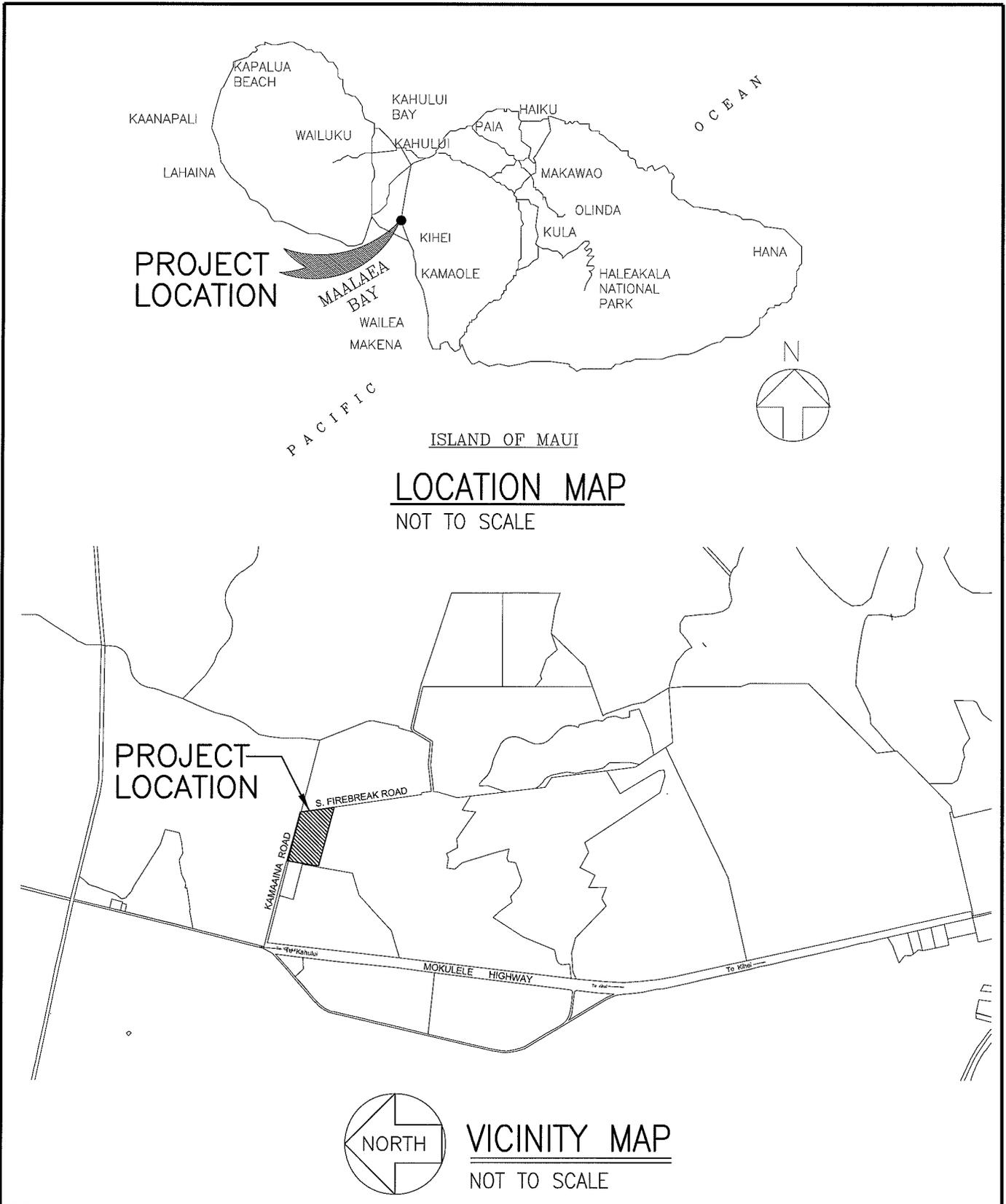
Multiple individual wastewater systems (IWSs), which include septic tanks and leaching fields, will be utilized to treat and dispose of the wastewater generated onsite. The IWSs will not be located within 1,000 feet of any existing drinking water well. Also, the construction and discharge from the IWSs will not affect any public trust or Native Hawaiian resources or the exercise of traditional cultural practices in the vicinity. The IWSs will be designed, constructed and operated in accordance with DOH's Chapter 11-62 regulations.

Based on the information presented in this report, this project will have no adverse effects on the existing facilities or on the surrounding environment.

REFERENCES:

1. Department of Public Works & Waste Management, County of Maui. (November, 1995). *Rules for the Design of Storm Drainage Facilities in the County of Maui*, Title MC-15, Subtitle 01, Chapter 4.
2. Department of Public Works & Waste Management, County of Maui. (November 9, 2012). *Rules for the Design of Storm Water Treatment Best Management Practices*, Title MC-15, Subtitle 01, Chapter 111.
3. County of Maui, Wastewater Reclamation Division. (February 2006). *Wastewater Flow Standards*.
4. Water System Standards, State of Hawaii, 2002.
5. Department of Health, Hawaii Administrative Rules (HAR), Title 11, Chapter 62, "Wastewater Systems" (January 14, 2004)
6. Design Standards, Division of Wastewater Management, Vol. 1, February 1984.
7. USDA, Natural Resources Conservation Service (formerly Soil Conservation Service) in Cooperation with the University of Hawaii Agricultural Experiment Station. (August, 1972). *Soil Survey of Island of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*.
8. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 03/09/2015.
9. Federal Emergency Management Agency. (September 19, 2012). *Flood and Insurance Rate Map, Maui County, Hawaii*. Map Numbers: 1500030580F and 1500030557F.
10. National Oceanic and Atmospheric Administration, National Weather Service. NOAA Precipitation Data Server. Available online at: http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_hi.html, Accessed 05/07/2012.
11. Giambelluca TW, Chen Q, Frazier AG, Price JP, Chen Y-L, Chu P-S, Eischeid J., and Delparte, D. 2011. The Rainfall Atlas of Hawaii. Available online at <http://rainfall.geography.hawaii.edu>. Accessed 04/16/2015.
12. Sato & Associates, Inc. (March 2000). *Pre-Final Drainage Report for Pulehunui Avenue/ Mokulele Highway Widening, Federal Aid Project No.: CMAQ-0900(57)*.
13. Sato & Associates, Inc. (June 2005). *Plan Set: Mokulele Highway Widening, Maui Humane Society to Vicinity of Kolaloa Bridge, Federal Aid Project No.: NH-A311(6)R*.

EXHIBITS



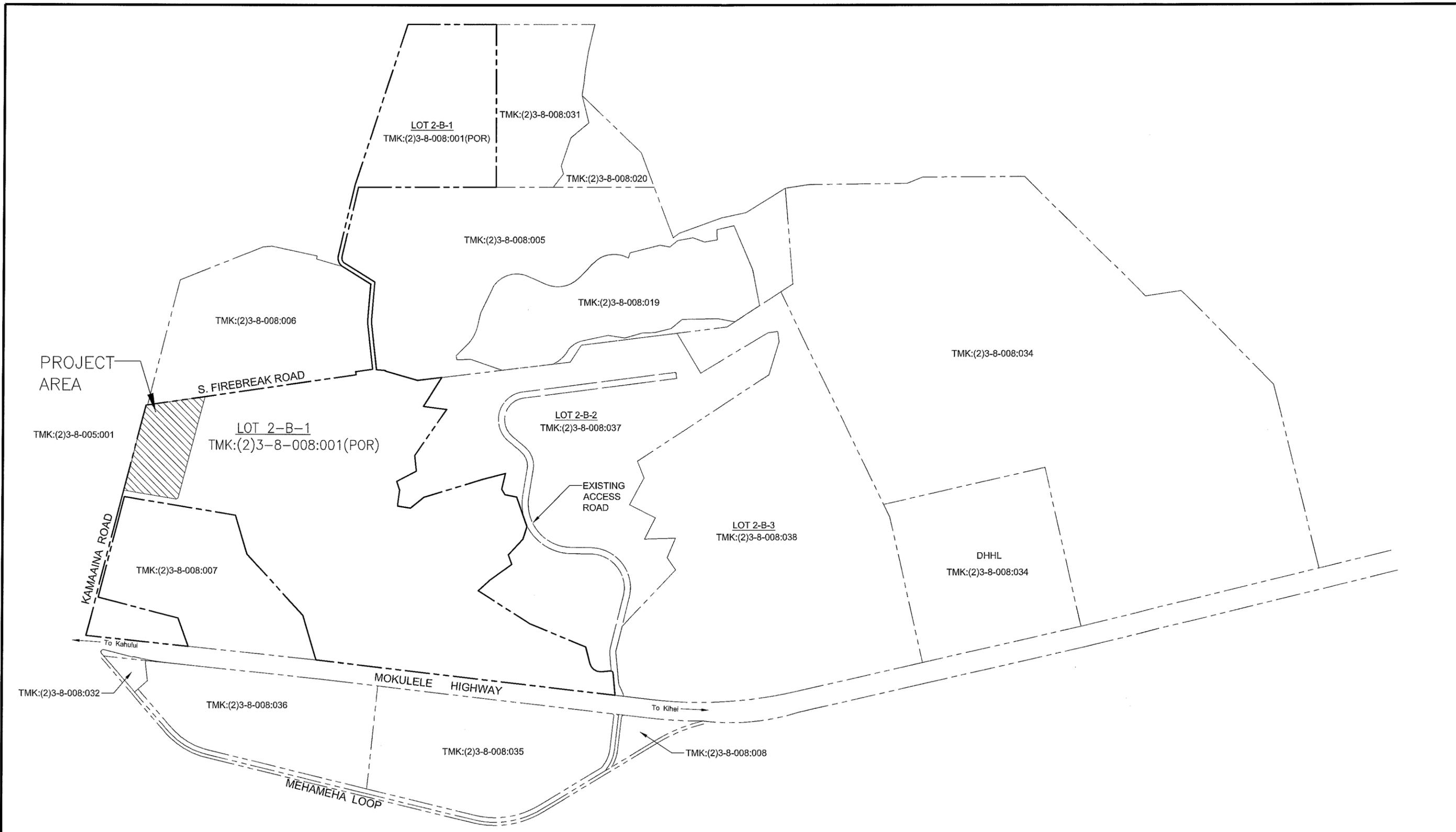
PRELIMINARY ENGINEERING
REPORT AND DRAINAGE STUDY
DIVISION OF FORESTRY AND WILDLIFE
BASEYARD AT PULEHUNUI
PULEHUNUI, MAUI, HAWAII

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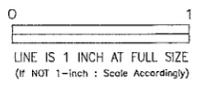
LOCATION AND VICINITY MAP

EXHIBIT

1



SCALE: 1" = 1200'



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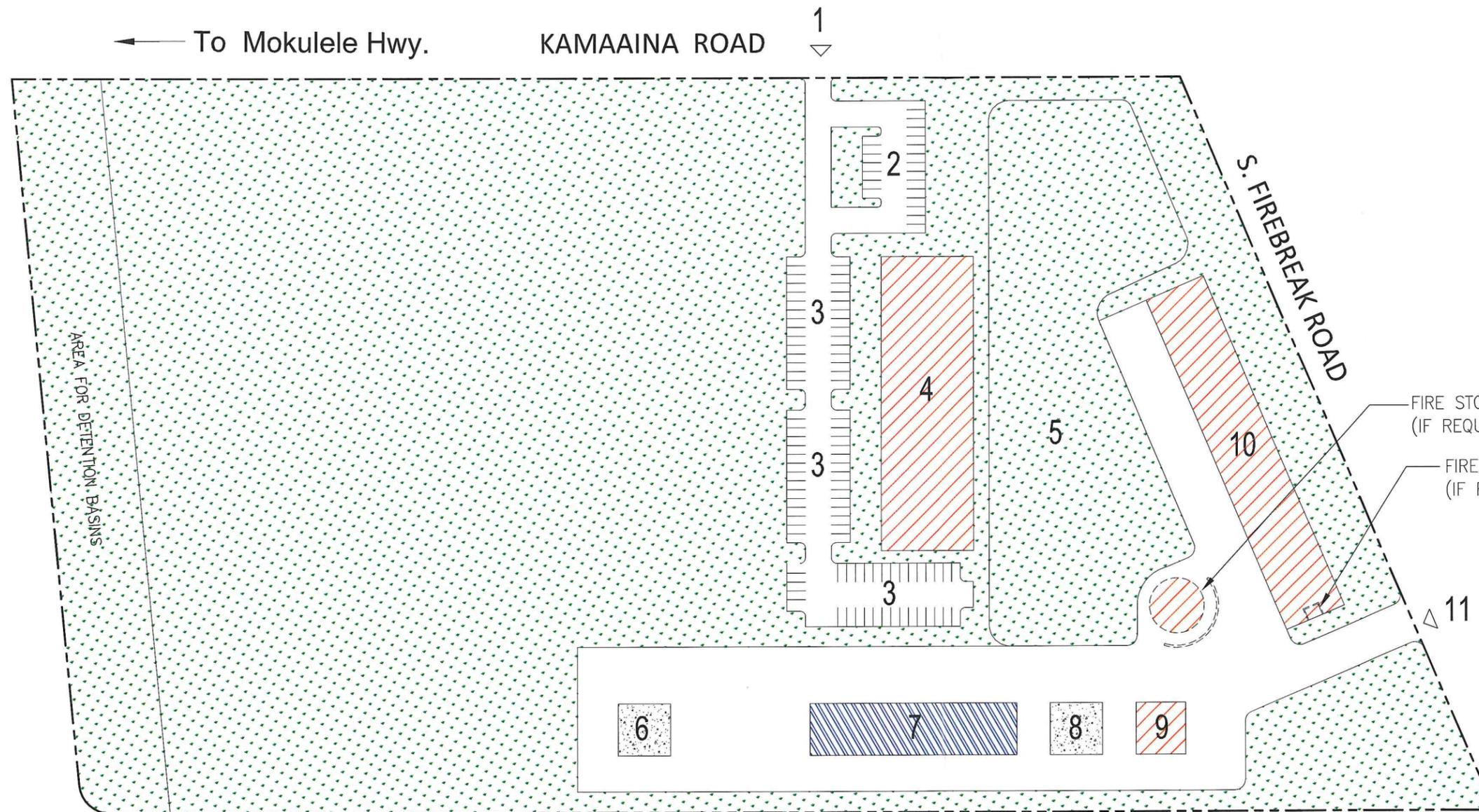
GENERAL SITE PLAN
AND TMK MAP

EXHIBIT

2

PHASE 1

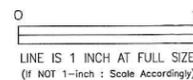
- 1 MAIN ENTRY
- 2 PUBLIC PARKING
- 3 EMPLOYEE PARKING
- 4 ONE STORY OFFICE BUILDING, 25,455 SF
- 5 NURSERY, 2 ACRES
- 6 FUELING STATION
- 7 HEAVY EQUIPMENT PARKING, 10,000 SF
- 8 WASH BAY
- 9 AUTO MAINTENANCE SHOP, 2,400 SF
- 10 WAREHOUSE 20,000 SF
- 11 MAINTENANCE ENTRY



- GRASS/ LANDSCAPE/ NURSERY
- PAVEMENT
- BUILDING/ TANK
- COVERED AREA
- CONCRETE PAD



SCALE: 1" = 120'



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SITE PLAN - PHASE 1

EXHIBIT

3A

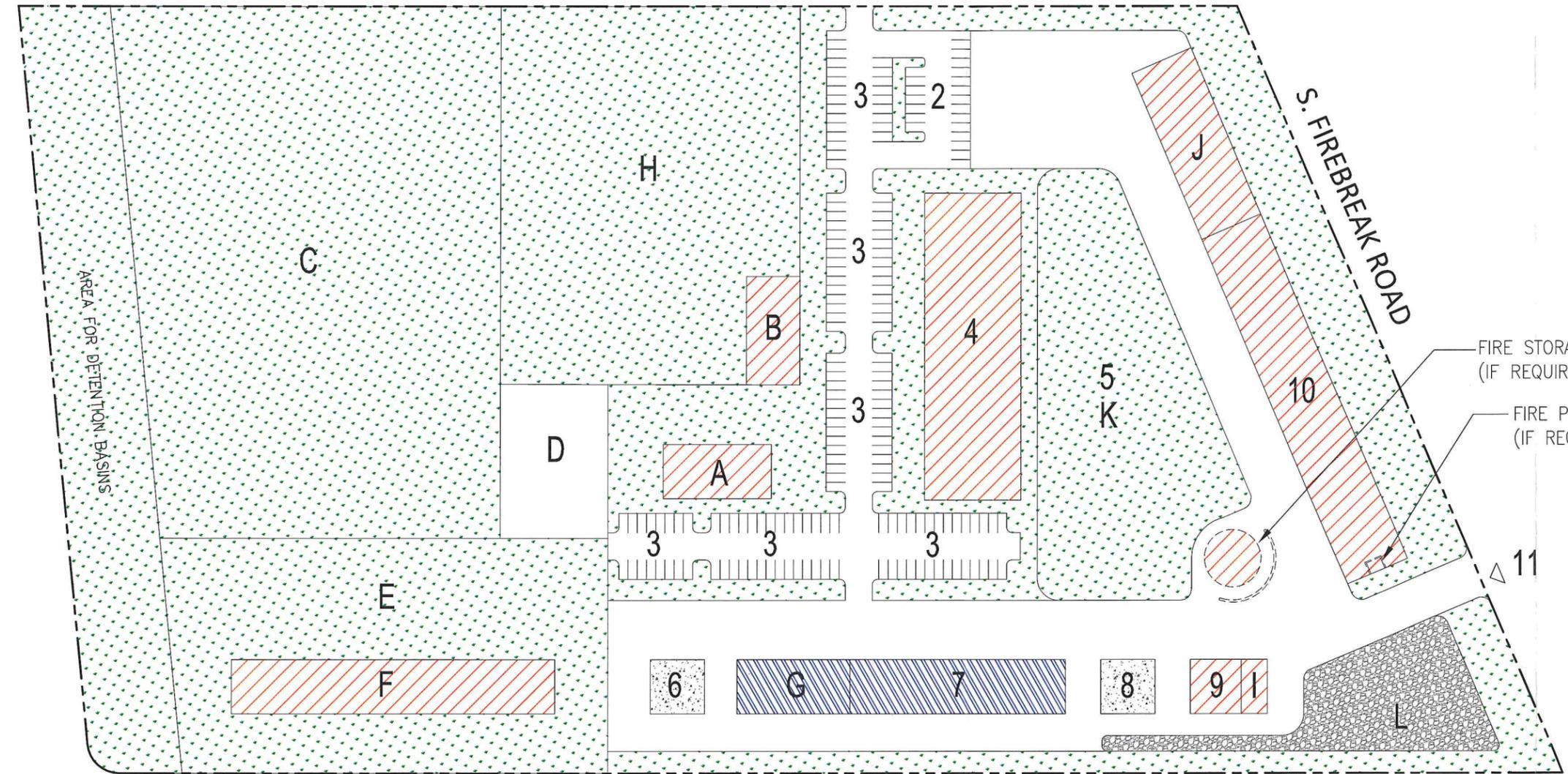
← To Mokulele Hwy.

KAMAAINA ROAD

1
▽

PHASE 1

- 1 MAIN ENTRY
- 2 PUBLIC PARKING
- 3 EMPLOYEE PARKING
- 4 ONE STORY OFFICE BUILDING, 25,455 SF
- 5 NURSERY, 2 ACRES
- 6 FUELING STATION
- 7 HEAVY EQUIPMENT PARKING, 10,000 SF
- 8 WASH BAY
- 9 AUTO MAINTENANCE SHOP, 2,400 SF
- 10 WAREHOUSE 20,000 SF
- 11 MAINTENANCE ENTRY



FIRE STORAGE TANK
(IF REQUIRED BY DWS)

FIRE PUMP ENCLOSURE
(IF REQUIRED BY DWS)

PHASE 2

- A WILDLIFE LAB, 5,000 SF
- B NURSERY OFFICE / GREENHOUSE, 5,000 SF
- C DRYLAND FOREST RESTORATION, 4 ACRES
- D HELICOPTER OPERATIONS LANDING ZONE
- E EQUIPMENT YARD
- F FUTURE WAREHOUSE, 15,000 SF
- G HEAVY EQUIPMENT PARKING, +5,200 SF
- H NURSERY, 2 ACRES
- I AUTO MAINTENANCE SHOP, +1,200 SF
- J WAREHOUSE, +10,000 SF
- K TRAINING FIELD
- L DOZER & STAGING

- GRASS/ LANDSCAPE/ NURSERY
- PAVEMENT
- BUILDING/ TANK
- COVERED AREA
- CONCRETE PAD
- GRAVEL AREA



SCALE: 1" = 120'



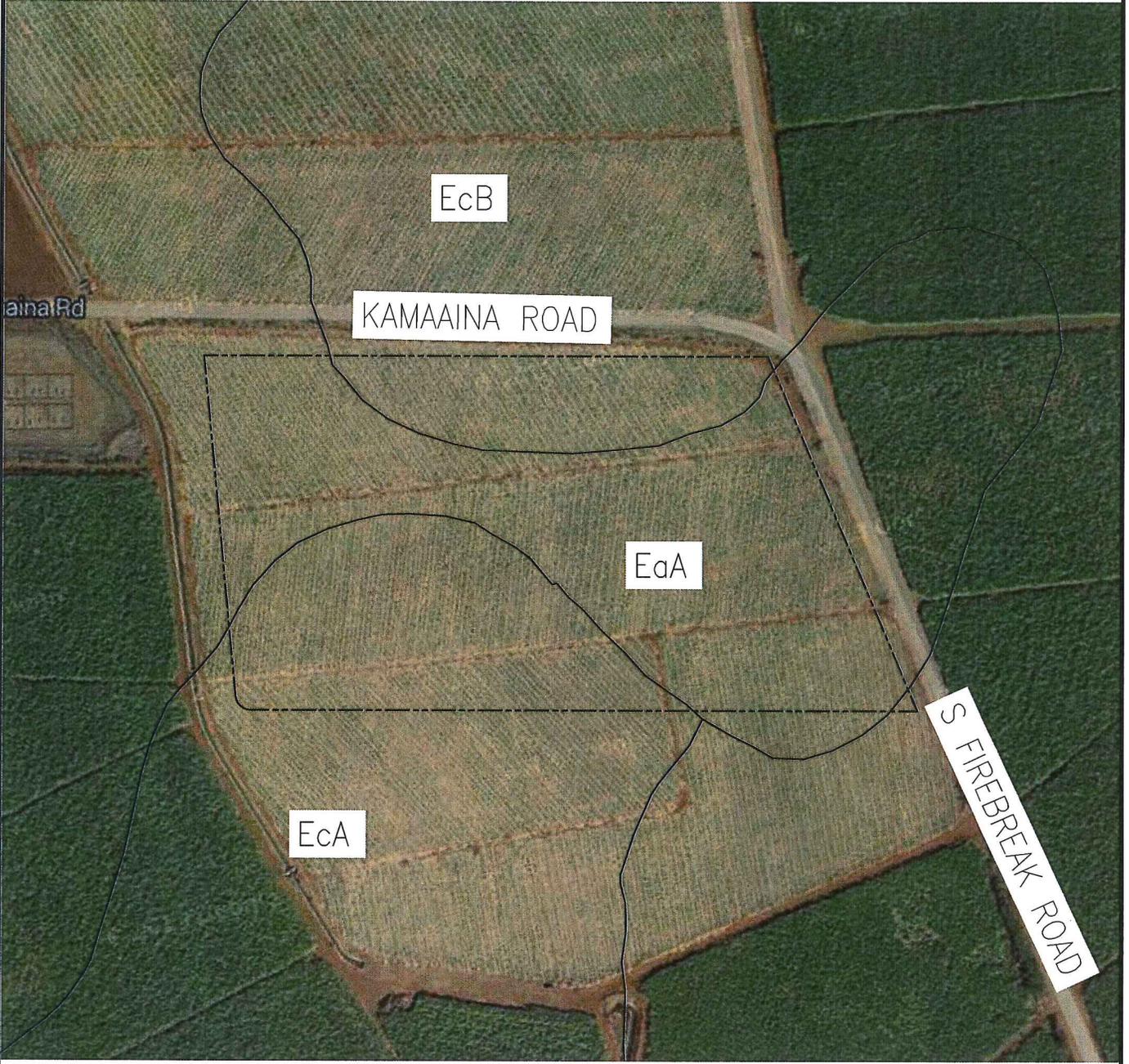
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SITE PLAN - PHASES 1 AND 2

EXHIBIT

3B



SCALE 1" = 300'

REF: NATURAL RESOURCES CONSERVATION SERVICE,
WEB SOIL SURVEY

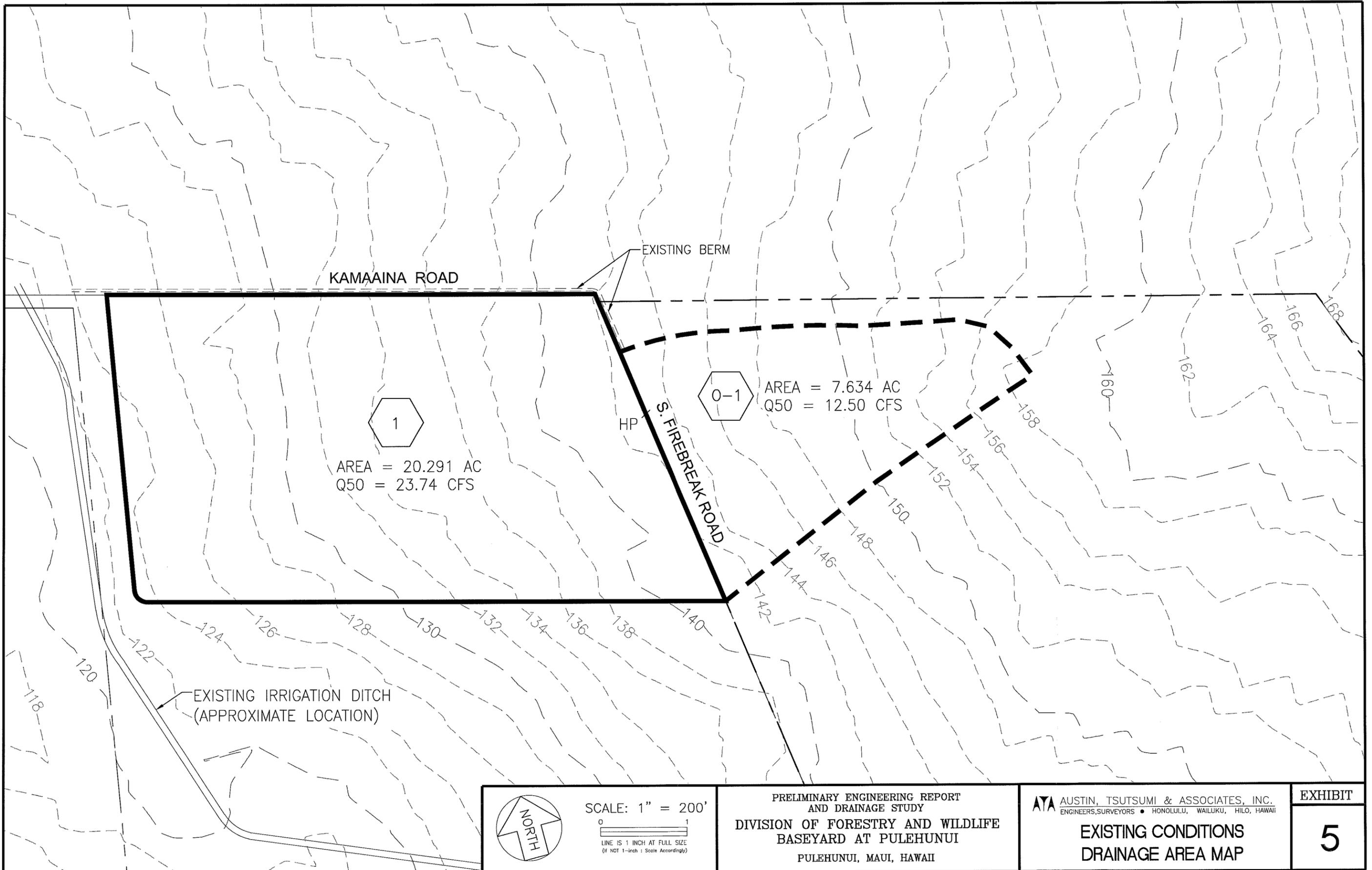
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SOILS MAP

EXHIBIT

4



KAMAAINA ROAD

EXISTING BERM

1

AREA = 20.291 AC
Q50 = 23.74 CFS

HP

O-1

AREA = 7.634 AC
Q50 = 12.50 CFS

S. FIREBREAK ROAD

EXISTING IRRIGATION DITCH
(APPROXIMATE LOCATION)

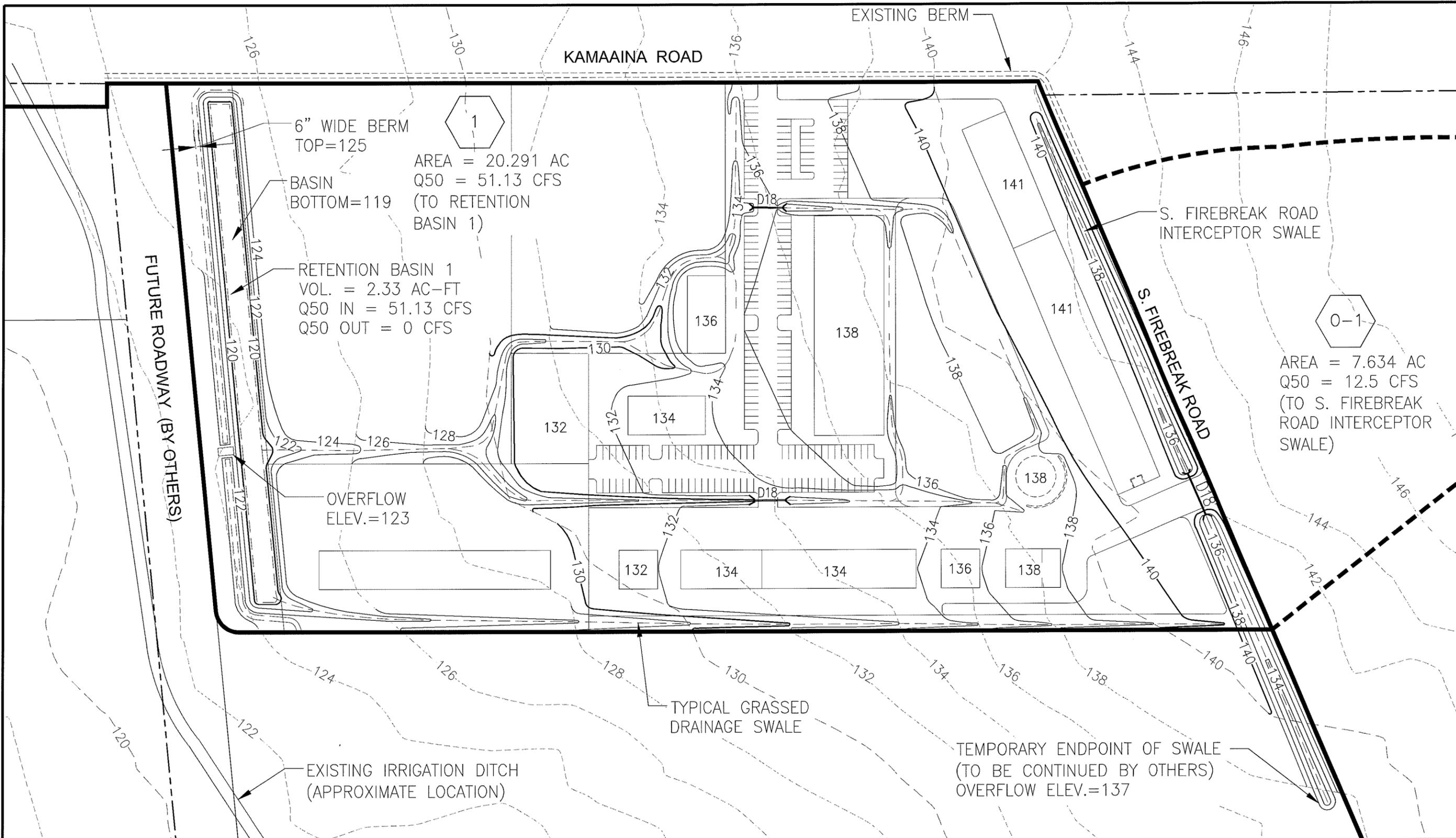


SCALE: 1" = 200'
0 1
LINE IS 1 INCH AT FULL SIZE
(IF NOT 1-INCH : Scale Accordingly)

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EXISTING CONDITIONS
DRAINAGE AREA MAP

EXHIBIT
5

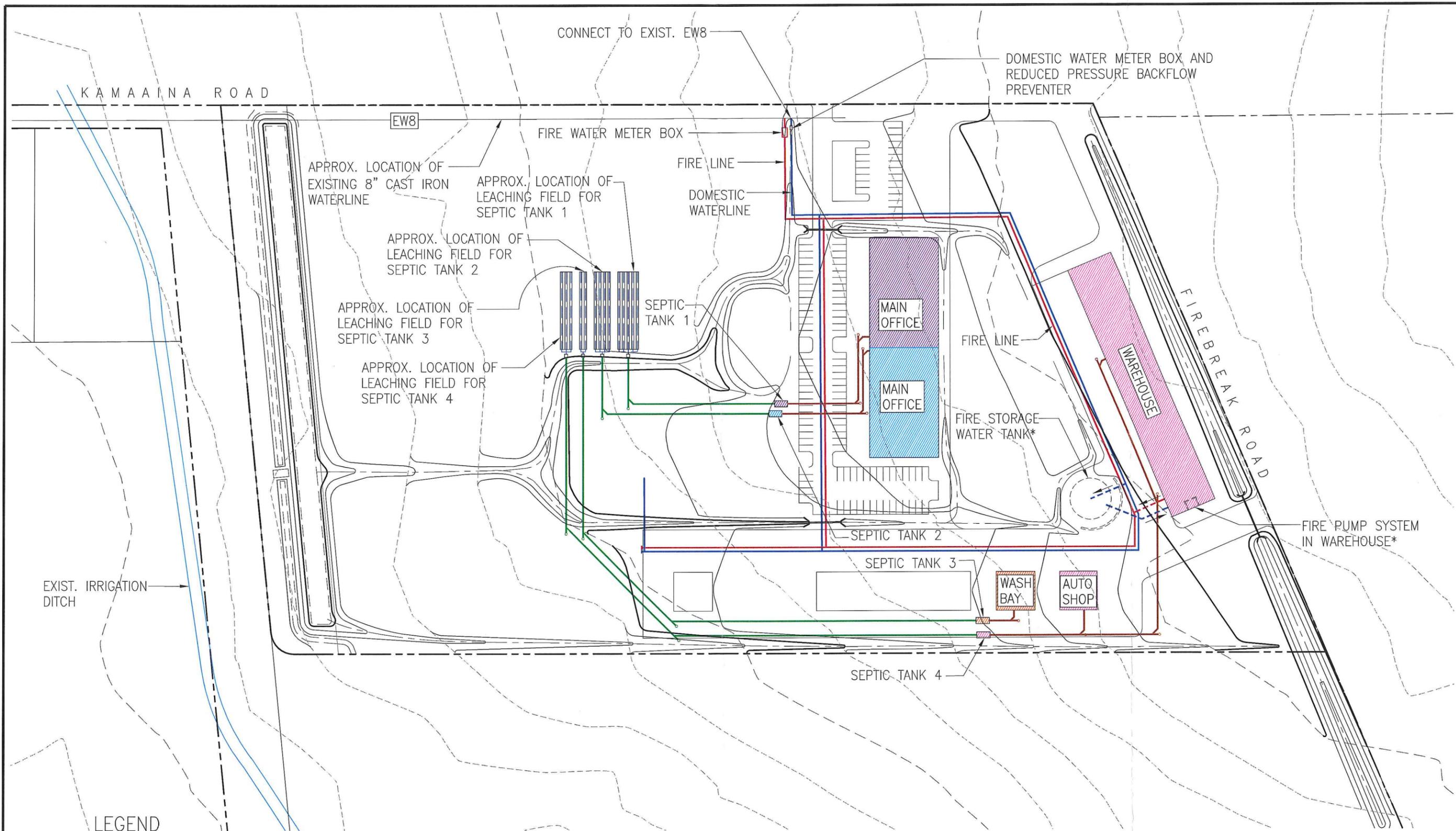


SCALE: 1" = 120'
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 LINE IS 1 INCH AT FULL SIZE
 (IF NOT 1-INCH : Scale Accordingly)

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 PROPOSED CONDITIONS
 DRAINAGE AREA MAP

EXHIBIT
 7



LEGEND

- FIRE LINE
- DOMESTIC LINE
- GRAVITY SEWER LINE
- EFFLUENT LINE
- - - EFFLUENT DISTRIBUTION LINE

*IF REQUIRED BY DWS.



