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LAND USE COMMISSION
STATE OF HAWAII

2018 APR -9 P 2:24

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BEFORE THE LAND USE COMMISSION
OF THE STATE OF HAWAII

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF
MAUI

To Amend the Land Use District Boundary of
Certain Lands Situated at Wailuku, Island of
Maui, State of Hawai'i, Consisting of 25.263
Acres from the Agriculture District to the
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

MOTION FOR EXTENSION OF TIME TO
COMPLETE PROJECT; MEMORANDUM IN
SUPPORT OF MOTION; AFFIDAVIT OF
MICHAEL REILEY; AFFIDAVIT OF
WILLIAM FRAMPTON; PETITIONER'S
EXHIBITS "A" THRU "F"; CERTIFICATE OF
SERVICE

MOTION FOR EXTENSION OF TIME TO COMPLETE PROJECT

I. RELIEF SOUGHT

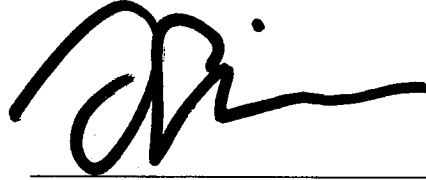
Petitioner EMMANUEL LUTHERAN CHURCH OF MAUI ("**Petitioner**"), by and through its legal counsel, CARLSMITH BALL LLP, hereby respectfully requests that the STATE OF HAWAII LAND USE COMMISSION issue an order modifying the Commission's *Findings of Fact, Conclusions of Law, and Decision and Order*, filed March 7, 2008, to amend Condition No. 2 to allow for a ten year extension of time, from March 7, 2018 to March 7, 2028, to complete construction of the project.

II. GROUND FOR MOTION

This Motion is made pursuant to Chapter 205, Hawai'i Revised Statutes and Title 15, Subtitle 3, Chapter 15 of the Hawai'i Administrative Rules ("**HAR**"), §§ 15-15-70, 15-15-79, and

15-15-94, the other authorities and arguments stated in the attached Memorandum in Support of Motion, and the pleadings and files herein.

Petitioner requests a hearing on this Motion pursuant to HAR § 15-15-70(c).



JENNIFER A. LIM
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Attorneys for Petitioner
**EMMANUEL LUTHERAN CHURCH OF
MAUI**

Dated: Honolulu, Hawai'i, April 9, 2018.

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MEMORANDUM IN SUPPORT OF MOTION

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MEMORANDUM IN SUPPORT OF MOTION

I. BACKGROUND

The Land Use Commission of the State of Hawai'i ("**Commission**") reclassified approximately 25.263-acres of land in Wailuku ("**Petition Area**") into the State Land Use ("**SLU**") Urban District by Findings of Fact, Conclusions of Law, and Decision and Order in Docket No. A07-773, filed on March 7, 2008 ("**D&O**"). The petitioner in that matter was EMMANUEL LUTHERAN CHURCH OF MAUI, a Hawai'i nonprofit corporation ("**Petitioner**" or "**ELC**"), which is the current fee simple owner of the Petition Area.

Petitioner currently operates a preschool-to-8th-grade school program at its Kahului campus, at 520 W. One Street in Kahului. That school was started in 1972 and has grown from being a preschool-only program to educating children through 8th grade. Today, there are 137 students enrolled in the kindergarten-to-8th-grade program and 36 students in the preschool program.

Space at the Kahului campus is tight (approximately 1.3 acres), which severely limits Petitioner's ability to serve Maui families. Petitioner sought the reclassification of the Petition Area in order to eventually replace its Kahului campus and provide additional educational space for students, and to accommodate the needs of a projected growing student body and congregation.

The Petition Area is located on the mauka (west) side of Waiale Road, midway between the towns of Wailuku and Waikapu, in Maui. It is bounded by Honoapiilani Highway to the west and Waiale Road to the east. A vacant lot lies between the Petition Area and Kuikahi Drive

to the north, and the recently constructed Valley Isle Fellowship Church is to the South.

Petitioner acquired the Petition Area from Wailuku Agribusiness Co., Inc., in December 2004.

Petitioner's development plans for the Petition Area are to create a new campus for a church and school. The project that Petitioner presented to the Commission included a pre-school building, upwards of eighteen classrooms for grades K through 8, a multi-purpose complex, and other buildings accessory to school functions, and a 450-seat sanctuary for religious and school-related functions (collectively, the "**Original ELC Project**"). At full build-out, the Original ELC Project church/school campus was intended to accommodate approximately 450 students. Although the Petition Area is slightly over 25 acres, the Original ELC Project was anticipated to be developed within an envelope of approximately half that size, with the remainder being reserved for open space and unidentified future uses. *See* Petitioner's **Exhibit A** (ELC's Campus Plan and ELC's Option B, both of which were included with Petitioner's Exhibit 6 to the Petition).

The Original ELC Project was planned to be developed in three phases. *See* D&O FOF ¶41. Phase 1 included construction of necessary infrastructure, a pre-school building, some classrooms, and a multi-purpose complex for art, music, and athletics. Phase 1A was to include an administration building and another building to accommodate a library, computer lab and science room, and Phase 2 would include the 450-seat sanctuary and additional classrooms.

However, funding complications, the Great Recession and associated reduction in enrollment numbers, and escalated construction costs have caused Petitioner to re-evaluate its present and projected future needs. Based on those factors, Petitioner has concluded that the Original ELC Project, as previously presented to the Commission, is likely too large and the

costs are not justified by the expected needs, at least not in the short term. As such, Petitioner is now in the process of revising the Original ELC Project to a more modest, multi-phase project that remains substantially consistent with the project the Commission approved, but scaled-down to better suit Petitioner's needs ("**Updated ELC Project**").

As currently conceptualized, the Updated ELC Project will be built out in at least two phases, with the possibility of additional phases in the future. Phase 1 will include all necessary infrastructure and the construction of a multi-purpose building that will house Petitioner's preschool during the week and then be converted over the weekend to host worship services and other church functions. The multi-purpose building could also function as a gym space after preschool hours. Phase 2 would involve the construction of approximately three classrooms that would become the new home of Petitioner's middle school (grades 6-8), and may also include office space for the pastor and preschool director. Petitioner will later evaluate the feasibility of additional phases that would include the construction of additional classrooms sufficient to support its elementary school (grades K-5), a sanctuary, and potentially other buildings, with the ultimate goal of moving the entirety of Petitioner's preschool-to-8th-grade school program to the Petition Area and selling the Kahului campus.

The Commission imposed 23 conditions upon the reclassification ("**D&O Conditions**"). Through this Motion, Petitioner seeks relief from D&O Condition No. 2 in the form of an extension of time to complete the Updated ELC Project. D&O Condition No. 2 currently provides as follows:

2. Reversion of District Classification. Petitioner shall develop the Petition Area and complete construction of the Project no later than ten (10) years from the date of the decision and order. If Petitioner fails to complete Project construction within ten (10)

years from the date of the decision and order, the Commission may, on its own motion or at the request of any party, file an Order to Show Cause and require Petitioner to appear before the Commission to explain why the Petition Area should not revert to its previous Agricultural classification.

For the reasons set forth herein, Petitioner respectfully requests an extension under D&O Condition No. 2 to allow for an additional ten years, until **March 7, 2028**, to complete development of the Updated ELC Project.

In due time, Petitioner will return to the Commission to seek relief from certain other D&O Conditions and related modifications to the D&O in order to develop the Updated ELC Project and allow for the development of a 100% affordable housing project, to be known as the Waikapu Affordable Workforce Housing Project, within a portion of the Petition Area that ELC intends to subdivide and convey to Waikapu Development Venture LLC ("**WDV**"), as discussed more fully below.

II. WAIKAPU AFFORDABLE WORKFORCE HOUSING PROJECT

WDV is pursuing the development of a 100% affordable housing project to be contained within approximately half (12.5-acres) of the Petition Area. The Waikapu Affordable Workforce Housing Project is planned for a total of 80 residential units, consisting of 68 improved lots with single-family dwellings and 12 duplex units. The lots will range from 3,200 sq. ft. to 6,500 sq. ft.

The Waikapu Affordable Workforce Housing Project will be 100% affordable, meaning that the homes will be offered to Maui residents earning between 70% to 140% of the Maui area median income ("**AMI**"), as established by the County of Maui Department of Housing and Human Concerns ("**DHHC**"). The proposed breakout of affordability ranges are shown on Table

Table 1		
AMI Range	Number of Units	Percentage of WDV Project
70% - 79% AMI	12	15%
80% - 100% AMI	12	15%
101% - 120% AMI	40	50%
121% - 140% AMI	16	20%
Total	80	100%

Pursuant to Maui County Code § 2.96.060, the units will be deed restricted to limit ownership to the required income levels as follows: (a) "Below-moderate income," ten years; (b) "Moderate income," eight years; and (c) "Above-moderate income," five years. Additional transfer restrictions under the Maui County Code will also apply.

In addition to the 80 affordable homes, the Waikapu Affordable Workforce Housing Project will include a neighborhood park approximately 29,000 sq. ft. in size. WDV will provide all site work and infrastructure needed for the Waikapu Affordable Workforce Housing Project, such as internal roadways, drainage systems, utilities, and grading, and will construct the homes.

WDV is pursuing the development of the Waikapu Affordable Workforce Housing Project under Hawai'i Revised Statutes ("**HRS**") § 201H-38.² However, neither Petitioner nor

¹ For context, the AMI threshold being offered by WDV is *lower* than and the 100% affordable is *higher* than what would be imposed upon a market-rate development triggering workforce housing set asides pursuant to Chapter 2.96 of the Maui County Code.

² HRS § 201H-38 provides as follows:

(a) The corporation may develop on behalf of the State or with an eligible developer, or may assist under a government assistance program in the development of, housing projects that shall be exempt from all statutes, ordinances, charter provisions, and rules of any government agency relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon; provided that:

WDV intend to request any specific approvals from the Commission under HRS § 201H-38, as there is no need to do so. The Commission has already determined that the Petition Area warranted a SLU Urban District designation, and reclassified the Petition Area accordingly in 2008. Instead, WDV on its own will be requesting the anticipated HRS § 201H-38 approvals from the Maui County Council ("**County Council**"), in cooperation with DHHC, solely for the Waikapu Affordable Workforce Housing Project.

WDV will ask the County Council to exempt the Waikapu Affordable Workforce Housing Project from certain County permit and fee requirements, as well as exemptions from the Wailuku-Kahului Community Plan, existing zoning, and a modification of lot sizes and related subdivision criteria. A current draft of WDV's 201H proposal is provided as Petitioner's

(1) The corporation finds the housing project is consistent with the purpose and intent of this chapter, and meets minimum requirements of health and safety;

(2) The development of the proposed housing project does not contravene any safety standards, tariffs, or rates and fees approved by the public utilities commission for public utilities or of the various boards of water supply authorized under chapter 54;

(3) The legislative body of the county in which the housing project is to be situated shall have approved the project with or without modifications:

(A) The legislative body shall approve, approve with modification, or disapprove the project by resolution within forty-five days after the corporation has submitted the preliminary plans and specifications for the project to the legislative body. If on the forty-sixth day a project is not disapproved, it shall be deemed approved by the legislative body;

(B) No action shall be prosecuted or maintained against any county, its officials, or employees on account of actions taken by them in reviewing, approving, modifying, or disapproving the plans and specifications; and

(C) The final plans and specifications for the project shall be deemed approved by the legislative body if the final plans and specifications do not substantially deviate from the preliminary plans and specifications. The final plans and specifications for the project shall constitute the zoning, building, construction, and subdivision standards for that project. For purposes of sections 501-85 and 502-17, the executive director of the corporation or the responsible county official may certify maps and plans of lands connected with the project as having complied with applicable laws and ordinances relating to consolidation and subdivision of lands, and the maps and plans shall be accepted for registration or recordation by the land court and registrar; and

(4) The land use commission shall approve, approve with modification, or disapprove a boundary change within forty-five days after the corporation has submitted a petition to the commission as provided in section 205-4. If, on the forty-sixth day, the petition is not disapproved, it shall be deemed approved by the commission.

(b) For the purposes of this section, "government assistance program" means a housing program qualified by the corporation and administered or operated by the corporation or the United States or any of their political subdivisions, agencies, or instrumentalities, corporate or otherwise.

Exhibit B. In December 2017, DHHC circulated WDV's draft 201H proposal to some 29 State and County agencies for comment. Copies of all agency comment letters received are included in Section VII of WDV's 201H proposal. *See id.* All agency comments have been or will be addressed by WDV prior to the County Council taking final action on WDV's 201H proposal.

A starting point for the Waikapu Affordable Workforce Housing Project is the purchase and sale agreement that Petitioner entered into with William Frampton in November 2016 ("PSA"). Mr. Frampton is a member of the Hawai'i limited liability company that is the manager of WDV, and has assigned the PSA to WDV. Under the PSA, WDV cannot close on the purchase of the 12.5-acre lot until that property has been subdivided by the County. The subdivision application to split the Petition Area into two large lots (Lot A-1 (12.5 acres) and Lot A-2 (12.763 acres)) will be submitted to the County later this month.

While the subdivision application is being processed through the County, WDV will submit its 201H proposal to the County Council for decision-making. The precise timing for the formal acceptance of WDV's 201H proposal, and therefore the County Council's final decision-making, has not been determined. However, it is expected that the County Council will take action on this matter by September 2018. Once that process is completed, Petitioner and WDV will return to this Commission for additional approvals and modifications related to the D&O.

Petitioner and WDV originally expected to have the 201H process completed with the County before formally approaching the Commission with any requests, as stated in Petitioner's letter to Executive Officer Orodener of January 2, 2018, a copy of which is provided as Petitioner's **Exhibit C.** However, the County legislative calendar proved too full and the fiscal year 2019 budget deliberations got underway in March and are expected to demand the County

Council's attention through June or July, 2018, likely precluding the County Council's ability to complete the 201H process for the Waikapu Affordable Workforce Housing Project. The expected timing for the 201H approval is not itself a concern, except that D&O Condition No. 2 requires Petitioner to complete the Original ELC Project by March 7, 2018. Thus, Petitioner's filing of this Motion.

III. **ADDITIONAL COMMISSION APPROVALS NEEDED**

Upon the County Council's approval of a Resolution under HRS § 201H-38 for the Waikapu Affordable Workforce Housing Project, Petitioner and proposed co-Petitioner WDV will return to this Commission to request modifications to the D&O to allow for the development of the Waikapu Affordable Workforce Housing Project and related modifications for the development of the Updated ELC Project.

In addition, the Commission needs to delete the sui generis D&O Condition No. 18, which provides as follows:

18. Sale of Petition Area. Petitioner shall secure prior approval of the Commission of any sale of the Petition Area or any portion thereof.

This extraordinary and aberrant condition is invalid as an unreasonable restraint on the alienation of property and should be discharged irrespective of any plans related to Petitioner or WDV. *See, e.g., Ass'n of Owners of Kukui Plaza v. City & County of Honolulu*, 7 Haw. App. 60, 73–74, 742 P.2d 974, 983 (1987) ("The general rule is that restraints on alienation are not favored by the law, and are uniformly held to be void.") (citations omitted); *Pac. Tr. Co. v. Mataji Nagamori*, 32 Haw. 323 (1932) (trust provision prohibiting two beneficial owners of trust land from assigning, transferring, or selling their interest without the written consent of the other, which

provision was expressly binding on the heirs, executors, administrators and permitted assigns of the beneficial owners, held an invalid restraint on alienation of property and void in violation of the rule against perpetuities). Petitioner is unaware of this condition being imposed upon any other Dockets, and requests that the Commission delete this unreasonable and invalid condition.

Petitioner and proposed co-Petitioner WDV will seek Commission approval to modify the D&O. Under D&O Condition No. 1, the Petition Area should be developed in accordance with the plans presented by ELC in 2007/2008. D&O Condition No. 1 provides as follows:

1. Compliance with Representations to the Commission.

Petitioner shall develop the Petition Area in substantial compliance with the representations made to the Commission. Failure to so develop the Petition Area may result in reversion of the Petition Area to its former classification or change to a more appropriate classification.

As discussed, Petitioner still intends to develop the Petition Area, but as the more modest Updated ELC Project, with the potential for additional construction as contemplated under the Original ELC Project. The Updated ELC Project easily fits within the ELC 12.76-acre portion of the Petition Area. See Petitioner's **Exhibit D** for a rendering showing the much larger Original ELC Project fitting within the ELC 12.76-acre lot. The reconfiguration under the Updated ELC Project will not be very different from ELC's original concept plans, and will incrementally provide ample space for the growing needs of students and families within the church community.

Petitioner and WDV, as proposed co-Petitioner, will also return to the Commission to request that the Commission recognize WDV as the successor in interest to a 12.5-acre portion of the Petition Area, and to request either a release of the Petition Area from Commission jurisdiction or a bifurcation of this Docket. After final subdivision approval, the Petition Area

will be split into two large lots, each of which will be under 15 acres (WDV's 12.5 acre lot and ELC's 12.763 acre lot). Should the Commission determine that it retains jurisdiction over the Petition Area notwithstanding that each project area and subdivided lot will be under 15 acres, Petitioner and WDV will seek to bifurcate the Docket so that the Commission will have two separate Dockets that are geographically distinct.³ It is expected that the Commission will make additional findings relative only to the Waikapu Affordable Workforce Housing Project, and bifurcation will allow conditions to be appropriately modified and tailored accordingly.

IV. PETITIONER'S PROGRESS SINCE ISSUANCE OF THE D&O

The conceptual planning for the Original ELC Project in 2007/2008 was undertaken by Flansburgh Associates of Boston. At that time, Flansburgh had recently done a project at Seabury Hall, as well as design work for other schools in Hawai'i. Shortly after issuance of the D&O, Petitioner contracted with Maui Architectural Group, Inc. to prepare detailed plans for the construction of the Original ELC Project.

Petitioner also launched a fundraising campaign to support the development of the Original ELC Project. Petitioner sought support from the families who were members of the church, as well as those who had children attending school at the Kahului campus. Petitioner retained Creative Fundraising Associates, Inc., a Hawai'i firm with experience in fundraising and capital campaigns for nonprofit entities, to assist with fundraising and grants from education-oriented foundations.

In January 2009, Petitioner presented its rezoning request to the Maui Planning

³ This process is similar to the Commission's procedures in Docket A99-728 that initially covered some 1,300 acres, and was split into three separate sub-dockets as follows: (1) Docket A99-728(a) (University of Hawai'i at West Oahu), which covered 500 acres; (2) Docket A99-728(b) (The Salvation Army), which covered 15 acres; and (3) and Docket A99-728(c) (Department of Hawaiian Homelands), which covered 785 acres.

Commission. Petitioner sought to have the Petition Area rezoned from the County Agricultural District to the P-1 Public/Quasi-Public District. The Maui Planning Commission voted unanimously to recommend approval of Petitioner's change in zoning request.

Late in 2009, the County Council enacted Ordinance 3686, rezoning the Petition Area from the County Agricultural District to the County P-1 Public/Quasi-Public District. *See* Maui County Ordinance 3686 (2009), copy enclosed as Petitioner's **Exhibit E**. To document the conditions imposed on the rezoning, Petitioner recorded against the Petition Area a Unilateral Agreement and Declaration for Conditional Zoning on September 10, 2009.

Petitioner made substantial progress toward development of the Original ELC Project in the first few years after the D&O, but then suffered significant setbacks due to losses within the ELC community, funding complications, the Great Recession and associated reduction in student enrollment numbers, and its inability to sell the Kahului campus.

V. APPLICABLE RULES AND STATUTES

Hawai'i Administrative Rules ("HAR") § 15-15-94(c) provides that "For good cause shown, the commission may act to modify or delete any of the conditions imposed or modify the commission's order." Relatedly, HAR § 15-15-79 provides that Petitioners shall make substantial progress within a reasonable period of time.

HRS § 205-16 provides that "[n]o amendment to any land use district boundary nor *any other action* by the land use commission shall be adopted *unless* such amendment or *other action conforms to the Hawaii state plan*." (Emphasis added). In addition, HAR § 15-15-94 instructs that Motions to modify conditions must be served on all parties to the original boundary amendment proceeding, and any person with a property interest in the Petition Area, as recorded

in the respective County's real property tax records at the time the Motion is filed.

VI. ARGUMENT

A. GOOD CAUSE SHOWN FOR AMENDING D&O CONDITION NO. 2

There is good cause to extend the timeframe for Petitioner to complete the Updated ELC Project. "The term 'good cause' has been defined to mean 'a substantial reason amounting in law to a legal excuse for failing to perform an act required by law.' " *Miller v. Tanaka*, 80 Hawai'i 358, 363, 910 P.2d 129, 134 (Ct. App. 1995) (citation omitted). "'Good cause' also 'depends upon [the] circumstances of [the] individual case, and [a] finding of its existence lies largely in [the] discretion of [the] officer or court to which [the] decision is committed.' " *Id.* at 363-64, 910 P.2d at 134-35 (citation omitted). "As a general rule, 'good cause' means a substantial reason; one that affords a legal excuse. " *State v. Estencion*, 63 Haw. 264, 267, 625 P.2d 1040, 1042 (1981) (citations omitted).

There have been significant transitions within ELC over the past ten years that have prevented Petitioner from developing the Original ELC Project as it was initially presented to the Commission. The driving force behind the project's development was Petitioner's Land Use Committee. However, several key members of that committee are no longer with ELC. Richard Sudheimer, who was the Chairman of the Land Use Committee and played a central role in Petitioner's prior proceedings before the Commission, passed away in 2014. Reverend Milton Fricke, ELC's pastor for over 40 years, who was also closely involved in the planning of the ELC Project, including its rezoning efforts before the Maui Planning Commission, retired shortly after Petitioner's entitlements efforts. In more recent years, ELC has lost several other key members of its Land Use Committee in similar fashion, including Orley Anderson (retired principal who passed away in 2013), Tom Leuteneker (a Hawai'i attorney with development

experience), and Art Gau, who, for health reasons, moved to the mainland in 2013 and has since passed away.

Petitioner's efforts to develop the Updated ELC Project are now headed by Dr. Michael Reiley, Pastor Joshua Schneider, and David Hobus. Dr. Reiley is ELC's congregational president, and president of HNu Photonics and HNu Energy, a Maui-based electrical engineering firm specializing in renewable energy. Pastor Schneider has served as ELC's full-time pastor since Reverend Fricke's retirement, prior to that he served as a teacher and part-time pastor, and has been involved with the Land Use Committee in some capacity since 2006. Mr. Hobus is the principal of ELC's K-8 program (since 2016) and has also recently become involved with advancing the Updated ELC Project. Mr. Hobus has prior experience with planning, fundraising, and development for numerous church and school projects, including a 20,000 sq. ft. addition to the Trinity Lutheran School in Kalispell, Montana. This newly reinvigorated team at ELC entered into the PSA with Mr. Frampton in hopes of eliminating the debt that currently encumbers the Petition Area, thereby opening opportunities for the development of the Updated ELC Project, while at the same time supporting the development of badly needed affordable housing for local families on Maui.

Funding difficulties, which were exacerbated by the Great Recession, further compromised Petitioner's ability to complete the Original ELC Project by March 7, 2018. One source of anticipated development funding was the proceeds from the sale of Petitioner's Kahului campus. However, among the known effects of the Great Recession are the financial regulations that imposed more strict underwriting standards on banks. This reduced access to capital for many business owners who could no longer pursue new opportunities, thereby depressing the demand for niche properties. The ELC Kahului campus was put on the market in 2009, in the

midst of the Great Recession, and was eventually taken off the market after a year due to a lack of buyer response and a drop in appraised value from a high of \$5.6 million to a low of \$3.5 million in 2012 (a reduction of 37.5%). In addition, the Great Recession also significantly reduced grant funding opportunities and student enrollment.

Existing debt encumbering the Petition Area complicates Petitioner's ability to pursue the Updated ELC Project, but the proposed sale to WDV will resolve that complication. Petitioner took out a mortgage to fund its purchase of the Petition Area in 2004. The eventual sale of a portion of the Petition Area to WDV will allow ELC to pay off the remaining balance on its mortgage. In addition, with the Petition Area no longer encumbered by the mortgage, Petitioner will be better positioned to pursue grant funding and other currently unavailable funding opportunities, many of which require an applicant's property to be unencumbered or take the property's existing encumbrances into consideration when awarding funds.

Petitioner also experienced a reduction in its enrollment numbers due to the Great Recession. Ten years ago, enrollment in Petitioner's K-8 program was at capacity for the Kahului campus (approximately 175 students), which was a major consideration in pursuing the SLU Urban District reclassification and rezoning. However, with the Great Recession, enrollment dropped to as low as 120 students. Currently, enrollment is at a healthy 137 students. Petitioner's goal is to return to the 175-180 student enrollment range. Petitioner is actively pursuing ways to increase its enrollment, and is currently in the process of seeking accreditation, which Petitioner strongly believes will strengthen its marketability and increase its enrollment numbers. Once Petitioner is able to stabilize its enrollment at near capacity for the Kahului campus, it will re-evaluate additional phases for the Updated ELC Project that would include construction classrooms for its elementary school (grades K-5).

Notwithstanding the losses within the Land Use Committee and the Great Recession and associated difficulties, ELC's fundraising efforts between 2008 and 2011 were successful, with contributions received from friends and families of the church and school. The funds raised were put toward architectural, civil engineering and entitlements efforts, leaving no funds to go toward site work and construction. Although donations have tapered off, Petitioner continues to receive regular inquiries from school families regarding how to best help once the Updated ELC Project begins to move forward again, whether through financial or in-kind contributions (many school parents are contractors and other tradesmen). The proposed sale of a portion of the Petition Area to WDV will provide Petitioner with a capital infusion that will significantly assist Petitioner in pursuing its development plans for the Updated ELC Project. To date, Petitioner has spent approximately \$1,290,000 in its efforts to develop the Petition Area.

Extending the development deadline by ten years will also be an important first step toward the development of badly needed affordable housing in Maui. Attached as Appendix K to WDV's 201H proposal is a market demand study prepared for WDV by R.W. Spangler LLC in 2017 ("**Market Demand Study**"). *See* Exhibit B. The Market Demand Study concluded that the Waikapu Affordable Workforce Housing Project will be well received by the local market, with anticipated full pre-sale absorption, and an important source of affordable for-sale housing to address the significant shortage of affordable entry-level housing in Central Maui. According to the Market Demand Study, the demand for affordable housing is so high on Maui that the Waikapu Affordable Workforce Housing Project's proposed 80 units represent only 2.5% of the projected housing demand through 2025 for the 71% to 140% AMI range. In addition, the Market Demand Study found that the Waikapu Affordable Workforce Housing Project's two-to-four bedroom, principally detached single-family units are well-tailored to Central Maui's

demand preferences.

Granting an extension of time under D&O Condition No. 2 will also remove a cloud from WDV's 201H proposal, such that DHHC and the County Council can be reassured that the SLU Urban District designation will remain in place and the Petition Area will not become subject to a Motion for Order to Show Cause during the pendency of the County Council's 201H decision-making process for the Waikapu Affordable Workforce Housing Project.

B. AREA WIDE CHANGES PROVIDE ADDITIONAL GOOD CAUSE

At the time of the D&O, the area immediately surrounding the Petition Area was relatively undeveloped. D&O FOF ¶28. In the ensuing years, however, the surrounding area has been identified for additional residential development in County plans, and residential projects have been approved on adjacent properties.

In the time since the Commission's issuance of the D&O, the County adopted the Maui Island Plan through Ordinance No. 4004, effective as of December 28, 2012 ("**MIP**"). The MIP provides direction for future growth, economic, social, and environmental decisions on Maui through 2030. The Petition Area is within the "Urban Growth Boundary" of the MIP's Directed Growth Boundaries land use maps. *See* Petitioner's **Exhibit F**. The Urban Growth Boundary identifies areas within which urban-density development requiring a full range of services, such as new multi-user sewer and water systems, is supported in accordance with applicable land use laws. *See* MIP at 8-4. "Growth boundaries are a long-range planning tool that will be used on Maui to evaluate proposals involving community plan amendments, changes in zoning, development proposals or utility extensions." *Id.*

The Petition Area continues to be identified for Public/Quasi Public use under the

Wailuku-Kahului Community Plan, last updated in 2002. Anticipated uses within the Public/Quasi Public areas include schools, libraries, fire/police stations, government buildings, public utilities, hospitals, churches, cemeteries, and community centers. *See* Wailuku-Kahului Community Plan at 59.

The Kehalani Village Center, a retail shopping center, is to the north of the Petition Area, within the 550-acre master-planned Kehalani Village. The Village Center was opened in 2014.

About 2 miles southeast of the Petition Area is A&B Properties Hawaii, Inc.'s proposed 545-acre Waiale Master Planned Residential Project. The Commission granted a SLU Agricultural to Urban District reclassification for that project area in 2012 (Docket A10-798).

In June 2016, the County Council approved Resolution 16-81 authorizing the development of the Waiale Affordable Housing Project under HRS § 201H-38 on a 10.4-acre property immediately south of the Petition Area (at TMK (2) 3-5-002:012 (por.)). The Waiale Affordable Housing Project will have a total of 71 lots consisting of 70 single-family lots and one lot designed as a park lot. The residential lots will be 100% affordable and offered to qualified families or individuals earning between 80% and 140% of Maui's AMI. The Waiale property was within the SLU Agricultural District, but pursuant to HRS § 201H-38, the County Council exempted the project from having to obtain a District Boundary Amendment.⁴

The Waiale Affordable Housing Project should be seen as a template for the Updated ELC Project and the Waikapu Affordable Workforce Housing Project. Valley Isle Fellowship, Inc., a Hawai'i nonprofit corporation that operates a Southern Baptist Church, sold roughly half

⁴ Property acquisition and due diligence for the Waiale Affordable Housing Project began in April 2015. The large-lot subdivision, creating the separate lot for purchase, began in January, 2016, and concluded in the late summer 2016. Small-lot subdivision is expected soon and construction is slated to begin later this month.

of its property to an affordable housing developer, Waiale Road 201 LLC, in October 2016. According to the Maui News (May 20, 2016),⁵ Senior Pastor Stephen Kaneshiro explained that the church sold the property to help fund construction of a new church for Valley Isle Fellowship. Selling a portion of the church property for the development of affordable housing was particularly attractive because so many Maui families are priced out of the residential housing market. Certain of the principals involved in the acquisition, entitlement, and development of the Waiale Affordable Housing Project, Mr. Frampton and Vincent Bagoyo are closely involved in the proposed Waikapu Affordable Workforce Housing Project.

C. AMENDING D&O CONDITION NO. 2 IS IN COMPLIANCE WITH THE STATE PLAN

HRS § 205-16 provides that no action by the Commission shall be adopted unless the action conforms to the State Plan. The State Plan is a comprehensive guide for the future long-range development of the State of Hawai'i. The requested amendment of D&O Condition No. 2 is consistent with applicable goals, objectives, and policies of the State Plan, HRS Chapter 226. The Commission already determined that the reclassification of the Petition Area to the SLU Urban District conformed to the State Plan. *See* D&O FOF ¶¶127-133.

In addition, any actions taken to further development of affordable housing is also compliant with the State Plan. *See* HRS § 226-19. One of the primary objectives of the State Plan with respect to housing is to provide

Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes . . . , through collaboration

⁵ <http://www.mauinews.com/news/local-news/2016/05/panel-advances-waiale-affordable-housing-project/>. As the article suggests, both Petitioner and Valley Isle Fellowship are in similar positions in that, even once subdivided and sold, both have sufficient land to meet their institutional needs, and were able to find a developer committed to providing much needed affordable housing to the Central Maui community. Both situations present a win-win-win for the landowners, the developer, and the Central Maui community.

and cooperation between government and nonprofit and for-profit developers to ensure that more . . . for sale affordable housing is made available to extremely low-, very low-, lower-, moderate-, and above moderate-income segments of Hawaii's population.

HRS § 226-19(a)(1). To achieve this objective, it is the express policy of the State to: (1) stimulate and promote feasible approaches that increase affordable for sale housing choices for low-income households; and (2) increase homeownership opportunities and choices in terms of quality, location, cost, densities, style, and size of housing. *Id.* at § 226-19(b)(2)&(3). The requested amendment of D&O Condition No. 2 is consistent with these objectives and policies because it is a necessary step towards the development of the Waikapu Affordable Workforce Housing Project, which, as discussed, is a 100% affordable project that will offer homes to Maui residents earning between 70% to 140% of Maui's AMI.

D. THE MOTION WAS PROPERLY SERVED

Pursuant to HAR § 15-15-94, Petitioner must serve a copy of this Motion "on all parties to the boundary amendment proceeding in which the condition was imposed or in which the order was issued, and to any person that may have a property interest in the subject property as recorded in the county's real property tax records at the time that the motion is filed." This Motion was properly served.

Currently the Petition Area is owned by Petitioner. As discussed, proposed Co-Petitioner WDV was assigned Mr. Frampton's rights under the PSA to purchase approximately 12.5 acres of the Petition Area upon issuance of final subdivision approval from the County. WDV has been served with a copy of this Motion.

The State Office of Planning and the Maui Planning Department are parties to this proceeding, and each have also been served with a copy of this Motion. In addition, based on a

title review of the Petition Area, Petitioner has served a copy of this Motion on all persons and entities with a recorded interest in the Petition Area.

VII. SUMMARY AND CONCLUSION

Based on the foregoing, HAR §§ 15-15-70, 15-15-94, and the records and files in this Docket, Petitioner respectfully requests that the Commission issue an order amending D&O Condition No. 2 to provide Petitioner until March 7, 2028, to complete the Updated ELC Project.

In deference to the Commission and in expectation that the Commission may wish to defer further action in this Docket until such time that the County Council passes a Resolution authorizing the development of the Waikapu Affordable Workforce Housing Project under HRS § 201H-38, at this time Petitioner is not formally requesting Commission approval for:

- (a) the deletion of D&O Condition No. 18 (requiring Commission approval prior to the sale of any portion of the Petition Area);
- (b) recognition of WDV as the successor in interest to a portion of the Petition Area;
- (c) an amendment to the development proposed under the D&O so that Petitioner and WDV can be in substantial compliance with D&O Condition No. 1 (requiring development to be in substantial compliance with representations made to the Commission); and
- (d) the bifurcation of this Docket No. A07-773 so that appropriate findings, conclusions, and conditions can be made separately for the Updated ELC Project and the Waikapu Affordable Workforce Housing Project.

However, Petitioner reserves rights its under HAR § 15-15-70(a) to modify this request before, during, or after the close of the hearing on this Motion.

DATED: Honolulu, Hawai'i, April 9, 2018.

A handwritten signature in black ink, appearing to read 'JAL', is positioned above a horizontal line.

JENNIFER A. LIM

DEREK B. SIMON

Attorneys for Petitioner
Emmanuel Lutheran Church of Maui

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF
MAUI

DOCKET NO. A07-773

AFFIDAVIT OF MICHAEL REILEY

To Amend the Land Use District Boundary of
Certain Lands Situated at Wailuku, Island of
Maui, State of Hawai'i, Consisting of 25.263
Acres from the Agriculture District to the
Urban District, Tax Map Key No. 3-5-002:011.

AFFIDAVIT OF MICHAEL REILEY

MICHAEL REILEY, being duly sworn on oath, deposes and says:

1. I am the President of Emmanuel Lutheran Church of Maui, a Hawai'i nonprofit corporation ("**Petitioner**" or "**ELC**").
2. As President of ELC, my responsibilities include conducting all congregational voters' meetings, reviewing and executing all documents on behalf of ELC, and various other executive functions.
3. I submit this affidavit in support of Petitioner's Motion for Extension of Time to Complete Project ("**Motion**").
4. I have read the Motion and know the contents thereof, and attest that it is true to the best of my knowledge and belief.
5. I am competent and authorized to testify to the matters set forth herein, and unless otherwise indicated, I make this affidavit based upon personal knowledge.
6. Petitioner is the fee owner of approximately 25.263-acres of land ("**Petition Area**") that is the subject of the State of Hawai'i Land Use Commission's ("**Commission**") Findings of Fact, Conclusions of Law, and Decision and Order in Docket No. A07-773 ("**D&O**"), which

reclassified the Petition Area from the State Land Use ("SLU") Agriculture District to the SLU Urban District.

7. With respect to the Petition Area, my responsibilities include overseeing and managing all activities related to land use approvals, planning, design, construction, funding and fundraising, and similar other activities.

8. Petitioner originally sought reclassification of the Petition Area to develop a new campus for its preschool-to-8th-grade school program ("**Original ELC Project**"). The Original ELC Project was intended to replace Petitioner's current Kahului campus.

9. Attached to the Motion as Petitioner's Exhibit A are renderings of ELC's Campus Plan and ELC's Option B for the Original ELC Project, both of which were included with Petitioner's Exhibit 6 to the Petition.

10. Petitioner made substantial progress toward development of the Original ELC Project in the first few years after the D&O. However, funding difficulties, the Great Recession and associated reduction in enrollment numbers, and escalated construction costs compromised Petitioner's ability to complete the Original ELC Project by March 7, 2018.

11. These same factors also required Petitioner to re-evaluate the appropriateness of the Original ELC Project. As a result, Petitioner is revising the Original ELC Project to a smaller project that will be substantially consistent with the project the Commission approved, as described in the Motion ("**Updated ELC Project**").

12. Petitioner is committed to developing the Updated ELC Project. With the Commission's approval of the extension of time requested by the Motion, as well as the subdivision and subsequent sale of a portion of the Petition Area, Petitioner will be significantly better positioned to develop the Updated ELC Project.

13. Attached to the Motion as Petitioner's Exhibit C is a true and correct copy of a letter Petitioner sent to Commission Executive Officer Orodener on January 2, 2018.

14. Attached to the Motion as Petitioner's Exhibit D is a graphic showing the Original ELC Project fitting within the Petition Area after it has been subdivided.


15. Attached to the Motion as Petitioner's Exhibit E is a true and correct copy of County of Maui Ordinance 3686 that rezoned the Petition Area, and a copy of that certain Unilateral Agreement and Declaration for Conditional Zoning, dated August 21, 2009, and recorded in the State of Hawai'i Bureau of Conveyances as Document 2009-138944, making the conditions therein run with the land.

16. To date, Petitioner has spent approximately \$1,290,000 in its efforts to develop the Petition Area.

17. Attached to the Motion as Petitioner's Exhibit F is a copy of the Directed Growth Map from the Maui Island Plan ("MIP"), enacted through Ordinance No. 4004, and effective as of December 28, 2012, which shows the Petition Area (shaded in green) within the MIP's "Urban Growth Boundary."

I declare under the penalty of perjury that the foregoing is true and correct.

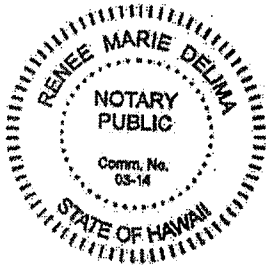
EXECUTED: Wa'lu Ku, Hawai'i, April 9, 2018.


MICHAEL REILEY

STATE OF HAWAII
COUNTY OF MAUI

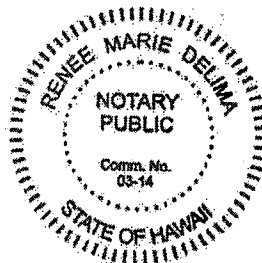
)
) ss.
)

On this 9th day of April, 2018, before me personally appeared MICHAEL REILEY, to me personally known, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.



Renee Marie Delima
Name of Notary:
State of Hawaii
My Commission expires: 01.05.19

Doc. Description: Before the Land
Use Commission of the State of
Doc. Date: 4/9/18 No. Pages: 4
Renee Marie Delima 2nd
Renee Marie Delima



**BEFORE THE LAND USE COMMISSION
OF THE STATE OF HAWAII**

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF
MAUI

To Amend the Land Use District Boundary of
Certain Lands Situated at Wailuku, Island of
Maui, State of Hawai'i, Consisting of 25.263
Acres from the Agriculture District to the
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

AFFIDAVIT OF WILLIAM FRAMPTON

AFFIDAVIT OF WILLIAM FRAMPTON

WILLIAM FRAMPTON, being duly sworn on oath, deposes and says:

1. I am the sole member of William Frampton Consulting, LLC, a Hawaii limited liability company.
2. I, along with my partners Peter A. Horovitz and Vince Bagoyo, am also a member of VBP, LLC, a member-managed Hawaii limited liability company, which is the manager of Waikapu Development Venture LLC, a Hawaii limited liability company ("WDV").
3. I am competent and authorized to testify to the matters set forth herein, and unless otherwise indicated, I make this affidavit based upon personal knowledge.
4. I submit this affidavit in support of Petitioner Emanuel Lutheran Church of Maui's ("**Petitioner**") Motion for Extension of Time to Complete Project ("**Motion**").
5. I have read the Motion and know the contents thereof, and attest that it is true to the best of my knowledge and belief.
6. WDV is pursuing the development of a 100% affordable housing project (the "**Waikapu Affordable Workforce Housing Project**") to be contained within approximately half (12.5-acres) of the approximately 25.263-acres of land in Wailuku ("**Petition Area**") that the Land Use Commission of the State of Hawai'i ("**Commission**") reclassified into the State Land Use ("**SLU**") Urban District by Findings of Fact, Conclusions of Law, and Decision and Order in Docket No. A07-773, filed on March 7, 2008 ("**D&O**").

7. The Waikapu Affordable Workforce Housing Project is planned for a total of 80 residential units, consisting of 68 improved lots with single-family dwellings and 12 duplex units. The lots will range from 3,200 sq. ft. to 6,500 sq. ft.

8. The Waikapu Affordable Workforce Housing Project will be 100% affordable, and offer homes to Maui residents earning between 70% to 140% of the Maui area median income ("AMI"), as established by the County of Maui Department of Housing and Human Concerns ("DHHC").

9. Table 1 of the Motion contains an accurate breakout of the both the number of proposed units and the proposed affordability ranges for the Waikapu Affordable Workforce Housing Project.

10. Pursuant to current Maui County Code Section 2.96.060, the units will be deed restricted to limit ownership to the required income levels as follows: (a) "Below-moderate income," ten years, (b) "Moderate income," eight years, (c) "Above-moderate income," five years. Additional transfer restrictions contained within the Maui County Code will also apply.

11. The Waikapu Affordable Workforce Housing Project will also include a neighborhood park approximately 29,000 sq. ft. in size. WDV will provide all site work and infrastructure needed for the Waikapu Affordable Workforce Housing Project, such as internal roadways, drainage systems, utilities, and grading, and will construct the homes.

12. WDV is pursuing the development of the Waikapu Affordable Workforce Housing Project under Hawaii Revised Statutes ("HRS") § 201H-38. Neither Petitioner nor WDV intend to request any specific approvals from the Commission under HRS § 201H-38. Instead, WDV on its own will be requesting the anticipated HRS § 201H-38 approvals from the Maui County Council ("**County Council**"), in cooperation with DHHC, solely for the Waikapu Affordable Workforce Housing Project.

13. WDV will ask the County Council to exempt the Waikapu Affordable Workforce Housing Project from certain County permit and fee requirements, as well as exemptions from the Wailuku-Kahului Community Plan, existing zoning, and a modification of lot sizes and related subdivision criteria.

14. Attached to the Motion as Petitioner's **Exhibit B** is a copy of the current draft of WDV's 201H proposal.

15. In December 2017, DHHC and WDV circulated WDV's draft 201H proposal to 29 State and County agencies for comment. Copies of all agency comment letters received and responded to are included in Section VII of WDV's 201H proposal. All comments have been or will be addressed in WDV's 201H proposal prior to the County Council taking final action.

16. I entered into a purchase and sale agreement with Petitioner ("PSA") for the purchase of a 12.5-acre portion of the Petition Area. I have assigned my rights under the PSA to WDV. Under the PSA, WDV cannot close on the purchase of the 12.5-acre lot until that property has been subdivided by the County. The subdivision application to split the Petition Area into two large lots (Lot A-1 (12.5 acres) and Lot A-2 (12.763 acres)) will be submitted to the County later this month.

17. While the subdivision application is being processed through the County, WDV will submit its 201H proposal to the County Council for decision-making. It is expected that the County Council will take action on this matter by September 2018.

18. Once the 201H process is completed, WDV along with Petitioner will return to this Commission for additional approvals and modifications related to the D&O to allow for the development of the Waikapu Affordable Workforce Housing Project and related modifications for Petitioner's project. WDV and Petitioner will also request that the Commission recognize WDV as the successor in interest to the 12.5-acre portion of the Petition Area it will purchase under the PSA, and request either a release of the Petition Area from Commission jurisdiction or a bifurcation of this Docket.

19. While we had hoped to have the 201H process with the County complete before approaching the Commission, as stated in Petitioner's letter to Executive Officer Orodénker of January 2, 2018, the County legislative calendar proved too full and the fiscal year 2019 budget deliberations got underway in March and are expected to demand the County Council's attention through June or July, 2018, likely precluding the County Council's ability to complete the 201H process for the Waikapu Affordable Workforce Housing Project. We recognize that ELC needs to approach the Commission now for its own purposes, and support them in their efforts. Irrespective of WDV's project needs, the ELC project is good for the community in general and their request for additional time and modifications that they may require should be approved.

20. I was raised on Maui and in my 25+ years in the development industry on Maui, first with Pacific Rim Land, and subsequently in private practice, I have participated in dozens of development projects at varying levels from the planning to construction phases. My current CV is attached as **Exhibit 1** to this Affidavit and representative projects include:

Planning Consultant Services:

- Pioneer Farms Subdivision: 61 Agricultural Lots
- Launiupoko Master Planned Residential Community: 500 Acres
- Olowalu Master Planned Residential Community: 450 Acres
- Pu'unoa Master Planned Residential Community: 200 Acres
- West Maui Breakers Affordable Housing Project: 90-Unit Project
- Upcountry Health Center and Business Apartments.
- Paia Town Center Commercial Property.

Projects which WFC are Owners and have or had Financial Interest:

- Papa'anui Residential Subdivision: 7 Lots.
- Consolidated Baseyards Light-Industrial Subdivision: 35 Lots.
- Olowalu Ekolu: 16 Acre Ocean Front Parcel.
- Olowalu Master Planned Residential Community: 600 Acres
- Waiale Road 201-H Affordable Housing Project: 71 Units

21. Through the entitlement phase I served as a partner and project manager in the neighboring Waiale Affordable Housing Project under HRS § 201H-38 on a 10.4-acre property immediately south of the Petition Area (at TMK (2) 3-5-002:012 (por.)) (the "Waiale Project"). This project is now fully entitled and will be breaking ground shortly.

22. The Waiale Project will have a total of 71 lots consisting of 70 single-family lots and one lot designed as a park lot. The residential lots will be 100% affordable and offered to qualified families or individuals earning between 80% and 140% of Maui's AMI. The Waiale Project was within the SLU Agricultural District, but pursuant to HRS § 201H-38, the County Council exempted the project from having to obtain a District Boundary Amendment.

23. The Waiale Project, which is most analogous to the Waikapu Affordable Housing Project in scope, size, and market impact, was processed through the Maui County Council with Council as noted above. Property acquisition, due diligence began in April, 2015. The large-lot subdivision, creating the separate lot for purchase began in January, 2016 and concluded in the late summer 2016. I stepped out of the project at that point. Small lot subdivision is expected soon and construction is slated to begin this month.

I declare under the penalty of perjury that the foregoing is true and correct.

Further affiant sayeth naught.

EXECUTED: Waimanalo, Hawai'i, April 6, 2018.

William Frampton
WILLIAM FRAMPTON

STATE OF HAWAII

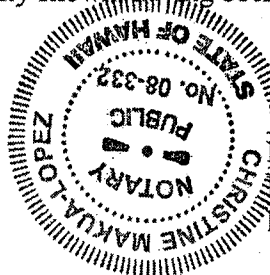
)

) ss.

COUNTY OF MAUI

)

On this 6th day of April, 2018, before me personally appeared WILLIAM FRAMPTON, to me personally known, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.



Christine Makua Lopez
Notary Public, State of Hawaii
My commission expires: 8/10/20

NOTARY CERTIFICATION STATEMENT

Document Identification or Description: **AFFIDAVIT OF WILLIAM FRAMPTON**

Document Date: April 6, 2018

No. of Pages: 1

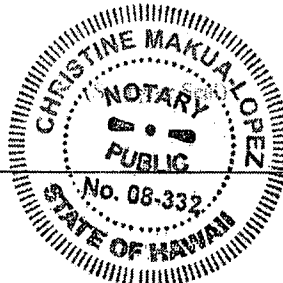
Jurisdiction (in which notarial act is performed): 2nd Circuit

Signature of Notary

Date of Notarization and
Certification Statement

Printed Name of Notary

Christine Makua Lopez



Cond
mp.

WILLIAM CHARLES FRAMPTON

56 PALIULI PLACE ♦ KULA, HAWAII ♦ 96790

CELL PHONE: (808) 357-1954 ♦ EMAIL: bill@mauiframpton.com

RESUMÉ

EDUCATION

- ♦ SEABURY HALL HIGHSCHOOL - Class of 1987; Olinda, Maui, Hawaii.
- ♦ HUMBOLDT STATE UNIVERSITY - Class of 1992; *Bachelor of Arts Degree in Geography,*
Emphasis *Natural Resource Planning*; Arcata, California.

EMPLOYMENT EXPERIENCE

- ♦ *WILLIAM FRAMPTON CONSULTING, LLC.*

Period: January 2016 → Present.

Location: Kula, Maui, Hawaii.

Type: Planning, Consulting, Project Management & Development of Affordable Housing.

Title: Owner/Managing Member.

Duties: Manage company projects, land use planning, consulting, development. Emphasis on Affordable Housing for Maui's families and residents. Project analysis, financial feasibility assessment; Proforma/Budget Analysis; Timelines; Prepare/file land use permits, entitlement approvals from various government agencies, construction management.

- ♦ *FRAMPTON & WARD, LLC.*

Period: April 2002 → December 2015.

Location: Wailuku, Maui, Hawaii.

Type: Land Use Planning, Consulting, Project Management & Development.

Title: Co-Owner/Co-Managing Member.

Duties: Manage company projects, land use planning, consulting, development. Project analysis, financial feasibility assessment; Assessments; Proforma/Budget Analysis; Timelines; Prepare/file land use permits, entitlement approvals from various government agencies; construction management.

- ♦ *PACIFIC RIM LAND, INC.*

Period: May 1999 → April 2002.

Location: Kihei, Maui, Hawaii.

Type: Real Estate Development and Project Management.

Title: Project Coordinator/Project Manager.

Duties: Coordinate, manage real estate development projects. Project assessment/financial feasibility; Coordinate all aspects of development projects including preparing and filing land use permits/entitlements from various government agencies, construction management.

SEPTEMBER 2016

Exhibit 1

❖ *KAHO'OLAWA ISLAND RESERVE COMMISSION*

Period: January 1998 → May 1999.

Location: Kaho'olawe, Maui, Hawaii.

Type: Environmental Remediation/Restoration; UXO Removal.

Title: Project Coordinator/Field Technician.

Duties: Coordinate/Manage & observe US Navy & Private Contractor re: implementing \$400 Million Environmental Remediation/Restoration/UXO Removal of Kaho'olawe. Assist implementing environmental restoration program, cultural/historical education & program & ocean resource program.

❖ *MUNEKIYO & HIRAGA, INC.*

Period: October 1994 → April 1998.

Location: Wailuku, Maui, Hawaii.

Type: Land Use Planning, Consulting, and Project Management.

Title: Land Use Planner.

Duties: Prepare/file, and represent clients during all aspects of land use permits, entitlements, and government approvals (permits). Monitor and coordinate projects throughout various government approval processes (Zoning, SMA, Community Plans, etc.). Examine land use laws, rules, regulations and requirements.

❖ *CHRIS HART & PARTNERS, INC.*

Period: September 1992 → March 1994.

Location: Wailuku, Maui, Hawaii.

Type: Land Use Planning, Consulting, and Project Management.

Title: Land Use Planner.

Duties: Prepare/file, and represent clients during all aspects of land use permits, entitlements, and government approvals (permits). Monitor and coordinate projects throughout various government approval processes (Zoning, SMA, Community Plans, etc.). Examine land use laws, rules, regulations and requirements.

❖ *MAUI LAND & PINEAPPLE COMPANY*

Period: June 1991 → August 1991.

Location: Wailuku, Maui, Hawaii.

Type: Summer Internship re Natural Resources Management.

Title: Internship Planner.

Duties: Assist w/ tracking, monitoring progress of non-native/invasive plants spreading on ML&P's mauka lands in West Maui Mountains; and assess the adverse impacts caused by such re reduced natural recharge rates of groundwater aquifers underlying West Maui Mountains.

WILLIAM CHARLES FRAMPTON

56 PALIULI PLACE ♦ KULA, HAWAII ♦ 96790
CELL PHONE: (808) 357-1954 ♦ EMAIL: bill@mauiframpton.com

RESUMÉ

COMMUNITY INVOLVEMENT

- ✧ CATHOLIC CHARITIES – MAUI ISLAND COMMITTEE - 2015→Present.
- ✧ CROSS COUNTRY COACH - Seabury Hall: 1995→2000; and, 2010→Present.
- ✧ TRACK & FIELD COACH - Seabury Hall: 1995→2000.
- ✧ MAUI/LANAI ISLAND BURIAL COUNCIL - State of Hawaii, DLNR: 2002→2010.
- ✧ MAUI FAMILY YMCA - Board of Directors: 2012→2016.
- ✧ PTA KULA ELEM. SCHOOL - Board of Directors (President): 2007→2013.
- ✧ SEABURY HALL PARENTS ORGANIZATION - Board of Directors: 2013→2016.
- ✧ BOY SCOUTS - Den Leader Kula Pack 14: 2005→2012.
- ✧ AYSO SOCCER COACH - Youth League, Kula, Maui: 2004→2012.
- ✧ MAYOR'S BIKEWAY ADVISORY COMMITTEE: 1994→1998.
- ✧ MAUI JUNIOR ACHIREVEMENT - Volunteer Teacher: 1995→1998.
- ✧ MAUI UNITED WAY - Employer's Campaign Coordinator: 1994→1999.
- ✧ KULAMANU COMMUNITY HOMEOWNER'S ASSOCIATION - Board of Directors: 2006→2012

CERTIFICATIONS

- ✧ CERTIFIED EMERGENCY FIRST RESPONDER - Maui Paramedics - 1999.
- ✧ CPR/FIRST AID TRAINING - Maui Paramedics - 1999.
- ✧ OSHA HAZARDOUS WASTE OPERATIONS & EMERGENCY RESPONSE TRAINING - State of Hawaii - 1999.
- ✧ US DEPT. OF INTERIOR ADVANCED AVIATION SAFETY TRAINING - 1999.
- ✧ US NAVY UXO RECOGNITION TRAINING - Pearl Harbor - 1998.
- ✧ US COAST GUARD BOATING & SAFETY PATROL - Ma'alaea - 1998.

CONTINUING EDUCATION

- ✧ SEILER SCHOOL OF REAL ESTATE - Real Estate License Class - Maui - 1996.
- ✧ ECOSYSTEM & ENVIRONMENT SUMMER SEMINAR - University Hawaii, Monoa - 1996.

HONORS/AWARDS

- ✧ NCAA DIV.II ALL AMERICAN CROSS COUNTRY (1991) & TRACK (1992).
- ✧ INDIVIDUAL HALL OF FAME: TRACK & CROSS COUNTRY - Humboldt State University - 1999.
- ✧ TEAM HALL OF FAME: 1991 MEN'S CROSS-COUNTRY Team - Humboldt State University - 2011.

SEPTEMBER 2016

BEFORE THE LAND USE COMMISSION
OF THE STATE OF HAWAI'I

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF
MAUI

To Amend the Land Use District Boundary of
Certain Lands Situated at Wailuku, Island of
Maui, State of Hawai'i, Consisting of 25.263
Acres from the Agriculture District to the
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served on the following by the methods indicated next to their names on April 9, 2018, to their last known addresses as shown below:

Patrick Wong, Esq. Corporation Counsel County of Maui 250 South High Street Wailuku, HI 96793	[Via U.S. Mail, postage prepaid]
Michael Hopper, Esq. Corporation Counsel County of Maui 250 South High Street Wailuku, HI 96793	[Via U.S. Mail, postage prepaid]
William Spence, Planning Director Maui Planning Department County of Maui 2200 Main Street One Main Plaza, Suite 315 Wailuku, HI 96793	[Via U.S. Mail, postage prepaid]
Dawn T. Apuna, Deputy Attorney General Office of the Attorney General State of Hawaii 425 Queen Street Honolulu, Hawaii 96813	[Via Hand Delivery]

Leo Asuncion, Director Office of Planning State of Hawaii 235 South Beretania Street, 6th Floor Honolulu, HI 96813	[Via Hand Delivery]
County of Maui 200 South High Street Wailuku, HI 96793	[Via U.S. Mail, postage prepaid]
Department of Public Works County of Maui 200 South High Street Wailuku, HI 96793	[Via U.S. Mail, postage prepaid]
Department of Water Supply County of Maui P.O. Box 1109 Wailuku, Hawaii 96793	[Via U.S. Mail, postage prepaid]
Ronald R. Jacintho Sr. Waiko Baseyard, LLC P.O. Box 5 Kula, Hawaii 96790	[Via U.S. Mail, postage prepaid]
Scott Nunokawa Waikapu 28 Investment, LLC 834 Alewa Drive Honolulu, Hawaii 96817	[Via U.S. Mail, postage prepaid]
Susan A. Li Maui Electric Company, Limited 900 Richards Street, Room 414 Honolulu, Hawaii 96813	[Via U.S. Mail, postage prepaid]
Gwen Massiah Hawaiian Telcom, Inc., f/k/a Verizon Hawaii Inc. Legal Department 1177 Bishop Street Honolulu, Hawaii 96813	[Via U.S. Mail, postage prepaid]
Avery B. Chumbley Wailuku Water Company, LLC 255 E. Waiko Road Wailuku, Hawaii 96793	[Via U.S. Mail, postage prepaid]
Stanford S. Carr Kehalani Holdings Company, Inc. 1100 Alakea Street, Suite 27th Floor Honolulu, Hawaii 96813	[Via U.S. Mail, postage prepaid]
Lutheran Church Extension Fund-Missouri Synod 1136 Union Mall, Suite 301 Honolulu, Hawaii 96813	[Via U.S. Mail, postage prepaid]

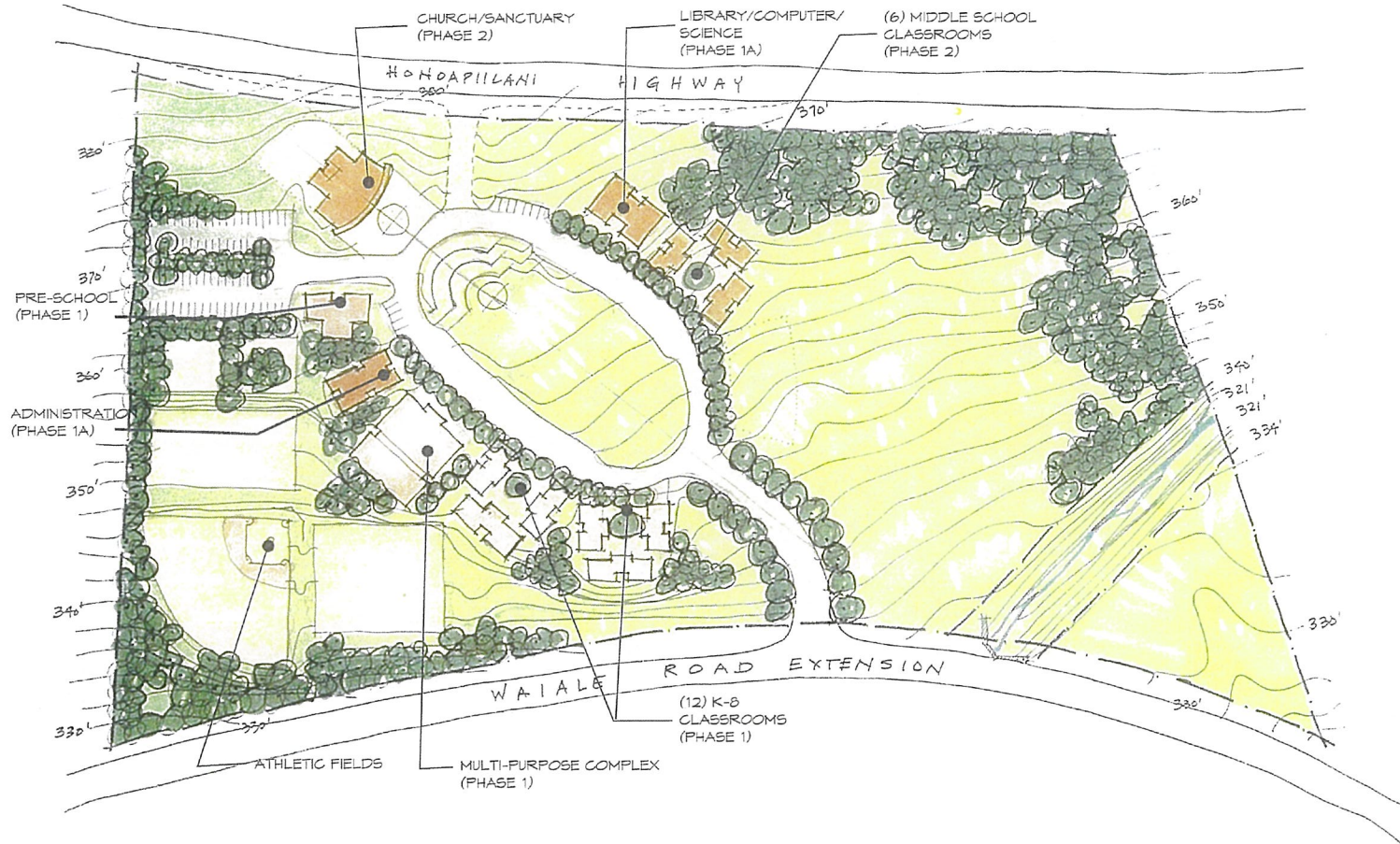
DATED: Honolulu, Hawaii, April 9, 2018.

A handwritten signature in black ink, appearing to read 'Ji' or 'Li', written over a horizontal line.

JENNIFER A. LIM
DEREK B. SIMON

Attorneys for Petitioner
Emmanuel Lutheran Church of Maui

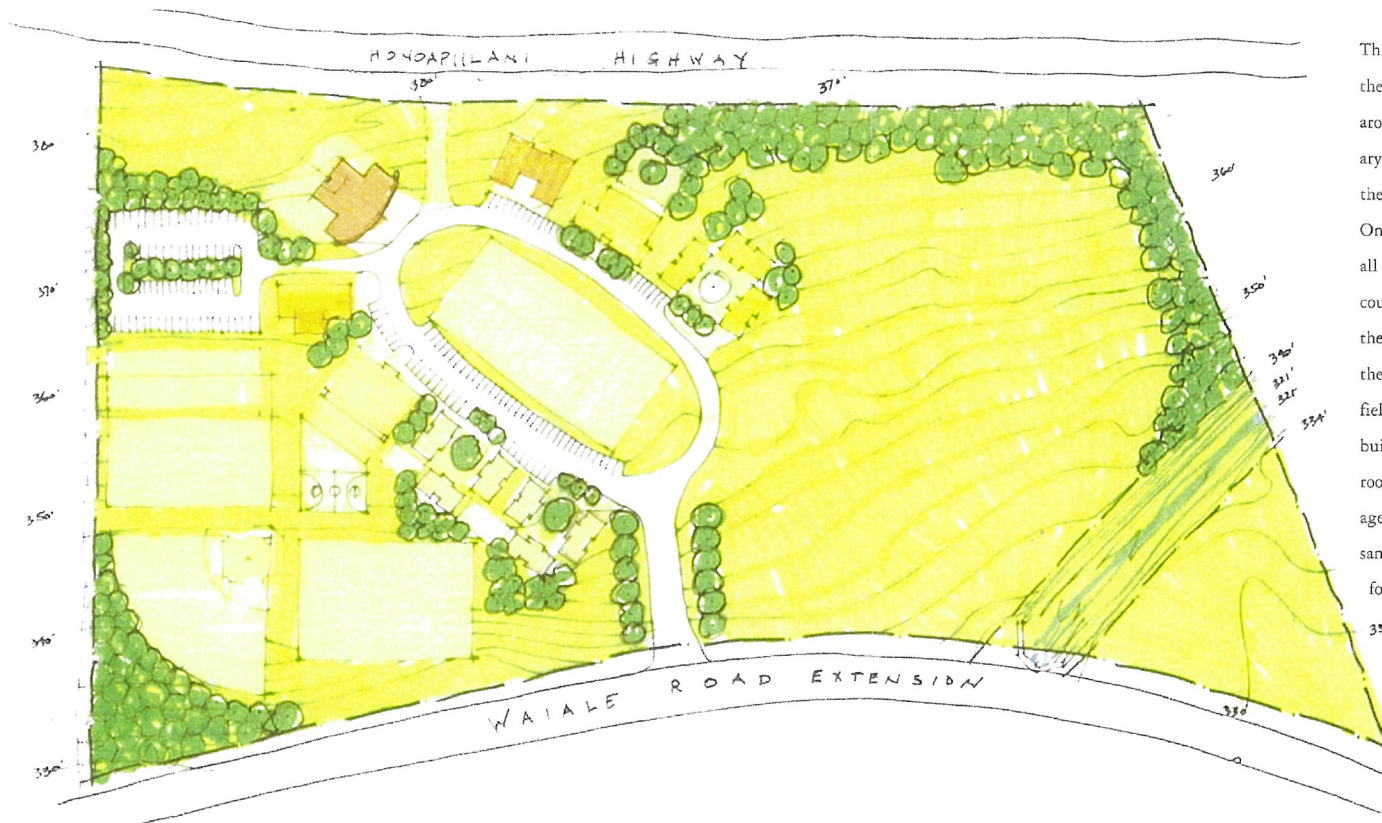
Petitioner's Exhibit A



THE CAMPUS PLAN
EMMANUEL LUTHERAN CHURCH + SCHOOL

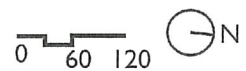
0 60 120





This Beaux-arts/Village Green Scheme organizes the 25-acre site into an elegant campus. Set around a large oval, open green space, the sanctuary sits at the site highest point and on axis with the campus entrance road and views to the ocean. On the left are twelve of the eighteen classrooms, all single-story and clustered around landscaped courtyards. Next to the twelve K – 5 classrooms, the multi-purpose complex is a central element in the campus organization, close to multiple playfields and parking. This option offers separate buildings for administration and specialty classrooms and the library, both buildings have frontage on the green. The pre-school is next to the sanctuary and close to the multipurpose complex for ease of access for the youngest children. Middle school classrooms are single story and clustered around a courtyard also on the green. Option B develops a little more than half of the 25-acre site and supports magnificent views of the ocean and mountains.

OPTION B
EMMANUEL LUTHERAN CHURCH + SCHOOL



Draft Application for Affordable Workforce Housing Subdivision

Pursuant to Section 201H-38, Hawai'i Revised Statutes (HRS)



Affordable Workforce Housing Project

**Located at Honoapi'ilani Highway
Wailuku, Hawai'i • Island of Maui**

TMK: 3-5-02:11 (por)

Prepared for:

Waikapū Development Venture LLC

Prepared by:



BAGOYO
DEVELOPMENT
CONSULTING GROUP

1500 Killinoe Place • Wailuku Maui Hawai'i 96793 • (808) 357-3842 • vbago-yo-devgroup@hawaii.rr.com

PETITIONER'S EXHIBIT B

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WAIKAPU DEVELOPMENT VENTURE, LLC

2145 WELLS STREET NO.303 • WAILUKU • HI • 96793

PHONE: (808) 242-5700 • EMAIL: bill@mauiframpton.com

August 18, 2017

SUBJECT: Letter of Authorization to Prepare, File, Process and Seek Approval for State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications for the Subject Property located along Waiale Road in Vicinity of Waikapu, Maui, Hawaii; and, further identified as County Tax Map Key: (2) 3-5-002:011.

To Whom It May Concern,

Please note that by way of this Letter of Authorization, *WAIKAPU DEVELOPMENT VENTURE, LLC* ("WDV") hereby provides Vince Bagoyo, of *Bagoyo Development Consulting Group*; William Frampton, of *William Frampton Consulting, LLC*; and Peter Horovitz, Esq., of *Merchant Horovitz, LLP* with authorization to act on our behalf and represent us in the preparing, filing, and processing of various State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications; including, but not limited to the following: (1) Application for an 100% Affordable Housing Project pursuant to *Hawaii Revised Statutes §201H-38*; (2) Application for County Subdivision pursuant to *Maui County Code Title 18*; and, (3) Petition to Amend and/or Modify Existing State Land Use Commission Docket No. A07-773 pursuant to *Hawaii Revised Statutes §205*, and *Hawaii Administrative Rules Title 15, Subtitle 3, Chapter 15*; for our proposed Project to be located on approximately 12.50 acres of land located along Waiale Road in the vicinity of Waikapu, Maui, Hawaii; and, further identified as a portion of Maui County Tax Map Key: (2) 3-5-002:011 (Portion).

It is noted that at this present time, *Emmanuel Lutheran Church of Maui* ("ELC") holds the title and full ownership of "*LOTA*"; which has an approximate area of 25.263 acres, and is identified as TMK: (2) 3-5-002:011. However, by way of a Real Estate Purchase and Sales Agreement (PSA); ELC and WDV are working together to file a 2-Lot Subdivision to which will subdivide LOT A into "*LOT A-1*" and "*LOT A-2*"; measuring 12.50 acres and 12.763 acres respectively. After Final Subdivision is granted; ELC will convey/transfer Fee Ownership of *LOT A-1* to WDV for the proposed development of the aforementioned 201-H Affordable Housing Project. ELC will retain Lot A-2 for the proposed future development of a new School Campus and new Church. Since ELC still owns LOT A; ELC will also be preparing for a separate *LETTER OF AUTHORIZATION* which will authorize WDV and its representatives and consultants to prepare, file, process and seek approval of the same above-referenced State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications.

LETTER OF AUTHORIZATION

August 10, 2017

PAGE 2

If you have any additional questions, or if you require further information or documentation; please do not hesitate to contact us at 808-242-5700. Mahalo.

Sincerely,

WAIKAPU DEVELOPMENT VENTURE, LLC

By: VBP, LLC

Its: MANAGER

VBP, LLC



By: William Frampton

Its: MEMBER

CC: Vince Bagoyo - Bagoyo Development Consulting Group
Peter Horovitz, Esq. - Merchant Horovitz, LLLP

NOTARY CERTIFICATE ON NEXT PAGE

STATE OF HAWAII

)

) SS.

COUNTY OF MAUI

)

On August 18, 2017, before me appeared WILLIAM FRAMPTON, whose identity I verified, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable, in the capacity shown, having been duly authorized to execute such instrument in such capacity.

Laura Gima
(Signature)

Print Name: Laura Gima

Notary Public, State of Hawaii

My Commission Expires: 02/29/2020

L.S.

Doc. Date: 08/18/2017

No. Pages: 3

Name: Laura Gima

2nd Circuit

Doc. Description: Letter of Authorization

Laura Gima

8/18/17

L.S.
(Stamp or Seal)

Notary Signature

Date

NOTARY CERTIFICATION



R-731

STATE OF HAWAII
BUREAU OF CONVEYANCES
RECORDED

DEC 30, 2004 08:01 AM

Doc No(s) 2004-264052



20 3/4 Z6

/s/ CARL T. WATANABE
REGISTRAR OF CONVEYANCES

CONVEYANCE TAX: \$675.00

LAND COURT SYSTEM

REGULAR SYSTEM

Return by Mail (✓) Pickup () To:

MR RICHARD H SUTHEIMER
EMMANUEL LUTHERAN CHURCH OF MAUI
520 WEST ONE STREET
KAHULUI, HI 96732

TG: 200420153 - B

TGE: AL2015373
DORIE SCHOEPPNERRS
(3)

Tax Key: (2) 3-5-002-001

Total No. of Pages: 12

LIMITED WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS:

That WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, whose address is 255 East Waiko Road, Wailuku, Hawaii 96793, hereinafter called the "Grantor," in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration to Grantor paid by EMMANUEL LUTHERAN CHURCH OF MAUI, a Hawaii non-profit corporation, whose address is 520 West One Street, Kahului, Maui, Hawaii 96732, hereinafter called the "Grantee," the receipt whereof is hereby acknowledged, does hereby grant and convey unto the Grantee as a tenant in

severalty, all of Grantor's right, title and interest in and to the real property described in Exhibit "A" attached hereto and by this reference incorporated herein; subject, however, to all encumbrances noted on said Exhibit "A".

TO HAVE AND TO HOLD the same, together with any improvements thereon and the rights, easements, privileges, and appurtenances thereunto belonging or appertaining unto the Grantee, the heirs, representatives, administrators, successors and assigns of the Grantee, forever.

AND the Grantor covenants with the Grantee that the former is now seised in fee simple of the property granted; that the latter shall enjoy the same without any lawful disturbance; that the same is free from all encumbrances made by persons claiming by, through or under the Grantor, except the liens and encumbrances hereinbefore mentioned, and except also the liens and encumbrances created or permitted by the Grantee after the date hereof; and that the Grantor will WARRANT and DEFEND the Grantee against the lawful claims and demands of all persons claiming by, through or under the Grantor, except as aforesaid.

The terms "Grantor" and "Grantee", as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, or neuter, the singular or plural number, individuals or corporations, and their and each of their respective successors, heirs, personal representatives,

and permitted assigns, according to the context hereof. If these presents shall be signed by two or more Grantors or by two or more Grantees, all covenants of such parties shall for all purposes be joint and several.