SCALE: 1" = 120'



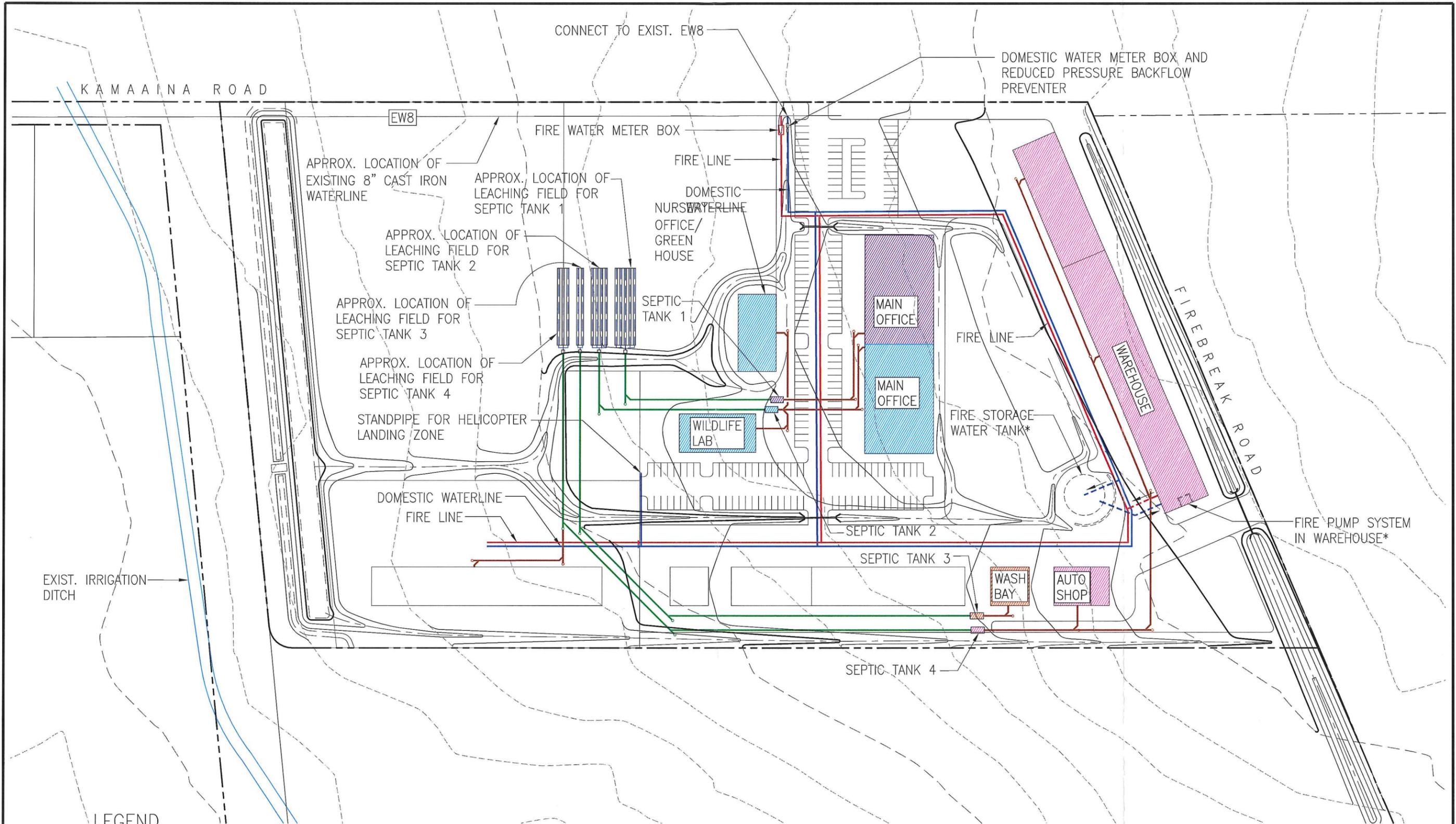
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PROPOSED WATER AND
WASTEWATER SYSTEMS - PHASE 1

EXHIBIT

8A



LEGEND

- FIRE LINE
- DOMESTIC LINE
- GRAVITY SEWER LINE
- EFFLUENT LINE
- EFFLUENT DISTRIBUTION LINE

*IF REQUIRED BY DWS

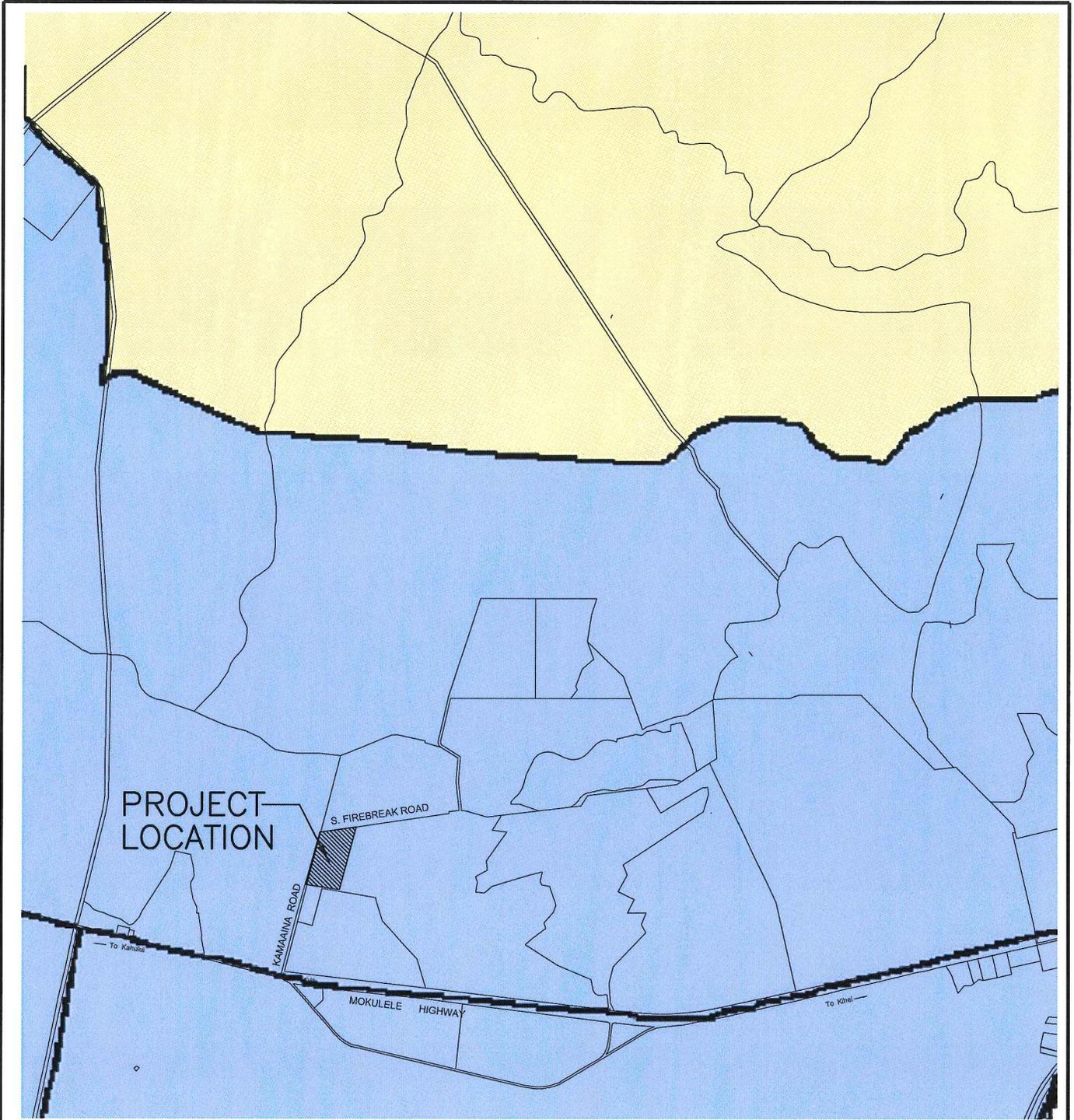


SCALE: 1" = 120'
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 LINE IS 1 INCH AT FULL SIZE
 (IF NOT 1-INCH : Scale Accordingly)

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 DIVISION OF FORESTRY AND WILDLIFE
 BASEYARD AT PULEHUNUI
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 PROPOSED WATER AND WASTEWATER
 SYSTEMS - PHASES 1 AND 2

EXHIBIT
8B



PROJECT
LOCATION

S. FIREBREAK ROAD

KAMAKINA ROAD

MOKULELE HIGHWAY

To Kahala

To Kihel

LEGEND

- AREA ABOVE UIC LINE
- AREA BELOW UIC LINE



UIC MAP
NOT TO SCALE

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**UNDERGROUND INJECTION
CONTROL MAP**

EXHIBIT

9

A P P E N D I C E S

APPENDIX A

Drainage System Preliminary Hydrology Calculations

APPENDIX A

RUNOFF CALCULATIONS EXISTING CONDITIONS

| Drainage Area Label | Drainage Area Description | Area (acres) | Runoff Coeff. | Tc (min) | 50-Yr Design Intensity (in/hr) | 50-Yr, 1-Hr Runoff | |
|----------------------------------|---------------------------|--------------|---------------|----------|--------------------------------|--------------------|---------------|
| | | | | | | Flow (cfs) | Volume (cf) |
| 1 | Onsite Area | 20.291 | 0.30 | 26.5 | 3.90 | 23.74 | 42,732 |
| O-1 | Offsite Area East of Site | 7.634 | 0.39 | 24.0 | 4.20 | 12.50 | 22,500 |
| Total Runoff Leaving Site | | | | | | 36.24 | 65,232 |

- Notes:
1. All drainage areas are less than 100 acres. The Rational Method ($Q = CIA$) is used to determine runoff.
 2. 50-year rainfall is used for design due to the use of retention basins.
 3. Refer to Runoff Coefficient Calculations for determination of "C" value.
 4. Refer to Time of Concentration Calculations for determination of "Tc" value.
 5. Rainfall Intensity obtained from the NOAA Precipitation Frequency Data Server, accessed online at: <http://hdsc.nws.noaa.gov/hdsc/pfds>
 6. Runoff volume determined using triangular Rational Method hydrograph ending at 1-hour. Hydrograph Volume = $(Q \text{ ft}^3/\text{sec}) \times (60 \text{ sec}/\text{min}) \times (60 \text{ min}/\text{hr}) \times (1/2)$

APPENDIX A

RUNOFF CALCULATIONS PROPOSED CONDITIONS

| Drainage Area Label | Area (acres) | Runoff Coeff. | Tc (min) | 50-Yr Design Intensity (in/hr) | 50-Yr, 1-Hr Runoff | | Flows To |
|----------------------------------|--------------|---------------|----------|--------------------------------|--------------------|---------------|---------------------------|
| | | | | | Flow (cfs) | Volume (cf) | |
| 1 | 20.291 | 0.56 | 21.1 | 4.50 | 51.13 | 92,034 | Basin 1 (Retained) |
| O-1 | 7.634 | 0.39 | 24.0 | 4.20 | 12.50 | 22,500 | Interception Swale |
| Total Runoff Leaving Site | | | | | 12.50 | 22,500 | 23.74 cfs Decrease |

- Notes:
1. All drainage areas are less than 100 acres. The Rational Method ($Q = CIA$) is used to determine runoff.
 2. 50-year rainfall is used for design due to the use of retention basins.
 3. Refer to Runoff Coefficient Calculations for determination of "C" value.
 4. Refer to Time of Concentration Calculations for determination of "Tc" value.
 5. Rainfall Intensity obtained from the NOAA Precipitation Frequency Data Server, accessed online at: <http://hdsc.nws.noaa.gov/hdsc/pfds>
 6. Runoff volume determined using triangular Rational Method hydrograph ending at 1-hour. Hydrograph Volume = $(Q \text{ ft}^3/\text{sec}) \times (60 \text{ sec}/\text{min}) \times (60 \text{ min}/\text{hr}) \times (1/2)$
 7. The prop. site runoff will be fully retained in the proposed retention basin.

APPENDIX A

RUNOFF COEFFICIENT CALCULATIONS

| Drainage Area Label | $C_{50} = 0.30$ | | $C_{50} = 0.35$ | | $C_{50} = 0.15$ | | $C_{50} = 0.85$ | | $C_{50} = 0.95$ | | Weighted Avg. Coeff. | |
|----------------------------|--------------------------------------|----------|-----------------|----------|-------------------------|----------|-----------------|----------|---------------------|----------|----------------------|---------------|
| | Ex. Fallow Sugar Cane | | Ex. Sugar Cane | | Prop. Grass/Landscaping | | Dirt/Bare Soil | | Impervious Surfaces | | TOTAL | |
| | Area (sf) | Area (%) | Area (sf) | Area (%) | Area (sf) | Area (%) | Area (sf) | Area (%) | Area (sf) | Area (%) | Area (sf) | Runoff Coeff. |
| Existing Conditions | | | | | | | | | | | | |
| 1 | 88,360 | 100.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 88,360 | 0.30 |
| O-1 | 0 | 0.0 | 356,639 | 92.4 | 0 | 0.0 | 7,497 | 1.9 | 21,664 | 5.6 | 385,800 | 0.39 |
| Proposed Conditions | | | | | | | | | | | | |
| 1 | 0 | 0.0 | 0 | 0.0 | 423,868 | 48.0 | 19,326 | 2.2 | 440,666 | 49.9 | 883,860 | 0.56 |
| O-1 | (No Change, See Existing Conditions) | | | | | | | | | | | |

Surface Type Detailed Descriptions:

- Ex. Fallow Sugar Cane, Fair/Poor Cover, Mild Slopes, HSG B $C = 0.30$
- Ex. Sugar Cane, Partial Cover*, Mild Slopes, HSG B $C = 0.35$
- Prop. Grass/Landscaped Area, Good Cover, Mild Slopes, HSG B $C = 0.15$
- Dirt Roadways or Bare Soil, HSG B $C = 0.85$
- Impervious Surfaces (Pavement, Buildings, Pads, etc) $C = 0.95$

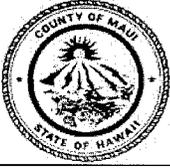
- Note:
1. Partial Cover assumed for sugar cane areas to account for harvested conditions.
 2. Ultimate Phase 2 development conditions assumed for proposed site, including future equipment yard and future 15,000 sf warehouse.

APPENDIX A

TIME OF CONCENTRATION CALCULATIONS

| Drain Area Label | Flow Segment 1 Overland Flow | | | Flow Segment 2 Overland Flow | | | Flow Segment 3 Concentrated Flow | | | Flow Segment 4 Concentrated Flow | | | TOTAL | | | | |
|----------------------------|--------------------------------------|-------------|-----------|---------------------------------|------------|-------------|-------------------------------------|------------|------------|-------------------------------------|-----------|------------|------------|-------------|-----------|------------|------------|
| | Surf. Type | Length (ft) | Slope (%) | Time (min) | Surf. Type | Length (ft) | Slope (%) | Time (min) | Surf. Type | Length (ft) | Slope (%) | Time (min) | Surf. Type | Length (ft) | Slope (%) | Time (min) | Time (min) |
| Existing Conditions | | | | | | | | | | | | | | | | | |
| 1 | Fallow | 1,222 | 1.6 | 26.5 | | | | | | | | | | | | | 26.5 |
| O-1 | Cane | 948 | 1.7 | 24.0 | | | | | | | | | | | | | 24.0 |
| Proposed Conditions | | | | | | | | | | | | | | | | | |
| 1 | Pave | 56 | 1.8 | 1.0 | Grass | 130 | 2.0 | 13.8 | Swale | 1,140 | 1.5 | 6.3 | | | | | 21.1 |
| O-1 | (No Change, See Existing Conditions) | | | | | | | | | | | | | | | | |

- Notes:
1. County of Maui Storm Drain Manual Plate 1 used for the determination of overland flow time.
 2. County of Maui Storm Drain Manual Table 4 and/or Manning's Formula used for the determination of concentrated flow time.
 3. Fallow Sugar Cane and Sugar Cane assumed equivalent to "Poor Grass Surface" in Maui Storm Drain. Manual Plate 1.



FORM B

COUNTY OF MAUI
 DEPARTMENT OF PUBLIC WORKS
 DEVELOPMENT SERVICES ADMINISTRATION
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**STORMWATER RUNOFF
 CONTROL PRACTICES AND
 MAINTENANCE PLAN**

INTRODUCTION

Increases in impervious surfaces associated with development can increase runoff, degrade water quality, and negatively impact streams, coastal waters, and other water bodies. The best way to mitigate these impacts is to treat, infiltrate, or store runoff onsite before it can impact water bodies downstream.

This General Permit allows the permit holder to construct the proposed project, subject to special conditions and requirements to mitigate stormwater impacts due to development.

OWNER/PERMITTEE INFORMATION

| | |
|------------------------|---------------------------------------------------------|
| Project Name: | Division of Forestry and Wildlife Baseyard at Pulehunui |
| Address: | (T B D) |
| Tax Map Key: | (2) 3-8-008: 001 (POR.) |
| Permit No.: | (TBD) |
| Facility Contact Name: | Division of Forestry and Wildlife (Contact Person TBD) |
| Phone Number: | (TBD) |
| E-Mail: | (T B D) |

REQUIRED BEST MANAGEMENT PRACTICES

To the maximum extent feasible, runoff from paved areas and other impervious surfaces, roof drains, and other onsite drainage systems shall not be allowed to directly drain into the street, gutter, storm drain, or drainage ditch, or any stream, creek, or other body of water. Rather runoff shall be directed to vegetated areas, gravel or sand pits, retention ponds, vegetated swale, tree wells, planter areas, porous pavements, or other treatment devices.

TREATMENT CONTROL MEASURES

- | | | |
|-----------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------|
| <input checked="" type="checkbox"/> Detention Basin | <input type="checkbox"/> Bioretention | <input type="checkbox"/> Pre-fabricated Treatment Device |
| <input type="checkbox"/> Infiltration Basin/Trench | <input checked="" type="checkbox"/> Vegetated Swale | <input type="checkbox"/> Porous Pavement |
| <input type="checkbox"/> Sand Filter | <input checked="" type="checkbox"/> Vegetated Filter Strip | <input type="checkbox"/> Subsurface Drainage System |
| <input type="checkbox"/> Other | | |

- Attach appropriate checksheet.
- 8-1/2x11 exhibit showing location and size of the treatment control measure shall be provided.

MAINTENANCE REQUIREMENT

- Property owner shall provide adequate long term maintenance to ensure that all storm water control facilities remain in proper working condition.
- County representatives are authorized to enter the property at reasonable times and in a reasonable manner for the purpose of inspecting the facilities.
- Appropriate maintenance checklists are attached.

OWNER'S CERTIFICATION

- The site shall be developed and maintained in accordance with all provisions of this plan.
- Compliance with the provisions of this plan shall remain as a condition of the associated building permit or subdivision approval in perpetuity and shall run with the land unless otherwise released in writing by the County of Maui.

(Contact Person TBD), Div. of Forestry and Wildlife

Name _____ Signature _____ Date _____

WATER QUALITY CALCULATIONS

Overview:

Stormwater runoff from developed areas can contain water quality degrading pollutants such as suspended solids, hydrocarbons, trace metals, pesticides, phosphorus, nitrogen, and trash and debris. Water quality treatment is provided with the goal to reduce the pollution associated with stormwater runoff from the redevelopment project to the "maximum extent practicable".

Design Criteria:

Reference: Department of Public Works & Waste Management, County of Maui, *Rules for the Design of Storm Water Treatment Best Management Practices*, Title MC-15, Subtitle 01, Chapter 111.

Water Quality BMPs Used:

- Dry Extended Detention Pond (Primary Treatment for Drainage Area 1)
- Vegetated Swales (Secondary Treatment for Drainage Area 1)
- Vegetated Filter Strip (Secondary Treatment for Drainage Area 1)

NOTE: OFFSITE DRAINAGE AREA O-1 IS BYPASSED AND DOESN'T REQUIRE WQ TREATMENT.

Design Calculations- Dry Extended Detention Pond (Drainage Area 1):

1. General Description:

Dry Extended Detention Ponds provide treatment through extended detention of the water quality volume. The extended detention time allows for the settling of fine particles and the pollutants that are associated with those particles.

Retention Basin 1 will have sufficient volume to retain the water quality volume. The basin will not have a low-flow drain and retained water will infiltrate into the native soils.

2. Design Requirements

- Draw-down time for Water Quality Volume must be at least 48 hours (36 hours for the bottom half)
- Draw down time can be reduced to 36 hours (24 hours for the bottom half) if the drainage area is less than 20 acres and the outlet size would be less than 4".
- Outlet can not be < 4"

WATER QUALITY CALCULATIONS (Continued)

3. Calculations

Determine required Water Quality Design Volume (WQDV) at Retention Basin 1:

Required WQDV

| Drainage Area | Water Quality BMP | Contributing Drainage Area (ac) | Detention Based Treatment Calcs | | | |
|----------------------------------------------------------------------|--------------------|---------------------------------|---------------------------------|--------------|----------------------|---------------|
| | | | Imperv. Area (%) | Runoff Coeff | Rainfall Amount (in) | WQDV (cf) |
| Proposed Conditions (Ultimate Development Conditions Assumed) | | | | | | |
| 1 | Extended Detention | 20.291 | 52 | 0.52 | 1.0 | 38,301 |
| TOTAL | | 20.291 | | | | 38,301 |

Notes: 1. Detention based BMPs are required to treat $WQDV = C \times 1.0'' \times A \times 3630$, where $C = 0.05 + (0.009 \times IMP\%)$.

2. See Runoff Coefficient Calculations for proposed site coverage breakdown.

Approximate Storage Volume provided at Basin 1 = 2.33 ac-ft = 101,500 cf (OK)

Conclusion: Retention Basin 1 has sufficient volume to store the required water quality volume. The water quality volume will be retained and will infiltrate into the native soils. Extended detention time is met since all runoff is retained and there is no piped outflow. All water quality pollutants will be captured in the basin.

Design Calculations- Vegetated Swale (Secondary Treatment for Drainage Area 1):

1. General Description:

Vegetated swales are open channels that are designed to treat the water quality flow rate. Runoff is filtered as it slowly flows through the vegetation at the surface. The vegetated swales also increase runoff time and promote infiltration.

Vegetated swales will be used as a secondary water quality BMP for Drainage Area 1. Vegetated swales will be incorporated into the grading and drainage design throughout the site.

2. Design Requirements

- Longitudinal slopes shall be less than 2.0%.
- Drops can be used for higher land slopes to achieve the 2.0% hydraulic gradient.
- The flow length of the swale should be a minimum of 100 feet.
- At the Water Quality Flow Rate (WQFR), the flow depth shall be no greater than 4 inches.
- Inflow should be directed at the upstream end of the swale as much as possible, but should at a minimum occur evenly over the length of the swale.

WATER QUALITY CALCULATIONS (Continued)

3. Calculations:

Determine required Water Quality Flow Rate (WQFR) at Drainage Area 1:

Required WQFR

| Drainage Area | Water Quality BMP | Contributing Drainage Area (ac) | Flow-Through Based Treatment Calcs | | |
|----------------------------------------------------------------------|-------------------|---------------------------------|------------------------------------|----------------------------|-------------|
| | | | Runoff Coeff. | Rainfall Intensity (in/hr) | WQFR (cfs) |
| Proposed Conditions (Ultimate Development Conditions Assumed) | | | | | |
| 1 | Vegetated Swale | 20.291 | 0.56 | 0.20 | 2.27 |
| TOTAL | | 20.291 | | | 2.27 |

Notes: 1. Flow-Through based designs are required to treat $WQFR = C \times 0.4 \times A$, where C is the Rational Method Coefficient from the drainage calculations.
 WQFR requirement can be reduced by 50% if downstream detention is provided.
 Use 0.2 inches per hour for Rainfall Intensity per 111-5-d.

Summary of Vegetated Swale Treatment Devices:

| Swale BMP | WQFR (cfs) | Swale Slope (%) | d_n at WQFR (ft) | Flow Length (ft) | Swale Width (ft) | Swale Sides (H:V) | Meets Req.? |
|-----------|------------|-----------------|--------------------|------------------|------------------|-------------------|-------------|
| 1 | 1.14 | 1.50 | 0.32 | 300 | 6.00 | 3.00 | Yes |
| 2 | 1.14 | 1.50 | 0.32 | 300 | 6.00 | 3.00 | Yes |

Notes: 1. Flow Depth determined using Manning's Equation.
 2. Manning's n = 0.150 for flow depths 0 to 4 inches.
 (Reference: Claytor, R. and T. Schueler. 1996. Design of Stormwater Filtering Systems. Center for Watershed Protection. Ellicott City, MD.)
 3. WQFR is divided among two proposed swales.
 4. Swale treatment flow length is conservative and is generally much longer.

Design Calculations- Vegetated Filter Strip (Secondary Treatment for Drainage Area 1):

1. General Description:

Vegetated Filter Strips provide treatment by filtering widely dispersed (sheet flow) runoff through a grass or vegetated area.

Drainage Area 1 contains several open areas where stormwater sheet flows over grass/ landscaped surfaces. The extended detention basin is still the primary treatment method as all runoff eventually flows to the basin.

2. Design Requirements

- No official guidelines, but flow through the strip should be sheet flow throughout.
- Surface must be grass or a vegetated.

WATER QUALITY CALCULATIONS (Continued)

3. Calculations

No calculations required. Vegetated Filter strips in Drainage Area 1 meets design requirements.

**STORMWATER POST-DEVELOPMENT
CONTROL MEASURE MAINTENANCE
CHECK LIST FOR:**



COUNTY OF MAUI

DETENTION BASIN

MAINTENANCE REQUIREMENTS

| Maintenance Activity | Schedule |
|--------------------------------------------------------------------------------------------|-------------------------------------------|
| Reconstruct or replace facility when it no longer functions properly. | As needed |
| Ensure that appropriate site runoff continues to flow to facility. | Annual |
| Assess overall operation of facility and make necessary repairs. | Annual |
| Inspect, clean, and repair all pretreatment areas. | Annual, After major storms |
| Maintain establishment of vegetation and replant bare areas. | Annual |
| Remove unwanted trees, brush, and weeds. | Annual |
| Repair inlet and outlet structures, overflow, low flow channels, and any other structures. | Annual, After major storms |
| Remove trash and debris. | Annual, After major storms |
| Repair erosion and other damage. | Annual, After major storms |
| Remove sediment from main basin | When 50% of original volume has been lost |
| Other: | |

**STORMWATER POST-DEVELOPMENT
CONTROL MEASURE MAINTENANCE
CHECK LIST FOR:**



COUNTY OF MAUI

VEGETATED SWALE

MAINTENANCE REQUIREMENTS

| Maintenance Activity | Schedule |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Reconstruct or replace facility when it no longer functions properly. | As needed |
| Ensure that appropriate site runoff continues to flow to facility. | Annual |
| Assess overall operation of facility and make necessary repairs. | Annual |
| Inspect, clean, and repair all pretreatment areas. | Annual, after major storms |
| Mow grass to maintain a height of 4 to 6 inches. | Bi-Annual |
| Remove trash and debris from the swale. | Annual, after major storms |
| Inspect swale for sign of erosion, vegetation damage/coverage, channelization problems, debris build-up and excessive sedimentation in bottom of the channel. | Annual, after major storms |
| Remove sediment in inlet areas, channels, culverts, and outlets whenever flow into the swale is retarded or blocked. | Annual, after major storms |
| Inspect swale for obstructions (e.g. debris accumulation, invasive vegetation) and pools of standing water that can provide mosquito-breeding habitat. Correct observed problems. | Annual, after major storms |
| Other: | |

**STORMWATER POST-DEVELOPMENT
CONTROL MEASURE MAINTENANCE
CHECK LIST FOR:**



COUNTY OF MAUI

VEGETATED FILTER STRIP

MAINTENANCE REQUIREMENTS

| Maintenance Activity | Schedule |
|-----------------------------------------------------------------------|----------------------------|
| Reconstruct or replace facility when it no longer functions properly. | As needed |
| Ensure that appropriate site runoff continues to flow to facility. | Annual |
| Assess overall operation of facility and make necessary repairs. | Annual |
| Inspect, clean, and repair all pretreatment areas. | Annual, after major storms |
| Mow grass to maintain a height of 2 to 4 inches. | Bi-Annual |
| Remove trash and debris from filter strip. | Annual, after major storms |
| Remove sediment. | Annual, after major storms |
| Repair ruts or holes in filter strip. Replant bare areas. | Annual, after major storms |
| Other: | |

APPENDIX B

Wastewater Calculations

Per DOFAW BASEYARD AT PULEHUNUI Revised Site Plan , dated 08-19-2015

| | |
|-------------------------------------------|--------------|
| Per MH, Total Number of daytime workers = | 80 employees |
| Assumed Number of Office Workers = | 60 employees |
| Assumed Number of Warehouse Workers = | 20 employees |

Septic Tank 1

Office Workers

| | |
|----------------------------------------------------------|-------------------|
| Assumed Number of Office Workers = | 30 employees |
| Wastewater Contribution for Office Worker ¹ = | 20 gpcd |
| Total Wastewater Contribution for Office Worker = | 600 gpd |
| Assumed number of shower users = | 20 people per day |
| Wastewater Contribution for Shower user ² = | 10 gpcd |
| Total Wastewater Contribution for Shower user = | 200 gpd |

Total Wastewater Contribution for Office and Shower = 800 gpd

| | |
|-----------------------------------|--------------|
| Number of Septic Tanks Required = | 2 each |
| Capacity of Septic Tanks = | 1000 gallons |

Septic Tank 2

Office Workers

| | |
|----------------------------------------------------------|--------------|
| Assumed Number of Office Workers = | 30 employees |
| Wastewater Contribution for Office Worker ¹ = | 20 gpcd |
| Total Wastewater Contribution for Office Worker = | 600 gpd |

Total Wastewater Contribution for Office/Lab/Nursery 600 gpd

| | |
|-----------------------------------|-------------|
| Number of Septic Tanks Required = | 1 each |
| Capacity of Septic Tanks = | 750 gallons |

Septic Tank 3

Wash Bay

| | |
|---------------------------------|------------|
| Volume per car wash = | 60 gallons |
| Number of cars washed per day = | 5 each |

Total Car wash volume per day = 300 gpd

| | |
|-----------------------------------|-------------|
| Number of Septic Tanks Required = | 1 each |
| Capacity of Septic Tank = | 500 gallons |

Septic Tank 4

Warehouse Workers

| | |
|-------------------------------------------------------------|---------|
| Wastewater Contribution for Warehouse Worker ³ = | 25 gpcd |
|-------------------------------------------------------------|---------|

Total Wastewater Contribution for Office Worker = 500 gpd

| | |
|-----------------------------------|-------------|
| Number of Septic Tanks Required = | 1 each |
| Capacity of Septic Tank = | 750 gallons |

Size of Leaching Fields

| | |
|--------------------------------------------------------|--------------------------|
| Saturated Hydraulic Conductivity (Ksat) ⁴ = | 9 micrometers per second |
| Saturated Hydraulic Conductivity (Ksat) = | 1.28 inches per hour |
| Percolation Rate = | 47 minutes per inch |
| Required absorption area ⁵ = | 304 sf per 200 gal |
| Trenches | |
| Width = | 3 ft |
| Length = | 100 ft |
| Area = | 300 sf |

Septic Tank 1

| | | | |
|----------------------------|-----------|-----|---|
| Wastewater Flow = | 800 gpd | | |
| Required absorption area = | 1,216 sf | | |
| Trenches Required = | 4.05 each | say | 5 |

Septic Tank 2

| | | | |
|----------------------------|-----------|-----|---|
| Wastewater Flow = | 600 gpd | | |
| Required absorption area = | 912 sf | | |
| Trenches Required = | 3.04 each | say | 4 |

Septic Tank 3

| | | | |
|----------------------------|-----------|-----|---|
| Wastewater Flow = | 300 gpd | | |
| Required absorption area = | 456 sf | | |
| Trenches Required = | 1.52 each | say | 2 |

Septic Tank 4

| | | | |
|----------------------------|-----------|-----|---|
| Wastewater Flow = | 500 gpd | | |
| Required absorption area = | 760 sf | | |
| Trenches Required = | 2.53 each | say | 3 |

¹ Wastewater Contribution for Office: 20 gpcd

² From Chapter 11-62, Appendix F, Table 1

³ Wastewater Contribution for Industrial Shop: 25 gpcd

⁴ From Web Soil Survey, National Cooperative Soil Survey

⁵ From Chapter 11-62, Appendix F, Table III

APPENDIX H.

Traffic Assessment for Kahului Baseyard Renovation Alternative

TRAFFIC IMPACT ANALYSIS REPORT DIVISION OF FORESTRY & WILDLIFE KAHULUI BASEYARD

Kahului, Maui, Hawaii

DRAFT FINAL

October 27, 2015

Prepared for:

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TRAFFIC IMPACT ANALYSIS REPORT
DIVISION OF FORESTRY & WILDLIFE
KAHULUI BASEYARD
Kahului, Maui, Hawaii

DRAFT FINAL

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Prepared by
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Civil Engineers • Surveyors
Honolulu • Wailuku • Hilo, Hawaii

October 27, 2015

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TRAFFIC IMPACT ANALYSIS REPORT

DIVISION OF FORESTRY AND WILDLIFE

KAHULUI BASEYARD

Kahului, Maui, Hawai'i

1. INTRODUCTION

This report documents the findings of a traffic study conducted by Austin, Tsutsumi & Associates, Inc. (ATA) to evaluate the potential traffic impacts resulting from the proposed Division of Forestry and Wildlife (DOFAW) Kahului Baseyard Renovation (hereinafter referred to as the "Project").

1.1 Location

The Project will be located on the existing DOFAW Kahului Baseyard site. The Project is located in Kahului on the island of Maui on approximately 4.3 acres of land more specifically identified as a portion of TMKs: (2) 3-8-079:018 and 001:019. The Project site is located north of Haleakala Highway, with Aalele Street to the east and Kuleana Street to the west, on land owned by the State of Hawaii. Figure 1.1 shows the Project location.

1.2 Project Description

The existing Project site currently provides an approximate 10,000 square-foot (SF) covered heavy equipment parking area, a 19,840 SF warehouse and an auto repair shop, which will be maintained upon build-out of the Project. Improvements and renovations for the Project are based on available funding for the DOFAW that is determined on an annual basis. This TIAR conservatively assumes the Project will be completed by Year 2025. Upon completion, the Project proposes the following new land uses in addition to the existing land uses described above:

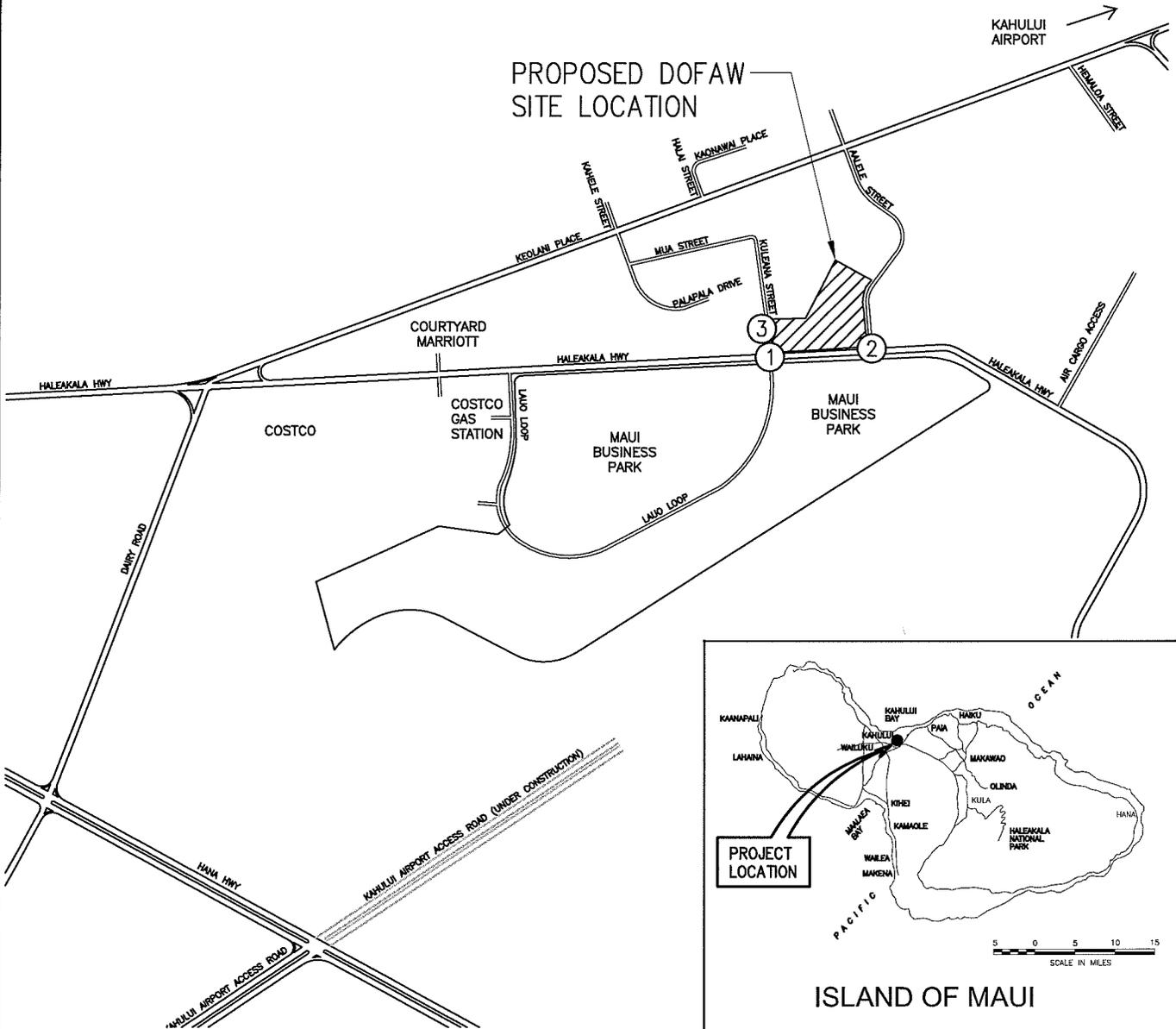
- Multi-story, 25,455 square-foot (SF) Office Building
- 12,000 SF of Nursery Space
- 3,300 SF of additional Heavy Equipment Parking Space

The Project anticipates an overall increase of 51 employees at the Kahului Baseyard, from its existing 25 employees to 76 employees by Year 2025. This TIAR assumes no additional traffic increases would occur from the increased heavy equipment parking space. Figure 1.2 shows the Project site plan.



NOT TO SCALE

- STUDY INTERSECTIONS**
- ① HALEAKALA HIGHWAY & KULEANA STREET/LAUO LOOP
 - ② HALEAKALA HIGHWAY & AALELE STREET
 - ③ KULEANA STREET & PROJECT DRIVEWAY



DIVISION OF FORESTRY
AND WILDLIFE (DOFAW)
KAHULUI BASEYARD TIAR

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS HONOLULU, HAWAII

FIGURE
1.1

PROJECT LOCATION MAP



LEGEND

EXISTING BUILDING

NEW BUILDING



FIGURE 1.2

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
 ENGINEERS, SURVEYORS • HONOLULU, HAWAII

PROJECT SITE PLAN

DIVISION OF FORESTRY AND WILDLIFE (DOFAW)
 KAHULUI BASEYARD
 TIAR



2. STUDY METHODOLOGY

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), dated 2010, methodology for calculating volume to capacity ratios, delays and corresponding Levels of Service was utilized in this study. LOS definitions for signalized and unsignalized intersections are provided in Appendix B.

2.1 Intersection Analysis

For applicable intersections shown in Section 2.2, intersection analysis was performed using the traffic analysis software Synchro, which prepares Highway Capacity Manual (HCM) reports. The reports contain quantitative delay results, as based on intersection lane geometry, signal timing (including coordination and actuated minimums and maximums), and hourly traffic volume.

Based on the vehicular delay, reserve capacity and critical gaps at the intersection, a LOS is assigned (see Appendix B) as a qualitative measure of performance. These results constitute the technical analysis that will form the basis of the recommendations outlined in this report.

2.2 Study Area Intersection Analysis

Intersection analysis within the study area was performed on the following intersections based on their proximity to the Project:

- Haleakala Highway/Kuleana Steet/Lauo Loop
- Haleakala Highway/Aalele Street
- Kuleana Street/Project Driveway

3. EXISTING TRAFFIC CONDITIONS

The existing conditions scenario represents the traffic conditions within the study area as it currently stands, without the Project.

3.1 Roadway Network

Haleakala Highway is a generally two-lane, two-way, undivided roadway that runs in the east-west direction within the vicinity of the Project. This roadway begins to the west at the Hana Highway/Hanakai Street intersection and traverses the southern portion of Kahului Airport before crossing Hana Highway and continuing up towards Haleakala as a divided highway. The posted speed limit in the vicinity of the project is 30 miles per hour (mph).

Kuleana Street is a local roadway that extends to the north from Haleakala Highway for approximately 600 feet and terminates at Mua Street. It currently provides access to the existing Kahului DOFAW Baseyard and other various government agency offices.

Aalele Street is a two lane, two-way roadway that provides a connection between Haleakala Highway and Kahului Airport via Keolani Place. The posted speed limit along this roadway is 25 mph.



3.2 Existing Traffic Volumes

The existing traffic volume data at the study intersections were collected on Thursday, September 24, 2015. Based on this traffic count data, the weekday AM peak hour of traffic was determined to be from 7:15 AM to 8:15 AM and the PM peak hour of traffic was determined to be from 3:30 PM to 4:30 PM. See the traffic count data provided in Appendix A for the existing intersections studied.

3.3 Existing Traffic Conditions Analysis and Observations

Haleakala Highway/Kuleana Street/Lauo Loop is a two-way stop-controlled (TWSC) intersection with exclusive left-turn lanes on the eastbound and westbound approaches and an exclusive right-turn lane on the northbound approach. All movements at this intersection currently operate at LOS B or better with no significant queuing observed during the AM and PM peak hours of traffic. The south leg of the intersection serves as the eastern terminus of Lauo Loop and was restricted from vehicle access at the time of the traffic count. Lauo Loop will provide for future vehicle access as part of the Maui Business Park North Project Area development, though no adjacent parcels have been developed aside from the Costco Gas Station.

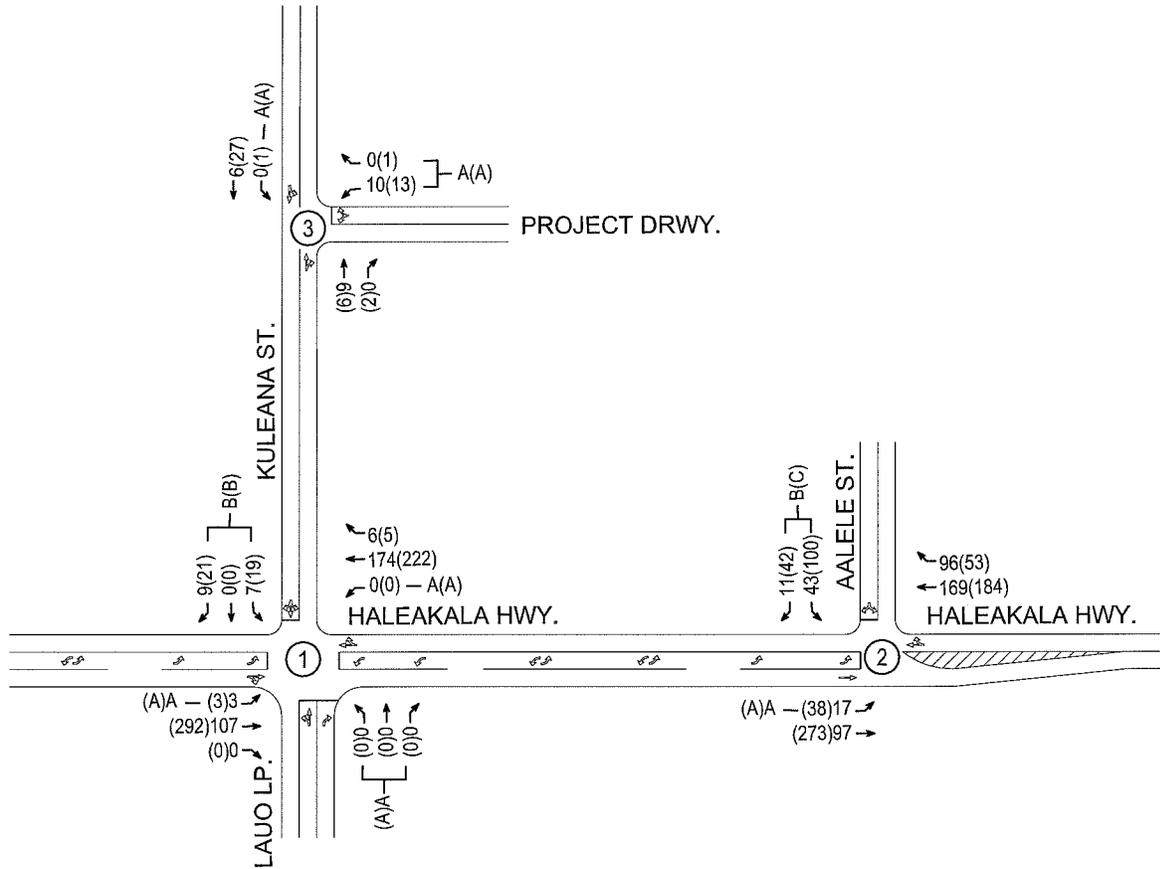
Haleakala Highway/Aalele Street is a TWSC T-intersection with the north leg as the stop controlled approach. The eastbound approach provides an exclusive left-turn lane, while the two remaining approaches provide shared movement lanes. All movements currently operate at LOS C or better with no significant queuing observed during the AM and PM peak hours of traffic. Due to construction for the new Kahului Airport Access Road (KAAR) connection to Kahului Airport, the east leg of the intersection had been temporarily closed, with traffic being circulated just around the construction area along the Aalele Street-Haleakala Highway path. Since the path of the detour was not lengthy and did not appear to increase travel times, traffic patterns in the study area likely reflect typical traffic conditions. For comparative purposes for future scenarios described in this TIAR, the intersection was analyzed without the road closure.

Kuleana Street/Project Driveway is a TWSC T-intersection on State land with shared lanes on all approaches. All movements at this intersection currently operate at LOS A with no significant queuing observed during the AM and PM peak hours of traffic. Due to limited on-site public and employee parking within the Kahului DOFAW Baseyard, some employees were observed parking along the Kuleana Street shoulder across the Project site. In addition, the majority of entering employee traffic occurred before the AM peak hour, with most employees arriving before 7:00 AM. Exiting AM peak hour traffic was heavier due to employees leaving for off-site work.

Existing traffic volumes, lane configuration and movement LOS are illustrated in Figure 3.1. Table 3.1 shows the existing delay, v/c ratio, and LOS for the study intersections, with the full LOS summary tables provided in Appendix C.



NOT TO SCALE



LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

X(X) - AM(PM) LOS

Ⓚ - UNSIGNALIZED INTERSECTION Y

DATE OF COUNTS:
September 24, 2015

AM PEAK HOUR:
7:15 AM - 8:15 AM

PM PEAK HOUR:
3:30 PM - 4:30 PM

NOTE:
THIS DRAWING IS FOR ILLUSTRATIVE
PURPOSES ONLY. DO NOT USE FOR
CONSTRUCTION.

DIVISION OF FORESTRY
AND WILDLIFE (DOFAW)
KAHULUI BASEYARD TIAR

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS HONOLULU, HAWAII

**EXISTING CONDITIONS LANE CONFIGURATION,
TRAFFIC VOLUMES, AND LOS**

FIGURE

3.1

Table 3.1: Existing Conditions LOS

| Intersection | Existing Conditions | | | | | |
|---------------------------------------------------------|---------------------|-----------|-----|-----------|-----------|-----|
| | AM | | | PM | | |
| | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| Haleakala Highway & Kuleana Street/Lauo Loop | | | | | | |
| EB LT | 7.6 | 0.00 | A | 7.7 | 0.00 | A |
| WB LT | 0.0 | 0.00 | A | 0.0 | 0.00 | A |
| NB LT/TH | 0.0 | 0.00 | A | 0.0 | 0.00 | A |
| NB RT | 0.0 | 0.00 | A | 0.0 | 0.00 | A |
| SB LT/TH/RT | 10.0 | 0.02 | B | 11.9 | 0.08 | B |
| Haleakala Highway & Aalele Street | | | | | | |
| EB LT | 7.9 | 0.02 | A | 7.8 | 0.03 | A |
| SB LT/RT | 11.1 | 0.09 | B | 15.0 | 0.30 | C |
| Kuleana Street & Project Driveway | | | | | | |
| WB LT/RT | 8.6 | 0.01 | A | 8.7 | 0.02 | A |
| SB LT | 0.0 | 0.00 | A | 7.2 | 0.00 | A |



4. BASE YEAR 2025 TRAFFIC CONDITIONS

4.1 Defacto Growth Rate

Projections for Base Year 2025 traffic were based upon the Maui Regional Traffic Demand Model (MRTDM) and historical traffic count data collected by the Hawaii Department of Transportation (HDOT). The growth rate along Haleakala Highway was determined to be approximately 1.0 percent per year. This growth rate was applied to the mainline through volumes along Haleakala Highway.

4.2 Traffic Forecasts for Known Developments

By the year 2025, other known developments within the vicinity of the Project are planned to be completed with forecast traffic volumes potentially generated along Haleakala Highway. These known developments are described below. The associated forecast traffic volumes for each known development traveling through the study intersections were added to the forecast Base Year 2025 traffic volumes.

- Maui Business Park North Project Area (MBP NPA) – This 33.5-acre development is currently under construction, located east of Costco and south of Haleakala Highway. MBP NPA is subdivided into 30 separate lots that will be sold individually, with only one 4.1-acre (12 percent of total site) lot currently occupied by the Costco gas station and parking lot. It should be noted that although none of the 29 remaining lots at the MBP NPA are currently known to be developed and occupied, this study conservatively assumes all 29 lots will be occupied by Year 2025. Accounting for trip reductions from this 4.1-acre Costco site, the remaining MBP NPA is forecast to conservatively generate approximately 305 new trips during the AM peak hour and 995 new trips during the PM peak hour based on the Maui Business Park Phase II North and South Project Area TIAR, dated June 16, 2010, prepared by ATA. Vehicular access to the Project is provided via Lauo Loop at two access points separated by approximately 900 feet, both intersecting Haleakala Highway. The eastern terminus at the Haleakala Highway/Kuleana Street intersection is currently barricaded. Table 4.1 below shows the forecast trip generation and reduction due to developed parcels.

Table 4.1: Total Trips Generated by Maui Business Park Phase II – North Project Area

| Land Use | Units | AM Peak Hour | | | PM Peak Hour | | |
|----------------------------------|-------------------|--------------|-----------|------------|--------------|------------|------------|
| | | Enter | Exit | Total | Enter | Exit | Total |
| Total Trips generated by MBP NPA | 33.5 Acres | 241 | 106 | 347 | 508 | 625 | 1,133 |
| Costco Occupied | 4.1 Acres | (29) | (13) | (42) | (62) | (76) | (138) |
| Remaining New Trips | 29.4 Acres | 212 | 93 | 305 | 446 | 549 | 995 |

Note: Volumes denoted by (##) represent reduction in trips generated.



- Kahului Airport Consolidated Rental Car Facility – To accommodate future increases in airport traffic and car rentals, an expansion and relocation of the rental car facilities, in addition to an expansion of on-site Airport parking, is expected to occur at the Kahului Airport by Year 2025. To our knowledge, various alternatives for the size and location of the consolidated rental car facility are being proposed. Without a single proposed location, it is difficult to determine traffic impacts in the study area. However, based on the layout of roadways leading to the consolidated rental car facility and parking expansion, the majority of traffic impacts will likely occur along Phase 2 of the Kahului Airport Access Road (KAAR), Keolani Place, Dairy Road and Hana Highway.

4.3 Planned Roadway Projects

- Kahului Airport Access Road (KAAR), Phase 2 – This future roadway is currently being constructed and will extend the initial phase of the KAAR from its current terminus at Hana Highway and connect directly to the Kahului Airport. Current plans provide grade separation for KAAR with Haleakala Highway. An off-ramp will be constructed from KAAR onto Haleakala Highway, connecting directly to the existing Air Cargo roadway. An on-ramp from Haleakala Highway onto KAAR has been discussed with HDOT, but is currently NOT proposed and therefore, not assumed to be implemented.

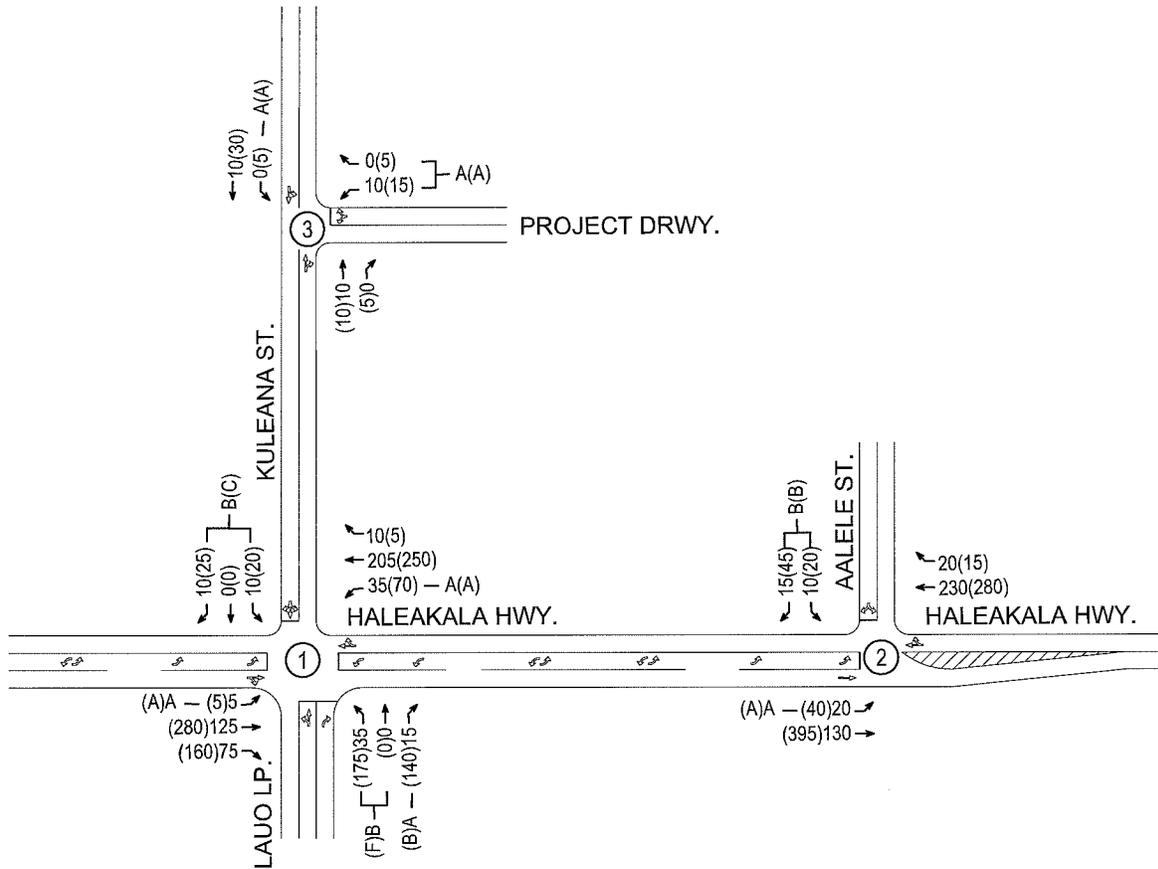
4.4 Base Year 2025 Analysis

By year 2025 without the Project, all movements at the study intersections are forecast to operate at LOS C or better during AM and PM peak hours of traffic with the exception of the northbound left-through movement at the Haleakala Highway/Kuleana Street/Lauo Loop intersection, which is forecast to operate at LOS F during the PM peak hour of traffic. Based on forecast AM and PM traffic volume, a traffic signal is not anticipated to be warranted at this location based on the 4-hour vehicular traffic signal warrant in the Manual on Uniform Traffic Control Devices (MUTCD). It should be noted that turning movement traffic at Lauo Loop is dependent upon development of the remaining 29 MBP NPA lots, which will be sold separately. Currently, the schedule and development of these lots are unknown but for purposes of this study were conservatively assumed to be fully built out by Year 2025.

Figure 4.1 illustrates the forecast traffic volumes, lane configuration, and movement LOS for Base Year 2025 conditions. Table 4.2 shows the Base Year 2025 LOS at the study intersections, with the full LOS summary tables provided in Appendix C. Figure D-1 shows the traffic signal warrant in Appendix D.



NOT TO SCALE



LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

X(X) - AM(PM) LOS

(Y) - UNSIGNALIZED INTERSECTION Y

NOTE:

- TRAFFIC VOLUMES ROUNDED UP TO THE NEAREST 5 VEHICLES.

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DIVISION OF FORESTRY
AND WILDLIFE (DOFAW)
KAHULUI BASEYARD TIAR

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS HONOLULU, HAWAII

**BASE YEAR 2025 LANE CONFIGURATION,
TRAFFIC VOLUMES, AND LOS**

FIGURE

4.1

Table 4.2: Base Year 2025 Conditions LOS

| Intersection | Base Year 2025 Conditions | | | | | |
|---------------------------------------------------------|---------------------------|-----------|-----|-----------|-----------|-----|
| | AM | | | PM | | |
| | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| Haleakala Highway & Kuleana Street/Lauo Loop | | | | | | |
| EB LT | 7.7 | 0.00 | A | 7.8 | 0.00 | A |
| WB LT | 7.7 | 0.03 | A | 8.6 | 0.07 | A |
| NB LT/TH | 13.4 | 0.08 | B | 50.0 | 0.74 | F |
| NB RT | 9.2 | 0.02 | A | 12.1 | 0.23 | B |
| SB LT/TH/RT | 11.3 | 0.04 | B | 16.9 | 0.14 | C |
| Haleakala Highway & Aalele Street | | | | | | |
| EB LT | 7.8 | 0.02 | A | 8.0 | 0.04 | A |
| SB LT/RT | 10.6 | 0.04 | B | 12.9 | 0.13 | B |
| Kuleana Street & Project Driveway | | | | | | |
| WB LT/RT | 8.7 | 0.01 | A | 8.8 | 0.02 | A |
| SB LT | 0.0 | 0.00 | A | 7.3 | 0.00 | A |



5. FUTURE YEAR 2025 TRAFFIC CONDITIONS

The future traffic conditions scenario represents the traffic conditions within the Project study area with the full build-out of the Project. According to the current Project plan, this will occur in Year 2025.

5.1 Background

As previously mentioned in Section 1.2, the existing Project site currently provides an approximate 10,000 square-foot (SF) covered heavy equipment parking area, a 19,840 SF warehouse and an auto repair shop, which will be maintained upon build-out of the Project. Improvements and renovations for the Project are based on available funding for the DOFAW that is determined on an annual basis. This TIAR conservatively assumes the Project will be completed by Year 2025. Upon completion, the Project proposes the following new land uses in addition to the existing land uses described above:

- Multi-story, 25,455 square-foot (SF) Office Building
- 12,000 SF of Nursery Space
- 3,300 SF of additional Heavy Equipment Parking Space

The Project anticipates an overall increase of 51 employees at the Kahului Baseyard, from its existing 25 employees to 76 employees by Year 2025. This TIAR assumes no additional traffic increases would occur from the increased heavy equipment parking space.

5.2 Travel Demand Estimations

5.2.1 Trip Generation

The Institute of Transportation Engineers (ITE) publishes a book based on empirical data compiled from a body of more than 4,250 trip generation studies submitted by public agencies, developers, consulting firms, and associations. This publication, titled Trip Generation Manual, 9th Edition, provides trip rates and/or formulae based on graphs that correlate vehicular trips with independent variables. See Tables 5.1 and 5.2 for Trip Generation formulae and projections for the Project. The auto shop and additional heavy equipment parking are not anticipated to generate additional vehicular traffic to the site.

5.2.2 Trip Distribution

Trips generated by the Project were distributed throughout the study area based upon existing travel patterns within the vicinity of the Project and anticipated nearby roadway configurations. The traffic generated by the Project was added to the forecast Base Year 2025 traffic volumes within the vicinity of the Project to constitute the traffic volumes for the Future Year 2025 traffic conditions with the Project. All Project-generated trips are anticipated to access the site via Kuleana Street from Haleakala Highway. Figure 5.1 illustrates the Project-generated trip distribution.