The parties hereto agree that this instrument may be executed in counterparts, each of which shall be deemed an original, and said counterparts shall together constitute one and the same agreement, binding all of the parties hereto, notwithstanding all of the parties are not signatory to the original or the same counterparts. For all purposes, including, without limitation, recordation, filing and delivery of this instrument, duplicate unexecuted and unacknowledged pages of the counterparts may be discarded and the remaining pages assembled as one document.

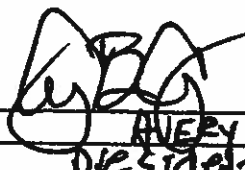
IN WITNESS WHEREOF, the Grantor and the Grantee have executed these presents on this 27th day of Dec, 2004.

APPROVED AS TO FORM:
MANCINI, WELCH & GEIGER

WAILUKU AGRIBUSINESS CO., INC.

By Peter A. Horovitz

By



Its AVERY B. CHUMLEY
President

By

Its

Grantor

and permitted assigns, according to the context hereof. If these presents shall be signed by two or more Grantors or by two or more Grantees, all covenants of such parties shall for all purposes be joint and several.

The parties hereto agree that this instrument may be executed in counterparts, each of which shall be deemed an original, and said counterparts shall together constitute one and the same agreement, binding all of the parties hereto, notwithstanding all of the parties are not signatory to the original or the same counterparts. For all purposes, including, without limitation, recordation, filing and delivery of this instrument, duplicate unexecuted and unacknowledged pages of the counterparts may be discarded and the remaining pages assembled as one document.

IN WITNESS WHEREOF, the Grantor and the Grantee have executed these presents on this 27th day of Dec, 2004.

APPROVED AS TO FORM:
MANCINI, WELCH & GEIGER

WAILUKU AGRIBUSINESS CO., INC.

By Peter A. Horovitz

By _____
Its _____

By Beverly Y. Crudele
Its Secretary

Grantor

EMMANUEL LUTHERAN CHURCH OF MAUI

By Richard H. Sudheimer
Richard H. Sudheimer
Its President

By Larry L. Niles
Larry L. Niles
Its Secretary
Grantee

STATE OF HAWAII)
) SS.
COUNTY OF ~~MAUI~~ HAWAII)

On this 23rd day of December, 2004, before me personally appeared AVERY B. CHUMBLEY and BEVERLY Y. CRUDELE, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

Nora Rosario) S.
Print Name: Nora Rosario
Notary Public, State of Hawaii.

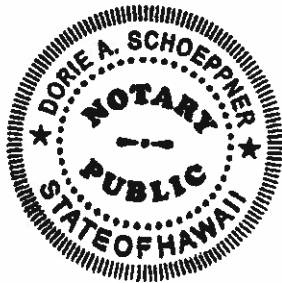
My commission expires: 12-13-2006

STATE OF HAWAII

)
) SS.
)

COUNTY OF MAUI

On this 27th day of Dec, 20 09, before me personally appeared Richard H. Schoepner and Lucy E. Niles, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.



Dorie A. Schoepner
Print Name: _____
Notary Public, State of Hawaii.

My commission expires: _____

Dorie A. Schoepner
Expiration Date: September 28, 2007

EXHIBIT "A"

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Grant 3152 to Henry Cornwell and Grant 3343 to Claus Spreckels) situate, lying and being on the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) at Waikapu and Wailuku, Island and County of Maui, State of Hawaii, being LOT A of the "WAIKAPU EAST (LARGE-LOT) SUBDIVISION NO. 3" and thus bounded and described:

Beginning at a point at the southwesterly corner of this lot, being also the northwesterly corner of Lot B of Waikapu East (Large-Lot) Subdivision No. 3, the coordinates of said point of beginning referred to Government Survey Triangulation Station "LUKE" being 5,563.76 feet south and 2,085.73 feet west and running by azimuths measured clockwise from true South:

1. Thence along the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) on a curve to the left with the point of curvature azimuth from the radial point being: 271° 55' 48" and the point of tangency azimuth from the radial point being: 262° 39' 11", having a radius of 2,899.93 feet, the chord azimuth and distance being: 177° 17' 29.5" 469.02 feet to a point;
2. 172° 39' 11" 865.57 feet along same to a point;
3. 241° 16' 878.02 feet along R. P. 4529-B and 4549, L. C. Aw. 71 to Michael J. Nowlein, being also along Lot 9-A of Waiale Road and Kuikahi Drive Extension Subdivision to a point;
4. Thence along the remainder of Grant 3343 to Claus Spreckels, being also along Lot L of Waikapu East (Large-Lot) Subdivision No. 3 on a curve to the right with the

point of curvature azimuth
from the radial point being:
104° 32' 45" and the point
of tangency azimuth from the
radial point being: 284°
39' 17", having a radius of
1,600.00 feet, the chord
azimuth and distance being:
14° 36' 01" 3.04 feet to a
point;

5. Thence along same on a curve to the left with the point of curvature azimuth from the radial point being: 104° 39' 17" and the point of tangency azimuth from the radial point being: 99° 00', having a radius of 1,600.00 feet, the chord azimuth and distance being: 11° 49' 38.5" 157.85 feet to a point;
6. 9° 00' 84.93 feet along same to a point;
7. Thence along same on a curve to the left, having a radius of 1,560.00 feet, the chord azimuth and distance being: 354° 03' 30" 804.45 feet to a point;
8. 339° 07' 622.61 feet along the remainders of Grant 3343 to Claus Spreckels and Grant 3152 to Henry Cornwell, being also along Lot L of Waikapu East (Large-Lot) Subdivision No. 3 to a point;
9. 82° 00' 904.67 feet along the remainder of Grant 3343 to Claus Spreckels, being also along Lot B of Waikapu East (Large-Lot) Subdivision No. 3 to the point of beginning and containing an area of 25.263 acres, more or less.

TOGETHER WITH an easement for roadway purposes over Roadway Lot L of "WAIKAPU EAST (LARGE-LOT) SUBDIVISION NO. 3" and the KUIKAHI DRIVE EXTENSION; provided, however, that if and when any of said roadway lots shall be conveyed to or acquired by any governmental authority as a public highway, then all private easement rights granted hereby in said roadway lots shall automatically terminate.

SUBJECT, HOWEVER, to the following:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines.

2. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement dated June 2, 1986, and recorded in the Bureau of Conveyances of the State of Hawaii in Liber 19563 on Page 104, by and between Wailuku Agribusiness Co., Inc. and County of Maui, by its Department of Water Supply, re: private fire protection system

3. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement dated March 14, 1990, and recorded in the said Bureau of Conveyances as Document No. 90-069334, by and between Wailuku Agribusiness Co., Inc. and Department of Water Supply of the County of Maui, re: private water system.

Above agreement was amended by instrument dated August 24, 1990, and recorded as Document No. 90-164426.

4. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement dated March 14, 1990, and recorded in the said Bureau of Conveyances as Document No. 90-069335, by and between Wailuku Agribusiness Co., Inc. and Department of Water Supply of the County of Maui, re: private fire protection system.

5. Existing sewerline Easement "S-1" (15 feet wide), as shown on survey map prepared by Warren S. Unemori, Land Surveyor, with Warren S. Unemori - Engineering, Inc., dated June 27, 1994, revised January 11, 1995 and February 17, 1995.

6. Grant to County of Maui dated March 30, 1994, and recorded in the said Bureau of Conveyances as Document No.

95-079773, granting an easement for sewerline purposes over Easement "S-1", being more particularly described therein.

Lack of joinder by C. Brewer Homes, Inc., now known as Hawaii Land & Farming Company, Inc., a Delaware corporation.

7. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Memorandum Concerning Grant of Various Property Rights dated --- (acknowledged August 19, 1999 and August 18, 1999), and recorded in the said Bureau of Conveyances as Document No. 99-189645.

8. Grant to Hawaii Land & Farming Company, Inc., a Delaware corporation, dated August 3, 1999, and recorded in the said Bureau of Conveyances as Document No. 99-189647, granting a perpetual Offsite Drainage Easement "D-1" in favor of Tax Key (2) 3-5-001-001 and (2) 3-4-007-002.

9. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Unilateral Agreement and Declaration for Conditional Zoning dated April 6, 2000, and recorded in the said Bureau of Conveyances as Document No. 2000-049836.

10. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Subdivision Agreement dated June 21, 2001, and recorded in the said Bureau of Conveyances as Document No. 2001-104990, by and between Wailuku Agribusiness Co., Inc., a Hawaii corporation, and the County of Maui, through its Department of Public Works and Waste Management.

11. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement to Grant Easement dated June 25, 2001, and recorded in the said Bureau of Conveyances as Document No. 2001-097114, by and between Wailuku Agribusiness Co., Inc., a Hawaii corporation, and Waiko Baseyard, LLC, a Hawaii limited liability company.

12. Grant to Waiko Baseyard, LLC, a Hawaii limited liability company, dated June 25, 2001, and recorded in the said Bureau of Conveyances as Document No. 2001-097115, granting a non-exclusive easement over and across a portion of the

"existing cane haul" road, being more particularly described therein.

13. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Private Fire Protection System Agreement dated March 21, 1997, and recorded in the said Bureau of Conveyances as Document No. 2002-046402, by and between Brewer Environmental Industries, Inc., a Hawaii corporation, and Wailuku Agribusiness Co., Inc., a Hawaii corporation.

14. Grant to Waikapu 28 Investment, LLC, a Hawaii limited liability company, dated January 30, 2003, and recorded in the said Bureau of Conveyances as Document No. 2003-058167, granting easements for utility purposes being more particularly described therein.

15. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement for Allocation of Future Subdivision Potential dated November 3, 2004, and recorded in the said Bureau of Conveyances as Document No. 2004-227693, by and between Wailuku Agribusiness Company, Inc. and Hawaii Land & Farming Company, Inc.

16. Designation of Easement "D-1" for drainage purpose shown on survey map prepared by Reed M. Ariyoshi, Registered Professional Land Surveyor, with Warren S. Unemori-Engineering Inc., dated September 21, 2004.

17. Designation of Easement "E-2" for electrical purpose shown on survey map prepared by Reed M. Ariyoshi, Registered Professional Land Surveyor, with Warren S. Unemori-Engineering Inc., dated September 21, 2004.

18. Grant to Maui Electric Company, Limited, a Hawaii corporation, and Verizon Hawaii Inc., a Hawaii corporation, dated Nov 13, 2004, and recorded in the said Bureau of Conveyances as Document No. 2004, granting easements for utility purposes being more particularly described therein.

19. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Declaration of Covenants, Conditions, Easements, Reservations and Restrictions dated Dec 27, 2004, and recorded in the said Bureau of Conveyances as Document No. 2004-20405-1

20. Any lien (or claim of lien) for services, labor or material arising from an improvement or work related to the land described herein.

21. Any unrecorded leases and matters arising from or affecting the same.

END OF EXHIBIT "A"

Tax Key: (2) 3-5-002-001



COMMERCIAL REAL PROPERTY PURCHASE AND SALE AGREEMENT (PSA)

Hawaii Association of REALTORS® Standard Form

Revised 2/14 (NC) For Release 11/16



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Reviewed By: _____
Principal Broker/Broker-in-Charge **Keoni Fursse, R(PB)**

Reference Date: **November 18, 2016** Purchase Price: **\$1,150,000.00** (See Paragraph D-2)

Closing Date: The Scheduled Closing Date shall be as set forth in Paragraph F-2.

Property Reference or Address: **0 Honoapiilani Hwy**
Wailuku, HI (See Paragraph E-1)

Tax Map Key: Div. **2** /Zone **3** /Sec. **5** /Plat **002** /Parcel(s) **011** /CPR _____ (if applicable).

IDENTIFICATION OF PARTIES:

IDENTIFICATION OF BROKERAGE FIRMS:

Buyer: <u>William Frampton etal/assigns</u>	Brokerage Firm: <u>Kokua Realty, LLC</u>
	Agent Name: <u>Keoni Fursse</u>
Street _____	Street <u>296 Alamaha St Ste A</u>
Address: _____	Address: <u>Kahului, HI 96732-2412</u>
Phone: _____	Phone: <u>(808) 280-6556</u>
Fax: _____	Fax: <u>(808) 877-5078</u>
E-mail: _____	E-mail: <u>keoni@kokuarealty.com</u>

Seller: <u>Emmanuel Lutheran Church Maui</u>	Brokerage Firm: <u>Kokua Realty, LLC</u>
	Agent Name: <u>Uvette J. Sakamoto</u>
Street _____	Street <u>296 Alamaha St Ste A</u>
Address: _____	Address: <u>Kahului, HI 96732-2412</u>
Phone: _____	Phone: <u>(808) 269-5000</u>
Fax: _____	Fax: <u>(808) 877-5078</u>
E-mail: _____	E-mail: <u>uvette@kokuarealty.com</u>

CONTRACT: This is more than a receipt for money. It is a legally binding contract for the purchase of real estate. Read it carefully. Handwritten or typed provisions herein shall supersede any printed provisions if there is a conflict. FILL IN ALL BLANKS. WRITE "NA" IF NOT APPLICABLE. ITEMS WITH CHECK-OFF BOXES ARE OPTIONAL. ALL OTHERS ARE STANDARD PROVISIONS.

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SECTION A: AGENCY DISCLOSURE

A-1 Agency. Buyer and/or Seller in a real estate transaction in Hawaii may retain a real estate Brokerage Firm as their agent. In such case, Buyer and/or Seller is represented by the Brokerage Firm and all of its licensees. Hawaii law requires real estate licensees to disclose orally or in writing to Seller and/or Buyer whom the licensee represents. The form of representation may be one of the following:

- (a) **Seller's Agent.** Brokerage Firm represents Seller only unless a disclosed dual agency exists. Seller's Agent owes the highest duties to Seller, including confidentiality, loyalty, and due care and diligence.
- (b) **Buyer's Agent.** Brokerage Firm represents Buyer only unless a disclosed dual agency exists. Buyer's Agent owes the highest duties to Buyer, including confidentiality, loyalty, and due care and diligence.
- (c) **Dual Agent.** Brokerage Firm represents both Buyer and Seller. This commonly occurs when licensees in the Brokerage Firm representing Seller have Buyer clients looking for types of property similar to Seller's property. In such event, the Brokerage Firm and all of its licensees represent both Buyer and Seller and are dual agents. Dual agents must remain neutral in negotiations and must not advance the interest of one party over the other. **A separate Dual Agency Consent Addendum is required under Hawaii law.**
- (d) **No Agency Representation** (see A-2(d) below).

A-2 Disclosure.

- (a) **Seller Representation:** Seller is represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®.
- (b) **Buyer Representation:** Buyer is represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®.
- (c) **Dual Agency Representation:** Seller and Buyer are represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®. **A separate Dual Agency Consent Addendum is required.**
- (d) **No Agency Representation:**
 - ☐ Seller is a Customer and is not represented by a Brokerage Firm.
 - ☐ Buyer is a Customer and is not represented by a Brokerage Firm.

It is recommended that Customers seek legal counsel prior to signing a PSA.

If requested, a licensee may present a Customer's PSA to Seller and report Seller's response. A licensee cannot, however, negotiate for or otherwise advise a Customer in the transaction.

Buyer and Seller acknowledge that oral or written disclosure relative to agency representation was provided to them before the signing of this PSA.

WF (Buyer's initials)

MR (Seller's initials)

SECTION B: EARNEST MONEY DEPOSIT

B-1 Earnest Money. Buyer shall deposit with Escrow (identified in Paragraph F-4), the sums set forth below (the "Earnest Money") in good funds on or before the deadlines required by this Paragraph B-1 or as otherwise agreed in writing by the parties. Buyer shall pay (from sources other than the Earnest Money or any interest accruing thereon) any and all escrow or other fees charged by Escrow pursuant to Paragraph F-6. All interest accruing on such sum shall become a part of the Earnest Money and shall be distributed as Earnest Money in accordance with the terms of this PSA.

- ☒ (a) An initial Earnest Money deposit in the amount of \$ 50,000.00 shall be paid within 5 business days of the Acceptance Date (or as otherwise agreed in writing by the parties) (defined in Paragraph S-1).
- ☐ (b) An additional Earnest Money deposit in the amount of \$ _____ shall be paid within _____ business days after the end of the Inspection Period (see Paragraph J-2).

B-2 Interest on Earnest Money. (Choose (a) OR (b))

- ☐ (a) Buyer to Earn Interest. The parties instruct Escrow to place Buyer's deposit(s) in an interest-bearing account with all interest to be credited to Buyer at closing. Buyer shall pay any processing fee required by Escrow and all costs of setting up, maintaining and closing the account. Fees/costs may exceed the interest earned.
- ☒ (b) Buyer not to Earn Interest. Buyer hereby waives the right to place Buyer's deposits in an interest-bearing account. Buyer understands any interest earned on such deposits shall belong to Escrow.

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SECTION C: ADDENDA

C-1 **Addenda.** The following addenda, if checked, are attached to and made a part of this PSA.

[X] Existing "As Is" Condition [] Other _____
 [X] Other Dual Agency [] Other _____
 [] Other _____ [] Other _____

SECTION D: OFFER TO BUY AND PURCHASE PRICE

D-1 **Offer to Buy.** Buyer offers to buy the Property described below on the terms and conditions contained herein, acknowledges receipt of a copy of the PSA, and agrees that this PSA shall be binding on Buyer if accepted by Seller on or before:
 Date November 23, 2016 Time 4:00 AM [] PM [X].

D-2 **Purchase Price.** Purchase price for the Property in U.S. Dollars shall be paid as follows:

\$ 50,000.00 Initial cash deposit of Earnest Money ("B-1(a)").
 \$ _____ Additional cash deposit of Earnest Money ("B-1(b)").
 \$ 525,000.00 Balance of down payment (or balance of purchase price if all cash) paid into Escrow before closing.

\$ 575,000.00 TOTAL CASH FUNDS FROM BUYER (exclusive of closing costs).

\$ 575,000.00 By way of New first mortgage at terms and conditions acceptable to Buyer.

\$ _____

\$ 1,150,000.00 TOTAL PURCHASE PRICE

Failure to make any of the scheduled deposits herein shall constitute a default, and the termination provisions of Paragraph O-1 shall apply.

SECTION E: PROPERTY

E-1 **Description.** Tax Map Key: Div. 2 /Zone 3 /Sec. 5 /Plat 002 /Parcel(s) 011 /CPR _____ (if applicable).

All of that [X] fee simple [] leasehold Property zoned Public Quasi situated at the address set forth above described as follows: Approximately twelve (12.5) acres of vacant land in Wailuku, Maui, Hawaii.

The full legal description will be provided in the title report.

"Property" includes all improvements and fixtures except those owned by tenants and except as listed below:

SECTION F: CLOSING

F-1 **Closing.** For purposes of this PSA, "Closing" shall be the date when all appropriate conveyance documents are recorded. Buyer and Seller agree to promptly execute appropriate or customary documents when requested by Escrow.

F-2 **Scheduled Closing Date.** (Choose Paragraph F-2(a) OR F-2(b))

[] (a) _____, or
 [X] (b) 30 days after the end of Inspection Period. If the Scheduled Closing Date falls on a day the Bureau of Conveyances of the State of Hawaii is closed, closing will be on the next day when documents can be recorded.

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F-3 Change to the Scheduled Closing Date. (Choose Paragraph F-3(a) OR F-3(b))

- ☐ (a) **Extensions. There is no automatic right to extend.** If, for reasons beyond Buyer's or Seller's control, a party cannot perform its obligation to close by the Scheduled Closing Date, then such party may extend the Scheduled Closing Date up to _____ () days by delivery of written notice to the other party prior to the Scheduled Closing Date. Thereafter, time shall be of the essence, and if a party fails to perform by the extended Scheduled Closing Date, such party shall be considered in default and the other party may elect to terminate this PSA pursuant to Paragraph O-1. The extended Scheduled Closing Date may not be further extended unless Buyer and Seller agree in writing. This provision relates only to the extension of the Scheduled Closing Date.
- ☒ (b) **Time is of the Essence.** Time is of the essence and the Scheduled Closing Date may not be extended unless Buyer and Seller agree in writing.

F-4 Escrow. This transaction shall be escrowed by: Fidelity National, Branch _____ ("Escrow").

Escrow officer: _____ Phone No.: _____ Fax No.: _____

Escrow officer email address: _____

Within the time period set forth in Paragraph B-1, Seller shall open an account with Escrow and provide Escrow with a copy of this PSA and escrow instructions.

F-5 Prorations and Closing Adjustments. At closing, Escrow shall prorate the following, if applicable, as of the date of closing: real property tax, lease rents, interest on assumed obligations, tenant rents, common area expenses and other items customarily prorated in commercial real estate transactions in Hawaii. When applicable, Escrow shall charge to Seller and credit to Buyer the amount of any tenant security deposits. Seller and Buyer agree to cooperate and use their best efforts to complete such prorations or adjustments that are not available at Closing no later than thirty (30) days after Closing. Such items of income and expense for the period prior to the date of Closing will be for the account of Seller and such items of income and expense for the period on and after Closing will be for the account of Buyer, all as determined by the accrual method of accounting, except that rent shall be prorated only to the extent actually collected. Bills received after Closing to the extent they relate to expenses incurred for services performed prior to Closing shall be paid by Seller, and those which relate to services performed after Closing (except as otherwise agreed to by the parties in writing) shall be paid by Buyer; provided, however, that Buyer's obligations under this PSA to assume and pay for services rendered after Closing pursuant to any service contracts shall not apply to any service contract that Buyer elected not to assume during the Inspection Period.

F-6 Closing Costs. The following allocates customary closing costs and are not intended to be an all-inclusive list. Escrow may charge the appropriate party other closing costs as agreed and directed in writing by the parties.

Charge to Buyer, if applicable:

50% of the premium for standard coverage title insurance and any additional costs relating to the issuance of extended coverage policy and endorsements (including a lender's policy)
 Cost of drafting of agreement of sale or mortgage and note
 Cost of obtaining Buyer's consents
 Buyer's notary fees
 50% of Escrow's fees
 Any fees pertaining to any Buyer financing

Charge to Seller, if applicable:

50% of the premium for standard coverage title insurance
 Cost of drafting of conveyance documents and bills of sale
 Cost of obtaining Seller's consents
 Seller's notary fees
 Conveyance tax
 50% of Escrow's fees
 Recording fees
 FIRPTA (Federal withholding)
 HARPTA (State withholding)

F-7 Assessments. For purposes of Paragraphs F-7(a), F-7(b), and F-7(c), an assessment is defined as any obligation (not including prorations in Paragraph F-5) levied against the Property by a governmental body or any other entity with a legal right to assess. Assessments, if any, shall be charged as follows:

- (a) Any lump sum assessments levied against the Property prior to the Acceptance Date shall be paid by Seller ☒ or assumed by Buyer ☐.
- Exceptions, if any: _____
- (b) Any assessments against the Property authorized as of the Acceptance Date which are being paid in installments shall be paid in full by Seller ☒ or pro-rated by Escrow as of the date of closing ☐.
- Exceptions, if any: _____
- (c) If a new assessment is authorized against the Property between the Acceptance Date and the Scheduled Closing Date, such assessment shall be paid as Buyer and Seller shall agree, and if Buyer and Seller cannot reach an agreement within five (5) days of both parties being aware of the new assessment, either party may terminate this PSA and the termination provisions of Paragraph O-2 shall apply.

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[NA] F-8 **Lessor or Other Consents.** The obligations of Buyer or Seller hereunder are conditioned upon obtaining consents of the following lessor or other identified person or entity prior to Closing or such earlier time as may be required by this PSA: _____ . Neither Buyer nor Seller may waive this condition without the consent of the other. Buyer and Seller agree to cooperate and take all reasonable action to obtain such consents.

F-9 Risk of Loss.

- (a) **Minor Damage.** In the event of loss or damage to the Property or any portion thereof that is not "major" (as hereinafter defined), Seller shall notify Buyer within five (5) days of Seller being made aware of such loss or damage, and this PSA shall remain in full force and effect provided Seller performs any necessary repairs or, at Seller's option, assigns to Buyer all of Seller's right, title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies or condemnation awards relating to the Property. In the event that Seller elects to perform repairs upon the Property, Seller shall use reasonable efforts to complete such repairs promptly and the Scheduled Closing Date shall be extended for a reasonable time in order to allow for the completion of such repairs. If Seller elects to assign to Buyer Seller's title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies, the Purchase Price shall be reduced by an amount equal to the deductible amount under Seller's insurance policy and Seller shall be fully released from any additional claims. Upon Closing, full risk of loss with respect to the Property shall pass to Buyer, subject to the terms and conditions of this PSA.
- (b) **Major Damage.** In the event of a "major" loss or damage, Seller shall notify Buyer in writing of such damage within five (5) days of Seller being made aware of such loss or damage. In such event, Buyer may terminate this PSA by written notice to Seller within thirty (30) days of the loss or damage, in which event the Earnest Money shall be returned to Buyer. If Buyer does not elect to terminate this PSA within ten (10) days after Seller sends Buyer written notice of the occurrence of major loss or damage, then Buyer shall be deemed to have elected to proceed with Closing, in which event Seller shall, at Seller's option, either (1) perform any necessary repairs, or (2) assign to Buyer all of Seller's right, title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies or condemnation awards relating to the Property. In the event that Seller elects to perform repairs upon the Property, Seller shall use reasonable efforts to complete such repairs promptly and the Scheduled Closing Date shall be extended for a reasonable time in order to allow for the completion of such repairs. If Seller elects to assign to Buyer Seller's title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies, the Purchase Price shall be reduced by an amount equal to the deductible amount under Seller's insurance policy. Upon Closing, full risk of loss with respect to the Property shall pass to Buyer.
- (c) **Definition of "Major" Loss or Damage.** For purposes of this PSA, "major" loss or damage refers to the following: (1) loss or damage to the Property or any portion thereof such that the cost of repairing or restoring the Property to a condition substantially identical to that of the Property prior to the event of damage would be, in the opinion of a contractor reasonably selected by Buyer, equal to or greater than an amount equal to five percent (5%) of the Purchase Price; or (2) any loss due to a condemnation which impairs the current use of the Property.

F-10 **Possession.** Seller agrees to give Buyer possession at Closing or _____ , subject to tenant leases, if any.

SECTION G: TITLE

G-1 **Preliminary Title Report.** Within Seven (7) days after the Acceptance Date, Seller shall cause Fidelity National (the "Title Company") to deliver a preliminary title report (the "Title Report") on the Property to Buyer.

G-2 **Title.** Seller agrees to convey the Property with warranties vesting marketable title in Buyer, free and clear of all liens and encumbrances EXCEPT: (a) easements, covenants, conditions, reservations or restrictions now of record and (b) _____ .

[X] G-3 **Title Objections; Permitted Exceptions; Cure of Title Objections.**

- (a) **Title Objections.** Buyer shall have ten (10) days prior to the expiration of the Inspection Period to send written notice of any objections that Buyer may have in regard to the Title Report.
- (b) **Permitted Exception.** Any item contained in the Title Report to which Buyer does not so object shall be deemed a "Permitted Exception".
- (c) **Cure of Title Objections.** In the event Buyer shall timely notify Seller of objections to any item contained in the Title Report, Seller shall have the right, but not the obligation, to cure the Title Objections. Seller shall inform Buyer in writing (the "Seller's Title Cure Notice") not later than five (5) business days after receipt of Title Objections whether Seller shall cure such objections. Unless otherwise expressly stated, Seller's failure to deliver Seller's Title Cure Notice shall be deemed Seller's election not to cure the Title Objections, and Buyer's election not to terminate this PSA prior to the expiration of the Inspection Period in accordance with Paragraphs J-2 and O-2 shall be deemed Buyer's waiver of any objections that Seller has not elected to cure.

[X] G-4 **Vesting and Tenancy.** Title shall vest in Buyer(s) as follows (provide full legal names and marital status for individuals, trust information, name and form of business entity, etc.):

- [] (a) _____
- [X] (b) to be determined by Buyer by written notice to Seller and Escrow Officer not later than five (5) business days prior to Closing.

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SECTION H: FINANCING CONTINGENCIES

- [X] H-1 **Financing Contingency.** Buyer's obligation to buy the Property is subject to Buyer obtaining the loan (the "Loan") described in this PSA. Buyer is obligated to use Buyer's commercially reasonable efforts to obtain the Loan.

Buyer is obligated to deliver to Seller a conditional loan commitment letter not later than 150 days after the Acceptance Date, and a final loan approval letter not later than 30 days after the end of the Inspection Period.

If Buyer does not obtain the conditional loan commitment letter or the final loan commitment letter within the time periods specified above, Buyer may terminate this PSA by providing written notice of such failure and Buyer's termination of this PSA to Seller and Escrow on or before expiration of such specified time periods.

Buyer may increase the amount of Buyer's Cash Funds and thereby reduce the amount of the Loan or waive this Financing Contingency and purchase the Property on an all cash basis. If Buyer elects either of these two options, Buyer shall promptly give written notice of such election to Escrow and to Seller, together with evidence of Buyer's ability to do so.

- H-2 **Seller's Right to Terminate PSA for Financing Contingency.** If Paragraph H-1 is applicable, Seller's obligation to sell the Property is contingent upon Buyer using Buyer's commercially reasonable efforts to obtain the Loan within the time periods specified in Paragraph H-1 above. If any such obligation is not met by the end of the applicable time period, Seller may elect to terminate this PSA by delivering to Buyer written notice of termination within Seven (7) days (seven days if left blank) of the expiration of the time period or the date stated in Paragraph H-1, and Paragraph O-2 ("Termination Provision") shall apply. However, this right of Seller to terminate shall no longer apply if Buyer has elected to proceed pursuant to Paragraph H-1 and has provided Seller with reasonable assurance of Buyer's ability to do so. Seller shall have the right to inquire with Buyer's lender regarding the status of Buyer's financing.

SECTION I: CONTINGENCY PROCEDURES

- I-1 **Contingencies.** Buyer's obligation to buy and Seller's obligation to sell the Property may be subject in this PSA to satisfaction of one or more conditions (each called a "Contingency").

As used in this PSA, the term "Benefited Party" shall mean (a) Buyer, as to each Contingency which must be satisfied before Buyer is required to close on the purchase of the Property from Seller; and (b) Seller, as to each Contingency which must be satisfied before Seller is required to close on the sale of the Property to Buyer.

If a Contingency is not satisfied within the specified time period for meeting such Contingency ("Contingency Period"), the Benefited Party may elect to terminate this PSA and Paragraph O-2 ("Termination Provision") shall apply; or to waive the Contingency. **Unless otherwise expressly stated, the time period within which all Contingencies in this PSA must be satisfied shall be 5:00 PM, Hawaii Standard Time, on the last day of the Inspection Period identified in Paragraph J-2.**

If the Benefited Party wishes to terminate this PSA because a Contingency for that party's benefit has not been satisfied, the Benefited Party must deliver to Escrow a written notice terminating this PSA prior to the expiration of the Contingency Period or such other termination period which may be set forth in a specific contingency in this PSA. **If the Benefited Party fails to deliver the written notice to Escrow within such time period, the Contingency shall be deemed to be waived.**

Each party understands the requirement to act upon each Contingency according to the strict deadlines described therein.

SECTION J: INSPECTION; MAINTENANCE AND WARRANTIES

- J-1 **Inspection of Property.** At Buyer's sole cost and expense Buyer may (personally or by any expert, professional, or other representative of Buyer's choice): (a) inspect the Property or any portion thereof; (b) inspect all fixtures and improvements included in the sale; (c) inspect, investigate the Property, including, but not limited to all public records relating to the Property; (d) inspect all applicable laws and regulations which may affect the Property; and (e) inspect all financial and administrative records of Seller pertaining to the ownership and operation of the Property, except appraisals, material relating to negotiations with other buyers and material that is attorney-client privileged.

On or before 5 days after the Acceptance Date, Seller shall deliver to Buyer copies of the following documents (applicable only if checked), to the extent such documents are in the possession or control of Seller.

- [X] Plans and Specifications
 [] Ground Lease
 [] Rent Roll
 [X] Tenant Leases
 [] Financial Statements for years & Year-to-date
 [] Inventory of Tangible Personal Property
 [] Management Contracts
 [] Service Contracts
 [X] Existing Surveys
 [X] Soils Report

- [X] Environmental Report(s)
 [X] Architectural Report
 [X] Structural Engineering Report
 [] Electrical Engineering Report
 [] Mechanical Engineering Report
 [] Building Maintenance Reports
 [] ADA Report
 [] Condominium Documents
 [] Other:
 [X] Other: All other reports & studies

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J-2 BUYER'S RIGHT TO INSPECT THE PROPERTY AND TO TERMINATE THIS PSA BECAUSE BUYER IS NOT SATISFIED WITH THE PROPERTY ENDS ON 270 DAYS AFTER ACCEPTANCE ("INSPECTION PERIOD").

Seller shall provide Buyer and Buyer's representatives reasonable access to the Property during the Inspection Period, including Seller's records (except for excluded records described above) for this purpose, during reasonable hours with reasonable prior notice to Seller. The obligation of Buyer to purchase the Property is contingent upon Buyer's approval of the results of such inspection on or before the expiration of the Inspection Period. All inspections must be completed within the Inspection Period. In consideration of Seller making the Property and records available, Buyer agrees to perform a thorough investigation of the Property, including but not limited to any investigation deemed prudent by Buyer relating to the following: building improvements, environmental matters, mold, termite infestation, compliance with the Americans with Disabilities Act and any pending assessments against the Property. Buyer agrees that Buyer will rely on Buyer's own due diligence investigation and not upon information provided by Seller, Seller's Brokerage Firm, or Buyer's Brokerage Firm.

If Buyer disapproves of the results within such time period, Buyer may elect to terminate this PSA pursuant to Paragraph O-2. **If Buyer fails to elect to terminate prior to the end of the Inspection Period, Buyer shall have waived this contingency.**

Prior to the expiration of the Inspection Period, Seller may make changes to existing tenant leases and/or enter into new tenant lease agreements without the approval of the Buyer, however, Seller shall provide Buyer with at least five (5) days advance written notice that Seller intends to execute such documents along with copies of such documents. After the expiration of the Inspection Period, Seller shall not, without the written consent of Buyer, make any changes to existing tenant leases, enter into any new leases that extend beyond the Scheduled Closing Date, or enter into any other agreements that cannot be terminated upon forty-five (45) days' notice. The existing tenant leases will be assigned to Buyer at Closing and Buyer will assume the obligations of the Seller under the existing tenant leases, either as part of the instrument conveying the Property to Buyer or in a separate instrument, as elected by Seller. Seller will use commercially reasonable efforts to obtain estoppel certificates from all tenants on the Property, dated not earlier than thirty (30) days prior to Closing; provided, however, delivery of such estoppel certificates shall not be a condition of Closing unless otherwise specified in this PSA.

Buyer agrees to indemnify, defend and hold Seller, Seller's Brokerage Firm, and Buyer's Brokerage Firm harmless from any actions, suits, liens, claims, damages, expenses, losses and liability for damage to personal or real property or personal injury to the extent arising from or attributable to any acts performed by Buyer or Buyer authorized agents in exercising Buyer's inspection rights, if any, under this PSA (excluding any and all losses, claims, suits, damages and expenses, including reasonable attorneys' fees resulting from the mere discovery of, disclosure of, or injury or death resulting from, any pre-existing physical or environmental condition on, in, under or about the Property). This agreement to indemnify Seller, Seller's Brokerage Firm, and Buyer's Brokerage Firm shall survive any termination of this PSA.

☒ **J-3 Property Condition Maintenance.** Seller shall maintain the Property in the same condition and repair as when Buyer inspected the Property pursuant to Paragraph J-1.

☒ **J-4 Existing Warranties, Plans, etc.** Seller shall provide to Buyer at closing all existing warranty documents in Seller's possession covering the improvements and personal property being sold to Buyer; and, to the extent legally permissible, all originals and copies in Seller's possession of as-built blueprints, specifications, and copies of architectural or engineering drawings relating to the Property.

Buyer understands: (a) any warranties delivered by Seller to Buyer represent obligations of other persons, not Seller; (b) the warranties and other documents are provided for informational purposes only; (c) the warranties and other documents may not reflect improvements as built; and (d) Seller does not promise that any such warranties are transferable to Buyer, and that Buyer must contact the providers of such warranties to determine whether the warranties are transferable to Buyer.

SECTION K: SURVEY

☐ **NA] K-1 Survey.** Within _____ () days after the Acceptance Date, Seller shall, at Seller's sole cost and expense, provide Buyer with a current map (with surveyor's stamp and dated after the Acceptance Date) and accompanying report to show the perimeters of the Property and the location of any improvements in the vicinity of the perimeter Property lines. This survey and map may not address whether improvements on the Property are in compliance with State and/or County requirements, and/or subdivision covenants, conditions, and restrictions. If Buyer objects to any matters shown in such survey, Buyer shall notify Seller pursuant to Paragraph K-2 below.

☐ Buyer elects to have an ALTA survey prepared and agrees to pay the increase in cost to obtain an ALTA survey.

☐ **NA] K-2 Survey Objections; Permitted Exceptions; Cure of Survey Objections.**

(a) **Survey Objections.** Buyer shall have ten (10) days prior to the expiration of the Inspection Period to send written notice of any objections that Buyer may have in regard to the Survey.

(b) **Permitted Exception.** Any matter shown on the Survey to which Buyer does not so object shall be deemed a "Permitted Exception".

(c) **Cure of Survey Objections.** In the event Buyer shall timely notify Seller of objections to any matter shown on the Survey, Seller shall have the right, but not the obligation, to cure the Survey Objections. Seller shall inform Buyer in writing (the "Seller's Survey Cure Notice") not later than five (5) business days after receipt of Survey Objections whether Seller shall cure such objections. Unless otherwise expressly stated, Seller's failure to deliver Seller's Survey Cure Notice shall be deemed Seller's election not to cure the Survey Objections, and Buyer's election not to terminate this PSA prior to the expiration of the Inspection Period in accordance with Paragraphs J-2, and O-2 shall be deemed Buyer's waiver of any objections that Seller has not elected to cure.

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BUYER'S INITIALS & DATE

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SECTION L: ASBESTOS AND HAZARDOUS MATERIALS

- L-1 Asbestos Disclosure.** Buyer is aware that asbestos materials are hazardous to one's health, particularly if asbestos fibers are released into the air and inhaled. In the past (before 1979, but possibly since) asbestos was a commonly used insulation material in heating facilities and in certain types of floor and ceiling materials, shingles, plaster products, cement and other building materials. Buyer is aware that Buyer should make appropriate inquiry into the possible existence of asbestos on the Property. Structures having "popcorn" or "cottage cheese" type ceilings may contain asbestos fibers or asbestos-containing material. Such ceilings should not be disturbed since it could release asbestos fibers in the air. Any disturbance should be done only by licensed abatement contractors.
- L-2 Hazardous Waste and Toxic Substances Disclosure.** Buyer is aware that federal and state laws place strict liability on property owners for dangers caused by hazardous waste management and may require that such owner pay for the cost of the cleanup of hazardous substances and other toxic substances. Buyer is aware that Buyer should make appropriate inquiries into the past use of the Property and should seek an environmental assessment to ascertain the possible existence of such hazardous substances or materials on or under the Property. Buyer is aware Buyer may have liability for hazardous substances located on or under the Property even if Buyer did not cause such substances to be on or under the Property.
- [X] L-3** Buyer ☒ Seller ☐ will perform a Phase I Environmental Assessment at its sole cost and expense. Seller shall complete an Environmental Questionnaire required by the person/entity performing the Phase I Environmental Assessment.

SECTION M: INTERNAL REVENUE CODE SECTION 1031 EXCHANGE

- [X] M-1 Right to Exchange/Cooperation.** Either Seller or Buyer may assign all of its right, title and interest in this PSA with respect to all or any portion of the Property to an affiliated entity and/or a qualified intermediary in order to facilitate a like-kind exchange transaction, which includes the Property, pursuant to Section 1031 of the Internal Revenue Code. Seller and Buyer will remain liable under this PSA, subject to the limits set forth herein, following any such assignment and shall indemnify, defend and hold the other party harmless from any additional cost, liability or expense suffered or incurred by reason of such assignment or cooperation with the exchange. Seller and Buyer further agree to cooperate with the other in effecting such transaction, including, without limitation, consenting in writing to the assignment of this PSA to any such qualified intermediary and/or any affiliated entity; provided that any such exchange transaction, and the related documentation, shall: (a) not require the other party to execute any contract (other than as set forth above), make any commitment, or incur any obligations, contingent or otherwise, to third parties which would expand the obligations beyond this PSA or incur any additional costs, (b) not delay the Closing or the transaction contemplated by this PSA, or (c) not include acquiring title to any other property. The obligations of Seller and Buyer under this Paragraph shall survive the Closing and shall not be merged therein.

SECTION N: ELECTRONIC (Digital or Fax) SIGNATURES AND COUNTERPARTS

- N-1** Electronically executed copies of this PSA and any related documents shall be fully binding and effective for all purposes whether or not originally executed documents are transmitted to Escrow. Electronic signatures on documents will be treated the same as original signatures; however, each party agrees to promptly forward original executed documents (if any) to Escrow. The parties understand that conveyance, mortgage and other recordable documents must be delivered in original form and will not be acceptable if signed only electronically.
- N-2** This PSA and any addenda and related documents may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so signed, shall be deemed to be an original, and all of which taken together shall constitute one and the same document, binding upon all of the parties, notwithstanding that all of the parties do not sign the original or the same counterpart.

SECTION O: TERMINATION PROVISIONS

- O-1 Termination Due to Default.** In the event that Buyer is in default for failure to perform Buyer's obligations under this PSA (Seller not being in default), Seller may retain the initial deposit and all additional deposits provided for herein as liquidated damages. Buyer shall be responsible for any costs incurred in accordance with this PSA.

In the event that Seller is in default for failure to perform Seller's obligations under PSA (Buyer not being in default), Buyer may (a) seek specific performance of this PSA or (b) if the remedy of specific performance is not available, bring an action for damages for breach of contract. Seller shall be responsible for any costs incurred in accordance with this PSA.

In addition to the foregoing remedies, Buyer and Seller agree to the following additional remedies, if any:

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O-2 **Termination Due to Contingencies.** If the party for whose benefit a contingency exists, elects to terminate this PSA because the contingency has not been satisfied, that benefited party shall deliver to the other party a written notice of termination. If the benefited party so terminates this PSA, Buyer and Seller shall promptly execute all cancellation documents requested by Escrow. Buyer shall return to Seller all documents delivered by Seller to Buyer in connection with Buyer's inspection of the Property, and Escrow shall, unless otherwise agreed to in this PSA, return to Buyer all deposits previously made, less the amount of any escrow expenses or fees chargeable to Buyer. Thereafter, neither Buyer nor Seller shall have any further rights or obligations under this PSA.

O-3 **Attorneys' Fees.** In the event of default by a party and/or a legal action or arbitration (including a claim by a Brokerage Firm for commission), the prevailing party shall be entitled to recover all costs incurred including reasonable attorney's fees.

SECTION P: TRANSACTIONS INVOLVING FOREIGN OR NON-RESIDENT BUYER AND SELLER

P-1 **HARPTA Withholding Required If Seller is a Non-Resident of the State of Hawaii.** Under Hawaii law, if Seller is a non-resident person or entity (corporation, partnership, trust, or estate) of the State of Hawaii, Buyer must withhold a specified percentage of the "amount realized" by Seller on the sale of the Property and forward the amount with the appropriate form to the State Department of Taxation. Such withholding may not be required if Seller obtains and provides Buyer with an authorized exemption or waiver from withholding. If Seller does not provide Buyer with a certificate of exemption or waiver from HARPTA not later than two (2) business days prior to Closing, Escrow is hereby authorized and instructed to withhold/collect from Seller the required amount at closing and forward it to the State Department of Taxation.

P-2 **FIRPTA Withholding Required If Seller is a Foreign Person.** Under the Internal Revenue Code, if Seller is a foreign person or entity (non-resident alien, corporation, partnership, trust, or estate), Buyer must generally withhold a specified percentage of the "amount realized" by Seller on the sale of the Property and forward this amount to the Internal Revenue Service ("IRS"). Such withholding may not be required if Seller obtains and provides Buyer with an authorized exemption or waiver from withholding. If Seller does not provide Buyer with a certificate of exemption or waiver from FIRPTA not later than two (2) business days prior to Closing, Escrow is hereby authorized and instructed to withhold/collect from Seller the required amount at closing and forward it to the IRS.

P-3 **Additional Disclosures Required by Foreign Buyers and Sellers.** Buyer and Seller understand that under statutes and ordinances such as the Agricultural Foreign Investment Disclosure Act of 1978, and the International Investment and Trade in Services Survey Act, among others, disclosures are required by foreign Buyers and/or Sellers under certain conditions.

P-4 **Government Restrictions Disclosure.** Buyer is aware that the Property is subject to all applicable federal, state and county laws, statutes, regulations, codes, ordinances, rules, procedures, restrictions, and requirements, including but not limited to, those concerning land use, zoning, building permits and requirements, setbacks, height limitations, and allowable uses.

SECTION Q: SPECIAL TERMS

[X] Q-1 (Please number)

Q-1(a). Starting April 1, 2017, Escrow is authorized to deduct \$3,500.00 per month until Closing from the Earnest Money Deposit as non-refundable monthly payments which shall be credit to Purchase Price.

Q-1(b). It is Buyer's intent to create a 2-lot subdivision with Buyer receiving one 12.5-Acre lot and Seller receiving one 12.763 acre lot. The exact size of all lots is approximate and subject to changing in the final subdivision process. Buyer discloses they will be seeking a deferral agreement of improvements until the start of development of Buyer's project.

Q-1(c). Buyer has the right to extend Closing for 90 days by providing Seller with forty-five (45) days prior written notice. If the Closing is extended, Buyer shall continue to make monthly payments from Escrow of \$3,500/month.

Q-1(d). Seller agrees to cooperate with Buyer with all governmental applications. All applications and due diligence shall be done by Buyer, at Buyer's sole expense. In addition, if required by Buyer, Seller shall be the applicant on any governmental permits, subdivisions, and anything else required by Buyer.

(See attached Addendum for additional Special Terms).

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SECTION R: BROKERAGE FIRMS SERVICES AND DISCLAIMERS

- R-1 **Scope of Service.** Seller's Brokerage Firm and Buyer's Brokerage Firm, including their owners, agents and employees (collectively the "Brokerage Firms"), recommend that Buyer and Seller each consult their own accountant, appraiser, architect, attorney, contractor, estate planner, insurance advisor, land use professional, surveyor, environmental consultant, title insurer, zoning expert, and other professionals should they have any questions within those fields about this sale. Buyer and Seller understand and acknowledge that neither party is relying upon the Brokerage Firms for any of the foregoing services or advice.
- R-2 **Disclaimers by Brokerage Firms.** Buyer and Seller understand that the Brokerage Firms have not made any representations or warranties, and have not rendered any opinions about: (a) the legal or tax consequences of this transaction; (b) the legality, validity, correctness, status or lack of any building permits which may have been required for the Property; (c) the size of any improvements on the Property, or the land area of the Property or the location of the boundaries; (d) the existence or non-existence of mold, asbestos or hazardous materials on the Property; (e) compliance of the Property with law, including but not limited to the Americans with Disabilities Act and land use laws.
- R-3 **Obligations.** Brokerage Firms shall not be held liable to either Buyer or Seller for the failure of either Buyer or Seller to perform their obligations pursuant to this PSA.
- [] R-4 **Disclosure of Real Estate Licensing Status.** Hawaii law requires that licensees disclose that they hold a real estate license in any transaction in which they are purchasing or selling real property as a principal, or in which they are buying for themselves, immediate relatives, or an entity in which they have an interest. If applicable, the licensee(s) in this transaction disclose the following: _____

SECTION S: "ACCEPTANCE DATE", OTHER DEFINITIONS, MISCELLANEOUS

- S-1 As used in this PSA, the term "**Acceptance Date**" means the date on which this PSA becomes binding upon the parties (i.e. when both parties have signed this PSA.)
- S-2 As used in this PSA, the term "**day**" means a calendar day unless the term "business day" is used. The term business day shall mean Monday through Friday except Federal or Hawaii holidays. All dates and times are based on Hawaii Standard Time (UTC-10). Unless otherwise specified in writing in this PSA, contingencies herein shall expire at 5:00 PM HST on the day stated.
- S-3 **Time is of the Essence.** Except as otherwise provided in this PSA, time is of the essence in the performance by all parties in their respective obligations to this PSA.
- S-4 **Complete Agreement.** This PSA constitutes the entire agreement between Buyer and Seller and supersedes and cancels any and all prior negotiations, representations, warranties, understandings or agreements (both written and oral) of Buyer and Seller. No variation or amendment of this PSA shall be valid or enforceable without written approval by Buyer and Seller. All agreements and representations about the Property must be set forth in writing and the parties agree that to be effective any representation made by a Brokerage Firm or any party hereto must be set forth in writing in this PSA or an amendment hereto. Buyer and Seller shall each hold harmless and release the Brokerage Firm(s) from any claims based upon any alleged representation which is not set forth in writing as stated in this paragraph.
- S-5 **Assignment.** Buyer shall not have any right to assign any of its rights, or to delegate any duties or obligations under this PSA without the prior written consent of Seller except that consent shall not be required in the event Buyer assigns its rights under this PSA to an entity where Buyer owns at least fifty percent (50%) of the controlling interest. For the purposes of this paragraph, assignment and/or delegation shall be deemed to include any sale, transfer, assignment or other event which, directly or indirectly, results in a change of fifty percent (50%) or more in the controlling interest in Buyer. This PSA, and each and every term and provision hereof, shall inure to the benefit of, and be binding upon and enforceable against, Buyer and its respective legal representatives, successors, and permitted assigns.
- S-6 **Representations and Warranties.** Each party hereby represents and warrants to the other as follows:
- If it is an entity, it is duly organized, validly existing and in good standing under the laws of the state of its incorporation or organization, and is qualified to conduct business, and is in good standing in the state(s) in which it conducts business.
 - It is in compliance with all laws, rules and regulations that govern the operation of a business in which it is involved.
 - It has all the requisite power and authority to carry on its business as it is now being conducted.
 - It has been duly authorized by all necessary action on its part and possesses all the requisite power and authority to execute, deliver and perform this PSA and to hereby consummate the transactions contemplated herein.
 - It knows of no reason why it cannot consummate the transactions contemplated herein.
 - There are no actions, suits or proceedings existing, pending or, to the knowledge of it, threatened against or affecting it before any court, arbitrator or governmental or administrative body or agency that would affect the validity or enforceability of this PSA or that would affect the performance of its obligations hereunder.

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BUYER'S INITIALS & DATE

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SELLER'S INITIALS & DATE

Offer Date November 18, 2016, 8:00 [] AM [] PMBuyer's Name William Frampton et al/assignsSignature William FramptonTitle Buyer

Buyer's Name _____

Signature _____

Title _____

Buyer's Name _____

Signature _____

Title _____

SECTION T: ACCEPTANCE OR COUNTER OFFER

- [] T-1 **ACCEPTANCE OF OFFER.** Seller agrees to sell the Property at the price and terms offered above and acknowledges receipt of a copy of this PSA.
- [] T-2 **COUNTER OFFER.** Seller agrees to sell the Property at the price and terms offered above as amended by the attached Counter Offer and acknowledges receipt of a copy of the PSA.

IN EITHER EVENT:

T-3 Seller agrees to pay to Kokua Realty, LLC at Closing a commission for the sale of the Property pursuant to the commission agreement with Seller's Brokerage Firm, or in the amount of 6% of the purchase price + GET. Seller instructs Escrow to pay the commission directly to Brokerage Firm at closing in U.S. Dollars. These instructions cannot be changed without the written agreement of such identified Brokerage Firm and Seller. Seller further consents to such Brokerage Firm's sharing of the commission with another real estate Brokerage Firm which may have provided services to Buyer for this transaction.

Acceptance Date 11/23/16, 10:00 [X] AM [] PMSeller's Name Emmanuel Lutheran Church MauiSignature Michael ReileyTitle PresidentSeller's Name Michael Reiley

Signature _____

Title _____

Seller's Name _____

Signature _____

Title _____

Seller is a Foreign Person [] Non-Hawaii Resident [] Owner/Occupant [] Other []

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Preface

Waikapu Development Venture, LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units pursuant to 201H, Hawaii Revised Statutes (HRS). The proposed project consists of 68 single-family units and 12 duplex units. The proposed development is located at Waiale Road, Wailuku, Island of Maui, Hawaii further identified as TMK: (2) 3-5-002:011 por. The subject property consists of approximately 12.5 acres. The project will be developed under the 210H, HRS and the housing units will be affordably-priced to families making 70 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38, Hawaii Revised Statutes. These exemptions request by the Applicant will be processed through the County of Maui with approval to be granted by the Maui County Council. The proposed subdivided residential lots will range from approximately 3,200 square feet to 6, 500 square feet along with approximately 29,000 square feet of land for neighborhood passive park.

The proposed project does not involve the use of State and County lands or funds, and there are no other triggers for an environmental assessment pursuant Chapter 343, HRS. As noted, the project will be developed pursuant to 201H, HRS.

This document provides a basis for review and analysis of the proposed affordable workforce residential housing project.

Executive Summary

Project Name: Waikapu Development Venture Affordable Workforce Housing Project

Type of Document: 201H, Hawaii Revised Statutes Affordable Housing Application

Accepting Authority: Department of Housing and Human Concerns
County of Maui
2200 Main Street, Suite 546
Wailuku, Hawaii 96793
Contact: Ms. Jo-Ann Ridao, Director
Phone: (808) 270-2805

Approving Authority: Maui County Council

Location: TMK: (2) 3-5-002:011 por
Waiale Road, Wailuku
Island of Maui, Hawaii

Applicant: Waikapu Development Venture, LLC
2145 Wells Street, Suite 303
Wailuku, Maui, Hawaii 96793
Contact: Mr. William Frampton
Phone: (808) 357-1954

Consultant: V. Bagoyo Development Consulting Group, LLC.
1500 Kilinoe Place
Wailuku, Hawaii 96793
Contact: Vince G Bagoyo, Jr.
Phone: (808) 357-3842

Existing Land Use Designations: State Land Use District: *Urban*
County Zoning: *Public-Quasi-Public*
Community Plan – *Public-Quasi-Public*
Maui Island Plan – *Urban Growth Boundary*
Special Management Area – *Not in SMA*

Project Summary: The applicant (“Waikapu Development Venture, LLC”) is proposing to develop 80 affordable workforce residential housing units on approximately 12.5 acres of land located at Waiale Road, Wailuku, Island of Maui, Hawaii and further

identified as TMK: (2) 3-5-002:011 por. The proposed project will be 100 percent affordable to qualified individuals earning within the 70 percent to 140 percent of Maui median income as set forth by the County of Maui, Department of Housing and Human Concerns' Affordable Sales Price Guidelines. The proposed workforce housing project will consist of 68 single-family units and 12 duplex units. The proposed 12 duplex units will be sold to qualified individuals earning 70 percent to 80 percent of Maui median income and the 68 single-family units will be sold to qualified individuals earning 81 percent to 140 percent of Maui's median income. The basic parameters of the allocation for affordability are as follows:

- a) 15% (12 units) of the total project will be priced to families earning 70% to 80% of Maui's median income.
- b) 15% (12 units) of the total project will be priced to families earning 81% to 100% of Maui's median income.
- c) 50% (40 units) of the total project will be priced to families earning 101% to 120% of Maui's median income.
- d) 20% (24 units) of the total project will be priced to families earning 121% to 140% of Maui's median income.

The project will also include a neighborhood passive park. Related improvements include

grading, the construction of drainage system, construction of internal roadway, utilities, and construction of residential dwelling units.

The proposed project will be filed pursuant 201H, Hawaii Revised Statutes (HRS). This document has been prepared to serve as project's 201H. It provides a basis for review and analysis of the proposed affordable workforce residential housing project along with the proposed neighborhood passive park and related improvements.

I. Project Overview

I. PROJECT OVERVIEW

A. PROPERTY LOCATION, EXISTING USE AND LAND OWNERSHIP

The applicant for the proposed workforce housing project is Waikapu Development Venture, LLC ("Applicant") and whose mailing address is 2145 Wells Street, Suite 303, Wailuku, Maui, Hawaii 96793. The applicant is buying a portion of TMK: (2) 3-5-002:011 por, approximately 12.5 acres from Emmanuel Lutheran Church (ELC), current owner of the subject property. The applicant entered into a purchase agreement with ELC to buy the approximately 12.5 acres for the proposed project (see attached executed purchase agreement). The subject parcel is identified as TMK: (2) 3-5-002:011 por. It is also known as Lot A of the Waikapu East (Large Lot) Subdivision. The proposed project will encompass the southern 12.5 acres of the 25.263-acre parcel. The remaining northern portion of the property is owned and utilized by Emmanuel Lutheran Church. The property is bordered by te undeveloped Lot J of the Waikapu East (Large Lot) Subdivision to the north, Waiale Road to the East; Honoapiilani Highway to the West, and the Valley Isle Fellowship Church and Waiale Elua Subdivision to the south.

The proposed project consists of 68 single-family lots and 12 duplex units for a total of 80 residential workforce units. The project will have lot sizes ranging from approximately 3,200 square feet to 6,500 square feet. Proposed improvements include paved roadways, concrete curbs, gutters and sidewalks; landscaping, underground utilities, and a neighborhood green (see Appendix B, Preliminary Site Plan). The subject property is within the State Land Use Urban District, County zoned public-quasi, Community Plan public quasi, and Maui Island Plan Urban Growth Boundary. The proposed project will be sold in fee as house and lot package.

The subject property is adjacent to existing recently-developed 411 affordable workforce housing subdivision known as Waikapu Gardens Subdivision Phase I and recently-completed 56 Waikapu Gardens Phase II affordable workforce housing project. Immediately south of the proposed project is the 70 lots Waiale Elua affordable workforce housing project. The proposed project is an ideal extension of the existing Waikapu Gardens Phases I and II subdivisions affordably-priced for Maui's working families.

The subject site is currently vacant and the north portion of the property is planned to be used by the Emmanuel Lutheran Church's proposed school. The proposed project site that is under purchase agreement consists of approximately 12.5 acres which will be conveyed to the applicant upon completion of the subdivision of the subject parcel.

B. PROPOSED ACTION

The applicant (Waikapu Development Venture, LLC) is requesting approval of its proposed project pursuant to 201H, Hawaii Revised Statutes, for the use of the subject property for affordable workforce residential housing subdivision. Upon receipt of applicant's 201H, HRS application approval, the applicant proposes to develop approximately 68 improved lots and single-family dwelling units and 12 duplex units for a total of 80 residential units. The residential lots will range in size approximately 3,200 square feet to 6,500 square feet and will be sold in fee simple (see Appendix B, Preliminary Site Plan). The proposed residential workforce housing project will be 100 percent affordable to qualified individuals earning within the 70 percent to 140 percent of the Maui median income as set forth by the County of Maui, Department of Housing and Human Concerns Affordable Sales Price Guidelines. The 12 duplex units will be sold to qualified individuals earning 70% to 80% percent of Maui's median income. The 68 single-family residential lots will be sold to individuals earning 81% to 140 percent of Maui's median income. Along with the proposed affordable housing



EXISTING ELECTRICAL
SEGMENT E-2

TO MAUI

HONOLULU HIGHWAY

TO MAUI



**REDUCED COPY
NOT TO SCALE**

PRELIMINARY SITE PLAN
SCALE 1 IN. = 40 FT.



WAKAPU DEVELOPMENT VENTURE
T.M.K.: (2) 3-5-002: 011
WAKAPU, WAILUKU, MAUI, HAWAII
PRELIMINARY SITE PLAN

REVISION	DATE	NOTE
1		
2		
3		
4		
5		

DESIGNED BY: K.M.S.
DRAWN BY: L.C.A.
PROJECT NO.: 2017-10
DRAWING NO.: P-012-00
DATE: 7-15-17

SHEET NO.
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OF SHEETS

project, the applicant is proposing to include a neighborhood passive green park measuring approximately 29,000 square feet. Also planned are related infrastructure improvements required for the proposed project, such as grading, the construction of internal roadways, drainage systems, utilities, and construction of residential dwelling units. The sales price for the proposed affordable house-lot package will be based on the Maui Department of Housing and Human Concerns' Affordable Sales Guidelines for qualified families earning 70 percent to 140 percent of Maui's median income. The proposed project will be sold as house and lot package in fee simple.

A market demand study for the proposed project was prepared by R.W. Spangler, LLC (see Appendix K referred to as Market Demand Study). The primary objectives of the market demand study is to identify and analyze the current supply and demand conditions specific to the subject market; and identify, measure and forecast the effect of anticipated developments or other factors on future supply. The market demand study prepared for the proposed project has concluded that the proposed development will be well received by the local market and will be an incremental, yet important source of supply of affordable housing to address the substantive shortage of entry-level housing priced for Maui County households within the 70% to 140% of Maui's Area Median Income (AMI). The above conclusion by the market demand study is based on its detailed findings and supported by the following:

- a) Strong local new housing demand: annual new supply requirement of 1,437 to 1,670 units to meet the ten-year projected demand of which roughly one-third is from buyers under 141% of AMI;
- b) Suitability of proposed project physical characteristics relative to Central Maui demand preferences (two-to-four-bedrooms, principally detached single-family);
- c) Proposed project housing pricing is consistent with 57% of the single-family and condominium sales in Wailuku year-to-date 2017;

- d) Proposed project size is only 2.8% of the projected Maui housing demand through 2025 for 71% to 140% MI;
- e) Excess demand for affordable projects reflected by the complete pre-sale absorption prior to construction within the local and extended Maui-wide markets; and
- f) Shortage of new development and inventory.

Based on project's preliminary market demand study prepared by R.W. Spangler, LLC (See attached Appendix K referred to as Market Demand Study) – the report shows that there is a very strong demand for affordably-priced single-family housing subdivision in Central Maui, especially families earning 70 percent to 140 percent of Maui's median income. These are the working families that this proposed affordable housing project will serve. There's a great demand for affordably-priced single-family residential housing project on Maui.

According to the Hawaii Housing Planning Study, 2011 prepared by SMS Research and Marketing Services, Inc. for the County of Maui, among Maui's 53,621 households in 2011, about 56 percent were homeowners. The study further reports that a "significant number of Maui households live in overcrowded conditions or are double-up with other families". In the past four years, crowding has begun to increase and is presently over 11 percent, according to Hawaii Housing Planning Study, 2011. According to SMA Research, Housing Demand Survey measures demand as interest in moving to a new housing unit. In 2006, Maui County demand led the State. Nearly 45 percent of all Maui County households expressed a desire to move to a new home in the near future, the study notes. Based on these conclusive findings by SMS Research's Hawaii Housing Planning Study, 2011, the applicant's proposed affordable housing project will undoubtedly help meet the housing demand on the island of Maui, especially families earning between 80 percent to 140 percent of Maui's median income.

The proposed single-family dwelling unit sizes will range from approximately 1,200 square feet to 1,800 square feet, 3-bedroom/2-bath home and the duplex units will range in size 700 square feet to 900 square feet, 2-bedroom/1bath unit. Refer to Appendix L that shows the preliminary house floor plans for the proposed project.

The applicant's market demand Consultant, R.W. Spangler, LLC, has researched the current prevailing sales prices for similar affordable housing project in the Central Maui area, more specifically, the 411-affordable housing project in Waikapu recently developed by Spencer Homes Development. The price range being proposed by the applicant will meet those earning 70 percent to 140 percent of Maui's median income families and affordably-priced for Maui's working families.

The estimated cost of the subdivision improvements is approximately \$4 million and the estimated cost for the construction of the dwelling units is approximately \$18 million. Construction of the subdivision improvements and the dwelling units and related infrastructure improvements is anticipated to begin as soon as all permitting approvals of applicant's 201H application have been received. The applicant anticipates that the completion of the project is expected to take 36 months to complete barring no unanticipated delays.

C. REASONS FOR JUSTIFYING THE REQUEST

The proposed project will provide affordable single-family dwelling units for sale to those earning 70 percent to 140 percent of Maui's median income families with sales price according to Maui Department of Human Concerns' Affordable Sales Guidelines. The entire proposed project will be 100 percent affordable. The project is adjacent to Waikapu Gardens affordable housing project and the recently-approved Waiale Elua affordable workforce housing project. The proposed site is located in very close proximity of old Waikapu residential village

town and Waiolani residential subdivision. The proposed project is designed to be compatible with existing residential subdivision within Waikapu town village and neighboring subdivision.

With the 2012 median price of single-family units at \$465,000, many Maui working families earning 80 percent to 140 percent of the median income are unable and have difficulty purchasing a house and lot package at the current median sales price. With this proposed affordable housing project, it will allow families the opportunity to purchase a home that they can comfortably afford.

As noted earlier in this report, based on the project market demand study prepared by R.W. Spangler, LLC (see Appendix K) there is a great need for affordable housing dwelling units within the price range as proposed by the applicant those families earning 80 percent to 140 percent of Maui's median income. The median price of a single-family home in Maui County soared to over \$760,000 in March 2017, the highest month benchmark in more than a decade, according to the Realtors Association of Maui. But it remains to be seen whether the highest middle-of-the-road home value seen since the third quarter of 2006 is an aberrant spike or part of a trend toward ever-higher price tags for Maui homes. With the increase of median price of single-family units and lack of housing supply, many Maui working families earning 70 percent to 140 percent of the median income are unable and have difficulty purchasing a house at the current median sales price. With this proposed affordable workforce housing project, it will allow families the opportunity and entry to homeownership.

According to the Wailuku-Kahului Community Plan District it encourages the development of affordable housing within the region. Under the community plan, its housing policy goal specifically states that *"a sufficient supply and choice of attractive, sanitary and affordable housing accommodations for the broad section of residents, including the elderly"*. Similarly, the Maui Countywide Policy Plan adopted by Ordinance No. 3732 and took effect on March 24, 2010, states in its

goals, objectives, policies, and action to “*expand housing opportunities for residents*” in order to “*reduce the affordable housing deficit for residents*”. With the applicant’s proposed affordable housing project at the proposed site will meet a significant community need as noted within the Wailuku-Kahului Community Plan District and in the Maui Countywide Policy Plan.

D. ENTITLEMENTS APPROVALS REQUIRED

The proposed affordable workforce housing project will be developed 100 percent affordable targeting families earning 70 percent to 140 percent of Maui’s median income as set forth by Maui County Department of Housing and Human Concerns’ Affordable Sales Guidelines. This application is filed and processed and approved by Maui County pursuant to 201H, HRS. Under Section 201H-38, Hawaii Revised Statutes promotes the development of affordable housing project by providing exemptions from “*all statutes, ordinances, charter provisions, and rules of any government agency relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon*” provided that the proposed housing project is consistent with the purpose and intent of 201H-38, HRS, and meets minimum requirements of health and safety. This proposed project will be consistent and in compliance with the requirements pursuant to 201H, HRS.

The subject property is within the State Land Use Urban District. Pursuant to 201H-38, Hawaii Revised Statutes, the applicant is requesting exemptions from Community Plan Amendment (CPA) and Change-In Zoning (CIZ) processes, as well as other County requirements to expedite the implementation and delivery of the proposed affordable workforce housing units to Maui’s residents without compromising health and safety considerations. This project meets the intent of Maui Countywide Policy Plan and the Wailuku-Kahului Community Plan District goals and objectives relating to providing and expanding affordable housing opportunities for Maui’s residents.

The proposed action does not involve the use of any State and County funds or lands, it is not within the shoreline area or conservation district, and it is not within any historic site designated in the National Register or Hawaii Register; hence, there are no other triggers for an environmental assessment pursuant to Chapter 343, Hawaii Revised Statutes.

As noted above, the proposed project site is in the Urban Growth Boundary (UGB) designation within the approved Maui Island Plan (MIP) and it is outside of protected areas per MIP..

II. Description of the Existing Environment

II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL SETTING

1. Project Site History

The subject site is currently vacant. The project area is located along the northeastern alluvial slopes of the West Maui Mountains in Waikapu and Wailuku *ahupua`a*. It is bounded by Honoapiilani to the west, Waiale Road to the east, and a recent housing project to the south. During the mid-1800's this area was cleared for sugar cane and pineapple agriculture. According to the former owner, Wailuku Agribusiness Company the site was formerly used for sugar cultivation until the late 1970's when sugar production ended. All of these above noted operations at the subject site have ceased operation and the said site is now fully vacant.

2. Surrounding Land Uses

The Waikapu village town community is located immediately west of the subject property. Waikapu town is an old plantation community originally developed as a sugar plantation village. Today, Waikapu is primarily a residential community with limited lands allocated for commercial use along Honoapiilani Highway. South of the subject property are 467 Waikapu Gardens Phase I and II affordable workforce housing subdivisions and recently approved 70 lots Waiale Elua affordable housing project. There are newer residential subdivisions that have been developed southwest or mauka of the subject property. Such residential projects are: Waiolani subdivision and Waiolani Elua residential projects. Kehalani subdivision located west or mauka of the subject property; and Wailuku Heights subdivision located about west of the subject property.

North boundary of the project site is Kehalani commercial Center and east of the property is Maui Lani Parkway commercial center. The Maui Tropical Plantation is located at the southern extent of Waikapu, approximately a mile south west of the subject property. The eastern boundary of the property is along Waiale Road and west of the property is Honoapiilani Highway. Honoapiilani Highway provides access to Wailuku Town, South and West Maui, as well as Waiehu and Waihee communities.

3. **Climate**

Maui's climate is relatively consistent through out the year. The island's climate varies from terrain. Characteristic of most of Maui's climate, the proposed project site experiences mild and uniform temperatures year-round, moderate humidity and consistent northeasterly trade winds.

Average temperatures at the project site (based on temperatures recorded at Kahului Airport) range from low 60 to high 80 degrees Fahrenheit.

August is historically the warmest month, while January and February are the coolest. Based on rainfall data from the Maui County Data Book, annual precipitation rainfall average is 20 to 30 inches per year. Winds blow predominantly out of the north-northeasterly direction.

4. **Topography and Soils Characteristics**

The existing ground slopes in a west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet at the Waiale Road (eastern boundary).

The subject property has average slope of approximately 4.8%. As noted earlier in this report, the project site is currently vacant and was previously used for pineapple and sugar cultivation.

According to the “Soil Survey Geographic database for the Island of Maui (September 2014) prepared by the United States Department of Agriculture Natural Conservation Service, the soils within the project site are classified as Puuone sand (PZUE) and Iao silty clay (IaA). Puuone sand is characterized as having rapid permeability near the surface, slow runoff, and a moderate to severe wind erosion hazard. Iao silty clay is characterized as having slow runoff and an erosion hazard of no more than slight.

The State Department of Agriculture has established three categories of Agricultural Lands of Importance to the State of Hawaii (ALISH). These are: “Prime” agricultural lands which have soil quality, growing season, and moisture supply needed to produce sustained high yield of crops economically when treated and managed according to farming methods; “Unique” agricultural lands which have the special combination of soil quality, location, growing season, moisture supply, and is used to produce sustained high quality and of high yields of specific crop when treated and managed according to modern farming methods; and, “Other” important agricultural lands are lands other than Prime or Unique agricultural lands that are also of statewide or local importance for agricultural use.

As indicated by the ALISH map (refer to Appendix N) a portion of the subject property falls within the “Prime” agricultural land category and a portion falls within the “Other” land category. The small portion of the subject property that is classified “Prime” agricultural land is located at the western portion of the property. According to the former landowner, Wailuku Sugar Company, this portion of the property was used for sugar cane cultivation and it ceased operation in 1970s and it has remained vacant since the closure of its sugar cane operation. As noted earlier in this report, the subject property is undeveloped and is not presently used in any agricultural cultivation.

5. Flood and Tsunami Hazard

The proposed project site is located near the base of the West Maui Mountains. According to Panel Numbers 150003 0391E of the Flood Insurance Rate Map (FIRM), dated September 29, 2009, prepared by the United States Federal Emergency Management Agency (FEMA), the project site is situated in Flood Zone X. Flood Zone X represents areas outside of the 0.2% annual chance flood plain. The classification of the subject property as Flood Zone X is further confirmed by the Maui County Planning Department's Zoning and Flood Confirmation Form (refer to Appendix M) and no flood development permit is required.

6. Flora and Fauna

As noted earlier in this report, a portion of the project site was formerly used by its former owner, Wailuku Agribusiness Company, for sugar cane and pineapple cultivation and the site has been vacant and remained fallow since it ceased sugar operation in the early 1970s.

Biological resources survey (flora and fauna survey) was conducted at the property by Robert W. Hobdy (Environmental Consultant) on July 2017 (refer to Appendix I). Flora and fauna survey field work of the project site was performed by the Consultant. The primary objectives of the field survey were to: a) document what plant, and animal species occur on the property or may likely occur in the existing habitat; b) document the status and abundance of each species; c) determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered; and d) 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.

According to the flora and fauna field survey by Mr. Robert Hobdy, the vegetation throughout the project area is dominated by non-native species that are of no particular environmental interest and concern. Just one common indigenous plant, `uhaloa was found growing in the area. No Federally listed Endangered or Threatened plant species (USFWS, 2017) were found, nor do any plants that are candidates for such status occur on the project area. No special plant habitats were identified during his field inspection of the project site. According to Mr. Hobdy the proposed project is not expected to have any significant negative impacts on the botanical resources of the area.

With respect to fauna survey, a walk-through survey method was conducted by the consultant in conjunction with the botanical survey. According to the consultant, all parts of the project site were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. 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 Hawaii hoary bat. According to Mr. Hobdy, the wildlife within the project area was composed primarily of non-native species. Just two species were native in Hawaii: the endemic and endangered Hawaiian hoary bat and the indigenous globe skimmer dragonfly (see Appendix I). A single bat was detected in one portion of the project area. It was recommended by Mr. Hobdy to seek guidance with U.S. Fish and Wildlife Service to protect this bat. It is further recommended by Mr. Hobdy that trees greater than 15 feet in height should not be removed between the months of April and mid-September. The globe skimmer dragonfly is common throughout Hawaii and it carries no protective status and is of no particular environmental concern. There was no Blackburn's sphinx moth or nene (Hawaiian goose) found nor seen in or around the project area.