Table 5.1: Project Trip Generation Rates

| Land Use Type (ITE Code) | Independent Variable | AM Peak Hour | | PM Peak Hour | |
|-------------------------------------|----------------------|--------------|---------|--------------|---------|
| | | Rate | % Enter | Rate | % Enter |
| Government Office Complex (ITE 733) | 1,000 SF | 2.21 | 89% | 2.85 | 31% |
| Nursery – Wholesale (ITE 818) | Acres | 0.26 | 43% | 0.45 | 49% |

Notes:

SF = Square Feet

Source: Institute of Transportation Engineers, Trip Generation Manual, 9th Edition

Table 5.2: New Project Generated Trips

| Land Use Type (ITE Code) | Quantity | AM Peak Hour | | | PM Peak Hour | | |
|---------------------------------------|------------|--------------|----------|-----------|--------------|-----------|-----------|
| | | Enter | Exit | Total | Enter | Exit | Total |
| Multi-Story Office Building (ITE 733) | 25,455 SF | 51 | 6 | 57 | 23 | 50 | 73 |
| Nursery (ITE 818) | 0.28 Acres | 1 | 0 | 1 | 0 | 1 | 1 |
| Total New Trips | -- | 52 | 6 | 58 | 23 | 51 | 74 |

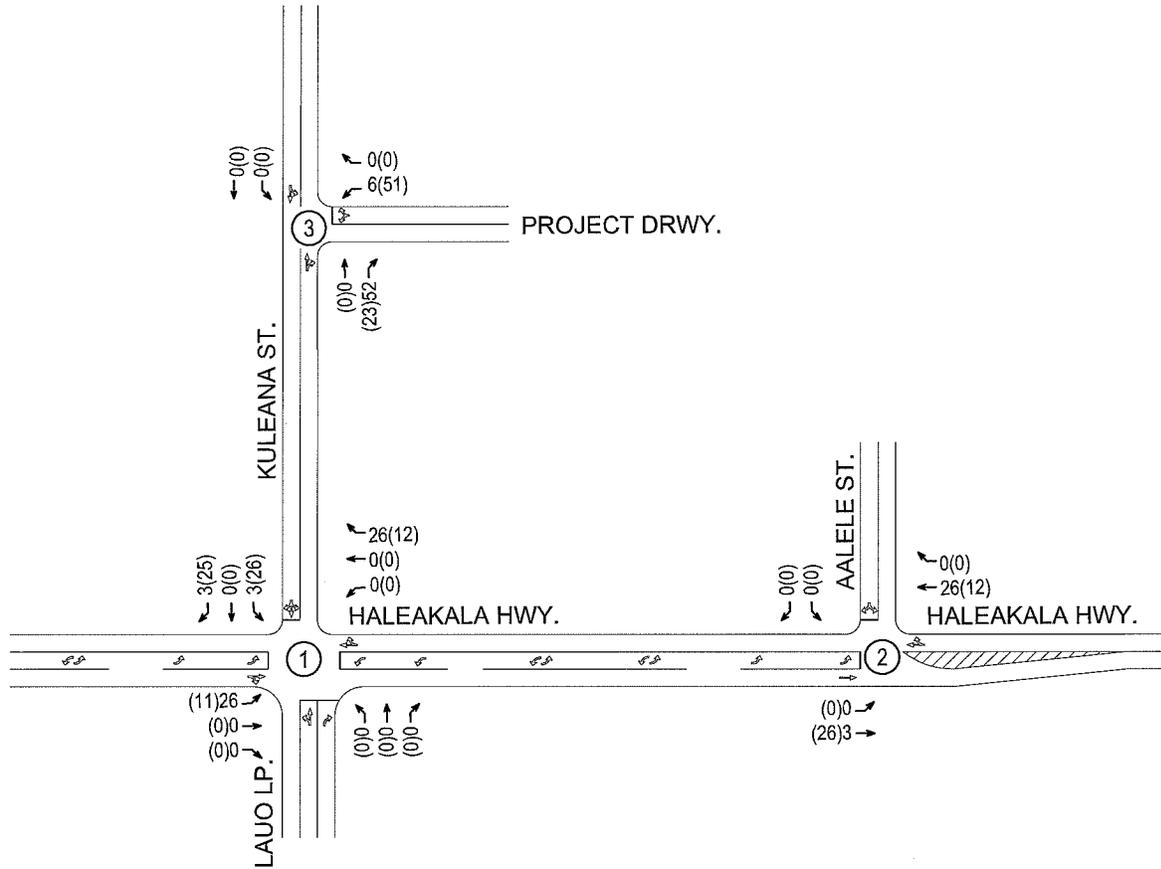
5.3 Future Year 2025 Analysis

Upon completion of the Project, all movements at the study intersections are forecast to operate with LOS similar to Base Year 2025 conditions, with the northbound left-through movement at the Haleakala Highway/Kuleana Street/Lauo Loop continuing to operate at LOS F during the PM peak hour of traffic. However, traffic generated by the Project is anticipated to be relatively low, with each left-turn movement heading into and out of Kuleana Street consisting of less than 30 vehicles during peak hours of traffic, which translates on average to only 1 turning vehicle every 2 minutes. Project generated traffic into and out of Kuleana Street is significantly lower than the turning movements along Lauo Loop accessing MBP NPA, and should not heavily impact operations at the intersection. As a result, a traffic signal is not anticipated to be warranted at this location based on the AM and PM 4-hour vehicular traffic signal warrant, since the heavier minor street approach will continue to occur along Lauo Loop. No roadway improvements are required as a result of the Project.

Figure 5.2 illustrates the forecast traffic volumes, lane configuration, and LOS for Future Year 2025 conditions. Table 5.3 summarizes the delay, V/C, and LOS at the study intersections for the Future Year 2025 conditions. Full LOS summary tables are provided in Appendix C.



NOT TO SCALE



LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

Ⓨ - UNSIGNALIZED INTERSECTION Y

NOTE:

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DIVISION OF FORESTRY AND WILDLIFE (DOFAW)
KAHULUI BASEYARD TIAR

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ENGINEERS, SURVEYORS HONOLULU, HAWAII

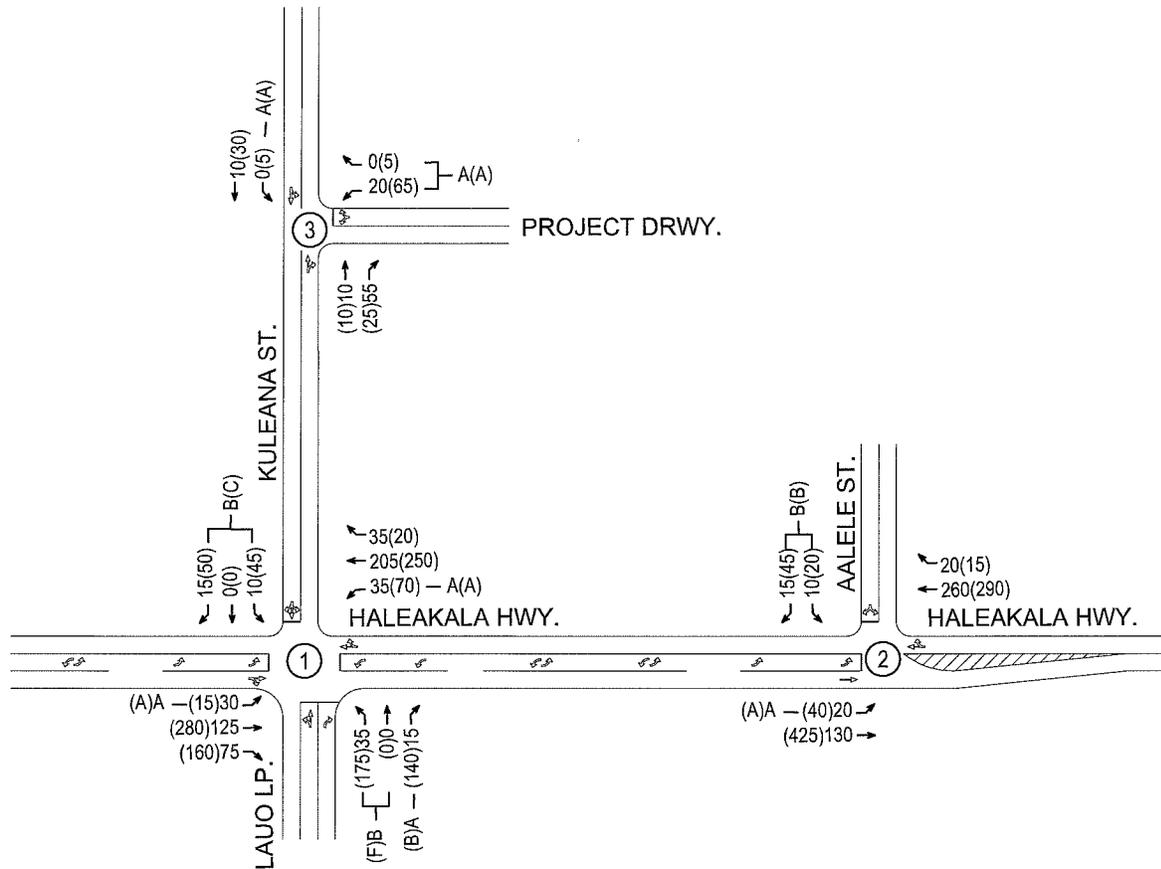
PROJECT-GENERATED TRAFFIC VOLUMES

FIGURE

5.1



NOT TO SCALE



LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

X(X) - AM(PM) LOS

(Y) - UNSIGNALIZED INTERSECTION Y

NOTE:

- TRAFFIC VOLUMES ROUNDED UP TO THE NEAREST 5 VEHICLES.

- THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

DIVISION OF FORESTRY
AND WILDLIFE (DOFAW)
KAHULUI BASEYARD TIAR

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS HONOLULU, HAWAII

**FUTURE YEAR 2025 LANE CONFIGURATION,
TRAFFIC VOLUMES, AND LOS**

FIGURE

5.2

Table 5.3: Future Year 2025 Conditions LOS

| Intersection | Future Year 2025 Conditions | | | | | |
|---------------------------------------------------------|-----------------------------|-----------|-----|-----------|-----------|-----|
| | AM | | | PM | | |
| | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| Haleakala Highway & Kuleana Street/Lauo Loop | | | | | | |
| EB LT | 7.8 | 0.03 | A | 7.9 | 0.01 | A |
| WB LT | 7.7 | 0.03 | A | 8.6 | 0.07 | A |
| NB LT/TH | 14.7 | 0.09 | B | 66.6 | 0.82 | F |
| NB RT | 9.2 | 0.02 | A | 12.1 | 0.23 | B |
| SB LT/TH/RT | 11.5 | 0.05 | B | 21.1 | 0.32 | C |
| Haleakala Highway & Aalele Street | | | | | | |
| EB LT | 7.9 | 0.02 | A | 8.0 | 0.04 | A |
| SB LT/RT | 10.8 | 0.04 | B | 13.2 | 0.14 | B |
| Kuleana Street & Project Driveway | | | | | | |
| WB LT/RT | 8.8 | 0.02 | A | 9.2 | 0.08 | A |
| SB LT | 0.0 | 0.00 | A | 7.3 | 0.00 | A |



6. CONCLUSIONS

Existing Conditions

The existing Project site in Kahului currently provides an approximate 10,000 SF covered heavy equipment parking area and a 19,840 SF warehouse on the northeast corner of the Haleakala Highway/Kuleana Street/Lauo Loop intersection. All study intersection movements currently operate at LOS C or better with no significant queuing observed during the AM and PM peak hours of traffic.

Base Year 2025 WITHOUT the Project

This TIAR conservatively assumes that the Project will be completed by Year 2025. Traffic volumes within the vicinity of the Project are anticipated to experience approximately 1.0 percent growth per year along Haleakala Highway based on the MRTDM and historical HDOT traffic count data in addition to traffic increases in the study area generated by the Maui Business Park North Project Area (MBP NPA). The completion of the second phase of the Kahului Airport Access Road (KAAR) is also anticipated to be completed by Year 2025 and will extend the existing KAAR from Hana Highway to the Kahului Airport.

By Year 2025 without the Project, all movements at the study intersections are forecast to operate at LOS C or better during the AM and PM peak hours of traffic with the exception of the northbound left-through movement at the Haleakala Highway/Kuleana Street/Lauo Loop intersection, which is forecast to operate at LOS F during the PM peak hour of traffic. Based on forecast AM and PM traffic volume, a traffic signal is not anticipated to be warranted at this location based on the 4-hour vehicular traffic signal warrant. It should be noted that turning movement traffic at Lauo Loop is dependent upon development of the remaining 29 MBP NPA lots, which will be sold separately. Currently, the schedule and development of these lots are unknown but for purposes of this study was conservatively assumed to be fully built out.

Future Year 2025 WITH the Project

The Project plans to renovate the DOFAW Baseyard in Kahului, based upon funding for the DOFAW that is determined on an annual basis. Upon full build-out, the Project proposes to maintain the 10,000 square-foot (SF) covered heavy equipment parking area, 19,840 SF warehouse and an auto repair shop and construct approximately 25,455 SF of office space and 12,000 SF of nursery space. The Project will also provide an additional 3,300 SF of heavy vehicle parking, which is not anticipated to generate additional vehicular traffic. These proposed land uses are forecast to generate an additional 58 AM and 74 PM peak hour trips, which were distributed throughout the study area based upon existing travel patterns and planned roadway projects within the vicinity of the Project and added to the forecast Base Year 2025 traffic volumes.

Upon completion of the Project, all movements at the study intersections are forecast to operate with LOS similar to Base Year 2025 conditions, with the northbound left-through movement at the Haleakala Highway/Kuleana Street/Lauo Loop continuing to operate at LOS F during the PM peak hour of traffic. Traffic generated by the Project is anticipated to be relatively low, with each left-turn movement heading into and out of Kuleana Street consisting of less than 30 vehicles during any peak hour, which translates on average to



only 1 turning vehicle every 2 minutes. Project generated traffic into and out of Kuleana Street is considerably lower than the turning movements along Lauo Loop accessing MBP NPA, and should not significantly impact operations at the intersection. As a result, a traffic signal is not anticipated to be warranted at this location based on the AM and PM 4-hour vehicular traffic signal warrant, since the heavier minor street approach will continue to occur along Lauo Loop. No roadway improvements are required as a result of the Project.



7. REFERENCES

1. Austin, Tsutsumi & Associates, Inc., Maui Business Park Phase II North Project Area TIAR, March 23, 2010.
2. Austin, Tsutsumi & Associates, Inc., Maui Business Park Phase II North and South Project Area, June 16, 2010.
3. Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009.
4. Ricondo & Associates, Munekiyo & Hiraga, Final Environmental Assessment for the Proposed Consolidated Rental Car Facility at Kahului Airport, September, 2013.
5. State of Hawaii Department of Transportation Highways Division, Kahului Airport Access Road, Phase 1 Environmental Assessment, March 8, 2012.
6. Transportation Research Board, Highway Capacity Manual, 2010.
7. Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.



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APPENDICES



AUSTIN, TSUTSUMI & ASSOCIATES, INC.
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APPENDIX A

TRAFFIC COUNT DATA

Austin, Tsutsumi, & Associates

501 Sumner Street, Suite 521
Honolulu, HI, 96817

Phone: (808) 533-3646 Website: ATAHawaii.com

File Name : AM Haleakala Hwy-Kuleana St

Site Code : 00000000

Start Date : 9/24/2015

Page No : 1

Groups Printed- Class 1

| Start Time | HALEAKALA HWY Eastbound | | | | HALEAKALA HWY Westbound | | | | KULEANA ST Southbound | | | | Int. Total |
|-------------|----------------------------|------|------|------------|----------------------------|-------|------|------------|--------------------------|-------|------|------------|------------|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | |
| 07:00 AM | 3 | 21 | 0 | 24 | 42 | 2 | 0 | 44 | 2 | 3 | 0 | 5 | 73 |
| 07:15 AM | 1 | 22 | 0 | 23 | 38 | 1 | 0 | 39 | 3 | 3 | 0 | 6 | 68 |
| 07:30 AM | 2 | 26 | 0 | 28 | 44 | 2 | 0 | 46 | 1 | 3 | 0 | 4 | 78 |
| 07:45 AM | 0 | 31 | 0 | 31 | 49 | 2 | 0 | 51 | 0 | 2 | 0 | 2 | 84 |
| Total | 6 | 100 | 0 | 106 | 173 | 7 | 0 | 180 | 6 | 11 | 0 | 17 | 303 |
| 08:00 AM | 0 | 28 | 0 | 28 | 43 | 1 | 0 | 44 | 3 | 1 | 0 | 4 | 76 |
| 08:15 AM | 0 | 27 | 0 | 27 | 40 | 0 | 0 | 40 | 2 | 1 | 0 | 3 | 70 |
| 08:30 AM | 0 | 31 | 0 | 31 | 34 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 65 |
| 08:45 AM | 0 | 36 | 0 | 36 | 36 | 1 | 0 | 37 | 1 | 1 | 0 | 2 | 75 |
| Total | 0 | 122 | 0 | 122 | 153 | 2 | 0 | 155 | 6 | 3 | 0 | 9 | 286 |
| Grand Total | 6 | 222 | 0 | 228 | 326 | 9 | 0 | 335 | 12 | 14 | 0 | 26 | 589 |
| Apprch % | 2.6 | 97.4 | 0 | | 97.3 | 2.7 | 0 | | 46.2 | 53.8 | 0 | | |
| Total % | 1 | 37.7 | 0 | 38.7 | 55.3 | 1.5 | 0 | 56.9 | 2 | 2.4 | 0 | 4.4 | |

Austin, Tsutsumi, & Associates

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Honolulu, HI, 96817

Phone: (808) 533-3646 Website: ATAHawaii.com

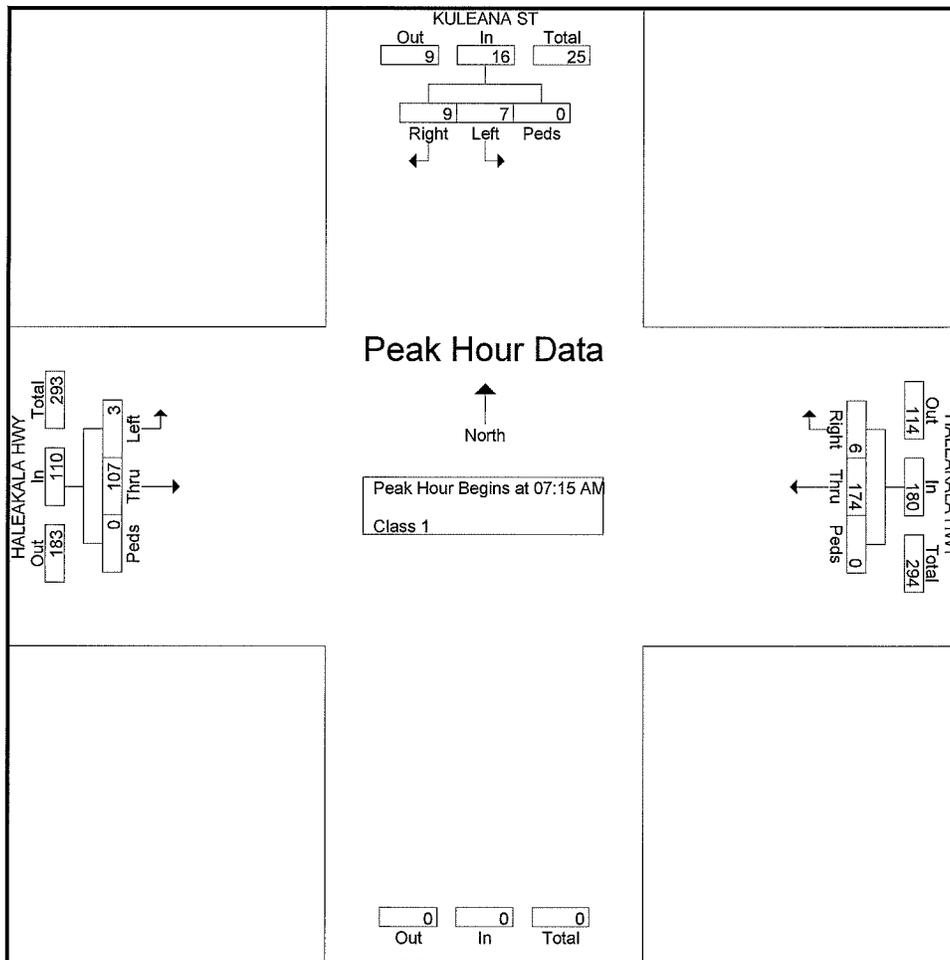
File Name : AM Haleakala Hwy-Kuleana St

Site Code : 00000000

Start Date : 9/24/2015

Page No : 2

| Start Time | HALEAKALA HWY Eastbound | | | | HALEAKALA HWY Westbound | | | | KULEANA ST Southbound | | | | Int. Total |
|------------------------------------------------------------|----------------------------|------|------|------------|----------------------------|-------|------|------------|--------------------------|-------|------|------------|------------|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | |
| Peak Hour Analysis From 07:00 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | |
| 07:15 AM | 1 | 22 | 0 | 23 | 38 | 1 | 0 | 39 | 3 | 3 | 0 | 6 | 68 |
| 07:30 AM | 2 | 26 | 0 | 28 | 44 | 2 | 0 | 46 | 1 | 3 | 0 | 4 | 78 |
| 07:45 AM | 0 | 31 | 0 | 31 | 49 | 2 | 0 | 51 | 0 | 2 | 0 | 2 | 84 |
| 08:00 AM | 0 | 28 | 0 | 28 | 43 | 1 | 0 | 44 | 3 | 1 | 0 | 4 | 76 |
| Total Volume | 3 | 107 | 0 | 110 | 174 | 6 | 0 | 180 | 7 | 9 | 0 | 16 | 306 |
| % App. Total | 2.7 | 97.3 | 0 | | 96.7 | 3.3 | 0 | | 43.8 | 56.2 | 0 | | |
| PHF | .375 | .863 | .000 | .887 | .888 | .750 | .000 | .882 | .583 | .750 | .000 | .667 | .911 |



Austin, Tsutsumi, & Associates

501 Sumner Street, Suite 521
Honolulu, HI, 96817

Phone: (808) 533-3646 Website: ATAHawaii.com

File Name : AM Haleakala Hwy-Aalele St

Site Code : 00000000

Start Date : 9/24/2015

Page No : 1

Groups Printed- Class 1

| Start Time | HALEAKALA HWY Eastbound | | | HALEAKALA HWY Westbound | | | AALELE ST Southbound | | | Int. Total |
|-------------|----------------------------|------|------------|----------------------------|-------|------------|-------------------------|-------|------------|------------|
| | Left | Thru | App. Total | Thru | Right | App. Total | Left | Right | App. Total | |
| 07:00 AM | 3 | 20 | 23 | 43 | 23 | 66 | 7 | 2 | 9 | 98 |
| 07:15 AM | 0 | 25 | 25 | 36 | 21 | 57 | 14 | 2 | 16 | 98 |
| 07:30 AM | 3 | 24 | 27 | 45 | 31 | 76 | 7 | 1 | 8 | 111 |
| 07:45 AM | 4 | 27 | 31 | 47 | 20 | 67 | 10 | 3 | 13 | 111 |
| Total | 10 | 96 | 106 | 171 | 95 | 266 | 38 | 8 | 46 | 418 |
| 08:00 AM | 10 | 21 | 31 | 41 | 24 | 65 | 12 | 5 | 17 | 113 |
| 08:15 AM | 5 | 24 | 29 | 35 | 18 | 53 | 10 | 5 | 15 | 97 |
| 08:30 AM | 4 | 27 | 31 | 31 | 21 | 52 | 9 | 3 | 12 | 95 |
| 08:45 AM | 3 | 34 | 37 | 32 | 15 | 47 | 7 | 3 | 10 | 94 |
| Total | 22 | 106 | 128 | 139 | 78 | 217 | 38 | 16 | 54 | 399 |
| Grand Total | 32 | 202 | 234 | 310 | 173 | 483 | 76 | 24 | 100 | 817 |
| Apprch % | 13.7 | 86.3 | | 64.2 | 35.8 | | 76 | 24 | | |
| Total % | 3.9 | 24.7 | 28.6 | 37.9 | 21.2 | 59.1 | 9.3 | 2.9 | 12.2 | |

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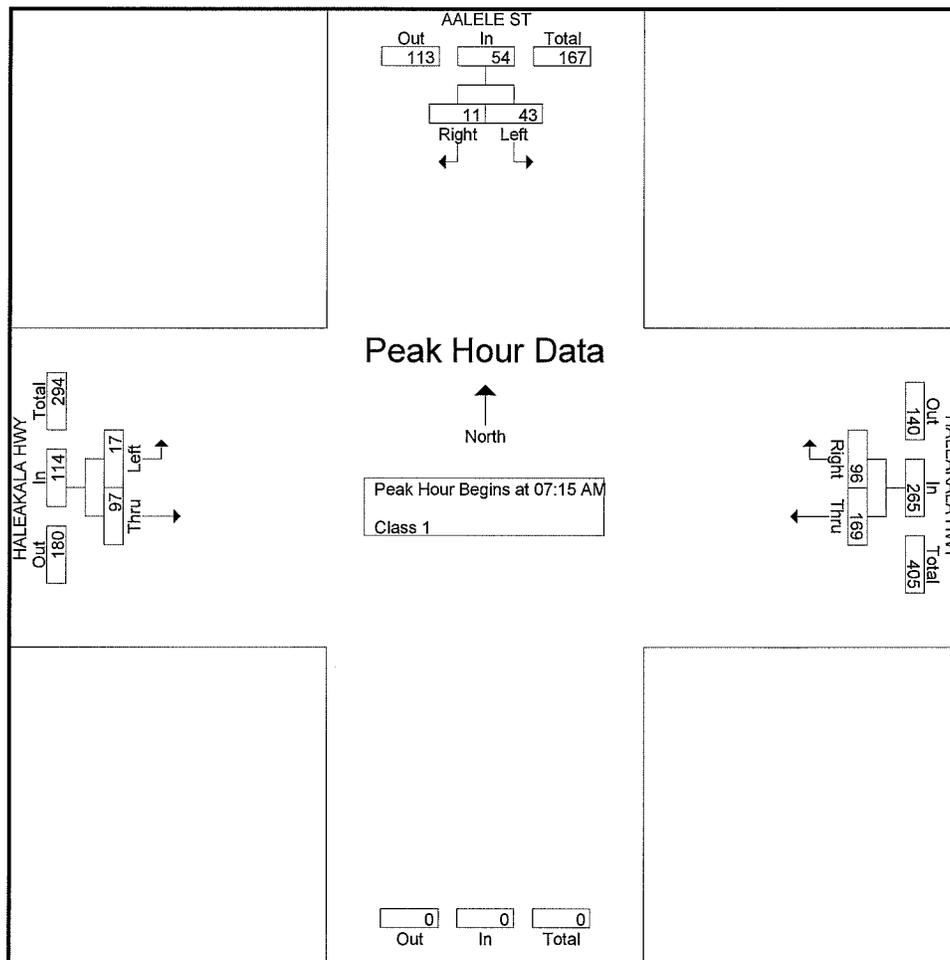
File Name : AM Haleakala Hwy-Aalele St

Site Code : 00000000

Start Date : 9/24/2015

Page No : 2

| Start Time | HALEAKALA HWY Eastbound | | | HALEAKALA HWY Westbound | | | AALELE ST Southbound | | | Int. Total |
|------------------------------------------------------------|-------------------------|-------------|-------------|-------------------------|-------------|-------------|----------------------|-------------|-------------|-------------|
| | Left | Thru | App. Total | Thru | Right | App. Total | Left | Right | App. Total | |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 0 | 25 | 25 | 36 | 21 | 57 | 14 | 2 | 16 | 98 |
| 07:30 AM | 3 | 24 | 27 | 45 | 31 | 76 | 7 | 1 | 8 | 111 |
| 07:45 AM | 4 | 27 | 31 | 47 | 20 | 67 | 10 | 3 | 13 | 111 |
| 08:00 AM | 10 | 21 | 31 | 41 | 24 | 65 | 12 | 5 | 17 | 113 |
| Total Volume | 17 | 97 | 114 | 169 | 96 | 265 | 43 | 11 | 54 | 433 |
| % App. Total | 14.9 | 85.1 | | 63.8 | 36.2 | | 79.6 | 20.4 | | |
| PHF | .425 | .898 | .919 | .899 | .774 | .872 | .768 | .550 | .794 | .958 |



Austin, Tsutsumi, & Associates

501 Sumner Street, Suite 521
Honolulu, HI, 96817

Phone: (808) 533-3646 Website: ATAHawaii.com

File Name : AM Kuleana St-DLNR Drwy

Site Code : 00000000

Start Date : 9/24/2015

Page No : 1

Groups Printed- Class 1

| Start Time | DLNR DRWY Westbound | | | KULEANA ST Northbound | | | KULEANA ST Southbound | | | Int. Total |
|-------------|------------------------|-------|------------|--------------------------|-------|------------|--------------------------|------|------------|------------|
| | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | |
| 07:00 AM | 1 | 0 | 1 | 3 | 2 | 5 | 0 | 4 | 4 | 10 |
| 07:15 AM | 5 | 0 | 5 | 2 | 0 | 2 | 0 | 1 | 1 | 8 |
| 07:30 AM | 3 | 0 | 3 | 4 | 0 | 4 | 0 | 1 | 1 | 8 |
| 07:45 AM | 2 | 0 | 2 | 2 | 0 | 2 | 0 | 0 | 0 | 4 |
| Total | 11 | 0 | 11 | 11 | 2 | 13 | 0 | 6 | 6 | 30 |
| 08:00 AM | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 4 | 5 |
| 08:15 AM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 3 |
| 08:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 AM | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 3 |
| Total | 2 | 0 | 2 | 2 | 0 | 2 | 0 | 7 | 7 | 11 |
| Grand Total | 13 | 0 | 13 | 13 | 2 | 15 | 0 | 13 | 13 | 41 |
| Apprch % | 100 | 0 | | 86.7 | 13.3 | | 0 | 100 | | |
| Total % | 31.7 | 0 | 31.7 | 31.7 | 4.9 | 36.6 | 0 | 31.7 | 31.7 | |

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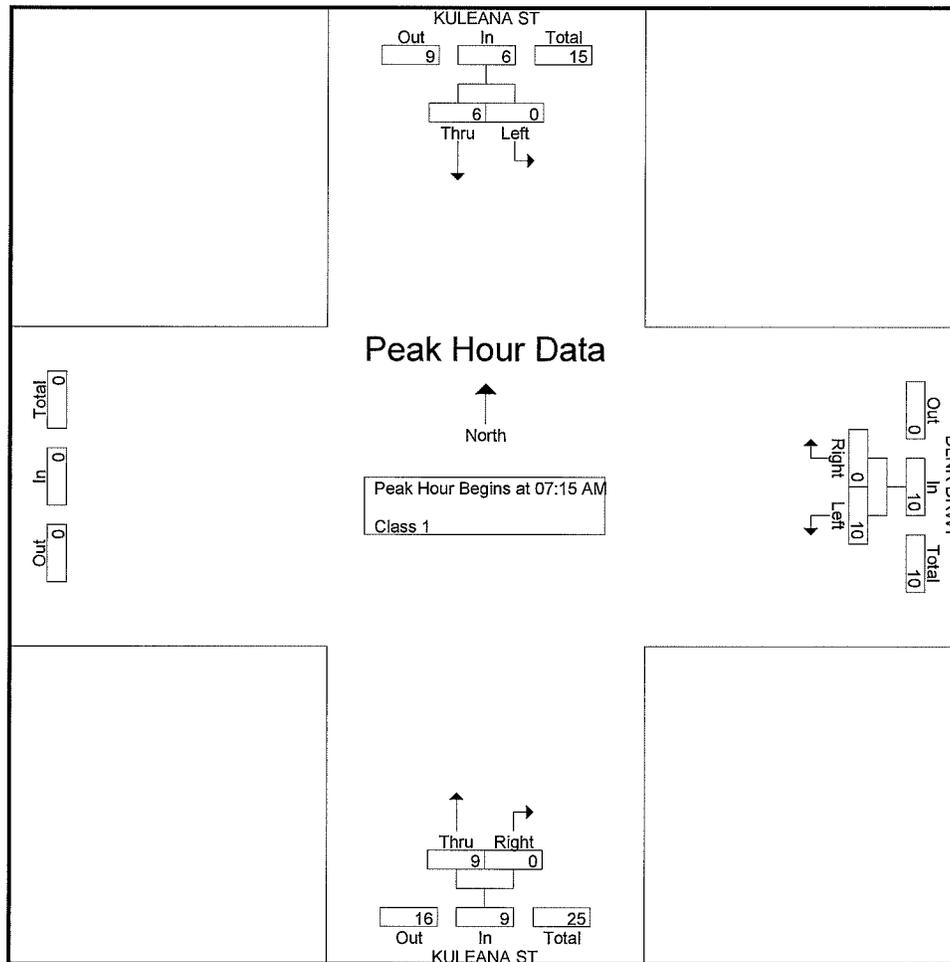
File Name : AM Kuleana St-DLNR Drwy

Site Code : 00000000

Start Date : 9/24/2015

Page No : 2

| Start Time | DLNR DRWY Westbound | | | KULEANA ST Northbound | | | KULEANA ST Southbound | | | Int. Total |
|------------------------------------------------------------|------------------------|-------|------------|--------------------------|-------|------------|--------------------------|------|------------|------------|
| | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 5 | 0 | 5 | 2 | 0 | 2 | 0 | 1 | 1 | 8 |
| 07:30 AM | 3 | 0 | 3 | 4 | 0 | 4 | 0 | 1 | 1 | 8 |
| 07:45 AM | 2 | 0 | 2 | 2 | 0 | 2 | 0 | 0 | 0 | 4 |
| 08:00 AM | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 4 | 5 |
| Total Volume | 10 | 0 | 10 | 9 | 0 | 9 | 0 | 6 | 6 | 25 |
| % App. Total | 100 | 0 | | 100 | 0 | | 0 | 100 | | |
| PHF | .500 | .000 | .500 | .563 | .000 | .563 | .000 | .375 | .375 | .781 |



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File Name : PM Haleakala Hwy-Kuleana St