As a result of these findings by Mr. Hobdy, it is determined that there is little of environmental concern beyond the recommendations offered with regard to animal life within the proposed project. The development of the proposed project is not expected to have a significant negative impact on the native wildlife resources in this part of West Maui.

7. Streams and Reservoirs

Waikapu stream is located about half a mile south of the proposed project site. Waikapu stream is perennial stream which originates in the upper reaches of Waikapu Valley, ultimately discharging into Kealia pond, in the Maalaea flats. According to the Hawaii Stream Assessment, the Waikapu Stream has no listed tributaries and flows to the sea year-round. The said assessment also found that the Waikapu Stream was important for taro cultivation in the past and that Waikapu Valley may contain valuable cultural and historical sites (Hawaii Cooperative Park Service, 1990). It is important to note that some families at Waikapu Village (located about a mile southwest upstream or mauka of the proposed project site) began to rehabilitate old taro patches and began cultivating taro at new rehabilitated taro patches. There is a plantation reservoir located west or mauka across Honoapiilani Highway of the project site and specifically located below the existing Wailuku Heights residential subdivision. This reservoir is used and maintained by Wailuku Water Company.

There are no identified wetlands on the project site. Nothing remotely approaching the three essential criteria that define a federally- recognized wetland, namely: hydrophytic vegetation; hydric soils; and, wetland hydrology occurs within this dry project site.

8. Air Quality

There are no point sources of airborne emissions within close proximity of the project site. Air quality in the vicinity of the project site may be affected by a variety of sources, including dust from construction activities south of the project site. Vehicular traffic on nearby roadways including, Honoapiilani Highway and Waiale Road are the primary sources of pollutants. However, these sources are intermittent and prevailing winds quickly disperse the particulates generated by these temporary sources. These activities do not result in adverse regional air quality impacts.

Overall, air quality in the Central Maui region, and more specifically, air quality in Waikapu-Wailuku-Kahului regions is considered excellent.

9. Noise

Traffic noise from Waiale Road located east of the subject project and Honoapiilani Highway located west of the subject property are the predominant sources of noise in the vicinity of the project site. However, this activity is temporary in nature. Also, on intermittent basis, noise from construction activities at Maui Lani Parkway and Kehalani subdivision located east and northwest, respectively, of the subject property are the secondary sources of background noise, as well as natural conditions such as wind and rain.

10. Scenic and Open Space Resources

Waikapu Valley and the West Maui Mountains, including Haleakala Mountain to the east define the scenic resources of the project site. Immediately south boundary of the project site is Valley Isle Fellowship Church and the proposed Waiale Elua affordable workforce housing

project. Also, north of the project site is Kehalani Commercial Center. The subject property has an unobstructed view of the East Maui Mountain and Haleakala Mountain and the West Maui Mountains. The project site is not part of a scenic corridor.

11. **Hazardous Materials**

An Environmental Site Assessment – Phase I Investigation was conducted for the subject property by Vuich Environmental Consultants, Inc. Both site reconnaissance and records review of the subject property, as well as the surrounding areas, were completed. The Phase I Environmental Site Assessment (ESA) was conducted to determine if the site may be contaminated with hazardous or toxic substances or waste resulting from current or past activities, unauthorized dumping or disposal, or migration of contaminants from adjacent or nearby properties. The goal of the ESA is to identify *recognized environmental* conditions on the property that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products. These release conditions apply to structures on the property as well as the soil, groundwater, or surface water of the property. The study objectives are to characterize the environmental setting of the subject property, to identify any obvious activity of environmental concern that may have occurred at or near the site, and to evaluate potential migration pathways for any identified contaminants. It may also address any activities that affect future considerations for potential environmental impairment to the property.

As noted above, Vuich Environmental Consultants, Inc. has performed the Phase I ESA in conformance with the scope and limitations of the ASTM Standard 1527-00 for the subject property. According to the ESA report prepared by the consultant, the subject site is not listed in any federal or state database hazardous site. The assessment revealed no evidence of

recognized environmental conditions in connection with the property. The report finds no evidence of any historic or current significant misuse of hazardous or regulated substances on the subject property (see Appendix O for more detailed information).

12. Archaeological Resources

An archaeological inventory survey was conducted on the subject property by Archaeological Services Hawaii, LLC ("Consultant"). The archaeological inventory survey was conducted by the Consultant on May 2004 and July 2004, and updated in May 2016 in response to request by SHPD. The purpose of the archaeological survey was to determine the presence/absence, nature, and extent and significant of any cultural and archaeological resources in the proposed project area. A total of 25 backhoe trenches were strategically placed by Consultant's personnel in various areas of the subject property. Subsurface testing included the excavation of a series of 25 mechanical backhoe test trench excavations across accessible areas throughout the subject property.

No significant cultural remains were encountered during trenching and representative stratigraphic profiles were recorded. Based on the negative results of the fieldwork, according to the Consultant, no further inventory level work is recommended prior to commencing construction activities. Further discussions and details on the result of the archeological inventory survey can be found in Consultant's attached report identified as Appendix C. The archaeological report has been accepted by the State Historic Preservation Division on July 1, 2016 (see Appendix D, SHPD acceptance letter).

Also, an archaeological monitoring plan (AMP) was prepared by Archaeological Services Hawaii, LLC for the proposed project site and

said plan was submitted to SHPD (see Appendix E) and the AMP has been accepted by SHPD on May 22, 2017 (see Appendix F, SHPD acceptance letter of AMP). Per archaeological monitoring plan, monitoring will be performed for all disturbing activities associated with the proposed subdivision.

13. Cultural Assessment

Chris Hart & Partners, Inc. conducted a cultural impact analysis (CIA) of the project area for the project's State Land Use Urban District Boundary amendment under LUC Docket No. A07-773. In LUC's Conclusion of Law and Decision and Order for the project's urban boundary approval the CIA analysis included consideration of the history of the project area which have been in heavy industrial agricultural operations for the past century, research on nearby parcels in the vicinity of the project area, and review of informant interviews and archival research conducted for several projects in the vicinity of the project area, specifically Waiolani Mauka Subdivision and the Spencer Homes project. Based on the results of the CIA analysis by Chris Hart & Partners, Inc. the project will not have any adverse effects on Native Hawaiian traditional and customary rights which would require protection under Article XII, Section 7, of the Hawaii State Constitution.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Population

The population of the Island of Maui has increased dramatically over the last two (2) decades. The 2000 population was estimated at 117,644, an increase from 1990 of 91,361 (County of Maui 2030 General Plan - Countywide Policy Plan). According to the Maui Countywide Policy

Plan, Maui's resident population is expected to grow from 129,471 in 2005 to 176,686 in 2030. This is a 1.46% annual growth rate which equates to a 36.5% increase in population over the 25-year period. These projections, according to draft Maui Island Plan indicate a population increase of 16% between 2010 and 2020, and an increase of 12% between 2020 and 2030.

According to the *Socio-Economic Forecast* as noted in the Maui Island Plan, the total population is not expected to increase equally throughout the island, rather, there are specific regions where population growth is more likely to occur. To further illustrate the population growth that will likely occur, there are four community plan regions that are in close proximity of the proposed project site, namely: Kihei-Makena, Wailuku-Kahului, Makawao-Pukalani-Kula, and Paia-Haiku regions. The combined population growth within these regions is: population in 2005 is 107,621; in 2010 is 112,716, and in 2020 is expected to grow at 130,774, and in 2030 the combined population in these regions will reach at a staggering 146,777 (according to Maui Countywide Policy Plan). Within the Wailuku-Kahului District the population in 2015 is approximately 52,343 and it is expected that the population by 2030 will be 64,853. The Wailuku-Kahului district represents the largest population center with 37% of the island residents.

Because of the proposed project unique central location between Wailuku-Kahului Community Plan District and Kihei-Makena Community Plan District, and its close proximity with Paia and Upcountry Community Plan regions, the proposed project will help meet the demand for affordable housing units in these Maui community plan districts.

2. Housing

According to the SMS Hawaii Housing Planning Study, 2011 prepared for the County of Maui, among Maui's 53,621 households in 2011, about 56 percent were homeowners and 93 percent of them owned their property fee simple. The report further stated that a significant number of Maui households live in overcrowded conditions or are 'doubled-up' with other families. According to the SMS report, in the past four years, crowding has begun to increase and is presently over 11 percent. Since 2003, doubling up has increased to 10 percent in 2006 and 13 percent in 2011.

In the County of Maui 2030 General Plan – Countywide Policy Plan rightfully notes that “shelter is among the most basic of human needs.” The affordability, quality, and location of housing – including the degree of crowding within the home and within the neighborhood – play an enormous role in the quality of life of Maui County's residents.

The SMS Socio-Economic Forecast for Maui County notes that the island of Maui's housing supply in the year 2000 is estimated at 40,041 units of which 32 percent or 12,852 were located in the Wailuku-Kahului Community Plan District. This region accounts for the largest percentage of housing units on the island. Demand for housing in this community plan region in the year 2000 was estimated at 13,528 units. Housing demand in the Wailuku-Kahului district is projected to grow to 16,826 units in the year 2010 while the expected number of households is estimated at 15,985 units. By the year 2020, the projected housing demand will reach 20,054 units compared to household count of 19,051, according to SMS findings.

A Market Demand Study for the proposed 80-unit Waikapu Development Venture affordable workforce housing project was prepared for the project

by R.W. Spangler, LLC in August 2017 see Appendix K, Market Demand Study). The market demand study is to analyze the residential real estate market as it relates to the proposed project. In particular, the report studied economic trends and demographics, and supply and demand factors for residential property. The study also gathered as much information as possible on real estate sales on Maui while focusing on the Central Maui market. The objectives of the market analysis were: (1) to define and delineate the market area; (2) to identify and analyze the current supply and demand conditions specific to the proposed project's market; (3) identify, measure and forecast the effect of anticipated developments or other factors on future supply. The demand market study by R.W. Spangler, LLC concluded that the proposed development will be well received by the local market and will be an incremental, et important source of supply of affordable for-sale housing to address the substantive shortage of entry-level housing for Central Maui households priced within 70% to 140% of Area Median Income (AMI). According to the Market Demand Study by ACM Consultants, Inc. the demand for housing still exist and many who are willing to buy in today's market are finding it easier to obtain financing, as compared to the late 2000. The report further notes that it is safe to assume that as economic conditions continue to improve, housing units within the affordable and workforce segments will be the most sought after. As the market conditions improve, the proposed project can expect to see heightened demand, due to its Central Maui location and affordable price points. This proposed affordable workforce housing project will give entry-level market participants an opportunity for home ownership. The Housing Demand Survey prepared for Maui County by SMS (2011) shows nearly 47 percent of all Maui County households expressed a desire to move to a new home in the near future.

4. **Employment**

The Island of Maui recorded a 2.9 percent unemployment rate in April 2017, up from 2.8 percent rate recorded in March, and unchanged from the 2.9 percent rate reported in April of last year. Important to note, the State Department of Labor and Industrial Relations is attributing the Maui Region hospital privatization as being mostly responsible for a large growth of workers in the educational and health services jobs sector in July 2017. The educational and health services category increased by 2,300, according to the report. Maui County unemployment rate dipped to 2.7 percent in July, down from 3.4 percent in June and from 3.3 percent a year ago, the State Department of Labor and Industrial Relations reported. According to recent report, Maui County's economic picture is marked by impressive tourism industry rebound, which is the major economic drivers for Maui's economy.

According to the project's market demand report, the strength of the economy is largely measured by job growth, which exhibited signs of improvement. Maui County saw a net gain of 1,000 jobs or a 1.3 percent increase in the first quarter of 2017 over the same quarter of 2016. Jobs gained the most in Arts, entertainment & recreation (500 jobs), followed by Natural Resource, Mining, and construction (200 jobs). The largest private sector job losses occurred in accommodations (200 jobs lost). Government added 100 jobs in the quarter. Maui County employment is heavily concentrated in government and hospitality industry.

According to the Maui County Data Book, 2015, total wage and salary jobs in Maui County is approximately 73,230, and by 2020 to 2030, it is projected to be approximately 77,140 and 84,170, respectively. Most of the jobs are in accommodations and food services; trade; government; and other services. It is anticipated according to recent report by First

Hawaiian Bank – Economic Forecast that robust tourism propels Maui’s economy in 2016. The report further confirms that visitor sector has led the way and looks promising as more capacity comes on line; County’s labor market is strong; and construction, which has been bolstered by public infrastructure, seems ready to break out as greater commercial construction leads into more residential building activity.

C. PUBLIC SERVICES

1. Police and Fire Protection

Police protection for the Wailuku-Kahului region is provided by the Maui Police Department (MPD) located at Wailuku Station headquartered at its main station at Kaahumanu Avenue in Wailuku located approximately 2 miles north of the project area. The Maui Police Department provides investigative services, uniform patrol services, technical support, and traffic services as stated in its mission to protect the residents on Maui County. As noted earlier, the station is located in very close proximity of the project site.

Fire prevention, protection, rescue, and emergency services for the Wailuku-Kahului region are provided by the Maui County Department of Fire and Public Safety. The department has 2 stations to service the Wailuku-Kahului region that is in close proximity of the project site. The Wailuku station is located in Wailuku town approximately 2 miles north of the project site and the Kahului station is located at Dairy Road, Kahului located approximately 2.5 miles east of the project site.

4. Recreational Facilities (Parks)

Within the Wailuku-Kahului Community Plan District, there are many recreational activities opportunities as well, including shoreline and boating activities at the Kahului Harbor and adjoining beach parks, organized recreational activities provided/offered at County Parks. Within close proximity of the project site is the Waikapu Community Center located about half a mile west of the project area. Other Maui County owned parks within the Wailuku-Kahului region are the Papohaku Park and Wailuku Community Center, War Memorial Athletic complex, Wailuku Little League baseball fields, Sakamoto Swimming Pool, Keopuolani Regional Park, 65-acre Maui regional park, and Maui Lani Parkway Park. All this county owned recreational facilities are all located within approximately 2 to 3 miles north of the project site. A nearby park adjacent to the Hale Makana O Waiale Affordable Housing complex contains a baseball field, basketball court, and playground equipment. This park is located less than a mile north of the project site. Other recreational facilities in the Wailuku area include Iao Park, Wells Park, Wailuku Pool, Wailuku Gym, and Wailuku Elementary School Park. In addition, there are several golf courses in the Wailuku-Kahului region located within close proximity of the project site, namely: Kahili and Kamehameha golf courses, The Dunes at Maui Lani Golf Course, and Maui County-owned Waiehu Golf course. These golf courses are within 1 to 3 miles of the project site.

5. Solid Waste Disposal

Solid waste collection services for single-family residential are provided by Maui County Department of Environmental Management. It is collected once-a-week basis and disposed at the Maui County's 55-acre Central Maui Landfill, located approximately 4 to 6 miles east of the

subject property. This county-owned landfill is managed and operated by Maui County Department of Environmental Management.

D. EXISTING INFRASTRUCTURE

1. Roadways

Honoapiilani Highway is under the jurisdiction of the State of Hawaii Department of Transportation and is the main artery linking Waikapu to Central, South, and West Maui. Honoapiilani Highway is located west of the project site. It is a two-lane undivided State Highway which runs in the north-south direction into Wailuku town. There is no direct access from Honoapiilani Highway into the subject property.

Kuihelani Highway is located approximately 4,500 feet east of the project site. The highway is under the jurisdiction of the State of Hawaii Department of Transportation. It is a two-way, four-lane divided State arterial highway which also runs in a north-south direction. The posted speed limit on Kuihelani Highway varies at 30 to 55 miles per hour (mph). There is an existing traffic signal at the Kuihelani Highway-Waiko Road intersection. The southern terminus of Kuihelani Highway is its intersection with Honoapiilani Highway. The northern terminus is at its intersection with Puunene Avenue, where it turns to Dairy Road in Kahului.

Waiko Road is a two-lane County collector roadway that connects Honoapiilani Highway and Kuihelani Highway. Immediately east of Honoapiilani Highway, where Waiko Road provides access to a residential community. The posted speed limit on Waiko Road is 20 miles per hour (mph). Further east, Waiko Road provides access to industrial subdivision located east of the project site. There is also a heavy vehicle restriction on

Waiko Road near its intersection with Honoapiilani highway that prohibits vehicles weighing over 10,000 pounds from entering and exiting Waiko Road via its intersection with Honoapiilani Highway.

Waiale Road is a two-lane collector road running north from Waiko Road. It turns into Lower Main Street. The section of Waiale Road from Waiko Road to Kuikahi Drive was improved to 36' of pavement as part of the Waikapu Gardens Subdivision. Waiale is proposed to be extended from the intersection with Waiko Road southward to intersect with Honoapiilani Highway in the vicinity of the Tropical Plantation.

2. Drainage

A Preliminary Engineering Report (PER) together with drainage report was prepared by Otomo Engineering, Inc. for the proposed project (refer to attached Appendix G). The project site is currently vacant. According to the PER, the existing ground slopes in a west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet at the Waiale Road (eastern boundary), with an average slope of approximately 4.8%.

According to Soil Survey Geographic Database for the Island of Maui, State of Hawaii (September 2014) prepared by the U.S. Department of Agriculture Natural Conservation Service, the soils within the project site are classified as Puuone sand (PZUE) and Iao silty clay ((IaA). Puuone sand is characterized as having rapid permeability near the surface, slow runoff, and a moderate to severe wind erosion hazard. Iao silty clay is characterized as having slow runoff and an erosion hazard of no more than slight.

According to Panel Number 150003 0391E of the Flood Insurance Rate Map (FIRM), dated September 29, 2009, prepared by the U.S. Federal Emergency Management Agency (FEMA), the project site is situated Flood Zone "X" which represents areas outside of the 0.2% annual chance floodplain.

There are no drainage improvements within the project site. The onsite runoff presently sheet flows across the project site in a west to east direction towards Waiale Road. It is estimated that the present onsite runoff for a 50-year, 1-hour runoff from the entire project site is 13.0 cfs (refer to Appendix G, "Preliminary Engineering Report") and approximately 15,625 cubic feet of runoff volume. There is an existing drainage channel which conveys storm runoff from the Kehalani Community to the north to an existing retention basin further south of the property and on the makai side of Waiale Road.

3. Water

Domestic water and fire flow for the Waikapu area are serviced from the 300,000-gallon Waikapu tank and 1.5 million gallon Kehalani mid-level storage tank. A series of 8-inch and 12-inch waterlines traverse along West Waiko Road from the Waikapu tank to Honoapiilani Highway. As part of the existing Waikapu Gardens Subdivision, a 12-inch waterline was installed from Waiko Road, through the center of the subdivision and reduced to 8-inch waterlines to provide distribution throughout the subdivision. A 12-inch waterline was connected to the existing waterlines in the Waikapu Gardens subdivision and installed along the southern boundary line of the Valley Isle Fellowship. Separately to the north of the project site, there is an existing 12" waterline along Kuikahi Drive that services the surrounding properties and continues east at the intersection with Waiale Road.

The source for this water system is the Mokuhau wells in Happy Valley.

4. **Wastewater**

According to project's Preliminary Engineering Report (refer to Appendix G), there is a 12-inch gravity sewer lines traversing through a portion of the property entering along the southern boundary and continues north exiting the property and enters the Waiale Road right-of-way. Wastewater collected from the Waikapu area is transported to the Kahului Wastewater Treatment Plant in Naska managed by the Maui Department of Environmental Management.

5. **Electric, Telephone and Cable TV**

There is an existing electrical transmission system traversing along Waiale Road and Waiko Road fronting the proposed project site. The existing system currently provides service to the adjacent properties and surrounding area.

Maui Electric Company, Ltd., Verizon Hawaii, and Time Warner Oceanic Cable provide electrical, telephone, and cable television services, respectively.

E. **ANTICIPATED INFRASTRUCTURE IMPROVEMENTS**

1. **Roadways**

The subdivision roadway will access onto Waiale Road at two locations along the frontage of the property. There will be no direct access from the individual lots onto Waiale Road and Honoapiilani Highway. Based on

the Traffic Impact Analysis Report (see Appendix H, TIAR), left turn storage lanes along Waiale Road are recommended at the two proposed intersections into the project. From Waiko Road, vehicles can head west to Honoapiilani Highway or east to access Kuihelani Highway. Vehicles on Waiale Road which continue north can access to Kuikahi Drive and eventually exit to Lower Main Street.

The interior subdivision streets are intended to be dedicated to the County. The main loop road will have a 52-foot right-of-way, concrete curbs, gutters and sidewalk on at least one side. The interior roadways will have 36-foot right-of-way with 20 feet of pavement, concrete curbs and gutters. Sidewalks and pedestrian lanes will be constructed to provide access throughout the property such as to the neighborhood green concrete wheel chair ramps will be constructed at appropriate locations to comply with ADA standards.

A Traffic Impact Assessment Report (TIAR) (refer to Appendix H for more detailed information), was prepared for the proposed project by Austin, Tsutsumi & Associates, Inc (August 2017). There were several study intersections that were studied as part of the Traffic Impact Assessment Report by the project's traffic engineer. The report analyzed these intersections for the potential impacts due to the proposed project. Based on the Traffic Impact Analysis Report, left turn storage lanes along Waiale Road are recommended at the two proposed intersections into the project. According to the TIAR, generally, all movements at each study intersections operate at LOS D or better during the AM and PM peak hours of traffic.

2. Drainage

The project's drainage system will be designed to accommodate the increase runoff generated by the development of the entire project site. As noted in the project's PER (see Appendix G) the estimated post development runoff from the project site will be 36.8 cfs generating 28,670 cf of runoff volume, which equates to a net increase of 23.8 cfs of runoff and 13,045 cf of runoff volume. Onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to the retention basin at the eastern end of the property along Waiale Road. The retention basin will have a capacity of approximately 33,250 cf which will accommodate the entire post development runoff volume of the design storm from the project site. According to the PER, there will be no increase in runoff sheet flowing from the project site after construction of the development. This is in accordance with Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui.

Development of the project will also include implementation of site specific best management practices (BMPs) during construction to provide erosion control and minimize impacts on downstream properties.

3. Wastewater

It is estimated that the proposed project will generate approximately 28,000 gallons per day of wastewater based on the 80 residential units. Wastewater from the project will be collected by an onsite gravity sewer system and conveyed to the existing sewer system along the eastern boundary. The gravity sewer system will be constructed along the eastern boundary of the project site which continues in the northerly direction

towards Lower Main Street. The existing system will continue to convey wastewater to the Kahului Wastewater Treatment Plant.

4. Water

Based on the preliminary site plan for the project, the domestic water demand, as determined by the Domestic Consumption Guidelines set forth by the Department of Water Supply (DWS), the average daily water domestic demand for the project is calculated to be approximately 50,397 gallons per day. Waterlines will be extended from the existing 12-inch waterline near the Kuikahi Drive and Waiale Road intersection to provide domestic and fire protection throughout the project site and service each proposed lot. In accordance with DWS standards, the fire flow demand for a single-family residential development is 1,000 gallons per minute for a 2-hour duration and 1,250 gallons per minute for duplex units. Fire hydrants will be installed according to existing County standards.

5. Electric, Telephone and Cable TV

The proposed electrical, telephone and cable TV distribution systems to the subject subdivision will be serviced from the existing facilities along Waiale Road. Within the subdivision, all distribution systems will be installed underground and service laterals will be provided for each lot. Street lights will be installed along the subdivision streets in accordance with existing County standards.

III. Potential Impacts and Mitigative Measures

III. POTENTIAL IMPACTS AND MITIGATIVE MEASURES

A. Impacts to the Physical Environment

1. Surrounding Land Uses

As noted earlier in this report, the project site is located in close proximity of Waikapu and Wailuku Town and it is bounded by Honoapiilani Highway to the west and Waiale Road to the east. South of the subject property are Waikapu Gardens Phase I and II affordable workforce housing subdivisions and recently approved 70-lots Waiale Elua workforce housing project. The project site sits in very close proximity to the two major master planned communities in Central Maui, Maui Lani and Kehalani residential subdivisions. Also, north of the project are Kehalani Commercial Complex and Maui Lani Parkway Commercial Center. About less than half a mile east of the project site are fully-developed light industrial subdivision such as the Consolidated Baseyard Subdivision, a light industrial development developed a few years ago and Rojac Trucking Baseyard industrial subdivision. About a mile east of the proposed project is A & B Properties Hawaii, Inc.'s proposed 540-acre Waiale Master Planned Residential Project. A & B's planned project will be a village concept with mixed uses including single-family and multi-family uses are being proposed. The Maui Tropical Plantation is located at the southern extent of Waikapu, approximately a mile south west of the subject property.

The proposed project consists of 80-unit affordable workforce residential project. The proposed action will result in a subdivision compatible with surrounding residential uses. The proposed project site is an ideal

extension of the existing Waikapu Gardens affordable workforce and the recently approved Waiale Elua affordable housing subdivision. The proposed housing project will undoubtedly meet and consistent with the affordable housing policy as stated in the County of Maui 2030 General Plan-Countywide Policy Plan. The proposed affordable housing subdivision is consistent and compatible with its neighboring residential subdivisions.

2. Topography and Landform

The 12.5-acre project site existing ground slopes in the west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet above mean sea level at the Waiale Road (eastern boundary), with an average slope of approximately 4.8%.

The design intent of the proposed project will be to limit the need for extensive grading as much as possible, some grading will be undertaken within the project site to provide the desired grade for the subdivision roadways and house sites construction. As noted earlier in this report, the onsite runoff presently sheet flows across the project site in a west to east direction towards Waiale Road. Also noted earlier, onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to a retention basin at the eastern end of the property along Waiale Road. The retention basin will have a capacity of approximately 33,250 cf which will accommodate the entire post development runoff volume of the design storm from the project site.

The project's drainage system will be designed to accommodate the increase in runoff generated by the proposed development of the entire

project site (refer to Appendix G, "Preliminary Engineering Report", for detailed information of drainage plans). Drainage patterns of proposed improvements will be maintained to ensure impacts to downstream properties are minimized. With the proposed drainage improvements, adverse impacts to topography and landforms resulting from minimum grading activities are not expected. The adjoining and downstream properties will not have any additional increase of runoff due to this proposed development. Development of the project site will also include best management practices (BMPs) during construction to provide erosion control and minimize any potential impacts to downstream properties. There are no anticipated adverse impacts to topography and landforms from grading activities of the project site.

3. Wetlands and Streams

There are no wetlands on the subject property or in the immediate vicinity of the property. Waikapu Stream on the south will not be affected by the proposed project. Drainage generated from the subject property will not be discharged directly into Waikapu Stream. According to the Preliminary Engineering Report prepared by Otomo Engineering, Inc. for the proposed project, the drainage runoff from the project site will be contained at the proposed retention basin to be located at the eastern boundary of the property site along Waiale Road. The retention basin will have adequate capacity to store the anticipated drainage runoff from the proposed project. The proposed project is not anticipated to have an adverse impacts on wetlands and Waikapu stream.

4. Flood and Tsunami Hazard

As previously stated in this report, the subject site is located in Flood Zone "X" according to Flood Insurance Rate Map (FIRM), September 29, 2009.

Flood Zone “X” represents areas outside of the 0.2% annual chance flood plain. Best Management Practices (BMPs) will be implemented to mitigate any future or potential flooding on the site. Furthermore, the subject site is not located within the tsunami inundation zone. No adverse impacts is anticipated.

5. Flora and Fauna

According to the flora and fauna survey conducted by Mr. Robert Hobdy, July 2017 (see Appendix I), the vegetation throughout the project area is dominated by non-native species that are of no particular environmental interest or concern. No federally listed Endangered or Threatened plant species were found, nor do any plants that are candidates for such status occur on the project area. According to Mr. Hobdy, a single bat was detected in one portion of the project area. It is recommended by Mr. Hobdy that trees greater than 15 feet in height should not be removed between the months of April and mid-September. The U.S. Fish and Wildlife Service will be consulted for any further guidance.

6. Air Quality

Emissions from construction equipment and vehicles used during construction activities may temporarily affect the ambient air quality within the immediate vicinity of the project site. However, these temporary air quality affects can be minimized by instituting Best Management Practices (BMPs) during project construction. In addition, dust control will be instituted such as dust barriers, watering graded areas, and/or sprinklers to control dust during construction of the project.

On a long-term basis, upon completion of the proposed affordable workforce residential project, it is not anticipated to generate adverse impact on air quality on or in close proximity of the project site.

7. **Noise**

Ambient noise conditions may be temporarily affected during construction activities at project site. Construction equipment machinery will likely be the dominant noise-generating source during construction period. Best Management Practices (BMPs) will be instituted, including equipment maintenance and vehicle maintenance, are anticipated to reduce noise levels. Construction activities will be limited to daytime working hours. In addition, heavy trucks, dump trucks, and material transport vehicles will be advised not to use upper Waiko Road to minimize noise in the residential area of Waikapu town village.

Construction-period noise will be mitigated in accordance and strict adherence with Title 11, Administrative Rules, Chapter 46, Community Noise Control of the State Department of Health. All construction equipment and onsite vehicles will be equipped with mufflers as required in Section 11-46 (b)(1)(A). Required permit conditions for construction activities may include, where appropriate:

“No permit shall allow construction activities creating excessive noise before 7:00 A.M. and after 6:00 P.M. of the same day”

“No permit shall allow construction activities which emits noise in excess of ninety-five dB(A) except between 9:00 A.M. and 5:30 P.M. of the same day”

Once project is completed, the proposed single-family affordable residential project is not anticipated to generate significant long term adverse noise conditions. These conclusions were drawn based on the existing and surrounding residential uses in the area.

8. Scenic and Open Space Resources

As previously noted in this report, Haleakala is visible to the east of the project site and West Maui Mountains to the west define the scenic resources of the project site. The project is not part of a scenic corridor and will not affect views from inland vantage points. As such, the proposed project is not anticipated to have an adverse impact upon the visual character of the surrounding areas.

9. Hazardous Materials

As noted earlier in this report, the subject project site was not listed on any hazardous database listings. There was no evidence of any historic misuse or significant spills of hazardous or regulated substances on the subject property, except for some minor soil staining as a result of vehicle and construction equipment activities. A Phase I Environmental Site Assessment Investigation was conducted on the property by Vuich Environmental Consultant, Inc. Based on its findings as a result of the Phase I environmental site investigation, there are no hazardous or regulated substances found on the property site. As noted earlier in this report, the subject property is not in any state or federal database hazardous site listings. Further, the environmental assessment report finds no evidence of any historic or current significant misuse of hazardous or regulated substances on the subject property (see Appendix O). BMPs will be instituted during the construction of the subject property. No adverse impacts are anticipated per environmental consultant's findings.

10. Archaeological Resources

As noted earlier in this report, an archaeological inventory survey was conducted by Archaeological Services Hawaii, LLC (“Consultant”). The archaeological inventory survey (AIS) was conducted on May 2004 and July 2004, and updated in May 2016. The purpose of the AIS was to determine the presence/absence, nature, and extent and significant of any cultural and archaeological resources in the proposed project area. No significant remains were encountered during trenching and representative stratigraphic profiles were recorded. Based on the negative results of the field work, according to the Consultant, no further inventory level work is recommended prior to commencing construction activities. Further discussions and details on the results of the AIS can be found on Appendix C. The AIS report has been accepted by the State Historic Preservation Division on July 1, 2016. The proposed project does not anticipate any adverse impact on archaeological and cultural resources of the area.

11. Cultural Assessment

As noted earlier in this report, Chris Hart and Partners, Inc. conducted a cultural impact analysis (CIA) of the project area for the project’s State Land Use Urban District Boundary Amendment under LUC Docket No. A07-773. The project’s urban boundary designation was approved by LUC and further found that the project will not have any adverse effects on Native Hawaiian traditional and customary rights which would require protection under Article XII, Section 7, of the Hawaii State Constitution.

B. Impacts to the Socio-Economic Environment

1. Population and Local Economy

The proposed project, on the short-term, should not impact the population parameters. On the other hand, the proposed project will create immediate construction employment during the development of the project.

Estimated construction costs for the subdivision site work and vertical construction of the dwelling units will be approximately \$22 million. As noted above, the proposed project will create construction jobs for local residents during the development of the project. This projected employment will have a multiplier effect on local material suppliers and retail businesses that can be expected to benefit from the proposed project. Also, in the long-term, residential homeowners will require services related to home improvements and maintenance which will further support local businesses, thereby creating more employment opportunities.

Both long and short-term basis, the proposed action should not affect population parameters. The proposed project is not considered population generator from a long-term perspective. The proposed project is anticipated to meet existing demand demands for affordable housing by current residents that are waiting for affordably-priced housing project. This project does not significantly (if any) affect/increase population parameters within the Kahului-Wailuku Community Plan District.

No mitigative measures are necessary in response to the anticipated increased short-term as well as long-term employment and no additional mitigative measures are required regarding population since the proposed project is not a population generator.

2. Agriculture

The approximately 12.5-acre project site is situated in a region of existing and ongoing urban development. As noted earlier in this report, the subject property based on the ALISH map, falls within the “Prime” agricultural land category (see Appendix N, ALISH Map). As noted earlier in this report, the project site that falls within the prime agricultural land category was used for sugar cane and pineapple cultivation over three decades ago. The sugar operation and any agricultural activity have ceased operation and the subject property has been vacant and remained fallow.

As noted earlier in this report, immediately south and west boundary of the project site are existing residential developments. On the north and east of the project site are Kehalani commercial center and Maui Lani Parkway commercial complex, respectively. Use of the property for the proposed single family affordable workforce housing project is not anticipated to adversely impact agricultural productivity on the island. Since proposed action will not affect agricultural production on the island, no mitigative measures are expected to be required.

3. Police, Fire, and Medical Services

The proposed action is not anticipated to impact the service capacity and capability of police, fire, and emergency medical operations. The proposed project will not expand nor extend the existing service area limit for emergency medical services. There are existing police, fire, and medical facilities in very close proximity of the project site. Additionally, internal roadways within the proposed single-family residential subdivision will be constructed in accordance with Maui Fire Department standards. No further mitigative measures are expected to be required.

4. Recreational and Educational Resources

As noted earlier in this report, the proposed action is not a population generator that will increase population parameters within the Kahului-Wailuku Community Plan District, hence, the proposed project is not expected to generate the need for additional recreational facilities or services. Park facilities are currently available at neighboring Waikapu Community Center and at the Waikapu Gardens Subdivision adjacent to the proposed project site. The County is proposing to develop approximately 242-acre parcel for its proposed Central Maui regional park located less than half a mile south east of the project site. Also, a 65-acre regional sports complex recently open located about a mile east of the project site. Also, the Maui Parkway county park located less than a mile east of the project site is available for community use. There are many other County parks and recreational facilities within the Wailuku-Kahului Community Plan District that are located within the 2-4 miles from the project site. With respect to schools for the project's anticipated residents, the applicant acknowledges that the project is located in the Central Maui Impact Fee District and further acknowledges that decisions on which schools will serve new residential areas are determined at the local level by the complex area superintendent who is responsible for all schools on Maui. The applicant will work closely with the State Department of Education (DOE) to ensure that the proposed project meets with all DOE's applicable rules and regulations concerning appropriate assessment policy. No further mitigative measures are expected to be required.

5. Hydrology

There will be no anticipated short-term impact to groundwater as a result of construction activities on the project site. Therefore, no mitigation measure is expected to be required.

As a precautionary measure, Best Management Practices (BMPs) will be strictly enforced during the project construction.

6. Solid Waste Disposal

A solid waste management plan will be developed for the disposal of any construction materials during the subdivision and development of the proposed project. Once construction is completed, it is anticipated that the project solid waste collection and disposal will be provided by the County of Maui's Department of Environmental Management.

After subdivision is completed, residents will be encouraged to implement waste recycling programs to reduce the amount of waste to the County's Central Maui Landfill site.

C. Impacts to Infrastructure

1. Roadways

A detailed Traffic Impact Assessment Report (TIAR) for the proposed project was completed on August 11, 2017 by Austin, Tsutsumi and Associates, Inc. Refer to Appendix H for detailed traffic assessment for the project. The TIAR for the proposed project address the following:

- Assess existing traffic operating conditions within the study area;
- Traffic Projections for Base Year 2020 (without the project);
- Estimate the vehicular trips that will be generated by the proposed project;
- Traffic projections for the project for future year 2020 (with project);

- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the proposed project.

To mitigate potential traffic concerns as a result of the development of the proposed project, based on the Traffic Impact Analysis Report (TIAR), it is recommended by the project's traffic consultant that two northbound left-turn storage lanes along Waiale Road are recommended for the entrance into the two proposed project accesses, to remove left turn vehicles from mainline through traffic. According to TIAR, left-turn storage lanes should accommodate a minimum 50 feet of storage length (see Appendix H, Traffic Impact Analysis Report).

2. Water

As noted earlier in this report, the proposed project will be served by the Maui County Department of Water Supply (DWS) system. The domestic water demand, as determined by the Domestic Consumption Guidelines set forth by the Department of Water Supply, for the project is anticipated to be approximately 50,397 gallons per day (gpd). Waterlines will be extended from the existing 12-inch waterline near the Kuikahi Drive and Waiale Road intersection to provide domestic and fire protection for the proposed project. In accordance with DWS standards, the fire flow demand for a residential development is 1,000 gallons per minute for a 2-hour duration for a single-family subdivision and 1,250 gallons per minute for duplex units. Fire hydrants will be installed at the appropriate spaced intervals along the subdivision roadways in conformance with the County's applicable standards.

3. Wastewater

As noted earlier in this report, the proposed project will generate approximately 28,000 gallons per day of wastewater based on the proposed 80 residential units. Wastewater from the project will be collected by an onsite gravity sewer system and conveyed to the existing sewer system along the eastern boundary. The gravity sewer system will be constructed along the eastern boundary of the project site which continues in the northerly direction. The existing system will continue to convey wastewater to the Kahului Wastewater Treatment Plant located in Naska (Kahului). See Preliminary Engineering Report by Otomo Engineering, Inc., dated July 2017, identified as Appendix G for more detailed information. According to the project's PER, the sewer system for the proposed project will be constructed per County standards.

4. Drainage

According to the Preliminary Engineering Report (PER) by Otomo Engineering, Inc. prepared for this project (refer to Appendix G) it is estimated that the post development runoff from the project site will be 36.8 cfs generating 28,670 cf of runoff volume, which equates to a net increase of 23.8 cfs of runoff and 13,045 cf of runoff volume. The project's drainage system will be designed to accommodate the increase in runoff generated by the development of the entire project site. Onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to the retention basin at the eastern end of the subject property along Waiale Road. According to the PER, there will be no increase in runoff sheet flowing from the project site after construction of the proposed project. The drainage will be in accordance with Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui.

With the proposed drainage improvements for the project no further adverse impact is anticipated on downstream properties.

5. Electric, Cable and Telephone System

The proposed electrical, telephone, and cable TV distribution systems to the subject subdivision will be serviced from the existing facilities along Waiale Road. Within the subdivision, all distribution systems will be installed underground. Street lights will be installed along the subdivision streets at intervals to be determined by the electrical engineer in strict adherence to rules and regulations. No further adverse impact is anticipated with the proposed improvements.

D. Potential Cumulative Impacts

Cumulative impacts are defined as the potential impact on the environment which results from the incremental impact of action when added to other past, present, and near or long-term foreseeable future actions.

This potential cumulative impact analysis evaluates present and reasonably foreseeable future projects in the area that have the potential to contribute to cumulative effects of such actions. The analysis uses the best available information and data to assess these projects and their potential impacts.

The following criteria were considered in identifying the past, present and reasonable foreseeable future projects that could result in potential cumulative impacts to the region's resources:

- Projects that are of a similar nature could affect similar resources or are located in close proximity to the proposed project.

- Projects that have the potential to generate environmental impacts and when addressed collectively with the proposed project, could result in potential cumulative impacts to the environment.

To fully assess the potential cumulative impacts, the proposed affordable workforce housing project was grouped with the following housing projects in the vicinity having similar scope and scale:

- **Waikapu Gardens Subdivision Phase I:** This fully developed affordable housing project encompasses approximately 95 acres located south of the proposed project site. This affordable residential subdivision consists of 411 single-family residences, as well as park. This housing project is a fee simple project was developed by Spencer Homes and completed over ten years ago.
- **Waikapu Gardens Phase II.** This affordable housing project encompasses approximately 10 acres located south of the project site. This affordable housing subdivision consists of 56 single-family residences. This project was developed by Spencer Homes and completed over two years ago.
- **Waiolani Mauka Subdivision:** This single-family housing subdivision consists of approximately 28-acre parcel located mauka side of the Honoapiilani Highway in Waikapu west of the project site. This residential development consisting of 108 residential lots was completed a few years ago.
- **Waiko Baseyard Light Industrial Subdivision (Rojac):** This light industrial subdivision encompasses approximately 14.9 acres that contains 19 lots, ranging in lot size from 13,000+ square feet to 2.8 acres. This LI subdivision is completed and fully developed. This subdivision is located the makai or south east of the proposed project site.

In considering the potential impacts of the proposed affordable workforce housing project, together with the projects that are listed above, the following parameters were examined: (a) topography; (b) flora and fauna; (c) noise and air quality; (d) visual resources; (e) cultural resources; (f) water quality; (g) public services; and (h) infrastructure. In assessing the potential cumulative impacts of these projects that are listed above, a qualitative approach was used. It is worth noting that cumulative impact considerations may change as new projects are presented or proposed projects are modified in scope and scale. Accordingly, the assessment presented in this report is intended to identify potential issues, concerns and mitigative measures based upon available information. Potential cumulative impact concerns relating to each of these resource parameters are herein presented below.

a. Topography

All of the above noted projects were completed and fully developed. Minimum alterations to topographic features were applied due to their respect to existing landforms to ensure that visual impacts are minimized, drainage patterns are maintained and all infrastructure design and construction criteria were met. Because of these projects' sensitivity to the existing landform, the cumulative impacts of these projects were not adverse to the regional topography.

b. Flora and Fauna (Plant and Animal Life)

Prior to the development of the above subject projects, each of the projects has prepared and reviewed the flora and fauna resources affected by their respective actions. The above noted lands were formerly used for sugar and pineapple cultivation or ranching activities and there were no adverse impacts on the flora and fauna parameters that were encountered during the development and construction of these projects.

c. **Noise and Air Quality**

Short term construction related noises were experienced for each during the construction of the above noted projects. All projects complied with Department of Health noise regulations and BMPs were implemented during the construction and resulted in minimum construction-related noises. There were no significant point sources of noise encountered during the construction of the above projects and no adverse impacts to surrounding communities.

As with noise and air quality was temporarily affected during the construction of the above noted projects. BMPs were instituted during the construction of the above projects and were all in compliance with the Department of Health and County of Maui grading requirements. There were no new point sources of air emissions associated with any of the above mentioned projects. From a cumulative stand point, the projects had no adverse impact upon regional conditions.

d. **Visual Resources**

The visual landscape of Waikapu Town has changed minimally since the above noted projects were completed. The Waikapu Gardens affordable housing project site, formerly used as agricultural land has been replaced by residential use. Consolidated Baseyard Subdivision and Waiko Light Industrial Subdivision, both completed projects, are situated in areas where light and heavy industrial uses have previously operated under special uses and/or conditional permits.

These above completed projects, residential and light industrial projects, collectively reflect a visual character more urban in scale, that have replaced lands formerly used for agricultural purposes. The landscaping buffers and

architectural designs used in the subdivision of these projects have provided visual relief from surrounding properties.

e. Cultural Resources

Based on archaeological studies and cultural impact assessments conducted for each project that are noted above, appropriate mitigative measures were utilized to address potential archaeological concerns/issues. Approved monitoring plans were prepared for these above noted projects and archaeologists monitored the project during the development to ensure that no cultural resources are affected during projects construction. Collectively, these above noted projects have no adverse affect on cultural and archaeological resources and practices in the Waikapu region.

f. Water Quality

Surface runoff and other non-point source pollutants can affect water quality if unmitigated. All the above noted projects were subjected to the NPDES permitting process and BMPs to control erosion and sediment loss were implemented during construction activities for each of the project. Additionally, all the projects have complied and will comply with Maui County drainage regulations to provide required mitigation, including drainage storage basins to ensure that runoff velocities are controlled and water quality effects minimized. From a regional water quality standpoint, projects' compliance with federal, state, and local regulatory requirements helped to mitigate potential adverse impacts to water quality.

g. Public Services

With regards to public services, the Waikapu Gardens affordable housing project that was completed a few years ago and has an effect on parks and

recreation and schools due to the residential nature of the project. The impact on public services of this affordable housing project was met by the developer as part of its entitlement process.

Since the proposed housing project is 100% affordable pursuant to the Department of Housing and Human Concerns Affordable Sales Guidelines, the proposed project is exempt from the park assessment fee pursuant to the Maui County Code. The proposed project will provide a passive neighborhood green within the project site.

The applicant for this proposed affordable housing project will meet and will work closely with the State Department of Education (DOE) prior to the development of the project to ensure compliance of DOE's rules and regulations. The applicant acknowledges that the project is located in the Central Maui Impact Fee District and further acknowledges that decisions on which schools will serve new residential areas are determined at the local level by the complex area superintendent who is responsible for all schools on Maui. It is important to note that a new Puu Kukui Elementary School located in Wailuku was completed.

Due to the nature of the other projects such as Consolidated Baseyard, Waiko Baseyard (Rojac), and the proposed Waiko Light industrial project, in reviewing the cumulative impact on public services, it was concluded that their effects would be minimal since these industrial projects do not generate the need for parks and recreation and schools. Other services, such as police, fire and emergency medical services, are currently servicing the Waikapu region and would not extend the current limits of service.

h. Housing and Land Use

The availability of affordably-priced housing projects is an island-wide concern for working families and policy makers. As noted in the County of Maui 2030 General Plan – Countywide Policy Plan – shelter is among the most basic of human needs. The affordability, quality, and location – plan an enormous role in the quality of life of Maui County’s residents.

Cumulatively, the Waikapu Gardens Phases I and II affordable housing projects and the recently-approved Waiale Elua affordable housing project he applicant’s proposed affordable single-family housing project will undoubtedly increase the availability of affordably-priced housing units for the island of Maui.

i. Infrastructure

Infrastructure requirements for the completed projects as noted above were met by respective developers/applicants. Water and wastewater requirements for Waikapu Gardens affordable residential projects, Waiolani mauka and Pikake residential subdivisions and Waiko baseyard industrial project are serviced by the County systems. Waterline improvements including storage tank were completed to serve these projects and meet all applicable rules and regulations of the County and state agencies. Wastewater transmission and treatment services for Waikapu Gardens, Waiolani Mauka and Pikake residential subdivisions and Waiko Baseyard subdivision are provided by the County of Maui Environmental Management. Applicable wastewater assessment fees were required of each applicant. Likewise, the applicant’s proposed affordable workforce housing subdivision will be served by the County systems. The proposed project will be designed and constructed to ensure compliance with all county’s rules and regulation and guidelines. There are no anticipated adverse impacts to the county’s systems.

Each project noted above including the proposed residential subdivision in this application was and is responsible for addressing and mitigating drainage impacts. Collectively, through these measures, it is anticipated that there will be no adverse impacts to downstream or adjacent properties.

The infrastructure component that were examined for these subject projects are roadway systems. These above noted completed projects were each required to prepare traffic impact analysis reports and made appropriate improvements on roadway systems as recommended in their respective TIAR and each project traffic impacts were mitigated by each respective applicant/developer. For the applicant's proposed 80-unit affordable workforce housing project, the TIAR prepared for this project reviewed the cumulative conditions for the Waikapu area including the existing completed projects noted above. See Appendix H (Traffic Impact Analysis Report, dated August 11, 2017, prepared by Austin Tsutsumi and Associates). The traffic analysis made several assumptions and recommendations to mitigate potential impacts on the roadway systems in Waikapu region and the applicant will comply with the recommendations and conditions set forth by approving county and state agencies.

E. SECONDARY IMPACTS

Secondary impacts are impacts that have the potential to occur later in time in the future but are still reasonably foreseeable. They can be seen as actions by others that are taken because of the presence of the project. Related to the proposed affordable workforce housing subdivision, secondary impacts include the creation of a larger residential population center which may lead to new additional regional demands for public services in the Wailuku-Kahului community plan district. It is anticipated that public service needs as a result from the proposed project will be met through additional revenues from the developed house lots through property tax assessments and other related fees and impact assessments.

***IV. Consistency and Relationship
To Land Use, Plans,
Policies, and Controls***

IV. CONSISTENCY AND RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Pursuant to Chapter 205, Hawaii Revised Statutes, all lands in the State of Hawaii have been placed into one (1) of four (4) land use districts category by the State Land Use Commission. These land use districts have been designated “Urban”, “Rural”, “Agricultural”, and “Conservation”. The proposed project site is presently classified “Urban” within the State Land Use District Designation. Reclassification of the project site is not required since the site is currently in urban designation, hence, the proposed project use is consistent with the State Land Use District urban designation.

B. HAWAII STATE PLAN, CHAPTER 226, HAWAII REVISED STATUTES

Chapter 226, HRS, also known as the Hawaii State Plan, is a long-range comprehensive plan which serves as a guide for the future long-range development of the State by identifying goals, objectives, policies, priorities, as well as implementation mechanisms. The proposed project is consistent with the following State goals, objectives, and policies of the Hawaii State Plan:

Chapter 226-4, HRS, State Goals

- (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii’s present and future generations.

- (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- (3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring and of participation in community life.

Objectives and Policies of the Hawaii State Plan

The proposed reclassification and project's affordable housing application pursuant to 201H-38, Hawaii Revised Statutes is consistent and in conformance with the following objectives and policies of the Hawaii State Plan:

Chapter 226-5, HRS, Objectives and Policies for Population

- (a) It shall be the objective in planning for the State's population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.
- (b)(1) Manage population growth statewide in a manner that provides increase opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each County.
- (b)(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.
- (b)(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

Chapter 226-6, HRS, Objectives and Policies for the Economy

- (b)(6) Strive to achieve a level of construction activity responsive to, and consistent with, State growth objectives.

- (b)(10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.

Discussion and Response:

The proposed project conforms with the objectives and policies of HRS 226-4, 5, and 6 for the economy, potential growth activities, and population. The proposed 12.5-acre 80-unit affordable workforce housing project will provide a wide-range of economic activities through construction of the subdivision improvements and housing development for working families in the Kahului-Wailuku Community Plan region and for the island residents. It is anticipated that the development of this project will generate significant expenditures by the developer during the construction of the site work for subdivision and construction of the residential dwelling units. With the infusion of new capital expenditures on this project, these investments are expected to favorably impact the Maui economy on a broad scale, and in multitude of ways. With the capital investment during the initial phase of the subdivision development and construction of the housing units, significant direct new construction job opportunities are expected to be created by this project.

The proposed development is intended to reflect and meet the housing needs at affordably priced single-family residential subdivision for Maui's working families. The architectural design of the proposed dwelling units will be similar to its neighboring affordable housing projects.

Chapter 226-11, HRS, Objectives and Policies for the Physical Environment - Land-Based, Shoreline, and Marine Resources

- (a)(2) Effective protection of Hawaii's unique and fragile environmental resources.
- (b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.
- (b)(8) Pursue compatible relationships among activities, facilities, and natural resources.

**Chapter 226-12, HRS, Objectives and Policies for the Physical Environment-
Scenic, Natural Beauty, and Historic Resources**

- (b)(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Discussion and Response:

The proposed project meets with stated objective and policies of HRS 226-11 & 12 for physical environment, scenic and historic resources. The planning and design concept of the proposed project will reflect similar architectural character of the neighboring residential development in Waikapu town, the history, location and topography and setting of the site. View corridors and topographic features will be maintained and highlighted in the project design. The historical setting of the regions will be reflected in the proposed project's traditionally-based planning and design of the subdivision. The project's design concept will embrace similar architectural design of its neighboring residential development and will meet the intent and stated objectives of HRS 226-11 & 12.

Based on thorough field assessment of the site by the applicant's consultant, no rare or endangered plant and animal species or habitats are present on site. The applicant will comply with the recommendation by the project's flora/fauna consultant to protect any native habitats within the project site.

**Chapter 226-13, HRS, Objectives and Policies for the Physical Environment-
Land, Air, and Water Quality**

- (b)(2) Promote the proper management of Hawaii's land and water resources.
- (b)(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.
- (b)(7) Encourage urban developments in close proximity of existing services and facilities.

Discussion and Response:

The proposed 12.5-acre 80-unit affordable workforce housing project will be designed to be complimentary to the neighboring existing residential development in Waikapu Town village and will meet the needs of Maui's working families.

The proposed project is located along the main thorough fare to west and central Maui and in very close proximity to Kahului and Wailuku regions as well as Paia and South Maui regions. The project is inland and will not have any impact on our shoreline resources. Also, the project is in close proximity to existing public services and facilities that are critical to the success of the project.

Chapter 226-19, HRS, Objectives and Policies for Socio-Cultural

Advancement – Housing

- (a)(2) The orderly development of residential areas sensitive to community needs and other land uses.
- (b)(1) Effectively accommodate the housing needs of Hawaii's people.
- (b)(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.
- (b)(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.
- (b)(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.

Discussion and Response:

The proposed affordable residential housing project meets the stated objectives and policies of HRS 226-19 for the orderly development of residential areas sensitive to community needs. The proposed project effectively accommodate the housing needs of Maui's residents and will increase homeownership opportunities at an affordably-priced dwelling units. The design of the project is consistent with the surrounding residential subdivision (refer to Appendix L,

house floor plans models). The proposed project is centrally located within the Wailuku-Kahului Community Plan region and it is conveniently accessible to public facilities and services.

Priority Guidelines of the Hawaii State Plan

The proposed project is consistent with the following priority guidelines of the Hawaii State Plan:

Chapter 226-103, HRS, Economic Priority Guidelines

- (1) Seek variety of means to increase the availability of investment capital for new and expanding enterprises:
 - A. Encourage investments which:
 - (i) Reflect long-term commitments to the State;
 - (ii) Rely on economic linkages within the local economy;
 - (iii) Diversify the economy;
 - (iv) Reinvest in the local economy;
 - (v) Are sensitive to community needs and priorities; and
 - (vi) Demonstrate a commitment to provide management opportunities to Hawaii's residents.

Discussion and Response:

As noted earlier in this report, the proposed 12.5-acre parcel proposed affordable workforce residential housing project will provide a variety of economic activities for the Waikapu Town and in the Kahului-Wailuku Community Plan regions. Because of the anticipated large investment capital that will be infused in the development of the proposed affordable housing project, short-term construction employment opportunities will be created as a result from the development of the subdivision. Approximately \$22 million dollars will be invested for the construction of the proposed project, thereby creating short-term construction related jobs. The project will contribute, because of its infusion of capital investment, to the growth of Maui's economic base.

Chapter 226-104, HRS, Population Growth and Land Resources Priority Guidelines

- (a)(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaii's people.
- (b)(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.
- (b)(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.
- (b)(12) Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.

Discussion and Response:

The proposed project is in keeping with HRS 226-104 Priority Guidelines on Population, Growth and Land Resources. The project is located within the existing urban core of Waikapu and Wailuku Town where adequate public facilities and services are already available such as water and wastewater services for the proposed project. In addition, the project is located in very close proximity to parks, schools, medical facilities, fire and police services and other public facilities that serve the Wailuku-Kahului Community Plan District. The proposed affordable workforce housing project will meet the existing and projected housing needs for Maui's working families. The project location is far inland and will not have any impact on the shoreline or conservation lands.

Chapter 226-106, HRS, Affordable Housing Priority Guidelines

- (1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low and moderate-income and gap group households.
- (1) Give a higher priority to the provision of quality development of housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii.

Discussion and Response:

The proposed affordable housing project meets the stated Affordable Housing Policy Guidelines for the provision of affordable housing pursuant to Chapter 226-106, HRS. The project site has been fallow and hasn't been used for agricultural purposes for decades. The site is centrally-located within the Wailuku-Kahului Community Plan region and surrounded with existing residential housing development, the proposed project is complementary and consistent with its neighboring residential developments. The proposed project will be 100 percent affordable under the Maui county affordable housing guidelines meeting those families within the 70 percent to 140 percent of Maui's median family income.

STATE FUNCTIONAL PLANS

The State Functional Plans (SFP) define actions for implementation of the Hawaii State Plan through the identification of needs, problems and issues, and recommendations on policies and priorities, which address the identified areas of concern. The proposed affordable workforce housing project is consistent with the stated objectives of the following State functional plans:

a. State Agricultural Functional Plan

As noted earlier in this report, the subject property is currently designated "Urban" within the State Land Use District designation. The property has been vacant and remained fallow for decades and hasn't been used for any agricultural activities. The subject property is in very close proximity to existing urban uses, particularly, residential development. The proposed residential use is consistent

with the its current urban designation. The proposed use is not anticipated to adversely impact agricultural productivity on the island.

b. State Housing Functional Plan

As noted in the Maui County's Housing Planning Study, conducted by SMS for the Maui County Department of Human Concerns and Housing, there's critical need for affordable housing especially for working families in Maui County. According to the SMS report, a significant number of Maui households live in overcrowded conditions or are "double-up" with other families. This growing public demand for affordable workforce housing indicates a current shortage of affordable single-family housing especially in the Wailuku-Kahului Community Plan District. With the proposed 80-unit affordable workforce residential homes planned within the subject property will help to address a critical community need.

COUNTYWIDE POLICY PLAN – COUNTY OF MAUI 2030
GENERAL PLAN

The Countywide Policy Plan was adopted by Ordinance No. 3732 (2010) and took effect on March 24, 2010. This Policy Plan that was recently adopted is an update and an amendment to the Maui County's 1990 General Plan. As noted in the subject policy plan, Maui County has experienced significant changes economically, demographically, socially, and physically that must be addressed in the scope of the Countywide Policy Plan.

The purpose of the Countywide Policy Plan is to provide broad goals, objectives, policies, and implementing actions that portray the desired direction of the County's future. The Countywide Policy Plan further provides the policy framework for the development of the Maui Island Plan and the nine community plans.

The newly adopted Countywide Policy Plan advances the following core themes:

- Protect the natural environment
- Preserve local cultures and traditions
- Improve education
- Strengthen social and healthcare services
- Expand housing opportunities for residents
- Strengthen the local economy
- Improve parks and public facilities
- Diversify transportation options
- Improve physical infrastructure
- Promote sustainable land use and growth management
- Strive for good governance

According to the Countywide Policy Plan, shelter is among the most basic of human needs. The affordability, quality, and location of housing – including the degree of crowding within the home and within the neighborhood – play an enormous role in the quality of life of Maui County’s residents.

The proposed 80-unit affordable workforce residential housing project meets the following stated goals, objectives, policies and actions of the Countywide Policy Plan – County of Maui 2030 General Plan:

“E. Expand Housing Opportunities for Residents”

Goal:

Quality, island-appropriate housing will be available to all residents.

Objective:

1. Reduce the affordable housing deficit for residents.

Policies:

- a. Ensure that an adequate and permanent supply of affordable housing, both new and existing units, is made available for purchase or rental to our resident and/or workforce population, with special emphasis on

providing housing for low to moderate income families, and ensure that all affordable housing remains affordable in perpetuity.

- b. Seek innovative ways to lower housing costs without compromising the quality of our island lifestyle.
- c. Seek innovative methods to secure land for the development of low and moderate income housing.
- k. Ensure residents are given priority to obtain affordable housing units developed in their communities, consistent with all applicable regulations.
- l. Establish pricing for affordable housing that is more reflective of Maui County's workforce than the United States Housing and Urban Development's median income estimates for Maui County.

Objective:

- 2. Increase the mix of housing types in towns and neighborhoods to promote sustainable land use planning, expand consumer choice, and protect the County's rural and small town character.

Policies:

- b. Design neighborhoods to foster interaction among neighbors.
- c. Encourage a mix of social, economic, and age groups within neighborhoods.
- d. Promote infill housing in urban areas at scales that capitalize on existing infrastructure, lower development costs, and are consistent with existing or desired patterns of development.

Objective:

- 3. Increase and maintain the affordable housing inventory.

Policies:

- a. Recognize housing as basic human need, and work to fulfill that need.
- b. Prioritize available infrastructure capacity for affordable housing.
- g. Minimize the intrusion of housing on prime, productive, and potentially productive agricultural lands and regionally valuable agricultural lands.

- h. Encourage long-term residential use of existing and future housing to meet residential needs.

Discussion and Response:

The proposed affordable workforce housing project is consistent and meets the stated goals, objectives, and policies of the Maui County's Countywide Policy Plan – 2030 General Plan. Conformance with the objectives and policies of the Maui County Policy Plan is achieved by the proposed project as it will provide needed affordable workforce housing for working families on Maui. The project will be 100 percent affordable meeting families with income of 70 percent to 140 percent of Maui's median income pursuant to Maui's Affordable Housing Guidelines. The project design (refer to Appendix L, identified as floor plans models) is consistent and complementary with is neighboring residential subdivisions in Waikapu Town. The project site is in close proximity to existing urban core of Kahului-Wailuku Community Plan District and Waikapu Town village and the availability of existing infrastructures for the proposed project.

KAHULUI-WAILUKU COMMUNITY PLAN

The project site is located within the Kahului-Wailuku Community Plan region, one (1) of nine (9) community plan regions established in the County of Maui. Each region's growth and development is guided by a Community Plan. The County's Community Plan reflects current and anticipated conditions in the Wailuku-Kahului region and advances planning goals, objectives, policies and implementation considerations to guide decision-making in the region. The primary purpose of the Community Plan is to outline a detailed agenda for carrying out these policies and objectives. The Kahului-Wailuku Community Plan was adopted by the County of Maui through Ordinance Number 3061, Bill Number 29, and became effective on June 5, 2002. The Community Plan land use map designates the subject property as "Public-Quasi-Public". As part of the project's Section 201H application, an exemption from the community amendment process is being sought.

The Wailuku-Kahului Community Plan identified the lack of affordable housing as one of its major problems. Similarly, the Countywide Policy Plan and the 2011 SMS report entitled "Housing Planning Study for Maui County" is one of Maui's challenges to address in order to meet this critical need and demand for affordable housing. It further recognizes that providing affordable housing opportunities for residents, specifically those earning below 70 percent to 140 percent of the Maui's median income, needs to be addressed and should be front and center of Maui's policy decision makers.

The proposed project is consistent with the following goals, objectives, and policies of the Kahului-Wailuku Community Plan:

Goal:

Housing:

A sufficient supply and choice of attractive, sanitary and affordable housing accommodations for the broad cross section of residents, including the elderly.

Objectives and Policies:

- (1) Utilize a project district planning approach for major housing expansion areas which will allow flexibility in project planning and will provide for flexible development standards and a mix housing types which can result in more efficient site utilization and potential reductions in housing development costs.
- (2) Provide efficient land areas for new residential growth which relax constraints on the housing market and afford variety in type, price, and locations of units. Opportunities for the provision of housing are presently constrained by a lack of expansion areas. This condition should be relieved by a choice of housing in a variety of locations, both rural and urban in character.

- (3) Seek alternative residential growth areas within the planning region, with high priority given to the Wailuku and Kahului areas. This action should recognize that crucial issues of maintaining important agricultural lands, achieving efficient patterns of growth, and providing adequate housing supply and choice of price and location must be addressed and resolved.
- (8) Promote efficient housing designs in order to reduce residential home energy and water consumption.

Discussion and Response:

The proposed affordable housing project is consistent and meets the stated goals, objectives and policies of the Wailuku-Kahului Community Plan. As clearly noted earlier in this report, this proposed housing project will be 100 percent affordable based on Maui's Affordable Housing Guidelines those earning 70 percent to 140 percent of Maui's median income. The project site is centrally-located and surrounded with existing residential neighborhoods and it is in very close proximity to public facilities within community plan region. Equally important, existing infrastructures required for the project are available at the site. Designs of the dwelling units are compatible and consistent with its residential neighbors.

COUNTY ZONING

The proposed housing project site is zoned "Public-Quasi-Public", according to Maui County zoning. While the current zoning does not allow for the proposed residential uses, this 201H application has been prepared for submittal with the Maui County Council through the Maui County Department of Housing and Human Concerns. Included in this 201H filing is a request to exempt the proposed project from the County's Title 19 zoning provisions which will allow the proposed project to be developed for affordable workforce residential housing project.

COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES

Pursuant to Chapter 205A, Hawaii Revised Statutes, projects should be evaluated with respect to Coastal Zone Management (CZM) objectives, policies and guidelines. The subject parcel is not located within the County of Maui's Special Management Area, however, the applicability of coastal zone management considerations has been reviewed and assessed.

Recreational Resources:

Objectives:

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 shoreline with recreational value;

- (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreations;
- (v) Ensuring public recreational use 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

Discussion and Response:

The proposed project site is located inland, miles away from the coastline. As such, there should be no adverse impact on coastal recreational opportunities or adverse affect on existing public access to the shoreline.

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 archaeological 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.

Discussion and Response:

The proposed project does not have an adverse affect on historical or cultural resources. Archaeological Services Hawaii, LLC, project's archaeological consultant for the project conducted an archaeological inventory survey of the site to assess any presence and/or absence of any historical and archaeological resources on the proposed project site. Based on the archaeological consultant's survey (refer to Appendix C) there are no archeological and historical resources on the project site.

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 use 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 affects are minimized; and
 - (iii) The development is important to the State's economy.

Discussion and Response:

The proposed project is not a coastal dependent development. The project

site is miles inland from the shoreline. The proposed project will stimulate the economy through the generation of construction jobs and related job opportunities during the development of the housing subdivision. The proposed project is consistent with the objective and policy for economic use.

Coastal Hazards:

Objectives:

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, point and non-point pollution hazards;
- (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
- (D) Prevent coastal flooding from inland projects; and
- (E) Develop a coastal point and nonpoint source pollution control program.

Discussion and Response:

As noted earlier in this report, the project site is in Flood Zone "X", which represents areas outside of the 0.2% annual chance flood plain, according to FEMA. In addition, tsunami inundation parameters do not apply to the subject project.

Beach Protection

Objective:

Protect beaches for public use and recreation.

Policies:

- (A) Locate new structures inland from the shoreline setback to conserve open space and to 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.

Discussion and Response:

The proposed project is located miles inland, away from the shoreline and as a result, there is no anticipated adverse impact on beaches.

Marine Resources:

Objective:

Implement the State's ocean resources management plan.

Policies:

- (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- (B) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

- (C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;
- (D) 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;
- (E) 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
- (F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion and Response:

As previously stated, the proposed project is located miles inland, away from the ocean and is therefore, no anticipated adverse impact on marine or coastal resources. Appropriate Best Management Practices (BMP) will be utilized to ensure that construction runoff is appropriately captured, minimizing any impact on coastal waters.

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.
- (D) Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion and Response:

The proposed affordable housing project will not adversely impact the scenic and open space resources. The project will not involve significant alteration of the existing topographic character of the project site and will not impact public views to and along the coastal shorelines.

Public Participation

Objective:

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

Policies:

- (A) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management;
- (B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concern with coastal-related issues, developments, and government activities; and

- (C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion and Response:

The project will meet county public awareness, education and participation objectives. Opportunities for agency and further public review of the proposed action are provided through the notification review and comment processes of the County.

MAUI ISLAND PLAN

The Maui Island Plan was adopted by Ordinance No. 4004 and took effect on December 28, 2012, provides direction for future growth, the economy, social, and environmental decisions on the island through 2030. The project site is located within the "Urban Growth Boundary" in the Maui Island Plan's Kahului-Wailuku region. It is further designated that the subject property is "Outside of Protected Areas" in the Maui Island Plan (MIP). The proposed affordable workforce housing project is consistent with the MIP's designation. The proposed project meets the goals, objectives, and policies as stated in Chapter 5 of the Maui Island Plan.

***V. Proposed Exemptions
Request Pursuant to
201H-38, HRS***

WAIKAPU DEVELOPMENT VENTURE, LLC IS PROPOSING THE DEVELOPMENT OF A 201-H AFFORDABLE HOUSING PROJECT ("the PROJECT"); AND AS SUCH, THE PROJECT IS REQUESTING THE FOLLOWING EXEMPTIONS LISTED BELOW FROM STATE OF HAWAII REVISED STATUTES ("HRS") AND MAUI COUNTY CODE ("MCC") PURSUANT TO *SECTION 201H-38, HAWAII REVISED STATUTES ("HRS")*.

A. EXEMPTION FROM TITLE 2, MCC, ADMINISTRATION AND PERSONNEL

1. An exemption from Chapter 2.80B, MCC, General Plan and Community Plans, shall be granted to permit the Project to proceed without obtaining a *Community Plan Amendment*.

B. EXEMPTIONS FROM TITLE 8, MCC, HEALTH AND SAFETY; CHAPTER 8.04 REFUSE COLLECTION AND LANDFILLS

1. An exemption from Section 8.04.040, MCC, Disposal Permits - Application and suspension, shall be granted to exempt the Project from the requirement of acquiring a *Disposal Permit*.
2. An exemption from Section 8.04.050, MCC, Disposal Charges, shall be granted to exempt the Project from *Disposal Charges*.

C. EXEMPTIONS FROM TITLE 12 - STREETS, SIDEWALKS AND PUBLIC PLACES

1. An exemption from Chapter 12.08, MCC, Driveways; shall be granted to exempt the Project from *Driveway Permit* and *Inspection Fees*.
2. An exemption from Chapter 12.24A, MCC, Landscape Planting and Beautification; shall be granted to exempt the Project from requiring compliance with the *Landscape Planting Plan* as it pertains to requiring *One (1) Tree per Residential Lot*.

D. EXEMPTIONS FROM TITLE 14, MCC, PUBLIC SERVICES

1. An exemption from Section 14.05.090, MCC, Fire Protection, shall be granted to exempt the Project from providing *Fire Protection* for the portions of the Property along *Waiale Road*.
2. An exemption from Chapter 14.35, MCC, Wastewater Assessment Fees for Facility Expansion for the Wailuku/Kahului Wastewater Treatment System; shall be granted to exempt the Project from having to pay *Wastewater Assessment Fees*.
3. An exemption from Chapter 14.76, MCC, Impact Fees for Traffic and Roadway Improvements in Wailuku-Kahului, Maui, Hawaii; shall be granted to exempt the

Project from having to pay any *Traffic Impact Fees* should such fees be adopted prior to the issuance of Building Permits for the Project.

E. EXEMPTIONS FROM TITLE 16, MCC, BUILDINGS AND CONSTRUCTION

1. Exemptions from Chapters 16.04C, Fire Code; 16.18B, Electrical Code; 16.20B, Plumbing Code; and 16.26B, Building Code; shall be granted to exempt the Project from *Fire, Electrical, Plumbing, and Building Inspection Fees*.
2. An exemption from Chapter 16.04C, MCC, Fire Code, shall be granted to exempt the Project from any *Permit Fees* required by the Fire Code.
3. An exemption from Section 16.04C.440, MCC, Fire Code, shall be granted to exempt the Project from providing an *Unobstructed Width of Twenty (20) feet* for the *Interior Subdivision Roadways* (Roads B, C, and D). The Access Loop Road (Road A) will have an *Unobstructed Width of Twenty (20) feet*.
4. An exemption from Section 16.04C.470, MCC, Fire Code, shall be granted to exempt the Project from providing fire protection for the portions of the property along Waiale Road.
5. An exemption from Section 16.25B.3600, MCC, Improvements to Public Streets, as it relates to *Urban Standards for Curbs and Gutters*, shall be granted for the portion of the Project adjacent to *Waiale Road* (Please Refer to Exhibit 1 – Typical Section of Waiale Road).

F. EXEMPTIONS FROM TITLE 18, MCC, SUBDIVISIONS

1. Exemptions from Section 18.04.030, MCC, Administration, and Section 18.16.020, MCC, Compliance; shall be granted to exempt the Project from requirements of obtaining a *Change in Zoning*, a *Community Plan Amendment*, and a *State Land Use District Boundary Amendment*.
2. An exemption from Section 18.16.050, MCC, Minimum Right-of-Way and Pavement Widths, shall be granted to allow the *Internal Subdivision Roadways* (Roads B, C, and D) to have a *Minimum Right-of-Way Width of Thirty-Six (36) feet* and *Minimum Pavement Width of Twenty (20) feet*.
3. An exemption from Section 18.16.070A, MCC, Intersection Angles, shall be granted to allow the Right-of-Way Lines at Intersections to have a Minimum Corner Radii of Ten (10) feet.
4. An exemption from Section 18.16.220, MCC, Lots - Size and Shape, is requested to allow *Lot Sizes, Widths, Shapes, and Orientation, and Minimum Building Setback Lines*, within the project that are *not consistent with, and not in conformance with* the provisions of Title 19, Chapter 19.31, MCC, Public/Quasi-Public District.

5. An exemption from Section 18.16.230, MCC, Lots - Minimum Sizes, is requested to allow Lot Sizes within the Project that are *not consistent with, and not in conformance with* the provisions of Title 19, Chapter 19.31, MCC, Public/Quasi-Public District.
6. An exemption from Sections 18.20.040, and 18.20.080, MCC, as they relate to the *Urban Standards for Curbs, Gutters*; shall be granted for the portions of the Project adjacent to *Waiale Road* (Please Refer to Exhibit 1 – Typical Section of Waiale Road).
7. An exemption from Section 18.20.070, MCC, shall be granted to exempt the Project from constructing *Sidewalks on Both Sides of the Internal Subdivision Roadways*. *Five (5) Feet wide concrete Sidewalks will be provided on One Side* of portions of the *Internal Subdivision Roadways*.