Site Code : 00000000

Start Date : 9/24/2015

Page No : 1

Groups Printed- Class 1

| Start Time | HALEAKALA HWY Eastbound | | | | HALEAKALA HWY Westbound | | | | KULEANA ST Southbound | | | | Int. Total |
|-------------|----------------------------|------|------|------------|----------------------------|-------|------|------------|--------------------------|-------|------|------------|------------|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | |
| 03:00 PM | 3 | 69 | 0 | 72 | 50 | 5 | 0 | 55 | 2 | 4 | 0 | 6 | 133 |
| 03:15 PM | 1 | 54 | 0 | 55 | 53 | 2 | 0 | 55 | 8 | 11 | 0 | 19 | 129 |
| 03:30 PM | 2 | 65 | 0 | 67 | 60 | 2 | 0 | 62 | 9 | 7 | 0 | 16 | 145 |
| 03:45 PM | 1 | 70 | 0 | 71 | 60 | 0 | 0 | 60 | 2 | 10 | 0 | 12 | 143 |
| Total | 7 | 258 | 0 | 265 | 223 | 9 | 0 | 232 | 21 | 32 | 0 | 53 | 550 |
| 04:00 PM | 0 | 71 | 0 | 71 | 52 | 2 | 0 | 54 | 3 | 1 | 0 | 4 | 129 |
| 04:15 PM | 0 | 86 | 0 | 86 | 50 | 1 | 0 | 51 | 5 | 3 | 0 | 8 | 145 |
| 04:30 PM | 0 | 60 | 0 | 60 | 39 | 1 | 0 | 40 | 3 | 1 | 0 | 4 | 104 |
| 04:45 PM | 0 | 72 | 0 | 72 | 30 | 1 | 0 | 31 | 1 | 2 | 0 | 3 | 106 |
| Total | 0 | 289 | 0 | 289 | 171 | 5 | 0 | 176 | 12 | 7 | 0 | 19 | 484 |
| Grand Total | 7 | 547 | 0 | 554 | 394 | 14 | 0 | 408 | 33 | 39 | 0 | 72 | 1034 |
| Apprch % | 1.3 | 98.7 | 0 | | 96.6 | 3.4 | 0 | | 45.8 | 54.2 | 0 | | |
| Total % | 0.7 | 52.9 | 0 | 53.6 | 38.1 | 1.4 | 0 | 39.5 | 3.2 | 3.8 | 0 | 7 | |

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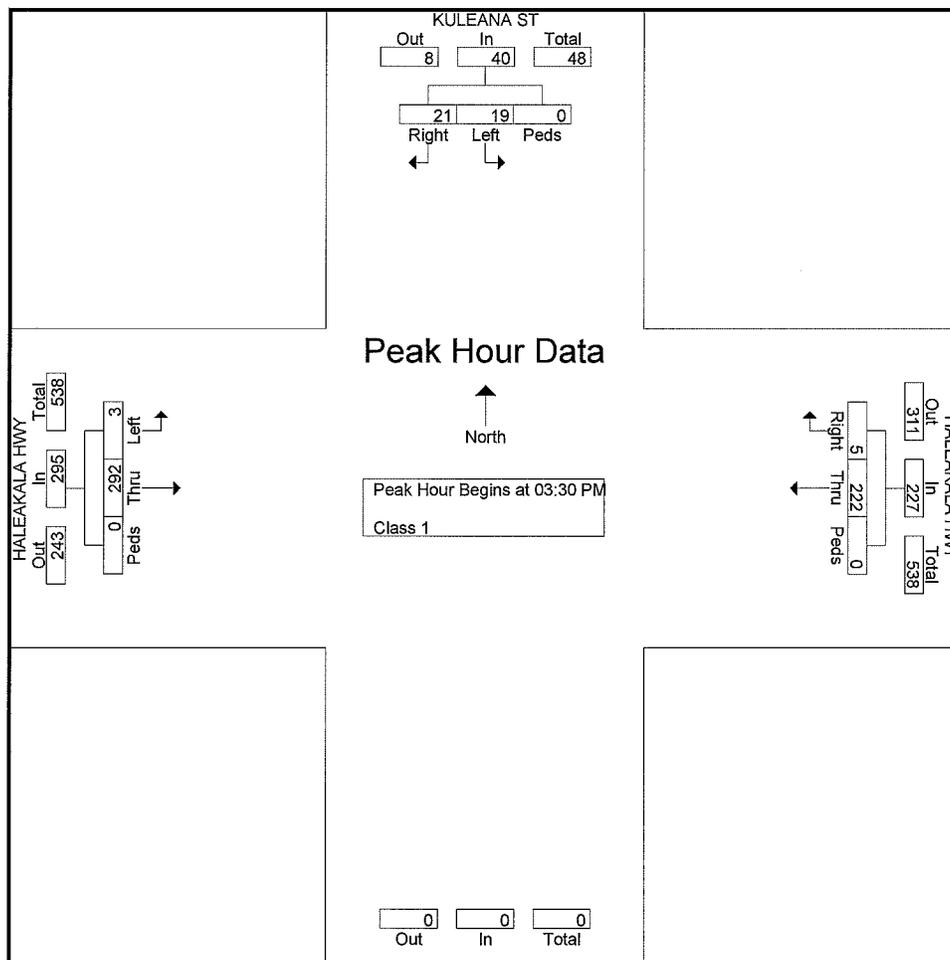
File Name : PM Haleakala Hwy-Kuleana St

Site Code : 00000000

Start Date : 9/24/2015

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| Start Time | HALEAKALA HWY Eastbound | | | | HALEAKALA HWY Westbound | | | | KULEANA ST Southbound | | | | Int. Total |
|------------------------------------------------------------|-------------------------|------|------|------------|-------------------------|-------|------|------------|-----------------------|-------|------|------------|------------|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | |
| Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1 | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | | | | |
| 03:30 PM | 2 | 65 | 0 | 67 | 60 | 2 | 0 | 62 | 9 | 7 | 0 | 16 | 145 |
| 03:45 PM | 1 | 70 | 0 | 71 | 60 | 0 | 0 | 60 | 2 | 10 | 0 | 12 | 145 |
| 04:00 PM | 0 | 71 | 0 | 71 | 52 | 2 | 0 | 54 | 3 | 1 | 0 | 4 | 129 |
| 04:15 PM | 0 | 86 | 0 | 86 | 50 | 1 | 0 | 51 | 5 | 3 | 0 | 8 | 145 |
| Total Volume | 3 | 292 | 0 | 295 | 222 | 5 | 0 | 227 | 19 | 21 | 0 | 40 | 562 |
| % App. Total | 1 | 99 | 0 | | 97.8 | 2.2 | 0 | | 47.5 | 52.5 | 0 | | |
| PHF | .375 | .849 | .000 | .858 | .925 | .625 | .000 | .915 | .528 | .525 | .000 | .625 | .969 |



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Site Code : 00000000

Start Date : 9/24/2015

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Groups Printed- Class 1

| Start Time | HALEAKALA HWY Eastbound | | | HALEAKALA HWY Westbound | | | AALELE ST Southbound | | | Int. Total |
|-------------|----------------------------|------|------------|----------------------------|-------|------------|-------------------------|-------|------------|------------|
| | Left | Thru | App. Total | Thru | Right | App. Total | Left | Right | App. Total | |
| 03:00 PM | 11 | 62 | 73 | 47 | 10 | 57 | 20 | 9 | 29 | 159 |
| 03:15 PM | 4 | 56 | 60 | 41 | 13 | 54 | 22 | 13 | 35 | 149 |
| 03:30 PM | 8 | 67 | 75 | 53 | 11 | 64 | 37 | 9 | 46 | 185 |
| 03:45 PM | 10 | 61 | 71 | 47 | 12 | 59 | 27 | 11 | 38 | 168 |
| Total | 33 | 246 | 279 | 188 | 46 | 234 | 106 | 42 | 148 | 661 |
| 04:00 PM | 8 | 66 | 74 | 44 | 13 | 57 | 20 | 11 | 31 | 162 |
| 04:15 PM | 12 | 79 | 91 | 40 | 17 | 57 | 16 | 11 | 27 | 175 |
| 04:30 PM | 9 | 53 | 62 | 33 | 8 | 41 | 15 | 5 | 20 | 123 |
| 04:45 PM | 5 | 68 | 73 | 27 | 12 | 39 | 25 | 3 | 28 | 140 |
| Total | 34 | 266 | 300 | 144 | 50 | 194 | 76 | 30 | 106 | 600 |
| Grand Total | 67 | 512 | 579 | 332 | 96 | 428 | 182 | 72 | 254 | 1261 |
| Apprch % | 11.6 | 88.4 | | 77.6 | 22.4 | | 71.7 | 28.3 | | |
| Total % | 5.3 | 40.6 | 45.9 | 26.3 | 7.6 | 33.9 | 14.4 | 5.7 | 20.1 | |

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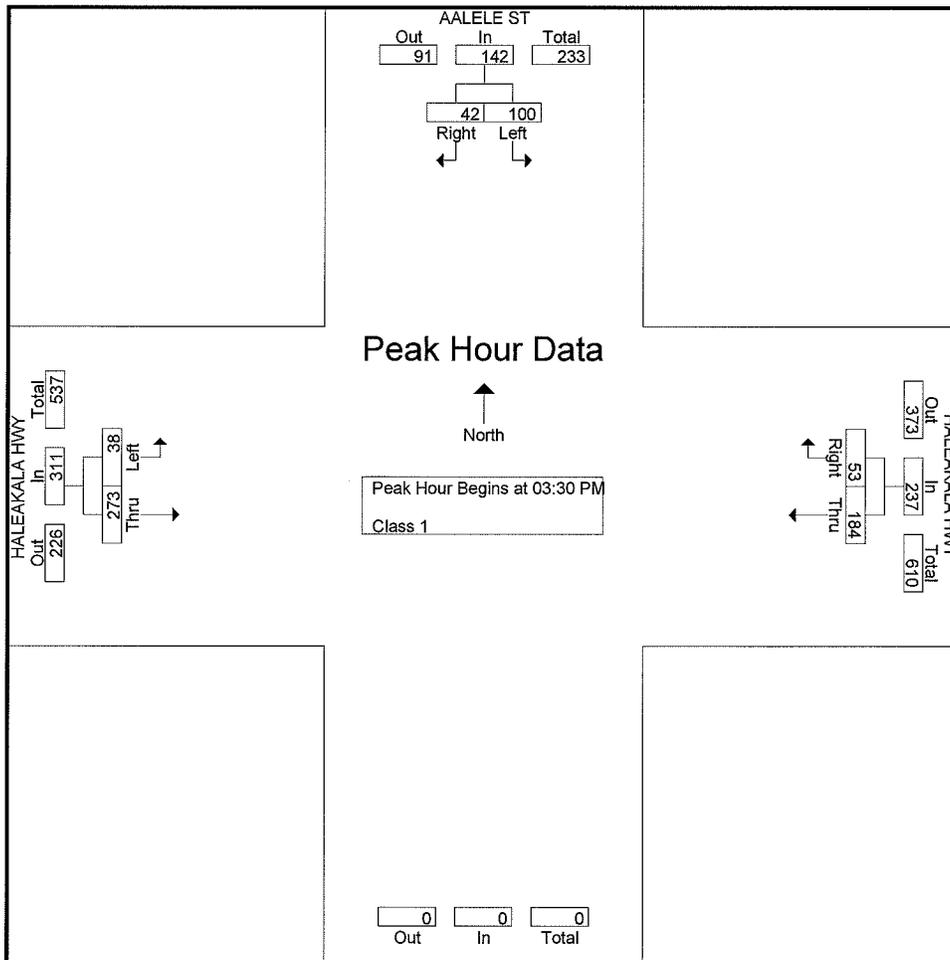
File Name : PM Haleakala Hwy-Aalele St

Site Code : 00000000

Start Date : 9/24/2015

Page No : 2

| Start Time | HALEAKALA HWY Eastbound | | | HALEAKALA HWY Westbound | | | AALELE ST Southbound | | | Int. Total |
|------------------------------------------------------------|-------------------------|------|------------|-------------------------|-------|------------|----------------------|-------|------------|------------|
| | Left | Thru | App. Total | Thru | Right | App. Total | Left | Right | App. Total | |
| Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | |
| 03:30 PM | 8 | 67 | 75 | 53 | 11 | 64 | 37 | 9 | 46 | 185 |
| 03:45 PM | 10 | 61 | 71 | 47 | 12 | 59 | 27 | 11 | 38 | 168 |
| 04:00 PM | 8 | 66 | 74 | 44 | 13 | 57 | 20 | 11 | 31 | 162 |
| 04:15 PM | 12 | 79 | 91 | 40 | 17 | 57 | 16 | 11 | 27 | 175 |
| Total Volume | 38 | 273 | 311 | 184 | 53 | 237 | 100 | 42 | 142 | 690 |
| % App. Total | 12.2 | 87.8 | | 77.6 | 22.4 | | 70.4 | 29.6 | | |
| PHF | .792 | .864 | .854 | .868 | .779 | .926 | .676 | .955 | .772 | .932 |



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Site Code : 00000000

Start Date : 9/24/2015

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Groups Printed- Class 1

| Start Time | DLNR DRWY Westbound | | | KULEANA ST Northbound | | | KULEANA ST Southbound | | | Int. Total |
|-------------|------------------------|-------|------------|--------------------------|-------|------------|--------------------------|------|------------|------------|
| | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | |
| 03:00 PM | 1 | 0 | 1 | 6 | 2 | 8 | 0 | 5 | 5 | 14 |
| 03:15 PM | 6 | 2 | 8 | 1 | 2 | 3 | 0 | 13 | 13 | 24 |
| 03:30 PM | 8 | 0 | 8 | 2 | 2 | 4 | 0 | 8 | 8 | 20 |
| 03:45 PM | 3 | 0 | 3 | 1 | 0 | 1 | 0 | 9 | 9 | 13 |
| Total | 18 | 2 | 20 | 10 | 6 | 16 | 0 | 35 | 35 | 71 |
| 04:00 PM | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 4 | 5 | 7 |
| 04:15 PM | 2 | 1 | 3 | 1 | 0 | 1 | 0 | 6 | 6 | 10 |
| 04:30 PM | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 3 | 3 | 5 |
| 04:45 PM | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 4 |
| Total | 4 | 1 | 5 | 4 | 1 | 5 | 1 | 15 | 16 | 26 |
| Grand Total | 22 | 3 | 25 | 14 | 7 | 21 | 1 | 50 | 51 | 97 |
| Apprch % | 88 | 12 | | 66.7 | 33.3 | | 2 | 98 | | |
| Total % | 22.7 | 3.1 | 25.8 | 14.4 | 7.2 | 21.6 | 1 | 51.5 | 52.6 | |

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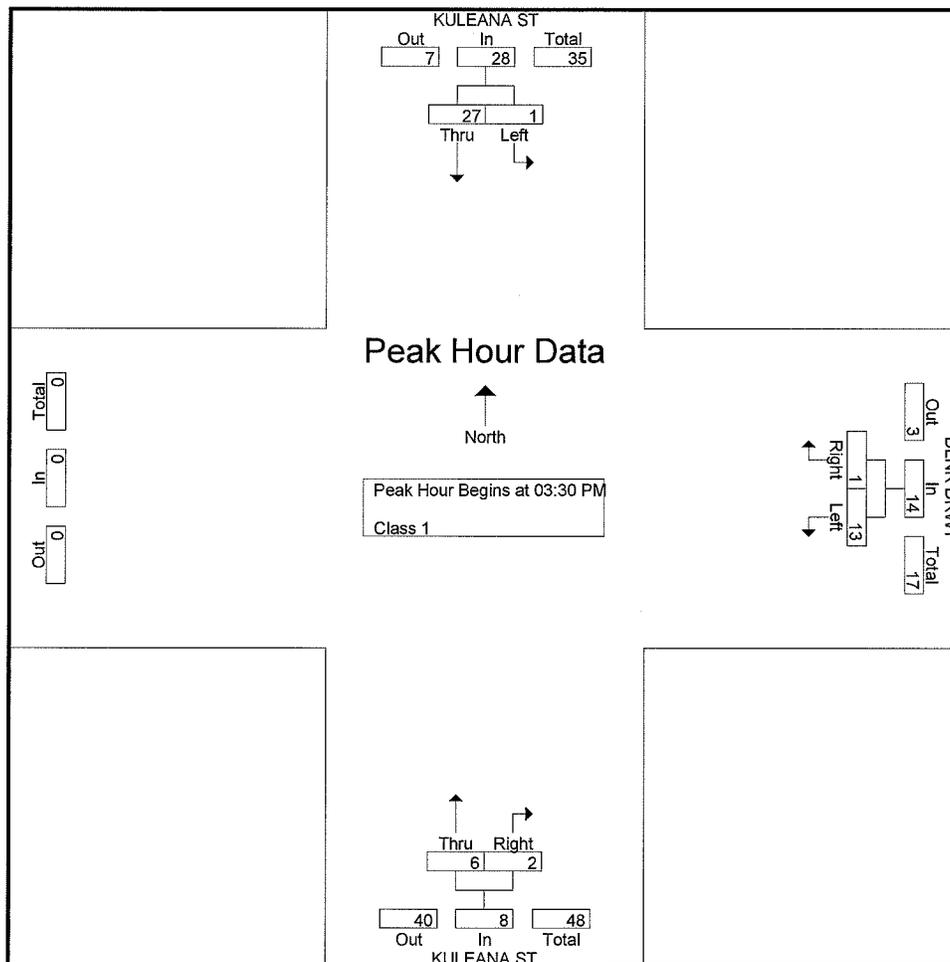
File Name : PM Kuleana St-DLNR Drwy

Site Code : 00000000

Start Date : 9/24/2015

Page No : 2

| Start Time | DLNR DRWY Westbound | | | KULEANA ST Northbound | | | KULEANA ST Southbound | | | Int. Total |
|------------------------------------------------------------|------------------------|-------|------------|--------------------------|-------|------------|--------------------------|------|------------|------------|
| | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | |
| Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | |
| 03:30 PM | 8 | 0 | 8 | 2 | 2 | 4 | 0 | 8 | 8 | 20 |
| 03:45 PM | 3 | 0 | 3 | 1 | 0 | 1 | 0 | 9 | 9 | 13 |
| 04:00 PM | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 4 | 5 | 7 |
| 04:15 PM | 2 | 1 | 3 | 1 | 0 | 1 | 0 | 6 | 6 | 10 |
| Total Volume | 13 | 1 | 14 | 6 | 2 | 8 | 1 | 27 | 28 | 50 |
| % App. Total | 92.9 | 7.1 | | 75 | 25 | | 3.6 | 96.4 | | |
| PHF | .406 | .250 | .438 | .750 | .250 | .500 | .250 | .750 | .778 | .625 |





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APPENDIX B

LEVEL OF SERVICE CRITERIA

APPENDIX B – LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 2010)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

| Level of Service | Control Delay per Vehicle (sec./veh.) |
|------------------|---------------------------------------|
| A | < 10.0 |
| B | >10.0 and ≤ 20.0 |
| C | >20.0 and ≤ 35.0 |
| D | >35.0 and ≤ 55.0 |
| E | >55.0 and ≤ 80.0 |
| F | > 80.0 |

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 2010)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

| Level of Service | Average Control Delay (sec/veh) |
|------------------|---------------------------------|
| A | ≤ 10 |
| B | >10 and ≤15 |
| C | >15 and ≤25 |
| D | >25 and ≤35 |
| E | >35 and ≤50 |
| F | > 50 |



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APPENDIX C

LEVEL OF SERVICE CALCULATIONS



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing AM Peak
-
-

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 3 | 107 | 0 | 0 | 174 | 6 | 0 | 0 | 0 | 0 | 7 | 0 |
| Traffic Volume (vph) | 3 | 107 | 0 | 0 | 174 | 6 | 0 | 0 | 0 | 0 | 7 | 0 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 0% | | | | | | | | | | | |
| Grade (%) | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 |
| Storage Length (ft) | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Storage Lanes | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 |
| Taper Length (ft) | 30 | | | | | | | | | | | |
| Link Speed (mph) | 889 | | | | | | | | | | | |
| Link Distance (ft) | 20.4 | | | | | | | | | | | |
| Travel Time (s) | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Conf. Peds. (#/hr) | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Conf. Bikes (#/hr) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Peak Hour Factor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Growth Factor | 0% | | | | | | | | | | | |
| Heavy Vehicles (%) | 0% | | | | | | | | | | | |
| Bus Blockages (#/hr) | 0% | | | | | | | | | | | |
| Parking (#/hr) | 0% | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | | | | | | | | | | | |
| Shared Lane Traffic (%) | 0% | | | | | | | | | | | |
| Intersection Summary | Other | | | | | | | | | | | |

| Intersection | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Int Delay, s/veh | 3 | 107 | 0 | 0 | 174 | 6 | 0 | 0 | 0 | 0 | 7 | 0 |
| Movement | 3 | 107 | 0 | 0 | 174 | 6 | 0 | 0 | 0 | 0 | 7 | 0 |
| Traffic Vol, veh/h | 3 | 107 | 0 | 0 | 174 | 6 | 0 | 0 | 0 | 0 | 7 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conflicting Peds. #/hr | Free | Free | Free | Free | Free | Free | None | None | None | None | None | None |
| Sign Control | 75 | - | - | 75 | - | - | 75 | - | - | 75 | - | - |
| RT Channelized | - | - | - | - | - | - | - | - | - | - | - | - |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh. in Median Storage, # | - | - | - | - | - | - | - | - | - | - | - | - |
| Grade, % | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Peak Hour Factor | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Heavy Vehicles, % | 3 | 116 | 0 | 0 | 189 | 7 | 0 | 0 | 0 | 0 | 8 | 0 |
| Mvmt Flow | Major1 | Minor1 | Major2 | Minor2 | Major1 | Minor1 | Major2 | Minor2 | Major1 | Minor1 | Major2 | Minor2 |
| Major/Minor | 196 | 0 | 0 | 320 | 319 | 116 | 116 | 0 | 0 | 315 | 315 | 192 |
| Conflicting Flow All | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Sig 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Sig 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1377 | - | - | 1473 | - | - | 633 | 598 | 936 | 638 | 601 | 860 |
| Stage 1 | - | - | - | - | - | - | 881 | 794 | - | 810 | 742 | - |
| Stage 2 | - | - | - | - | - | - | 805 | 739 | - | 881 | 794 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov. Cap-1 Maneuver | 1377 | - | - | 1473 | - | - | 625 | 597 | 936 | 637 | 600 | 850 |
| Mov. Cap-2 Maneuver | - | - | - | - | - | - | 625 | 597 | - | 637 | 600 | - |
| Stage 1 | - | - | - | - | - | - | 879 | 792 | - | 808 | 742 | - |
| Stage 2 | - | - | - | - | - | - | 796 | 739 | - | 879 | 792 | - |
| Approach | EB | WB | WB | NB | NB | SB | EB | WB | WB | NB | SB | SB |
| HCM Control Delay, s | 0.2 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 10 |
| HCM LOS | A | A | A | A | A | B | A | A | A | A | B | B |
| Minor Lane/Minor Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | WBR | SBLn1 | WBR |
| Capacity (veh/h) | - | - | 1377 | - | - | 1473 | - | - | 742 | - | - | - |
| HCM Lane V/C Ratio | - | - | 0.002 | - | - | - | - | - | 0.023 | - | - | - |
| HCM Control Delay (s) | 0 | 0 | 7.6 | - | - | 0 | - | - | 10 | - | - | - |
| HCM Lane LOS | A | A | A | A | A | A | A | A | B | A | A | A |
| HCM 95th %ile Q(veh) | - | - | 0 | - | - | 0 | - | - | 0.1 | - | - | - |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | W | W | W | W | W | W |
| Traffic Volume (vph) | 17 | 97 | 169 | 96 | 43 | 11 |
| Future Volume (vph) | 17 | 97 | 169 | 96 | 43 | 11 |
| Ideal Flow (Vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Lengths | 1 | 0 | 0 | 0 | 1 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 30 | 30 | 30 | 30 | 30 | 30 |
| Link Distance (ft) | 508 | 304 | 307 | 307 | 307 | 307 |
| Travel Time (s) | 11.5 | 6.9 | 7.0 | 7.0 | 7.0 | 7.0 |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary
 Area Type: Other

| Intersection | 1.7 | | | | | |
|--------------------------|--------|--------|--------|--------|--------|--------|
| Int Delay, s/veh | EBL | EBT | WBT | WBR | SBL | SBR |
| Movement | 17 | 97 | 169 | 96 | 43 | 11 |
| Traffic Vol, veh/h | 17 | 97 | 169 | 96 | 43 | 11 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 0 | 0 |
| Conflicting Peds. #/hr | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 75 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | 0 | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 18 | 105 | 184 | 104 | 47 | 12 |
| Major/Minor | Major1 | Major2 | Major2 | Major2 | Minor2 | Minor2 |
| Conflicting Flow All | 288 | 0 | - | 0 | 378 | 236 |
| Stage 1 | - | - | - | - | 236 | - |
| Stage 2 | - | - | - | - | 142 | - |
| Critical Hwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1274 | - | - | - | 624 | 803 |
| Stage 1 | - | - | - | - | 803 | - |
| Stage 2 | - | - | - | - | 885 | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1274 | - | - | - | 615 | 803 |
| Mov Cap-2 Maneuver | - | - | - | - | 615 | - |
| Stage 1 | - | - | - | - | 803 | - |
| Stage 2 | - | - | - | - | 872 | - |
| Approach | EB | EB | WB | WB | SB | SB |
| HCM Control Delay, s | 1.2 | 1.2 | 0 | 0 | 11.1 | 11.1 |
| HCM LOS | | | | | B | B |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBL | SBR |
| Capacity (veh/h) | 1274 | - | - | - | 646 | - |
| HCM Lane V/C Ratio | 0.015 | - | - | - | 0.091 | - |
| HCM Control Delay (s) | 7.9 | - | - | - | 11.1 | - |
| HCM Lane LOS | A | - | - | - | B | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.3 | - |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | W | | | | | A |
| Traffic Volume (vph) | 10 | 0 | 9 | 0 | 0 | 6 |
| Future Volume (vph) | 10 | 0 | 9 | 0 | 0 | 6 |
| Ideal Flow (Vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | | | | 25 |
| Link Speed (mph) | 25 | | 25 | | | 25 |
| Link Distance (ft) | 114 | | 171 | | | 411 |
| Travel Time (s) | 3.1 | | 4.7 | | | 11.2 |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | | 0% | | | 0% |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary
 Area Type: Other

| Intersection | 3.4 | | | | | |
|--------------------------|--------|-------|--------|------|--------|------|
| Int Delay, s/veh | WBL | WBR | NBT | NBR | SBL | SBT |
| Movement | 10 | 0 | 9 | 0 | 0 | 6 |
| Traffic Vol, veh/h | 10 | 0 | 9 | 0 | 0 | 6 |
| Future Vol, veh/h | 10 | 0 | 9 | 0 | 0 | 6 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 0 | 10 | 0 | 0 | 7 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 17 | 10 | 0 | 0 | 10 | 0 |
| Stage 1 | 10 | - | - | - | - | - |
| Stage 2 | 7 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 1001 | 1071 | - | - | 1610 | - |
| Stage 1 | 1013 | - | - | - | - | - |
| Stage 2 | 1016 | - | - | - | - | - |
| Platoon blocked, % | | | | | | |
| Mov Cap-1 Maneuver | 1001 | 1071 | - | - | 1610 | - |
| Mov Cap-2 Maneuver | 1001 | - | - | - | - | - |
| Stage 1 | 1013 | - | - | - | - | - |
| Stage 2 | 1016 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 8.6 | | 0 | | 0 | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBL | N | SBL | SBT |
| Capacity (veh/h) | - | - | 1001 | 1610 | - | - |
| HCM Lane V/C Ratio | - | - | 0.011 | - | - | - |
| HCM Control Delay (s) | - | - | 8.6 | 0 | - | - |
| HCM Lane LOS | - | - | A | A | - | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing PM Peak
-
-

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 3 | 292 | 0 | 0 | 222 | 5 | 0 | 0 | 0 | 0 | 19 | 0 |
| Traffic Volume (vph) | 3 | 292 | 0 | 0 | 222 | 5 | 0 | 0 | 0 | 0 | 19 | 0 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 0% | | | | | | | | | | | |
| Grade (%) | 75 | 0 | 0 | 75 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Length (ft) | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Storage Lanes | 75 | 0 | 0 | 25 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 30 | | | 30 | | | 25 | | | 25 | | 25 |
| Link Speed (mph) | 899 | | | 565 | | | 227 | | | 171 | | 171 |
| Link Distance (ft) | 20.4 | | | 12.8 | | | 6.2 | | | 4.7 | | 4.7 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | | | 0% | | | 0% | | | 0% | | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |

Other

| Intersection | 0.9 | | | | | | | | | | | |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh | 0.9 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Traffic Vol, veh/h | 3 | 292 | 0 | 0 | 222 | 5 | 0 | 0 | 0 | 0 | 19 | 0 |
| Future Vol, veh/h | 3 | 292 | 0 | 0 | 222 | 5 | 0 | 0 | 0 | 0 | 19 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | None | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 75 | - | - | 75 | - | - | 75 | - | 0 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 3 | 317 | 0 | 0 | 241 | 5 | 0 | 0 | 0 | 0 | 21 | 0 |
| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
| Conflicting Flow All | 247 | 0 | 0 | 317 | 0 | 0 | 579 | 571 | 317 | 588 | 568 | 244 |
| Stage 1 | - | - | - | - | - | - | - | 324 | 324 | - | 244 | 244 |
| Stage 2 | - | - | - | - | - | - | - | 255 | 247 | - | 324 | 324 |
| Critical Hwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hwy Stg 2 | - | - | - | - | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Follow-up Hwy | 2.218 | - | - | 2.218 | - | - | 4.26 | 4.31 | 7.24 | 4.34 | 4.32 | 7.95 |
| Pot Cap-1 Maneuver | 1319 | - | - | 1243 | - | - | 688 | 660 | - | 749 | 702 | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1319 | - | - | 1243 | - | - | 413 | 430 | 724 | 433 | 431 | 795 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 413 | 430 | - | 433 | 431 | - |
| Stage 1 | - | - | - | - | - | - | 688 | 649 | - | 768 | 704 | - |
| Stage 2 | - | - | - | - | - | - | 727 | 702 | - | 688 | 649 | - |
| Approach | EB | EB | WB | WB | EB | EB | NB | NB | SB | SB | SB | SB |
| HCM Control Delay, s | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 11.9 | 11.9 | 11.9 | 11.9 |
| HCM LOS | A | A | A | A | A | A | A | A | B | B | B | B |
| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 | SBLn3 | SBLn4 |
| Capacity (veh/h) | - | - | 1319 | - | - | 1243 | - | - | 569 | - | - | - |
| HCM Lane V/C Ratio | - | - | 0.002 | - | - | 0.076 | - | - | 0.076 | - | - | - |
| HCM Control Delay (s) | 0 | 0 | 7.7 | - | - | 0 | - | - | 11.9 | - | - | - |
| HCM Lane LOS | A | A | A | A | A | A | A | A | B | B | B | B |
| HCM 95th %ile Q(veh) | - | - | 0 | - | - | 0 | - | - | 0.2 | - | - | - |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 38 | 273 | 184 | 53 | 100 | 42 |
| Future Volume (vph) | 38 | 273 | 184 | 53 | 100 | 42 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 1 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 0 | 25 | 0 |
| Link Speed (mph) | 30 | 30 | 30 | 30 | 30 | 30 |
| Link Distance (ft) | 565 | 248 | 565 | 248 | 313 | 565 |
| Travel Time (s) | 12.8 | 5.6 | 12.8 | 5.6 | 7.1 | 12.8 |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | |

Other

Intersection Summary

| Intersection | 3.5 | | | | | |
|--------------------------|--------|--------|--------|--------|--------|--------|
| Int Delay, s/veh | 3.5 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Traffic Vol, veh/h | 38 | 273 | 184 | 53 | 100 | 42 |
| Future Vol, veh/h | 38 | 273 | 184 | 53 | 100 | 42 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 75 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 297 | 200 | 58 | 109 | 46 |
| Major/Minor | Major1 | Major2 | Major2 | Minor2 | Minor2 | Minor2 |
| Conflicting Flow All | 258 | 0 | - | 0 | 608 | 229 |
| Stage 1 | - | - | - | - | 229 | - |
| Stage 2 | - | - | - | - | 379 | - |
| Critical Hwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hwy Stg 2 | - | - | - | - | 3.518 | 3.318 |
| Follow-up Hwy | 2.218 | - | - | - | 459 | 810 |
| Pot Cap-1 Maneuver | 1307 | - | - | - | 809 | - |
| Stage 1 | - | - | - | - | 692 | - |
| Stage 2 | - | - | - | - | 445 | 810 |
| Platoon blocked, % | - | - | - | - | 445 | - |
| Mov Cap-1 Maneuver | 1307 | - | - | - | 445 | - |
| Mov Cap-2 Maneuver | - | - | - | - | 809 | - |
| Stage 1 | - | - | - | - | 670 | - |
| Stage 2 | - | - | - | - | - | - |
| Approach | EB | WB | WB | SB | SB | SB |
| HCM Control Delay, s | 1 | 0 | 0 | 15 | 15 | C |
| HCM LOS | | | | | | C |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBL | SBR |
| Capacity (veh/h) | 1307 | - | - | - | 513 | - |
| HCM Lane V/C Ratio | 0.032 | - | - | - | 0.301 | - |
| HCM Control Delay (s) | 7.8 | - | - | - | 15 | - |
| HCM Lane LOS | A | - | - | - | C | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.3 | - |

| Approach | EB | WB | WB | SB | SB | SB |
|-----------------------|-------|-----|-----|-----|-------|-----|
| HCM Control Delay, s | 1 | 0 | 0 | 15 | 15 | C |
| HCM LOS | | | | | | C |
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBL | SBR |
| Capacity (veh/h) | 1307 | - | - | - | 513 | - |
| HCM Lane V/C Ratio | 0.032 | - | - | - | 0.301 | - |
| HCM Control Delay (s) | 7.8 | - | - | - | 15 | - |
| HCM Lane LOS | A | - | - | - | C | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.3 | - |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|-------------------------|-------|------|------|------|------|------|
| Lane Configurations | 13 | 1 | 6 | 2 | 1 | 27 |
| Traffic Volume (vph) | 13 | 1 | 6 | 2 | 1 | 27 |
| Future Volume (vph) | 13 | 1 | 6 | 2 | 1 | 27 |
| Ideal Flow (vehpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 114 | | 171 | | 411 | |
| Travel Time (s) | 3.1 | | 4.7 | | 11.2 | |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | | 0% | | 0% | |
| Shared Lane Traffic (%) | | | | | | |
| Intersection Summary | Other | | | | | |

| Intersection | 2.6 | | | | | |
|--------------------------|--------|-----------|--------|-------|--------|------|
| Int Delay, s/Veh | WBL | WBR | NBT | NBR | SBL | SBT |
| Movement | 13 | 1 | 6 | 2 | 1 | 27 |
| Traffic Vol, veh/h | 13 | 1 | 6 | 2 | 1 | 27 |
| Future Vol, veh/h | 13 | 1 | 6 | 2 | 1 | 27 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 1 | 7 | 2 | 1 | 29 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 40 | 8 | 0 | 0 | 9 | 0 |
| Stage 1 | 8 | - | - | - | - | - |
| Stage 2 | 32 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 972 | 1074 | - | - | 1611 | - |
| Stage 1 | 1015 | - | - | - | - | - |
| Stage 2 | 991 | - | - | - | - | - |
| Platoon blocked, % | | | | | | |
| Mov Cap-1 Maneuver | 971 | 1074 | - | - | 1611 | - |
| Mov Cap-2 Maneuver | 971 | - | - | - | - | - |
| Stage 1 | 1015 | - | - | - | - | - |
| Stage 2 | 990 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 8.7 | | 0 | | 0.3 | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR/WBLn1 | SBL | SBT | | |
| Capacity (veh/h) | - | - | 978 | 1611 | - | - |
| HCM Lane V/C Ratio | - | - | 0.016 | 0.001 | - | - |
| HCM Control Delay (s) | - | - | 8.7 | 7.2 | 0 | - |
| HCM Lane LOS | - | - | A | A | A | - |
| HCM 95th %ile Q(veh) | - | - | 0 | 0 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2025 AM Peak
-
-

| Area Type: | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Traffic Volume (vph) | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 75 | 0% | 0 | 75 | 0% | 0 | 75 | 0% | 0 | 0 | 0% | 0% |
| Grade (%) | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Storage Length (ft) | 25 | 30 | 30 | 25 | 30 | 30 | 25 | 25 | 25 | 25 | 25 | 25 |
| Taper Length (ft) | 899 | 489 | 489 | 899 | 489 | 489 | 899 | 262 | 262 | 262 | 262 | 171 |
| Link Speed (mph) | 20.4 | 11.1 | 11.1 | 20.4 | 11.1 | 11.1 | 20.4 | 7.1 | 7.1 | 7.1 | 7.1 | 4.7 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |

Intersection Summary

| Area Type: | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Traffic Volume (vph) | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 75 | 0% | 0 | 75 | 0% | 0 | 75 | 0% | 0 | 0 | 0% | 0% |
| Grade (%) | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Storage Length (ft) | 25 | 30 | 30 | 25 | 30 | 30 | 25 | 25 | 25 | 25 | 25 | 25 |
| Taper Length (ft) | 899 | 489 | 489 | 899 | 489 | 489 | 899 | 262 | 262 | 262 | 262 | 171 |
| Link Speed (mph) | 20.4 | 11.1 | 11.1 | 20.4 | 11.1 | 11.1 | 20.4 | 7.1 | 7.1 | 7.1 | 7.1 | 4.7 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |

| Area Type: | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Traffic Volume (vph) | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 75 | 0% | 0 | 75 | 0% | 0 | 75 | 0% | 0 | 0 | 0% | 0% |
| Grade (%) | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Storage Length (ft) | 25 | 30 | 30 | 25 | 30 | 30 | 25 | 25 | 25 | 25 | 25 | 25 |
| Taper Length (ft) | 899 | 489 | 489 | 899 | 489 | 489 | 899 | 262 | 262 | 262 | 262 | 171 |
| Link Speed (mph) | 20.4 | 11.1 | 11.1 | 20.4 | 11.1 | 11.1 | 20.4 | 7.1 | 7.1 | 7.1 | 7.1 | 4.7 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |

Intersection Summary

| Area Type: | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Traffic Volume (vph) | 5 | 125 | 75 | 35 | 205 | 10 | 35 | 0 | 15 | 10 | 0 | 10 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 75 | 0% | 0 | 75 | 0% | 0 | 75 | 0% | 0 | 0 | 0% | 0% |
| Grade (%) | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Storage Length (ft) | 25 | 30 | 30 | 25 | 30 | 30 | 25 | 25 | 25 | 25 | 25 | 25 |
| Taper Length (ft) | 899 | 489 | 489 | 899 | 489 | 489 | 899 | 262 | 262 | 262 | 262 | 171 |
| Link Speed (mph) | 20.4 | 11.1 | 11.1 | 20.4 | 11.1 | 11.1 | 20.4 | 7.1 | 7.1 | 7.1 | 7.1 | 4.7 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | W | ← | ← | ← | ← | ← |
| Traffic Volume (vph) | 20 | 130 | 230 | 20 | 10 | 15 |
| Future Volume (vph) | 20 | 130 | 230 | 20 | 10 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 1 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 30 | 30 | 30 | 30 | 30 | 30 |
| Link Distance (ft) | 489 | 305 | 303 | 303 | 303 | 303 |
| Travel Time (s) | 11.1 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 |
| Conti. Peds. (#/hr) | | | | | | |
| Conti. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary
 Area Type: Other

| Intersection | EBL | EBT | WBT | WBR | SBL | SBR |
|--------------------------|--------|------|--------|------|--------|-------|
| Int Delay, s/veh | 1 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Traffic Vol, veh/h | 20 | 130 | 230 | 20 | 10 | 15 |
| Future Vol, veh/h | 20 | 130 | 230 | 20 | 10 | 15 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 75 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 141 | 250 | 22 | 11 | 16 |
| Major/Minor | Major1 | | Major2 | | Minor2 | |
| Conflicting Flow All | 272 | 0 | - | 0 | 446 | 261 |
| Stage 1 | - | - | - | - | 261 | - |
| Stage 2 | - | - | - | - | 185 | - |
| Critical Hwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1291 | - | - | - | 570 | 778 |
| Stage 1 | - | - | - | - | 783 | - |
| Stage 2 | - | - | - | - | 847 | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1291 | - | - | - | 560 | 778 |
| Mov Cap-2 Maneuver | - | - | - | - | 560 | - |
| Stage 1 | - | - | - | - | 783 | - |
| Stage 2 | - | - | - | - | 833 | - |
| Approach | EB | | WB | | SB | |
| HCM Control Delay, s | 1 | | 0 | | 10.6 | |
| HCM LOS | | | | | B | |
| Minor Lane/Minor Mvmt | EBL | EBT | WBT | WBR | SBL | SBR |
| Capacity (veh/h) | 1291 | - | - | - | 673 | - |
| HCM Lane V/C Ratio | 0.017 | - | - | - | 0.04 | - |
| HCM Control Delay (s) | 7.8 | - | - | - | 10.6 | - |
| HCM Lane LOS | A | - | - | - | B | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.1 | - |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | 10 | 0 | 10 | 0 | 0 | 10 |
| Traffic Volume (vph) | 10 | 0 | 10 | 0 | 0 | 10 |
| Future Volume (vph) | 10 | 0 | 10 | 0 | 0 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 25 | | 25 | | 411 | |
| Link Distance (ft) | 114 | | 171 | | 4.7 | |
| Travel Time (s) | 3.1 | | 4.7 | | 11.2 | |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | | 0% | | 0% | |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary
 Area Type: Other

| Intersection | 2.9 | | | | | |
|--------------------------|--------|-------|--------|------|--------|------|
| Int Delay, s/veh | WBL | WBR | NBT | NBR | SBL | SBT |
| Movement | 10 | 0 | 10 | 0 | 0 | 10 |
| Traffic Vol, veh/h | 10 | 0 | 10 | 0 | 0 | 10 |
| Future Vol, veh/h | 10 | 0 | 10 | 0 | 0 | 10 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | | | | | |
| Veh in Median Storage, # | 0 | | 0 | | 0 | |
| Grade, % | 0 | | 0 | | 0 | |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 0 | 11 | 0 | 0 | 11 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 22 | 11 | 0 | 0 | 11 | 0 |
| Stage 1 | 11 | | | | | |
| Stage 2 | 11 | | | | | |
| Critical Hdwy | 6.42 | 6.22 | | | 4.12 | |
| Critical Hdwy Stg 1 | 5.42 | | | | | |
| Critical Hdwy Stg 2 | 5.42 | | | | | |
| Follow-up Hdwy | 3.518 | 3.318 | | | 2.218 | |
| Pot Cap-1 Maneuver | 995 | 1070 | | | 1608 | |
| Stage 1 | 1012 | | | | | |
| Stage 2 | 1012 | | | | | |
| Platoon blocked, % | | | | | | |
| Mov Cap-1 Maneuver | 995 | 1070 | | | 1608 | |
| Mov Cap-2 Maneuver | 995 | | | | | |
| Stage 1 | 1012 | | | | | |
| Stage 2 | 1012 | | | | | |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 8.7 | | 0 | | 0 | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBL | SBL | SBT | |
| Capacity (veh/h) | - | - | 995 | 1608 | - | |
| HCM Lane V/C Ratio | - | - | 0.011 | - | - | |
| HCM Control Delay (s) | - | - | 8.7 | 0 | - | |
| HCM Lane LOS | - | - | A | A | - | |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - | |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2025 PM Peak
-

Lanes and Geometrics
 1: Laou Loop/Kuleana St & Haleakala Hwy

DOFAW Kahului Baseyard
 10/21/2015

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 5 | 280 | 160 | 70 | 250 | 5 | 175 | 0 | 140 | 20 | 0 | 25 |
| Traffic Volume (vph) | 5 | 280 | 160 | 70 | 250 | 5 | 175 | 0 | 140 | 20 | 0 | 25 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Grade (%) | 75 | 0 | 0 | 75 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Length (ft) | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Storage Lanes | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 25 |
| Link Speed (mph) | 899 | 0 | 0 | 489 | 0 | 0 | 262 | 0 | 0 | 0 | 0 | 171 |
| Link Distance (ft) | 20.4 | 0 | 0 | 11.1 | 0 | 0 | 7.1 | 0 | 0 | 0 | 0 | 4.7 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |

HCM 2010 TWSC
 1: Laou Loop/Kuleana St & Haleakala Hwy

DOFAW Kahului Baseyard
 10/21/2015

| Intersection | 10.5 | | | | | | | | | | | |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Int Delay, s/veh | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Movement | 5 | 280 | 160 | 70 | 250 | 5 | 175 | 0 | 140 | 20 | 0 | 25 |
| Traffic Vol, veh/h | 5 | 280 | 160 | 70 | 250 | 5 | 175 | 0 | 140 | 20 | 0 | 25 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conflicting Peds. #/hr | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| Sign Control | - | - | - | - | - | - | - | - | - | - | - | - |
| RT Channelized | 75 | - | - | 75 | - | - | 75 | - | 0 | - | - | - |
| Storage Length | - | 0 | 0 | - | 0 | 0 | - | 0 | - | - | - | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | 0 | - | 0 | - | - | - | - |
| Grade, % | - | 0 | 0 | - | 0 | 0 | - | 0 | - | - | - | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 5 | 304 | 174 | 76 | 272 | 5 | 190 | 0 | 152 | 22 | 0 | 27 |
| Major/Minor | Major1 | Major2 | Major2 | Minor1 | Minor2 | Minor2 | Minor1 | Minor2 | Minor2 | Minor2 | Minor2 | Minor2 |
| Conflicting Flow All | 277 | 0 | 0 | 478 | 0 | 0 | 842 | 831 | 391 | 829 | 916 | 274 |
| Stage 1 | - | - | - | - | - | - | - | 402 | 402 | - | 427 | 427 |
| Stage 2 | - | - | - | - | - | - | - | 440 | 429 | - | 402 | 469 |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1286 | - | - | 1084 | - | - | 284 | 305 | 668 | 280 | 272 | 765 |
| Stage 1 | - | - | - | - | - | - | 625 | 600 | - | 596 | 584 | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1286 | - | - | 1084 | - | - | 258 | 283 | 658 | 210 | 252 | 765 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 258 | 283 | - | 210 | 252 | - |
| Stage 1 | - | - | - | - | - | - | 623 | 588 | - | 604 | 544 | - |
| Stage 2 | - | - | - | - | - | - | 535 | 543 | - | 479 | 547 | - |
| Approach | EB | EB | WB | WB | EB | EB | EB | WB | WB | EB | WB | WB |
| HCM Control Delay, s | 0.1 | 0.1 | 1.8 | 1.8 | 0.1 | 0.1 | 33.2 | 16.9 | 16.9 | 33.2 | 16.9 | 16.9 |
| HCM LOS | D | D | D | D | D | D | D | D | D | D | D | C |
| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 | SBR | SBR |
| Capacity (veh/h) | 258 | 658 | 1286 | - | - | 1084 | - | - | 352 | - | - | - |
| HCM Lane V/C Ratio | 0.737 | 0.231 | 0.004 | - | - | 0.07 | - | - | 0.139 | - | - | - |
| HCM Control Delay (s) | 50 | 12.1 | 7.8 | - | - | 8.6 | - | - | 16.9 | - | - | - |
| HCM Lane LOS | F | B | A | - | - | A | - | - | C | - | - | - |
| HCM 95th %ile Q(veh) | 5.2 | 0.9 | 0 | - | - | 0.2 | - | - | 0.5 | - | - | - |

Lanes and Geometrics
 2: Haleakala Hwy & Aalele St

DOFAW Kahului Baseyard
 10/21/2015



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 40 | 395 | 280 | 15 | 20 | 45 |
| Future Volume (vph) | 40 | 395 | 280 | 15 | 20 | 45 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 1 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 0 | 25 | 0 |
| Link Speed (mph) | 30 | 30 | 30 | 30 | 30 | 30 |
| Link Distance (ft) | 489 | 305 | 305 | 303 | 303 | 303 |
| Travel Time (s) | 11.1 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 |
| Conf. Peds. (#/hr) | | | | | | |
| Conf. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary
 Area Type: Other

HCM 2010 TWSC
 2: Haleakala Hwy & Aalele St

DOFAW Kahului Baseyard
 10/21/2015

| Intersection | 1.4 | | | | | |
|--------------------------|--------|------|--------|------|--------|-------|
| Int Delay, s/veh | EBL | EBT | WBT | WBR | SBL | SBR |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Traffic Vol, veh/h | 40 | 395 | 280 | 15 | 20 | 45 |
| Future Vol, veh/h | 40 | 395 | 280 | 15 | 20 | 45 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 75 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | 0 | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Movmt Flow | 43 | 429 | 304 | 16 | 22 | 49 |
| Major/Minor | Major1 | | Major2 | | Minor2 | |
| Conflicting Flow All | 321 | 0 | - | 0 | 829 | 313 |
| Stage 1 | - | - | - | - | 313 | - |
| Stage 2 | - | - | - | - | 516 | - |
| Critical Hwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1239 | - | - | - | 340 | 727 |
| Stage 1 | - | - | - | - | 741 | - |
| Stage 2 | - | - | - | - | 599 | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1239 | - | - | - | 328 | 727 |
| Mov Cap-2 Maneuver | - | - | - | - | 328 | - |
| Stage 1 | - | - | - | - | 741 | - |
| Stage 2 | - | - | - | - | 578 | - |
| Approach | EB | | WB | | SB | |
| HCM Control Delay, s | 0.7 | | 0 | | 12.9 | |
| HCM LOS | | | | | B | |
| Minor Lane Major Movmt | EBL | EBT | WBT | WBR | SBL | SBR |
| Capacity (veh/h) | 1239 | - | - | - | 529 | - |
| HCM Lane V/C Ratio | 0.035 | - | - | - | 0.134 | - |
| HCM Control Delay (s) | 8 | - | - | - | 12.9 | - |
| HCM Lane LOS | A | - | - | - | B | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.5 | - |

Lanes and Geometrics
 3: Kuleana St & Project Driveway

DOFAW Kahului Baseyard
 10/21/2015

| | WBL | WBR | NBT | NBR | SBL | SBT |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | 15 | 5 | 10 | 5 | 5 | 30 |
| Traffic Volume (vph) | 15 | 5 | 10 | 5 | 5 | 30 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 0% | 0% | 0% | 0% | 0% | 0% |
| Grade (%) | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Length (ft) | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | | | | 25 |
| Link Speed (mph) | 25 | | 25 | | | 25 |
| Link Distance (ft) | 114 | | 171 | | | 411 |
| Travel Time (s) | 3.1 | | 4.7 | | | 11.2 |
| Conf. Peds. (#/hr) | | | | | | |
| Conf. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | | 0% | | | 0% |
| Shared Lane Traffic (%) | | | | | | |

Other

Intersection Summary

HCM 2010 TWSC
 3: Kuleana St & Project Driveway

DOFAW Kahului Baseyard
 10/21/2015

| Intersection | 3 | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/Veh | 3 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Traffic Vol, veh/h | 15 | 5 | 10 | 5 | 5 | 30 |
| Future Vol, veh/h | 15 | 5 | 10 | 5 | 5 | 30 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | 0 | - |
| Grade, % | 0 | - | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Movmt Flow | 16 | 5 | 11 | 5 | 5 | 33 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 57 | 14 | 0 | 0 | 16 | 0 |
| Stage 1 | 14 | - | - | - | - | - |
| Stage 2 | 43 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 950 | 1066 | - | - | 1602 | - |
| Stage 1 | 1009 | - | - | - | - | - |
| Stage 2 | 979 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 947 | 1066 | - | - | 1602 | - |
| Mov Cap-2 Maneuver | 947 | - | - | - | - | - |
| Stage 1 | 1009 | - | - | - | - | - |
| Stage 2 | 976 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 8.8 | | 0 | | 1 | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Movmt | NBT | NBR | WBL | WBR | SBL | SBT |
| Capacity (veh/h) | - | - | 974 | 1602 | - | - |
| HCM Lane V/C Ratio | - | - | 0.022 | 0.003 | - | - |
| HCM Control Delay (s) | - | - | 8.8 | 7.3 | 0 | 0 |
| HCM Lane LOS | - | - | A | A | A | A |
| HCM 95th %ile Q(veh) | - | - | 0.1 | 0 | 0 | 0 |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2025 AM Peak
-
-

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|-------------------------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 30 | 125 | 75 | 35 | 205 | 35 | 0 | 15 | 10 | 0 | 0 | 15 |
| Traffic Volume (vph) | 30 | 125 | 75 | 35 | 205 | 35 | 0 | 15 | 10 | 0 | 0 | 15 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Grade (%) | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 |
| Storage Length (ft) | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Storage Lanes | 25 | 0 | 25 | 0 | 25 | 0 | 25 | 0 | 25 | 0 | 25 | 0 |
| Taper Length (ft) | 30 | Link Speed (mph) | 899 | 489 | 262 | 7.1 | 25 | 25 | 25 | 25 | 25 | 25 |
| Link Distance (ft) | 20.4 | Travel Time (s) | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Travel Time (s) | 20.4 | Cont. Bikes (#/hr) | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Cont. Bikes (#/hr) | 0.92 | Peak Hour Factor | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Peak Hour Factor | 100% | Heavy Vehicles (%) | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bus Blockages (#/hr) | 0 | Parking (#/hr) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | 0% | Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Mid-Block Traffic (%) | 0% | Shared Lane Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | 0% | Other | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Other | 0% | Intersection Summary | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

| Intersection | 2.5 | | | | | | | | | | | | | |
|--------------------------|--------|-------|-------|-------|------|-------|--------|-------|-------|-------|-------|-------|--------|--|
| Int Delay, s/veh | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | | |
| Movement | 30 | 125 | 75 | 35 | 205 | 35 | 0 | 15 | 10 | 0 | 0 | 15 | | |
| Traffic Vol, veh/h | 30 | 125 | 75 | 35 | 205 | 35 | 0 | 15 | 10 | 0 | 0 | 15 | | |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Conflicting Peds, #/hr | Free | Free | Free | Free | Free | Free | None | None | None | None | None | None | | |
| Sign Control | 75 | - | - | 75 | - | - | 75 | - | - | 75 | - | - | | |
| RT Channelized | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Veh in Median Storage, # | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Grade, % | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | | |
| Peak Hour Factor | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| Heavy Vehicles, % | 33 | 136 | 82 | 38 | 223 | 38 | 38 | 0 | 16 | 11 | 0 | 16 | | |
| Mvmt Flow | | | | | | | | | | | | | | |
| Major/Minor | Major1 | | | | | | Major2 | | | | | | Minor2 | |
| Conflicting Flow All | 261 | 0 | 0 | 217 | 0 | 0 | 568 | 579 | 177 | 560 | 601 | 242 | | |
| Stage 1 | - | - | - | - | - | - | 242 | 242 | - | 318 | 318 | - | | |
| Stage 2 | - | - | - | - | - | - | 326 | 337 | - | 242 | 283 | - | | |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | | |
| Critical Hdwy Sig 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | | |
| Critical Hdwy Sig 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | | |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | | |
| Pot Cap-1 Maneuver | 1303 | - | - | 1353 | - | - | 434 | 426 | 866 | 439 | 414 | 797 | | |
| Stage 1 | - | - | - | - | - | - | 762 | 705 | - | 693 | 654 | - | | |
| Stage 2 | - | - | - | - | - | - | 687 | 641 | - | 762 | 677 | - | | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Mov Cap-1 Maneuver | 1303 | - | - | 1353 | - | - | 408 | 404 | 866 | 413 | 392 | 797 | | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 408 | 404 | - | 413 | 392 | - | | |
| Stage 1 | - | - | - | - | - | - | 743 | 687 | - | 675 | 636 | - | | |
| Stage 2 | - | - | - | - | - | - | 654 | 623 | - | 729 | 660 | - | | |
| Approach | EB | EB | WB | WB | EB | EB | NB | NB | SB | SB | SB | SB | | |
| HCM Control Delay, s | 1 | 1 | 1 | 1 | 1 | 1 | 13.1 | 13.1 | 11.5 | 11.5 | 11.5 | 11.5 | | |
| HCM LOS | B | B | B | B | B | B | B | B | B | B | B | B | | |
| Minor Lane/Minor Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 | SBLn3 | SBLn4 | | |
| Capacity (veh/h) | 408 | 866 | 1303 | - | - | 1353 | - | - | 581 | - | - | - | | |
| HCM Lane V/C Ratio | 0.093 | 0.019 | 0.025 | - | - | 0.028 | - | - | 0.047 | - | - | - | | |
| HCM Control Delay (s) | 14.7 | 9.2 | 7.8 | - | - | 7.7 | - | - | 11.5 | - | - | - | | |
| HCM Lane LOS | B | A | A | - | - | A | - | - | B | - | - | - | | |
| HCM 95th %tile Q(veh) | 0.3 | 0.1 | 0.1 | - | - | 0.1 | - | - | 0.1 | - | - | - | | |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 20 | 130 | 260 | 20 | 10 | 15 |
| Future Volume (vph) | 20 | 130 | 260 | 20 | 10 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 1 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 30 | 30 | 30 | 30 | 30 | 30 |
| Link Distance (ft) | 489 | 305 | 303 | | 303 | |
| Travel Time (s) | 11.1 | 6.9 | 6.9 | | 6.9 | |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary

Area Type: Other



| Intersection | 1 | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | EBL | EBT | WBT | WBR | SBL | SBR |
| Movement | 20 | 130 | 260 | 20 | 10 | 15 |
| Traffic Vol, veh/h | 20 | 130 | 260 | 20 | 10 | 15 |
| Future Vol, veh/h | 20 | 130 | 260 | 20 | 10 | 15 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 75 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | 0 | - | - |
| Grade, % | - | 0 | 0 | 0 | - | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 141 | 283 | 22 | 11 | 16 |

Major/Minor

Major1 Major2 Minor2

| Major/Minor | Major1 | Major2 | Minor2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 304 | 0 | 478 |
| Stage 1 | - | - | 293 |
| Stage 2 | - | - | 185 |
| Critical Hwy | 4.12 | - | 6.42 |
| Critical Hwy Stg 1 | - | - | 5.42 |
| Critical Hwy Stg 2 | - | - | 3.518 |
| Follow-up Hwy | 2.218 | - | 3.318 |
| Pot Cap-1 Maneuver | 1257 | - | 546 |
| Stage 1 | - | - | 757 |
| Stage 2 | - | - | 847 |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | 1257 | - | 536 |
| Mov Cap-2 Maneuver | - | - | 536 |
| Stage 1 | - | - | 757 |
| Stage 2 | - | - | 832 |

Approach

| Approach | EB | WB | SB |
|----------------------|-----|----|------|
| HCM Control Delay, s | 1.1 | 0 | 10.8 |
| HCM LOS | | | B |

Minor Lane/Major Mvmt

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 | SBRn1 |
|-----------------------|-------|-----|-----|-----|-------|-------|
| Capacity (veh/h) | 1257 | - | - | - | 645 | - |
| HCM Lane V/C Ratio | 0.017 | - | - | - | 0.042 | - |
| HCM Control Delay (s) | 7.9 | - | - | - | 10.8 | - |
| HCM Lane LOS | A | - | - | - | B | - |
| HCM 95th %ile Q(veh) | 0.1 | - | - | - | 0.1 | - |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 20 | 0 | 10 | 55 | 0 | 10 |
| Future Volume (vph) | 20 | 0 | 10 | 55 | 0 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 |
| Link Speed (mph) | 25 | 25 | 25 | 25 | 25 | 25 |
| Link Distance (ft) | 114 | 171 | 171 | 411 | 171 | 411 |
| Travel Time (s) | 3.1 | 4.7 | 4.7 | 11.2 | 4.7 | 11.2 |
| Contnl. Peds. (#/hr) | | | | | | |
| Contnl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | |

Area Type: Other

| Intersection | 1.9 | | | | | |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Int Delay, s/veh | WBL | WBR | NBT | NBR | SBL | SBT |
| Movement | 20 | 0 | 10 | 55 | 0 | 10 |
| Traffic Vol, veh/h | 20 | 0 | 10 | 55 | 0 | 10 |
| Future Vol, veh/h | 20 | 0 | 10 | 55 | 0 | 10 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh In Median Storage # | 0 | - | 0 | 0 | - | 0 |
| Grade, % | 0 | - | 0 | 0 | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 0 | 11 | 60 | 0 | 11 |
| Major/Minor | Minor1 | Minor1 | Major1 | Major2 | Major2 | Major2 |
| Conflicting Flow All | 52 | 41 | 0 | 0 | 71 | 0 |
| Stage 1 | 41 | - | - | - | - | - |
| Stage 2 | 11 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Sig 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Sig 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3,518 | 3,318 | - | - | 2,218 | - |
| Pot Cap-1 Maneuver | 957 | 1030 | - | - | 1529 | - |
| Stage 1 | 981 | - | - | - | - | - |
| Stage 2 | 1012 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 957 | 1030 | - | - | 1529 | - |
| Mov Cap-2 Maneuver | 957 | - | - | - | - | - |
| Stage 1 | 981 | - | - | - | - | - |
| Stage 2 | 1012 | - | - | - | - | - |
| Approach | WB | WB | NB | NB | SB | SB |
| HCM Control Delay, s | 8.8 | 8.8 | 0 | 0 | 0 | 0 |
| HCM LOS | A | A | | | | |
| Minor Lane/Minor Mvmt | NBT | NBR | WBL1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 957 | 1529 | - | - |
| HCM Lane V/C Ratio | - | - | 0.023 | - | - | - |
| HCM Control Delay (s) | - | - | 8.8 | 0 | - | - |
| HCM Lane LOS | - | - | A | A | - | - |
| HCM 95th %ile Q(veh) | - | - | 0.1 | 0 | - | - |



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2025 PM Peak
-

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | 15 | 280 | 160 | 70 | 250 | 20 | 175 | 0 | 140 | 45 | 0 | 50 |
| Traffic Volume (vph) | 15 | 280 | 160 | 70 | 250 | 20 | 175 | 0 | 140 | 45 | 0 | 50 |
| Future Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Lane Width (ft) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Grade (%) | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 0 |
| Storage Length (ft) | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| Storage Lanes | 25 | 0 | 25 | 25 | 0 | 25 | 25 | 0 | 25 | 0 | 25 | 0 |
| Taper Length (ft) | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Link Speed (mph) | 899 | 899 | 899 | 469 | 469 | 469 | 262 | 262 | 262 | 262 | 262 | 262 |
| Link Distance (ft) | 20.4 | 20.4 | 20.4 | 11.1 | 11.1 | 11.1 | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 |
| Travel Time (s) | | | | | | | | | | | | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Other | | | | | | | | | | | | |

| Intersection | 13.4 | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Movement | 15 | 280 | 160 | 70 | 250 | 20 | 175 | 0 | 140 | 45 | 0 | 50 |
| Traffic Vol, veh/h | 15 | 280 | 160 | 70 | 250 | 20 | 175 | 0 | 140 | 45 | 0 | 50 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conflicting Peds. #/hr | Free |
| Sign Control | - | - | - | - | - | - | - | - | - | - | - | - |
| RT Channelized | - | - | - | - | - | - | - | - | - | - | - | - |
| Storage Length | 75 | - | - | 75 | - | - | 75 | - | - | 75 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 16 | 304 | 174 | 76 | 272 | 22 | 190 | 0 | 152 | 49 | 0 | 54 |

| Major/Minor | Major1 | Major2 | Minor1 | Minor2 |
|----------------------|--------|--------|--------|--------|
| Conflicting Flow All | 293 | 0 | 0 | 886 |
| Stage 1 | - | - | - | 424 |
| Stage 2 | - | - | - | 462 |
| Critical Hdwy | 4.12 | - | - | 7.12 |
| Critical Hdwy Stg 1 | - | - | - | 6.12 |
| Critical Hdwy Stg 2 | - | - | - | 6.12 |
| Follow-up Hdwy | 2.218 | - | - | 3.518 |
| Pot Cap-1 Maneuver | 1269 | - | - | 265 |
| Stage 1 | - | - | - | 608 |
| Stage 2 | - | - | - | 580 |
| Platoon blocked, % | - | - | - | - |
| Mov Cap-1 Maneuver | 1269 | - | - | 231 |
| Mov Cap-2 Maneuver | - | - | - | 231 |
| Stage 1 | - | - | - | 600 |
| Stage 2 | - | - | - | 501 |

| Approach | EB | WB | NB | SB |
|----------------------|-----|-----|------|------|
| HCM Control Delay, s | 0.3 | 1.8 | 42.4 | 21.1 |
| HCM LOS | E | E | E | C |

| Minor Lane/Minor Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBL | SBT | SBR |
|-----------------------|-------|-------|-------|-----|-----|------|-----|-----|-------|-----|-----|
| Capacity (veh/h) | 231 | 688 | 1289 | - | - | 1084 | - | - | 326 | - | - |
| HCM Lane V/C Ratio | 0.823 | 0.231 | 0.013 | - | - | 0.07 | - | - | 0.317 | - | - |
| HCM Control Delay (s) | 66.6 | 12.1 | 7.9 | - | - | 8.6 | - | - | 21.1 | - | - |
| HCM Lane LOS | F | B | A | - | - | A | - | - | C | - | - |
| HCM 95th %ile Q(veh) | 6.3 | 0.9 | 0 | - | - | 0.2 | - | - | 1.3 | - | - |

| Area Type: | Other |
|------------|-------|
| Area Type: | 0% |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 40 | 425 | 290 | 15 | 20 | 45 |
| Future Volume (vph) | 40 | 425 | 290 | 15 | 20 | 45 |
| Ideal Flow (veh/pl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 75 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 1 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 30 | 30 | 30 | | 30 | |
| Link Distance (ft) | 489 | 305 | | | 303 | |
| Travel Time (s) | 11.1 | 6.9 | | | 6.9 | |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | 0% | | | 0% | |
| Shared Lane Traffic (%) | | | | | | |