G. EXEMPTION FROM CHAPTER 19, MCC, ZONING

1. An exemption from Chapter 19.31, MCC, Public/Quasi-Public District, shall be granted to permit the development and use of the subject parcel for Residential purposes. Permitted Uses shall be based on Chapter 19.08, MCC, Residential District, and Chapter 19.10, MCC, Two-Family (Duplex) District. The Project shall be exempt from all Development Design Standards set forth in Chapter 19.31, MCC. Further, this exemption shall allow the Subdivision of the Property in the Plat Configuration as generally shown in the Project Site Plan. The following Zoning District Standards shall apply to the Project:
 - **PERMITTED USES:**.....*Single-Family and Two-Family (Duplex) Residential Units.*
 - **MINIMUM LOT SIZE:**...3,000 Square Feet.
 - **MAXIMUM HEIGHT:**...No Building Shall Exceed Two (2) Stories or Thirty (30) feet in Height.
 - **MINIMUM LOT WIDTH:**.....Forty (40) feet.
 - **BUILDING SETBACKS:**...The Building Setbacks (Yards) to be as follows:
 - i. Lot Nos. 1-12 and 21-36 to have Six (6) feet *Rear Yard Setbacks*; and Zero Lot Line Setbacks (0 feet) between *Lots* (Side Yards) at *Garages Only*.
 - ii. Lot Nos. 13-20 to have Six (6) feet *Rear Yard Setbacks*; Zero Lot Line Setbacks (0 feet) between *Lots* (Side Yards) and at *Rear Yard Setback* at *Garages only*; and *Front Yard Setbacks* to be 10 Feet.
 - iii. Lot Nos. 37-49 to have Ten (10) Feet *Front Yard Setbacks*; and Zero Lot Line (0 feet) Setbacks between *Lots* (Side Yards) and at *Rear Yard Setback* at *Garages only*.
 - iv. Lot Nos. 50-74 to have Ten (10) Feet *Front Yard Setbacks*; and Zero Lot Line (0 feet) Setbacks between *Lots* (Side Yards) and at *Rear Yard Setback* at *Garages/Carports only*.
 - v. Lot Nos. 1, 35, and 36 to have Ten (10) Feet *Setback* along Waiale Road. Lot Nos. 55, 56, 67, and 68 to have Ten (10) Feet *Setback* at “Road A”.

- vi. Lot Nos. 62-67 (Duplex Lots) to have Six (6) Feet *Side Yard Setback* for Second-Story (2nd Story) exterior decks and exterior stairs only.

▪ **TOTAL NUMBER OF LOTS IN PROJECT:**

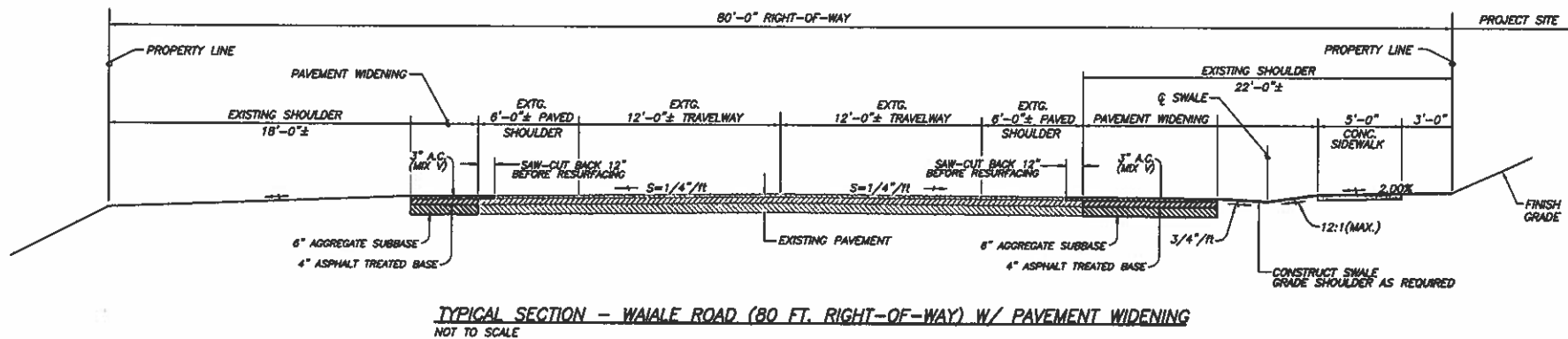
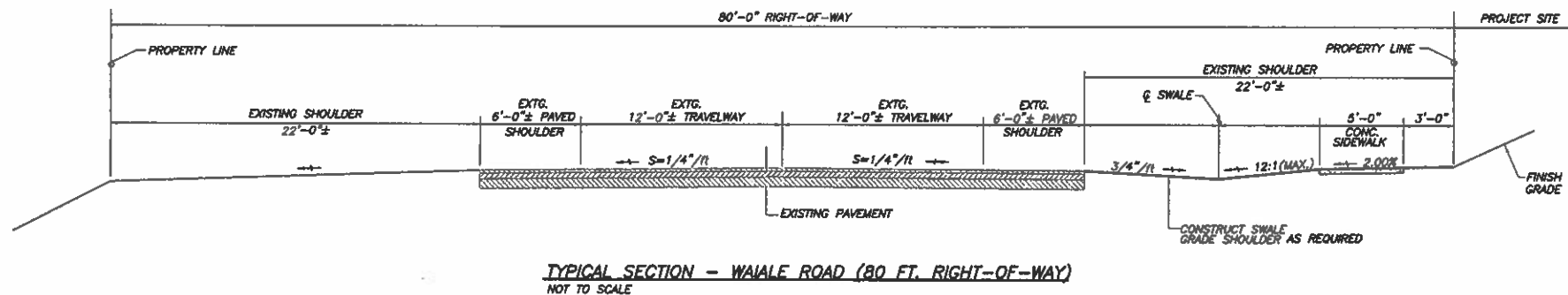
- » Residential Lots:..... 68
 - » Two-Family (Duplex) Lots: 6
- Total No. Lots: 74**

▪ **TOTAL NUMBER OF UNITS IN PROJECT:**

- » Single-Family Residential: 68
 - » Two-Family (Duplex): 12
- Total No. Units: 80**

H. EXEMPTIONS PURSUANT TO MAUI COUNTY CODE REGARDING PROJECTS COMPRISED OF 100% RESIDENTIAL WORKFORCE HOUSING UNITS

1. Section 12.08.050(D), MCC, as it pertains to *Driveway Permit Fees*.
2. Section 14.12.030, MCC, as it pertains to the exemption from Chapter 14.12, MCC.
3. Section 16.18B.107, MCC, as it pertains to the *Electrical Permit Fee* in Section 107-1(c).
4. Section 16.20B.103.4, MCC, as it pertains to the *Plumbing Permit Fee* in Section 103.4.1.3.
5. Section 16.26B.108, MCC, as it pertains to the *Building Permit Fee* in Section 108.2.
6. Section 18.16.320(1) (5), MCC, as it pertains to the *Park Assessment Fee*.
7. Section 20.08.090(D), MCC, as it pertains to *Grading and Grubbing Permit Fee*.





EXISTING ELECTRICAL
BASEMENT C-2

TO MAUI

HONOAPILANI HIGHWAY

TO WAILUKU

**REDUCED COPY
NOT TO SCALE**

PRELIMINARY SITE PLAN
SCALE 1" = 40'

EXISTING ROVENLINE
BASEMENT 3-1

8" WIDE CONCRETE
SIDEWALK



HAUAI ACTING 7-15-17
DATE
DATE
DATE

WAIKAPU DEVELOPMENT VENTURE
T.M.K.: (2) 3-5-002: 011
WAIKAPU, WAILUKU, MAUI, HAWAII
PRELIMINARY SITE PLAN

REVISION	DATE	NOTE

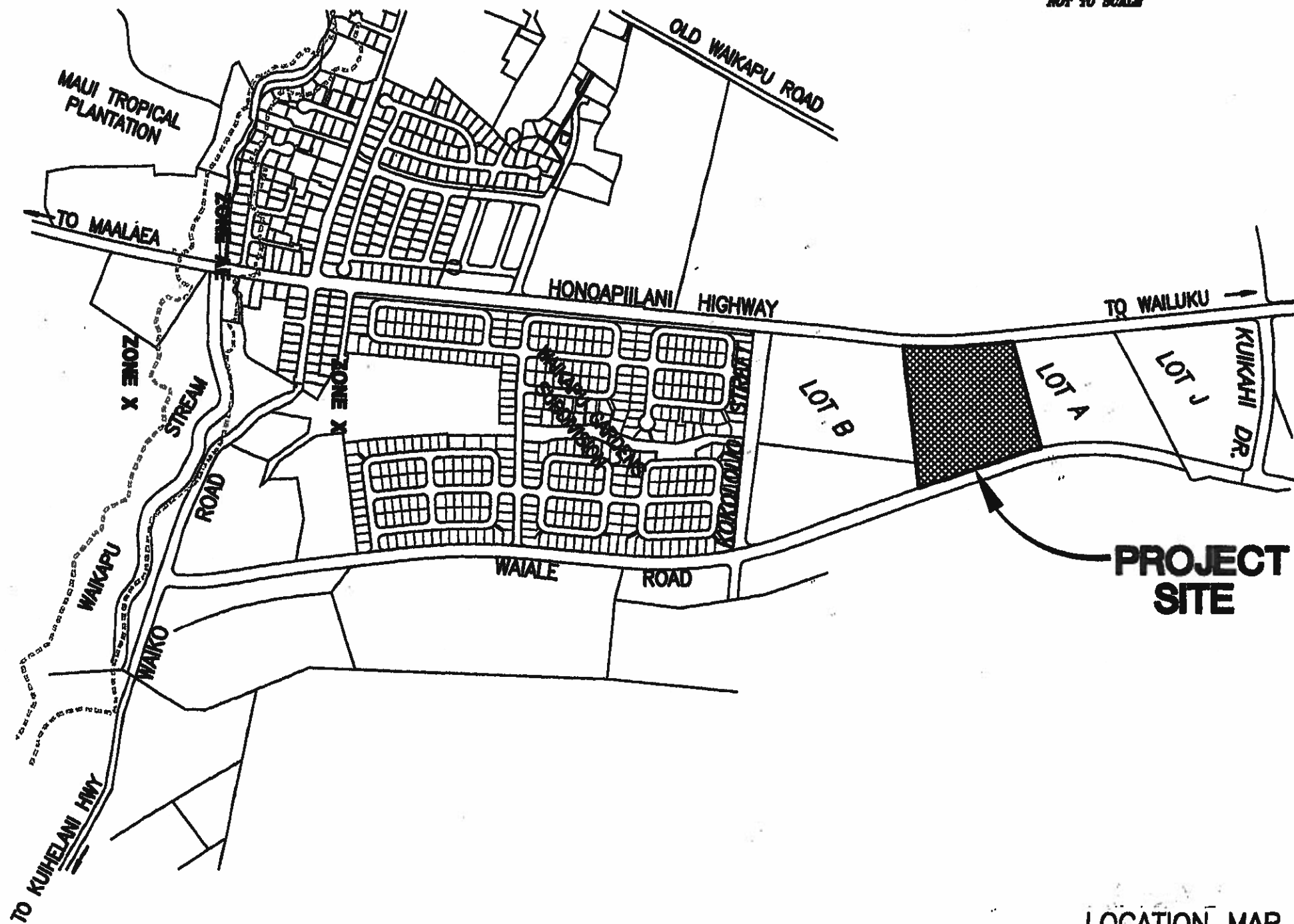
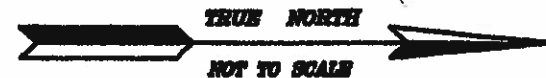
DESIGNED BY: NAKA
DRAWN BY: L.C.A.
PROJECT NO.: 2017-15
DRAWING NAME: P-SITE-00
DATE: 7-15-17

SHEET NO.
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OF SHEETS

VI. Appendices

Appendix A

Location Map



LOCATION MAP

Appendix B

Preliminary Site Plan



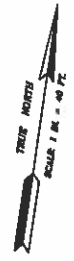
WAKAPU DEVELOPMENT VENTURE
T.M.K.: (2) 3-5-002-011
WAKAPU, WAILUKU, MAUI, HAWAII
PRELIMINARY SITE PLAN

REVISION DATE NOTE
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DESIGNED BY: HAWAII
DRAWN BY: J.M.K.
PROJECT NO.: 2013-18
DRAWING NAME: SITE-05
DATE: 6-8-17

SHEET NO.
1

OF SHEETS



PRELIMINARY SITE PLAN
SCALE 1" = 40'

Appendix C

Archaeological

Inventory Survey (AIS)

ASH

**FINAL ARCHAEOLOGICAL INVENTORY SURVEY
OF A 50-ACRE PARCEL OF LAND
WAIKAPU AND WAILUKU *AHUPUA*'A, WAILUKU DISTRICT MAUI ISLAND
TMK [2] 3-5-002:011 and 012 (formerly 3-5-002:001 pors.)**

by
Diane Guerriero, B.A., Lisa Rotunno-Hazuka
and Jeffrey Pantaleo, M.A.

for
The Emmanuel Lutheran Church and Valley Isle Fellowship
One Main Plaza Ste 400
Wailuku, HI 96793

REVISED MAY 2016

July 2004

**Archaeological Services Hawaii, LLC
16 South Market Street, Suite G
Wailuku, Hawaii 96793**

ABSTRACT

Archaeological Services Hawaii, LLC, of Wailuku, conducted an archaeological inventory survey (AIS) within a 50-acre parcel of land in Wailuku and Waikapū *ahupua'a*, Wailuku District, Maui Island, TMK [2] 3-5-002:001 pors. The AIS field work was conducted from 4-7 May 2004 during due diligence procedures as the Emmanuel Lutheran Church (ELC) and the Valley Isle Fellowship (VIF) were in the process of purchasing the project area from Wailuku Agribusiness. Upon completion of the field work, a post-field summary letter was provided to ELC and VIF and the property was subsequently purchased. Due to the proposed plans to subdivide and develop the parcel, the AIS report was prepared and submitted to the State Historic Preservation Division (SHPD) in 2004. The parcels were subsequently subdivided into two approximate 25.0 acre parcels and assigned TMK's [2] 3-5-002:011 for the north and [2] 3-5-002:012 for the south. Approximately 12-years later, the development plans for the parcels were re-vitalized; however it was determined that the AIS report was never reviewed. Thus, in February 2016, another copy of the report was provided to the SHPD.

The proposed development consists of the construction of two churches, the Emmanuel Lutheran Church (ELC) and the Valley Isle Fellowship (VIF), as well as an affordable residential subdivision. The ELC and residential subdivision are planned for the northern section, Parcel 11, and the VIF will be constructed in the southern half, Parcel 12. The purpose of the investigation was to determine the presence/absence, nature, extent, and significance of cultural resources (if applicable) in the project area that could be adversely affected by proposed development.

The scope of work for the current investigation included a pedestrian survey with subsurface backhoe testing. Results of the pedestrian survey identified one historic property, a disturbed segment of State Site 50-50-04-5474, the Kama Ditch, situated within the southwestern portion of the project area. Also noted was a metal sluice gate, designated Feature 1 of Site 5474. The ditch, constructed around 1905 to 1907, provided water to the sugarcane and subsequent pineapple fields and was supposedly abandoned approximately 30 years ago. Site 5474 was assessed as significant under Criterion "a" because of its association with the plantation era and Criterion "d" for its information content under the Federal and State historic preservation guidelines.

A total of 25 backhoe trenches (TR1-25) were selectively placed in areas that contained no active farming. Trenches ranging in length from 5 to 7 meters were excavated until sterile subsoil was

reached. No significant cultural remains were encountered during trenching and representative stratigraphic profiles were recorded.

Based on the negative results of fieldwork, no further inventory level work is recommended prior to commencing construction activities. However, due to the presence of numerous archaeological sites and Native Hawaiian burials in neighboring parcels, archaeological monitoring during all ground-altering activities is recommended. Prior to the commencement of construction, Archaeological Monitoring Plans (AMP) will be prepared and submitted to SHPD for review and approval. An AMP for the proposed affordable residential subdivision in Parcel 11 was recently submitted to the SHPD; however review of the AMP is pending approval of this AIS report.

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INTRODUCTION

At the request of potential landowners, the Emmanuel Lutheran Church (ELC) of 520 One St. Kahului, Hi. 96732 and Valley Isle Fellowship (VIF) of 473 S. High St. of Wailuku, Hi. 96793, and through an agreement with current landowner, Wailuku Agribusiness; Archaeological Services Hawaii, LLC (ASH) conducted an archaeological inventory survey (AIS) according to the rules and regulations set for Hawaii Administrative Rules (HAR) §13-276. The AIS was performed of an approximate 50-acre parcel of land slated for subdivision and development in Wailuku, Waikapū and Wailuku *ahupua'a*, Wailuku District, Maui Island, TMK [2] 3-5-002:011 and 012 (formerly a portion of Parcel 1-TMK 3-5-002:001) (Figs. 1 and 2).

The purpose of this investigation was to determine the presence/absence, extent, and significance of cultural resources in the project area. The AIS was comprised of a pedestrian survey and mechanical trench excavations (n=25). The survey was conducted from May 4-7, 2004, by Mr. Paul Titchenal, (M.A.) and supervisor Ms. Diane Guerriero, (B.A.) and one historic property, Site 50-50-04-5474, a portion of Waihe'e Ditch, along with a metal sluice gate, Feature 1 of site 5474 was documented along the southwestern/western side of the parcels (see Figure 1).

PROJECT AREA

The project area is located along the northeastern alluvial slopes of the West Maui mountains in Waikapū and Wailuku *ahupua'a*. It is bounded by Honoapi'ilani Highway to the west, Waiale Road to the east, a cane haul road and retention basin to the north, and a recent residential housing project to the south, constructed after the AIS procedures (Fig. 2).

The project area consists of two adjoining 25-acre parcels within a portion of the former Wailuku Agribusiness landholdings (TMK [2] 3-5-002:001 pors.) and contains numerous individual farm plots with bananas, sweet potatoes, and fallow sugar cane and a sod farm. The northern 25.0 acre parcel is owned by Emmanuel Lutheran Church (ELC) and the southern acreage is the Valley Isle Fellowship (VIF) parcel.

The south-eastern and eastern portions of the project area have been impacted by previous sand-mining and agricultural activities, the western portion by agricultural activities and the central portions are actively under agricultural production. The Kama Ditch (State Site 50-50-04-5474)

bisects a portion of the southwestern section of the project area and is oriented roughly north-south (see Figures 2 and 3). The County of Maui sewer line easement bisects the central south section and a portion of the central, east section.

ENVIRONMENT

The project area is situated along the northwestern margin of the isthmus of Maui Island, located below Waikapū Valley on the southwest and Iao Valley on the northwest. The terrain of the project area, altered by commercial agricultural production and previous sand-mining activities, is relatively flat along the western and eastern peripheries with a slope to the east in the central portion. Elevation ranges from 300 feet above mean sea level (AMSL) along the eastern boundary to 400 feet above mean sea level along the western boundary. Rainfall averages between 20-30 inches a year, predominantly occurring during the winter months between November and February (Armstrong 1973).

Vegetation in the project area is dominated by non-native plant species, these include: *koa haole* (*Leucaena glauca*), *kiawe* (*Prosopis pallida*), *wilelaiki* or Christmasberry (*Schinus terebinthifolius*), cane grass (*Setaria sp.*) growing in areas formerly cultivated with sugarcane, fallow pineapple (*Ananas sp.*), active and fallow sweet-potato (*Ipomoea sp.*), banana (*Musa sp.*), papaya (*Carica sp.*), various vegetables and non-native grasses and weeds. Native plant species observed include 'ilima (*Sida fallax*), 'uhaloa (*Waltheria americana*), and *popolo* (*Solanum nelsonii*).

Soils in the project area include Iao clay (Icb), 3-7% slopes, and Pu'uone sand (PZUE) 7-30% slopes. The Iao clay, occur on slopes between 3-7degrees, on smooth alluvial fans and valley fill. Permeability is moderately slow, runoff is medium, and erosion hazard is slight to moderate. This soil is used for sugarcane and home sites. The Pu'uone sands, occur on slopes between 7-30 degrees, on mid coastal plains near the ocean, and developed in material derived from marine coral and shells. This type of sand is transported and deposited by both alluvial and aeolian forces. Permeability is rapid above the cemented layer, runoff is slow, and erosion hazard is moderate to severe. This soil is used for pasture and home sites (Foote et al. 1972).

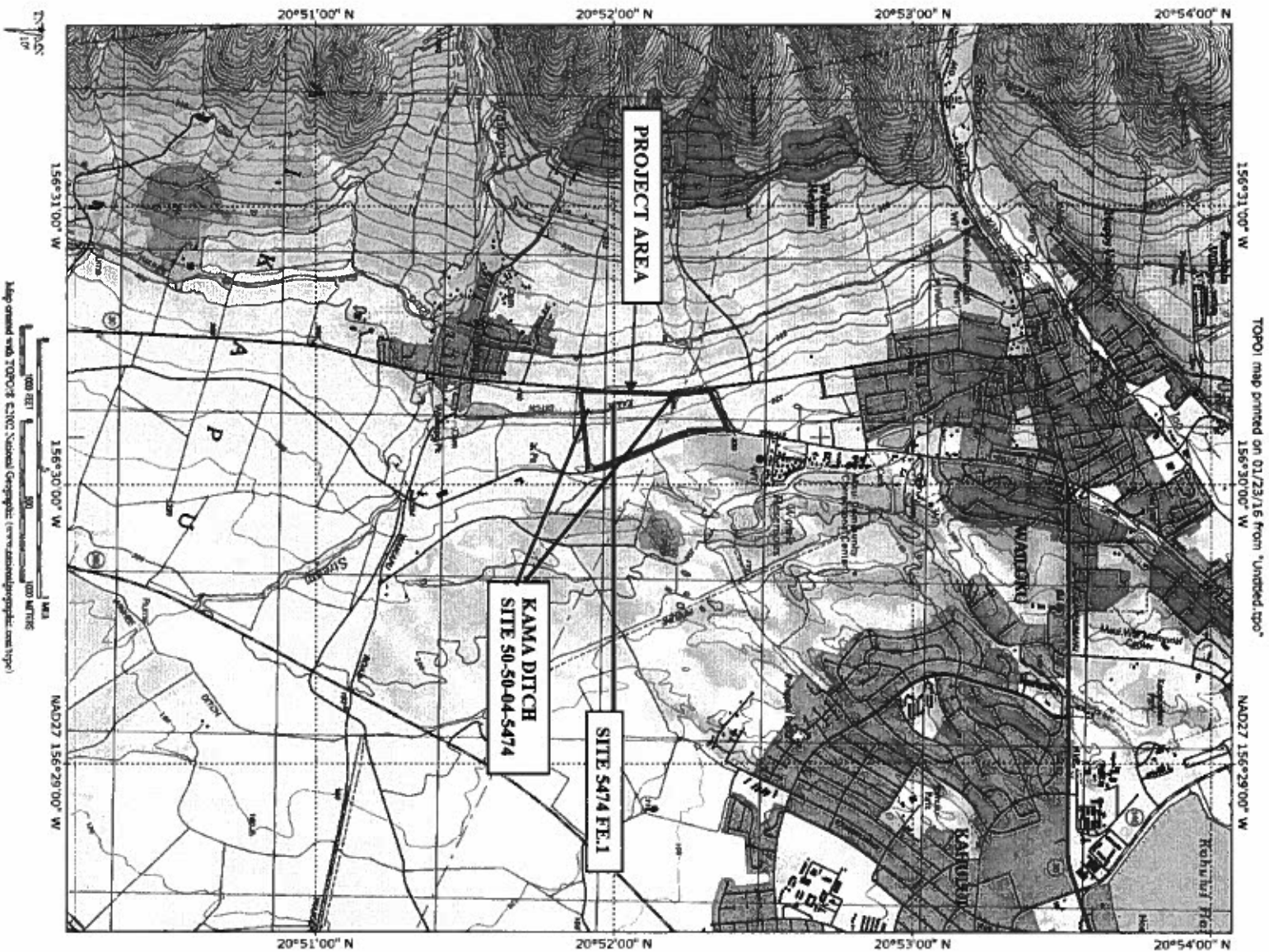


Figure 1. Location of Project Area on U.S.G.S. Quadrangle



Figure 3. Overview of Project Area (top) View to East-Northeast; (bottom) View to Northwest

HISTORICAL SUMMARY

Traditionally, the division of Maui's lands into districts or *moku* and subdistricts were said to have been "performed by a *kahuna* named Kalaiha'ohia, during the time of the *ali'i* Kaka'alaneo (Beckwith 1970:383). Further land divisions within the *moku* were *ahupua'a*, which ideally incorporated all the natural resources necessary for traditional subsistence strategies.

Ahupua'a boundaries were said to have been established about 500 years ago and remain largely unchanged (Sterling 1998:3); thus, it is expected that the current boundaries of Waikapū approximate its prehistoric ones.

The district of Wailuku contains the other *ahupua'a* of Waiehu, Waihe'e, and Kahakuloa to the north, and Waikapū and Pulehunui to the south.

The Wailuku District is considered one of Hawai'i's *wahi pana*, legendary places. Specific to Waikapū are many important legendary and traditional accounts.

The island of Maui was named for the demigod Maui (Pukui et al. 1974), a trickster hero known throughout Polynesia. The Hawaiian creation chant Kumulopo described Maui an ancestor of the Hawaiian people and descendant of Wakea, the mythical ancestor of all Hawaiians (Beckwith 1970:227, Pukui and Elbert 1986:381). Kamakau (1991:129) says that the island was originally called *'Ihi-kapalau-maewa*, and that it was called Maui only after Maui became famous for his exploits.

Historical research of Waikapū *ahupua'a* was summarized in Smith (in Brisbin et al. 1991), and Titchenal (1996). Creed (1993) has written extensively on the settle pattern and traditional background of the Waikapū *ahupua'a*. The reader is referred to these studies for detailed information. A brief summary of the history and land use of the subject area is included here.

The current project area is located in Waikapū *ahupua'a*, in an area which is referred to as Waikapū Commons, in the district of Wailuku. The literal meaning of Waikapū is "water of the conch" (Pukui et al. 1974:223). Legends and oral traditions of Waikapū *ahupua'a* include the story describing the origin and meaning of Waikapū. During ancient times a great conch shell (*pu*) was hidden in a cave on the south side of the stream, about a mile inland. Hence the name *Wai-ka-pu*, "water-of-the-conch" (Handy and Handy 1972:497-498). Another account places the

cave in the valley, a mile or more above the village. The conch was heard in the valley frequently, but never witnessed by the people. A dog, named Puapualenalena, coveted the conch and finally succeeded in stealing it after which its sound was not heard again.

Another interpretation comes from Stoddard (1894, in Wong-Smith, 1992), who says the name comes from a *kapu* Kamehameha I put on the stream during the battle of 'Iao Valley in 1790 (Fredericksen 2004:5).

“It was at Kalepolepo that Kamehameha the Conqueror beached his canoes. If the oldest inhabitant of Ma'alaea claims this distinction for his port, believe him not. I have the facts, from an eye-witness. The sea was dark with victorious canoes; Kamehameha landed at Kalepolepo, and a kapu was put upon the nearest stream. It became sacred to royalty, as was the custom and is known as Waikapū to this hour – that is forbidden water.”

A number of battles took place in the Waikapū region, including Fornander's (1969:153) account of the battle of the Waikapū Commons or the *Ahulau ka pi'ipi'i Kakanihūa*. The following account describes the battle on the sand hills southeast of Wailuku:

...The detachment or regiment known as the Alapa, mustering 800 men, was selected for this hazardous expedition, and with high courage they started across the isthmus of Kamaomao, now known as the Waikapū common, as the legend says, “to drink the waters of Wailuku that day. “...Little did this gallant troop apprehend the terrible fate that awaited them...Kahekili distributed his forces in various directions on the Wailuku side of the common, and fell upon the Hawaii corps d'armee as it was entering among the sandhills southeast of Kalua, near Wailuku. After one of the most sanguinary battles recorded in Hawaiian legends,...the gallant and devoted alapa was literally annihilated; only two out of the 800 escaped alive to tell Kalaniopuu of this Hawaiian Balaclava (Fornander 1969:153).

Early Historical Accounts

Since Hawaiians had no formal written language, early historical accounts of Hawaii were recorded by early Hawaiian historians and foreigners to the islands. These descriptions are invaluable as they provide vivid representations of the area and its use.

This area, called *Na Wai 'Eha*, fed by the four streams of Waikapū, Waihe'e, Waiehu, and Wailuku, prospered with the abundance of water. This valuable resource contributed to the population concentration of Wailuku and its surrounding area, which evolved into a substantial

Hawaiian settlement and central place of religious and political power on Maui during the pre-contact period and post contact period.

Foreigners visiting Maui in the early 1800's provided several descriptions of the region of Waikapū. The reader is referred to Wong-Smith (1991: Appendix A, in Brisbin et al. 1991) noteworthy summary of historic references to Waikapū for a more complete treatment of the subject.

Early historical references to Waikapū indicated that the valleys of Waikapū and Wailuku supported substantial populations in the 17th century:

The first village of any note on the way to Wai-lu-ku is Wai-ka-pu. It contains a population of about 500. Here the forces of Kamehameha the Great once assembled for battle at the sounding of the conch shell. Hence the name, Wai-ka-pu (water of the conch or trumpet) (Bates 1854:309).

Historic Land Use

With the arrival of the missionaries in Hawaii in 1820 every aspect of Hawaiian society was influenced. A Western-style government began to take form. In 1839, Kamehameha III (Kauikeaouli) promulgated a declaration of rights known as Hawaii's Magna Carta and, just a year later, Hawaii's first constitution was written.

The Wailuku District was utilized in historic times for many ventures. These included fishing, cultivation of taro, sweet potatoes, sugar cane, and cattle ranching.

According to Kame'eleihiwa (1992) by the mid-1800s, foreign demand for land was so great and the political power of chiefs so weak that the government privatized land ownership, first by distributing large tracts of lands to chiefs through a process called the Mahele and smaller parcels to *maka'ainana* as Land Commission Awards, and later by sale of mostly small parcels as Royal Patent Grants. Privatization opened the door to the transfer of Hawaiian lands to foreigners.

During the Mahele in 1848, Hawai'i was divided into thirds and distributed in three categories. Under the conditions of the Mahele together with the Kuleana Act of 1850: 24% of lands (1 million acres) went to King Kamehameha III; 39% (1.6 million acres) was divided between 251

chiefs; and 36% (1.9 million acres) was identified as government lands (Farber 1997:21). The amount of lands offered to *ali'i* were determined through genealogical rank.

Under the Land Commission Guidelines, for *Maka'ainana* to claim land, the claimant must have lived on the land before 1839 and could only claim it under cultivation and/or house lot. "At the time, the term *Maka'ainana* included foreigners who had sworn an oath of allegiance to the *Mo'i*" (Kame'eleihiwa 1992:295). According to Pickett, the process was as follows: *Maka'ainana* were required to give statements themselves, as well as submit evidence from witnesses defined as Native and Foreign testimonies. Lands were to be surveyed that were only accomplished by 'qualified' non-native surveyors. *Kanaka Maoli* (full blooded Hawaiians) were expected to pay for their individual surveys. Each claim was issued a Land Commission Award (L.C.A.) number, commutation fees were required, and another number called a Royal Patent (R.P.) was also issued (Pickett 2003).

"In 1848, there were approximately 88,000 Hawaiians, but only 14,195 applications were made...of the 14,195 *kuleana* claims, only 8,421 were actually awarded" (Kame'eleihiwa 1992:295). The *Maka'ainana* received less than 1% of the land.

Within a short time, large tracts of land were turned over to commercial agriculture, primarily sugarcane cultivation.

Countless Native Hawaiians lost their land use rights as a result of the Great Mahele of 1848, with the establishment of a system of private land ownership. Many landless Native Hawaiians signed on as laborers in the emerging sugar industry, which began on Maui in the 1820s.

According to Creed (1993, Vol. I, 1993, p.vii) the Mahele became a significant period because it was the first extensive written record on how land was being, and had been used. And accordingly the majority of LCAs in Waikapū were awarded to Hawaiians.

There are many indications in the LCAs that Waikapū was well on its path into "foreign" ways, nevertheless indications are still rife that it is still a thriving traditional community as well. People are still growing hala, raising *wauke* for clothing of tapa (*kapa*), and have small fish ponds, but the most telling traditional feature of the landscape is its taro (Ibid., p.47).

Creed also suggests the possible and the documented site types of Waikapū *ahupua`a*. Creed extracted the previous land use information from the Mahele records. These are: traditional agricultural sites, habitation sites, burials, boundary walls and markers, canoe landings at Ma`alaea, caves, springs and waterways, traditional activity areas, roads, trails, religious structures and areas (Ibid., p.19-21).

Handy and Handy (1972:497) provided descriptions of native Hawaiian planting techniques in Waikapū during the 1930s:

...Spreading north and south from the base of Waikapū to a considerable distance below the valley are the vestiges of extensive wet-taro plantings, now almost obliterated by sugar-cane cultivation; a few here and there are preserved in plantation camps and under house and garden sites along the roads. Among these gardens there were in 1934, a few patches of dry Japanese taro. Far on the north, just above the main road and at least half a mile below the entrance to the main canyon, an extensive truck garden on old terrace ground showed the large area and the distance below and away from the valley that was anciently developed in terraced taro culture. (Handy and Handy, 1972:497)

The traditional waterway of the Kama Ditch, also referred to as *Kamaauwai* ditch or Kama `auwai became an issue of great controversy of water rights (Sterling 1998:86). Two ancient `auwai, *Kamaauwai* and *Kalaniauwai* and the Wailuku mill water courses were all mentioned by Chief Justice Allen during the water court case in 1967 (Ibid).

The 1867 landmark court case, Peck vs. Bailey, set the precedent for ownership of water rights. Peck (Wailuku Sugar) argued that their water rights were paramount over the rights of Bailey's heirs. The judge ruled, "Each owner held the right to the water used on their portion of land". This decision greatly impacted traditional Hawaiian customs by breaking the traditional connection between the shared use of water and growing taro. Under customary Hawaiian law, the chiefs controlled and parceled out the use of water. Water was one of the most important aspects of traditional law, as Hawaii's staple crop, taro, depended on the stable delivery of water.

By the nineteenth century, however, sugar replaced taro as Hawai'i's dominant crop. This decision made possible the rapid expansion of the sugar industry and the subsequent growth of population in central Maui.

Sugarcane cultivation was introduced to the region in the early historic period by a Spaniard named Antone Catalina, who manufactured cane syrup at Waikapū in 1828, thus establishing the

beginning of the commercial sugar industry in the Wailuku District. Antone Catalina was granted LCA 205, a 13.61 acre parcel in the *ili* of Halepalahalaha in 1846 by Hoapili-Wahine (Maui's Governing Chiefess). Catalina along with James Louzada were partners in the Waikapū sugar industry.

James Louzada from Waimea, Hawaii established the Waikapū Sugar Plantation in 1863 and introduced cattle production to the Waikapū area. "Mahele records state that Louzada was allowed to take over *konohiki* land that had not been worked for some time, and turned the taro patches and house in productive and livable condition. For this hard work, the 26 acres of land (LCA 225) were granted to him and his Hawaiian heirs by Puupahoehoe" (Creed, Vol. II, 1993, p.6 in Fredericksen, 2004).

During the Mahele of 1848-1851, the Wailuku District was declared Crown Lands and numerous Land Commission Awards and Grants were awarded in Waikapū *ahupua`a* (Table 2.)(Fig. 6). According to Wai'hona data base a total of 104 out of 132 claims were awarded in Waikapū.

After the Mahele, government land in Waikapū was put under the Ministry of Instruction. "On November 15, 1875, the secretary of the Board of Education informed the Minister of Public Instruction that he was directing that a royal patent be made (Grant 3152) to Henry Cornwell (Kapu Louzada, the sister of James Louzada married Henry Cornwell), for the remainder of property belonging to the Board of Education, which had been sold to him at auction for \$15,050. (Creed, Vol. I, p.68).

In 1889, ½ interest in Waikapū sugar lands was bought by Claus Spreckles. The remaining acres continued to be held y G.W. Macfarlane & Co., the previous partner of Louzada and Catalena in Waikapū Sugar Mill (Fredericksen, 2004:13).

It was at this time that the Spreckels Ditch also referred to as the "Waihee Ditch" was built across the Waikapū *ahupua`a* in order to provide needed water for sugar production (Creed, v. I, p. 68, in Fredericksen, 2004:13).

In 1882, Princess Ruth sold one-half of the Crown Lands of Hawai'i to Claus Spreckels in order to settle her debts with him. Spreckels already held a lease (purchased from Henry Cornwell) for 16,000 acres of Wailuku *ahupua`a* (Waikapū Commons), dating from 1878 (R.P. 3152). Worried

about what Spreckels might do with half of the Crown Lands, King Kalakaua gave him (Grant 3343) in 1882, a 24,000 acre portion of the southeastern section of Wailuku *ahupua`a*, in return for the surrender of his claim. Claus Spreckles established the Hawaiian Commercial and Sugar Company in 1882. In 1898, control of HC&S passed from Claus Spreckels to that of S.T. Alexander and H.P. Baldwin.

After several changes in ownership the Waikapū Sugar Plantation passed into the control of Wailuku Sugar Company in 1894 (Maui News, February 3, 1926). The present project area was held by the Waikapū Sugar Company, (Grant 3152), that was awarded to H. Cromwell. These lands eventually passed into control of Wailuku Sugar Company.

Another water system utilized in the sugar production is the Kama Ditch system. This system crosses the present project area in the western portion. According to Fredericksen (2004), “this system was probably rebuilt by the Wailuku Sugar Company following their takeover of Waikapū Sugar Company in 1894, and followed an ancient route called *Kamaauawai*.”

Originally, the *Kamaauawai* or Kama Ditch system served mostly *kuleana* lands (Wilcox, 1996, p.125 in Fredericksen, 2004:13). The source of this water system originates in Iao Valley, which lies northwest of the present project area, and travels southeast towards Waikapū Stream. This system became a controversial issue of water rights in the 1867 Peck vs. Bailey case as previously mentioned.

Table I. lists the awarded Land Grant (3152) where the present project area is located and selected LCA claims that are located in close proximity to the present project area.

Table I. LIST OF LCAs AND GRANTS IN WAIKAPŪ (Source: Waihona `Aina Corp. 2004)

NAME	L.C.A.	R.P.	GRANT	COMMENTS	ACREAGE
H. Cornwell			3152	Present project area within awarded land	256.113
Wm. McLane	3201			Land given in 1822 by Puupahoehoe	3.85
Keliiolelo	3525			Taro land and houselot	1.77
Wm. Crowningburg	433			Houselot; 14 patches (son-in-law of <i>konohiki</i> Puupahoehoe	5.93
C. Louzada / H. Cornwell			2951	No land use indicated	17
Spreckles		3152		Waikapū Commons	16,000

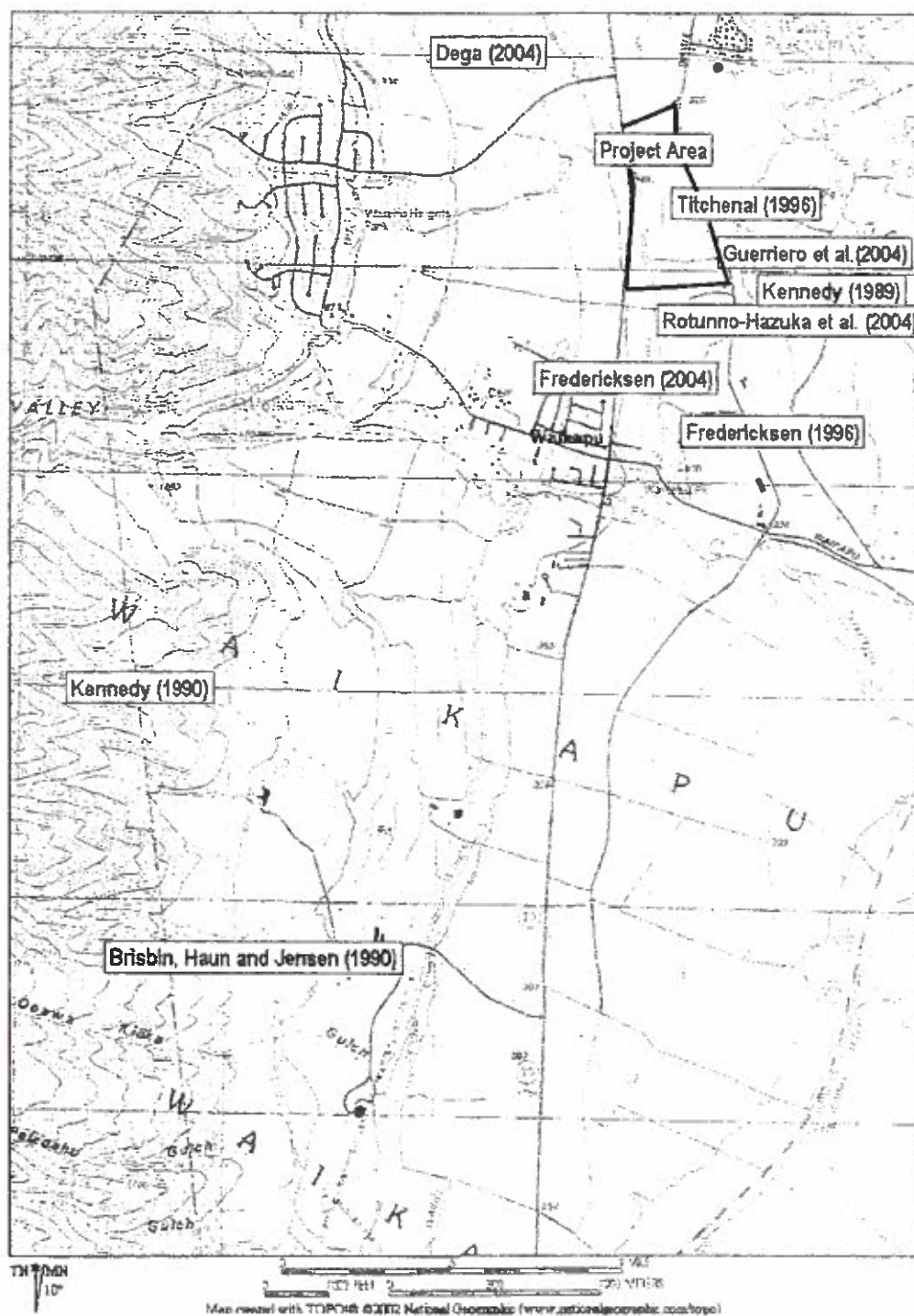


Figure 4. USGS Map Showing Project Area (Red) and Previous Archaeological Studies in Close Proximity to Subject Parcel

PREVIOUS ARCHAEOLOGY

Thomas Thrum and John Stokes explored ancient sacred sites on Maui during the early 1900's. Later, Winslow Walker compiled their information to conduct the earliest island wide archaeological survey where sites were re-visited and documented in a rough draft manual (1931). Thrum's study indicated that there were four *heiau* in the *ahupua'a* of Waikapū. Two *heiau* were reported to be in Waikapū village, located below the road "abreast of T. Everett's", and one below the Catholic Church, which had been both destroyed, and the names forgotten (Thrum, 1909-1918:59, in Creed, vol.I:22). Many ancient sites have been destroyed with the introduction of sugarcane and pineapple cultivation and as well as modern development.

Winslow M. Walker who recorded prominent sites in 1931 for the Bishop Museum, is considered to be another pioneer of early archaeology. Walker reported an unnamed *heiau* and c. 60 petroglyphs on 11 boulders, located 0.25 miles from the village of Maalaea at the base of the foothills of the West Mountains. He also notes an ancient village, with house and shelter sites. During the State wide inventory of historic sites, these were numbered Site 1441 (McGregor Point C-shapes) and Site 1287 (Maalaea Complex). He wrote that along the coast between Ma'alaea and McGregor Point (above the Highway):

...at least 45 (shelters) were noted. The shelters are low walled semi-circular or oval enclosures built against some large rock or group of rocks. Shells and pebbles are found around these sites (Walker unpublished)

Also during the State wide inventory near Ma'alaea Bay, in front of what is currently known as "Buzz's Wharf restaurant", Site 1440, a *piko* stone and Site 1286, and a grindstone were recorded.

In 1994, Archaeological Consultants of the Pacific conducted an archaeological inventory survey for the proposed Maui Ocean Center (TMK 3-6-01:1 & 19) at Ma'alaea Harbor (Kennedy 1994). Initially, a surface survey was performed in 1986 and noted one historic property (State Site 50-50-09-1604) the "Ebisu Jinja" fishing shrine. During the subsequent subsurface testing, human burials were identified and designated Sites 50-50-04-3553 and 3554) (Kennedy 1994).

No previous archaeological investigations have been conducted within the subject project area; however, several studies have been conducted in the vicinity (Dega 2004, Donham 1991, 1995; Fredericksen 2004, Kennedy 1988, 1989; Pantaleo 2003, Titchenal 1996).

In 1988, Archaeological Consultants of Hawaii conducted a preliminary archaeological survey of Phase Ia of the Waikapū Master Plan (TMK 3-4-04:25 por.). No surface cultural remains were identified. The entire parcel was previously disturbed by pineapple cultivation. Due to the presence of numerous L.C.A.'s within the project area, subsurface testing was recommended near the eastern boundary of L.C.A. 5280 to determine presence/absence of subsurface cultural remains associated with house clusters that were once located in this area. These house sites may have been associated with high ranking individuals and taro cultivation.

Archaeological subsurface testing was subsequently undertaken at Phase Ia of the Waikapū Master Plan (Kennedy 1989). A total of six backhoe trenches were excavated in the vicinity of the eastern boundary of L.C.A. 5280 (TMK 3-5-02: por.1). No subsurface cultural remains were encountered in all of the trenches. Kennedy (1989:4) concluded that sugarcane and other recent activities destroyed any subsurface deposits that may have once existed.

Aki Sinoto Consulting (Titchenal 1996) conducted an archaeological inventory survey of the proposed retention basin and adjoining lands in Waikapū and Wailuku *ahupua`a*, Wailuku District, Maui Island (TMK 3-5-01:17, por.: 3-5-02:1, por.), located east of the current project area. No surface cultural remains were located during the surface survey, and no subsurface cultural remains or deposits were identified in the thirteen backhoe trenches excavated in selected localities throughout the project area.

Xamanek Researches (Fredericksen 2004) recently conducted an archaeological inventory survey for the Waikapū affordable housing subdivision (TMK 3-5-02: por. 01 and 3-8-07:101), located adjacent to, south of the present project area. One previously identified historic property was noted during the inventory survey. State Site 50-50-04-5474 consists of a approximate 2000- foot portion of the Kama Ditch and a substantial reservoir (Reservoir No. 6). No other cultural remains were identified during the survey, it was estimated that approximately 40% of the project area was previously impacted by sand mining activities in the last 20 or so years and that much of the remainder of the 100-acre study area was most recently planted in pineapple. Determination by the SHPD architecture branch that sufficient information was collected at Site 5474 Kama

Ditch to document the site and that the proposed demolition of the bulk of Site 5474 for proposed development was approved.

Scientific Consultants (Dega 2004) conducted an archaeological inventory on 348.613-acre parcel in Wailuku near Waikapū, Wailuku *Ahupua`a*, Wailuku District, Maui Island (TMK 3-5-001: por. of 001). Eight historic sites were documented during the survey, two of which were recorded during a previous project. State Site 50-50-04-5473 represents Hopoi Reservoir, this reservoir predates Hopoi Camp and was present at least by 1922. Hopoi camp was not identified during the survey. State Site 50-50-04-5474, the Kama Ditch, was identified east of the Hopoi reservoir running in a north-south direction to Waikapū. State Site 50-50-04-5493 was designated for another unnamed ditch running in a north-south direction occurring along the western flank of the parcel. State Site 50-50-04-5197 represents the Waihe`e Ditch, constructed between 1905 and 1907. The four other sites consist of a combination of historic-modern roadways (Site 5489), a system of smaller historic ditches (Site 5490), a historic artifact scatter on the surface (Site 5491), and several clearing mounds likely created during the plantation era (Site 5492). Twenty-seven subsurface testing trenches revealed homogenous soil matrices across the project area.

SHPD (Donham 1991) conducted a field inspection of the water pipeline easement across Waikapū stream, Waikapū, Maui Island (TMK 3-5-4:14; 3-6-4:2). No surface structural remains were identified in the easement corridor; however, terraces were noted west of the easement and cattle pens and probable former terraces were noted east of the easement. Donham stated that extensive earthmoving activities that previously occurred within the pipeline easement on both sides of the stream destroyed any agricultural features.

SHPD (Donham 1995) conducted a field inspection of the Richardson family in Kukuialamaka, Waikapū, Wailuku District, Maui Island (TMK 3-5-4:22). State site number 50-50-04-4001 was assigned to the cemetery.

The Waikapū sand mining project by Wailuku Agribusiness, Ltd. has also been undergoing archaeological monitoring by Archaeological Services Hawaii, LLC, and Aki Sinoto Consulting since 1999. The project area is located along Waiale Road to the south of the present project area. Scattered human remains were recently found in a previous deposited spoil pile (Rotunno-Hazuka et al., in prep.).

The Ameron sand mining operations located within the Maui Lani acreage (3-6-07: 130 pors), located east of the present project area in the adjoining Wailuku *ahupua`a* has been ongoing since 1990. The Bishop Museum conducted archaeological monitoring from 1990-1992. In 1992, monitoring procedures were undertaken by Aki Sinoto Consulting and Archaeological Services Hawaii, LLC. To date, four area with human remains have been identified. The remains, designated SIHP 50-50-04-5556-Features 1-4, were disturbed prior to sand mining activities (Guerriero 2004).

The Hawaiian Cement sand borrow site, (TMK 3-9-07: 101) located in Wailuku and Waikapū *ahupua`a*, adjoining the Ameron borrow site to the south and southeast, have also been monitored by Archaeological Services Hawaii, LLC, since 1999. To date, remains representing fifty pre-Contact native Hawaiian burials, have been encountered (SIHP 50-50-04-4200, 4201, and 4202). No other cultural remains have been discovered (Rotunno-Hazuka and Pantaleo 2004).

In 1998, Archaeological Consultants of the Pacific, Inc., performed inventory procedures at the above referenced project area. During these procedures, three historic properties were identified which consisted of Native Hawaiian burials (SIHP 4200, 4201) and a three-tier rock terrace (4202). All historic properties were identified in Phase A and consisted of SIHP 4200 (4 individual burial features), and 4201 (solitary individual burial feature) adjacent to Site 4202 (the tiered terrace). Due to these findings, archaeological monitoring was recommended "during initial grubbing and grading as well as the beginning stages of mining (Kennedy and Moore 1999: 39).

Another series of burials was encountered at a sand mining operation located south of the Hawaiian Cement sand burrow site and southeast of the present project area, at the Maui Scrap Metal Company in Waikapū (Fredericksen 1996). Sand from the site transported to Lahaina for use at the Sewer Plant was found to contain human remains. From November 1994 to March of 1995, a mechanical sifter was used to screen the sand and recover the human remains. A minimum of 22 individuals was disturbed during sand mining activities. The origin of the burial site was established and designated (Site 3525).

An archaeological inventory survey was conducted by Aki Sinoto Consulting, in association with Archaeological Services Hawaii for the proposed Village Mixed Use (VMX) Industrial Park, located east and northeast of the project area at TMK 3-8-07:89 and 102 pors. (Sinoto et. al. 2000). No surface cultural materials were identified during the pedestrian survey, and no buried

cultural remains or deposits were recovered in the eight backhoe trenches. The survey also noted that roughly 75% of the surface area had been previously disturbed through vegetation clearing, and mass grading.

SETTLEMENT PATTERN

Early prehistoric settlement in Waikapū *ahupua`a* was situated along the coastal areas where the majority of known *heiau* were situated. Settlements probably concentrated around these religious structures overlooking fishponds, sheltered bays, and other coastal areas rich in marine resources. During the late prehistoric period, populations expanded into the upland valleys of West Maui, including Waikapū and Iao Valley, where irrigated pond fields existed. These upland settlements were characterized as “extensive terrace and pond field agricultural systems with dispersed, rather than centralized, residential structures throughout and on the margins of these agricultural complexes (Titchenal 1996:11).

Archaeological studies and oral traditions suggest that the intermediate areas, such as the Wailuku sand dunes and the open *kula* lands between the Waikapū Stream and Iao Stream Valley, were less desirable areas for traditional habitation. However, recent results of archaeological studies suggest that other activities such as human interment took place in the dune areas. The open *kula* lands although historical impacted from over a hundred year use in sugar cane cultivation may have supported large agricultural dryland taro fields with associated habitation settlements utilizing the traditional watercourse from the *Kamaauwai* (Kama Ditch).

SITE EXPECTABILITY

Due to extensive previous disturbances from sand-mining activities, from sugarcane and pineapple cultivation, and with current active agriculture production, the probability of encountering cultural remains through inventory level testing is low. Based on the results of previous archaeological investigations in the vicinity, and the presence of LCA's in the area, isolated artifacts associated with pre-Contact occupation and buried architecture or cultural layers associated with historic plantation activities and habitation may be present in the project area.

Based on the results of previous and recent archaeological investigations in the vicinity of the Wailuku sand dune areas and the Wailale / Lower Main corridor, the potential for human burials

is present, however the degree of surface alteration in the subject area may minimize the potential for intact remains in primary context.

METHODS

Archaeological and historical background researches were undertaken to determine the nature and extent of potential cultural resources in the project area. A review of previous archaeological investigations in the vicinity was conducted at the State Historic Preservation Division (SHPD) libraries of the Department of Land and Natural Resources (DLNR) at both the Maui and O'ahu offices. Additional references were researched at the Hamilton Library and the Hawaii State Library. Historic land tenure records were researched at the Bureau of Conveyances and Land Management Branch of DLNR, and at the Survey Division of the State Department of Accounting and General Services.

The fieldwork for the current survey was conducted from 5-7, May 2004 by Mr. Paul Titchenal (M.A.), under the supervision of Ms. Diane Guerriero (B.A.), and under the overall direction of Ms. Lisa Rotunno-Hazuka (B.A.) and Principal Investigator, Mr. Jeffrey Pantaleo (M.A.).

The survey entailed initially conducting a pedestrian surface survey of the entire parcel. Since portions of the parcel had been previously disturbed, subsurface testing through backhoe trenching was deemed appropriate. Excavations were conducted by Goodfellow Brothers Inc., utilizing a backhoe with a 2.5 feet wide bucket. The trenches were selectively located to permit a representative sampling of the subject area. A total of twenty-five backhoe trenches were selectively placed in areas that contained no active farming. Trenches ranging in length from 5 to 7 meters. The backhoe excavation was undertaken with the supervision of the archaeologist and terminated when sterile subsoil or bedrock was reached. Representative profiles were recorded and soils were described. Locations of trenches were plotted on a base map provided by the client. Color photographs on 35mm format were taken of project area and trench overviews. During the course of this project, all accepted standard archaeological procedures and practices were followed. Field notes, maps, and photographs, are being curated by Archaeological Services Hawaii, LLC, in Wailuku.

SCOPE OF WORK

Based on DLNR-SHPD rules for inventory survey, the following specific tasks were determined to constitute an appropriate scope of work for the project:

1. Conduct background review and research of existing archaeological and historical documentary literature relating to the project area and its immediate vicinity—including examination of Land Commission Awards, ahupua'a records, historic maps, archival materials, archaeological reports, and other historical sources;
2. Undertake thorough surface examination of the project area to locate all extant surface features;
3. Conduct detailed recording of all potentially significant sites including scaled plan drawings, written descriptions, and photographs, as appropriate; and clear vegetation where needed for adequate visibility;
4. Complete a location map of the project area showing identified surface features;
5. Conduct limited subsurface testing at selected features to determine the presence or absence of potentially significant buried cultural deposits or features, and to obtain suitable samples for radiocarbon age determinations;
6. Conduct processing and analysis of recovered materials, as warranted; and
7. Synthesize data, prepare, and submit a draft report to SHPD for review, and revise and submit final report.

RESULTS OF FIELDWORK

A total of 25 backhoe test trenches were executed at selected localities for subsurface sampling within the two parcels in areas that would not disrupt active farming. Table II presents descriptive summaries of TR1-25. Trenches 1-6, 15, 16, and 23-25 were excavated within the northern parcel, and trenches 7-14 and, 17-22 were excavated in the southern parcel. Test trenching was not conducted within the extreme central portion of the project area, due to dense active farming (Fig. 5). Representative stratigraphic profiles and photographs for TR1-25 are depicted on Figures 7-20. Descriptive summaries for Trenches 1-25 are presented below.

Test trenches were orientated either north-south or east-west and averaged 6.0 meters in length by 2.0 meters in depth, and were placed approximately 100 meters apart. A three layer stratigraphic sequence was identified within the trenches, where Layer I was usually disturbed at least 50 centimeters below surface. Within the south central portion, remnant sand dune matrices were identified along the 350 to 400 foot elevation contour within TR's 10, 17-23 (see Fig. 5). Also noted was the segment of the Kama Ditch, Site 5474 situated within the southwestern portion of the project area and is further discussed at the end of the trench descriptions

Table II. Backhoe Trench Stratigraphic Summary Table TR's 1-10

TRENCH (TR)	LOCATION	ORIENT.	DIMENSION	STRATIGRAPHY	COMMENTS
1	Located in the extreme northwest portion of project area. East of Honoapiʻilani Highway.	80 / 260 Az.	6.6 m (L) x .80 cm (W) x 1.5 m (H)	Layer I - Fine, Silt; Dark Brown, (10YR3/3); agricultural layer. Layer II - Very Fine, Silt; Dark Grayish Brown (10YR 3/2); Layer III - Fine, Silt; Dark Grayish Brown (10YR 3/2), colluvial deposited with water affected pebbles, cobbles and small boulders.	Previous surface disturbance with past and present agriculture farming. Level surface area. North Profile. No cultural remains identified.
2	South of TR. 1. East of Honoapiʻilani Highway.	90 / 270 Az.	7 m (L) x .80 m (W) x 1.5 m (H)	Layer I - Fine, Silt; Dark Brown, (10YR3/3); agricultural layer. Layer II - Very Fine, Silt; Dark Grayish Brown (10YR 3/2) with gravel inclusions; Layer III - Fine, Silt; Dark Grayish Brown (10YR 3/2), colluvial deposit with water affected pebbles and cobbles.	Previous surface disturbance with past and present agriculture farming. On level surface area. East Profile. No cultural remains identified.
3	Southeast of TR. 2 and TR.1. East of Honoapiʻilani Highway.	70 / 250 Az.	5 m (L) x .80m (W) x 1.4 m (H)	Layer I - Fine, Silt; Dark Brown, (10YR3/3); agricultural layer. Layer II - Very Fine, Silt; Dark Grayish Brown (10YR 3/2); Layer III - Fine, Silt; Dark Grayish Brown (10YR 3/2); gravelly.	Previous surface disturbance with past and present agriculture farming. On slight slope towards east. North Profile. No cultural remains identified.
4	East of TR. 3. East of Honoapiʻilani Highway and west of existing sugar cane hauling road.	80 / 260 Az.	6.2 m (L) x .80 m (W) x 1.3 - 1.6 m (H)	Layer I - Fine, Silt; with sand inclusions, Dark Brown to Dark Yellowish Brown (10YR 3/3-3/4); agricultural layer. Layer II - Fine, Silt; Dark Brown (10YR 3/3).	Previous surface disturbance with past and present agriculture farming. On level surface area. South Profile. No cultural remains identified.
5	Located in the extreme northeast portion of the project area. North of TR. 4 and east of TR-6.	70 / 250 Az.	6 m (L) x .80 m (W) x 1.5 m (H)	Same as TR-4 without sand inclusions identified in TR-4 Layer I	Previous surface disturbance with past and present agriculture farming. On level surface area. North Profile. No cultural remains identified.
6	Located along the northern project area boundary, west of TR-5 and east of TR-1.	90 / 270 Az.	4.8 m (L) x .80 cm (W) x 1.6 (H)	Same as TR-3	Previous surface disturbance with past and present agriculture farming. On slight slope towards east. South Profile. No cultural remains identified. No cultural remains identified.
7	Located in the extreme southern portion of project area. East of Honoapiʻilani Highway and adjacent to; east of the existing sewerline easement.	100 / 280 Az.	5.5 m (L) x .80 cm (W) x 1.4 (H)	Layer I - Fine, Silt; with sand inclusions, Dark Brown to Dark Yellowish Brown (10YR 3/3-3/4); agricultural layer. Layer II - Fine, Silt; with sand and gravel inclusion, river bed inclusions noted in North and South Profiles. Dark Brown (10YR 3/3). Layer III - Fine, Silt; Dark Brown to Dark Yellowish Brown (10YR 3/3 - 3/4).	Previous surface disturbance with past sand mining activities and agriculture farming. Historic debris noted within area. Level surface area. South Profile. No cultural remains identified.
8	Located in the extreme southeastern portion of project area. East of Honoapiʻilani Highway and TR-7	60 / 240 Az.	5.5 m (L) x .80 cm (W) x 1.5 m (H)	Layer I - Fine, Silt; with sand inclusions, Dark Brown to Dark Yellowish Brown (10YR 3/3-3/4); agricultural layer. Layer II - Fine, Silt; Dark Brown (10YR 3/3). Layer II same as Layer II with many water affected and sub-angular cobbles and pebbles.	Level ground surface. North Profile. No cultural remains identified.
9	North of TR. 8 and west of sugar cane hauling road.	90 / 270 Az.	6 m (L) x .80 cm (W) x 1.5 m (H)	Layer I - mottled Silt; with sand inclusions, Brown (7.5 3/2); agricultural layer. Layer II - remnant Aeolian Sand, (10YR 5/4); Yellowish Brown. Layer II / III - Transitional Layer, Sandy Silt; Brown (10YR 5/3), Layer III - Silt; Dark Brown (10YR 3/3).	Level ground surface in open fallow field of sweet potatoes. South Profile. No cultural remains identified.
10	West of TR. 9. Adjacent to; east of the existing sewerline easement.	180 / 360 Az.	6 m (L) x .80cm (W) x 1.5 m (H)	Layer I - Mottled Silty Sand, Very Dark Grayish Brown, (10YR 3/2) with charcoal flecks. Layer II - Sand Silt, Brown to Dark Brown (10YR 5/3-4/3); Layer III - Aeolian Sand/Silt Very Dark Grayish Brown (10YR 3/2); Layer IV - Very Fine Grain Sand Pale Brown (10YR 6/3); Layer V - BOE Coarse Sand Light Brown Gray (10YR 6/2).	Previous surface disturbance with past and present agriculture farming. West Profile. No cultural remains identified.
11	East of TR. 10. Adjacent to; east of the existing sewerline easement.	180 / 360 Az.	6 m (L) x .80cm (W) x 1.5 (H)	Layer I - Silty Loam; Very Dark Grayish Brown, (10YR 3/2); Layer II - Silt; Dark Brown, (10YR 3/3); Layer III - Silt; Dark Brown (10YR 3/3).	Previous surface disturbance with past and present agriculture farming. Level ground surface area. South Profile. No cultural remains identified.

Table III. (cont) Backhoe Trench Stratigraphic Summary Table TR's 12-25

TRENCH (TR)	LOCATION	ORIENT.	DIMENSION	STRATIGRAPHY	COMMENTS
12	Located in the extreme southeast portion of project area. Adjacent to east of, Honoapiʻilani Highway.	110 / 290 Az.	6 m (L) x .80 cm (W) x 1.8 (H)	Layer I - Silty Loam, Very Dark Grayish Brown (10YR 3/2); Layer II - Silt, Dark Brown, (10YR 3/3); Layer III - Silt, Dark Brown (10YR 3/3), with many water affected basalt cobbles and pebbles.	Level ground surface area on upper slope. North. Previous surface disturbance with past agricultural farming. North Profile. No cultural remains identified.
13	North of TR 12. Adjacent to; east of, Honoapiʻilani Highway.	100 / 280 Az.	5.5 m (L) x .80 cm (W) x 1.8 (H)	Same as TR - 12	Level ground surface area on upper slope. North. Previous surface disturbance with past agricultural farming. East Profile. No cultural remains identified.
14	North of TR 13. Adjacent to; east of, Honoapiʻilani Highway.	100 / 280 Az.	5 m (L) x .80 cm (W) x 1.7 m (H)	Same as TR - 12, and 13	Level ground surface area on upper slope. North. Previous surface disturbance with past agricultural farming. North Profile. No cultural remains identified.
15	North of TR 14. Adjacent to; east of, Honoapiʻilani Highway.	100 / 280 Az.	6 m (L) x .80 cm (W) x 2 m (H)	Same as TR - 12, 13, 14	Level ground surface area on upper slope. North. Previous surface disturbance with past agricultural farming. East Profile. No cultural remains identified.
16	North of TR 15. Adjacent to; east of, Honoapiʻilani Highway.	180 / 360 Az.	5 m (L) x .80 cm (W) x 1.8 m (H)	Same as TR - 12, 13, 14 and 15	Level ground surface area on upper slope. North. Previous surface disturbance with past agricultural farming. Profile. No cultural remains identified.
17	West of TR 10. Adjacent to; west of, the sewerline easement and east Honoapiʻilani Highway.	170 / 350 Az.	6 m (L) x .80 cm (W) x 1.7 m (H)	Layer I - Silty Sand, Grayish Brown (10YR 3/4); Layer II - Aeolian Sand, Yellowish Brown (10YR 5/8); Layer III - Silt, Very Dark Brown.	On slope surface area, below a field of agricultural farming of sweet potatoes. East Profile. No cultural remains identified.
18	South of TR 17 and east of TR 7. Adjacent to; east of, Honoapiʻilani Highway and the existing sewerline.	180 / 360 Az.	5 m (L) x .80 cm (W) x 1.8 m (H)	Same as TR - 17 with the exception of a disturbed sand layer below Layer I	On slope surface area. East Profile. No cultural remains identified.
19	West of TR 18. and east of TR - 12. Adjacent to; east of the Kama Ditch.	180 / 360 Az.	5 m (L) x .80 cm (W) x 2.2 m (H)	Same as TR - 18	Level ground surface on farm access road along upper slope. East Profile. No cultural remains identified.
20	North of TR 19. Adjacent to; east of the Kama Ditch.	180 / 360 Az.	5.6 m (L) x .80 cm (W) x 2.8 m (H)	Same as TR - 18 and 19.	On slope surface area along upper slope. West Profile. No cultural remains identified.
21	East of TR 22. Adjacent to; West of the sewerline easement.	120 / 300 Az.	5.5 m (L) x 1.6 m (W) x 2.5 m (H)	Same as TR - 18, 19 and 20.	Level ground surface. West Profile. No cultural remains identified.
22	West of TR 21. Adjacent to; east of the Kama Ditch.	90 / 270 Az.	6 m (L) x .80 cm (W) x 2.5 m (H)	Same as TR - 18 thru 21	Level ground surface. East Profile. No cultural remains identified.
23	North of TR 21. Adjacent to; west of the sewerline easement	90 / 270 Az.	6.5 m (L) x .80 cm (W) x 3.5 m (H)	Same as TR - 18 thru 22	Level ground surface. East Profile. No cultural remains identified.
24	Northwest of TR 23. Placed in an open unplanted agricultural field. West of existing sewerline easement	180 / 360 Az.	4 m (L) x 2 m (W) x 2 m (H)	Same as TR - 4 and 5	Level ground surface. West Profile. No cultural remains identified.
25	East of TR 24. Adjacent to; east of existing sewerline easement. Placed in a fallow sweet potatoe field.	90 / 270 Az.	4.6 m (L) x 1.2 m (W) x 1.9 m (H)	Same as TR - 4 and 5	Level ground surface. North / northwest Profile. No cultural remains identified.

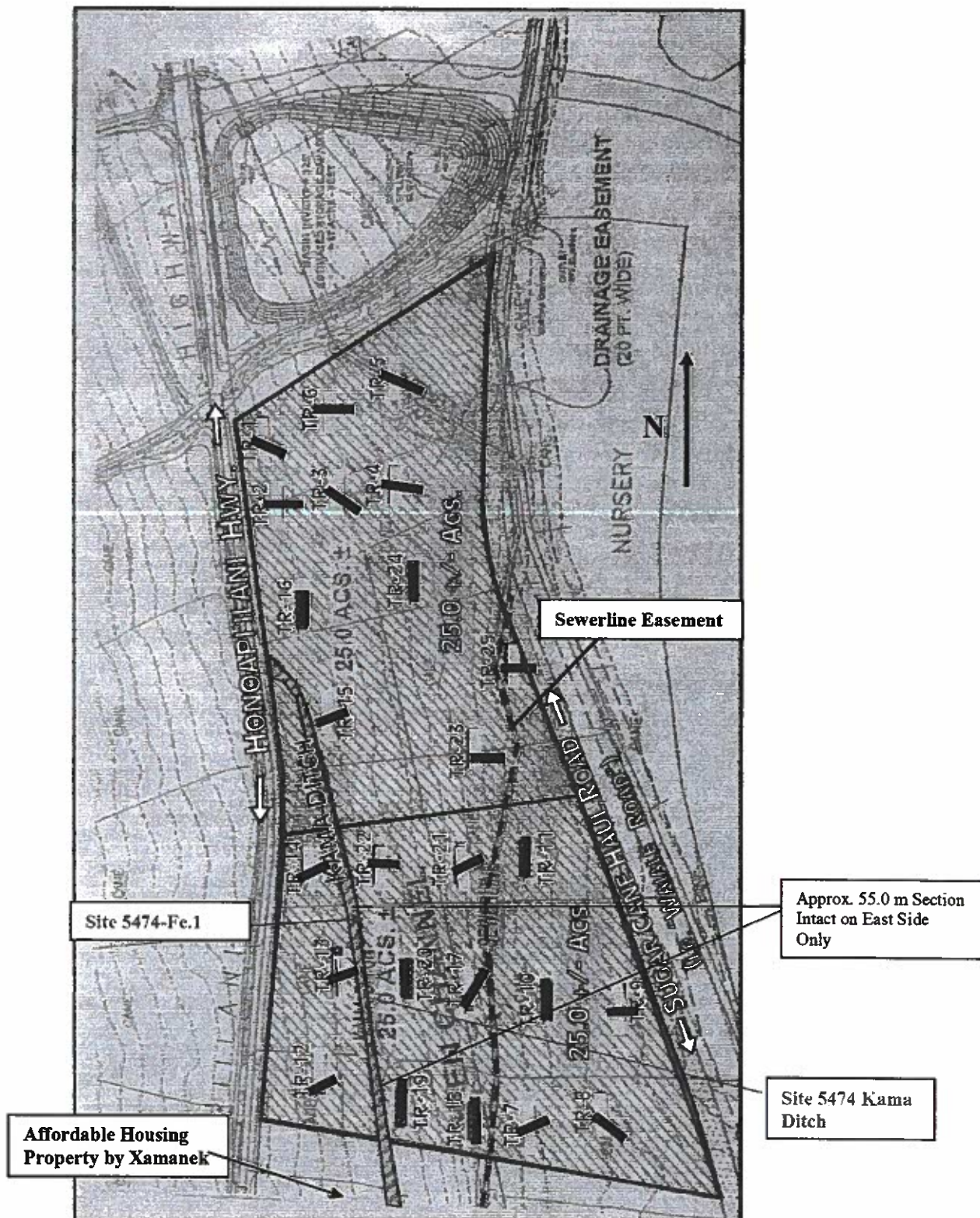


Figure 5. Topographic Map Showing TR's 1-25, Site 50-50-04-5474 and Waiale Housing to South

Backhoe Trench 1 and Backhoe Trench 2

Backhoe Trench 1 (TR1) and Backhoe Trench 2 (TR2), were placed in the northwest portion of the project area, and placed east of Honoapiʻilani Highway (Fig. 5). Trench 1 measured 6.6 m long by .8 m wide and 1.5 m deep, and orientated east / west. Trench 2 was placed c. 100 m south of Trench 1, measured 7.0 m long by .8 m wide and 1.5 m deep, and orientated east / west. Layer I in both trenches contained the plow zone with evidence of past and recent agricultural disturbance. Three stratigraphic layers were revealed in TR1 and TR2 (Fig.7).

Layer I contained the plow zone, was a dark brown (10YR 3/3), fine silty loam, and contained a high content of rootlets. It ranged from 0/40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark grayish brown (10YR 3/2), very fine silt, with gravel inclusions. Layer II ranged from .4-.5 / 1.0-1.5 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a dark grayish brown (10YR 3/2), very fine silt, with colluvial deposited water affected pebbles, cobbles and small boulders; and was non-cultural. Layer III ranged from 1.0 / 1.5 mbs. BOE was terminated at eroding bedrock.

Backhoe Trench 3

Backhoe Trench 3 (TR3), was placed centrally in the northwest portion of the project area, and placed c. 100 m east of Trench 2 and Honoapiʻilani Highway. Trench 3 measured 5.0 m long by .8 m wide and 1.4 m deep, and orientated east / west on a slight slope towards the east. Layer I contained the plow zone with evidence of past and recent agricultural disturbance. Three stratigraphic layers were revealed in TR3 (Fig. 6).

Layer I contained the plow zone, was a dark brown (10YR 3/3), fine silty loam, and contained a high content of rootlets. It ranged from 0/40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark grayish brown (10YR 3/2), very fine silt. Layer II ranged from .4-.5 / 1.3 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a dark grayish brown (10YR 3/2), very fine gravelly silt; and was non-cultural. Layer III ranged from 1.0 / 1.4 mbs. BOE was terminated at eroding bedrock.

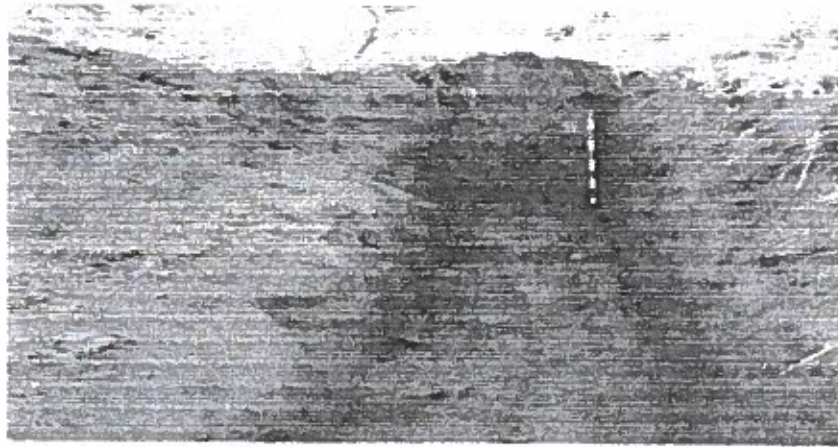


Figure 6. Overview of Trench 3, View to West

Backhoe Trench 4

Backhoe Trench 4 (TR4), was placed in the northwest portion of the project area along the lower slope, and placed c. 100 m east of Trench 3. Trench 4 measured 6.2 m long by .8 m wide and 1.3 – 1.6 m deep, and orientated east / west on a slight slope towards the east. Layer I contained the plow zone with evidence of past and recent agricultural disturbance. Two stratigraphic layers were revealed in TR4 (Fig. 7).

Layer I contained the plow zone, was a dark brown to dark yellowish brown (10YR 3/3-3/4), fine silty loam with sand inclusions, contained a high content of rootlets and scattered pieces of cement. It ranged from 0/-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark brown (10YR 3/2), homogenous fine silt. Layer II ranged from .5 / 1.6 mbs and was non-cultural. BOE was terminated in sterile subsoil.

Backhoe Trench 5

Backhoe Trench 5 (TR5), was placed in the northeast portion of the project area along the lower slope, and placed c. 100 m east of Trench 4. Trench 5 measured 6.2 m long by .8 m wide and 1.5 deep, and orientated east/west on a slight slope towards the east. Layer I contained the plow zone with evidence of past and recent agricultural disturbance, fallow vegetables and fruit were noted in the area. Two stratigraphic layers were revealed in TR5 same as Trench 4 (Fig. 8).

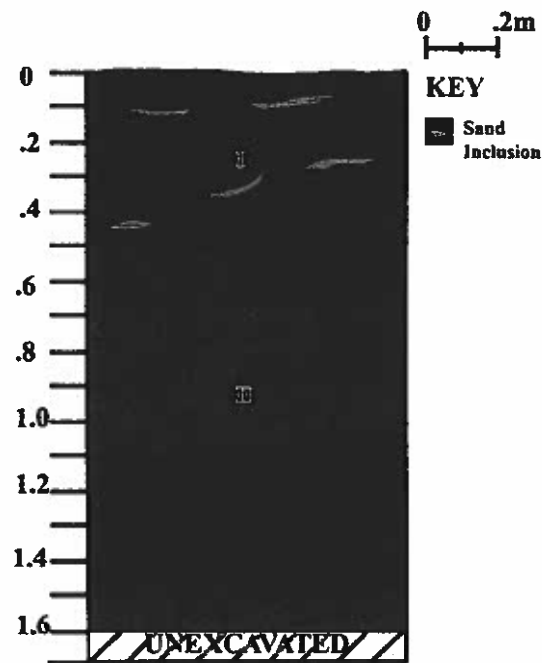
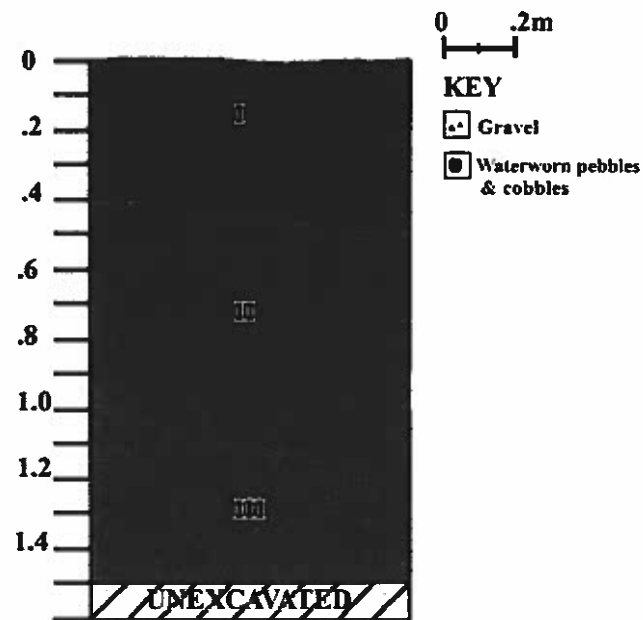


Figure 7. Representative Stratigraphic Profiles for Trenches 1-5, (top) TR2 North Wall (bottom) TR4 South Wall

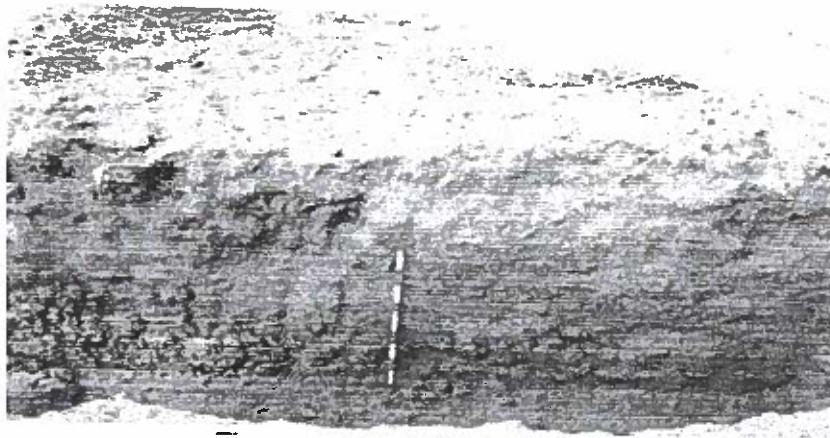


Figure 8. Trench 5, View to North

Backhoe Trench 6

Backhoe Trench 6 (TR6), was placed along the northern boundary of the project area, situated centrally along a slight slope to the east, and placed c. 100 m east of Trench 1 and c. 100 m north of Trench 3. Trench 6 measured 4.8 m long by .8 m wide and 1.6 deep, and orientated east / west. Layer I contained the plow zone with evidence of past and recent agricultural disturbance, fallow vegetables and fruit were noted in the area. Three stratigraphic layers were revealed in TR6 same as Trench 3.

Backhoe Trench 7

Backhoe Trench 7 (TR7), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement in an area previously sand mined. Trench 7 measured 5.5 m long by .8 m wide and 1.4 deep, and orientated east / west. Surface area was relatively flat with scattered modern historic debris. Three stratigraphic layers were revealed in TR7, and a concentration of riverbed pebbles and cobbles were noted in the north face (Fig. 11).

Layer I was a dark brown to dark yellowish brown (10YR 3/4), silt with sand inclusions, and contained a high content of rootlets. It ranged from 0/45 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark brown (10YR 3/3), fine silt, with sand and gravel inclusions Layer II ranged from .45 / 1.25 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a dark brown to dark yellowish brown (10YR 3/3-3/4), homogenous fine silt; and was non-cultural. Layer III ranged from 1.25 / 1.4 mbs. BOE was terminated in sterile subsoil.

Backhoe Trench 8

Backhoe Trench 8 (TR8), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement, and east of TR7, in an area previously sand mined. Trench 8 measured 5.5 m long by .8 m wide and 1.5 m deep, and orientated east / west. Surface area was relatively flat with scattered modern historic debris. Three stratigraphic layers were revealed in TR8 (Fig. 9).

Layer I was a dark brown to dark yellowish brown (10YR 3/4), mottled silty sand with sand inclusions, and contained a high content of rootlets. It ranged from 0 / 50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark brown (10YR 3/3), fine silt, Layer II ranged from .50 / 1.0 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a dark brown (10YR 3/3), fine silt; with subangular and water affected cobbles and was non-cultural. Layer III ranged from 1.0 / 1.5 mbs. BOE was terminated in sterile subsoil.

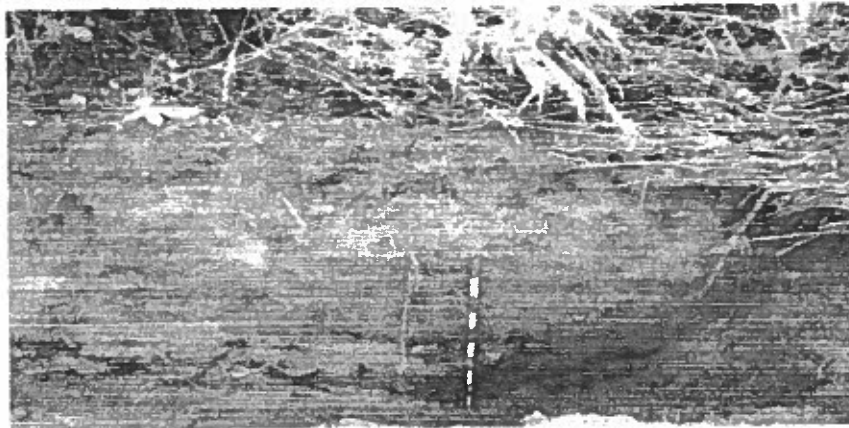


Figure 9. Trench 8, View to North

Backhoe Trench 9

Backhoe Trench 9 (TR9), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement, and north of TR8 and the cane road (Waiale Road), in an area previously used for sweet potato cultivation. Trench 9 measured 6 m long by .8 m wide and 1.5 m deep, and orientated east / west. Surface area was relatively flat with fallow sweet potato vines. Four stratigraphic layers were revealed in TR9 (Fig. 10 and 11).

Layer I was a brown (7.5YR 3/2), mottled silty sand with sand inclusions, and contained a high content of sweet potato rootlets. It ranged from 0 / 40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had a wavy, smooth lower boundary.

Layer II was a pale brown, brown (10YR 6/3-5/3), sand, Layer II ranged from .40-.50 / .70 cmbs, was found directly overlying Layer III and had a wavy, smooth lower boundary.

Layer III was a dark brown (10YR 3/3), fine silt; cultural. Layer III ranged from .40 / 1.5 mbs. BOE was terminated in Layer IV lithified sand.



Figure 10. Trench 9, View to South

Backhoe Trench 10

Backhoe Trench 10 (TR10), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement, and west of Trench 9 and the cane road (Waiale Road), in an area previously used for sweet potato cultivation.

Trench 10 measured 6 m long by .8 m wide and 1.5 m deep, and orientated north / south.

Surface area was relatively flat with fallow sweet potato vines. Five stratigraphic layers were revealed in TR10.

Layer I was a very dark grayish brown (10YR 3/2), mottled silty sand with charcoal flecks, irrigation driplines and contained a high content of sweet potato rootlets. It ranged from 0 / 50-80 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had a wavy, smooth lower boundary.

Layer II was a brown to dark brown (10YR 5/3-4/3), sandy silt, Layer II ranged from .50-.80 / 1.0 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a pale brown, (10YR 6/3), fine grain sand; and was non-cultural. Layer III ranged from 1.0 / 1.2mbs and had an abrupt, smooth lower boundary.

Layer IV was a very dark grayish brown, (10YR 3/2), silt; and was non-cultural. Layer IV ranged from 1.2 / 1.3 mbs. Abrupt, smooth boundary.

Layer V was a light brown grey, (10YR 6/2), coarse lithified sand; non-cultural. Layer V from 1.3 / 1.5 mbs. BOE was terminated lithified sand.

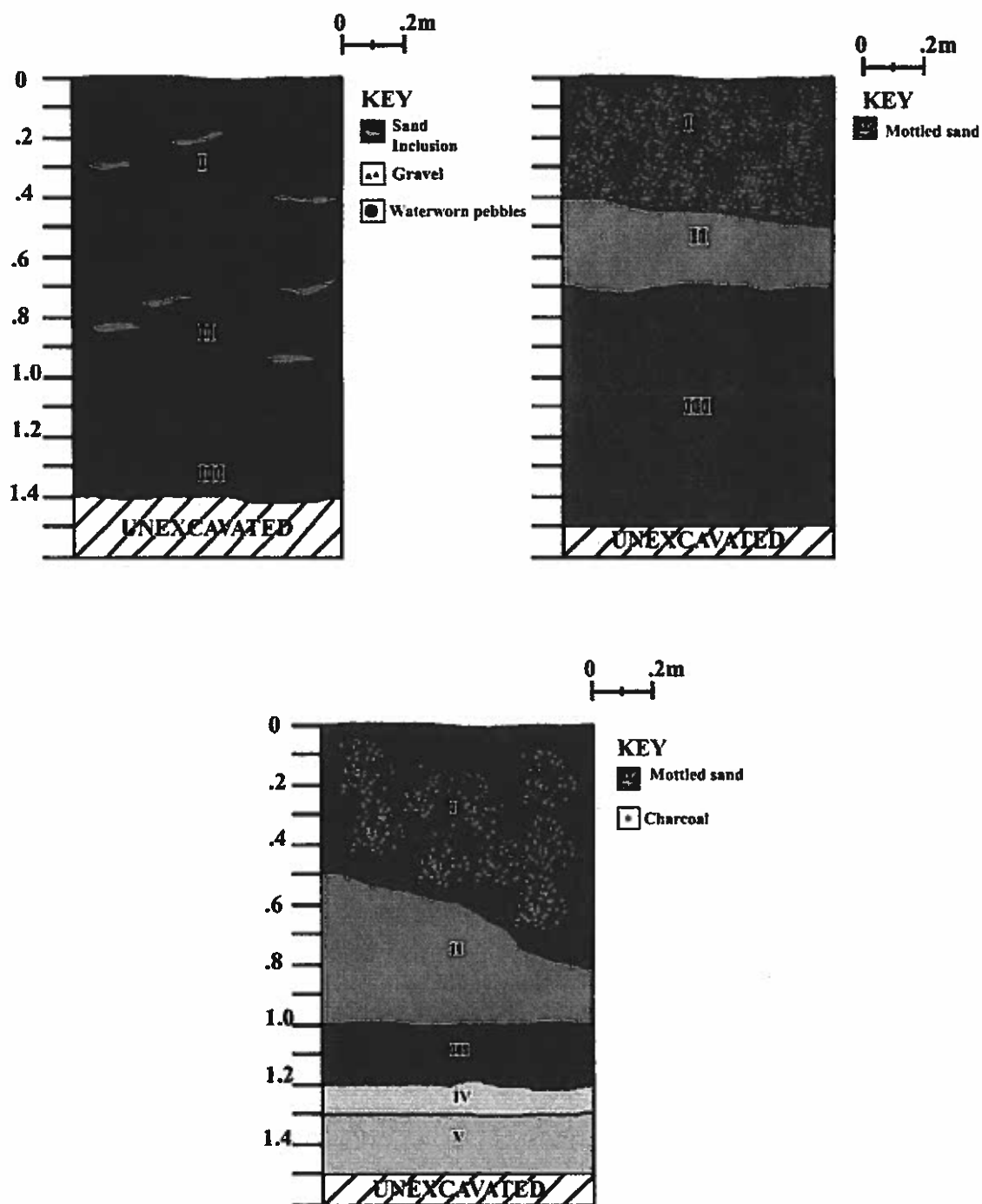


Figure 11. Representative Stratigraphic Profiles for Trenches 6 through 10, (top left) TR7 South Wall, (top right) TR9 South Wall and (bottom) TR10 West Wall

Backhoe Trench 11

Backhoe Trench 11 (TR11), was placed in the southeast portion of the project area, along the southern boundary, east of, adjacent to, the existing sewerline easement, and north of Trench 10 and south of a farming access road, in an area previously used for sweet potato cultivation. Trench 11 measured 6 m long by .8 m wide and 1.5 m deep, and orientated north / south. Surface area was relatively flat with fallow sweet potato vines. Three stratigraphic layers were revealed in TR11 (Figs. 11 and 13).

Layer I was a very dark grayish brown (10YR 3/2), silty loam, and contained a high content of sweet potato rootlets. It ranged from 0 / 40 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.
Layer II was a dark brown (10YR 5/3-4/3), silt, Layer II ranged from .40 / 1.2 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.
Layer III was a dark brown, (10YR 3/3), silt; and was non-cultural. Layer IV ranged from 1.2 / 1.5 mbs. BOE was terminated in sterile subsoil.

Backhoe Trenches 12 through 14

These three trenches were placed west of the Kama Ditch (Site5474), in the southwestern portion of the project area, east of Honoapi'ilani Highway, and excavated in the abandoned pineapple fields. All three trenches contained the plow zone – Layer I and all revealed a three layer substratum (Figs. 12 and 13).

Layer I was a very dark grayish brown (10YR 3/2), silt; with scattered subangular cobbles. It ranged from 0 / 80 cmbs directly overlying Layer II and had an abrupt lower boundary.

Layer II was a dark brown (10YR 3/3), silt. It ranged from .80 / 1.5 directly overlying Layer III and had an abrupt lower boundary

Layer III was a dark brown (10YR 3/3), silt with many water affected cobbles and pebbles. 1.50 to 1.80 mbs. BOE was terminated in sterile subsoil.

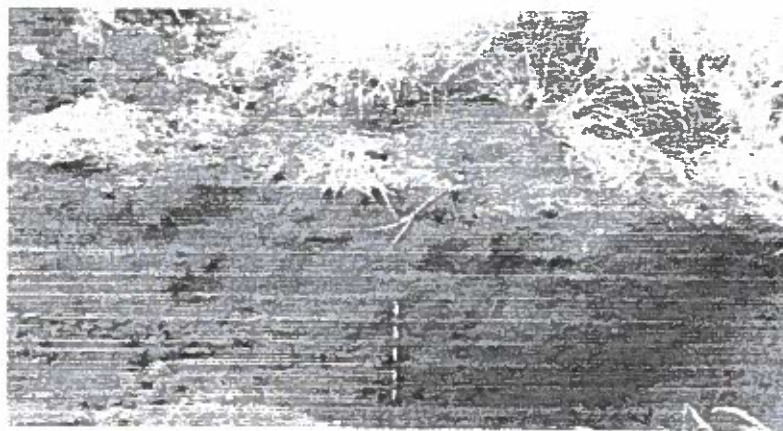


Figure 12. Trench 14, View to North

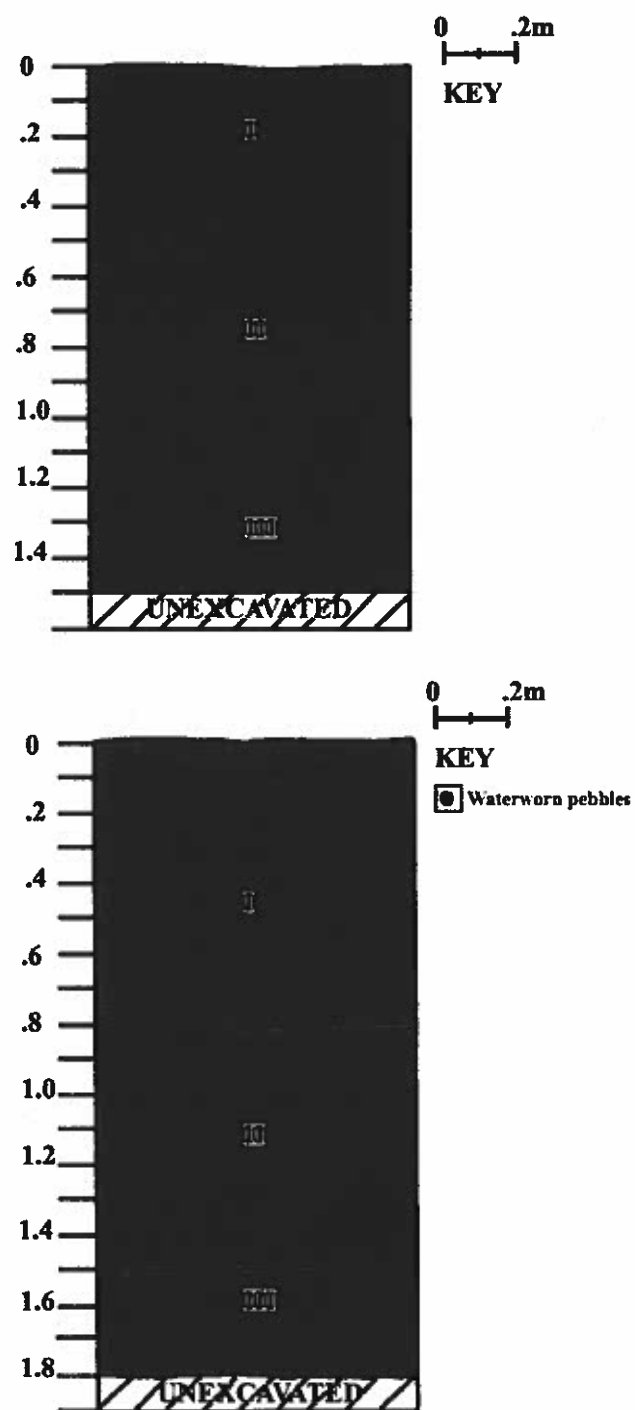


Figure 13. Representative Stratigraphic Profiles for Trenches 11-15 (top) TR11 South Wall and (bottom) TR12 North Wall

Backhoe Trenches 15 and 16

These two trenches were placed east of the Kama Ditch (Site 5474), in the western portion of the project area, east of Honoapiʻilani Highway, and excavated in the abandoned pineapple fields. Both of these trenches contained the plow zone – Layer I, and all revealed a three layer substratum such as identified in Trenches 12 through 14.

Backhoe Trench 17

Backhoe Trench 17 (TR17), was placed centrally in the south portion of the project area, along the southern boundary, west of, adjacent to, the existing sewerline easement, and east of the Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. Trench 17 measured 6 m long by .8 m wide and 1.65 m deep, and was orientated north / south. Surface area was on a slight slope towards the east. Three stratigraphic layers were revealed in TR17 (Figs. 14 and 16).

Layer I was a grayish brown (10YR 3/4), mottled silty sand with sand inclusions, and contained a high content of sweet potato rootlets. It ranged from 0 / 40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a yellowish brown, (10YR 5/6), Aeolian sand, Layer II ranged from .40-50 / 1.0 mbs, was non-cultural. Layer II was found directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a very dark brown (10YR 2/2), silt; was non-cultural. Layer III ranged from 1.0 / 1.65 mbs. BOE was terminated in Layer IV lithified sand.

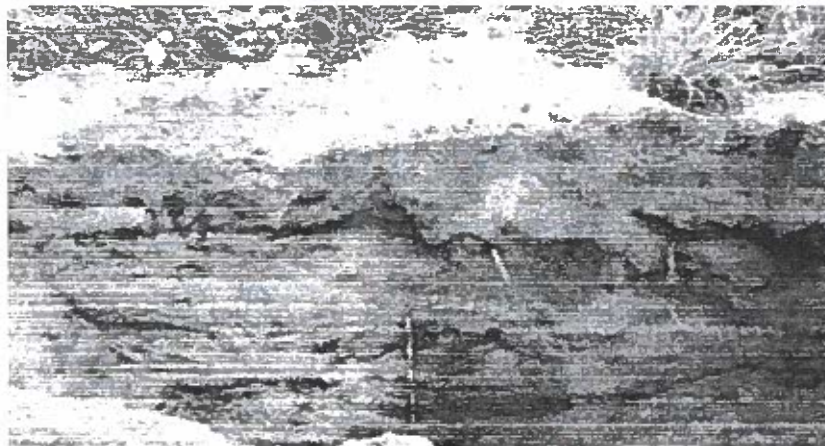


Figure 14. Trench 17, View to East

Backhoe Trench 18

Backhoe Trench 18 (TR18), was placed centrally in the south portion of the project area, along the southern boundary, west of, adjacent to, the existing sewerline easement, and east of the

Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. Trench 18 measured 5 m long by .8 m wide and 1.8 m deep, and was orientated north / south. Surface area was on a slight slope towards the east. Three stratigraphic layers were revealed similar to TR's 17, 19-22 with the exception of a disturbed sand layer with lithified dune inclusions located below Layer I and above the original dune layer of layer III (Fig. 16).

Backhoe Trench 19

Backhoe Trench 19 (TR19), was placed along the southern boundary of the project area, west of the existing sewerline easement, and east of; adjacent to; the Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. Trench 19 measured 5 m long by .8 m wide and 2.2 m deep, and was orientated north / south. Surface area was on a level roadbed. Three stratigraphic layers were revealed in TR19 similar to TR17 through TR 22.

Backhoe Trench 20

Backhoe Trench 20 (TR20), was placed in the southern portion of the project area, approximately 50 m north of TR19, west of the existing sewerline easement, and adjacent, east to Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. TR20 measured 5.5 m long (N/S) by .8m wide by 2.8m deep. Surface area was on a level roadbed. Three stratigraphic layers similar to TR's 17 through 22 were documented and culturally sterile (Fig. 15).

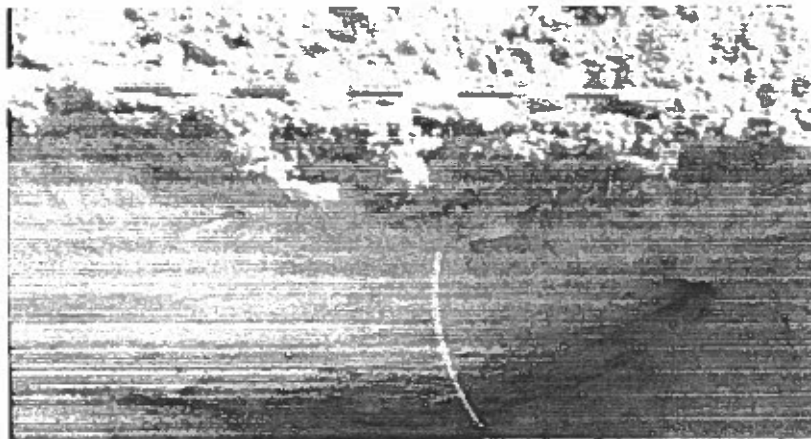


Figure 15. Trench 20, View to West

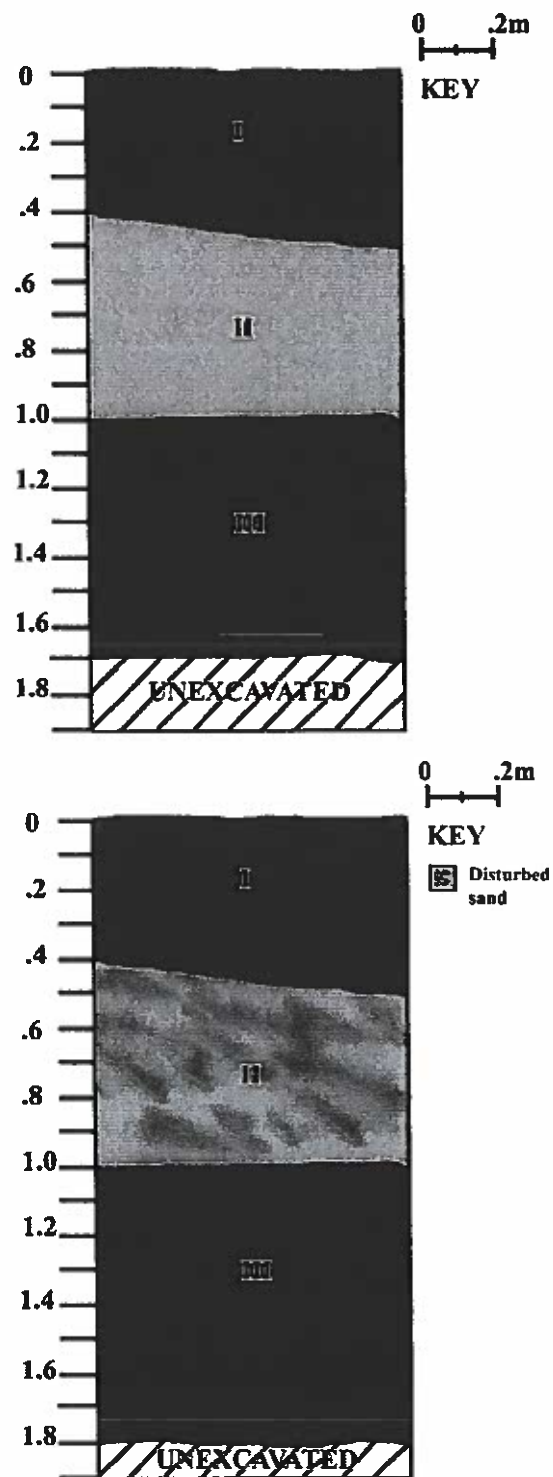


Figure 16. Representative Stratigraphic Profiles for Trenches 16 through 20, (top) TR17 East Wall, (bottom) TR18 East Wall

Backhoe Trench 21

Backhoe Trench 21 (TR21), was placed in the southern portion of the project area, approximately 100m west of TR19, west of the existing sewerline easement, east of Kama Ditch (Site 5474), along an access road, mid-slope in an area of active sweet potato at the base of a lithified dune. TR21 measured 6 m long by .8 m wide by 2.5 m deep, oriented north/south. The surface area was on a slight slope towards the east. Three stratigraphic layers similar to TR's 17-20 and 22 were documented and negative for cultural remains (Fig. 17).

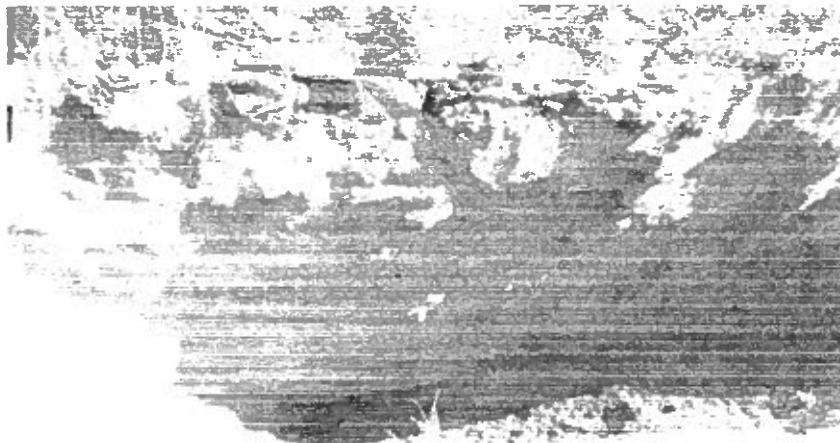


Figure 17. Trench 21, View to North

Backhoe Trench 22

Backhoe Trench 22 (TR22), was situated in the southern portion, approximately 50 m west of TR21, west of the existing sewerline easement, and adjacent and east of Kama Ditch (Site 5474), along the access road and in the active sweet potato area. Trench 22 measured 5 m long by .8 m wide and 2.5 m deep, and oriented north/south. Surface area was a level road bed. Three stratigraphic layers similar to TR's 17-21 were documented.

Backhoe Trench 23

Backhoe Trench 23 (TR23) was placed along the same elevation contour as Trenches 17, 18, and 21, in the central portion of the project area, located west of the existing sewer easement. Backhoe Trench 23 (TR23), measured 6.5 m long by .8 m wide and 2.5 deep. A two stratigraphic sequence was revealed in Trench 23, the same Layer I and Layer II as found in TR's 17 through 22 (Figs. 18 and 19). BOE was terminated in sterile substratum Layer II (Aeolian dune).

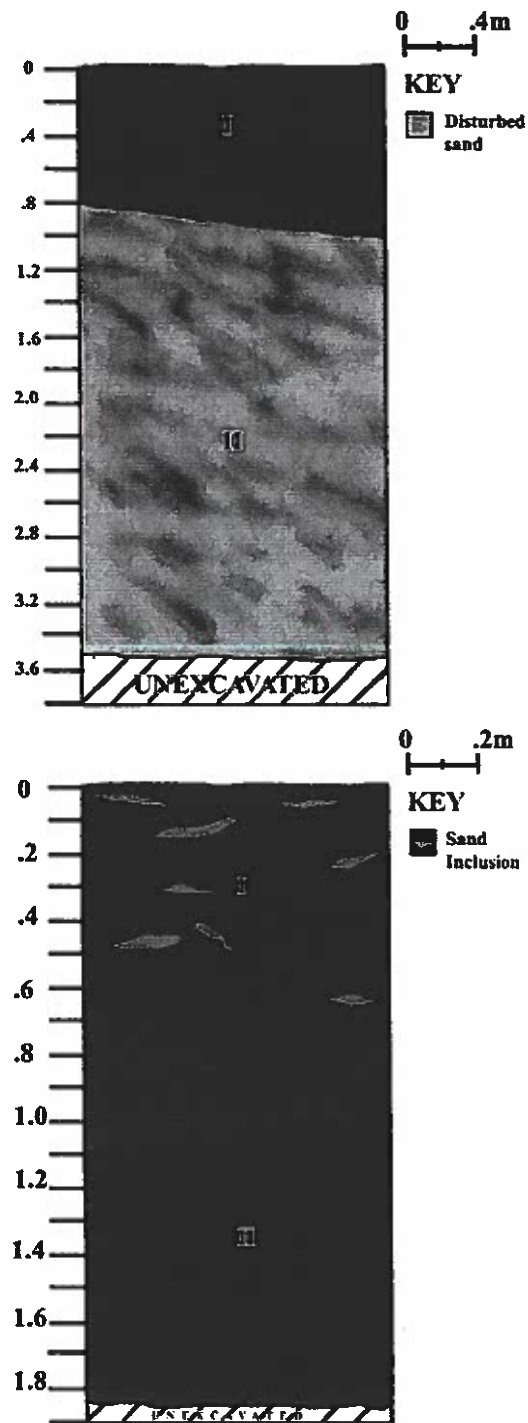


Figure 18. Representative Stratigraphic Profiles for Trenches 21-25 (top) TR23 East Wall (bottom)
TR25 North Wall

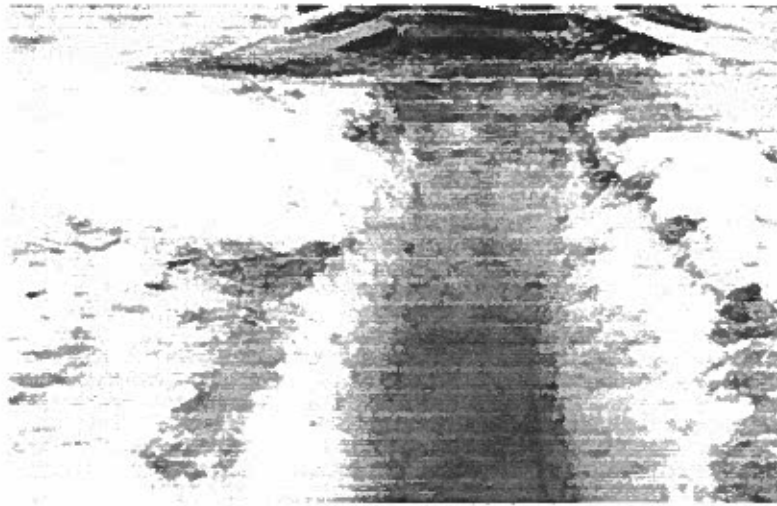


Figure 19. Trench 23, View to East

Backhoe Trench 24

Backhoe Trench 24 (TR24) was placed along the same elevation contour as Trenches 4, and 5, in the central portion of the project area, in an open, recently tilled, unplanted agricultural field, located west of the existing sewer easement. Backhoe Trench 24 (TR24), measured 4 m long by .8 m wide and 2 m deep. The same three stratigraphic sequence was revealed in Trench 24, as those found in Trenches 4 and 5. BOE was terminated in sterile substratum.

Backhoe Trench 25

Backhoe Trench 25 (TR25) was placed in the central portion of the project area, in an open, fallow sweet potato agricultural field, located east of, adjacent to, the existing sewer easement. Backhoe Trench 25 (TR25), measured 4.6 m long by 1.2 m wide and 1.9 m deep. The same three stratigraphic sequence was revealed in Trench 24, as those found in Trench 9 (Fig. 20). BOE was terminated in sterile substratum.



Figure 20. Trench 25, View to East

Results of the current investigation identified a segment of historic property State Site 50-50-04-5474, the Kama Ditch, as well as an associated metal sluice gate designated Feature 1 (see Figs 1 and 21). As exhibited below, the current configuration of Kama Ditch commences along the south side of Iao Stream and follows the stream east where it eventually turns southward flowing along the approximate 380 ft. elevation line, through the project area terminating at the Reservoir by Waikapū.



Originally, the *Kama auwai* or *Kamaauwai* (Kama Ditch) served mostly *kuleana* lands (Wilcox, 1996, p.125 in Fredericksen, 2004:13), and due to this original intent, *Kamaauwai* along with *Kalaniauwai* (on the north side of Iao Stream) became a controversial water rights issue in 1867. In the Peck vs. Bailey case, the complainants alleged that the extension of *Kamaauwai* “beyond its original and true terminus,” to feed his (Bailey’s) *kula* land called *Kaluapuhi* and *Kekipi* was illegal; as the original intent of *Kamaauwai* was to convey water to the defendant’s (Bailey) 12-acres of *kalo* land called *Ka pohakuokauhi* and the excess always spilled over the road (High St./Honoapi`ilani Hwy) to their adjacent lands in *Kalua `ili* (Sterling 1998: 85) (Figure 22).

During the aforementioned court case, there was no date mentioned for when *Kamaauwai* and *Kalaniauwai* were constructed; however per Sterling “these two *auwai* have existed immemorially and were constructed for the purposes of irrigating *kalo* (Sterling 1998: 86). According to Fredericksen (2004), “this system was probably rebuilt by the Wailuku Sugar Company, following their takeover of Waikapū Sugar Company in 1894, and followed an ancient route called *Kamaauwai*.”

Several historic maps were reviewed in an attempt to identify the construction of Site 5474 and to ascertain its’ original extent; however most maps, if available were either illegible or contained inconsistent information. For example, Figure 22 is from the year 1882 and shows Mission Ditch which appears to follow the current route of Site 5474 (Kama Ditch), yet there is no mention of Kama Ditch. As exemplified on Figure 23, Kama Ditch commences along the south side of Iao Stream and continues to the east where it eventually curves to the south and quickly terminates, instead of continuing south towards Waikapū. Perhaps this map exemplified the original extent of *Kamaauwai* discussed in the above court case. Unfortunately, there was no date available for this map. Also noted on the aforementioned map is Old Mill Ditch, which after the Kama Ditch curves south, the Old Mill Ditch continues to the east and crosses over/under High Street, terminating before Market Street. Another historic map from 1907 obtained from the Bailey House Museum shows *Kama auwai* along the south side of Wailuku Stream (instead of Iao Stream) and Baileys Ditch parallel and further south, along the south side of Iao Valley Road (Figures 25-27). Interestingly, Old Mill Ditch or Mission Ditch are not identified and this is the first indication of a separate ditch for Bailey. Unfortunately, this map was only created along the Stream, thus the configuration of *Kama auwai* apart from the stream (i.e. south) is not known.

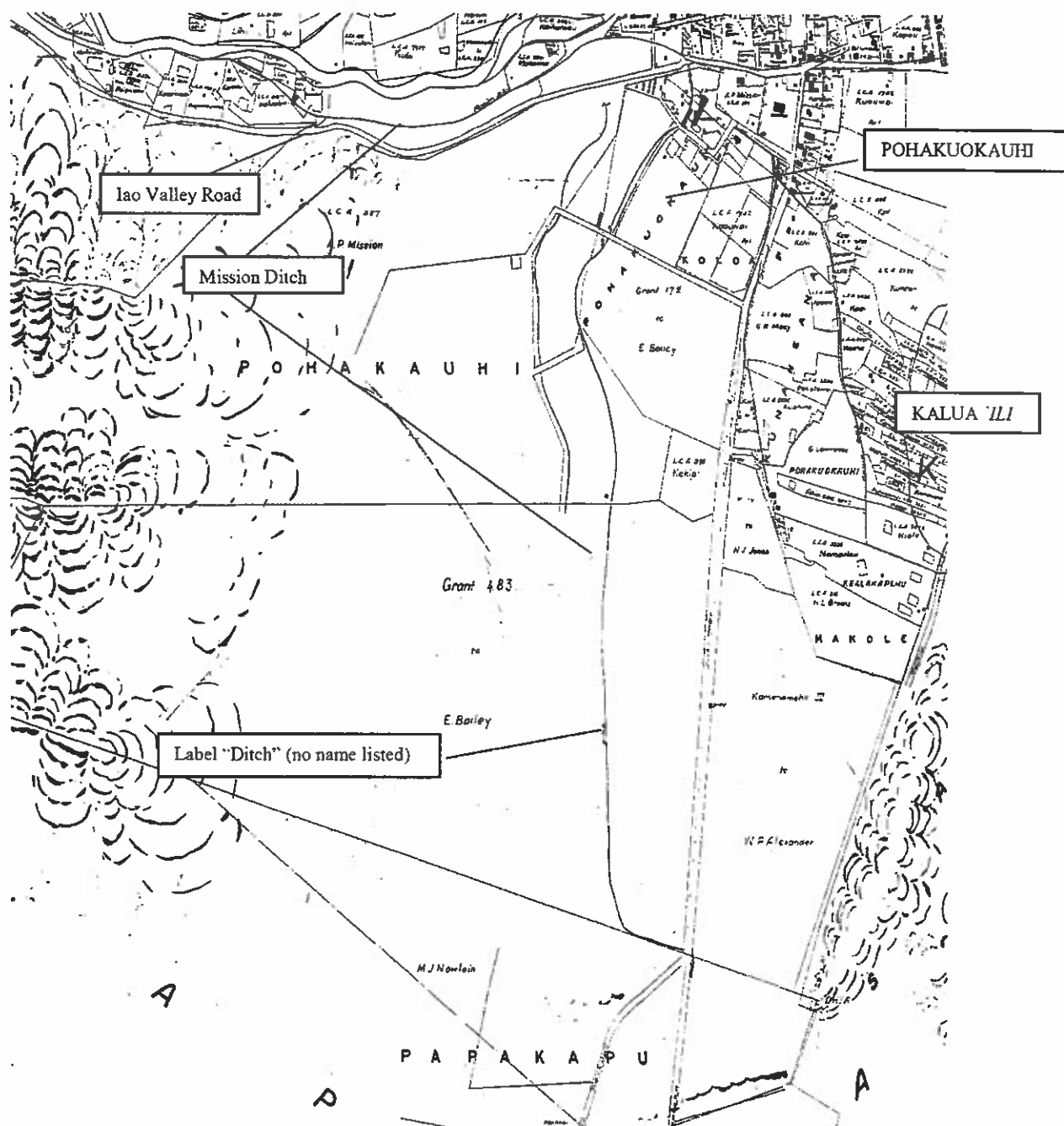


Figure 22. Registered Map 1261 by Monsarratt 1882 Showing a Portion of Wailuku

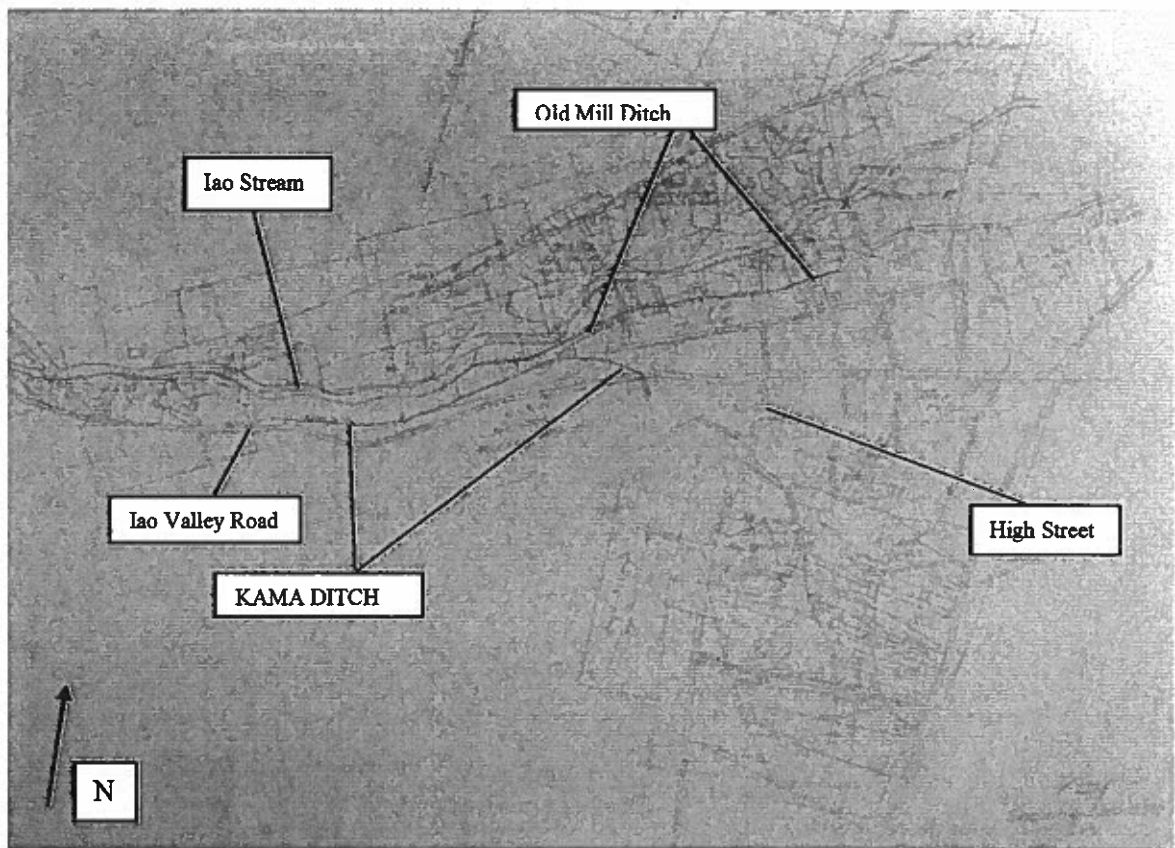


Figure 23. Photo Copy of Map Key for Wailuku from Bailey House Museum Archives likely from Late 1800's early 1900's (original map is no longer available. Photo copy contains no date or drafters name)

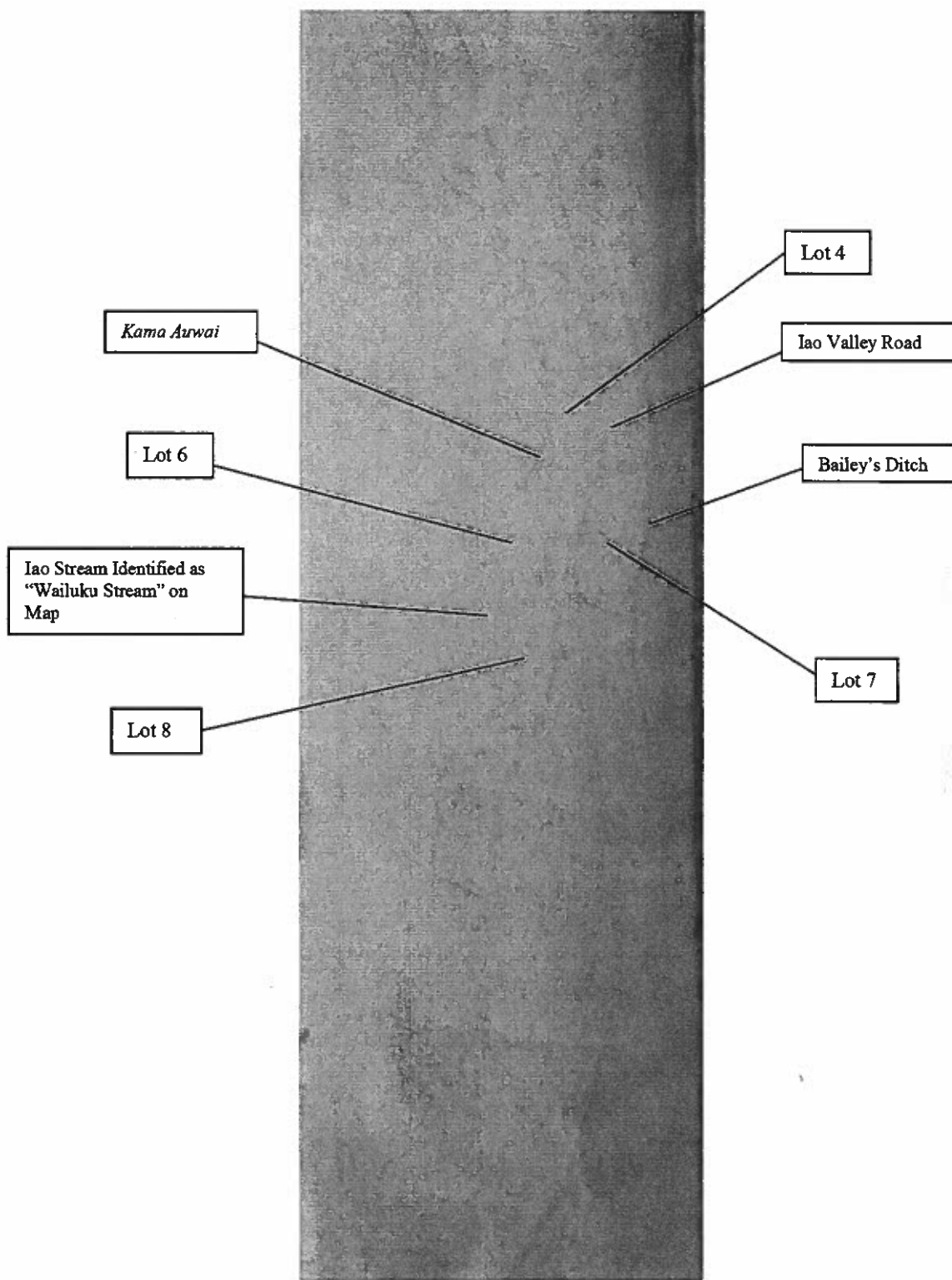


Figure 25. Photograph of Illegible Photo Copy of Map for Wailuku Sugar Co. in Iao Valley from Bailey House Archives (By J.K. Kahookele 1907) (photo copy included here as reference for Figs. 26 and 27 as original map no longer available)

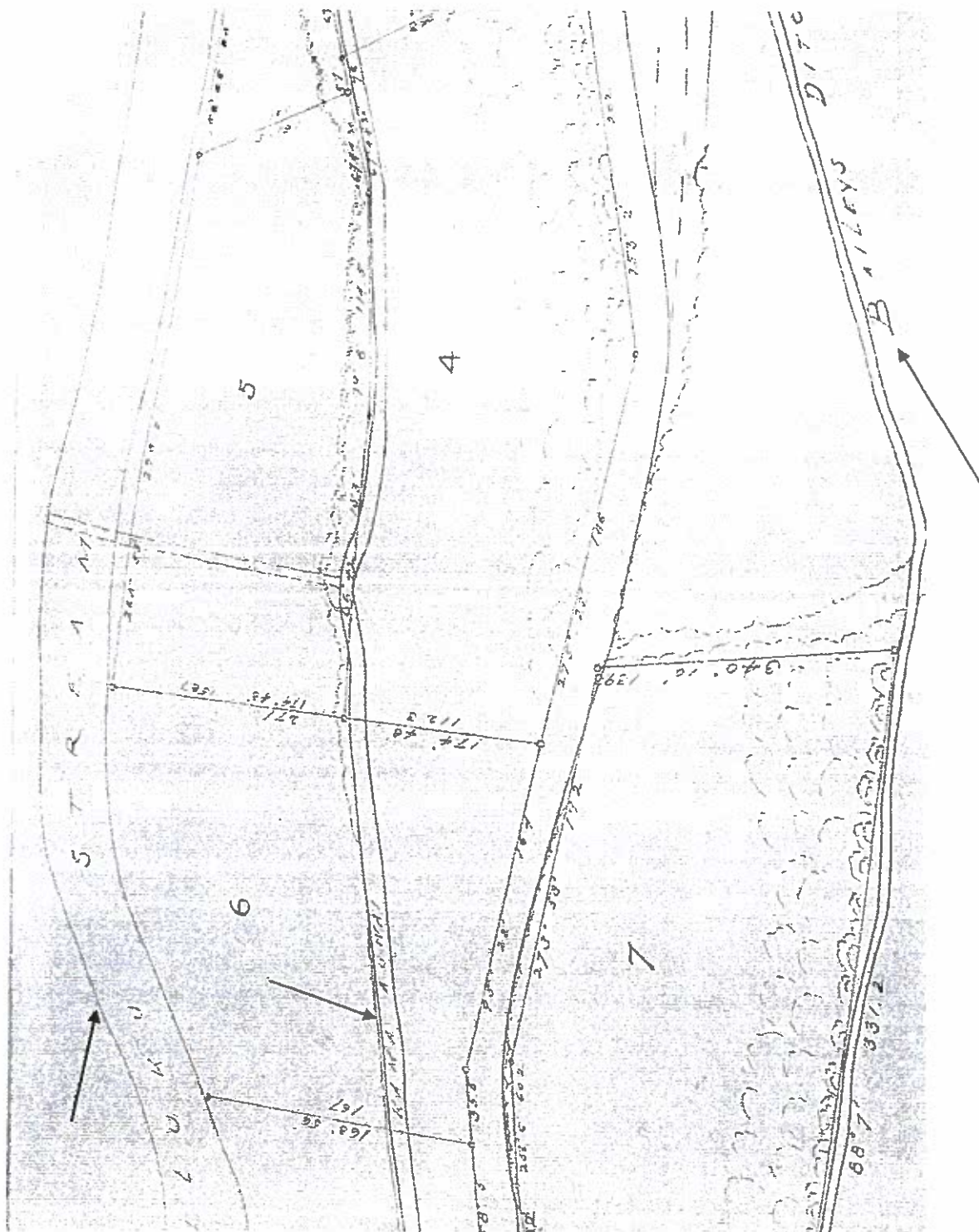


Figure 26. Enlarged Central Section of Wailuku Sugar Co. Map from 1907 (Fig.25) Showing Kama Auwai and Bailey's Ditch (note map designates Iao Stream as Wailuku Stream). Photo Copy courtesy of Baily House Museum as Original Map is no Longer Available

During the current course of work, the condition of Site 5474 ranged from poor to good with the overall condition as fair. The Kama Ditch was either dirt lined or concrete lined; however the majority, particularly on the northern end and western (*mauka*) side is either pushed up or removed by prior grading with the central portions infilled with vegetation and or soil (Figs. 28-31). The concrete lined portion when extant is along the east side intermittently for approximately 55.0 m. It averages 2.80 m wide by 0.60 m (top of silt) to 1.5 m deep. A metal sluice gate, designated Feature 1 was noted along the eastern side of the ditch approximately 60 m north of the southern boundary. The sluice gate is constructed of sheet metal and measures 0.43 m to 1.0 m long by 0.58 m wide by 0.04 m thick, and when operational, would release water to irrigate the fields below or *makai*. Unfortunately, Site 5474 has been severely damaged through prior grubbing and grading activities, abandonment and natural erosional forces. Site 5474 has been adequately documented at the inventory level and requires no further work beyond construction monitoring during removal.

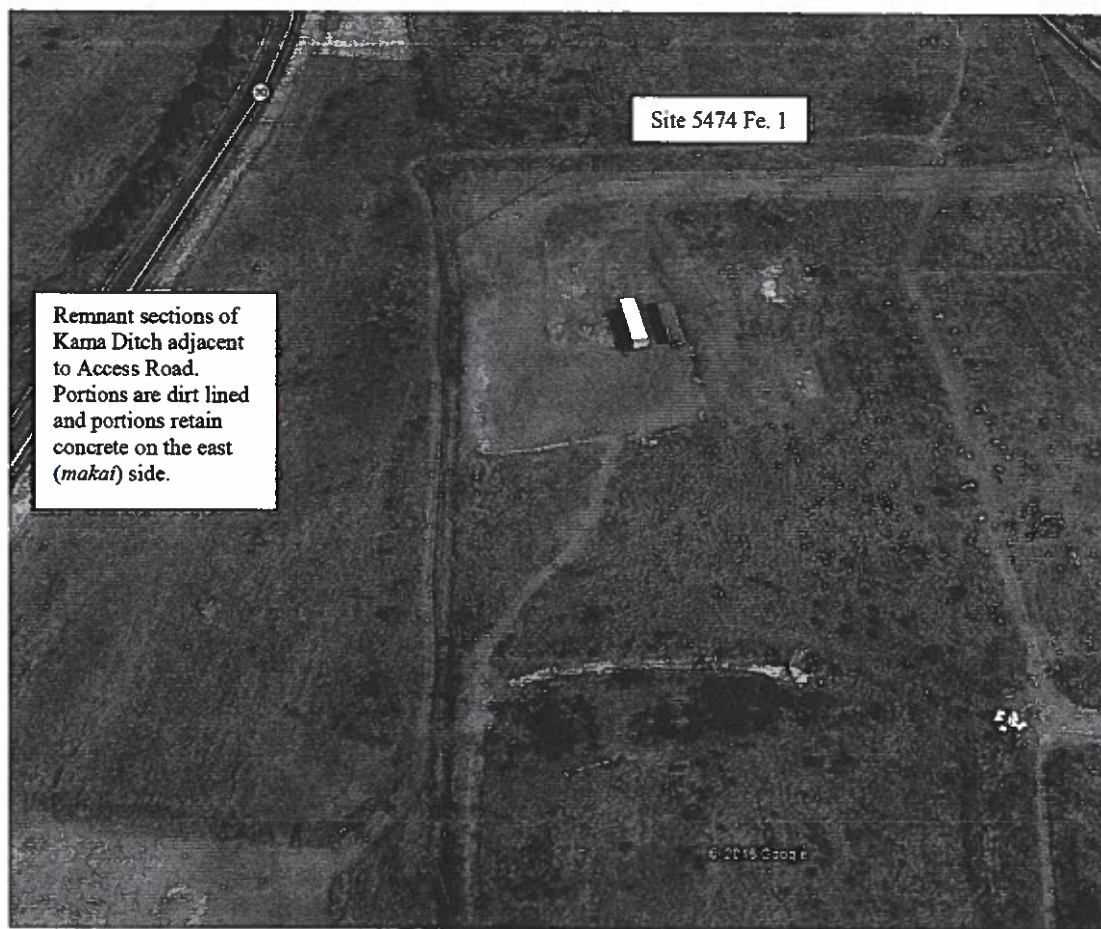


Figure 28. Aerial Photograph of Southwestern Quadrant of Project Area Showing



Figure 29. Photograph of Site 5474 Kama Ditch (View to North)



Figure 30. Overview Photograph of Project Area and Site 5474 (Kama Ditch) Feature 1 (Sluice Gate) along Southwest Side (View to South)



**Figure 31. Photograph of Site 5474 Feature 1 Metal Sluice Gate of Kama Ditch-Note infill of Silt
(View to East)**

INITIAL SIGNIFICANCE EVALUATION

The following significance evaluations are based on the Rules Governing Procedures for Historic Preservation Review (DLNR 1996; Chapter 275). According to these rules, a site must possess integrity of a location, design, setting, materials, workmanship, feeling and association and shall meet one or more of the following criteria:

Criterion "a": Be associated with events that have made an important contribution to the broad patterns of our history;

Criterion "b": Be associated with the lives of persons important in our past;

Criterion "c": Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

Criterion "d": Have yielded, or is likely to yield, important information for research on prehistory or history;

Criterion "e": Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts.

State Site 50-50-04-5474 is considered to be significant under Criterion "a" and Criterion "d" of the Hawaii Register of Historic Places. Criterion "a" has been assigned based on its association with the Sugar Plantation and the Landmark Court Case. The sugar industry had significant impacts and contributions to the island for over a century. Criterion "d" is based on the fact that the ditch has yielded important information to the understanding of the pre-history and history of the Wailuku and Waikapū *ahupua`a*.

DISCUSSION

Archaeological Inventory Survey (AIS) procedures comprised of a pedestrian survey and subsurface testing through mechanical excavations was undertaken within the approximate 50-acre project area. A total of 25 backhoe trenches, negative for buried cultural remains, were executed during the current AIS procedures. During the pedestrian survey, a disturbed segment of the Kama Ditch (Site 50-50-04-5474) and an associated sluice gate, Feature 1, was documented in fair to poor within the southwestern portion of the project area and evaluated as significant under Criteria a and d. Site 5474, along with numerous ditches, reservoirs and Mills were constructed or improved during the initial Plantation Era and have subsequently altered and shaped (both negatively and positively) the life styles of the historic period. Site 5474 continues to the north and south outside the subject parcel. However to the south, a 1000 ft. section of the Kama Ditch was approved for removal to develop the affordable subdivision by Spencer Homes at TMK's 3-5-002:001 and 3-8-007: 101 both portions (Fredericksen and Fredericksen 2004). During the review process for the southern subdivision, the SHPD Architecture Branch determined that sufficient information was collected at Site 5474 and the proposed demolition was approved. Similar to the above situation, the section of Site 5474 within the current project area shall be removed during proposed development.

No other significant surface or subsurface cultural remains were encountered during the inventory survey. The project area has undergone extensive compounded disturbances from sugar cane cultivation, past sand mining activities, a sewer line easement and individual farming plots. The backhoe testing and pedestrian survey exemplified that the entire surface consisted of the agricultural till zone designated as Layer I. The south, central section, primarily between the sewer line easement and Site 5474 (Kama Ditch), contains disturbed and un-disturbed sand within TR's 10, 17 through 23. TR's 1, 2, 7, 8 and 12-16 contained episodes of alluvium and possible colluvium comprised of rounded cobbles and boulders, silt and gravel with sub-angular cobbles noted in TR's 7 and 8. TR's 7 and 8 were located on the southeastern boundary, and the remaining trenches were confined to the western boundary adjacent to Honoapi'ilani Highway.

The results of the current investigations produced no evidence for sedentary cultural activities during the prehistoric and early historic periods in the subject area. These negative results are likely due to the prior disturbances across the parcel and the inherent bias in random sampling. Regardless of the negative results, previous archaeological investigations and archival research have documented traditional and historic burials in the vicinity of the subject parcel. Furthermore, based on the number of LCA's and Grants in the vicinity, together with the historical background research, Waikapū and Wailuku would have supported substantial populations.

RECOMMENDATIONS

Based on the negative results of fieldwork, no further inventory level work is recommended prior to commencing construction activities. However, due to the presence of sand dune remnants in the project area, as well as the proximity of archaeological sites and Native Hawaiian burials in neighboring parcels, archaeological monitoring is recommended during all ground-altering activities such as base yards, dust and silt fences, grubbing, grading and etc. Unfortunately, the Kama Ditch, Site 5474 has been severely impacted and retains little if any integrity; thus the site is not recommended for preservation. However, Site 5474 shall be closely monitored to assess and document subsurface construction if applicable.

Prior to the commencement of construction, and Archaeological Monitoring Plan (AMP) will be prepared and submitted for review and approval by the SHPD.

REFERENCES

- Adler, Jacob
1966 *Claus Spreckels: The Sugar King in Hawaii*. Mutual Publishing, Honolulu.
- Armstrong
1973 *Atlas of Hawaii*. Department of Geography, University of Hawaii. University Press of Hawaii, Honolulu.
- Bates, G.W.
1854 *Sandwich Island Notes*. Harper and Brothers, New York.
- Beckwith, Martha
1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu.
- Brisbin, J., A.E. Haun, and P. Jensen
1991 *Archaeological Data Recovery Excavations Waikapū Mauka Partners Golf Resort Project Area*. Ms. on File, State Historic Preservation Division, DLNR, Honolulu.
- Creed, Victoria S.
1993 *Settlement Pattern for Waikapū, Wailuku District, Maui, Hawaii, Vols. I and II*, Cultural Surveys Hawaii.
- Donham, T.
1991 *Field Inspection of the Water Pipeline Easement Across Waikapū Stream, Waikapū, Maui Island (TMK3-5-4:14, 3-6-04:2)*. State Historic Preservation Division, Dept. of Land and Natural Resources, Honolulu.
- 1995 *Field Inspection of the Richardson Family Cemetery (Site 50-50-04-4001), Kukuialamaka, Waikapū, Wailuku District, Maui*. State Historic Preservation Division, Dept. of Land and Natural Resources, Honolulu.
- Farber, Joseph M.
1997 *Ancient Hawaiian Fishponds: Can Restoration Succeed on Molokaʻi?* Neptune House Publications, Encinitas, CA.
- Foote, Donald E., E. L. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lana, State of Hawaii*. U.S.D.A. Soil Conservation Service, U.S. Government Printing Office, Washington, D.C.
- Fornander, A.
1969 *Account of the Polynesian Race: Its Origins and Migrations. Volumes I-III*, Charles E. Tuttle, Co., Tokyo.

Foreign Testimony

- 1849 *Foreign Testimony to the Board of Commissioners to Quiet Land Titles.*
Translation in the Hawai'i State Archives. Honolulu, HI.
- Fredericksen, Walter and Demaris
- 1996 *Report on the Waikapū Human Remains Recovery Project, Waikapū, Maui, Hawaii (Borrow Site 50-50-04-3525) TMK 3-8-07:104.* Prepared for SHPD, by Xamanek Researches, Pukalani, HI.
- 2004 *Archaeological Inventory Survey for Waikapū Affordable Housing Subdivision, Waikapū Ahupua`a, Wailuku District, Island of Maui (TMK: 3-5-02: por. 01 and 3-8-07: 101).* Prepared for Mr. Jesse Spencer, Xamanek Researches, Pukalani, HI.
- Guerriero, D., L. Rotunno-Hazuka, and J. Pantaleo
- 2004 *Archaeological Inventory Survey Report at TMK:3-8-07:121, Por. 136 & 137, Wailuku Ahupua`a; Wailuku District; Island of Maui.* Prepared for New Sandhills, LLC. Archaeological Services Hawaii, LLC, Wailuku, Hawaii.
- Guerriero, D., L. Rotunno-Hazuka, and J. Pantaleo
- 2004 *Archaeological Interim Monitoring Report for Ameron Sand Mining Operations at TMK:3-8-07:131, Wailuku Ahupua`a and District; Island of Maui.* Prepared for Maui Lani 100 LLC. Archaeological Services Hawaii, LLC.
- Handy, E.S.C.
- 1940 *The Hawaiian Planter*, B.P. Bishop Museum Bulletin 116, Bishop Museum Press, Honolulu.
- Handy, E.S. Craighill and E.G. Handy
- 1972 *Native Planters in Old Hawaii, their Life, Lore and Environment.* Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.
- Hawai'i State Archives
- N.D. *Native and Foreign Testimonies for Land Commission Awards.* Interior Department Files.
- Kalakaua, David.
- 1990 *The Legends and Myths of Hawai'i.* Mutual Publishing, Honolulu.
- Kamakau, Samuel, M.
- 1992 *Ruling Chiefs of Hawaii.* Revised Edition, Kamehameha Schools Press. Honolulu.
- Kamakau, Samuel, M., Pukui, and Barrere
- 1991 *Tales and Traditions of the People of Old: Na Mo`olelo a ka Po`e Kahiko.* B.P. Bishop Museum Press. Honolulu.

- Kame'eleihiwa, L.
1992 *Native Land and Foreign Desires – Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.
- Kennedy, Joseph
1988 *Preliminary Archaeological Survey of Phase 1A of the Waikapū Master Plan (TMK 3-5-04: Por. Of 25).* Archaeological Consultants of Hawaii, Inc., Haleiwa.
- 1989 *Subsurface Testing Results for the Proposed Waikapū Grading Project, TMK 3-5-02:1, Waikapū, Maui.* Prepared for C. Brewer Properties. Archaeological Consultants of Hawaii, Inc., Haleiwa.
- 1990 *Archaeological Inventory Report for the proposed Waikapū Maui Water Tank and Access Road Located at Waikapū, Island of Maui, TMK: 3-6-03: por. 2 and TMK: 3-6-02: por. 2.* Archaeological consultants of Hawaii, Inc., Haleiwa.
- 1994 *An Archaeological Inventory Survey with Subsurface Testing Report for the Proposed Maui Ocean Center Located at TMK: 3-6-01:1 & 19, in Waikapū Ahupua`a, Wailuku District, Island of Maui.* Prepared for Mr. Michael Spalding. Archaeological Consultants of Hawaii, Inc., Haleiwa.
- Kennedy, Joseph, and Moore
1999 *An Archaeological Inventory with Subsurface Testing at TMK:3-8-07:101 pors., Wailuku Ahupua`a; Wailuku District; Island of Maui.* Prepared for Mr. Bill Hornerman. Archaeological Consultants of Hawaii, Inc., Haleiwa.
- Neal, Marie C.
1965 *In Gardens of Hawaii.* Bishop Museum Special Publication No. 50. Bishop Museum Press. Honolulu.
- McDonald, Gordon A., and Agatin T. Abbott
1970 *Volcanoes in the Sea.* University Press of Hawaii, Honolulu.
- Munsell Color
1975 *Munsell Soil Color Charts.* MacBeth Division, Kollmorgan Corporation, Baltimore.
- Native Testimony
1849 *Native Testimony to the Board of Commissioners to Quiet Land Titles.* Translation in the Hawai'i State Archives.
- Pantaleo, Jeffrey
2003 *Archaeological Inventory Survey for the Proposed Waikapū Mauka Subdivision Waikapū Ahupua`a, Wailuku District, Maui Island (TMK 3-4-4:25, por.).* Prepared for Munekyo & Hiraga, Inc. Archaeological Services Hawaii, LLC of Wailuku.

- Pickett, Jenny L.
2003 *Cultural Resource Impact Statement, Paukukalo, Wailuku Ahupua`a and District, Maui Island, Hawai'i (TMK: (2)-3-3-01:1)*. Prepared for North Shore Wai`ehu LLC of Wailuku. Archaeological Services Hawaii, Wailuku.
- Pukui, Mary Kawena, and Caroline Curtis
1974 *The Water of Kane and Other Legends of the Hawaiian Islands*. The Kamehameha Schools Press, Honolulu.
- Pukui, Mary Kawena, Samuel Elbert, and Esther Mookini
1974 *Place Names of Hawaii*. University of Hawaii Press, Honolulu.
- Pukui, Mary Kawena and Samuel H. Elbert
1986 *Hawaiian Dictionary*. University of Hawai'i Press. Honolulu.
- Rotunno-Hazuka, Lisa and Jeffrey Pantaleo
2004 *Archaeological Interim Monitoring Report for Hawaiian Cement Sand Mining Operations at TMK: 3-8-07:101 pors., Wailuku Ahupua`a; Wailuku District; Island of Maui*. Prepared for Mr. Bill Horneman. Archaeological Services Hawaii, LLC.
- Sinoto, Aki, L. Rotunno-Hazuka and Jeffrey Pantaleo
2000 *Supplementary Archaeological Sampling: Proposed Light Industrial Park, Maui Lani Development Area, Wailuku, Maui Island (TMK 3-07: Por 131)*. For Maui Lani Partners, Ltd. Aki Sinoto Consulting, Honolulu.
- Sinoto, Aki, D. Guerriero, L. Rotunno-Hazuka and J. Pantaleo
2001 *An Archaeological Inventory Survey of The Proposed 62 Market Street Project, Wailuku Ahupua`a, Wailuku, Maui (TMK 3-4-12:22 & por 23)*. Prepared for the Office of Economic Development, County of Maui, Wailuku. Aki Sinoto Consulting, Honolulu.
- State of Hawai'i
1997 *Hawaii Administrative Rules, Title 11, Department of Health, Chapter 200, Environmental Impact Statements, (Unofficial version)*
- 1997 *Guidelines for Assessing Cultural Impacts*. Adopted by the Environmental Council, State of Hawai'i.
- Sterling, Elspeth P.
1998 *Sites of Maui*. Bernice P. Bishop Museum, Honolulu.
- Thrum, T.G.
1909 *Hawaiian Annual and Almanac*. Honolulu.
- Titchenal, P.
1996 *Archaeological Inventory Survey of the Proposed Retention Basin and Adjoining Lands, Waikapū and Wailuku Ahupua`a, Wailuku District, Maui Island (TMK 3-5-02:01, por.: 3-5-01:17, por.)*. Prepared for C. Brewer Homes Inc., Wailuku by Aki Sinoto Consulting, Honolulu.

- Walker, W.
1931 *Archaeology of Maui*. Ms. dept. Anthropology, B.P. Bishop Museum.
- Westervelt, William D.
1977 *Hawaiian Historical Legends*. Chas. E. Tuttle Co., Inc., Tokyo.
- Wilcox, Carol
1996 *Sugar Water: Hawaii's Plantation Ditches*, University of Hawai'i Press
Honolulu, HI.

Appendix D

SHPD Acceptance

Letter of AIS

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
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COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
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

July 1, 2016

Vince Bagoyo
Emmanuel Lutheran Church and Valley Isle Fellowship
Vbagoyo-devgroup@hawaii.rr.com

LOG NO: 2016.01495
DOC NO: 1607MN01
Archaeology

Dear Mr. Bagoyo:

SUBJECT: Chapter 6E-42 Historic Preservation Review
Revised Archaeological Inventory Survey Report of a 50 acre Parcel of Land
Waikapu and Wailuku Ahupua'as, Wailuku District, Island of Maui
TMK: (2) 3-5-002:001

Thank you for requesting our review of the revised draft report titled "*Archaeological Inventory Survey of a 50-Acre Parcel of Land, Waikapu and Wailuku Ahupua'as, Wailuku District, Island of Maui, Hawaii*" TMK (2)3-5-002:por 001" D. Guerriero, L. Rotunno-Hazuka, and J. Pantaleo, June 2016. We received the report in our Kapolei office on February 11, 2016, and reviewed it in a letter dated April 11, 2016 (2016.00321, Doc No. 1604MN02). We received the revised version in our Kaua'i section on May 17, 2016. We received the third draft electronically on July 1, 2016.

At the request of the Emmanuel Lutheran Church and Valley Isle Fellowship, Archaeological Services Hawaii, LLC. (ASH) conducted a 100% pedestrian archaeological inventory survey (AIS) of 50 acres owned by Emmanuel Lutheran Church. The survey, which included subsurface testing, was completed between May 4-7, 2004. One historic property was identified, State Inventory of Historic Places (SIHP) Site 50-50-04-5474, Kama Ditch, and is assessed as significant under criteria a and d in accordance with Hawaii Administrative Rule (HAR) §13-284-6. The authors state that the site is significant under criteria a, for its association with the plantation era, and under criteria d for data potential. No further inventory work is recommended prior to construction, but the authors recommend archaeological monitoring due to the presence of numerous historic properties, including burials, on adjacent properties. The State Historic Preservation Division (SHPD) concurs with this recommendation.