Intersection Summary
 Area Type: Other

| Intersection | 1.4 | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | EBL | EBT | WBT | WBR | SBL | SBR |
| Movement | 40 | 425 | 290 | 15 | 20 | 45 |
| Traffic Vol, veh/h | 40 | 425 | 290 | 15 | 20 | 45 |
| Future Vol, veh/h | 40 | 425 | 290 | 15 | 20 | 45 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 75 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | 0 | 0 | - |
| Grade, % | - | 0 | 0 | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 462 | 315 | 16 | 22 | 49 |

| Major/Minor | Major1 | Major2 | Minor2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 332 | 0 | 872 |
| Stage 1 | - | - | 323 |
| Stage 2 | - | - | 549 |
| Critical Hdwy | 4.12 | - | 6.42 |
| Critical Hdwy Stg 1 | - | - | 5.42 |
| Critical Hdwy Stg 2 | - | - | 5.42 |
| Follow-up Hdwy | 2.218 | - | 3.518 |
| Prot Cap-1 Maneuver | 1227 | - | 321 |
| Stage 1 | - | - | 734 |
| Stage 2 | - | - | 579 |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | 1227 | - | 310 |
| Mov Cap-2 Maneuver | - | - | 718 |
| Stage 1 | - | - | 734 |
| Stage 2 | - | - | 559 |

| Approach | EB | WB | SB |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.7 | 0 | 13.2 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------|-------|-----|-----|-----|-----|-------|
| Capacity (veh/h) | 1227 | - | - | - | - | 511 |
| HCM Lane V/C Ratio | 0.035 | - | - | - | - | 0.138 |
| HCM Control Delay (s) | 8 | - | - | - | - | 13.2 |
| HCM Lane LOS | A | - | - | - | - | B |
| HCM 95th %ile Q(veh) | 0.1 | - | - | - | - | 0.5 |



| Lane Group | WBL | WBR | NET | NBR | SBL | SBT |
|-------------------------|-------|------|------|------|------|------|
| Lane Configurations | W | | T | | | T |
| Traffic Volume (vph) | 65 | 5 | 10 | 25 | 5 | 30 |
| Future Volume (vph) | 65 | 5 | 10 | 25 | 5 | 30 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | 0% | 0% | 0% | 0% | 0% |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | | | 25 | |
| Link Speed (mph) | 25 | | 25 | | 25 | |
| Link Distance (ft) | 114 | | 171 | | 411 | |
| Travel Time (s) | 3.1 | | 4.7 | | 11.2 | |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | | 0% | | 0% | |
| Shared Lane Traffic (%) | | | | | | |
| Area Type: | Other | | | | | |

| Intersection | 4.9 | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | WBL | WBR | NBT | NBR | SBL | SBT |
| Movement | 65 | 5 | 10 | 25 | 5 | 30 |
| Traffic Vol, veh/h | 65 | 5 | 10 | 25 | 5 | 30 |
| Future Vol, veh/h | 65 | 5 | 10 | 25 | 5 | 30 |
| Conflicting Peds. #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | 0 | - |
| Grade, % | 0 | - | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 71 | 5 | 11 | 27 | 5 | 33 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 67 | 24 | 0 | 0 | 38 | 0 |
| Stage 1 | 24 | - | - | - | - | - |
| Stage 2 | 43 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Sig 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Sig 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 938 | 1052 | - | - | 1572 | - |
| Stage 1 | 989 | - | - | - | - | - |
| Stage 2 | 979 | - | - | - | - | - |
| Platoon blocked, % | | | | | | |
| Mov. Cap-1 Maneuver | 935 | 1052 | - | - | 1572 | - |
| Mov. Cap-2 Maneuver | 935 | - | - | - | - | - |
| Stage 1 | 989 | - | - | - | - | - |
| Stage 2 | 976 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 9.2 | | 0 | | 1 | |
| HCM LOS | A | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBL1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 942 | 1572 | - | - |
| HCM Lane V/C Ratio | - | - | 0.081 | 0.003 | - | - |
| HCM Control Delay (s) | - | - | 9.2 | 7.3 | 0 | - |
| HCM Lane LOS | - | - | A | A | A | - |
| HCM 95th %ile Q(veh) | - | - | 0.3 | 0 | - | - |

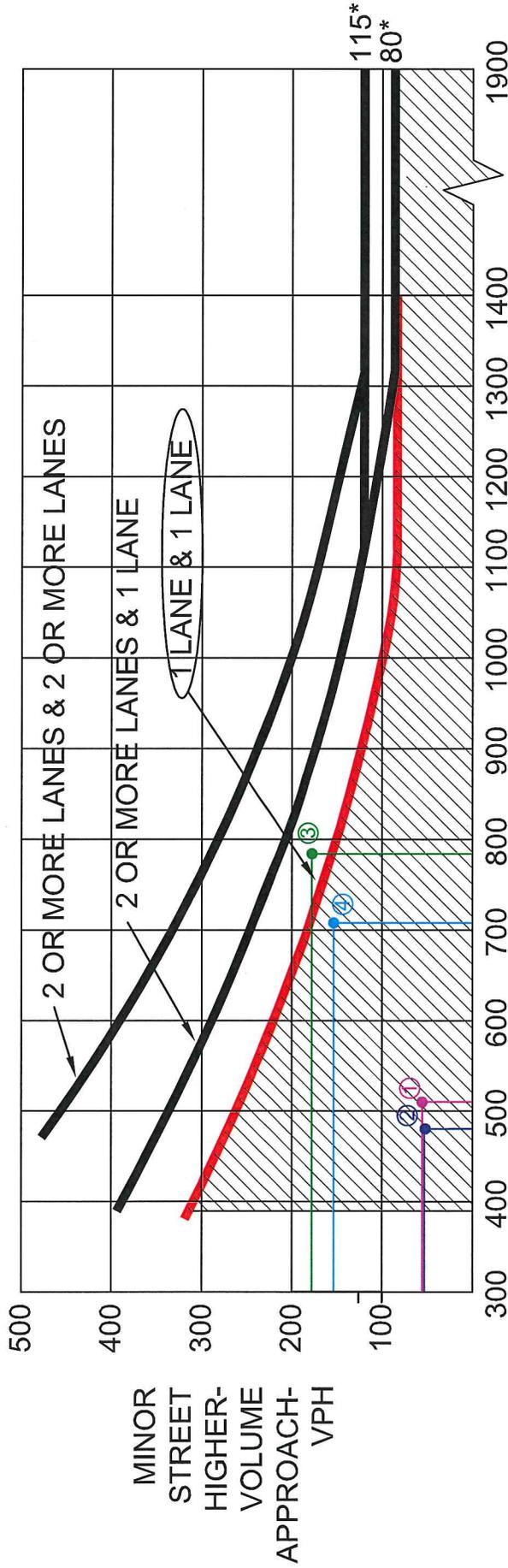


AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX D

TRAFFIC SIGNAL WARRANT

Warrant 2, Four-Hour Vehicular Volume



MAJOR STREET - TOTAL OF BOTH APPROACHES - VEHICLES PER HOUR (VPH)

- ① (7:00 AM to 8:00 AM), (505, 50)
- ② (8:00 PM to 9:00 AM), (485, 50)
- ③ (3:00 PM to 4:00 PM), (785, 175)
- ④ (4:00 PM to 4:00 PM), (705, 155)

*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

DIVISION OF FORESTRY AND WILDLIFE (DOFAW)
KAHALUI BASEYARD
TIAR

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS
HONOLULU, HAWAII

FIGURE

D-1

TRAFFIC SIGNAL WARRANT FOR HALEAKALA HIGHWAY AND KULEANA ST/LAUO LP

APPENDIX I.

Agencies Consulted Regarding the DOFAW Kahului Baseyard Renovation; Letters Received and Responses to Substantive Comments

APPENDIX I.

Agencies Consulted During the Preparation of the Draft Environmental Assessment for the DOFAW Kahului Baseyard Renovation; Letters Received and Responses to Substantive Comments

The State of Hawaii, Department of Land and Natural Resources-Engineering (DLNR-ENG) is proposing the development of a new baseyard for the DLNR-Division of Forestry and Wildlife (DOFAW) on State-owned land at Pulehunui (Pulehunui Baseyard), which is located in the vicinity of the former Pu'unēnē Airport.

As discussed in Chapter IV, Alternatives to the Proposed Action, prior to identifying land at Pulehunui for a new DOFAW Baseyard, DLNR-ENG had planned to renovate its existing baseyard in Kahului to accommodate its need for more space and updated facilities. The early consultation process for the Environmental Assessment (EA) for the Kahului Baseyard Renovation was initiated in December 2014. A list of agencies consulted during the preparation of the Draft EA for the Kahului Baseyard Renovation is included in **Appendix "I-1"**. The consultation comment letters and responses for the Kahului Baseyard Renovation are included in **Appendix "I-2"**.

When the the Pulehunui Baseyard site was subsequently identified as the preferred site and the Kahului Baseyard site as the secondary alternative, the early consultation process for a consolidated EA addressing both potential locations was initiated in March 2015. Comments received during this consultation process along with responses to these comments are provided in Chapter VIII of the Draft EA.

Although the March 2015 consultation process covered both the Pulehunui Baseyard and Kahului Baseyard sites, the comments originally provided in response to the December 2014 Kahului Baseyard renovation project are provided in this Appendix for completeness.

APPENDIX I-1.

Agencies Consulted Regarding the DOFAW Kahului Baseyard Renovation

APPENDIX I-1.

Agencies Consulted Regarding the DOFAW Kahului Baseyard Renovation

The agencies consulted during the preparation of the Draft Environmental Assessment (EA) for the Kahului Baseyard Renovation are noted below.

1. George Young, Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Regulatory Branch, Building 230
Fort Shafter, Hawaii 96858-5440
2. Loyal A. Mehrhoff, Field Supervisor
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122
Box 50088
Honolulu, Hawaii 96813
3. Douglas G. Murdock, Acting Comptroller
Department of Accounting and General Services
1151 Punchbowl Street, #426
Honolulu, Hawaii 96813
4. Scott Enright, Chair
Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512
5. Wesley Machida, Acting Director
Department of Budget and Finance
P.O. Box 150
Honolulu, Hawaii 96810
6. Luis P. Salaveria, Acting Director
State of Hawaii
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804
7. Keith Yamamoto, Acting Director
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814
8. Alec Wong, P.E., Chief
Clean Water Branch
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814
9. Patti Kitkowski
State of Hawaii
Department of Health
Maui Sanitation Branch
54 South High Street, Room 300
Wailuku, Hawaii 96793
10. Laura McIntyre, AICP
Environmental Planning Office
Department of Health
919 Ala Moana Blvd., Suite 312
Honolulu, Hawaii 96814
11. William J. Aila, Jr., Chairperson
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809
12. Alan Downer, Administrator
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707

13. Ford Fuchigami, Interim Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813
14. Major General Darryll Wong, Adjutant
General and Director
Hawaii State Civil Defense
3949 Diamond Head Road
Honolulu, Hawaii 96813-4495
15. Jessica Wooley, Director
Office of Environmental Quality
Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813
16. Dr. Kamana`opono Crabbe, Chief
Executive Officer
Office of Hawaiian Affairs
560 North Nimitz Highway, Suite 200
Honolulu, Hawaii 96817
17. Leo R. Asuncion, Jr., AICP, Acting
Director
State of Hawaii
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804
18. Dan Orodenker, Executive Officer
State of Hawaii
State Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804
19. Teena Rasmussen
County of Maui
Office of Economic Development
2200 Main Street, Suite 305
Wailuku, Hawaii 96793
20. Kyle Ginoza, Director
County of Maui
Department of Environmental
Management
One Main Plaza
2200 Main Street, Suite 100
Wailuku, Hawaii 96793
21. Jeffrey A. Murray, Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732
22. Jo-Ann Ridao, Director
County of Maui
Department of Housing and Human
Concerns
One Main Plaza
2200 Main Street, Suite 546
Wailuku, Hawaii 96793
23. Brianne Savage, Interim Director
County of Maui
Department of Parks and Recreation
700 Halia Nakoia Street, Unit 2
Wailuku, Hawaii 96793
24. William Spence, Director
County of Maui
Department of Planning
2200 Main Street, Suite 315
Wailuku, Hawaii 96793
25. Tivoli Faaumu, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793
26. David Goode, Director
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawaii 96793
27. Jo Anne Johnson Winer, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793
28. David Taylor, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

29. Mathew McNeff
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawaii 96733

30. Hawaiian Telcom
60 South Church Street
Wailuku, Hawaii 96793

APPENDIX I-2.

Letters Received and Responses to Substantive Comments on the Kahului Baseyard Renovation

DEC 16 2014

KERRY K. YONESHIGE
Interim Comptroller



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 118, HONOLULU, HAWAII 96810-0118

DEC 12 2014

(P)1373.4

Ms. Marisa Fujimoto, Senior Associate
Munekiyō & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96796

Dear Ms. Fujimoto:

Subject: Division of Forestry and Wildlife Baseyard Renovations
Kahului, Maui, Hawaii
TMK: (2) 3-8-079-018 (por)

Thank you for the opportunity to provide comments for the subject project. This project does not impact any of the Department of Accounting and General Services' projects or existing facilities in this area and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or your staff may call Mr. Alva Nakamura of the Public Works Division at 586-0488.

Sincerely,

KERRY K. YONESHIGE
Interim Comptroller

Michael T. Munekiyo
PRESIDENT
Karilynn K. Fukuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT

MUNEKIYO HIRAGA
Planning, Project Management, Sustainable Solutions.

February 2, 2016

Douglas G. Murdock, Comptroller
State of Hawaii
Department of Accounting and
General Services
P.O. Box 119
Honolulu, Hawaii 96810

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079-018 (por.) ((P)1373.4)

Dear Mr. Murdock:

Thank you for your letter dated December 12, 2014 providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.963.1233
www.munekiyohiraga.com

DAVID Y. IBE
GOVERNOR

KALBERT K. YOUNG
DIRECTOR

LUIS P. SALAVIERA
DEPUTY DIRECTOR



STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE

EMPLOYER RETIREMENT SYSTEM
HAWAII EMPLOYER UNION HEALTH BENEFITS TRUST FUND
PUBLIC UTILITIES COMMISSION

ADMINISTRATIVE AND PERSONNEL OFFICE
BUDGET PROGRAM PLANNING AND
MANAGEMENT DIVISION
FINANCIAL SERVICES DIVISION
OFFICE OF FEDERAL AWARDS MANAGEMENT

HONOLULU, HAWAII 96810-0160

December 26, 2014

With regard to your letter of December 12, 2014, we acknowledge that the Kahului Baseyard site does not impact any of the Department of Accounting and General Services (DAGS) projects or existing facilities and have noted that the State of Hawaii, DAGS did not have any further comments on the Kahului Baseyard Renovation Project at this time. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,

Marisa Fujimoto
Senior Associate

Ms. Marisa Fujimoto
Senior Associate
Munekiyō & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

MF:tn

Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting

KIDMTAB2wars1D0PAM Farmiling AssasIECT. Responas1D1D08 Responas1D08

Dear Ms. Fujimoto:

This is in response to your letter dated December 5, 2014, requesting comments for the environmental assessment related to the proposed renovation of the baseyard in Kahului, Maui, for the State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife.

We have no comments at this time.

Sincerely,

KALBERT K. YOUNG
Director of Finance

We appreciate your input and have noted that the State of Hawaii, Department of Budget and Finance did not have any comments on the Kahului Baseyard Renovation Project. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

February 2, 2016

Very truly yours,



Marisa Fujimoto
Senior Associate

Wesley Machida, Director
State of Hawaii
Department of Budget and Finance
P.O. Box 150
Honolulu, Hawaii 96810

MF:tn
Attachment
cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\DOFAW Permilting Assessment\Budget and Finance Response.doc

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (part.)

Dear Mr. Machida:

Thank you for your letter dated December 26, 2014 providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA.



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96807-3378

DEC 29 2014

KETILYAMAMOTO
DIRECTOR OF HEALTH

In reply, please refer to:
EID00096

12047PJF.14

December 24, 2014

Ms. Marisa Fujimoto
Senior Associate
Munekiyō & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Fujimoto:

**SUBJECT: Early Consultation request for the Proposed Division of Forestry
and Wildlife Baseyard Renovations
Kahului, Island of Maui, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated December 5, 2014, requesting comments on the subject document. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. Your applicant may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/10/CWB_Oct22.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:
 - a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
 - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
 - c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).
2. National Pollutant Discharge Elimination System (NPDES) permit coverage is required for pollutant discharges into State surface waters and for certain situations involving storm water (HAR, Chapter 11-55).

Ms. Marisa Fujimoto
December 24, 2014
Page 2

12047PJF.14

- a. Discharges into Class 2 or Class A State waters can be covered under an NPDES general permit only if all of the NPDES general permit requirements are met. Please see the DOH-CWB website (<http://health.hawaii.gov/cwb/>) for the NPDES general permits and instructions to request coverage.
 - b. All other discharges into State surface waters and discharges into Class 1 or Class AA State waters require an NPDES individual permit. To request NPDES individual permit coverage, please see the DOH-CWB forms website located at: <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/forms/>.
 - c. NPDES permit coverage for storm water associated with construction activities is required if your project will result in the disturbance of one (1) acre or more of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. NPDES permit coverage is required before the start of the construction activities. Land disturbance includes, but is not limited to clearing, grading, grubbing, uprooting of vegetation, demolition (even if leaving foundation slab), staging, stockpiling, excavation into pavement areas which go down to the base course, and storage areas (including areas on the roadway to park equipment if these areas are blocked off from public usage, grassed areas, or bare ground).
3. If the project involves work in, over, or under waters of the United States, it is highly recommended that your applicant contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their permitting requirements.

Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters..." (Emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2, and HAR, Chapter 11-54.
 4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.



Michael T. Munekiyo
PRESIDENT
Karilynn K. Fuliuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT

If you have any questions, please visit our website at <http://health.hawaii.gov/cwb>, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:bk

Alec Wong, P.E., Chief
State of Hawaii
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, Hawaii 96801

February 2, 2016

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.) (12047PJF.14)

Dear Mr. Wong:

Thank you for your letter dated December 24, 2014, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of December 24, 2014 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
www.munekiyohiraga.com

JAN 28 2015

DAVID Y. IBE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M.D., M.P.H.
DISTRICT HEALTH OFFICER



STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
34 HIGH STREET
WAILUKU, HAWAII 96793-3378

January 28, 2015

Ms. Marisa Fujimoto
Senior Associate
Munekyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Fujimoto:

Subject: Early Consultation Request for the Proposed Division of Forestry and
Wildlife Baseyard Renovations

Thank you for the opportunity to review this project. We have the following comments to offer:

National Pollutant Discharge Elimination System (NPDES) permit coverage may
be required for this project. The Clean Water Branch should be contacted at
808 586-4309.

It is strongly recommended that the Standard Comments found at the Department's website:
<http://health.hawaii.gov/epo/home/home/anduse-planning-review-program/> be reviewed and any
comments specifically applicable to this project should be adhered to.

Should you have any questions, please call me at 808 984-8230 or E-mail me at
patricia.kitkowski@doh.hawaii.gov.

Sincerely,

Patti Kitkowski
District Environmental Health Program Chief

c EPO

Alec Wong, P.E., Chief
February 2, 2016
Page 2

1. The criteria regarding potential impacts to State waters will be reviewed and adhered to by the Applicant as applicable.
2. NPDES permit coverage requirements will be reviewed and adhered to by the Applicant as applicable.
3. The proposed project does not involve work in, over, or under waters of the United States.
4. The Applicant will adhere to applicable State Water Quality Standards.

Additionally, the standard comments on the department's website will be reviewed and adhered to by the Applicant, as applicable.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,

Marisa Fujimoto
Senior Associate

MF:tn

Attachment

CC: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\BDFAW Permiing Assess\ECL_Response\DOH_OVB_Response.doc

Patti Kitkowski, District Environmental
Health Program Chief
February 2, 2016
Page 2

following responses to your comments of January 28, 2015 on behalf of the Applicant,
relating to the proposed action to the Kahului Baseyard.

1. It is noted that National Pollutant Discharge Elimination System (NPDES) permit
coverage may be required for this project. The Clean Water Branch Maui Office
will be contacted for further information as needed.

Additionally, the standard comments on the department's website will be reviewed and
adhered to by the Applicant.

We appreciate your input and will include your comments as part of the alternatives
analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter
please feel free to contact our office at 244-2015.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn
Attachment
cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers+Kubota\Permitting\Assess\ECCL\Responses\DOH\Hawaii\Responses.doc

February 2, 2016

Patti Kitkowski, District Environmental
Health Program Chief
State of Hawaii
Department of Health
Maui District Health Office
54 High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation request for the Proposed Division of Forestry
and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2)
3-8-079:018 (por.)

Dear Ms. Kitkowski:

Thank you for your letter dated January 28, 2015, providing early consultation
comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW)
Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard
renovation in December 2014, the Applicant, Department of Land and Natural
Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned
land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will
prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard.
Attached for your reference is a copy of the letter dated March 23, 2015, clarifying
DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting
comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred
alternative for accommodating the facility and operating requirements for DOFAW.
Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a
reasonable secondary alternative, and accordingly, will be addressed in the
"Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the

DAVID Y. KEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 2, 2015

CARTY S. CHANG
DEPARTMENT OF LAND AND NATURAL RESOURCES
CHIEF ENGINEER
HONOLULU, HAWAII 96809
FIRST DEPUTY
WILLIAM E. TASH
DEPUTY CHIEF ENGINEER - WATER
DEPUTY CHIEF ENGINEER - AQUATIC RESOURCES
DEPUTY CHIEF ENGINEER - DIVISION OF BOATING & OCEAN RECREATION
DEPUTY CHIEF ENGINEER - DIVISION OF FORESTRY & WILDLIFE
DEPUTY CHIEF ENGINEER - DIVISION OF STATE PARKS
DEPUTY CHIEF ENGINEER - DIVISION OF CONSERVATION & COASTAL LANDS
DEPUTY CHIEF ENGINEER - DIVISION OF HISTORIC PRESERVATION
HONOLULU, HAWAII 96809
STATE ENGINEER

DEPARTMENT OF LAND AND NATURAL RESOURCES
HONOLULU, HAWAII 96809



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 12, 2014

MEMORANDUM

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division - Maui District
- Historic Preservation

Kevin E. Moore, Acting Land Administrator
 Early Consultation Request for the Proposed Division of Forestry and Wildlife
 Baseyard Renovations
 Kahului, Island of Maui; TMK: (2) 3-8-079:018 (por.)
 DLNR - Division of Forestry and Wildlife

TO: FR:

FROM: Y0:
 SUBJECT:
 LOCATION:
 APPLICANT:

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 29, 2014.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: *Kevin E. Moore*
 Print Name: Kevin E. Moore, Chief Engineer
 Date: 12/22/14

cc: Central Files

Munekio & Hiraga, Inc.
 Attention: Ms. Marisa Fujimoto, Senior Associate
 305 High Street, Suite 104
 Wailuku, Hawaii 96793

via email: planning@mnhplanning.com

Dear Ms. Fujimoto:

SUBJECT: Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard Renovations

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division and (b) Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

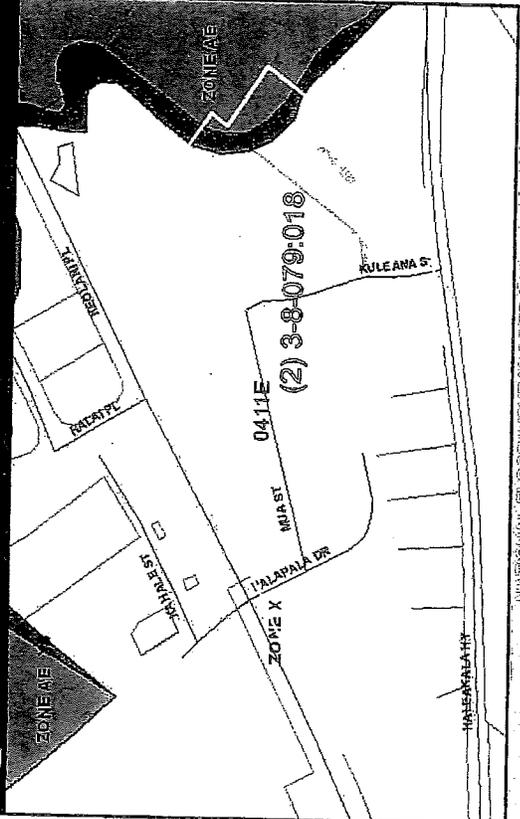
Kevin E. Moore
Acting Land Administrator

Enclosure(s)
cc: Central Files

WILLIAM A. LA, JR.
HONOLULU, HAWAII 96809
GOVERNOR OF HAWAII (H1-Admin) 2014



14 DEC 15 AM 9:30
RECEIVED
LAND DIVISION
2014 DEC 23 PM 3:15
DEPT. OF LAND AND NATURAL RESOURCES
STATE OF HAWAII



| PROPERTY INFORMATION | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| COUNTY: | MAUI |
| TMK NO.: | (2) 3-8-079:018 |
| PARCEL ADDRESS: | KALEIA PL, KAHULUI, HI 96732 |
| LETTER OF MAP CHANGES: | SEPTEMBER 19, 2012 |
| FEMA FIRM PANEL(S): | NONE |
| PANEL EFFECTIVE DATE: | SEPTEMBER 25, 2009 |
| FLOOD ZONE DEFINITIONS SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Elevation (FEF) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones: Zone A: No BFE determined. Zone AE: BFE determined. Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined, average depths determined. Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined. Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined. Zone X: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE. NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities. Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of 1 to 3 feet or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. Zone Y: Areas determined to be outside the 0.2% annual chance floodplain. OTHER FLOOD AREAS Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities. | |
| PARCEL DATA FROM: | JULY 2013 |
| IMAGERY DATA FROM: | MAY 2008 |
| IMPORTANT PHONE NUMBERS County NFIP Coordinator: Carolyn Cortez (808) 270-7253 State NFIP Coordinator: Carol Tyau-Beam, P.E., CFM (808) 587-0257 | |

Disclaimer: The Department of Land and Natural Resources (DLNR) is not responsible for any errors or omissions arising from the use of the information contained in this report. The user assumes all liability for any inaccuracies in the information and agrees to indemnify the DLNR from any liability, which may arise from its use.
 If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not intended to be used for regulatory compliance, or flood insurance rating. Contact your county engineer for flood zone determinations to be used for compliance with local floodplain management regulations.

DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

LD/ Kevin E. Moore
 Ref: Early Consultation Request for the Proposed DOFAW Baseyard Renovations, Kahului
 Maui.025

COMMENTS

- We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone _____.
- Please take note that parts of the project site, according to the Flood Insurance Rate Map (FIRM), are located in Flood Zones AE, XS, and X. The National Flood Insurance Program regulates developments within Flood Zones AE and XS as indicated in bold letters below, but not Flood Zone X.
- Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is _____.
- Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0257.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:
 Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting.
 Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.

Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Public Planning.
 Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
 The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

Additional Comments: _____

Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: *Christy S. Cortez*
 CHRISTY S. CORTAZ, CHIEF ENGINEER
 Date: 12/10/14



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
HONOLULU, HAWAII 96809

December 31, 2014

TO: Russell Tsuji, Administrator
Land Division

FROM: William M. Tam, Deputy Director
Commission on Water Resource Management

SUBJECT: Early Consultation Request for the Proposed DOFAW Baseyard Renovations, Kahului, Maui

FILE NO.: (2) 3-8-079-018 (por.)
TMK NO.:

REF: RFD.4088.6

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code. Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes; and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the internet at <http://www.hawaii.gov/dlnr/cwrmi>.

Our comments related to water resources are checked off below.

- 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.
- 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.
- 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at <http://www.usgbc.org/leed>. A listing of fixtures certified by the EPA as having high water efficiency can be found at <http://www.epa.gov/watersense/>.
- 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at <http://hawaii.gov/dbedt/crm/initiative/ld.php>.
- 6. We recommend the use of alternative water sources, wherever practicable.
- 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at <http://energy.hawaii.gov/green-business-program>

DRF-1A 03/20/2013

Russell Tsuji, Administrator

Page 2
December 31, 2014

- 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiilandscape.com/wp-content/uploads/2013/04/LICLH_Irrigation_Conservation_BMPs.pdf
- 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:

Additional information and forms are available at http://hawaii.gov/dlnr/cwrmi/info_permits.htm.

- 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- 11. A Well Construction Permit(s) is (are) required before any well construction work begins.
- 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be abandoned by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- 14. Ground water withdrawals from this project may affect streamflows, which may require an Instream flow standard amendment.
- 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.
- 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.
- 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

OTHER:

The DEA should include a discussion of the water requirements for the project, both potable and non-potable, and the calculations used to derive the projected water needs; water conservation and efficiency measures that will be implemented; the proposed water sources, including any alternative sources of water that may be available to meet nonpotable needs; and BMPs for stormwater management.

If there are any questions, please contact Lenore Ohiye at 587-0216.

DRF-1A 06/19/2008

February 3, 2016

Russell Tsuji, Land Administrator
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Early Consultation request for the Proposed Division of Forestry
and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2)
3-8-079:018 (por.)

Dear Mr. Tsuji:

Thank you for your letter dated January 2, 2015, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of January 2, 2015 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

Engineering Division:

1. It is noted that parts of the project site are located in Flood Zones AE, XS, and X and developments within Flood Zones AE and XS are regulated by the National Flood Insurance Program (NFIP).
2. It is noted that the project must comply with the rules and regulations of the NFIP presented in Title 44 of the Code of Federal Regulations as well as the flood ordinance for Maui County.

Commission on Water Resource Management:

1. The Applicant will coordinate with DLNR's Engineering Division to incorporate this project into the State Water Projects Plan.
2. The Applicant will consider water efficient fixtures and practices where feasible.
3. The Applicant will implement Stormwater Management Best Management Practices (BMPs) as applicable.
4. The Applicant will consider alternative water sources, where practicable, for the proposed project.
5. The Applicant will consider landscape irrigation conservation BMPs as feasible.
6. It is noted that DLNR did not comment on permits, petitions, or potential impacts to water resources, as a water source has not yet been identified for the proposed project.
7. Water demand information will be developed as engineering for the project advances.



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
KAKUHIWEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

CARLY S. CHANG
DIRECTOR
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCES MANAGEMENT
WALTER L. QUINN
DEPUTY DIRECTOR
W. KURT HARRIS
ACTING DEPUTY DIRECTOR - WATER
ADVISORY RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCES MANAGEMENT
HAWAIIAN HISTORIC PRESERVATION DIVISION
CONSERVATION AND RESTORATION
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE HISTORIC PRESERVATION DIVISION

Log No: 2014.05466
Doc No: 1502JF33
Archaeology

February 26, 2015

MEMORANDUM

TO: Kevin E. Moore, Acting Land Administrator
DLNR Land Division
Via email to: Kevin.E.Moore@hawaii.gov

FROM: Morgan E. Davis, Lead Archaeologist, Maui Section
Morgan E. Davis

SUBJECT: Chapter 6E-8 Historic Preservation Review -
Early Consultation Request
Division of Forestry and Wildlife (DOFAW) Baseyard Renovations
Wailuku Ahupua'a, Wailuku District, Island of Maui
TMK: (2) 3-8-079-018 (por.)

Thank you for the opportunity to comment on the subject consultation request received by our staff on December 15, 2014. We apologize for the delayed review. Proposed plans include the renovation of the DOFAW Baseyard including new office spaces, gym, shower, and locker room. The project includes improvements to warehouse spaces, construction of new and renovation of existing parking areas, the demolition of the existing and construction of a new auto shop, and the construction of a new plant nursery facility. The renovations are planned for the developed 3.076 acre parcel. The existing baseyard consists of a warehouse, covered and uncovered parking areas, and an auto shop.

Based on a search of our records, we understand that the existing structures are less than 50 years old and constructed on a fill deposit (Log 2006.0775, Doc 0603MK29). Subsequently, we believe that no historic properties will be affected by the proposed project.

In the event that historic resources, including human skeletal remains, structural remains, cultural deposits, or lava tubes are identified during construction activities, work shall cease in the immediate vicinity of the find, the find shall be protected from disturbance, and reported to the State Historic Preservation Division at (808) 243-1285. Please contact Jenny Pickett at (808) 243-5169 or Jenny.L.Pickett@hawaii.gov if you have any questions or concerns regarding this memorandum.