The latest draft of the report contains the information requested regarding Site 5474, including historic maps. **The AIS is accepted, in accordance with HAR§13-276.** Please provide one hard copy of the report, clearly marked FINAL, along with a text-searchable CD to our Kapolei section. Please send one hard copy to the Maui section. Please contact Kaua'i Lead Archaeologist Mary Jane Naone at (808) 271-4940 or Maryjane.Naone@hawaii.gov if you have questions regarding this letter. Mahalo for your assistance in preserving significant historic and cultural properties.

Aloha,

Mary Jane Naone

Mary Jane Naone, Kaua'i Lead Archaeologist

cc. Jenny Pickett Maui Archaeologist Jenny.L.Pickett@hawaii.gov
Lisa Rotunno-Hazuka, Archaeological Services Hawaii, LLC. lisa@ashmaui.com
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



Appendix E

***Archaeological
Monitoring Plan (AMP)***

**DRAFT ARCHAEOLOGICAL MONITORING PLAN
FOR THE PROPOSED
WAI ALE AFFORDABLE HOUSING PROJECT
WAIKAPŪ AHUPUA'A, WAILUKU DISTRICT,
PŪ'ALI KOMOHANA MOKU
ISLAND OF MAUI
TMK [2] 3-5-002:012 pors.**

FOR: Wai'ale Road 201, LLC

BY: Lisa J. Rotunno-Hazuka (B.A.)

JANUARY 2016



ARCHAEOLOGICAL SERVICES HAWAII, LLC.

POB 1015

PU'UNĒNĒ, HI 96784

"Protecting, Preserving, Interpreting the Past, While Planning the Future"

INTRODUCTION

At the request of Wai`ale Road 201, LLC, and pursuant to past recommendations by the State Historic Preservation Division (SHPD) and the Archaeological Assessment (AA), Archaeological Services Hawaii, LLC (ASH) of Pu`unēnē has prepared this Archaeological Monitoring Plan (AMP) according to the rules and regulations set forth in the Hawaii Administrative Rules (HAR) §13-279. Monitoring will be performed for all ground-disturbing activities associated with the proposed subdivision located off Waiale Road, Waikapū *ahupua`a* and District, Pū`ali Komohana *Moku*; Island of Maui, TMK [2] 3-5-002:012 pors (Figures 1-4).

The proposed improvements consist of the construction of an affordable residential subdivision with roadways, utilities and infrastructure (see Figure 3). Proposed excavations will range from 2.0 to 8.0 ft. deep and will occur within disturbed and original sand and soil matrices.

PROJECT AREA DESCRIPTION

The project area, comprised of 10.5 acres, is located along the isthmus of Central Maui within remnant inland sand dunes. It is adjacent and *mauka* (west) of Waiale Road within the eastern half of Parcel 12. The western half is planned for the Valley Isle Fellowship. The project area is bound to the north by an undeveloped lot, Parcel 11, to the south by Kokololio Street, to the east by Waiale Road, and to the west by a sewer line and a partially developed lot for Valley Isle Fellowship. The subject area has undergone compounded disturbances from past agricultural activities (sugar cane cultivation and individual farm plots) and sand mining operations.

An AA was performed of Parcel 11 and Parcel 12 (current project area) in 2004 for the then proposed Emmanuel Lutheran Church (Parcel 11) and Valley Isle Fellowship (Parcel 12) under former TMK 3-5-002: 001 pors. A total of 24 trenches were executed, five of which were undertaken within the project area and were negative for cultural materials and human remains (see Figure 4). Although no historic properties or burial sites were documented during the AA, several Native Hawaiian burial sites and secondary deposits of skeletal remains have been documented along and in close proximity to Waiale Road. Along Kuikahi Avenue extension (just north of the project) and adjacent to Kihei Nursery (across Waiale to the east from the subject area), numerous burial features and scatters of human

remains (Sites 5556, 6060, 6261 and 6573) were documented within the VMX (C/R) and VMX (R) subdivisions within Maui Lani landholdings (see Figure 1).

EXPECTABILITY OF SUBSURFACE SITES

Based on the foregoing information, the subject parcel is within an area known to contain traditional burial sites. However due to the varied disturbances across the project area; remnant burial features and secondary deposits of human remains may be extant. Thus all ground disturbing activities related to construction will be monitored full time.

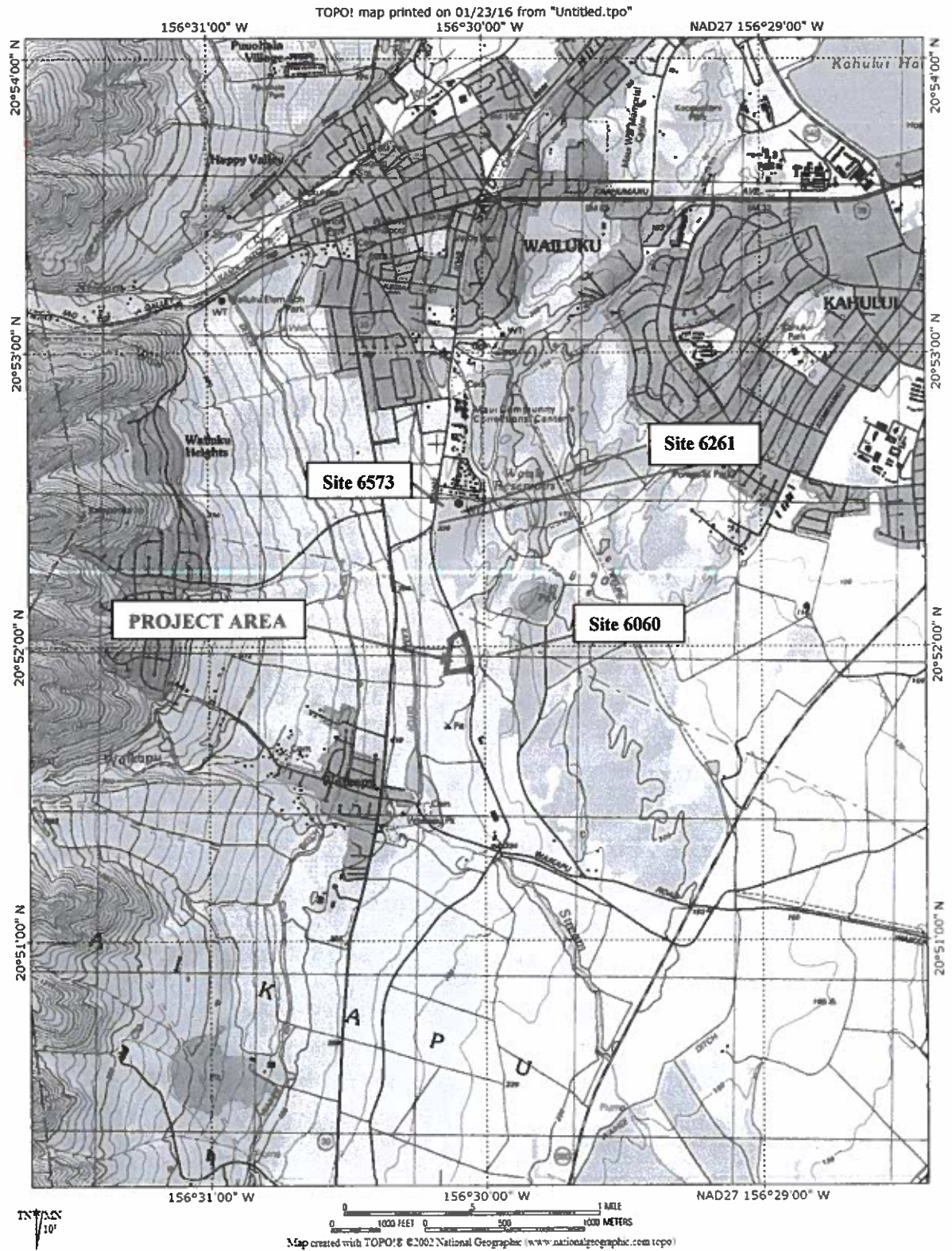
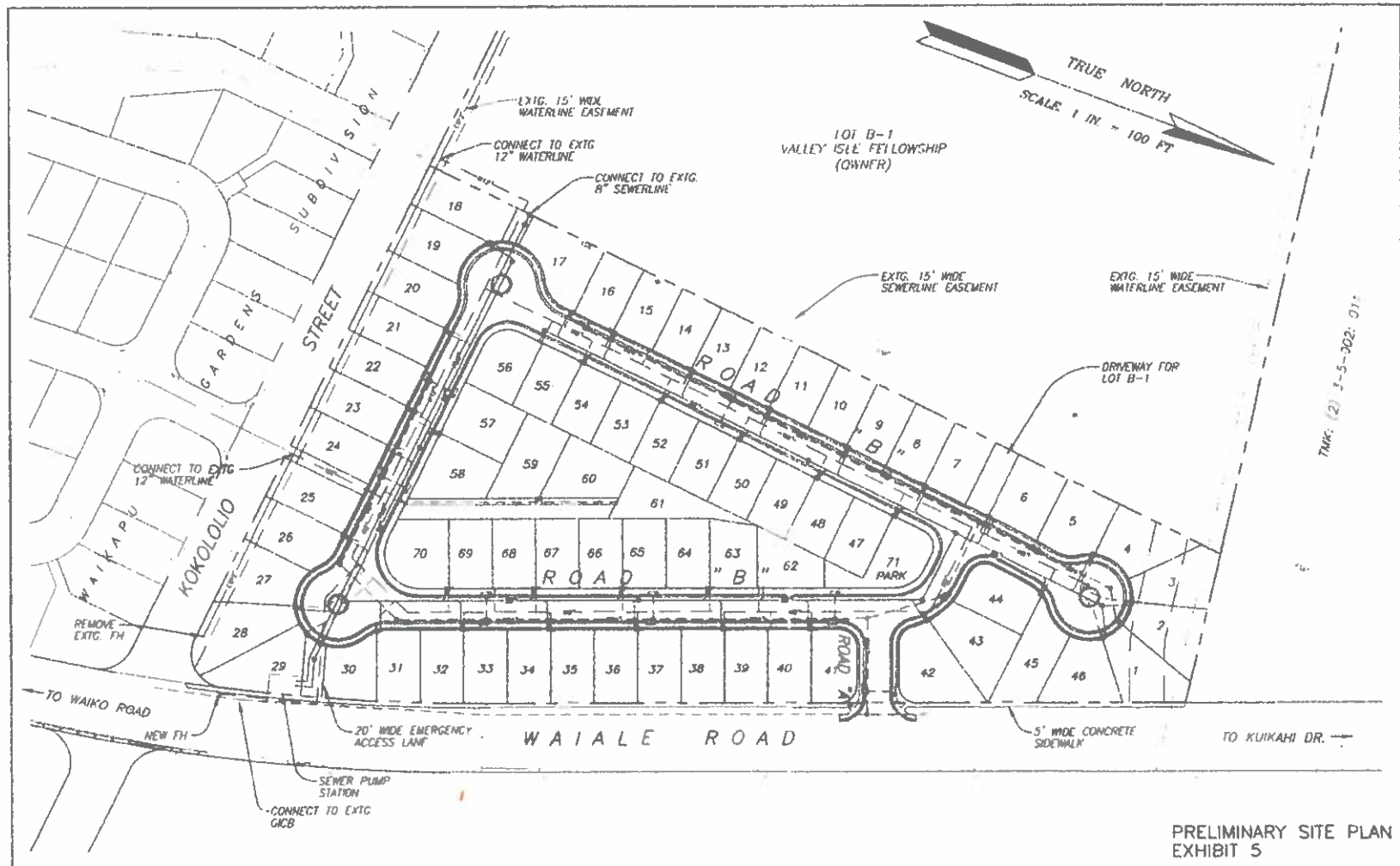


Figure 1. USGS Quadrangle Map Showing Location of Project Area (red) Burial Sites in Close

Figure 3. Proposed Residential Subdivision



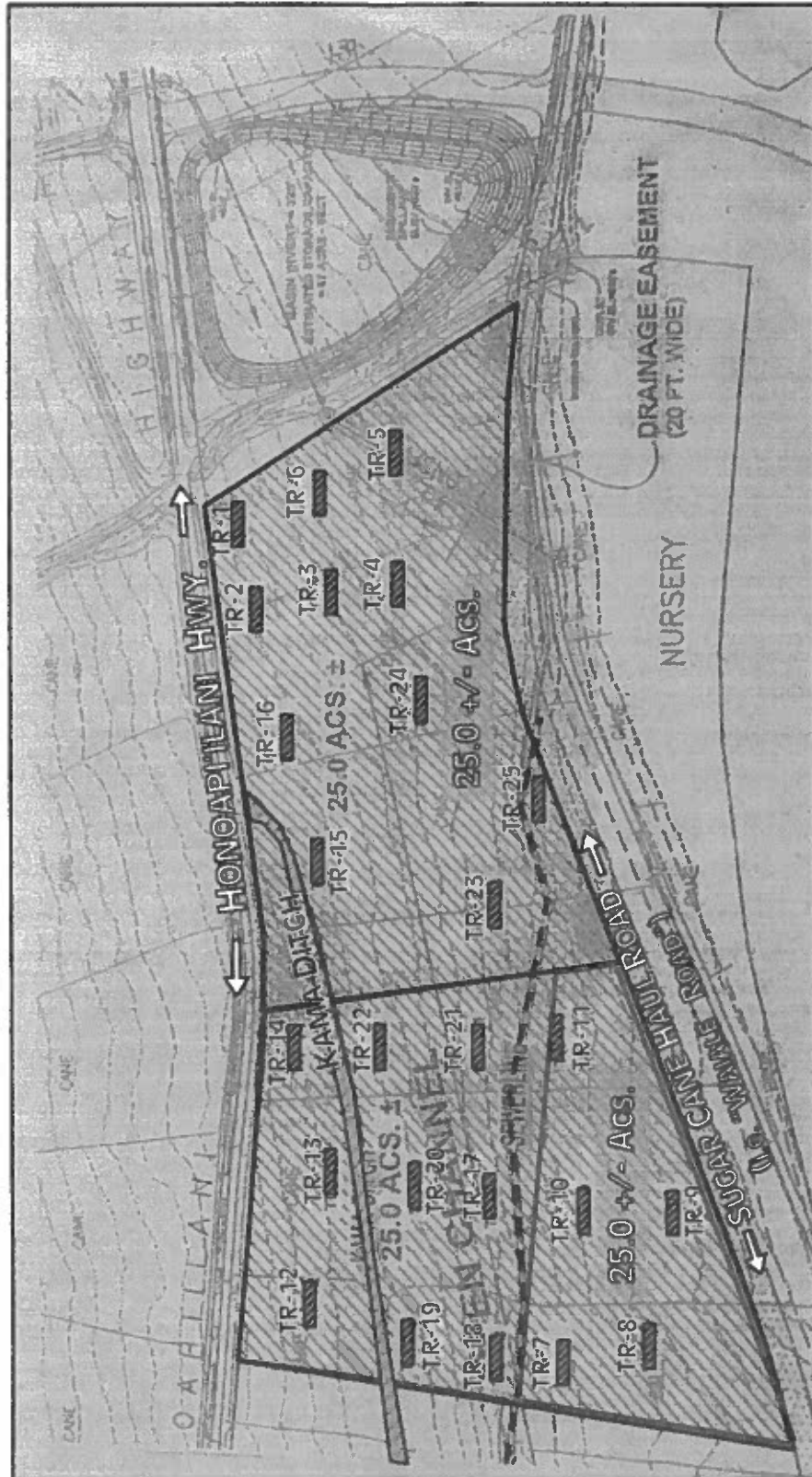


Figure 4. Topographic Map Showing Project Area (red) and Trenches 1-24 from Archaeological Assessment (from Guerriero et. al. 2004)

MONITORING PLAN

The construction plans call for excavations ranging from 2.0 to 8.0 ft. deep and all ground-altering activities will be monitored full-time. In the event that excavations are within bedrock or the water table, monitoring procedures may be suspended; however no changes may be made without consultation and approval by SHPD via telephone and or in writing. SHPD will also be notified of the onset and completion of the proposed undertaking.

One archaeological monitor per piece of ground-disturbing equipment is the protocol for this monitoring project. Dependent on availability, Maui resident archaeologists will be assigned to this project. Prior to the commencement of construction, all pertinent parties including but not limited to construction and archaeological personnel will be informed of the monitoring procedures as stipulated in this monitoring plan, including the monitors' authority to halt work in the vicinity of a find. If subsurface sites are exposed during construction, the procedures for the inadvertent discovery of historic properties pursuant to HAR §13-280 and §13-279 (5)-(6) will be instituted. These procedures include but are not limited to the following steps. If archaeological sites or suspicious anomalies are identified during construction, temporarily halt ground-disturbing activities in the immediate area of the find and project activities may shift to other localities of the project. Once the archaeologist makes an assessment, they will then consult with SHPD to determine the appropriate mitigation measures for the find. The area around the site shall be protected by erecting orange fencing or yellow caution tape. The site will be recorded utilizing all standard archaeological methods and procedures. Stratigraphic profiles will be drawn, photographs will be taken, and soil samples collected not only from the subsurface site, but from selected locations within the project area. During nighttime work, the archaeological monitor has sole discretion to determine if lighting is adequate to perform visual inspections of the soil.

If historic bottles are found they are to be collected by the archaeologist. No bottles may be collected or taken by any construction worker. In the event that human remains are inadvertently exposed during this undertaking, the procedures for the inadvertent discovery of human skeletal remains pursuant to HAR §13-300-40 will be instituted. First, the aforementioned procedures of halting and securing the site will be performed. After an initial assessment is made by the Maui Burial Sites Specialist of SHPD, and in consultation with members of the Maui/Lana'i Islands Burial Council-MLIBC (if the remains are

believed to be Native Hawaiian), procedures for documenting the burial find shall be undertaken. These mitigation measures may include mapping and collecting displaced human skeletal remains after authorization from SHPD, raking and screening of the spoil piles and manual controlled excavations to ascertain the context (*in situ* or displaced) and number of individuals represented by the skeletal remains. Additional documentation comprised of osteological inventory forms, plan view maps and SHPD notification forms will also be completed.

After the above referenced procedures have been performed, a Burial Component of an Archaeological Preservation Plan (BCPP) for burial(s) to be preserved in place, and or a Burial Component of an Archaeological Data Recovery Plan (BCDRP) for burial(s) that will be disinterred and relocated, will be prepared in consultation with the owner, SHPD and the MLIBC (if the remains are believed to be Native Hawaiian).

POSSIBLE PROCEDURES FOR INADVERTENTLY DISCOVERED HUMAN SKELETAL REMAINS

Potential procedures for exposed skeletal remains and possible burial pit outlines are presented below.

1. Upon the identification of scattered or fragmented human remains, possible burial pits, and or basalt and coral manuports, all construction activities in the immediate area of the find will be temporarily suspended.
2. SHPD and the MLIBC geographic representative shall be notified.
3. Identify the perimeter of the avoidance area with yellow caution tape, and or orange construction fencing and if applicable, cover exposed skeletal remains to protect them from the elements.
4. Inspect trench walls and base of trench to identify if a primary burial feature is extant. If present, notify SHPD and request permission to test the possible burial feature. Once authorization has been received, conduct the necessary testing and documentation to ascertain the context.
5. Manually rake and screen (if applicable) bulldozed or other mechanically produced push piles to collect all disturbed and fragmented skeletal remains.
6. Complete an osteological inventory of the collected remains to determine the number of individuals and if components may be left *in situ* or missing.
7. Fill out all test excavation and burial forms and cover burial feature with a thin layer of sand (if SHPD and MLIBC have seen the feature) and tarp.

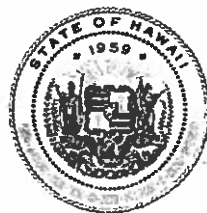
Upon completion of the fieldwork, all necessary lab procedures including but not limited to processing, cataloguing and analyses of artifacts and photographs; analyses of soil samples as warranted and submitting of charcoal samples for radiocarbon dating will be performed. All analyses will be synthesized into a final monitoring report, and the report will be submitted to SHPD for their review and comments. All notes, photographs and artifacts will be archived at the Consulting Archaeologists office. After analysis of the artifacts is completed, all artifactual material, with the exception of grave goods, will be returned to the landowner.

Appendix F

SHPD Acceptance

Letter of AMP

DAVID Y. IGE
GOVERNOR OF HAWAII



**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
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KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
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 22, 2017

Vince Bagoyo
Emmanuel Lutheran Church and Valley Isle Fellowship
Email: Vbagoyo-devgroup@hawaii.rr.com

IN REPLY REFER TO:
Log No. 2016.01693
Doc No. 1703MBF18
Archaeology

Dear Mr. Bagoyo:

**SUBJECT: Chapter 6E-42 Historic Preservation Review—
Draft Archaeological Inventory Survey of a 50-acre Parcel of Land
Waikapu and Wailuku Ahupua'a, Wailuku District, Island of Maui, Hawai'i
TMK: (2) 3-5-002:011 and 012 (formerly(2) 3-5-002:001 por.)**

Thank you for the opportunity to review the revised draft titled, *Draft Archaeological Inventory Survey of a 50-acre Parcel of Land in Wailuku; TMK: (2)3-5-002:011 and 012 (formerly 3-5-002:001 por.)* (Guerriero et al. 2016). The State Historic Preservation Division (SHPD) received this revised draft archaeological inventory survey (AIS) report on June 20, 2016.

The SHPD received the first revised version of the report on February 11, 2016, and returned review comments in a letter dated April 11, 2016 (Log No. 2016.00321, Doc. No. 1604MN02). Further revisions were requested on May 20, 2016 (Log No. 2016.01090; Doc. No. 1605MN08).

At the request of the Emmanuel Lutheran Church and Valley Isle Fellowship, Archaeological Services Hawai'i, LLC (ASH) conducted a 100 percent pedestrian survey of 50 acres owned by Emmanuel Lutheran Church. One historic property was identified and given a State Inventory of Historic Places number (SIHP 50-50-04-5474). It is a portion of the Kama Ditch, which has been assessed as significant under criteria a and d in accordance with Hawaii Administrative Rules (HAR) §13-284-6. The AIS also included subsurface testing with mechanized trenching, which was conducted on May 4-7, 2004. All subsurface testing produced negative results.

The most recent comment letter from the SHPD (May 20, 2016; Log No. 2016.01090; Doc. No. 1605MN08), indicated that while revisions previously requested in a letter dated April 11, 2016 were adequately addressed, the reviewer still lacked integral information placing Site 5474 in its historical context. The most recent version of the AIS report provides the requested information regarding the historical context of this portion of the Kama Ditch (SIHP 5474).

The ditch has integrity of location only within the current project area. The AIS report indicates that other portions of the ditch have been removed by previous construction. A 1,000 ft. section to the south of the current project area was removed as part of a subdivision development (TMK: [2] 3-5-002:001 and 3-8-007:001). The portion of SIHP 5474 within the current project area has been adequately documented.

The AIS report also indicates that while no subsurface archaeological resources were identified, the project area is located within a zone of beach sand dune and silty clay deposits, which are known to contain human burial features and historic habitation sites. Numerous marked and unmarked human burials and associated features have been identified in the area, and thus potential exists for the project to encounter yet unidentified subsurface historic properties. Therefore, on-site archaeological monitoring is recommended for all ground disturbing activities. The SHPD concurs with this recommendation.

Vince Bagoyo
May 22, 2017
Page 2

The revisions adequately address the issues and concerns identified in our previous correspondence. The report meets the minimum requirements of HAR §13-276-5. **It is accepted.** Please send one hardcopy of the document, clearly marked FINAL, along with a text-searchable PDF version to the Kapolei SHPD office, attention SHPD Library.

SHPD looks forward to receiving an archaeological monitoring plan (AMP) meeting the requirements of Hawai'i Administrative Rules §13-279-4 for review and acceptance prior to issuance of the permit.

SHPD will notify you when the AMP has been accepted, and permitting for the subject project may proceed.

Please feel free to contact Dr. Matthew Barker Fariss, Maui Lead Archaeologist, at (808) 243-4626 or at matthew.b.fariss@hawaii.gov if you have any questions or concerns about this letter. Thank you.

Sincerely,



Susan A. Lebo, PhD
Archaeology Branch Chief

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

County of Maui Department of Public Works –DSA
Lei.Smith@co.maui.hi.us

County of Maui, Department of Planning
Planning@co.maui.hi.us

Lisa Rotunno-Hazuka, Archaeological Services
Hawaii, LLC.
lisa@ashmaui.com

Appendix G

Preliminary

Engineering Report

PRELIMINARY ENGINEERING REPORT

FOR

**WAIKAPU DEVELOPMENT VENTURE
AFFORDABLE HOUSING PROJECT
Wailuku, Maui, Hawaii**

T.M.K.: (2) 3-5-002: por. of 011

Prepared for:

**Waikapu Development Venture, LLC
56 Paliuli Place
Kula, Maui, Hawaii 96790**



Mark M. Matsuda

Prepared by:



**CONSULTING CIVIL ENGINEERS
305 SOUTH HIGH STREET, SUITE 102
WAILUKU, MAUI, HAWAII 96793
PHONE: (808) 242-0032**

July 2017

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**PRELIMINARY ENGINEERING REPORT
FOR
WAIKAPU DEVELOPMENT VENTURE
AFFORDABLE HOUSING PROJECT
T.M.K.: (2) 3-5-002: por. of 011**

1.0 INTRODUCTION

The purpose of this report is to provide information on the existing infrastructure which will be servicing the proposed project. It will also evaluate the adequacy of the existing infrastructure and anticipated improvements which may be required for the proposed project.

The subject parcel is identified as T.M.K.: (2) 3-5-002: 011. It is also known as Lot A of the Waikapu East (Large Lot) Subdivision. The proposed project will encompass the southern 12.5 acres of the 25.263 acre parcel. The remaining northern portion of the property is owned and utilized by Emmanuel Lutheran Church. The property is bordered by the undeveloped Lot J of the Waikapu East (Large Lot) Subdivision to the north, Waiale Road to the east; Honoapiilani Highway to the west, and the Valley Isle Fellowship Church and Waiale Elua Subdivision to the south.

The proposed project consists of developing a 74 lot subdivision with 6 of the lots consisting of a duplex unit for a total of 80 units. The project will have lot sizes ranging from approximately 3,000 square feet to 6,500 square feet. Proposed improvements include paved roadways; concrete curbs, gutters and sidewalks; landscaping; underground water, sewer, drainage, electrical, cable, and telephone systems; and a neighborhood green.

2.0 EXISTING INFRASTRUCTURE

2.1 ROADWAYS

Honoapiilani Highway is located west of the project site. It is a two lane undivided State Highway which runs in the north-south direction into Wailuku town. The speed limit ranges between 30 and 45 miles per hour (mph) in the vicinity of Waikapu. There are traffic signals at the intersection with Waiko Road to the south of the project site and with Kuikahi Drive to the north of the project site with existing left turn pockets for southbound traffic to head east towards Waiale Road. There is no direct access from Honoapiilani Highway into the subject property.

Kuihelani Highway is located approximately 4,500 feet east of the project site. It is a two way, four-lane State arterial highway which also runs in the north-south direction. The posted speed limit on Kuihelani Highway varies between 30 and 55 mph. Traffic signals are installed at the Kuihelani Highway-Waiko Road intersection.

The southern terminus of Kuihelani Highway is its intersection with Honoapiilani Highway.

Kuikahi Drive is a two-lane collector roadway that connects Honoapiilani Highway and Waiale Road. The posted speed limit on Kuikahi Drive range between 25 mph and 35 mph. Kuikahi Drive begins west of Honoapiilani Highway within the Wailuku Heights Subdivision and continues east past Waiale Road, terminating near the Church of Jesus Christ of Latter Day Saints where it bends and becomes Maui Lani Parkway.

Waiko Road is a two-lane collector roadway that connects Honoapiilani Highway and Kuihelani Highway. The posted speed limit on Waiko Road is 20 mph. Immediately east of Honoapiilani Highway, where Waiko Road provides access to a residential community. Further east, Waiko Road provides access to industrial and livestock land uses.

Waiale Road is a two-lane collector roadway running north from Waiko Road. It turns into Lower Main Street near Kaahumanu Avenue. The section of Waiale Road from Waiko Road to Kuikahi Drive was improved with 36' of pavement as part of the Waikapu Gardens Subdivision (Subdivision File No. 3.2129). Waiale Road is proposed to be extended from the intersection with Waiko Road southward to intersect with Honoapiilani Highway in the vicinity of the Maui Tropical Plantation.

2.2 DRAINAGE

The existing ground slopes in a west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet along Waiale Road (eastern boundary), with an average slope of approximately 4.8%. The project site is currently vacant and was previously used for pineapple cultivation.

According to the Soil Survey Geographic Database for Island of Maui, State of Hawaii (September 2014) prepared by the United States Department of Agriculture Natural Conservation Service, the soils within the project site are classified as Puuone sand (PZUE) and Iao silty clay (IaA). Puuone sand is characterized as having rapid permeability near the surface, slow runoff, and a moderate to severe wind erosion hazard. Iao silty clay is characterized as having slow runoff and an erosion hazard of no more than slight.

According to Panel Number 150003 0391 E of the Flood Insurance Rate Map, Sept. 29, 2009, prepared by the United States Federal Emergency Management Agency, the project site is situated in Flood Zone X. Flood Zone X represents areas outside the 0.2% annual chance floodplain.

There are no drainage improvements within the project site for onsite runoff. The onsite runoff presently sheet flows across the project site in a west to east direction towards Waiale Road. Along Waiale Road there is a grassed shoulder which conveys some of the runoff to the existing drainage systems in the surrounding area.

It is estimated that the present onsite runoff for a 50-year, 1-hour storm from the entire project site is 13.0 cfs and approximately 15,625 cubic feet of runoff volume. Outside of the project area, but within the portion of the property to be retained by the Emmanuel Lutheran Church, there is an existing drainage channel which conveys storm runoff from the Kehalani Community to the north to an existing retention basin further south of the property and on the makai side of Waiale Road. Storm runoff from the project site does not enter this drainage channel.

2.3 SEWER

There is a 12-inch gravity sewer lines traversing through a portion of the property entering along the southern boundary and continues north exiting the property and enters the Waiale Road right-of-way. Wastewater collected from the Waikapu area is transported to the Kahului Wastewater Treatment Plant in Naska.

2.4 WATER

Domestic water and fire flow for the Waikapu area are serviced from the 300,000 gallon Waikapu Tank and 1.5 million gallon Kehalani mid-level tank. A series of 8-inch and 12-inch waterlines traverse along West Waiko Road from the Waikapu Tank to Honoapiilani Highway. As part of the Waikapu Gardens Subdivision, a 12-inch waterline was installed from Waiko Road, through the center of the subdivision and reduced to 8-inch waterlines to provide distribution throughout the subdivision. A 12" waterline was connected to the existing waterlines in the Waikapu Gardens Subdivision and installed along the southern boundary line of the Valley Isle Fellowship. Separately to the north of the project site, there is an existing 12" waterline along Kuikahi Drive that services the surrounding properties and continues east at the intersection with Waiale Road. The source for this water system is the Mokuahau wells located in Happy Valley.

2.5 ELECTRIC, TELEPHONE & CABLE TV

There is an existing electrical transmission system traversing along Waiale Road fronting the project site. The existing system currently provides service to the adjacent properties and surrounding area.

3.0 ANTICIPATED INFRASTRUCTURE IMPROVEMENTS

3.1 ROADWAYS

The subdivision roadway will access onto Waiale Road at two locations along the frontage the property. There will be no direct access from the individual lots onto Waiale Road or Honoapiilani Highway. From Waiale Road, vehicles can continue

north to access Kuikahi Drive and eventually onto Lower Main Street. Vehicles can turn south to the Waiko Road intersection and head west to access Honoapiilani Highway or east to access Kuihelani Highway. Based on the Traffic Impact Analysis Report, left turn storage lanes along Waiale Road are recommended at the two proposed intersections into the project.

The interior subdivision streets are intended to be dedicated to the County. The main loop road will have a 52 foot right-of-way, concrete curbs, gutters and sidewalk on at least one side. The interior roadways will have 36 foot right-of-ways with 20 feet of pavement, concrete curbs and gutters. The narrower pavement widths are to minimize pavement area which help to surface runoff and to encourage lower vehicle speeds. Concrete wheel chair ramps will be constructed at appropriate locations to comply with ADA standards. Appropriate striping and signage will be installed in accordance with the Department of Public Works standards. Sidewalks and pedestrian lanes will be constructed to provide access throughout the property such as to the neighborhood green.

3.2 DRAINAGE

It is estimated that the post development runoff from the project site will be 36.8 cfs generating 28,670 cf of runoff volume, which equates to a net increase of 23.8 cfs of runoff and 13,045 cf of runoff volume. Onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to a retention basin at the eastern end of the property along Waiale Road. The retention basin will have a capacity of approximately 33,250 cf which will accommodate the entire post development runoff volume of the design storm from the project site. Other features such as the grassed shoulders, vegetated strips and the neighborhood green will provide additional areas for runoff to infiltrate into the ground. There will be no increase in runoff sheet flowing from the project site after construction of the development. This is in accordance with Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui.

The design intent of the project will be to limit the need for extensive grading as much as possible. Development of the project will also include implementation of site specific best management practices (BMP's) during construction to provide erosion control and minimize impacts to downstream properties. BMP's which may be implemented would include, but is not limited to:

1. Prevention of cement products, oil, fuel, and other toxic substances from falling or leaching into the water.
2. Prompt and proper disposal of all loosened and excavated soil and debris material from drainage structure work.
3. Retention of ground cover until the last possible date.

4. Stabilization of denuded areas by sodding or planting as soon as possible.
5. Early construction of drainage features.
6. Minimize time of construction.

Design of the construction BMP's will be initiated at the time of construction to ensure the adequacy and applicability of the proposed features. County and State regulations also require ongoing inspections and maintenance during construction to ensure proper functionality and protection of downstream properties. Incorporating BMP's such during construction along with post construction measures to be installed will meet the requirements of Chapter 111, Rules for the Design of Stormwater Treatment Best Management Practices.

3.3 SEWER

The proposed project will generate approximately 28,000 gallons per day of wastewater based on the 80 residential units. Wastewater from the project will be collected by an onsite gravity sewer system and conveyed to the existing sewer system along the eastern boundary of the project site which continues in the northerly direction towards Lower Main Street. The existing system will continue to convey wastewater to the Kahului Wastewater Treatment Plant.

3.4 WATER

The domestic water demand for the project is anticipated to be approximately 50,397 gallons per day. Waterlines will be extended from the existing 12" waterline near the Kuikahi Drive and Waiale Road intersection to provide domestic and fire protection throughout the project site and service each proposed lot. In accordance with DWS standards, the fire flow demand for a single family residential development is 1,000 gallons per minute for a 2-hour duration and 1,250 gallons per minute for duplex units. Fire hydrants will be installed at the appropriately spaced intervals along the subdivision roadways.

3.5 ELECTRIC, TELEPHONE & CABLE TV

The proposed electrical, telephone, and cable TV distribution systems will be serviced from the existing facilities along Waiale Road. Within the subdivision, all distributions systems will be installed underground and service laterals will be provided to each lot. Street lights will be installed along the subdivision streets at intervals to be determined by the electrical engineer.

APPENDIX A
HYDROLOGIC CALCULATIONS

HYDROLOGIC CALCULATIONS

Purpose: Determine the increase in onsite surface runoff from the development of the proposed project based on a 50-year storm.

A. Determine the Runoff Coefficient (C):

EXISTING CONDITIONS:

Infiltration (Medium)	= 0.07
Relief (Rolling)	= 0.03
Vegetal Cover (High)	= 0.00
Development Type (Open)	= <u>0.15</u>
C	= 0.25

DEVELOPED CONDITIONS:

Infiltration (Slow)	= 0.14
Relief (Rolling)	= 0.03
Vegetal Cover (Good)	= 0.03
Development Type (Residential)	= <u>0.40</u>
C	= 0.60

B. Determine the 50-year 1-hour rainfall:

$$i_{50} = 2.5 \text{ inches}$$

Adjust for time of concentration to compute Rainfall Intensity (I):

Existing Condition:

$$T_c = 20 \text{ minutes}$$
$$I = 4.17 \text{ inches/hour}$$

Developed Condition:

$$T_c = 13 \text{ minutes}$$
$$I = 4.90 \text{ inches/hour}$$

C. Drainage Area (A) = 12.5 Acres

D. Compute the 50-year storm runoff volume (Q):

$$Q = CIA$$

Existing Conditions:

$$\begin{aligned} Q &= (0.25)(4.17)(12.5) \\ &= 13.0 \text{ cfs} \end{aligned}$$

Developed Conditions:

$$\begin{aligned} Q &= (0.60)(4.90)(12.5) \\ &= 36.8 \text{ cfs} \end{aligned}$$

The increase in runoff due to the proposed development is $36.8 - 13.0 = 23.8$ cfs.

Hydrograph Report

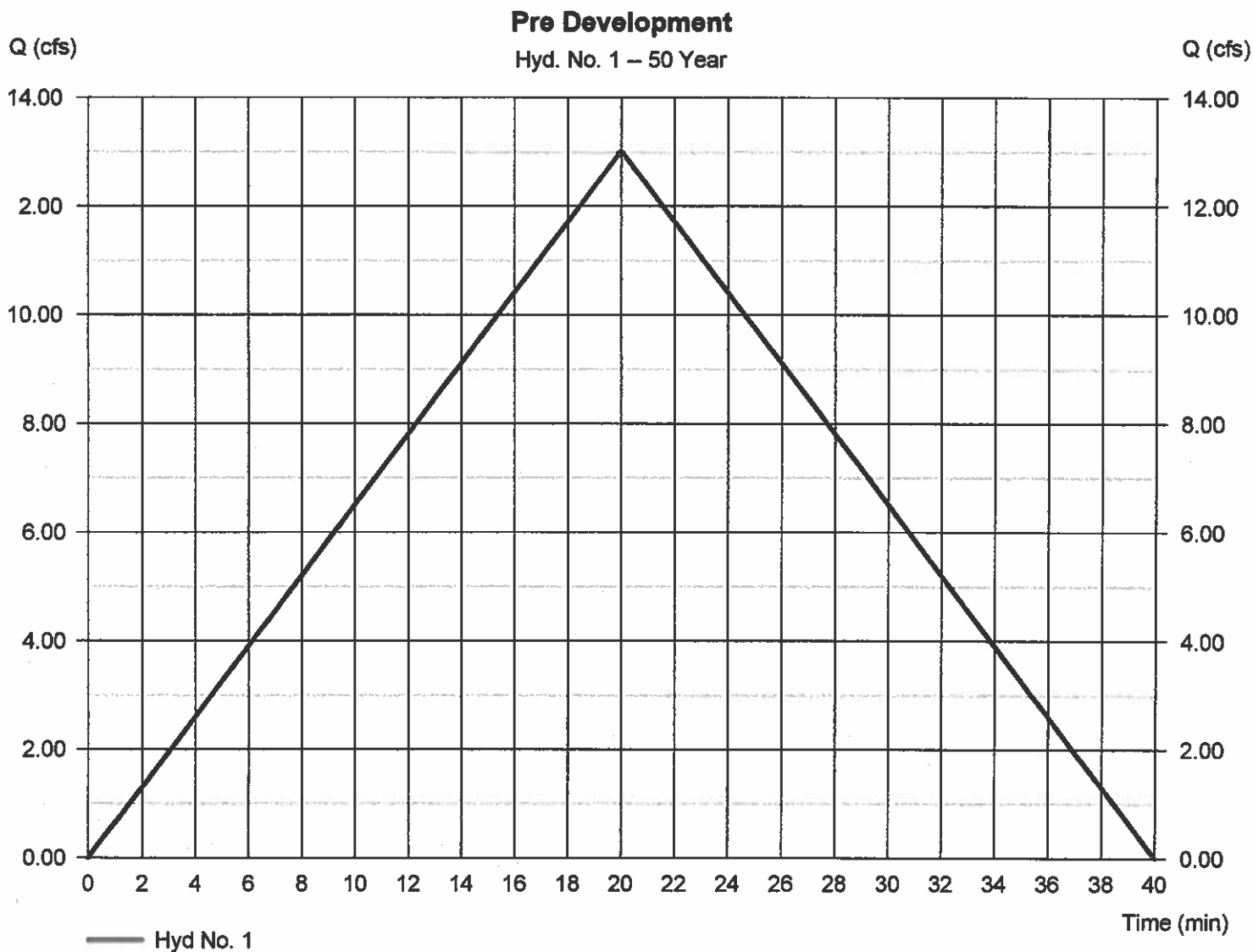
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

Friday, 06 / 30 / 2017

Hyd. No. 1

Pre Development

Hydrograph type	= Rational	Peak discharge	= 13.02 cfs
Storm frequency	= 50 yrs	Time to peak	= 20 min
Time interval	= 1 min	Hyd. volume	= 15,625 cuft
Drainage area	= 12.500 ac	Runoff coeff.	= 0.25
Intensity	= 4.167 in/hr	Tc by User	= 20.00 min
IDF Curve	= 2-5.IDF	Asc/Rec limb fact	= 1/1

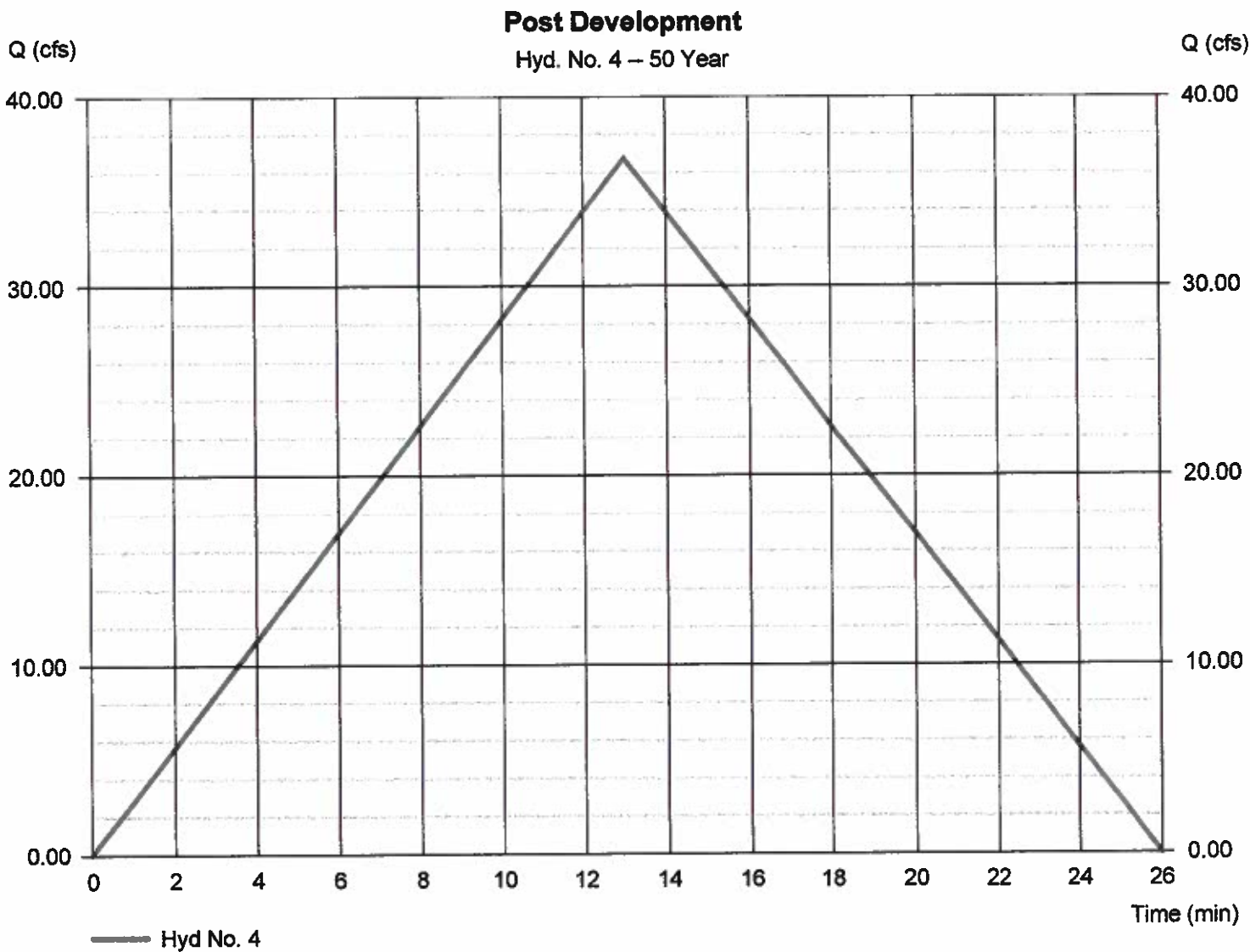


Hydrograph Report

Hyd. No. 4

Post Development

Hydrograph type	= Rational	Peak discharge	= 36.76 cfs
Storm frequency	= 50 yrs	Time to peak	= 13 min
Time interval	= 1 min	Hyd. volume	= 28,669 cuft
Drainage area	= 12.500 ac	Runoff coeff.	= 0.6
Intensity	= 4.901 in/hr	Tc by User	= 13.00 min
IDF Curve	= 2-5.IDF	Asc/Rec limb fact	= 1/1



Wednesday, 07 / 12 / 2017

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 326.00 ft

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	326.00	3,000	0	0
2.00	328.00	5,818	8,818	8,818
4.00	330.00	8,900	14,718	23,536
5.00	331.00	10,525	9,713	33,249
6.00	332.00	12,208	11,367	44,615

	[A]	[B]	[C]	[PrfRs]		[A]	[B]	[C]	[D]
Rise (in)	= 0.00	0.00	0.00	0.00	Crest Len (ft)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00	Crest El. (ft)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0	Weir Coeff.	= 0.00	0.00	0.00	0.00
Invert El. (ft)	= 0.00	0.00	0.00	0.00	Weir Type	= —	—	—	—
Length (ft)	= 0.00	0.00	0.00	0.00	Multi-Stage	= No	No	No	No
Slope (%)	= 0.00	0.00	0.00	n/a					
N-Value	= .000	.000	.000	n/a					
Orifice Coeff.	= 0.00	0.00	0.00	0.00	Exfil.(in/hr)	= 0.000 (by Wet area)			
Multi-Stage	= n/a	No	No	No	TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

[illegible]

APPENDIX B
WASTEWATER CALCULATIONS

WASTEWATER CALCULATIONS

Project Data:

74 Lot Residential Subdivision

68 single family units

12 duplex units

Per the 2000 Wastewater Flow Standards:

Residential = 350 gallons/day/unit

Occupancy = 4 persons unit

Wastewater Contribution:

Residential = 350 x 80 units = 28,000 gpd

APPENDIX C
WATER DEMAND CALCULATIONS

WATER DEMAND CALCULATIONS

Project Data:

80 Single Family and Duplex Residential Units (12.5 acres)

29,100 sf Neighborhood Green

32,400 sf Open Space/Retention Basin

Per 2002 Water System Standards:

Consumption Guidelines (Average Daily Demand):

Single Family Residential = 600 gallons/unit or 3,000 gallons/acre

Neighborhood Green/Retention Basin = 1,700 gallons/acre

Average Daily Demand (ADD)

Single Family Residential = 600 x 80 units = 48,000 gallons

or

= 3,000 x 12.5 acres = 37,500 gallons

Neighborhood Green = 1,700 x 0.67 acres = 1,139 gallons

Open Space/Retention Basin = 1,700 x 0.74 acres = 1,258 gallons

Total Average Daily Demand = 50,397 gpd

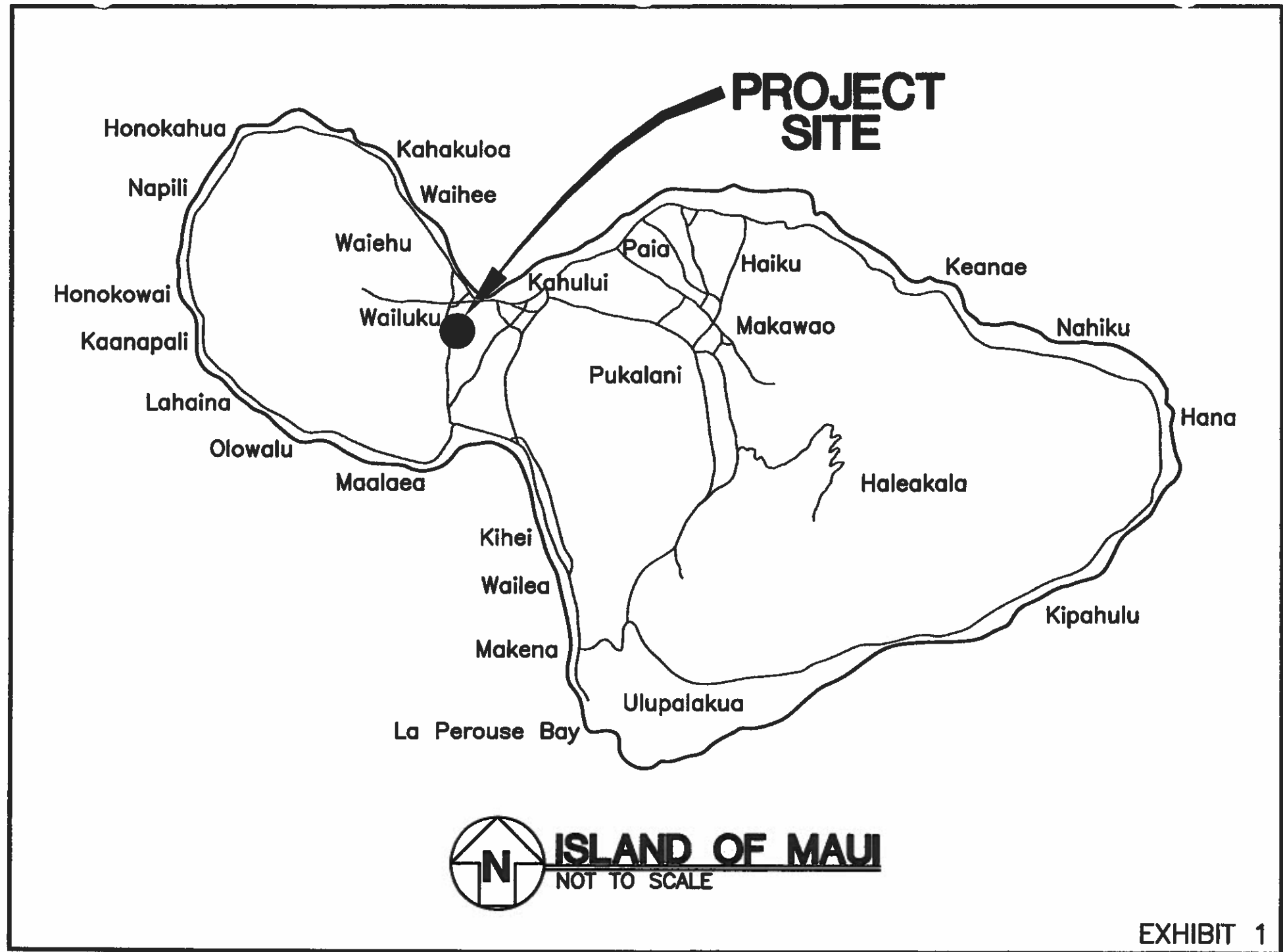
Max. Daily Demand (1.5 x ADD) = 1.5 x 50,397 = 75,596 gpd


Max. Fire Flow = 1,000 gpm (Single Family Residential)

= 1,250 gpm (Duplex)

EXHIBITS

- 1 Location Map**
- 2 Vicinity Map**
- 3 Soil Survey Map**
- 4 Flood Insurance Rate Map**
- 5 Preliminary Site Plan**
- 6 Preliminary Grading Plan**





NOT TO SCALE

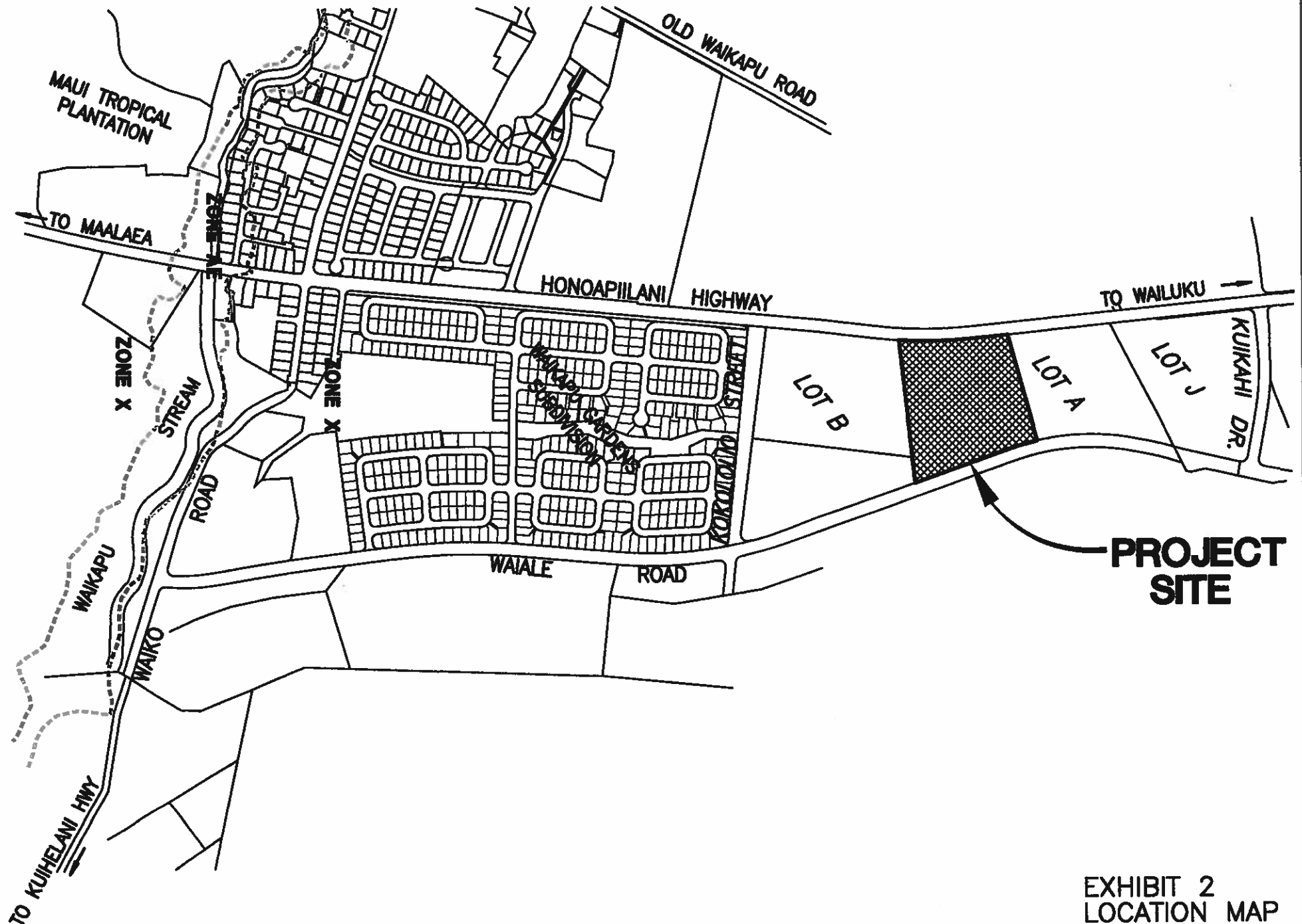
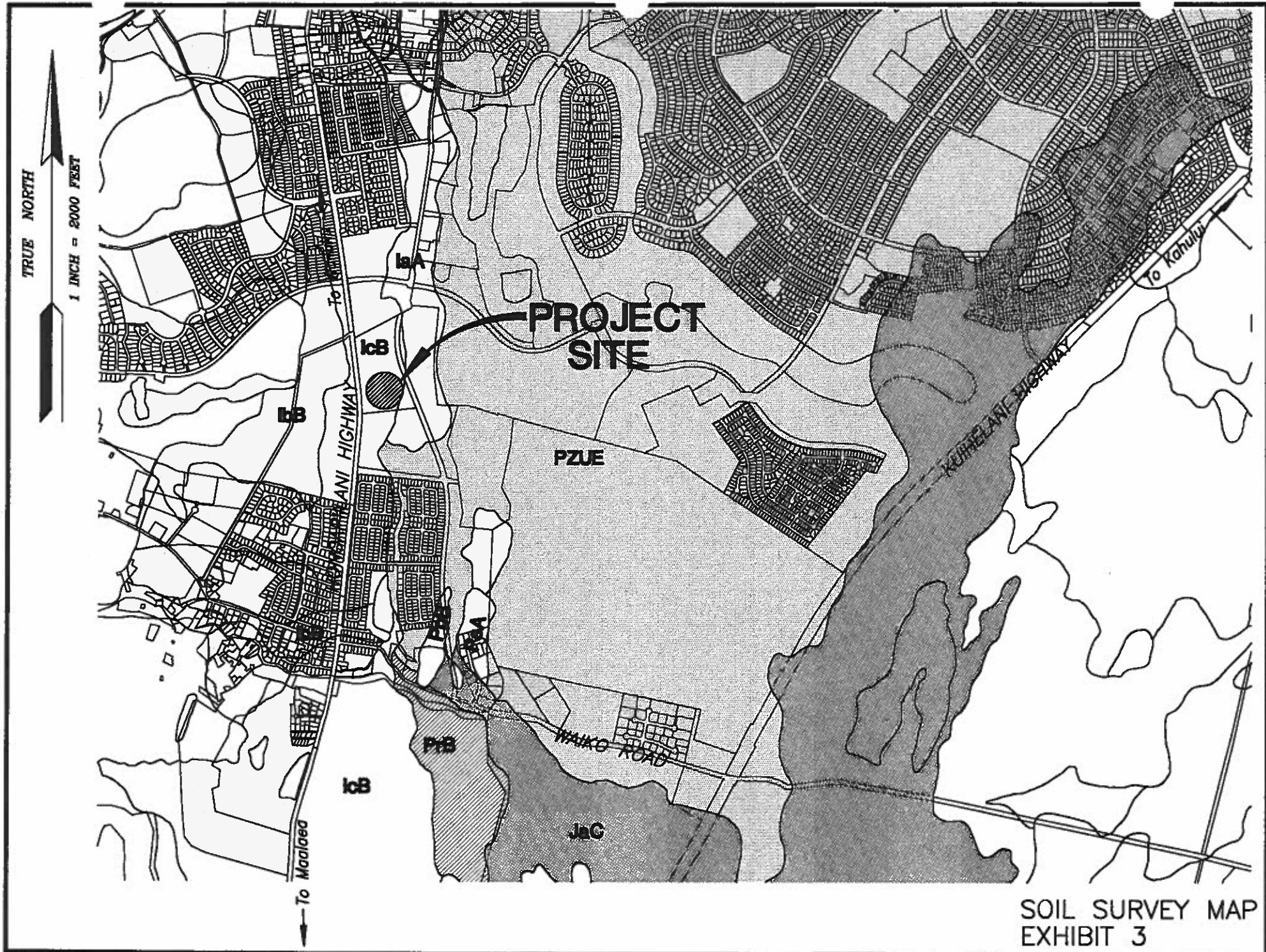
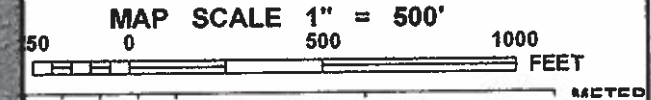


EXHIBIT 2
LOCATION MAP



SOIL SURVEY MAP
EXHIBIT 3



Maui County
150003

KUIKAHI DRIVE

ZONE X

PROJECT
SITE

30

NFIP

PANEL 0391E

FIRM

FLOOD INSURANCE RATE MAP

MAUI COUNTY,
HAWAII

PANEL 391 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
MAUI COUNTY	150003	0391	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
1500030391E

MAP REVISED
SEPTEMBER 25, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



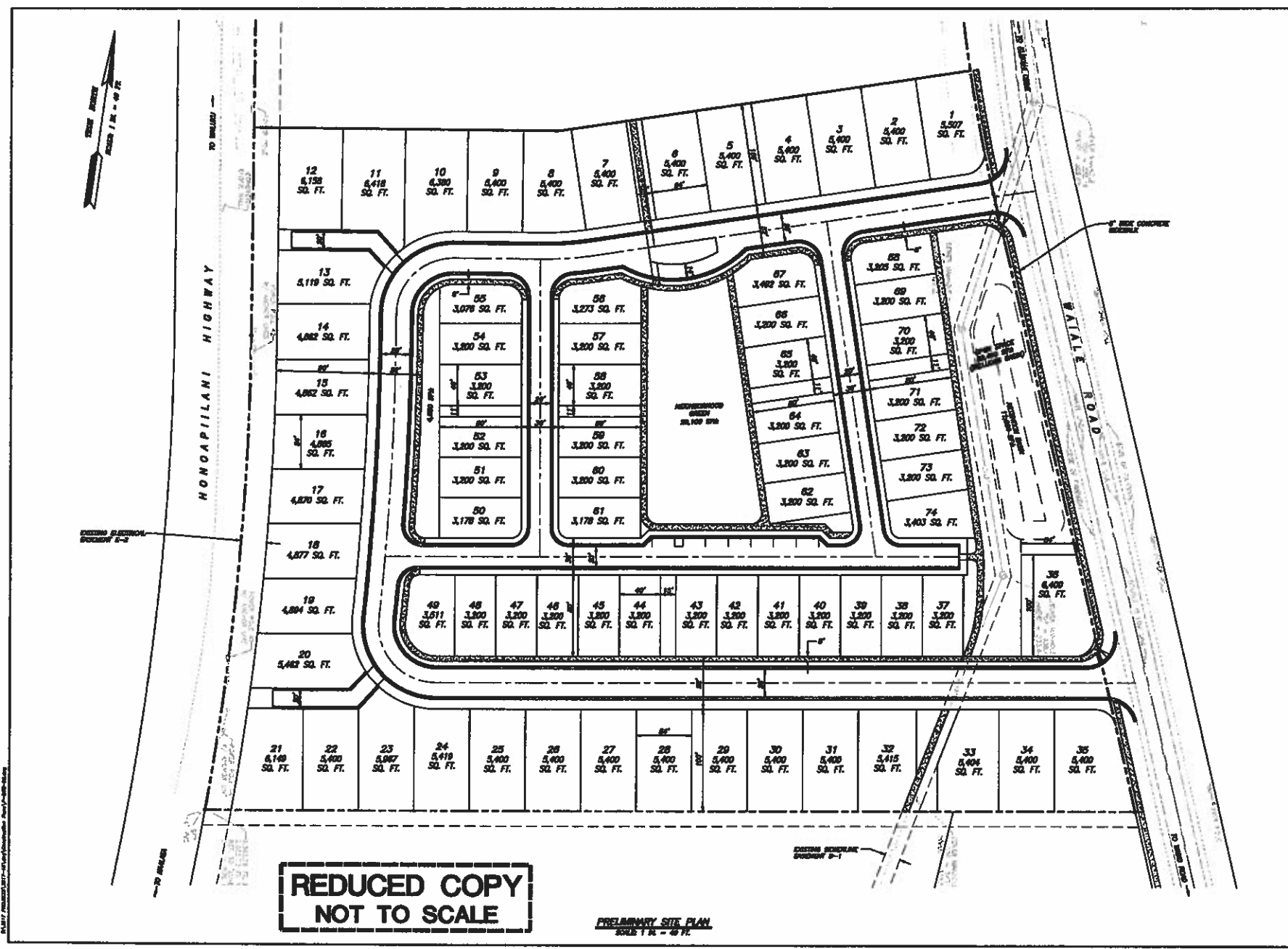
Professional Engineer
State of Hawaii
No. 10000
JOTOMO ENGINEERING, INC.
1000 W. ALI'AI DRIVE, SUITE 200
HONOLULU, HI 96813-3000

WAIKAPU DEVELOPMENT VENTURE
T.M.K.: (2) 3-5-002: 011
WAIKAPU, WAILUKU, MAUI, HAWAII
PRELIMINARY SITE PLAN

REVISION	DATE	BY
1		
2		
3		
4		
5		

DESIGNED BY: M.A.M.
DRAWN BY: L.G.A.
PROJECT NO.: 2017-10
SHEET NO.: 1-005-01
DATE: 7-15-17

SHEET NO.
5
OF 00000



**REDUCED COPY
NOT TO SCALE**

PRELIMINARY SITE PLAN
SCALE 1 IN. = 40 FT.

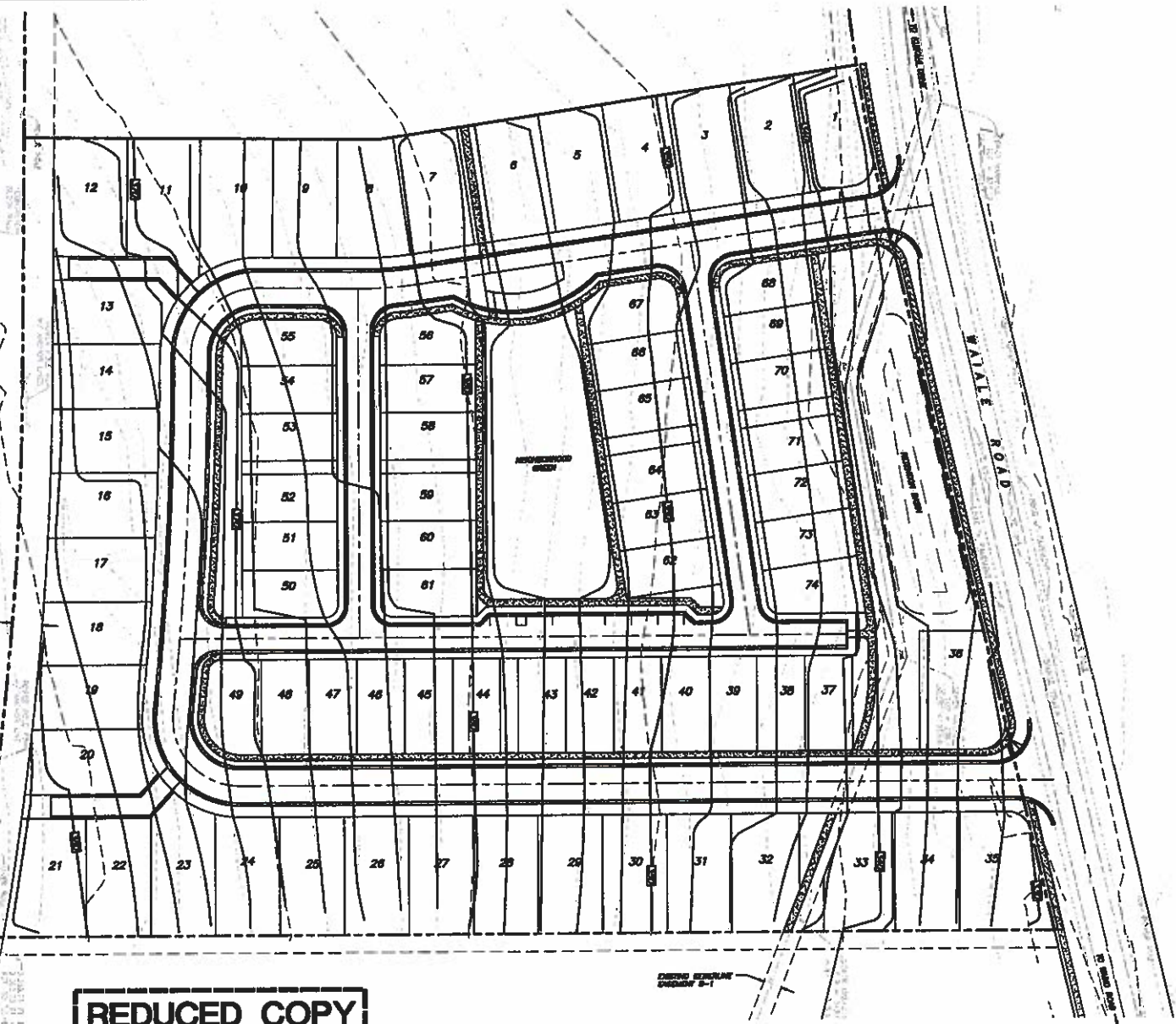


EXISTING ELEVATION
SURROUND 2-2

TO MAUI

HONOAPIILANI HIGHWAY

TO MAUI



**REDUCED COPY
NOT TO SCALE**

PRELIMINARY GRADING PLAN
SCALE 1" = 40' H.C.

EXISTING ELEVATION
SURROUND 2-1



MOTOMO ENGINEERING, INC.
1000 KALANIANA'OLANI BLVD., SUITE 100
HONOLULU, HAWAII 96813
TEL: 551-1234 FAX: 551-1234
WWW.MOTOMO-ENG.COM

WAIKAPU DEVELOPMENT VENTURE

T.M.K.: (2) 3-5-002: 011
WAIKAPU, WAILUKU, MAUI, HAWAII
PRELIMINARY GRADING PLAN

REVISION	DATE	BY
1		
2		
3		
4		
5		

DESIGNED BY: M.M.
DRAWN BY: L.L.
CHECKED BY: J.J.
DATE: 7-15-12

SHEET NO.
6

REFERENCES

- A. Soil Survey Geographic (SSURGO) Database of Island of Maui, State of Hawaii, prepared by U.S. Department of Agriculture, Natural Resources Conservation Service, September, 2014.
- B. Erosion and Sediment Control Guide for Hawaii, prepared by U.S. Department of Agriculture, Soil Conservation Service, March 1981.
- C. Rainfall-Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43, U.S. Department of Commerce, Weather Bureau, 1962.
- D. Flood Insurance Rate Maps of the County of Maui, September 2009.
- E. Chapter 4. Rules for the Design of Storm Drainage Facilities in the County of Maui, prepared by the Department of Public Works and Waste Management, County of Maui, 1995.
- F. Chapter 111. Rules for the Design of Storm Water Treatment Best Management Practices, prepared by the Department of Public Works, County of Maui, 2012.
- G. Water System Standards, Department of Water Supply, County of Maui, 2002.
- H. Traffic Impact Analysis Report, Waikapu 201-H Affordable Housing Project, prepared by Austin Tsutsumi & Associates, Inc., June 2017

Appendix H

***Traffic Impact Analysis
Report (TIAR)***

TRAFFIC IMPACT ANALYSIS REPORT WAIKAPU 201-H AFFORDABLE HOUSING PROJECT WAIKAPU, MAUI, HAWAII

FINAL DRAFT

August 11, 2017

Prepared for:

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AUSTIN, TSUTSUMI & ASSOCIATES, INC.

CIVIL ENGINEERS • SURVEYORS

CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

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WAIKAPU 201-H AFFORDABLE HOUSING TRAFFIC IMPACT ANALYSIS REPORT

Wailuku, Maui, Hawaii

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 Waikapu 201-H Affordable Housing (hereinafter referred to as the "Project") located in Wailuku, Maui, Hawaii.

1.1 Location

The Project is located in Wailuku on the island of Maui on the parcel of land more specifically identified as TMK: (2) 3-5-002-011. The Project will be bounded by Honoapiilani Highway to the west, Waiale Road to the east and the New Valley Isle Fellowship Church to the south. See Figure 1.1 for Project location.

1.2 Project Description

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. Vehicular traffic to the Project will be provided by two (2) new Project access along Waiale Road. The Project is anticipated to be completed by the Year 2020. See Figure 1.2 for Project Site Plan.



1.3 Study Methodology

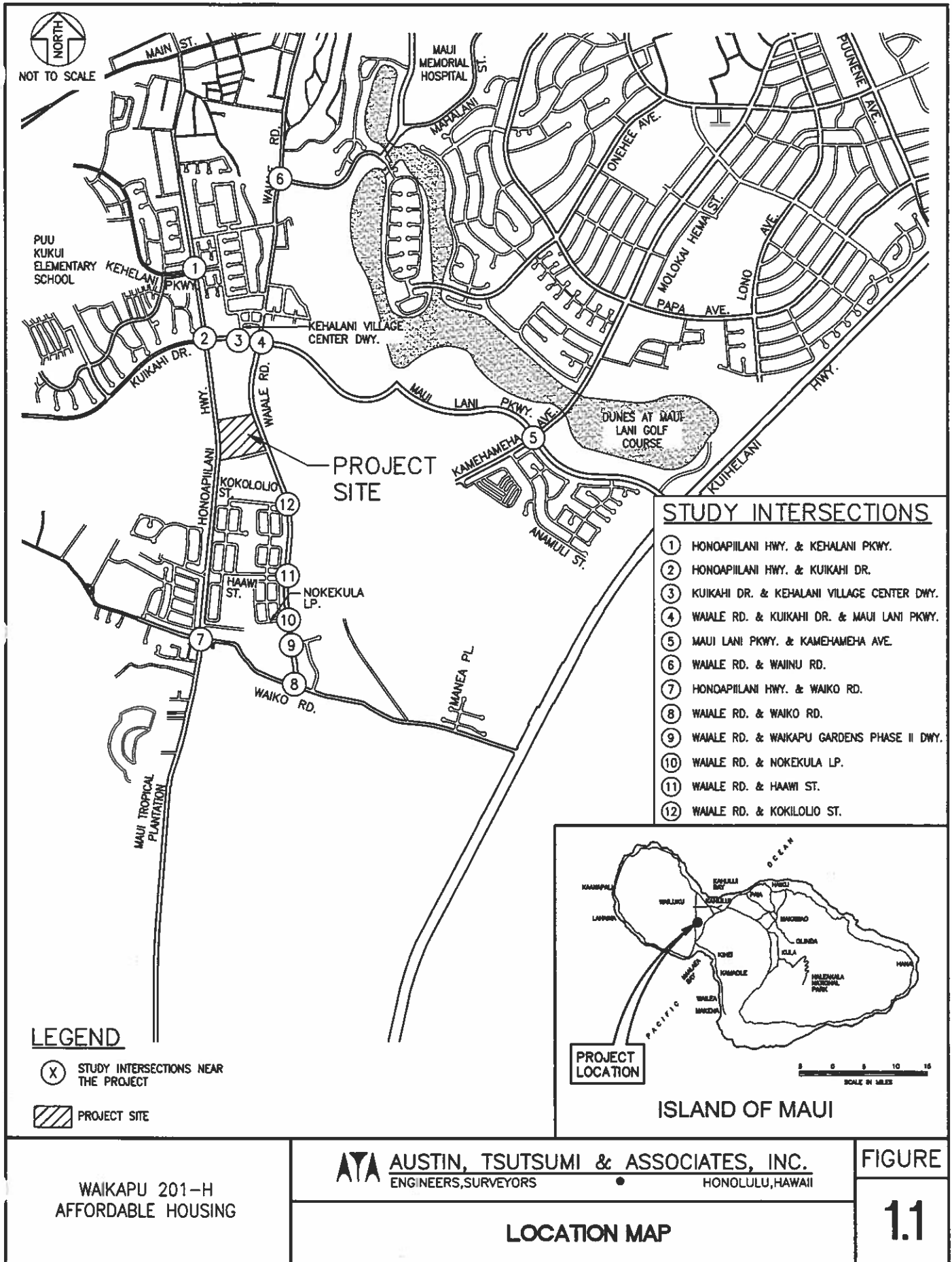
This study will address the following:

- Assess existing traffic operating conditions during the weekday AM and PM peak hours of traffic within the study area.
- Traffic Projections for Base Year 2020 (without the Project).
- Estimate the vehicular trips that will be generated by the Project.
- Traffic projections for the Project for Future Year 2020 (with Project).
- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the Project.

1.4 Intersection 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, includes methods for calculating volume to capacity ratios, delays, and corresponding Levels of Service that were utilized in this study. See Appendix B for Level of Service Criteria.

Analyses for the study intersections were performed using the traffic analysis software Synchro, which is able to prepare reports based on the methodologies described in the HCM. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. Based on the vehicular delay at each intersection, a LOS is assigned to each approach and intersection movement as a qualitative measure of performance. These results, as confirmed or refined by field observations, constitute the technical analysis that will form the basis of the recommendations outlined in this report.





WAIKAPU 201-H
AFFORDABLE HOUSING

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS HONOLULU, HAWAII

PROJECT SITE LOCATION

FIGURE

1.2



2. EXISTING TRAFFIC CONDITIONS

2.1 Roadway Network

The following are brief descriptions of the existing roadways studied within the vicinity of the Project:

Honoapiilani Highway is a north-south, two-way, two-lane, undivided arterial highway with posted speed limits ranging between 30 miles per hour (mph) and 45 mph. Honoapiilani Highway begins as the continuation of South High Street near Kahookele Street and continues southward through Waikapu, Maalaea, and wraps around the "Pali" to West Maui. Right turn channelization is provided at all of its major intersections within the study area.

Kuikahi Drive is an east-west, two-way, two-lane, undivided collector roadway with posted speed limits ranging between 25 mph and 30 mph. Kuikahi Drive begins approximately 1.2 miles west of Honoapiilani Highway within the Wailuku Heights development and extends eastward past Honoapiilani Highway, terminating near The Church of Jesus Christ of Latter Day Saints, where Kuikahi Drive becomes Maui Lani Parkway.

Maui Lani Parkway is a mostly east-west, two-way, one-lane, collector roadway with a posted speed limit of 20 mph. It begins to the west at the Kuikahi Drive/Waiale Road intersection and extends eastward until connecting to the Kuihelani Highway.

Waiale Road is a north-south, two-way, two-lane, undivided collector roadway with a posted speed limit of 20 mph in the Project study area. To the north, Waiale Road serves as the southern connection to Lower Main Street and extends past the Maui Community Correctional Center, Kehalani Village Center and various residential subdivisions, eventually terminating at a T-intersection with East Waiko Road.

East Waiko Road is an east-west, two-way, two-lane, undivided collector roadway with a posted speed limit of 20 mph in the Project study area. East Waiko Road extends westward from Kuihelani Highway to Honoapiilani Highway where it continues as West Waiko Road within the Waikapu residential neighborhood.

Kehalani Parkway is an east-west, two-way, four-lane, divided collector roadway with posted speed limits ranging between 20 mph and 30 mph on either side of Honoapiilani Highway. Kehalani Parkway extends east of Honoapiilani Highway from the lower Kehalani residential subdivision at Kamole Street and continues in the mauka direction, curving north past Puu Kukui Elementary School in the upper Kehalani residential subdivisions.

Nokekula Loop, Haawi Street & Kokololio Street are east-west, two-way, two lane, undivided local roadway to the west of Waiale Road with a posted speed limit of 20 mph. These three roads service the Waikapu Gardens Phase I residential neighborhood

Ohana Hana Loop is an east-west, two-way, two lane, undivided local roadway to the west of Waiale Road with a posted speed limit of 20 mph. Ohana Hana Loop extends from Waiale Road and services the Waikapu Gardens Phase II residential neighborhood.

Waiinu Road is mostly an east-west, two-way, one-lane, undivided local roadway with a posted speed limit of 25 mph. Waiinu Road starts at the west at the Waiale Road intersection servicing



a couple of neighborhoods until terminating at the Maui Lani Parkway/Puumele Street intersection.

Kamehameha Avenue is a north-south, two-way, two-lane, undivided County collector roadway that extends to the south from Hana Highway in Kahului to Pomaikai Elementary School. This roadway has a posted speed limit of 30 mph within the vicinity of the Project.

2.2 Existing Traffic Volumes

Intersection analysis within the study area was performed on the following intersections due to their proximity to the Project. The existing traffic volumes data utilized in this report were collected on Wednesday, March 15, 2017 and Thursday, March 16, 2017 with the exception of the Waikapu Gardens Phase 1 accesses along Waiale Road, which were counted in October 2015. Since the development is fully built out, turning movements at these intersections are anticipated to remain the same.

- Honoapiilani Highway/Waiko Road (Signalized)
- Honoapiilani Highway/Kuikahi Drive (Signalized)
- Kuikahi Drive/Kehalani Village Center Driveway (Unsignalized)
- Honoapiilani Highway/Kehalani Parkway (Signalized)
- Waiale Road/Waiko Road (Unsignalized)
- Waiale Road/Nokekula Loop (Unsignalized)
- Waiale Road/Haawi Street (Unsignalized)
- Waiale Road/Kokololio Street (Unsignalized)
- Waiale Road/Ohana Hana Loop (Unsignalized)
- Waiale Road/Kuikahi Drive (Signalized)
- Waiale Road/Waiinu Road (Unsignalized)
- Maui Lani Parkway/Kamehameha Avenue (Unsignalized)

Based on the traffic count data, the weekday AM peak hour of traffic was determined to occur between 7:00 AM and 8:00 AM, while the weekday PM peak hour of traffic was determined to occur between 4:15 PM and 5:15 PM. The traffic count data is provided in Appendix A for the existing intersections studied.

2.3 Existing Traffic Conditions Analysis and Observations

Honoapiilani Highway/Kehalani Parkway is a signalized intersection with exclusive left-turn and right-turn lanes on all approaches. The channelized northbound and southbound right-turn movements also include exclusive eastbound and westbound receiving lanes, respectively. All movements at this intersection currently operate at LOS D or better during the AM and PM peak hours of traffic, except for the eastbound left-turn movement which operates at LOS F and overcapacity conditions during the AM peak hour. For a portion of the AM peak hour, the eastbound left-turn movement operates with queues that extend to or beyond the existing left-turn storage lane and some vehicles may require two cycle lengths to clear the intersection. Heavy traffic during a short period of time is reflective of typical school traffic conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour, generally between 7:15-7:45 AM and primarily stem from traffic generated by the Puu Kukui Elementary School.



In addition, northbound traffic queues along Honoapiilani Highway were observed to primarily stem from Wailuku Elementary School. At Aupuni Street, northbound traffic queued back to Kehalani Parkway for about 5-10 minutes during the AM peak hour due to a police officer directing traffic at Aupuni Street to service Wailuku Elementary School traffic in the morning. The police officer is observed to stop mainline northbound and southbound traffic for as much as 30-40 seconds at a time, creating lengthy mainline queues. This impacted the vehicular progression through the Honoapiilani Highway/Kehalani Parkway intersection.

Honoapiilani Highway/Kuikahi Drive is a signalized intersection with exclusive left-turn and right-turn lanes on all approaches. The channelized northbound right-turn movement also includes an exclusive eastbound acceleration lane. All movements at this intersection currently operate at LOS D or better with no significant queueing observed during the AM and PM peak hours of traffic.

Waiale Road/Kuikahi Drive is a signalized intersection with exclusive left-turn lanes on all approaches and an exclusive right-turn lane on the westbound approach. All movements at this intersection currently operate at LOS C or better during the AM and PM peak hours of traffic. However, for about 20-30 minutes during the AM peak hour, vehicles were observed to queue beyond the length of the eastbound left-turn storage lane to the Kehalani Village Drive or as far as Honoapiilani Highway. These queues occur at variable lengths and are dependent on existing northbound queues that spill back from Waiale Road into the Waiale Road/Kuikahi Drive intersection, which limits full progression for eastbound left-turning vehicles.

Kamehameha Avenue/Maui Lani Parkway is a four-way stop controlled intersection with exclusive left-turn lanes on both approaches on Kamehameha Avenue and is located 700 feet northeast of Pomaikai Elementary School. Each approach includes flashing beacons with stop signs, and marked crosswalks are provided on the southwest leg of Kamehameha Avenue and the northwest leg of Maui Lani Parkway.

The northbound through/right-turn movement, southbound through/right-turn movement, eastbound approach, and westbound approach operate at LOS F with some overcapacity conditions during the AM and PM peak hours of traffic. This is primarily due to regional traffic between the Waikapu-Wailuku-Kahului regions. Queues were inconsistent and varied in length throughout the peak hours, with a short period of extensive southbound queuing during the AM peak hour and periodic eastbound queuing during the AM and PM peak hours of traffic.

Waiale Road/Waiinu Road is an unsignalized T-intersection the minor westbound approach of Waiinu Road stop-controlled. In both the AM and PM peak hours the westbound shared left-turn/through lane operates at LOS F and overcapacity conditions due to lengthy delays.

Traffic was generally observed to progress unimpeded along Waiale Road during the AM peak hour, except between 7:30-7:50 AM, where northbound traffic on Waiale Road was observed to slowly progress through the intersection in part due to northbound spillbacks from the Waiale Road/Kaohu Street 4-way stop controlled intersection and reduced northbound speeds generated by frequent northbound right-turning vehicles at the Waiale Road/Waiinu Road intersection. Some northbound vehicles along Waiale Road also stopped within the through travel lane to allow side street vehicles (ranging from 1-6 vehicles at a time) to turn onto or off of Waiale Road, which formed lengthy platoons. Congestion and queuing along Waiale Road generally dissipated around 7:50-7:55 AM.



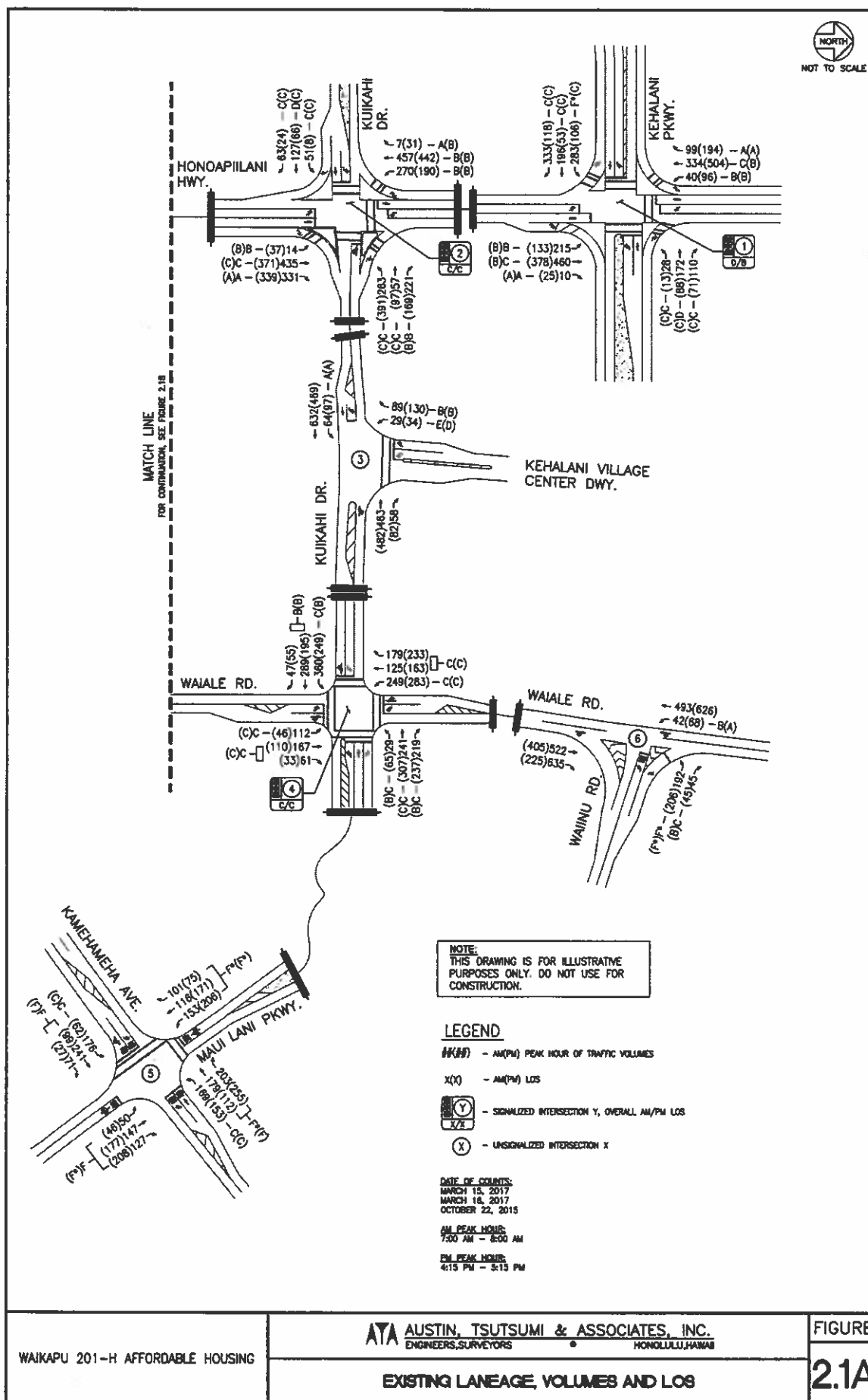
During the PM peak hour, traffic along Waiale Road operated smoothly, but queues continued to be observed along the westbound leg of Waiinu Road. Queues along the westbound approach also varies throughout the peak period, depending on gaps in traffic and the occurrence of throughput vehicles stopping within the through lane to allow westbound vehicles to turn onto Waiale Road.

Honoapiilani Highway/Waiko Road is a signalized intersection with exclusive left-turn lanes on the northbound and southbound approaches, and exclusive right-turn lanes on the eastbound and southbound approaches. All movements at this intersection currently operate at LOS C or better with no significant delays or queuing during the AM and PM peak hours of traffic.

Waiale Road/Waiko Road is an unsignalized T-intersection with shared lanes on all approaches and the southbound approach stop-controlled. All movements at this intersection currently operate at LOS B or better with no significant delays or queues during the peak hours of traffic.

Waiale Road at Ohana Hana Loop, Nokekula Loop, Haawi Street & Kokololio Street are unsignalized T-intersections servicing the Waikapu Gardens Phase I and II developments. All movements at these intersections currently operate at LOS B or better with no significant delays during the AM and PM peak hours of traffic.

Figure 2.1 illustrates the existing lane configuration, existing traffic volumes, and LOS for each study intersection. Table 2.1 summarizes the existing LOS at the study intersections. LOS worksheets are provided in Appendix C.





NOTE:
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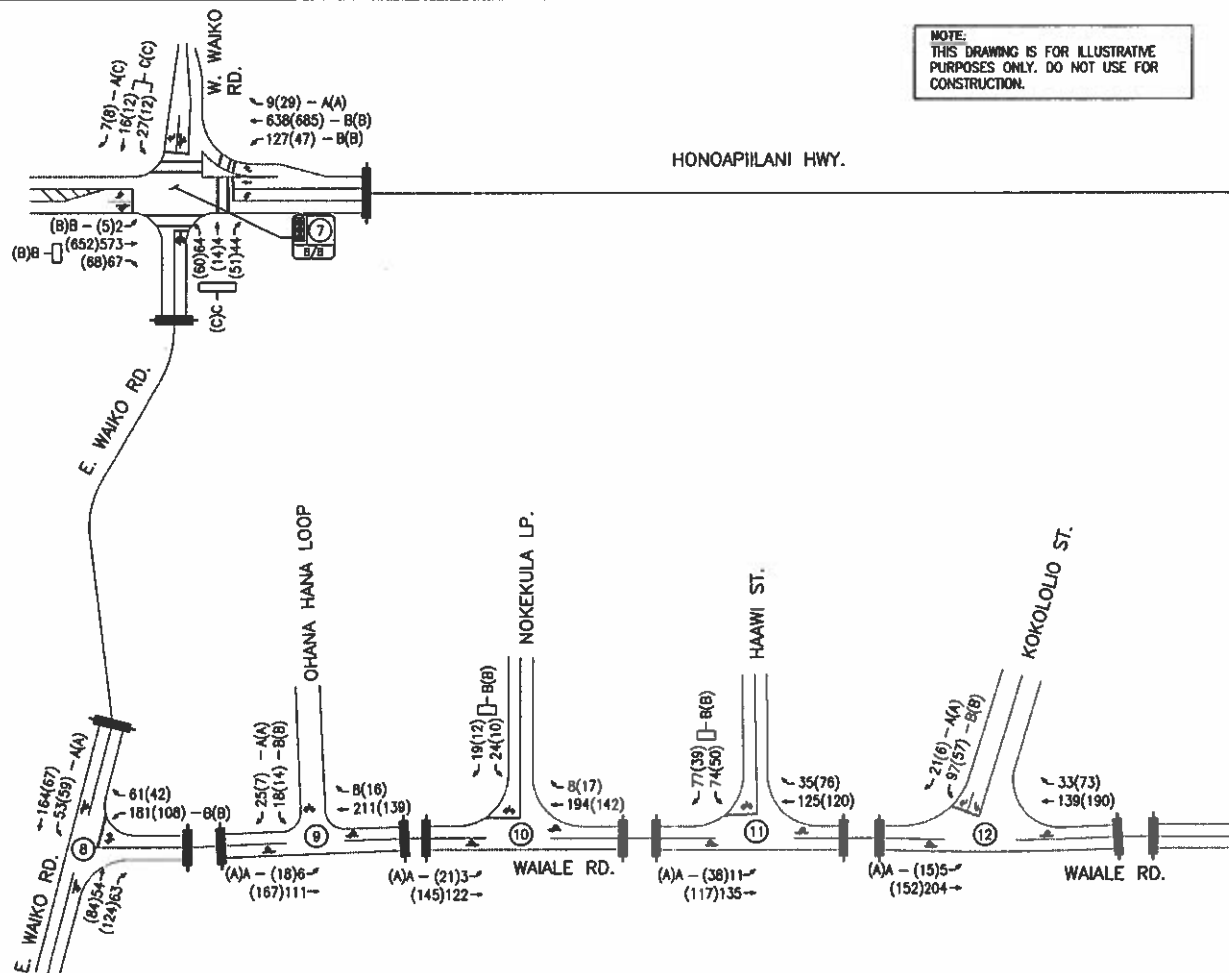
LEGEND

- V(H)** - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES
- X(X)** - AM(PM) LOS
- SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS
- UNSIGNALIZED INTERSECTION X

DATE OF COUNTS:
MARCH 15, 2017
MARCH 16, 2017
OCTOBER 22, 2015

AM PEAK HOUR:
7:00 AM - 8:00 AM

PM PEAK HOUR:
4:15 PM - 5:15 PM



MATCH LINE
FOR CONTINUATION, SEE FIGURE 2.1A

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EXISTING LANEAGE, VOLUMES AND LOS

FIGURE

2.1B

Table 2.1: Existing 2017 Level of Service Summary

Intersection	Existing Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
1: Honoapiilani Hwy & Kehalani Pkwy						
NB LT	17.0	0.53	B	11.6	0.36	B
NB TH	23.8	0.68	C	14.7	0.51	B
NB RT	0.0	0.00	A	0.0	0.00	A
EB LT	91.3	1.06	F*	24.1	0.38	C
EB TH	25.2	0.41	C	24.8	0.20	C
EB RT	24.9	0.37	C	26.7	0.53	C
WB LT	30.4	0.10	C	26.6	0.05	C
WB TH	37.1	0.74	D	30.0	0.56	C
WB RT	32.8	0.15	C	29.9	0.53	C
SB LT	19.0	0.14	B	10.1	0.21	B
SB TH	26.4	0.60	C	17.7	0.69	B
SB RT	0.0	0.00	A	0.0	0.00	A
Overall	37.6	-	D	18.6	-	B
2: Honoapiilani Highway & Kula Kahi Dr						
NB LT	16.0	0.04	B	16.2	0.12	B
NB TH	25.3	0.71	C	23.1	0.64	C
NB RT	0.0	0.00	A	0.0	0.00	A
EB LT	30.5	0.19	C	31.0	0.04	C
EB TH	42.2	0.74	D	33.6	0.48	C
EB RT	31.6	0.12	C	30.5	0.16	C
WB LT	27.1	0.68	C	30.5	0.79	C
WB TH	24.2	0.15	C	20.1	0.20	C
WB RT	17.4	0.15	B	16.0	0.30	B
SB LT	17.4	0.67	B	14.5	0.49	B
SB TH	16.3	0.57	B	19.0	0.63	B
SB RT	9.5	0.00	A	12.7	0.05	B
Overall	23.0	-	C	22.2	-	C
3: Kula Kahi Dr & Kehalani Village Center Drwy						
EB LT	8.8	0.07	A	9.2	0.11	A
SB LT	46.3	0.27	E	33.9	0.23	D
SB RT	13.0	0.18	B	14.4	0.27	B
Overall	2.3	-	-	3.0	-	-
4: Waiale Rd & Kula Kahi Dr/Maui Lani Pkwy						
NB LT	24.5	0.37	C	23.3	0.20	C
NB TH/RT	33.6	0.72	C	27.7	0.52	C
EB LT	22.7	0.81	C	16.6	0.61	B
EB TH/RT	18.2	0.49	B	17.4	0.42	B
WB LT	24.6	0.10	C	18.0	0.16	B
WB TH	32.4	0.71	C	26.1	0.75	C
WB RT	26.4	0.12	C	19.4	0.02	B
SB LT	25.5	0.67	C	20.1	0.62	C
SB TH/RT	29.4	0.67	C	27.4	0.79	C
Overall	25.9	-	C	22.4	-	C
5: Kamehameha Ave & Maui Lani Pkwy						
NB LT	24.5	0.55	C	15.9	0.20	C
NB TH/RT	53.9	0.90	F	18.2	0.38	F
EB LT/TH/RT	82.3	1.03	F*	109.2	1.11	F*
WB LT/TH/RT	57.4	0.93	F	76.9	1.05	F*
SB LT	23.0	0.52	C	19.1	0.44	C
SB TH/RT	88.0	1.06	F*	51.9	0.93	F
Overall	62.1	-	-	67.7	-	-
6: Waiale Rd & Wallinu Rd						
WB LT	486	1.86	F*	379	1.65	F*
WB RT	18	0.15	C	13	0.09	B
SB LT	12	0.08	B	9	0.08	A
Overall	49.0	-	-	50.3	-	-
7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd						
NB LT	10.1	0.01	B	10.4	0.01	B
NB TH/RT	19.6	0.71	B	20.0	0.79	B
EB LT/TH	28.6	0.12	C	26.9	0.07	C
EB RT	0.0	0.00	A	26.7	0.03	C
WB LT/TH/RT	29.4	0.24	C	29.1	0.36	C
SB LT	11.0	0.32	B	12.0	0.15	B
SB TH	12.2	0.60	B	12.9	0.66	B
SB RT	6.2	0.01	A	6.7	0.03	A
Overall	16.5	-	B	17.4	-	B

* Denotes overcapacity condition, v/c ≥ 1.

Table 2.1: Existing 2017 Level of Service Summary Cont'd

Intersection	Existing Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
8: E Waiko Rd & Waiale Rd						
EB LT	7.6	0.04	A	7.8	0.05	A
SB LT/RT	14.2	0.40	B	12.1	0.25	B
<i>Overall</i>	6.6	-	-	4.7	-	-
9: Waiale Rd & Ohana Hana Lp						
NB LT	7.7	0.01	A	7.6	0.01	A
EB LT	10.9	0.03	B	11.0	0.03	B
EB RT	9.6	0.03	A	9.1	0.01	A
<i>Overall</i>	1.3	-	-	1.0	-	-
10: Waiale Rd & Nokekula Lp						
NB LT	7.7	0.00	A	7.6	0.02	A
EB LT/RT	10.4	0.07	B	10.0	0.03	B
<i>Overall</i>	1.3	-	-	1.1	-	-
11: Waiale Rd & Haawi St						
NB LT	7.6	0.01	A	7.7	0.03	A
EB LT/RT	11.0	0.22	B	11.0	0.14	B
<i>Overall</i>	3.8	-	-	2.9	-	-
12: Waiale Rd & Kokololo St						
NB LT	7.6	0.00	A	7.9	0.01	A
EB LT	12.2	0.18	B	12.2	0.11	B
EB RT	9.2	0.03	A	9.6	0.01	A
<i>Overall</i>	2.9	-	-	1.8	-	-

* Denotes overcapacity condition, v/c ≥ 1.



3. BASE YEAR 2020 TRAFFIC CONDITIONS

3.1 Defacto Growth Rate

Projections for Base Year 2020 traffic were based upon existing traffic counts performed by ATA, the Maui Regional Travel Demand Model (MRTDM) growth for forecast years of 2020 and 2035, and nearby developments in the immediate vicinity of the Project. The resulting growth rate along study roadways was approximately 1.9 percent per year.

3.2 Traffic Forecasts for Known Developments

By year 2020, the following developments shown in Figure 3.1 and Table 3.1 may be constructed. Appendix D shows the general trip distribution/assignment percentages associated with each development either based on existing traffic patterns or their respective Project TIAR's. The Kehalani Village Center and Maui Lani Village Center are currently occupied and ongoing developments with associated growth assumptions described in Table 3.1 below.

Trips generated by the master planned communities for the Kehalani and Maui Lani residential developments are accounted for in the MRTDM growth. It was assumed that the Puunani Residences, Waiale Development, and Waikapu Country Town (WCT) developments are unlikely to be built by Year 2020, given their current statuses in the permitting process, and were therefore not explicitly included in this TIAR.

- **Waikapu Light Industrial Project** - Proposed 8.5-acre industrial development along Waiko Road. Forecast traffic growth generated by this development was obtained from the Project's TIAR dated April 2013 and was added to the roadway network.
- **Waiko Baseyard Light Industrial Development** - Proposed industrial development along Waiko Road that will include 100,000 SF of commercial space and 19.7 acres of light industrial uses. Forecast traffic growth generated by this development was obtained from the Project's TIAR dated May 2011 and was added to the roadway network.
- **Central Maui Regional Sports Complex (CMRSC)** - Proposed regional park development, located south of the Maui Lani Parkway and Kamehameha Avenue intersection. Forecast traffic growth generated by this development was obtained from the Project's TIAR dated May 2014 and was added to the roadway network.
- **Kehalani Village Center** - Existing retail center in the Kehalani subdivision. Currently occupied by Longs Drugs, Foodland, Foodland Gas, American Savings Bank, Coffee Bean Tea & Leaf and McDonalds. The forecast AM and PM peak hour trips for the remaining development was obtained from the Project's TIAR dated 2012 and was added to the roadway network.
- **Maui Lani Village Center** - Existing retail center in the Maui Lani subdivision. Currently occupied by Walgreen and a mix of various commercial, office and warehouse land uses. Based on the latest projections, approximately 20,000 SF of commercial, 20,000 SF of office and 107,000 SF of warehouse space may be completed by year 2020. The



forecast AM and PM peak hour trips were generated based on the cumulative ITE Trip generation and added to the roadway network.

- **Waiale Affordable Housing** – Proposed 70-unit single-family residential subdivision and a neighborhood park. It will be located adjacent to the Valley Isle Fellowship Church along Waiale Road. An existing gated access to the project is located along Waiale Road and was assumed to be the primary access to the subdivision. The forecast AM and PM peak hour trips were obtained from the Project's TIAR dated 2015 and was added to the roadway network.
- **Kehalani Mauka** – Existing residential subdivision located north of Kuikahi Drive and west of Honoapiilani Highway. Currently partially developed with residential homes and the Puu Kukui Elementary School. Based on the latest projections, approximately 246 single-family homes and 138 duplex units may be completed by year 2020. The Kehalani Mauka Parkway Loop is also anticipated to be completed by year 2020 and was assumed in the analysis.
- **Wailuku Apartments** – Proposed 324 multi-family dwelling units. Vehicular traffic will be provided by two (2) new accesses; one along Kuikahi Drive directly across the Kehalani Village Center Driveway and another along Waiale Road towards the south frontage of the site.

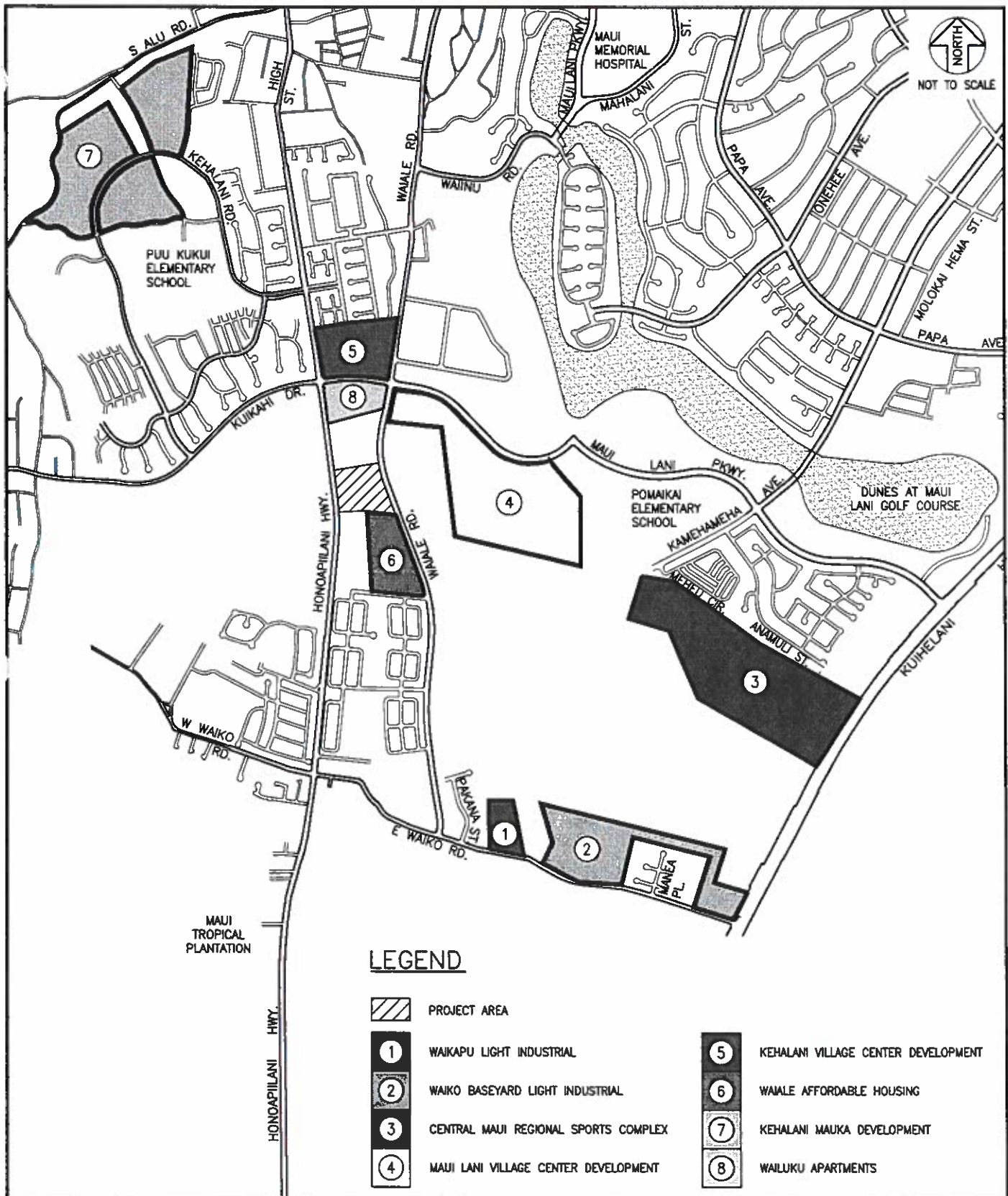


Table 3.1: Total Trips Generated by Known Developments in Project Vicinity ¹

Known Development	Land Use	Units	AM Peak Hour			PM Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Waikapu Light Industrial Project	Industrial Park	8.5 Acres	74	15	89	21	79	100
Waiko Baseyard Light Industrial Development	Light Industrial, Retail	19.7 Acres, 100,000 SF	219	86	305	220	351	571
Central Maui Regional Sports Complex	County Park, Soccer Complex	13 Acres, 12 Fields	9	6	15	144	71	215
Kehalani Village Center ²	Commercial	72,000 SF 56 MF	55	39	94	181	194	375
Maui Lani Village Center (formerly VMX) ³	Commercial, Office, Warehouse	165,000 SF	123	26	149	65	142	207
Waiale Affordable Housing	Single-Family Residential	70 Units	15	44	59	49	28	77
Kehalani Mauka ⁴	Single-Family, Multi-Family Residential	246 SF 138 MF	57	192	249	202	114	316
Wailuku Apartments	Residential Condo/ Townhouse	324 Units	23	110	133	106	52	158

Note:

1. Table 3.1 shows trips generated by known developments in the vicinity of the Project. Not all traffic generated by these developments travel through the study area of this TIAR, since some traffic will be routed to various roadways and intersections that were not included in this TIAR. See Appendix D for more detailed assessment of trip distribution/assignment patterns.
2. Kehalani Village Center partially completed with Longs Drugs, Foodland, Foodland Gas and McDonalds. Trips shown, accounts for assumed 30% remaining commercial development and residential unit and is based on Kehalani Village Center TIAR dated 2012.
3. Maui Lani Village Center projections based on latest assumptions for growth. Majority of expansion (147,000 SF) attributed to lower trip generating office and warehouse land uses.
4. Kehalani Mauka projections based on latest assumptions for growth.



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BACKGROUND DEVELOPMENTS IN PROJECT VICINITY

FIGURE

3.1

3.3 Planned Roadway Projects

The Waiale Road Extension and Waiko Road Improvements are planned roadway improvements to be constructed in the future. However, since they are unlikely to be built by Year 2020 given their current status, these roadway improvements were not included in this TIAR. In addition, at the Waiale Road/Waiinu Road intersection, a traffic signal and widening improvements are listed in the Statewide Transportation Improvement Program (STIP). However, it's unknown if this development will be constructed by Year 2020 and was therefore not included in this TIAR. At the Maui Lani Parkway/Kamehameha Avenue intersection, a single-lane roundabout is planned to be constructed and was included in this TIAR.

3.4 Base Year 2020 Analysis

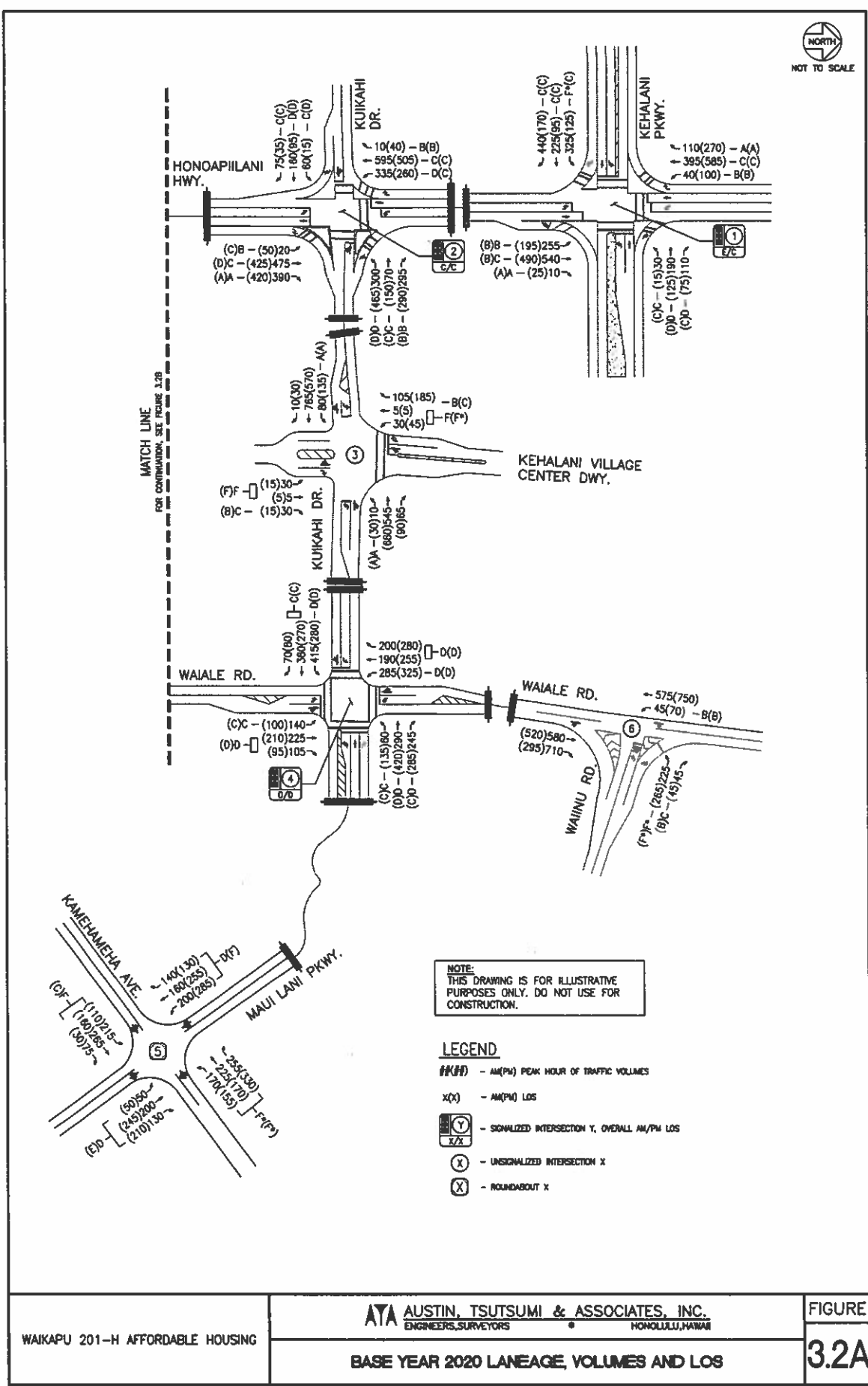
At the Honoapiilani Highway/Kehalani Parkway intersection, the eastbound left-turn movement will continue to operate at over-capacity and LOS F conditions during the AM peak hour. As noted in Section 2.3, heavy traffic during a short period of time is reflective of typical school traffic conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour and primarily stem from traffic generated by the Puu Kukui Elementary School. There are currently no identified or planned roadway improvements likely to occur at this intersection. Signal timing may be adjusted, but northbound congestion along Honoapiilani Highway will continue to occur during the AM peak hour.

The southbound left-turn movement at the Kuikahi Drive/Kehalani Village Center Driveway will worsen to operate at LOS F during the AM and PM peak hours of traffic, however will continue to operate with relatively low volume at 30(45) vehicles in the AM(PM) peak hours of traffic.

As a roundabout, various movements at the Kamehameha Avenue/Maui Lani Parkway intersection will operate at LOS E/F during the AM and PM peak hours. However, approach delays are anticipated to improve from existing conditions.

Since no roadway improvements were assumed at the Waiale Road/Waiinu Road intersection, the westbound left-turn movement will continue operating at LOS F and overcapacity conditions during the AM and PM peak hours. Northbound through traffic on Waiale Road will continue to spill back in the AM peak hour. For future planning purposes along Waiale Road, traffic control treatment at Waiale Road/Kaohu Street intersection, intersection improvements at the Waiale Road/Waiinu Road intersection (as identified on the STIP) and median refuge lanes along Waiale Road could be considered to help mitigate Waiale Road northbound flows in the AM peak hour of traffic.

Figure 3.2 illustrates the Base Year 2020 forecast traffic volumes and LOS for the study intersection movements. Table 3.2 summarizes the Base Year 2020 LOS at the study intersections compared to existing conditions. LOS worksheets are provided in Appendix C.



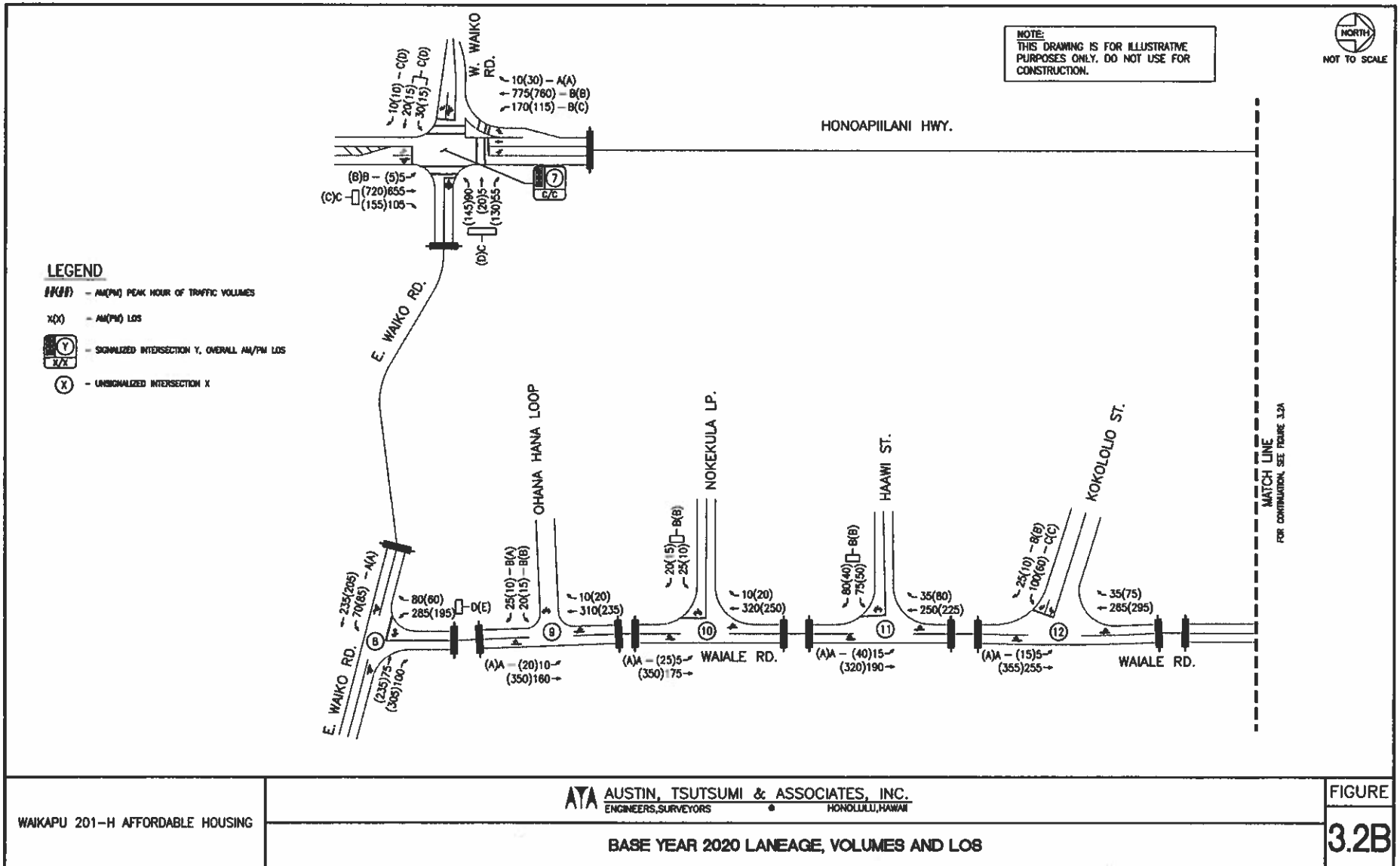


Table 3.2: Existing and Base Year 2020 Level of Service Summary

Intersection	Existing Conditions						Base Year 2020					
	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
1: Honoapiilani Hwy & Kehalani Pkwy												
NB LT	17.0	0.53	B	11.6	0.36	B	17.9	0.63	B	15.4	0.58	B
NB TH	23.8	0.68	C	14.7	0.51	B	25.0	0.72	C	17.5	0.61	B
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	91.3	1.06	F*	24.1	0.38	C	221.0	1.38	F*	27.0	0.46	C
EB TH	25.2	0.41	C	24.8	0.20	C	29.9	0.50	C	28.7	0.31	C
EB RT	24.9	0.37	C	26.7	0.53	C	34.7	0.67	C	31.4	0.65	C
WB LT	30.4	0.10	C	26.6	0.05	C	33.6	0.12	C	30.5	0.08	C
WB TH	37.1	0.74	D	30.0	0.56	C	42.3	0.82	D	35.3	0.66	D
WB RT	32.8	0.15	C	29.9	0.53	C	36.2	0.15	D	34.0	0.47	C
SB LT	19.0	0.14	B	10.1	0.21	B	19.6	0.15	B	12.5	0.26	B
SB TH	26.4	0.60	C	17.7	0.69	B	27.8	0.65	C	24.5	0.78	C
SB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
Overall	37.6	-	D	18.6	-	B	62.8	-	E	23.3	-	C
2: Honoapiilani Highway & Kuikahi Dr												
NB LT	16.0	0.04	B	16.2	0.12	B	18.4	0.09	B	20.8	0.20	C
NB TH	25.3	0.71	C	23.1	0.64	C	30.7	0.78	C	37.6	0.83	D
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	30.5	0.19	C	31.0	0.04	C	31.5	0.20	C	35.4	0.08	D
EB TH	42.2	0.74	D	33.6	0.48	C	48.9	0.79	D	40.8	0.70	D
EB RT	31.6	0.12	C	30.5	0.16	C	33.0	0.17	C	34.7	0.21	C
WB LT	27.1	0.68	C	30.5	0.79	C	36.3	0.80	D	38.8	0.88	D
WB TH	24.2	0.15	C	20.1	0.20	C	25.8	0.17	C	21.5	0.27	C
WB RT	17.4	0.15	B	16.0	0.30	B	19.0	0.28	B	18.2	0.44	B
SB LT	17.4	0.67	B	14.5	0.49	B	38.1	0.89	D	26.4	0.75	C
SB TH	16.3	0.57	B	19.0	0.63	B	22.4	0.74	C	27.0	0.75	C
SB RT	9.5	0.00	A	12.7	0.05	B	10.1	0.01	B	15.3	0.07	B
Overall	23.0	-	C	22.2	-	C	30.6	-	C	29.9	-	C
3: Kuikahi Dr & Kehalani Village Center Drwy												
NB LT/TH	-	-	-	-	-	-	165.0	0.7	F	270.3	0.7	F
NB RT	-	-	-	-	-	-	15.8	0.1	C	12.8	0.0	B
EB LT	8.8	0.07	A	9.2	0.11	A	9.3	0.09	A	10.4	0.18	B
WB LT	-	-	-	-	-	-	9.6	0.0	A	9.0	0.0	A
SB LT	46.3	0.27	E	33.9	0.23	D	-	-	-	-	-	-
SB LT/TH	-	-	-	-	-	-	122.9	0.59	F	274.9	1.07	F*
SB RT	13.0	0.18	B	14.4	0.27	B	14.7	0.24	B	22.5	0.50	C
Overall	2.3	-	-	3.0	-	-	7.7	-	-	14.1	-	-
4: Waiale Rd & Kuikahi Dr/Maul Lani Pkwy												
NB LT	24.5	0.37	C	23.3	0.20	C	33.9	0.48	C	34.4	0.51	C
NB TH/RT	33.6	0.72	C	27.7	0.52	C	54.2	0.85	D	46.8	0.77	D
EB LT	22.7	0.81	C	16.6	0.61	B	44.9	0.94	D	41.9	0.87	D
EB TH/RT	18.2	0.49	B	17.4	0.42	B	27.9	0.64	C	31.3	0.59	C
WB LT	24.6	0.10	C	18.0	0.16	B	34.0	0.20	C	26.7	0.39	C
WB TH	32.4	0.71	C	26.1	0.75	C	54.4	0.83	D	49.6	0.87	D
WB RT	26.4	0.12	C	19.4	0.02	B	36.9	0.09	D	30.3	0.13	C
SB LT	25.5	0.67	C	20.1	0.62	C	49.8	0.87	D	36.4	0.83	D
SB TH/RT	29.4	0.67	C	27.4	0.79	C	35.8	0.63	D	44.5	0.88	D
Overall	25.9	-	C	22.4	-	C	42.5	-	D	40.7	-	D
5: Kamehameha Ave & Maul Lani Pkwy												
NB LT	24.5	0.55	C	15.9	0.20	C	-	-	-	-	-	-
NB TH/RT	53.9	0.90	F	18.2	0.38	F	-	-	-	-	-	-
NB LT/TH/RT	-	-	-	-	-	-	57.7	0.98	F	21.7	0.64	C
EB LT/TH/RT	82.3	1.03	F*	109.2	1.11	F*	27.3	0.80	D	55.9	1.00	F
WB LT/TH/RT	57.4	0.93	F	76.9	1.05	F*	32.1	0.79	D	44.8	0.92	E
SB LT	23.0	0.52	C	19.1	0.44	C	-	-	-	-	-	-
SB TH/RT	88.0	1.06	F*	51.9	0.93	F	-	-	-	-	-	-
SB LT/TH/RT	-	-	-	-	-	-	79.6	1.07	F*	59.3	1.01	F*
Overall	62.1	-	-	67.7	-	-	52.6	-	-	49.5	-	-
6: Waiale Rd & Waiolu Rd												
WB LT	485.7	1.86	F*	378.8	1.65	F*	1020.3	3.02	F*	1218.0	3.47	F*
WB RT	17.7	0.15	C	12.5	0.09	B	20.0	0.17	C	14.6	0.12	B
SB LT	12.1	0.08	B	9.3	0.08	A	13.2	0.10	B	10.2	0.10	B
Overall	49.0	-	-	50.3	-	-	108.0	-	-	166.7	-	-
7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd												
NB LT	10.1	0.01	B	10.4	0.01	B	11.9	0.02	B	13.6	0.02	B
NB TH/RT	19.6	0.71	B	20.0	0.79	B	28.2	0.87	C	34.0	0.91	C
EB LT/TH	28.6	0.12	C	26.9	0.07	C	28.3	0.14	C	36.4	0.09	D
EB RT	0.0	0.00	A	26.7	0.03	C	27.4	0.00	C	35.8	0.00	D
WB LT/TH/RT	29.4	0.24	C	29.1	0.36	C	31.4	0.40	C	53.6	0.80	D
SB LT	11.0	0.32	B	12.0	0.15	B	16.9	0.55	B	25.5	0.51	C
SB TH	12.2	0.60	B	12.9	0.66	B	18.2	0.74	B	16.3	0.70	B
SB RT	6.2	0.01	A	6.7	0.03	A	6.5	0.01	A	7.9	0.02	A
Overall	16.5	-	B	17.4	-	B	22.3	-	C	29.3	-	C
8: E Waiko Rd & Waiale Rd												
EB LT	7.6	0.04	A	7.8	0.05	A	7.8	0.06	A	9.0	0.09	A
SB LT/RT	14.2	0.40	B	12.1	0.25	B	30.2	0.76	D	46.5	0.80	E
Overall	6.6	-	-	4.7	-	-	13.7	-	-	11.8	-	-
9: Waiale Rd & Ohana Hana Ln												
NB LT	7.7	0.01	A	7.6	0.01	A	8.0	0.01	A	7.8	0.02	A
EB LT	10.9	0.03	B	11.0	0.03	B	12.5	0.04	B	14.3	0.04	B
EB RT	9.6	0.03	A	9.1	0.01	A	10.3	0.04	B	9.7	0.01	A
Overall	1.3	-	-	1.0	-	-	1.1	-	-	0.7	-	-

Table 3.2: Existing and Base Year 2020 Level of Service Summary Cont'd

Intersection	Existing Conditions						Base Year 2020					
	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
10: Waiale Rd & Nokekula Ln												
NB LT	7.7	0.00	A	7.6	0.02	A	8.0	0.01	A	7.9	0.02	A
EB LT/RT	10.4	0.07	B	10.0	0.03	B	12.0	0.09	B	11.9	0.05	B
Overall	1.3	-	-	1.1	-	-	1.0	-	-	0.7	-	-
11: Waiale Rd & Haawi St												
NB LT	7.6	0.01	A	7.7	0.03	A	7.9	0.01	A	8.0	0.04	A
EB LT/RT	11.0	0.22	B	11.0	0.14	B	13.2	0.28	B	14.3	0.20	B
Overall	3.8	-	-	2.9	-	-	3.4	-	-	2.1	-	-
12: Waiale Rd & Kokoiolo St												
NB LT	7.6	0.00	A	7.9	0.01	A	7.9	0.00	A	8.2	0.01	A
EB LT	12.2	0.18	B	12.2	0.11	B	15.1	0.23	C	17.3	0.18	C
EB RT	9.2	0.03	A	9.6	0.01	A	10.1	0.04	B	10.3	0.02	B
Overall	2.9	-	-	1.8	-	-	2.6	-	-	1.5	-	-

* Denotes overcapacity condition, v/c ≥ 1.

4. FUTURE YEAR 2020 TRAFFIC CONDITIONS

The Future Year 2020 scenario represents the traffic conditions within the Project study area with the full build-out of the Project.

4.1 Background

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. Vehicular traffic to the Project will be provided by two (2) new Project access along Waiale Road.

4.2 Travel Demand Estimations

4.2.1 Transportation Demand Management (TDM) Assumptions

The State of Hawaii Department of Transportation (HDOT) and Maui County provide various TDM programs that promote the use of transit, walking, biking and alternative modes of transportation, to reduce the use of single-occupant vehicles on roadways. TDM measures discussed in this section have only been identified, but conservatively assumed to yield no vehicular reductions for Project generated traffic.

Maui County, in partnership with Roberts Hawaii provides bus service to the major areas in Maui. In the vicinity of the Project, the Maui Bus currently provides two (2) bus stops near the Project site. The first is part of the Wailuku Loop route that stops along Waiale Road in front of the Ka Hale A Ke Ola Resource Center, about 0.3 miles north of the Kuikahi Drive/Waiale Road/Maui Lani Parkway intersection. A marked crosswalk and rectangular rapid flash beacon (RRFB) is provided at the bus stop to provide for pedestrian crossings. The second bus stop is part of the Lahaina-Wailuku route that stops at the Honoapiilani Highway/Wilikona Place intersection, about 450 feet south of the Honoapiilani Highway/East Waiko Road intersection. The nearest park and ride lots are currently located to the northeast of the Project, on the southwest corner of the Puunene Avenue/Kuihelani Highway/Dairy Road intersection and to the south of the Project, at the Honoapiilani Highway/North Kihei Road intersection.

HDOT currently provides the Bike Plan Hawaii Master Plan, which identifies proposed bicycle routes that could potentially be implemented in the future. In the vicinity of the study area, Honoapiilani Highway is proposed to be a "signed shared roadway", which is a roadway shared by both vehicles and bicycles, which accommodate bicycles through wider vehicular travel lanes or paved shoulders. There is currently no bike improvement identified in the HDOT Bike Plan Hawaii Master Plan along Waiale Road.

4.2.2 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. The independent variable can range from Dwelling Units (DU) for single-family attached homes to Gross Floor Area (GFA) for commercial and office development. See Tables 4.1 and 4.2 for Trip Generation formulae and projections for the Project.



Table 4.1: Project Trip Generation Rates

Land Use Type	Independent Variable	AM Peak Hour		PM Peak Hour	
		Rate	% Enter	Rate	% Enter
Single-Family Detached Housing (ITE 210)	Dwelling Units (DU)	[a]	25%	[b]	75%
Residential Apartment/Townhouse (ITE 230)	Dwelling Units (DU)	[c]	17%	[d]	83%

Notes:

[a] $T = 0.70 \cdot X + 9.74$

[b] $\ln(T) = 0.90 \cdot \ln(X) + 0.51$

[c] $\ln(T) = 0.80 \cdot \ln(X) + 0.26$

[d] $\ln(T) = 0.82 \cdot \ln(X) + 0.32$

Table 4.2: New Project-Generated Trips

Land Use Type	Quantity	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Single-Family Detached Housing (ITE 210)	68 DU	15	43	58	47	28	75
Residential Apartment/Townhouse (ITE 230)	12 DU	2	8	10	7	4	11
TOTAL	80 DU	17	51	68	54	32	86

4.2.3 Trip Distribution

Trips generated by the Project were assigned throughout the study area generally based upon existing travel patterns in the study area. The traffic generated by the Project was added to the forecast Base Year 2020 traffic volumes within the vicinity of the Project to constitute the traffic volumes for the Future Year 2020 traffic conditions. Figure 4.1 illustrates the Project-generated trip volumes.

4.3 Future Year 2020 Analysis

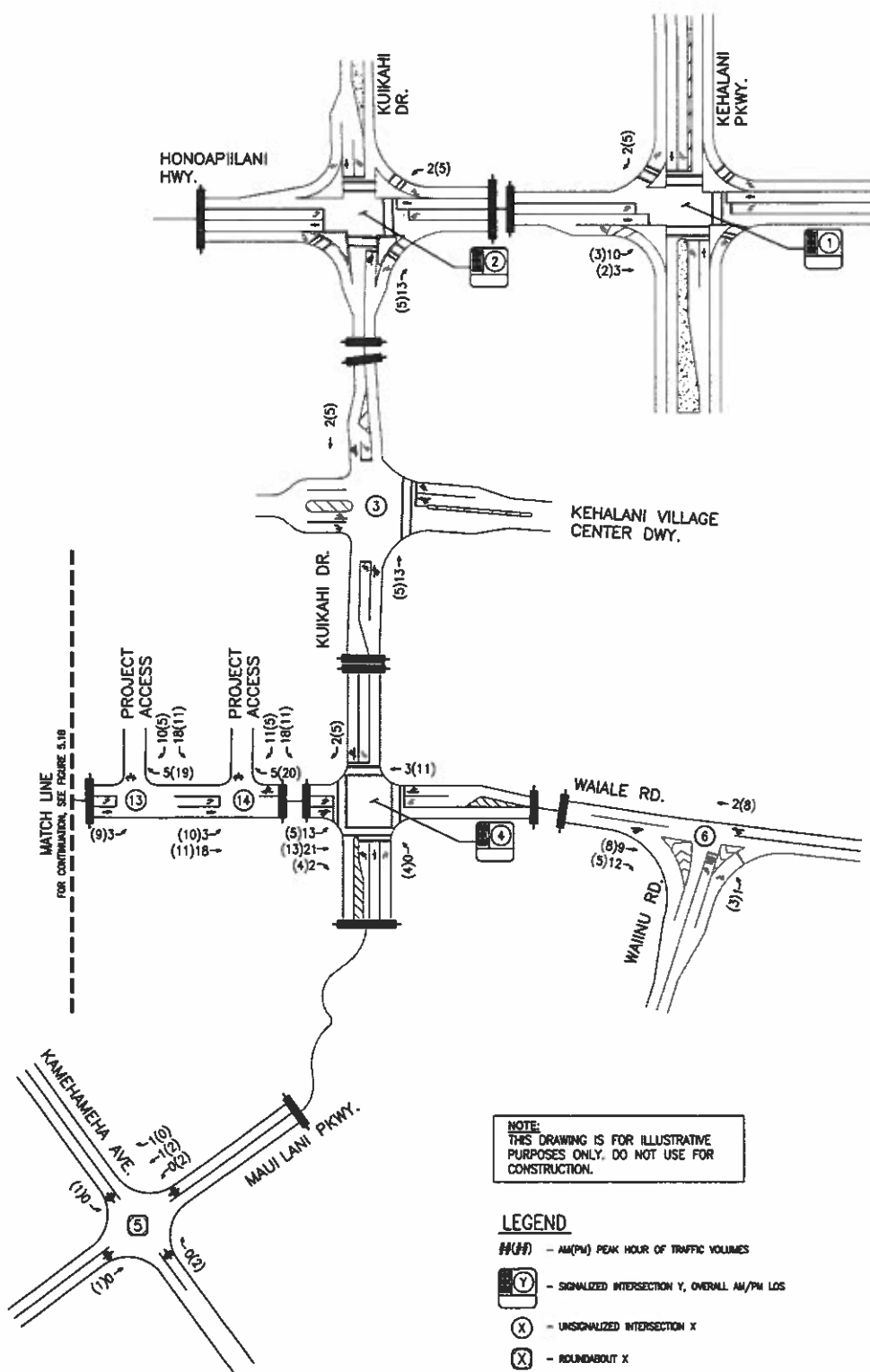
Upon completion of the Project, all study intersections are forecast to operate with LOS similar to Base Year 2020 conditions. The eastbound left-turn movement at the Honoapiilani Highway/Kehalani Parkway intersection is forecast to continue operating at over-capacity and LOS F conditions in the AM peak hour, similar to Base Year 2020 conditions. As noted in Section 2.3, heavy traffic during a short period of time is reflective of typical school conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour and likely primarily stem from traffic generated by the Puu Kukui Elementary School. However, the Project is only anticipated to increase traffic at the Honoapiilani Highway/Kehalani Parkway intersection by approximately 0.5%, with individual movement increases generally ranging from 1-7 vehicles. There are currently no identified or planned roadway improvements likely to occur at this intersection.

At the Kamehameha Avenue/Maui Lani Parkway roundabout intersection, all approaches will operate similar to Base Year 2020 conditions, with various delays operating at LOS E/F conditions during the AM and PM peak hours. The westbound left-turn movement at the Waiale Road/Waiinu Road intersection will continue operating at LOS F and overcapacity conditions during the AM and PM peak hours.

As mentioned in Section 2.3, northbound through traffic on Waiale Road will continue to spill back to the Waiale Road/Kuikahi Drive intersection in the AM peak hour. Based on the forecast trips, the Project will increase traffic at the intersection by approximately 1.5%. During the more critical AM peak hour of traffic, the Project is forecast to add only 18 northbound through vehicles and 11 northbound left-turn vehicles along Waiale Road through the intersection.

Based on MUTCD signal warrants, a signal will likely not be met at both Project accesses along Waiale Road. Two northbound left-turn storage lanes along Waiale Road are recommended for entrance into the two proposed Project accesses, to remove left-turn vehicles from mainline through traffic. Left-turn storage lanes should accommodate a minimum 50 feet of storage length.

Figure 4.2 illustrates the Future Year 2020 forecast traffic volumes and LOS for the study intersection movements. Table 4.3 summarizes the Future Year 2020 LOS at the study intersections compared to Base Year 2020 conditions. LOS worksheets are provided in Appendix C.