Cc: Muneakiyo & Hiraga Attn: Marisa Fujimoto, Senior Associate
305 High Street, Suite 104
Wailuku Hawaii 96796

Russell Tsuji, Land Administrator
February 3, 2016
Page 3

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,
Marisa Fujimoto
Marisa Fujimoto
Senior Associate

MF:tn
Attachment
cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\DOFAW Permiing\Asas\ECL_Responses\CLNR Responses.doc

February 2, 2016

Morgan E. Davis, Lead Archaeologist
Department of Land and Natural Resources
State Historic Preservation Division
130 Mahalani Street
Kahului, Hawaii 96732

SUBJECT: Early Consultation Request for the Proposed Division of Forestry
and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2)
3-8-079-018 (por.) (Doc No. 1502JP33)

Dear Ms. Davis:

Thank you for your letter dated February 26, 2015, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of February 26, 2015 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

1. It is noted that SHPD records indicate that the existing structures at the Kahului Baseyard are less than 50 years old and constructed on a fill deposit (Log 2006.0775, Doc 0603MK29), therefore SHPD believes that no historic properties will be affected by the proposed project.
2. If historic resources are identified during construction, work will be stopped and SHPD notified.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn

Attachment

CC: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\DOFAW\Permitting\Assess\EA\DLNR SHPD Response.doc

DAVID Y. IGE
GOVERNOR

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
EDWIN H. SNIFFEN

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
STP 8.1737

IN REPLY REFER TO:
STP 8.1763



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

January 26, 2015

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

February 25, 2015

Ms. Marisa Fujimoto
Senior Associate
Munekyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Ms. Marisa Fujimoto
Senior Associate
Munekyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Fujimoto:

Dear Ms. Fujimoto:

Subject: Department of Land and Natural Resources
Division of Forestry and Wildlife Baseyard Renovations
Early Consultation for Environmental Assessment
Kahului, Maui, Hawaii
TMK: (2) 3-8-079-018 (por.)

Subject: Department of Land and Natural Resources
Division of Forestry and Wildlife Baseyard Renovations
Early Consultation for Environmental Assessment
Kahului, Maui, Hawaii
TMK: (2) 3-8-079-018 (por.)

Our Department of Transportation's (DOT) comments on the subject project are as follows:

Our State Department of Transportation (DOT) previously commented on the subject project in our letter STP 8.1737 dated January 26, 2015 (attached) and now offers the following supplemental comments:

Airports Division

1. It should be noted that the subject project is located one half (1/2) mile from the Runway 2 at Kahului Airport. As such, the subject project will be exposed to aircraft noise and overflights day and night.

Highways Division

A traffic assessment should be prepared and submitted to DOT for review and acceptance.

2. The developer should submit a Federal Aviation Administration (FAA) Form 7460-1 "Notice of Proposed Construction or Alteration", in accordance with Code of Federal Regulations, Title 14, Part 77.9, if construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. In addition, a FAA Form 7460-1 should be submitted for any tall equipment, such as cranes, that may be used during construction. This form and criteria for submittal can be found at the following website: <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,


FORD N. FUCHIGAMI
Director of Transportation

3. Additionally, if a photovoltaic system is being considered, then the developer should be aware that photovoltaic (PV) systems, located in or near the approach path of aircraft into an airport, can create a hazardous condition for a pilot due to possible glint and glare reflected from the PV array. The following website may assist with preparation of a glint and glare analysis: www.sandia.gov/glare

Attachment: Ltr. STP 8.1737 dtd. 1/26/15

Ms. Marisa Fujimoto
January 26, 2015
Page 2

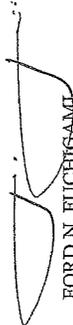
STP 8.1737

Highways Division

The DOT Highways Division is still conducting its review and has not yet provided comments. The Statewide Transportation Planning Office will inform you of any further DOT comments once received.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,



FORD N. FUCHIGAMI
Director of Transportation

c: Gordon Wong, Federal Aviation Administration



MUNEKIYO HIRAGA
Planning, Project Management, Sustainable Solutions.

Michael T. Munekiyo
PRESIDENT
Karilynn K. Fukuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT

February 2, 2016

Ford N. Fuchigami, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.) (STP 8.1737) (STP 8.1763)

Dear Mr. Fuchigami:

Thank you for your letters dated January 26, 2015 and February 25, 2015, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of February 25, 2015 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
www.munekiyoHIRAGA.com

OFFICE OF PLANNING
STATE OF HAWAII235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2358, Honolulu, Hawaii 96804Ford N. Fuchigami, Director
February 2, 2016
Page 2

1. A Traffic Impacts Analysis Report was prepared for the Kahului Baseyard renovation. It will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA and will be included as an Appendix in the EA.
2. It is noted that the subject project will be exposed to aircraft noise and overflights due to its proximity to the Kahului Airport.
3. The Applicant will submit Federal Aviation Administration forms for construction as applicable.
4. It is also noted that if a PV system is being considered, a glint and glare analysis should be prepared, given the proximity of the Kahului Baseyard to the airport.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,

Marisa Fujimoto
Senior Associate

MF:tn

Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
KIDATA\Bowers\DOFAW\Ferrelling_AssesECTL_Response\SDOT_Response.doc

Ref. No. P-14614

December 22, 2014

Ms. Marisa Fujimoto, Senior Associate
Munekyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Fujimoto:

Subject: Pre-Consultation for a Draft Environmental Assessment (EA), Department of Land and Natural Resources, Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii
TMK: (2) 3-8-079-018

Thank you for the opportunity to provide early consultation comments on the Department of Land and Natural Resources, Division of Forestry and Wildlife (D&NRF-D&FW) baseyard renovations. It is our understanding this project calls for the renovation of the DLNR-D&FW baseyard in Kahului, Maui. The proposed renovations include: construction of new office spaces, a new gym, shower, and locker room. Additionally, improvements to warehouse spaces, renovation of existing parking areas, demolition and construction of a new auto shop, and a plant nursery are proposed.

The Office of Planning (OP) has reviewed the documents sent to us by letter dated December 5, 2014, and has the following comments to offer:

1. The Office of Planning provides technical assistance to state and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of resources throughout the State. The Hawaii State Plan includes diverse policies and objectives of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.
- The Draft EA should include an analysis on the Hawaii State Plan, HRS Chapter 226, in a section that addresses whether this project conforms or is in conflict with state and county plans, policies, and controls. The analysis should include a discussion on the project's ability to meet the objectives and policies listed in HRS Chapter 226.

2. The Office of Planning is the lead agency for the Hawaii Coastal Zone Management Program. The coastal zone management area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" see HRS § 205A-1 (definition of "coastal zone management area").
- The Draft EA should include in a section that addresses how this project conforms or is in conflict with state and county plans, policies, and controls, a statement that discusses the proposed project's ability to meet all of the objectives and policies set forth in HRS § 205A-2. Where a conflict or inconsistency exists, the statement must describe the extent to which the applicant has reconciled its proposed action with HRS § 205A-2. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

3. The Draft EA should include a list of any federal, state, or county permits required for this project.

4. The proposed project lies within the Special Management Area (SMA) delineated by the County of Maui. Please consult with the Maui County Department of Planning on the procedures and requirements for addressing SMA regulations.

5. The project area's close proximity to the Kanaha Pond Wildlife Sanctuary and the nearshore waters of Kahului Bay may have nonpoint pollution impacts on coastal resources. Based on the documents and maps submitted to OP, this baseyard renovation project is approximately ¼ mile from Kanaha Pond Wildlife Sanctuary and ¾ of a mile from the Kanaha Beach Park and the nearshore waters of Kahului Bay. Please review the Hawaii Watershed Guidance, which provides a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. Specifically please examine page 122 (management measure for Existing Development). The Watershed Guidance can be viewed or downloaded from the Office of Planning website at http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI_Watershed_Guidance_Final.pdf.

6. The weather patterns in central Maui are typically sunny and dry; however this area, as well as the entire island chain, can be subject to flashy and unstable weather conditions during the winter that may lead to heavy rainfall and water runoff. Therefore, please consider utilizing OP's *Stormwater Impact Assessment* to identify

and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff occurrences. In particular, please examine the section on Low-Impact Development Concepts, which include decentralized micro-scale controls that infiltrate, filter, store, re-use, evaporate, and detain runoff close to its source.

This guidance document will assist in integrating stormwater impact assessment within your review process. The purpose of this document is to provide guidance on assessing stormwater impacts in the planning phase of project development. The goal is to provide a suggested framework and various tools for integrating stormwater impacts assessment. These concepts are listed on pages 14-16 of the *Stormwater Impact Assessment* guidance. This can be found at http://files.hawaii.gov/dbedt/op/czm/initiative/stormwater_impact_final_stormwater_impact_assessments_guidance.pdf.

If you have any questions regarding this comment letter, please contact Josh Hekektia of our office at 587-2845.

Sincerely,



Leo R. Asuncion
Acting Director

February 2, 2016

Leo R. Asuncion, Acting Director
Office of Planning
State of Hawaii
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96804

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.) (Ref. No. P-14614)

Dear Mr. Asuncion:

Thank you for your letter dated December 22, 2014, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

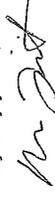
Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of December 22, 2014 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

1. The Draft EA will include a section analyzing the proposed project's ability to meet the applicable objectives and policies listed in the Hawaii Revised Statutes (HRS) Chapter 226.
2. The Draft EA will include a section that addresses the proposed project's ability to meet the objectives and policies set forth in HRS Section 205A-2.
3. The Draft EA will include a list of any Federal, State, or County permits required for the proposed project.
4. It is noted that the proposed project lies within the Special Management Area (SMA) delineated by the County of Maui. An SMA Use Permit application will be filed with the Maui County Department of Planning in accordance with Chapter 202 SMA Rules for the Maui Planning Commission.
5. The Applicant will review the Hawaii Watershed Guidance including page 122 (management measure for Existing Development) and BMPs will be implemented as applicable to the proposed project.
6. The Office of Planning's Stormwater Impact Assessment, including the section on Low-Impact Development Concepts, will be considered for the proposed project.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn
Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting

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FEB 13 2015

MICHAEL RATTE
Solid Waste Division
ERIC NAKAGAWA, P.E.
Wastewater Reclamation Division



COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2050 MAIN STREET, SUITE 1C
WAILUKU, MAUI, HAWAII 96793

February 3, 2015

ALAN M. ARAKAWA
Mayor
KYLE K. GINOZA, P.E.
Director
MICHAEL M. MIYAMOTO
Deputy Director

Ms. Marisa Fujimoto
Munekiyō & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

**SUBJECT: DIVISION OF FORESTRY AND WILDLIFE BASEYARD RENOVATIONS
EARLY CONSULTATION
TMK (2) 3-8-079:018, KAHULUI**

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:
 - a. Construction and demolition waste should be disposed at the Maui Demolition and Construction Landfill, not the municipal landfill. Recycle and reuse construction and demolition waste as feasible.
2. Wastewater Reclamation Division (WWRD) comments:
 - a. There is no County wastewater system in the immediate area of the subject project.

If you have any questions regarding this memorandum, please contact Michael Miyamoto at 270-8230.

Sincerely,


KYLE K. GINOZA, P.E.
Director of Environmental Management



Michael T. Munekiyo
PRESIDENT
Karilynn K. Fukuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT

February 2, 2016

Michael Miyamoto, Deputy Director
Department of Environmental Management
2050 Main Street, Suite 1C
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (ppr.)

Dear Mr. Miyamoto:

Thank you for your letter dated February 3, 2015, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

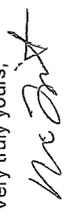
To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of February 3, 2015 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
www.munekiyohiraga.com

Michael Miyamoto, Deputy Director
February 2, 2016
Page 2

1. It is noted that construction and demolition waste should be recycled or reused as feasible or disposed at the Maui Demolition and Construction landfill.
2. It is noted that there is no County wastewater system in the immediate area of the subject project. The wastewater lines serving the DOFAW Baseyard are owned by the State.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

Very truly yours,

 Marisa Fujimoto
 Senior Associate

MF:tn
 Attachment
 cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
 K:\DATA\Bowers\DOFAW Permiing\Asstas\ECL Response\DEM Response.doc



ALAN M. ARAKAWA
 MAYOR

JEFFREY A. MURRAY
 FIRE CHIEF

ROBERT M. SHIMADA
 DEPUTY FIRE CHIEF

COUNTY OF MAUI
 DEPARTMENT OF FIRE AND PUBLIC SAFETY
 FIRE PREVENTION BUREAU

313 MANEA PLACE • WAILUKU, HAWAII 96793
 (808) 244-9161 • FAX (808) 244-1363

March 19, 2015

Munekiyō & Hiraga, Inc.
 Attn: Marisa Fujimoto, Senior Associate
 305 High Street, Suite 104
 Wailuku, HI 96793

Re: Proposed DOFAW Baseyard Renovations
 Early Consultation
 Kahului, Maui, HI
 (2) 3-8-079: 018 (por.)

Dear Marisa:

Thank you for the opportunity to comment on this subject. At this time, our office provides the following comments:

- Our office has no specific comments in regards to an EA or SMA related to this project.
- Our office does reserve the right to comment on the proposed project during the building permit review process when fire department access, water supply for fire protection, and fire and life safety requirements will be addressed.

If there are any questions or comments, please feel free to contact me at 244-9161 ext. 23.

Sincerely,

 Paul Haake
 Captain, Fire Prevention Bureau



Planning, Project Management, Sustainable Solutions.

Michael T. Munekiyo
PRESIDENT
Karilynn K. Fukuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT

Captain Paul Haake
February 2, 2016
Page 2

With regard to the Department's comments of March 19, 2015 relating to the Kahului Baseyard Renovation alternative, we note the following:

1. We acknowledge that the Department has no specific comments at this time.
2. We understand that the Department reserves the right to comment on the project during the building permit review phase of project development.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,

Marisa Fujimoto
Senior Associate

MF:tn
Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers+Kubota\DOFAW Permitting Assess\ECI_Response\MFD_response.doc

February 2, 2016

Captain Paul Haake
Department of Fire and Public Safety
Fire Prevention Bureau
313 Manea Place
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (part).

Dear Captain Haake:

Thank you for your letter dated March 19, 2015 providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
www.munekiyohiraga.com



OFFICIALS OF
HOUSING AND HUMAN CONCERNS
 HOUSING DIVISION
 COUNTY OF MAUI

35 LUNALLO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

ALAN M. ARAKAWA
 Mayor
 JO-ANN T. RIDAO
 Director
 JAN SEIGSHIDO
 Deputy Director



Michael T. Munekiyo
 PRESIDENT
 Karilynn K. Fukuda
 EXECUTIVE VICE PRESIDENT
 Mark Alexander Roy
 VICE PRESIDENT
 Tessa Munekiyo Ng
 VICE PRESIDENT

December 26, 2014

Ms. Marisa Fujimoto
 Senior Associate
 Munekiyo & Hiraga, Inc.
 305 High Street, Suite 104
 Wailuku, Hawaii 96793

Dear Ms. Marisa Fujimoto:

Subject: Early Consultation Request for Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por)

The Department has reviewed the request for Early Consultation for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. At the present time, the Department has no additional comments to offer.

Please call Mr. Veranio Tongson Jr. of our Housing Division at (808) 270-1741 if you have any questions.

Sincerely,



BUDDY ALMEIDA
 Assistant Housing Administrator

cc: Director of Housing and Human Concerns

TO SUPPORT AND EMPOWER OUR COMMUNITY TO REACH ITS FULLEST POTENTIAL
 FOR PERSONAL WELL-BEING AND SELF-RELIANCE

PRINTED ON RECYCLED PAPER

February 2, 2016

Buddy Almeida, Assistant Housing Administrator
 County of Maui
 Department of Housing and Human Concerns
 35 Lunaillo Street, Suite 102
 Wailuku, Hawaii 96793

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.)

Dear Mr. Almeida:

Thank you for your letter dated December 26, 2014 providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
 Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
 www.munekiyohiraga.com



DEPARTMENT OF PARKS & RECREATION
700 Hali'a Naluoa Street, Unit 2, Wailuku, Hawaii 96793

December 22, 2014

ALANI M. ARAKAWA
Mayor

Buddy Almeida, Assistant Housing Administrator
February 2, 2016
Page 2

With regard to your letter of December 26, 2014 relating to the Kahului Baseyard Renovation alternative, we acknowledge your determination that the proposed project is not subject to Chapter 2.96, Maui County Code and have noted that the County of Maui, Department of Housing and Human concerns did not have any further comments on the Kahului Baseyard Renovation Project at this time. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

Very truly yours,

Marisa Fujimoto
Senior Associate

MF:tn

Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\A\Bowers\DOFAW\Permitting_Assess\ECL_Responses\BHC_Response.doc

Ms. Marisa Fujimoto
Munekyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Fujimoto:

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii;
TMMK (2) 3-8-079:018 (por.)

Thank you for the opportunity to review and comment on the subject project.

The Department of Parks & Recreation is in support of the project. We look forward to reviewing the Environmental Assessment when it is available.

Please feel free to contact me or Robert Halvorson, Chief of Planning and Development, at 270-7931, should you have any questions.

Sincerely,

KAYALA BUENCONSEJO
Director of Parks & Recreation

c: Robert Halvorson, Chief of Planning and Development

KB:RH:csa

S:\PLANNING\CSA\County Reviews\EA & EIS Reviews\DOFAW Baseyard EA Early Consult.doc

We appreciate your support of this project and have noted that the County of Maui, Department of Parks and Recreation did not have any further comments on the Kahului Baseyard Renovation Project at this time. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

February 2, 2016

Ka'ala Buenconsejo, Director
County of Maui
Department of Parks and Recreation
711 Haila Nakoa Street, Unit 2
Wailuku, Hawaii 96793

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.)

Dear Mr. Buenconsejo:

Thank you for your letter dated December 22, 2014, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn

Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\DOFAW Permitted Areas\ECL_Responses\Paris_Responses.doc



COUNTY OF MAUI
DEPARTMENT OF PLANNING

January 29, 2015

Ms. Marisa Fujimoto
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Fujimoto:

SUBJECT: REQUEST FOR COMMENT ON EARLY CONSULTATION FOR THE PROPOSED DIVISION OF FORESTRY AND WILDLIFE (DOFAW) BASEYARD RENOVATIONS, LOCATED ON KULEANA STREET NEAR INTERSECTION WITH HALEAKALA HIGHWAY, MAUI, HAWAII; TMK (2) 3-8-079:018 (RFC 2014/0110)

The Department of Planning (Department) is in receipt of the above-referenced document for the proposed renovations at the DOFAW Baseyard. The Department understands that in regards to the proposed action:

- The Applicant is Munekiyo & Hiraga, Inc. acting as the Applicant's Consultant;
- The Applicant is proposing to renovate the existing DOFAW Baseyard which currently consists of a warehouse, covered and uncovered parking areas, and an auto shop;
- The proposed renovation will include the construction of new office spaces, gym facilities, parking areas, auto shop, and a plant nursery; renovation will also include improvements to warehouse spaces and the demolition of the existing auto shop;
- The proposed project is located on Kuleana Street near its intersection with Haleakala Highway;
- The proposed project area is within the State Land Use Urban District and the County Zoning is Airport District. In addition, the Wailuku-Kahului Community Plan designates the property for Airport use. The property also lies within the *Special Management Area (SMA)* and is subject to SMA rules. The Maui Island Plan designates the property as within the Urban Growth Boundary and outside of Protected Areas;

ONE MAIN PLAZA BUILDING / 2200 MAIN STREET, SUITE 315 / WAILUKU, MAUI, HAWAII 96793
MAIN LINE (808) 270-7735 / FACSIMILE (808) 270-7634
CURRENT DIVISION (ARR) 270-8205 / LONG RANGE DIVISION (808) 270-7214 / ZONING DIVISION (808) 270-7253

Ms. Marisa Fujimoto
January 29, 2015
Page 2

- Pursuant to Chapter 343, Hawaii Revised Statutes (HRS) and Section 11-200-6, Hawaii Administrative Rules (HAR) an Environmental Assessment (EA) will be required as the proposed project will utilize State land;
 - The Accepting Authority of the EA will be the State of Hawaii.
- Based on the foregoing, the Department provides the following comments with regards to the proposed DOFAW Baseyard renovations:

1. Per the Zoning Administration and Enforcement Division (ZAED), the aforementioned zoning and land use designations are confirmed. In addition, the proposed project area is within the Urban Growth Boundary of the Maui Island Plan and in Flood Hazard Area Zones AE, XS and X. Therefore, a Flood Development Permit will be required.
2. Upon completion of the draft EA, please forward a copy to the Department of Planning's Current Division for review.

Thank you for the opportunity to comment. Should you require further clarification, please contact Staff Planner Evelyn Aako at evelyn.aako@mauicounty.gov or at (808) 270-7378.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

xc: John S. Rapacz, Planning Program Administrator (PDF)
Evelyn Aako, Staff Planner (PDF)

Project File
General File

WRS:CIY:EA:Aal
K:\WP_DOCS\PLANNING\RFC\2014\0110_WildlifeBaseyard\WildlifeBaseyardCommentLetter.DOC

1. It is noted that the zoning and land use designations and flood zone areas are confirmed, and a Flood Development Permit will be secured as applicable.

2. A copy of the Draft EA will be provided to the Planning Department for review.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at (808) 244-2015.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn

Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\DOFAW Permitting Asses\DECL Responses\Planning Response.doc

February 2, 2016

William Spence, Director
Department of Planning
2200 Main Street, Suite 315
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.)

Dear Mr. Spence:

Thank you for your letter dated January 29, 2015, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of January 29, 2015 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.



POLICE DEPARTMENT
COUNTY OF MAUI

ALAN M. ARAKAWA
MAYOR

OUR REFERENCE
YOUR REFERENCE

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

December 29, 2014

TIVOLI S. FAAUMU
CHIEF OF POLICE
DEAN M. RICKARD
DEPUTY CHIEF OF POLICE



TO : TIVOLI S. FAAUMU, CHIEF OF POLICE, COUNTY OF MAUI
VIA : CHANNELS
FROM : TAYLOR KAMAKAWIWOOLE, POLICE OFFICER, COMMUNITY POLICING
SUBJECT : REVIEW AND RESPONSE FOR THE PROPOSED DIVISION OF FORESTRY AND WILDLIFE (DOFAW) BASEYARD RENOVATIONS, KAHAKUI, MAUI, HAWAII;
TMK (2) 3-8-079-018

*Reviewed and approved
A.H. [Signature]
12/19/14*

Sir, this communication is submitted as a response, requested by Muneikiyo and Hiraga, Inc., in regards to the property located at 685 Old Haleakaala Highway, Kahului, HI(TMK (2) 3-8-079-018).

Ms. Marisa Fujimoto
Senior Associate
Muneikiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Fujimoto:

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations
TMK (2) 3-8-079-018 (por.)

We have reviewed the information submitted for this project and have submitted our comments and/or recommendations. Thank you for giving us the opportunity to comment on this project.

Very truly yours,

[Signature]

Acting Assistant Chief Clarence Kenuli
for:
Tivoli S. Faaumu
Chief of Police

c: William Spence, Dept. of Planning

The applicant is seeking an early consultation from the Maui Police Department for the proposed renovations of the Division of Forestry and Wildlife Baseyard. These renovations include the construction of new office spaces for the DOFAW personnel, a new gym, shower, and locker room facility. Also proposed are improvements to the existing warehouse spaces, parking stalls, new auto shop, and the construction of a new plant nursery.

After reviewing the request from Muneikiyo & Hiraga, Inc., I would like to make the following recommendations. I would like to recommend that the updated gate code be forwarded to Central Dispatch as there have been multiple burglar alarm activations at this location. Due to the gate code not being updated officers could not make thorough checks of the property. Also if there could be a contact person who could respond to the base yard in the event of a criminal act on property.

This proposed renovation to the Division of Forestry and Wild Life will not affect pedestrian or vehicular traffic in any way.

Respectfully Submitted,

[Signature]

Ofc. TAYLOR KAMAKAWIWOOLE
Community Police Officer
12/17/14 @ 0915 Hrs

Egress and Ingress into the facility may be challenging during construction and demolition and this should be addressed. It is presumed all of the renovation and construction will be done on site.

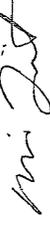
Acting Captain Arthur G. DADEZ E-8480
12/18/2014

*Concur with officer Kamakawioole's
To-From. The renovations will not
affect any type of traffic, however,
a contact person and gate code
should be provided. Construction
areas have been the areas target
by thieves and better checks by
patrol during a Code 33 activation
can be conducted
Sgt. [Signature] E-1086z
12-18-14 @ 1300 hours*

1. It is noted that the updated gate code for the DOFAW Baseyard should be forwarded to Central Dispatch so that officers can make thorough checks of the property in the event that a burglar alarm is triggered.
2. It is our understanding that DOFAW recently provided the Police Department with a person to contact in the event of a criminal act on the property.
3. It is noted that the Police Department does not anticipate an impact to pedestrian or vehicular traffic as a result of the proposed project.
4. Any issues with egress and ingress into the facility during demolition and construction at the project site will be considered and addressed as needed.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn
Attachment
cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
IC:\DATA\Bowers\DOFAW\Permitting\Assess\ECL_Response\Police_Response.doc

February 2, 2016

Tivoli S. Faauuu, Chief of Police
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.)

Dear Chief Faauuu:

Thank you for your letter dated December 29, 2014, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of December 29, 2014 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

JAN 19 2015

GLENA A. UENO, P.E., P.L.S.
Development Services Administration
CARY YAMASHITA, P.E.
Engineering Division
BRIAN HASHIRO, P.E.
Highways Division



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

ALAN M. ARAKAWA
Mayor
DAVID C. GOODE
Director
ROWENA M. DAGDAG-ANDAYA
Deputy Director
Telephone: (808) 270-7845
Fax: (808) 270-7855

January 7, 2015

Ms. Marisa Fujimoto, Senior Associate
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Ms. Fujimoto:

SUBJECT: EARLY CONSULTATION REQUEST FOR THE
PROPOSED DIVISION OF FORESTRY AND WILDLIFE
BASEYARD RENOVATIONS, KAHULUI, MAUI, HAWAII;
TMK: (2) 3-8-079:018 (POR.)

We reviewed your early consultation request and have the following comments:

1. We note that Kuleana Street is a State Airports Road and not controlled nor maintained by the County.
2. Our road inventory indicates that the State of Hawaii has ownership/ maintenance of Haleakala Highway adjacent to this project. Please confirm.
3. There is one (1) open permit, E2011/1113. No inspections to date.

Please call Rowena M. Dagdag-Andaya at 270-7845 if you have any questions regarding this letter.

Sincerely,

DAVID C. GOODE
Director of Public Works

DCG:RMDA:da
xc: Highways Division
Engineering Division
S:\DSA\Engr\GZM\Draft Comments\38079018_DOFAM_baseyard_reno_ec.wpd

Michael T. Munekiyo
PRESIDENT
Karilynn K. Fukuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT



Planning, Project Management, Sustainable Solutions.

February 2, 2016

David C. Goode, Director
County of Maui
Department of Public Works
200 South High Street, Room No. 434
Wailuku, Hawaii 96793

SUBJECT: Early Consultation request for the Proposed Division of Forestry
and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2)
3-8-079:018 (por.)

Dear Mr. Goode:

Thank you for your letter dated January 7, 2015, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of January 7, 2015 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
www.munekiyohiraga.com



ALAN M. ARAKAWA
Mayor

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

December 18, 2014

Ms. Marisa Fujimoto
Munekyo & Hiraga Inc.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

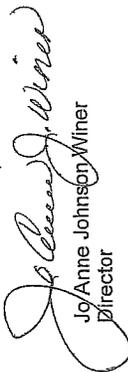
Subject: Proposed Division of Forestry and Wildlife Baseyard Renovations

Dear Ms. Fujimoto,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,


Jo Anne Johnson-Winer
Director

David C. Goode, Director
February 2, 2016
Page 2

1. It is noted that Kuleana Street is a State Airports Road.
2. According to a map provided by the Department's Engineering Division, Haleakala Highway is County owned/maintained west of the bend in the road just east of Aalele. The County portion includes the part of Haleakala Highway adjacent to the proposed project. See **Attachment 1**.
3. One (1) open permit, B2011/1113, is noted with no inspections to date.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn

Attachments

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting

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Michael T. Munekiyo
PRESIDENT
Karilyn K. Fukuda
EXECUTIVE VICE PRESIDENT
Mark Alexander Roy
VICE PRESIDENT
Tessa Munekiyo Ng
VICE PRESIDENT

Don Medeiros, Director
February 2, 2016
Page 2

We appreciate your input and have noted that the County of Maui, Department of Transportation did not have any comments on the Kahului Baseyard Renovation Project. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

February 2, 2016

Don Medeiros, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TW/K (2)
3--8-079:018 (por.)

Dear Mr. Medeiros:

Thank you for your letter dated December 18, 2014 providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA.

Maui: 305 High Street, Suite 104 • Wailuku, Hawaii 96793 • Tel: 808.244.2015 • Fax: 808.244.8729
Oahu: 735 Bishop Street, Suite 321 • Honolulu, Hawaii 96813 • Tel: 808.983.1233
www.munekiyo-hiraga.com

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn
Attachment
cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers+BK\DOFAW Permitting Assessment\County DOT.doc

DEC 24 2014
DAVID TAYLOR, P.E.
Director

PAUL J. MEYER
Deputy Director



DEPARTMENT OF WATER SUPPLY

COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

ALAN M. ARAKAWA
Mayor

Ms. Marisa Fujimoto
December 16, 2014
Page 2

Indoor Conservation Measures

- o Use EPA WaterSense labeled plumbing fixtures.
- o Install flow reducers and faucet aerators in all plumbing fixtures wherever possible.
- o Install dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.
- o Install showerheads with a flow rate of 1.5 gallons per minute (gpm) at 60 pounds per square inch (psi).
- o Install bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines must use Energy Star labeled washers.

Outdoor Conservation Measures

- o Use Smart Approved WaterMark irrigation products. Examples include ET irrigation controllers, drip irrigation, and water saving spray heads.
- o Avoid plant fertilizing and pruning that would stimulate excessive growth. Time watering to occur in the early morning or evening to limit evaporation.
- o Limit turf to as small an area as possible. Use native climate-adapted plants for landscaping. Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species.
- o Dust control: Reclaimed water for dust control is available from the Kihei and Kahului sewage treatment plants at a reasonable cost. It should be considered as an alternative source of water for dust control during construction.

Should you have any questions, please contact Arnold Y. Imae, Staff Planner, at Arnold.Imae@co.maui.hi.us or at (808) 463-3107.

Sincerely,

Dave Taylor, P.E., Director
ayl

c: DWS Engineering Division
DWS Water Resources & Planning Division files

December 16, 2014

Munekyo & Hiraga, Inc.
Attention: Ms. Marisa Fujimoto, Senior Associate
305 High Street, Ste. 104
Wailuku, HI 96793

Dear Ms. Fujimoto:

RE: Project: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard in Kahului, Maui, Hawaii

Applicant: State Department of Land and Natural Resources

Address: Kuleana Street, Kahului, Maui, Hawaii

Description: Construction of 1) new office spaces; 2) construction of new gym, shower, and locker room facility; 3) improvements to warehouse spaces; 4) construction of new and renovation of existing parking areas; 5) demolition of old auto shop and construction of a new auto shop and; 6) construction of a new plant nursery facility.

TMK: (2) 3-8-079:018 (por.)

Thank you for the opportunity to provide the following comments on the referenced project.

The referenced project has an existing 1 1/2 -inch water meter, 8-inch waterline, and fire hydrant #69 serving the project site. During the building permit process, the applicant will be required to submit calculations to ensure proper meter sizing for the project to our Engineering Division. The calculations must be certified and stamped by a licensed engineer or architect.

The Department of Water Supply recommends that the applicant include the following conservation measures in the Environmental Assessment and implement them in the project:

"By Water All Things Find Life"

1. It is noted that the Applicant must submit certified calculations to your Engineering Division to ensure proper meter sizing for the proposed project.
2. The Applicant will review and implement the recommended indoor and outdoor conservation measures as applicable.

We appreciate your input and will include your comments as part of the alternatives analysis in the Pulehunui Baseyard EA. If you have any questions regarding this matter please feel free to contact our office at 244-2015.

Dave Taylor, P.E., Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

February 2, 2016

SUBJECT: Early Consultation request for the Proposed Division of Forestry and Wildlife Baseyard Renovations, Kahului, Maui, Hawaii; TMK (2) 3-8-079:018 (por.)

Dear Mr. Taylor:

Thank you for your letter dated December 16, 2014, providing early consultation comments on the proposed renovation of the Division of Forestry and Wildlife (DOFAW) Baseyard in Kahului, Maui.

Since the request for Early Consultation comments on the DOFAW Baseyard renovation in December 2014, the Applicant, Department of Land and Natural Resources (DLNR), has proposed relocation of the DOFAW Baseyard to DLNR-owned land in Pulehunui, in the vicinity of the Old Puunene Airport. Accordingly, DLNR will prepare a separate Environmental Assessment (EA) for the Pulehunui Baseyard. Attached for your reference is a copy of the letter dated March 23, 2015, clarifying DLNR's intention to pursue the new DOFAW Baseyard in Pulehunui and requesting comments on the proposed project.

To summarize, the Pulehunui Baseyard location is now considered the preferred alternative for accommodating the facility and operating requirements for DOFAW. Nonetheless, the potential renovation of the existing Kahului Baseyard is viewed as a reasonable secondary alternative, and accordingly, will be addressed in the "Alternatives" chapter of the Pulehunui Baseyard EA. For this reason, we offer the following responses to your comments of December 16, 2014 on behalf of the Applicant, relating to the proposed action to the Kahului Baseyard.

Very truly yours,



Marisa Fujimoto
Senior Associate

MF:tn

Attachment

cc: Scott Kunioka, P.E., Bowers + Kubota Consulting
K:\DATA\Bowers\DOFAW Permitting\Assess\ECOL Responses\DWS Response.doc