NOTE:
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LEGEND

- HUT** - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES
- SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS
- UNSIGNALIZED INTERSECTION X
- ROUNDABOUT X

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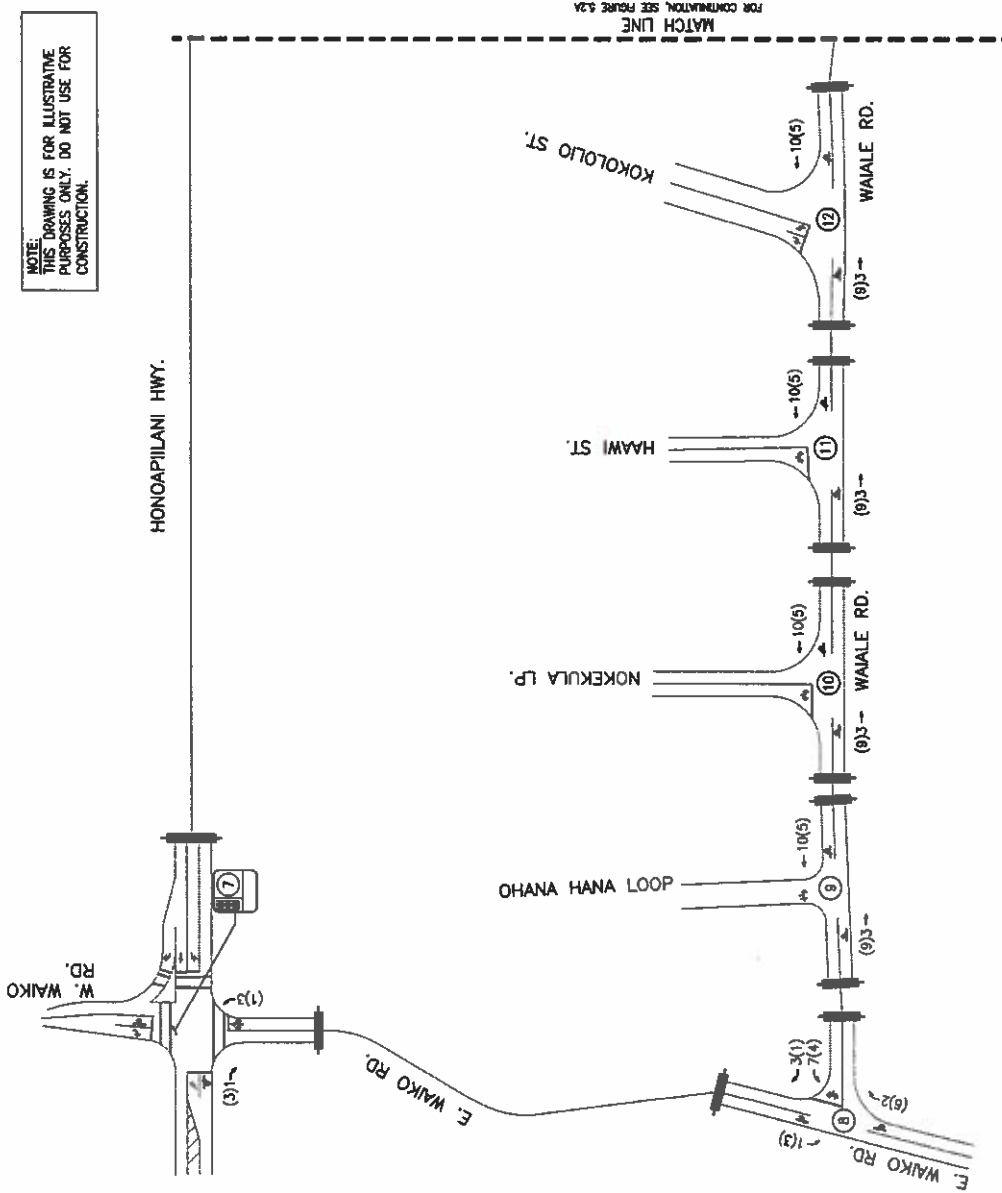
PROJECT TRIPS

FIGURE

4.1A

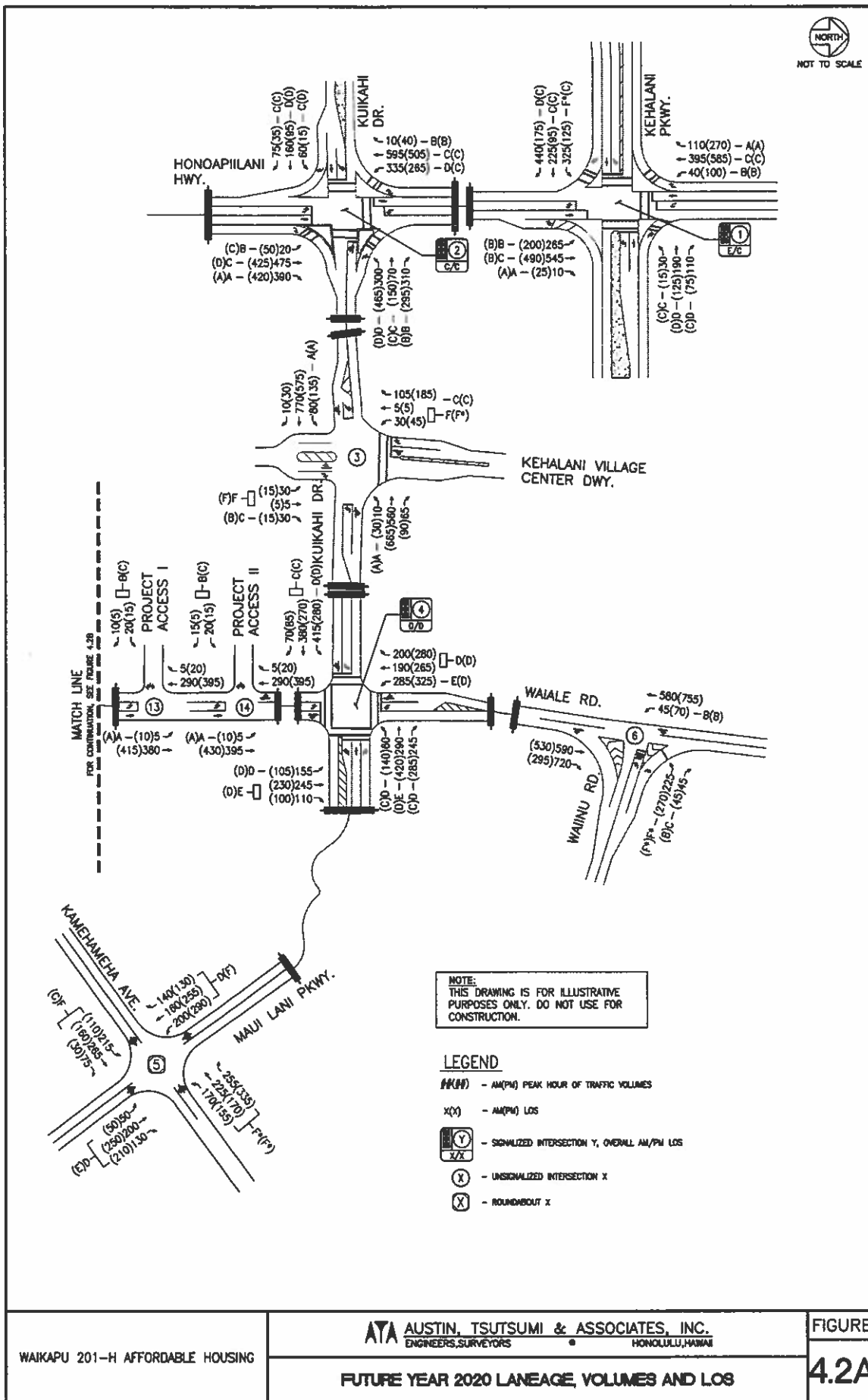


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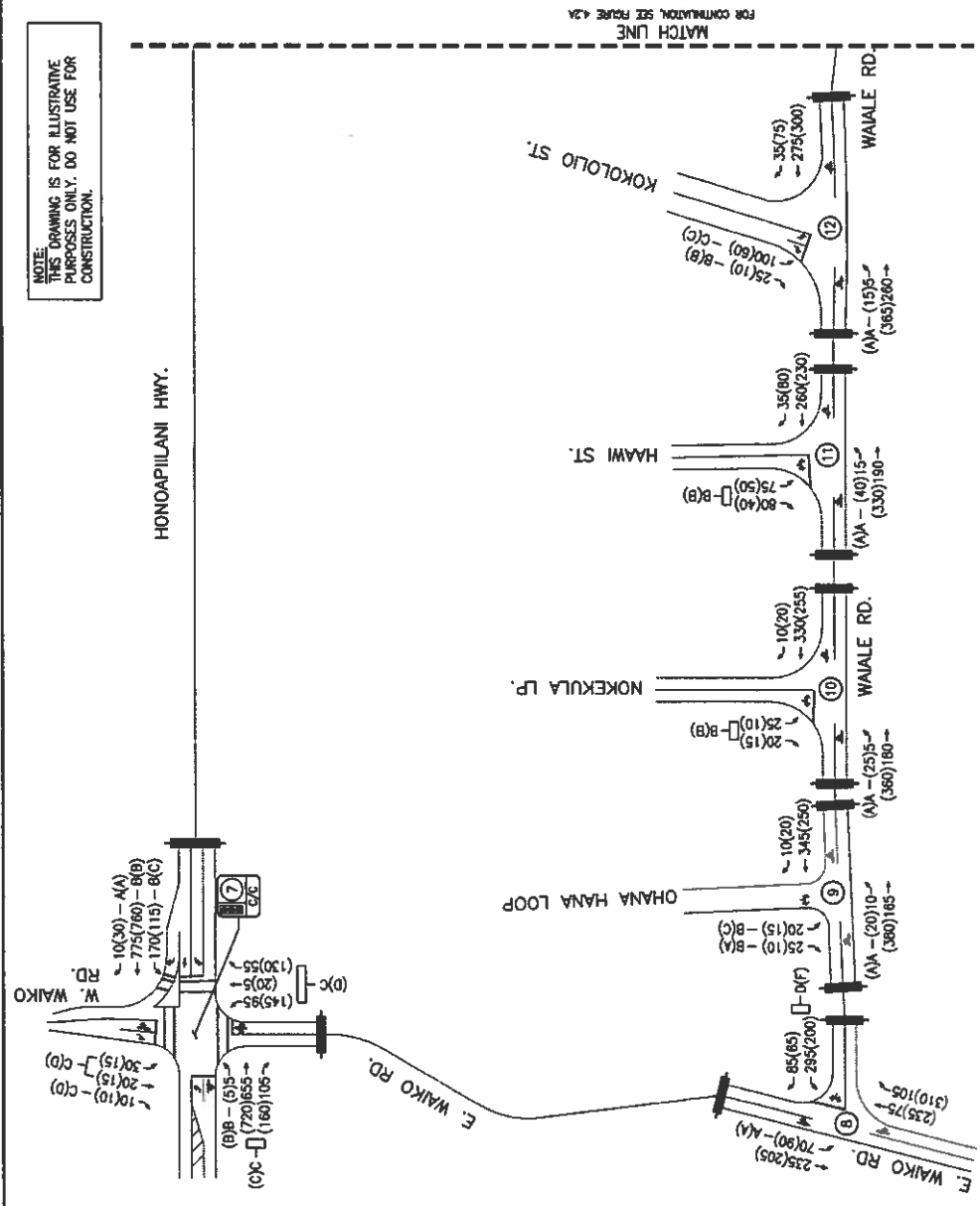
LEGEND
#(H) - AMPM PEAK HOUR OF TRAFFIC VOLUMES
[Symbol] - SIGNALIZED INTERSECTION Y
[Symbol] - UNSIGNALIZED INTERSECTION X

FIGURE	ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS/SURVEYORS HONOLULU, HAWAII	WAIKAPU 201-H AFFORDABLE HOUSING
4.1B	PROJECT TRIPS	





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- LEGEND**
- AMPH - AM/PM PEAK HOUR OF TRAFFIC VOLUMES
 - AMPH LOS
 - AMPH LOS
 - SIGNALIZED INTERSECTION 'Y', OVERALL AM/PM LOS
 - UNIGNALIZED INTERSECTION 'X'

FIGURE

4.2B

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FUTURE YEAR 2020 LANEAGE, VOLUMES AND LOS

Table 4.3: Existing, Base Year 2020 and Year 2020 with Project Level of Service Summary

Intersection	Existing Conditions						Base Year 2020						Future Year 2020					
	AM			PM			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	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
1: Honouliuli Hwy & Kehalani Pkwy																		
NB LT	17.0	0.53	B	11.6	0.36	B	17.9	0.63	B	15.4	0.58	B	18.1	0.85	B	15.5	0.59	B
NB TH	23.8	0.88	C	14.7	0.51	B	25.0	0.72	C	17.5	0.61	B	25.1	0.72	C	17.5	0.61	B
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	91.3	1.06	F*	24.1	0.38	C	221.0	1.38	F*	27.0	0.46	C	226.0	1.39	F*	27.0	0.46	C
EB TH	25.2	0.41	C	24.8	0.20	C	29.9	0.50	C	28.7	0.31	C	30.2	0.50	C	28.8	0.31	C
EB RT	24.9	0.37	C	26.7	0.53	C	34.7	0.67	C	31.4	0.65	C	35.2	0.68	D	31.7	0.67	C
WB LT	30.4	0.10	C	26.6	0.05	C	33.6	0.12	C	30.5	0.06	C	33.9	0.12	C	30.6	0.06	C
WB TH	37.1	0.74	D	30.0	0.56	C	42.3	0.82	D	35.3	0.66	D	42.7	0.82	D	35.5	0.66	D
WB RT	32.8	0.15	C	29.9	0.53	C	36.2	0.15	D	34.0	0.47	C	36.5	0.15	D	34.1	0.47	C
SB LT	19.0	0.14	B	10.1	0.21	B	19.6	0.15	B	12.5	0.26	B	19.7	0.15	B	12.6	0.26	B
SB TH	28.4	0.60	C	17.7	0.69	B	27.8	0.65	C	24.5	0.78	C	28.0	0.65	C	24.7	0.79	C
SB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
Overall	37.6	-	D	18.6	-	B	62.8	-	E	23.3	-	C	63.6	-	E	23.4	-	C
2: Honouliuli Highway & Kuikahi Dr																		
NB LT	18.0	0.04	B	16.2	0.12	B	18.4	0.09	B	20.8	0.20	C	18.4	0.09	B	20.8	0.20	C
NB TH	25.3	0.71	C	23.1	0.64	C	30.7	0.78	C	37.6	0.83	D	30.7	0.78	C	38.0	0.83	D
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	30.5	0.19	C	31.0	0.04	C	31.5	0.20	C	35.4	0.08	D	31.5	0.20	C	35.5	0.08	D
EB TH	42.2	0.74	D	33.6	0.48	C	48.9	0.79	D	40.8	0.70	D	48.8	0.79	D	40.9	0.70	D
EB RT	31.6	0.12	C	30.5	0.16	C	33.0	0.17	C	34.7	0.21	C	33.0	0.17	C	34.7	0.21	C
WB LT	27.1	0.68	C	30.5	0.79	C	36.3	0.80	D	38.8	0.88	D	36.2	0.80	D	39.0	0.88	D
WB TH	24.2	0.15	C	20.1	0.20	C	25.8	0.17	C	21.5	0.27	C	25.8	0.17	C	21.5	0.27	C
WB RT	17.4	0.15	B	16.0	0.30	B	19.0	0.28	B	16.2	0.44	B	19.2	0.31	B	16.2	0.45	B
SB LT	17.4	0.67	B	14.5	0.49	B	38.1	0.89	D	26.4	0.75	C	38.1	0.89	D	27.2	0.76	C
SB TH	18.3	0.57	B	19.0	0.63	B	22.4	0.74	C	27.0	0.75	C	22.4	0.74	C	26.9	0.74	C
SB RT	9.5	0.00	A	12.7	0.05	B	10.1	0.01	B	15.3	0.07	B	10.1	0.01	B	15.2	0.07	B
Overall	23.0	-	C	22.2	-	C	30.6	-	C	29.9	-	C	30.5	-	C	30.1	-	C
3: Kuikahi Dr & Kehalani Village Dr																		
NB LT/TH	-	-	-	-	-	-	165.0	0.71	F	270.3	0.73	F	170.6	0.72	F	285.1	0.75	F
NB RT	-	-	-	-	-	-	15.8	0.09	C	12.8	0.03	B	15.9	0.09	C	12.8	0.03	B
EB LT	8.8	0.07	A	9.2	0.11	A	9.3	0.09	A	10.4	0.18	B	9.4	0.10	A	10.4	0.18	B
WB LT	-	-	-	-	-	-	9.6	0.0	A	9.0	0.0	A	9.6	0.01	A	9.0	0.04	A
SB LT	46.3	0.27	E	33.9	0.23	D	-	-	-	-	-	-	-	-	-	-	-	-
SB LT/TH	-	-	-	-	-	-	122.9	0.8	F	274.9	1.1	F*	129.7	0.81	F	296.1	1.11	F*
SB RT	13.0	0.18	B	14.4	0.27	B	14.7	0.24	B	22.5	0.50	C	15.0	0.24	C	22.8	0.50	C
4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy																		
NB LT	24.5	0.37	C	23.3	0.20	C	33.9	0.48	C	34.4	0.51	C	35.9	0.52	D	35.6	0.55	D
NB TH/RT	33.6	0.72	C	27.7	0.52	C	54.2	0.85	D	48.8	0.77	D	59.5	0.88	E	49.9	0.81	D
EB LT	22.7	0.81	C	16.6	0.61	B	44.9	0.94	D	41.9	0.87	D	47.6	0.94	D	43.5	0.87	D
EB TH/RT	18.2	0.49	B	17.4	0.42	B	27.9	0.64	C	31.3	0.59	C	28.9	0.64	C	32.3	0.61	C
WB LT	24.6	0.10	C	18.0	0.16	B	34.0	0.20	C	28.7	0.39	C	35.2	0.20	D	27.3	0.41	C
WB TH	32.4	0.71	C	26.1	0.75	C	54.4	0.83	D	49.6	0.87	D	57.2	0.84	E	50.9	0.87	D
WB RT	26.4	0.12	C	19.4	0.02	B	36.9	0.09	D	30.3	0.13	C	38.1	0.09	D	30.8	0.13	C
SB LT	25.5	0.67	C	20.1	0.62	C	49.8	0.87	D	38.4	0.83	D	58.2	0.91	E	39.3	0.85	D
SB TH/RT	29.4	0.67	C	27.4	0.79	C	35.8	0.63	D	44.5	0.88	D	36.0	0.62	D	45.7	0.88	D
Overall	25.9	-	C	22.4	-	C	42.5	-	D	40.7	-	D	45.6	-	D	42.4	-	D
5: Kamehameha Ave & Maui Lani Pkwy																		
NB LT	24.5	0.55	C	15.9	0.20	C	-	-	-	-	-	-	-	-	-	-	-	-
NB TH/RT	53.9	0.90	F	18.2	0.38	F	-	-	-	-	-	-	-	-	-	-	-	-
NB LT/TH/RT	-	-	-	-	-	-	57.7	0.98	F	21.7	0.64	C	57.7	0.98	F	21.9	0.64	C
EB LT/TH/RT	82.3	1.03	F*	109.2	1.11	F*	27.3	0.80	D	55.9	1.00	F	27.3	0.80	D	57.6	1.00	F
WB LT/TH/RT	57.4	0.93	F	78.9	1.05	F*	32.1	0.79	D	44.8	0.92	E	32.1	0.79	D	47.6	0.93	E
SB LT	23.0	0.52	C	19.1	0.44	C	-	-	-	-	-	-	-	-	-	-	-	-
SB TH/RT	88.0	1.06	F*	51.9	0.93	F	-	-	-	-	-	-	-	-	-	-	-	-
SB LT/TH/RT	-	-	-	-	-	-	79.6	1.07	F*	59.3	1.01	F*	79.6	1.07	F*	62.9	1.02	F*
6: Waiale Rd & Waiolu Rd																		
WB LT	485.7	1.86	F*	378.8	1.65	F*	1020.3	3.02	F*	1218.0	3.47	F*	1076	3.14	F*	1266	3.58	F*
WB RT	17.7	0.15	C	12.5	0.09	B	20.0	0.17	C	14.6	0.12	B	20	0.17	C	15	0.12	B
SB LT	12.1	0.08	B	9.3	0.08	A	13.2	0.10	B	10.2	0.10	B	13	0.10	B	10	0.10	B
7: Honouliuli Hwy & W Waialae Rd/E Waialae Rd																		
NB LT	10.1	0.01	B	10.4	0.01	B	11.9	0.02	B	13.6	0.02	B	12.0	0.02	B	13.7	0.02	B
NB TH/RT	19.6	0.71	B	20.0	0.79	B	28.2	0.87	C	34.0	0.91	C	28.2	0.87	C	34.9	0.91	C
EB LT/TH	28.6	0.12	C	26.9	0.07	C	28.3	0.14	C	36.4	0.09	D	28.2	0.14	C	36.5	0.09	D
EB RT	0.0	0.00	A	26.7	0.03	C	27.4	0.00	C	35.8	0.00	D	27.4	0.00	C	35.8	0.00	D
WB LT/TH/RT	29.4	0.24	C	29.1	0.36	C	31.4	0.40	C	53.6	0.80	D	31.6	0.41	C	53.7	0.80	D
SB LT	11.0	0.32	B	12.0	0.15	B	16.9	0.55	B	25.5	0.51	C	16.9	0.55	B	26.1	0.52	C
SB TH	12.2	0.60	B	12.9	0.66	B	16.2	0.74	B	16.3	0.70	B	16.2	0.74	B	16.3	0.70	B
SB RT	6.2	0.01	A	6.7	0.03	A	6.5	0.01	A	7.9	0.02	A	6.5	0.01	A	7.9	0.02	A
Overall	16.5	-	B	17.4	-	B	22.3	-	C	29.3	-	C	22.4	-	C	29.8	-	C
8: E Waialae Rd & Waiale Rd																		
EB LT	7.6	0.04	A	7.8	0.05	A	7.8	0.06	A	9.0	0.09	A	7.8	0.06	A	9.1	0.10	A
SB LT/RT	14.2	0.40	B	12.1	0.25	B	30.2	0.76	D	46.5	0.80	E	33.0	0.79	D	53.4	0.85	F

* Denotes overcapacity condition, v/c ≥ 1.

Table 4.3: Existing, Base Year 2020 and Year 2020 with Project Level of Service Summary Cont'd

Intersection	Existing Conditions						Base Year 2020						Future Year 2020					
	AM			PM			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	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
9: Waiale Rd & Ohana Hana Lp																		
NB LT	7.7	0.01	A	7.6	0.01	A	8.0	0.01	A	7.6	0.02	A	8.1	0.01	A	7.9	0.02	A
EB LT	10.9	0.03	B	11.0	0.03	B	12.5	0.04	B	14.3	0.04	B	13.0	0.05	B	15.0	0.04	C
EB RT	9.6	0.03	A	9.1	0.01	A	10.3	0.04	B	9.7	0.01	A	10.6	0.04	B	9.8	0.01	A
10: Waiale Rd & Nokekula Lp																		
NB LT	7.7	0.00	A	7.6	0.02	A	8.0	0.01	A	7.9	0.02	A	8.0	0.01	A	7.9	0.02	A
EB LT/RT	10.4	0.07	B	10.0	0.03	B	12.0	0.09	B	11.9	0.05	B	12.2	0.09	B	12.0	0.05	B
11: Waiale Rd & Haawi St																		
NB LT	7.6	0.01	A	7.7	0.03	A	7.9	0.01	A	8.0	0.04	A	7.9	0.01	A	8.1	0.04	A
EB LT/RT	11.0	0.22	B	11.0	0.14	B	13.2	0.28	B	14.3	0.20	B	13.4	0.28	B	14.5	0.21	B
12: Waiale Rd & Kokololo St																		
NB LT	7.6	0.00	A	7.9	0.01	A	7.9	0.00	A	8.2	0.01	A	8.0	0.00	A	8.2	0.01	A
EB LT	12.2	0.18	B	12.2	0.11	B	15.1	0.23	C	17.3	0.18	C	15.4	0.24	C	17.6	0.19	C
EB RT	9.2	0.03	A	9.6	0.01	A	10.1	0.04	B	10.3	0.02	B	10.2	0.04	B	10.4	0.02	B
13: Waiale Rd & Project Access II																		
NB LT	-	-	-	-	-	-	-	-	-	-	-	-	7.9	0.00	A	8.3	0.01	A
EB LT/RT	-	-	-	-	-	-	-	-	-	-	-	-	13.6	0.07	B	16.1	0.06	C
14: Waiale Rd & Project Access I																		
NB LT	-	-	-	-	-	-	-	-	-	-	-	-	7.9	0.00	A	8.3	0.01	A
EB LT/RT	-	-	-	-	-	-	-	-	-	-	-	-	13.3	0.08	B	16.4	0.06	C

* Denotes overcapacity condition, $v/c \geq 1$.

5. CONCLUSIONS

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. Vehicular traffic to the Project will be provided by two (2) new Project access along Waiale Road. The Project is anticipated to be completed by the Year 2020.

5.1 Existing Conditions

Generally, all movements at each study intersection operate at LOS D or better during the AM and PM peak hours of traffic with a few exceptions.

The eastbound left-turn movement at the Honoapiilani Highway/Kehalani Parkway intersection operates at LOS F and overcapacity conditions during the AM peak hour likely due to heavy concentrated traffic as a result of the Puu Kukui Elementary School start time. The movement experiences queues that often extend beyond the existing left-turn storage lane and a portion of vehicles require two cycle lengths to clear the intersection. However, the queuing conditions were only observed to last about 30 minutes during the AM, generally between 7:15-7:45 AM.

The southbound left-turn movement at the Kuikahi Drive/Kehalani Village Center Access operates at LOS E during the AM peak hour of traffic.

The Kamehameha Avenue/Maui Lani Parkway intersection operates with various movements at LOS F and overcapacity conditions during both AM and PM peak hours of traffic. This is primarily due to regional traffic between the Waikapu-Wailuku-Kahului regions. Queues were inconsistent and varied in length throughout the peak hours, with a short period of extensive southbound queuing during the AM peak hour and periodic eastbound queuing during the AM and PM peak hours of traffic.

The westbound approach at the Waiale Road/Waiinu Road intersection operates at LOS F and overcapacity conditions during the AM and PM peak hours of traffic due to lengthy delays. Traffic was generally observed to progress unimpeded along Waiale Road during the AM peak hour, except between 7:30-7:50 AM, where northbound traffic on Waiale Road was observed to slowly progress through the intersection in part due to northbound spillbacks from the Waiale Road/Kaohu Street 4-way stop controlled intersection and reduced northbound speeds generated by frequent northbound right-turning vehicles at the Waiale Road/Waiinu Road intersection. Some northbound vehicles along Waiale Road also stopped within the through travel lane to allow side street vehicles (ranging from 1-6 vehicles at a time) to turn onto or off of Waiale Road, which formed lengthy platoons. Congestion and queuing along Waiale Road generally dissipated around 7:50-7:55 AM.

5.2 Base Year 2020 without the Project

Traffic growth in the study area was estimated for Year 2020 by using the existing count data collected by ATA and the MRTDM, which resulted in an anticipated growth rate of approximately 1.9 percent per year. Nearby future developments that are assumed to be completed by Year 2020 include the Waikapu Light Industrial Project, Waiko Baseyard Light Industrial Development, Kehalani Village Center, Maui Lani Village Center, Central Maui Regional Sports Complex, Waiale Affordable Housing, Kehalani Mauka Residential subdivision and the Wailuku Apartments. Other major developments such as the Puunani Residences, Waikapu Country

Town (WCT) and Waiale developments are unlikely to be built by Year 2020, and were therefore not explicitly included in this TIAR.

The Waiale Road Extension and Waiko Road Improvements are planned roadway improvements to be constructed in the future. However, since they are unlikely to be built by Year 2020 given their current status, these roadway improvements were not included in this TIAR. In addition, at the Waiale Road/Waiinu Road intersection, a traffic signal and widening improvements are listed in the Statewide Transportation Improvement Program (STIP). However, it's unknown if this development will be constructed by Year 2020 and was therefore not included in this TIAR. At the Maui Lani Parkway/Kamehameha Avenue intersection, a single-lane roundabout is planned to be constructed and was included in this TIAR.

The eastbound left-turn movement at the Honoapiilani Highway/Kehalani Parkway intersection will continue to operate at LOS F and overcapacity conditions during the AM peak hour. As noted in Section 2.3, heavy traffic during a short period of time is reflective of typical school traffic conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour and primarily stem from traffic generated by the Puu Kukui Elementary School. There are currently no identified or planned roadway improvements likely to occur at this intersection. Signal timing may be adjusted, but northbound congestion along Honoapiilani Highway will continue to occur during the AM peak hour.

The southbound left-turn movement at the Kuikahi Drive/Kehalani Village Center Driveway will worsen to operate at LOS F during the AM and PM peak hours of traffic, however will continue to operate with relatively low volume at 30(45) vehicles in the AM(PM) peak hours of traffic.

As a roundabout, various movements at the Kamehameha Avenue/Maui Lani Parkway intersection will operate at LOS E/F during the AM and PM peak hours. However, approach delays are anticipated to improve from existing conditions.

Since no roadway improvements were assumed at the Waiale Road/Waiinu Road intersection, the westbound left-turn movement will continue operating at LOS F and overcapacity conditions during the AM and PM peak hours. Northbound through traffic on Waiale Road will continue to spill back in the AM peak hour. For future planning purposes along Waiale Road, traffic control treatment at Waiale Road/Kaohu Street intersection, intersection improvements at the Waiale Road/Waiinu Road intersection (as identified on the STIP) and median refuge lanes along Waiale Road could be considered to help mitigate Waiale Road northbound flows in the AM peak hour of traffic.

5.3 Future Year 2020 with the Project

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. The Project is anticipated to generate approximately 38 AM peak hour trips and 86 PM peak hour trips.

Upon completion of the Project, all study intersections are forecast to operate with LOS similar to Base Year 2020 conditions. The eastbound left-turn movement at the Honoapiilani Highway/Kehalani Parkway intersection is forecast to continue operating at over-capacity and LOS F conditions in the AM peak hour, similar to Base Year 2020 conditions. The Project is only anticipated to increase traffic at the Honoapiilani Highway/Kehalani Parkway intersection by approximately 0.5%, with individual movement increases generally ranging from 1-7 vehicles.



There are currently no identified or planned roadway improvements likely to occur at this intersection.

At the Kamehameha Avenue/Maui Lani Parkway roundabout intersection, all approaches will operate similar to Base Year 2020 conditions, with various delays operating at LOS E/F conditions during the AM and PM peak hours. The westbound left-turn movement at the Waiale Road/Waiinu Road intersection will continue operating at LOS F and overcapacity conditions during the AM and PM peak hours.

As mentioned in Section 2.3, northbound through traffic on Waiale Road will continue to spill back to the Waiale Road/Kuikahi Drive intersection in the AM peak hour. Based on the forecast trips, the Project will increase traffic at the intersection by approximately 1.5%. During the more critical AM peak hour of traffic, the Project is forecast to add only 18 northbound through vehicles and 11 northbound left-turn vehicles along Waiale Road through the intersection.

Based on MUTCD signal warrants, a signal will likely not be met at both Project accesses along Waiale Road. Two northbound left-turn storage lanes along Waiale Road are recommended for entrance into the two proposed Project accesses, to remove left-turn vehicles from mainline through traffic. Left-turn storage lanes should accommodate a minimum 50 feet of storage length.



6. REFERENCES

- Austin, Tsutsumi & Associates, Central Maui Regional Sports Complex TIAR, 2014.
- Austin, Tsutsumi & Associates, Waiale Affordable Housing TIAR, 2016.
- Austin, Tsutsumi & Associates, Waikapu Light Industrial Project TIAR, 2013.
- Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009.
- Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.
- Phillip Rowell & Associates, Waiko Road Light Industrial Park TIAR, 2011.
- Transportation Research Board, Highway Capacity Manual, 2010.



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APPENDICES



AUSTIN, TSUTSUMI & ASSOCIATES, INC.
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APPENDIX A

TRAFFIC COUNT DATA

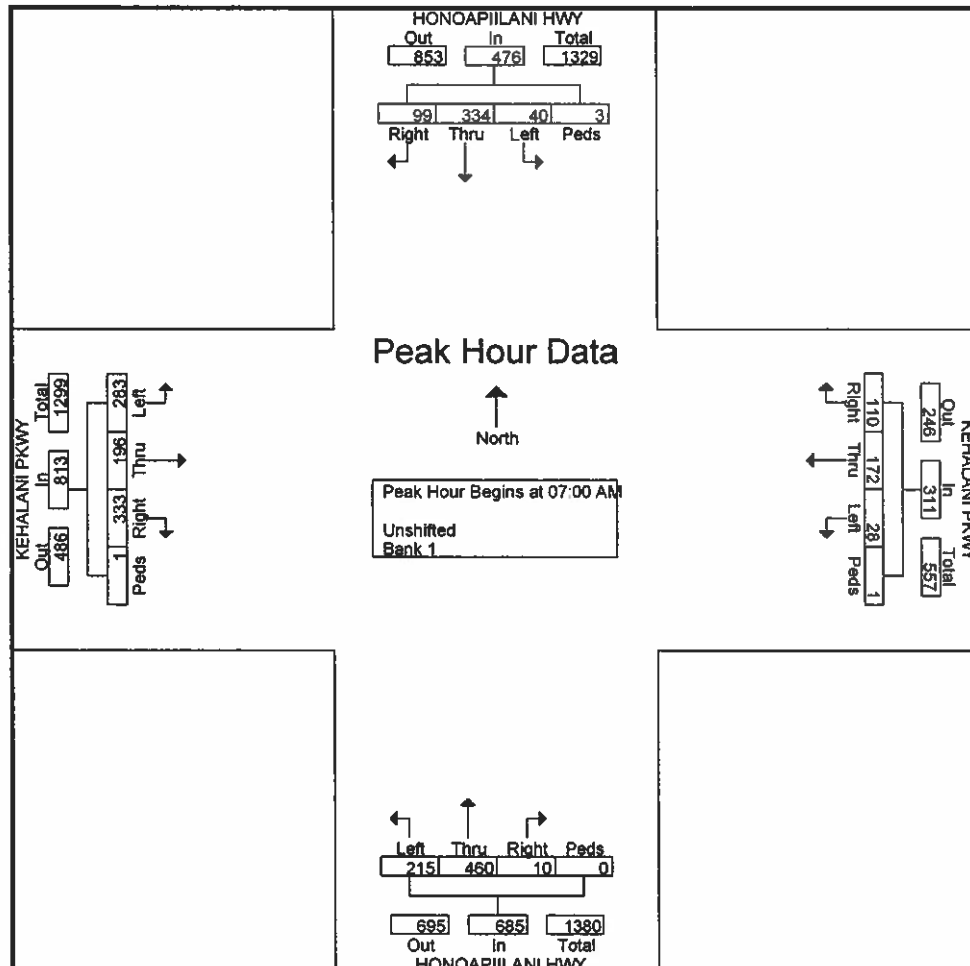
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File Name : AM_Honoapiilani Hwy - Kehalani Pkwy
Site Code : 00000000
Start Date : 3/15/2017
Page No : 2

	HONOAPIILANI HWY Southbound					KEHALANI PKWY Westbound					HONOAPIILANI HWY Northbound					KEHALANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	6	95	30	0	131	5	35	21	0	61	41	106	0	0	147	77	20	67	0	164	503
07:15 AM	11	71	33	2	117	8	51	38	0	97	73	116	2	0	191	92	49	90	1	232	637
07:30 AM	12	79	21	1	113	6	63	38	1	108	75	121	7	0	203	59	78	112	0	249	673
07:45 AM	11	89	15	0	115	9	23	13	0	45	26	117	1	0	144	55	49	64	0	168	472
Total Volume	40	334	99	3	476	28	172	110	1	311	215	460	10	0	685	283	196	333	1	813	2285
% App. Total	8.4	70.2	20.8	0.6		9	55.3	35.4	0.3		31.4	67.2	1.5	0		34.8	24.1	41	0.1		
PHF	.833	.879	.750	.375	.908	.778	.683	.724	.250	.720	.717	.950	.357	.000	.844	.769	.628	.743	.250	.816	.849



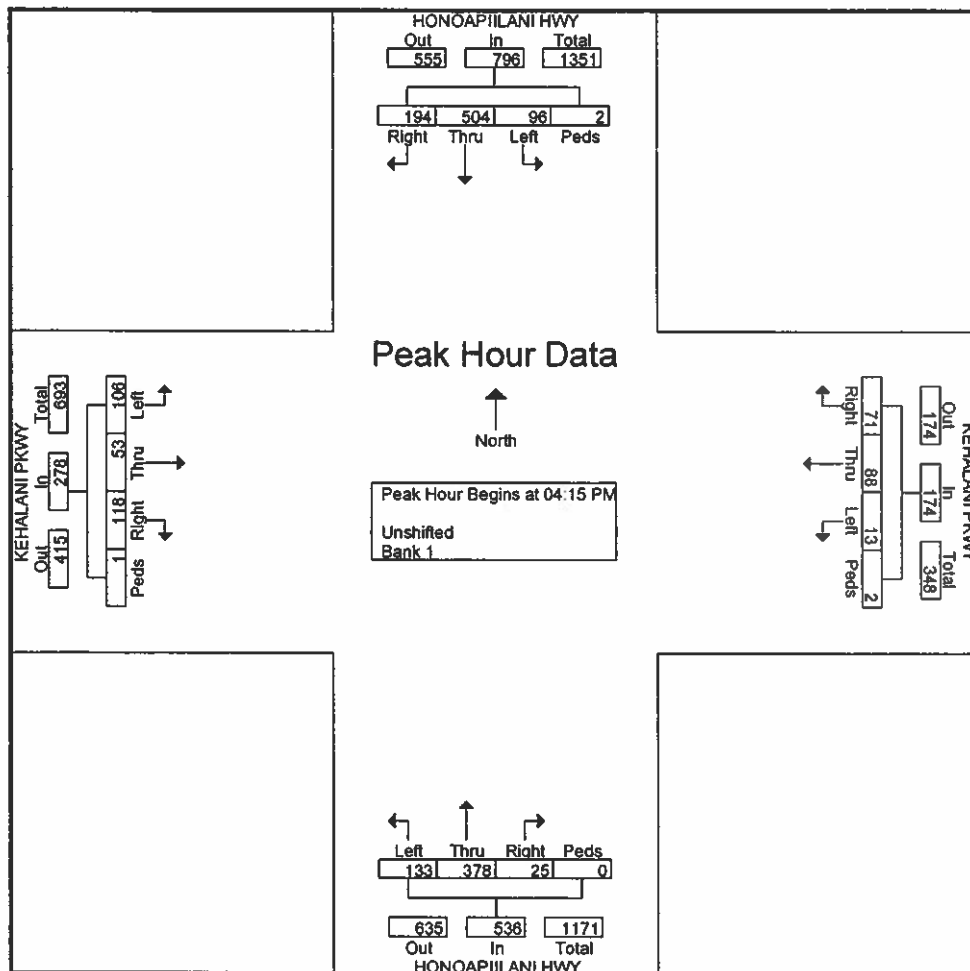
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Honolulu, HI 96817
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM_Honoapiilani Hwy - Kehalani Pkwy
Site Code : 00000000
Start Date : 3/15/2017
Page No : 2

	HONOAPIILANI HWY Southbound					KEHALANI PKWY Westbound					HONOAPIILANI HWY Northbound					KEHALANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	17	130	48	0	195	2	20	16	0	38	30	95	8	0	133	28	11	33	0	72	438
04:30 PM	30	133	47	0	210	5	23	21	0	49	36	103	6	0	145	30	15	31	0	76	460
04:45 PM	28	126	50	1	205	1	19	14	1	35	28	87	5	0	120	28	15	31	1	75	435
05:00 PM	21	115	49	1	186	5	26	20	1	52	39	93	6	0	138	20	12	23	0	55	431
Total Volume	96	504	194	2	796	13	88	71	2	174	133	378	25	0	536	106	53	118	1	278	1784
% App. Total	12.1	63.3	24.4	0.3		7.5	50.6	40.8	1.1		24.8	70.5	4.7	0		38.1	19.1	42.4	0.4		
PHF	.800	.947	.970	.500	.948	.850	.846	.845	.500	.837	.853	.917	.781	.000	.924	.883	.883	.894	.250	.914	.929



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File Name : AM_Honoapiilani Hwy - Kuikahi Dr_Maui Lani Pkwy

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Start Date : 3/15/2017

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Groups Printed- Unshifted - Bank 1

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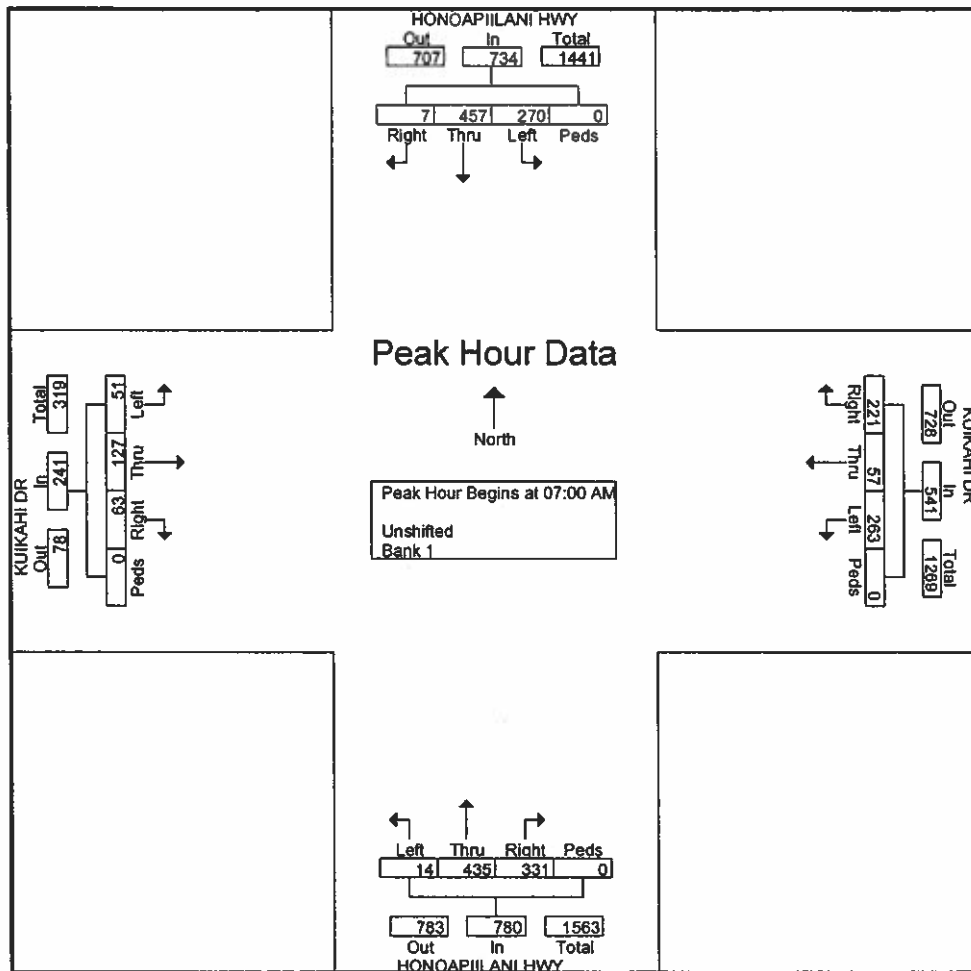
File Name : AM_Honoapiilani Hwy - Kuikahi Dr_Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					KUIKAHI DR Westbound					HONOAPIILANI HWY Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:45 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	57	126	1	0	184	63	13	60	0	136	0	95	79	0	174	8	29	15	0	52	548
07:15 AM	61	96	1	0	158	55	14	70	0	139	3	112	86	0	201	20	48	9	0	77	575
07:30 AM	79	132	2	0	213	71	8	57	0	136	8	139	88	0	235	18	25	28	0	72	656
07:45 AM	73	103	3	0	179	74	22	34	0	130	3	89	78	0	170	5	25	10	0	40	519
Total Volume	270	457	7	0	734	263	57	221	0	541	14	435	331	0	780	51	127	63	0	241	2296
% App. Total	36.8	62.3	1	0		48.6	10.5	40.9	0		1.8	55.8	42.4	0		21.2	52.7	26.1	0		
PHF	.854	.866	.583	.000	.862	.889	.648	.789	.000	.973	.438	.782	.940	.000	.830	.838	.661	.543	.000	.782	.875



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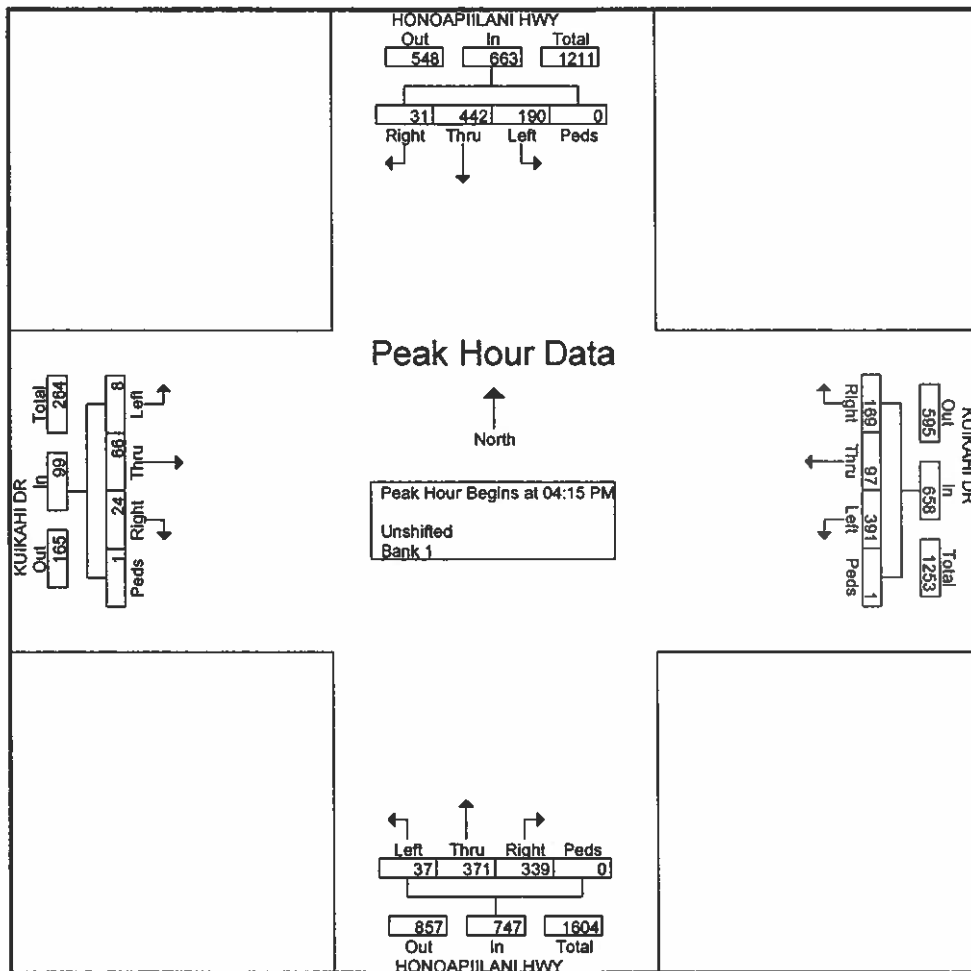
File Name : PM_Honoapiilani Hwy - Kuikahi Dr_Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					KUIKAHI DR Westbound					HONOAPIILANI HWY Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	80	100	8	0	188	92	29	42	0	163	6	107	96	0	211	1	15	7	0	23	565
04:30 PM	47	134	8	0	189	97	29	41	0	167	7	100	88	0	195	2	17	8	1	28	579
04:45 PM	48	105	11	0	164	103	17	41	1	162	14	79	73	0	166	2	15	2	0	19	511
05:00 PM	35	103	4	0	142	99	22	45	0	166	10	85	80	0	175	3	19	7	0	29	512
Total Volume	190	442	31	0	663	391	97	169	1	658	37	371	339	0	747	8	68	24	1	99	2167
% App. Total	28.7	66.7	4.7	0		59.4	14.7	25.7	0.2		5	49.7	45.4	0		8.1	66.7	24.2	1		
PHF	.792	.825	.705	.000	.877	.949	.836	.939	.250	.985	.661	.867	.865	.000	.885	.867	.868	.750	.250	.853	.936



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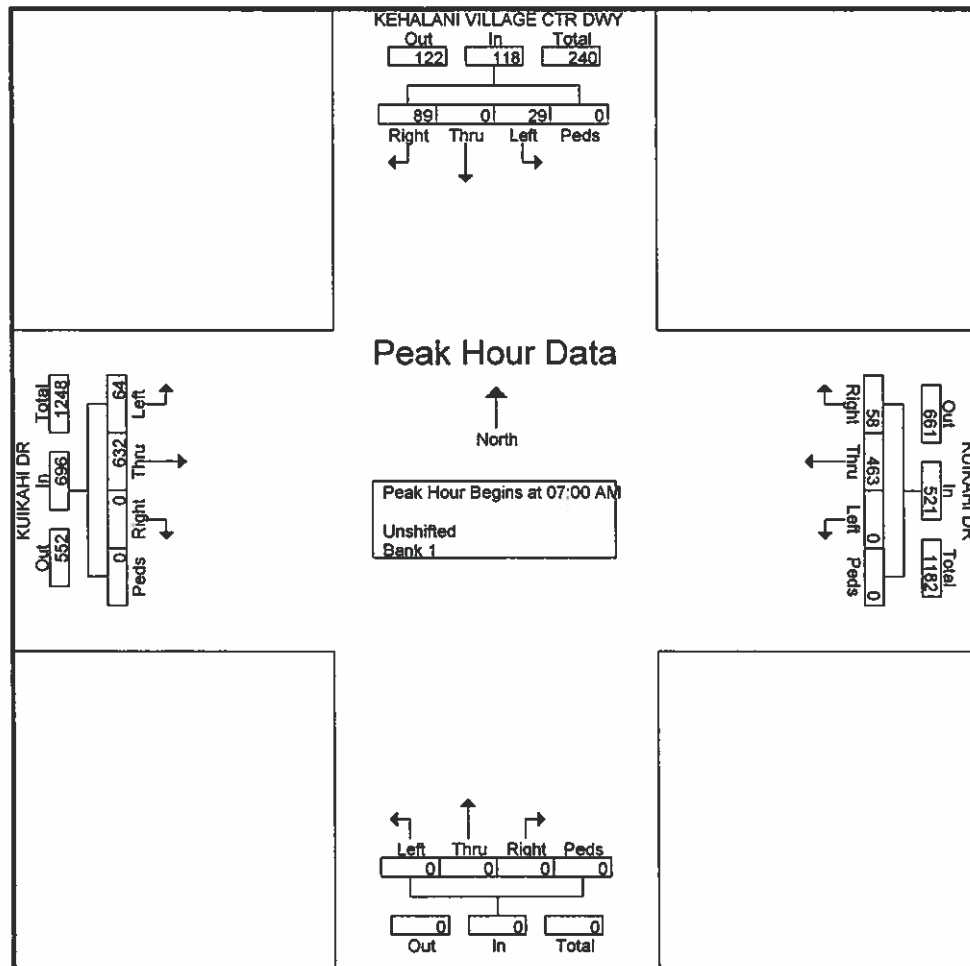
File Name : AM_Kehalani Village Ctr Dwy - Kuikahi Dr

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	KEHALANI VILLAGE CTR DWY Southbound					KUIKAHI DR Westbound					Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	8	0	18	0	24	0	119	18	0	135	0	0	0	0	0	13	164	0	0	177	336
07:15 AM	5	0	21	0	26	0	127	13	0	140	0	0	0	0	0	16	188	0	0	184	360
07:30 AM	6	0	27	0	33	0	120	13	0	133	0	0	0	0	0	22	146	0	0	168	334
07:45 AM	12	0	23	0	35	0	97	16	0	113	0	0	0	0	0	13	154	0	0	167	315
Total Volume	29	0	89	0	118	0	463	58	0	521	0	0	0	0	0	64	632	0	0	696	1335
% App. Total	24.6	0	75.4	0		0	88.9	11.1	0		0	0	0	0	0	9.2	90.8	0	0		
PHF	.604	.000	.624	.000	.843	.000	.911	.906	.000	.930	.000	.000	.000	.000	.000	.727	.940	.000	.000	.946	.954



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File Name : MD Kehalani Village Ctr Dwy - Kuikahi Dr

Site Code : 00000000

Start Date : 3/16/2017

Page No : 1

Groups Printed- Unshifted - Bank 1

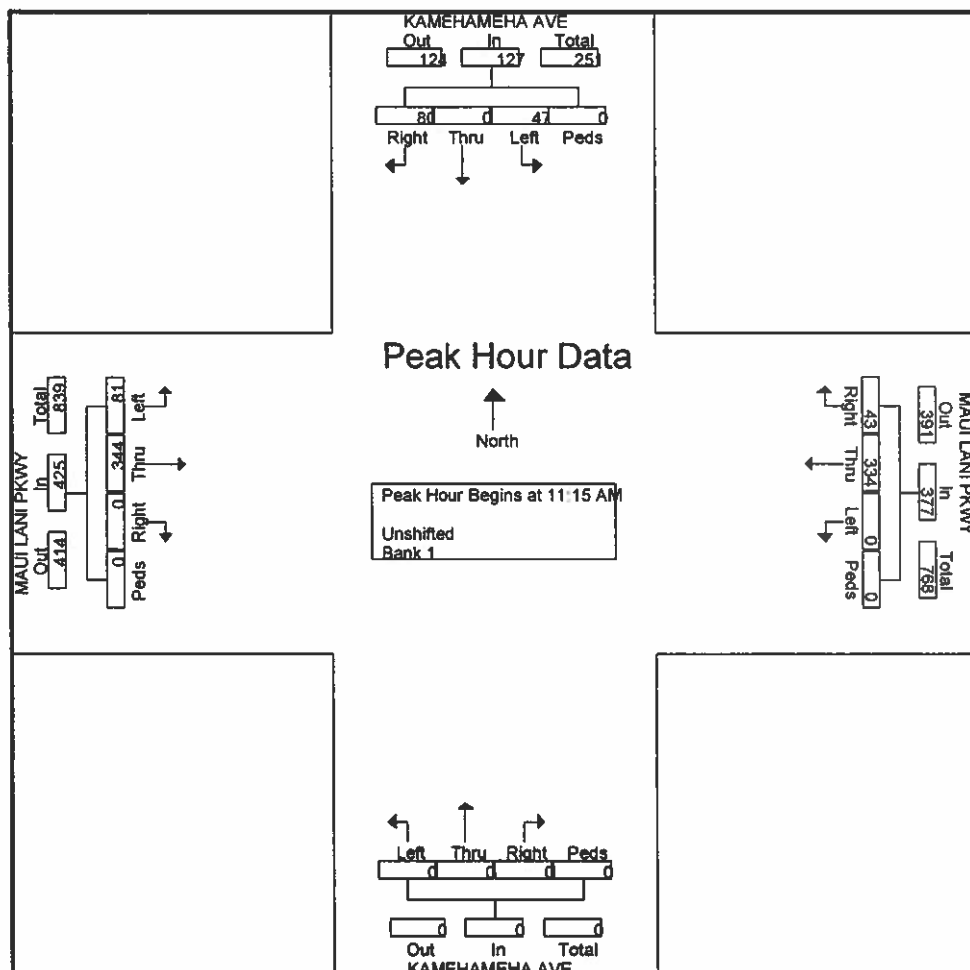
Groups Filtered - Unshifted - Bank 1																	
	KAMEHAMEHA AVE Southbound				MAUI LANI PKWY Westbound				KAMEHAMEHA AVE Northbound				MAUI LANI PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
09:00 AM	6	0	11	0	0	94	9	0	0	0	0	0	12	93	0	0	225
09:15 AM	6	0	13	0	0	71	7	0	0	0	0	0	13	84	0	0	194
09:30 AM	4	0	5	0	0	25	6	0	0	0	0	0	11	45	0	0	96
09:45 AM	6	0	14	0	0	59	5	0	0	0	0	0	10	69	0	0	163
Total	22	0	43	0	0	249	27	0	0	0	0	0	46	291	0	0	678
10:00 AM	9	0	18	0	0	93	15	0	0	0	0	0	11	133	0	0	279
10:15 AM	8	0	13	0	0	72	23	0	0	0	0	0	12	100	0	0	228
10:30 AM	14	0	17	0	0	69	16	0	0	0	0	0	16	80	0	0	212
10:45 AM	8	0	22	0	0	59	13	0	0	0	0	0	10	85	0	0	197
Total	39	0	70	0	0	293	67	0	0	0	0	0	49	398	0	0	916
11:00 AM	8	0	16	0	0	68	9	0	0	0	0	0	19	77	0	0	197
11:15 AM	10	0	18	0	0	74	7	0	0	0	0	0	25	84	0	0	218
11:30 AM	11	0	24	0	0	82	7	0	0	0	0	0	20	74	0	0	218
11:45 AM	13	0	17	0	0	94	13	0	0	0	0	0	20	97	0	0	254
Total	42	0	75	0	0	318	36	0	0	0	0	0	84	332	0	0	887
12:00 PM	13	0	21	0	0	84	16	0	0	0	0	0	16	89	0	0	239
12:15 PM	4	0	19	0	0	73	9	0	0	0	0	0	13	67	0	0	185
12:30 PM	6	0	26	0	0	76	20	0	0	0	0	0	17	78	0	0	223
12:45 PM	5	0	14	1	0	84	15	0	0	0	0	0	17	80	0	0	216
Total	28	0	80	1	0	317	60	0	0	0	0	0	63	314	0	0	863
01:00 PM	4	0	20	0	0	79	16	0	0	0	0	0	13	81	0	0	213
01:15 PM	4	0	25	0	0	81	6	0	0	0	0	0	15	110	0	0	241
01:30 PM	5	0	30	0	0	80	7	0	0	0	0	0	12	106	0	0	240
01:45 PM	6	0	13	0	0	88	15	0	0	0	0	0	24	89	0	0	235
Total	19	0	88	0	0	328	44	0	0	0	0	0	64	386	0	0	929
02:00 PM	3	0	8	0	0	50	5	0	0	0	0	0	13	55	0	0	134
02:15 PM	11	0	20	0	0	105	16	0	0	0	0	0	19	129	0	0	300
Grand Total	164	0	384	1	0	1660	255	0	0	0	0	0	338	1905	0	0	4707
Apprch %	29.9	0	69.9	0.2	0	86.7	13.3	0	0	0	0	0	15.1	84.9	0	0	
Total %	3.5	0	8.2	0	0	35.3	5.4	0	0	0	0	0	7.2	40.5	0	0	
Unshifted	164	0	384	1	0	1660	255	0	0	0	0	0	338	1905	0	0	4707
% Unshifted	100	0	100	100	0	100	100	0	0	0	0	0	100	100	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : MD_Kehalani Village Ctr Dwy - Kuikahi D
Site Code : 00000000
Start Date : 3/16/2017
Page No : 2

	KAMEHAMEHA AVE Southbound					MAUI LANI PKWY Westbound					KAMEHAMEHA AVE Northbound					MAUI LANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 09:00 AM to 02:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	10	0	18	0	28	0	74	7	0	81	0	0	0	0	0	25	84	0	0	109	218
11:30 AM	11	0	24	0	35	0	82	7	0	89	0	0	0	0	0	20	74	0	0	94	218
11:45 AM	13	0	17	0	30	0	94	13	0	107	0	0	0	0	0	20	97	0	0	117	254
12:00 PM	13	0	21	0	34	0	84	16	0	100	0	0	0	0	0	16	89	0	0	105	239
Total Volume	47	0	80	0	127	0	334	43	0	377	0	0	0	0	0	81	344	0	0	425	929
% App. Total	37	0	63	0		0	88.6	11.4	0		0	0	0	0		19.1	80.9	0	0		
PHF	.904	.000	.833	.000	.907	.000	.888	.672	.000	.881	.000	.000	.000	.000	.000	.810	.887	.000	.000	.908	.914



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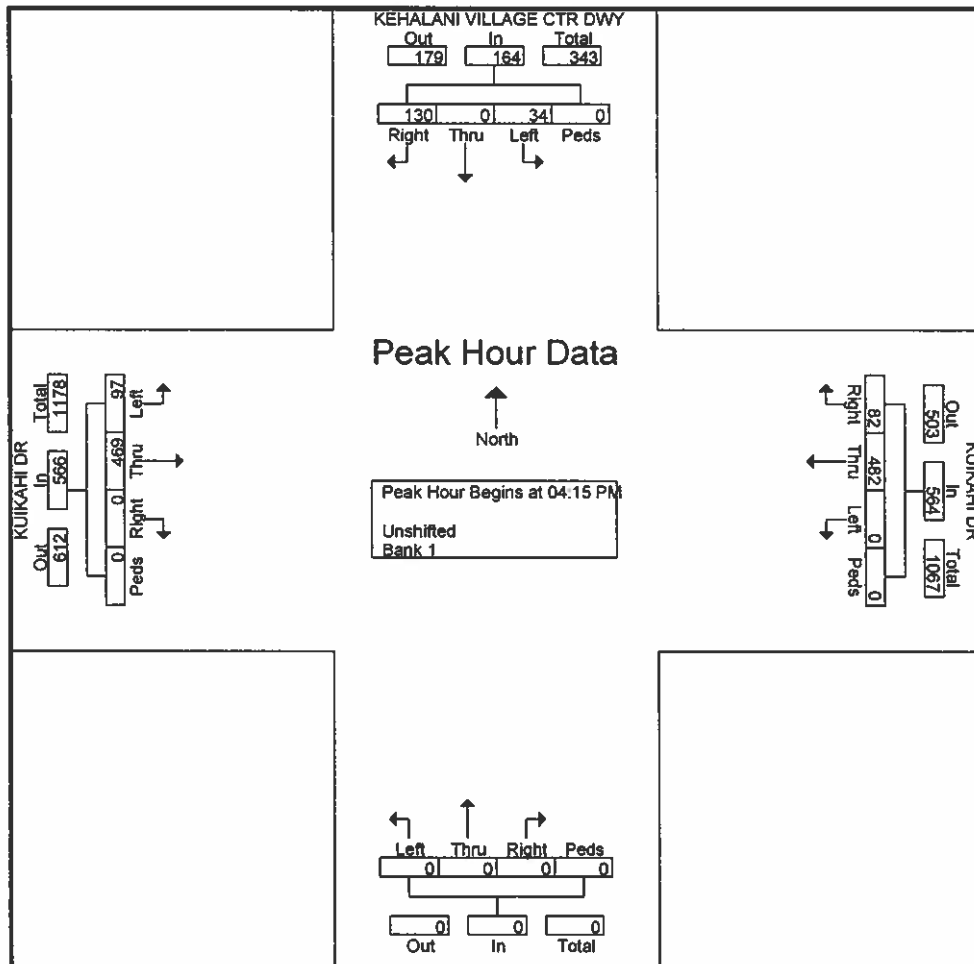
File Name : PM_Kehalani Village Ctr Dwy - Kuikahi Dr

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	KEHALANI VILLAGE CTR DWY Southbound					KUIKAHI DR Westbound					Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	4	0	30	0	34	0	122	20	0	142	0	0	0	0	0	21	148	0	0	167	343
04:30 PM	7	0	33	0	40	0	115	22	0	137	0	0	0	0	0	30	113	0	0	143	320
04:45 PM	12	0	28	0	40	0	125	22	0	147	0	0	0	0	0	21	109	0	0	130	317
05:00 PM	11	0	39	0	50	0	120	18	0	138	0	0	0	0	0	25	101	0	0	126	314
Total Volume	34	0	130	0	164	0	482	82	0	564	0	0	0	0	0	97	489	0	0	586	1294
% App. Total	20.7	0	79.3	0		0	85.5	14.5	0		0	0	0	0	0	17.1	82.9	0	0		
PHF	.708	.000	.833	.000	.820	.000	.964	.932	.000	.959	.000	.000	.000	.000	.000	.808	.803	.000	.000	.847	.943



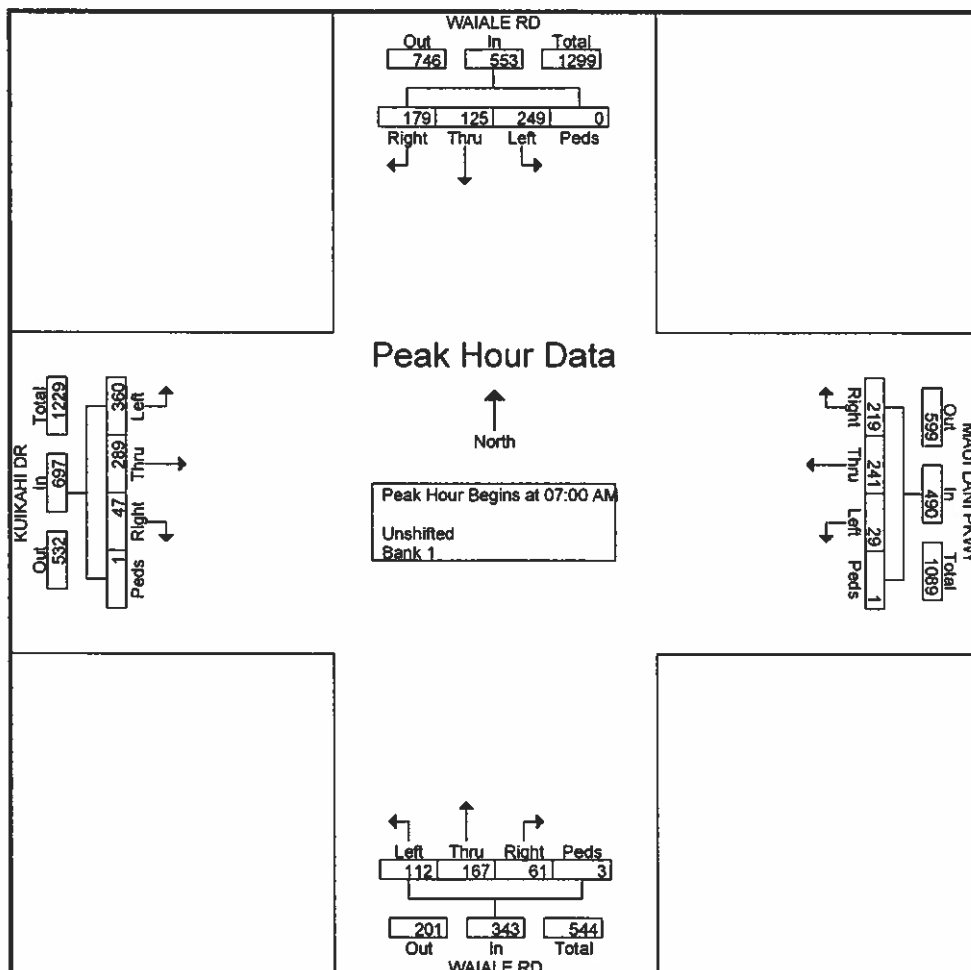
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File Name : AM_Waiale Rd - Kuikahi Dr_Maui Lani Pkwy
Site Code : 00000000
Start Date : 3/15/2017
Page No : 2

	WAIALE RD Southbound					MAUI LANI PKWY Westbound					WAIALE RD Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	52	27	51	0	130	0	68	50	0	124	24	31	13	1	69	89	57	8	1	155	478
07:15 AM	65	35	42	0	142	7	80	58	0	125	37	44	16	2	99	83	63	11	0	157	540
07:30 AM	80	33	42	0	155	7	80	58	0	125	37	44	16	2	99	88	66	15	0	169	548
07:45 AM	72	30	50	0	152	8	58	50	1	127	11	31	12	0	54	90	83	13	0	186	519
Total Volume	249	125	179	0	553	29	241	219	1	490	112	167	61	3	343	360	289	47	1	697	2083
% App. Total	45	22.6	32.4	0		5.9	49.2	44.7	0.2		32.7	48.7	17.8	0.9		51.6	41.5	6.7	0.1		
PHF	.865	.863	.877	.000	.910	.806	.888	.928	.250	.965	.700	.884	.783	.375	.709	.968	.840	.783	.250	.922	.954



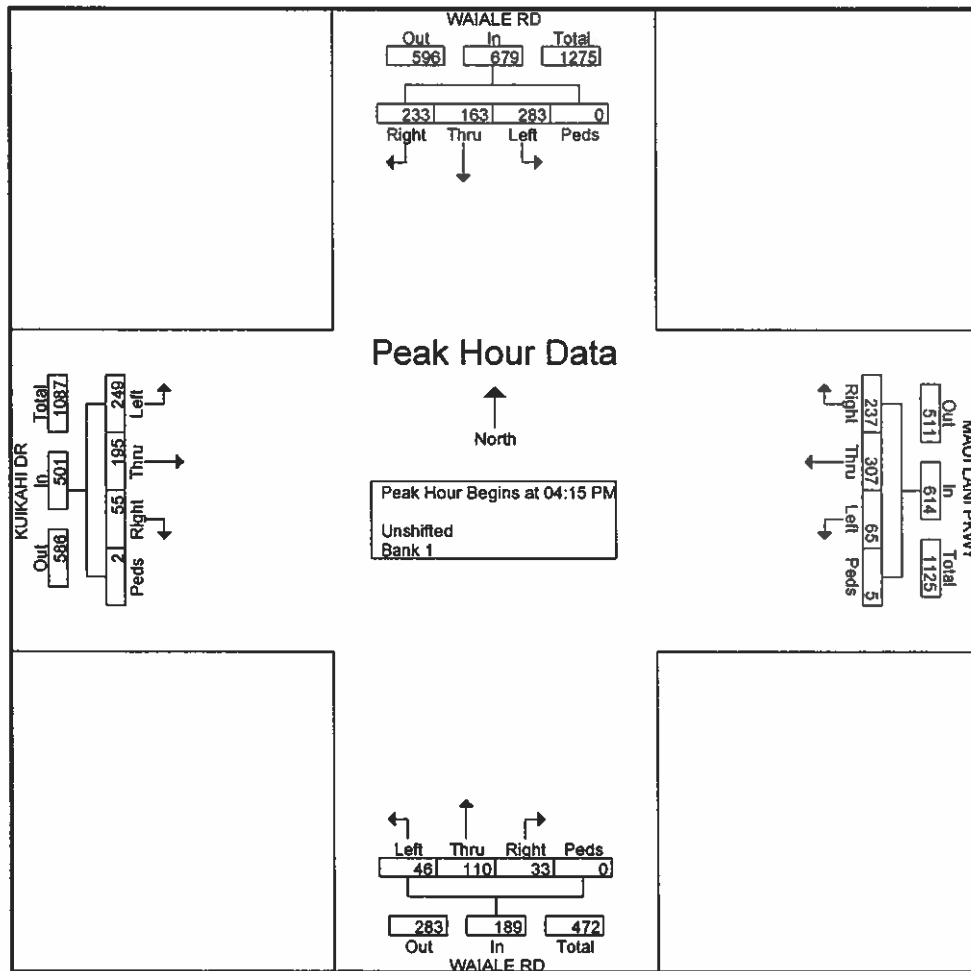
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Site Code : 00000000
Start Date : 3/15/2017
Page No : 2

	WAIALE RD Southbound					MAUI LANI PKWY Westbound					WAIALE RD Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	64	35	44	0	143	20	61	48	0	149	10	29	10	0	49	67	80	9	0	136	477
04:30 PM	73	48	87	0	188	15	78	71	4	168	10	30	6	0	46	72	44	13	0	129	627
04:45 PM	68	45	61	0	174	15	82	62	1	160	13	28	10	0	51	59	53	18	0	130	515
05:00 PM	78	37	61	0	176	15	68	56	0	139	13	23	7	0	43	51	38	15	2	106	464
Total Volume	283	163	233	0	679	65	307	237	5	614	46	110	33	0	189	249	195	55	2	501	1983
% App. Total	41.7	24	34.3	0		10.6	50	38.6	0.8		24.3	58.2	17.5	0		49.7	38.9	11	0.4		
PHF	.907	.888	.869	.000	.913	.813	.936	.835	.313	.925	.885	.917	.825	.000	.926	.865	.813	.764	.250	.921	.941



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File Name : AM_Kamehameha Ave – Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 1

Groups Printed- Unshifted

Start Time	MAUI LANI PKWY Eastbound				MAUI LANI PKWY Westbound				KAMEHAMEHA AVE Northbound				KAMEHAMEHA AVE Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	39	52	4	1	4	38	21	0	16	17	9	0	71	5	54	0	331
06:45 AM	49	39	11	8	12	53	25	0	19	20	11	0	53	21	51	0	372
Total	88	91	15	9	16	91	46	0	35	37	20	0	124	26	105	0	703
07:00 AM	35	30	33	4	15	34	23	0	42	38	18	1	58	44	50	0	425
07:15 AM	32	23	32	15	14	38	44	0	65	78	16	0	17	47	40	0	461
07:30 AM	41	29	28	4	16	27	29	0	38	72	22	0	31	67	32	0	436
07:45 AM	45	34	8	2	5	48	31	0	31	53	15	4	63	21	81	0	441
Total	153	116	101	25	50	147	127	0	176	241	71	5	169	179	203	0	1763
08:00 AM	43	37	4	0	3	52	22	0	14	17	8	0	47	11	45	0	303
08:15 AM	40	56	12	2	6	42	34	0	10	13	7	1	37	7	49	0	316
Grand Total	324	300	132	36	75	332	229	0	235	308	106	6	377	223	402	0	3085
Apprch %	40.9	37.9	16.7	4.5	11.8	52.2	36	0	35.9	47	16.2	0.9	37.6	22.3	40.1	0	
Total %	10.5	9.7	4.3	1.2	2.4	10.8	7.4	0	7.6	10	3.4	0.2	12.2	7.2	13	0	

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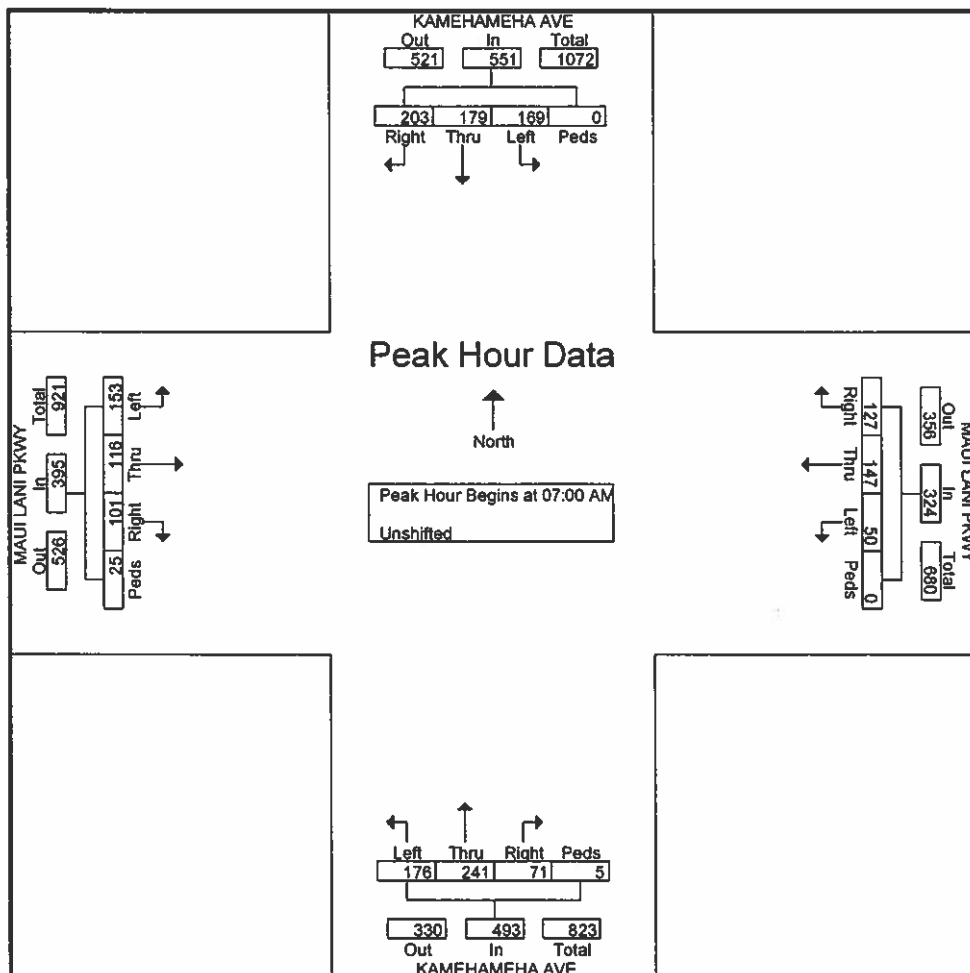
File Name : AM_Kamehameha Ave – Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 2

	MAUI LANI PKWY Eastbound					MAUI LANI PKWY Westbound					KAMEHAMEHA AVE Northbound					KAMEHAMEHA AVE Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	35	30	33	4	102	15	34	23	0	72	42	38	18	1	99	58	44	50	0	152	425
07:15 AM	32	23	32	15	102	14	38	44	0	96	65	78	16	0	159	17	47	40	0	104	461
07:30 AM	41	29	28	4	102	16	27	29	0	72	38	72	22	0	132	31	67	32	0	130	436
07:45 AM	45	34	8	2	89	5	48	31	0	84	31	53	15	4	103	63	21	81	0	165	441
Total Volume	153	116	101	25	395	50	147	127	0	324	176	241	71	5	493	169	179	203	0	551	1763
% App. Total	38.7	29.4	25.6	6.3		15.4	45.4	39.2	0		35.7	48.9	14.4	1		30.7	32.5	36.8	0		
PHF	.850	.853	.765	.417	.968	.781	.766	.722	.000	.844	.677	.772	.807	.313	.775	.671	.668	.627	.000	.835	.956



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File Name : PM_Kamehameha Ave - Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 1

Groups Printed- Unshifted

Start Time	MAUI LANI PKWY Eastbound				MAUI LANI PKWY Westbound				KAMEHAMEHA AVE Northbound				KAMEHAMEHA AVE Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:30 PM	47	44	13	1	6	59	40	0	23	21	10	0	40	32	58	0	394
03:45 PM	46	43	14	1	12	47	45	0	24	26	8	0	34	35	71	0	406
Total	93	87	27	2	18	106	85	0	47	47	18	0	74	67	129	0	800
04:00 PM	44	43	21	3	12	46	48	0	18	35	9	0	33	32	67	0	411
04:15 PM	51	39	26	1	10	52	55	0	15	24	13	0	27	29	60	0	402
04:30 PM	52	46	15	0	14	40	50	0	17	26	8	0	30	24	71	0	393
04:45 PM	43	44	18	0	15	37	50	0	17	22	4	0	59	32	70	0	411
Total	190	172	80	4	51	175	203	0	67	107	34	0	149	117	268	0	1617
05:00 PM	60	42	16	0	7	48	53	0	13	27	2	0	37	27	54	0	386
05:15 PM	41	52	17	1	15	51	42	0	16	13	5	1	42	24	53	0	373
Grand Total	384	353	140	7	91	380	383	0	143	194	59	1	302	235	504	0	3176
Apprch %	43.4	39.9	15.8	0.8	10.7	44.5	44.8	0	36	48.9	14.9	0.3	29	22.6	48.4	0	
Total %	12.1	11.1	4.4	0.2	2.9	12	12.1	0	4.5	6.1	1.9	0	9.5	7.4	15.9	0	

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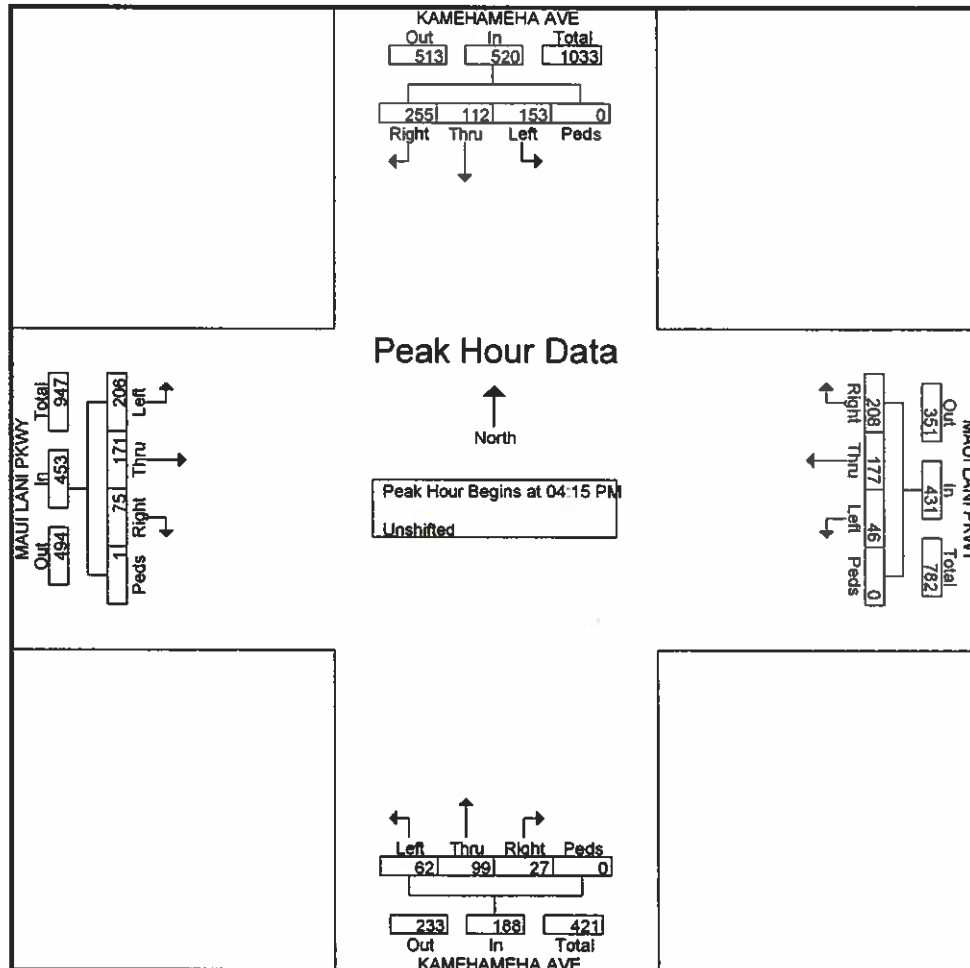
File Name : PM_Kamehameha Ave - Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 2

	MAUI LANI PKWY Eastbound					MAUI LANI PKWY Westbound					KAMEHAMEHA AVE Northbound					KAMEHAMEHA AVE Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	51	39	26	1	117	10	52	55	0	117	15	24	13	0	52	27	29	60	0	116	402
04:30 PM	52	46	15	0	113	14	40	50	0	104	17	26	8	0	51	30	24	71	0	125	393
04:45 PM	43	44	18	0	105	15	37	50	0	102	17	22	4	0	43	59	32	70	0	161	411
05:00 PM	60	42	16	0	118	7	48	53	0	108	13	27	2	0	42	37	27	54	0	118	386
Total Volume	206	171	75	1	453	46	177	208	0	431	62	99	27	0	188	153	112	255	0	520	1592
% App. Total	45.5	37.7	16.6	0.2		10.7	41.1	48.3	0		33	52.7	14.4	0		29.4	21.5	49	0		
PHF	.858	.929	.721	.250	.960	.767	.851	.945	.000	.921	.912	.917	.519	.000	.904	.648	.875	.898	.000	.807	.968



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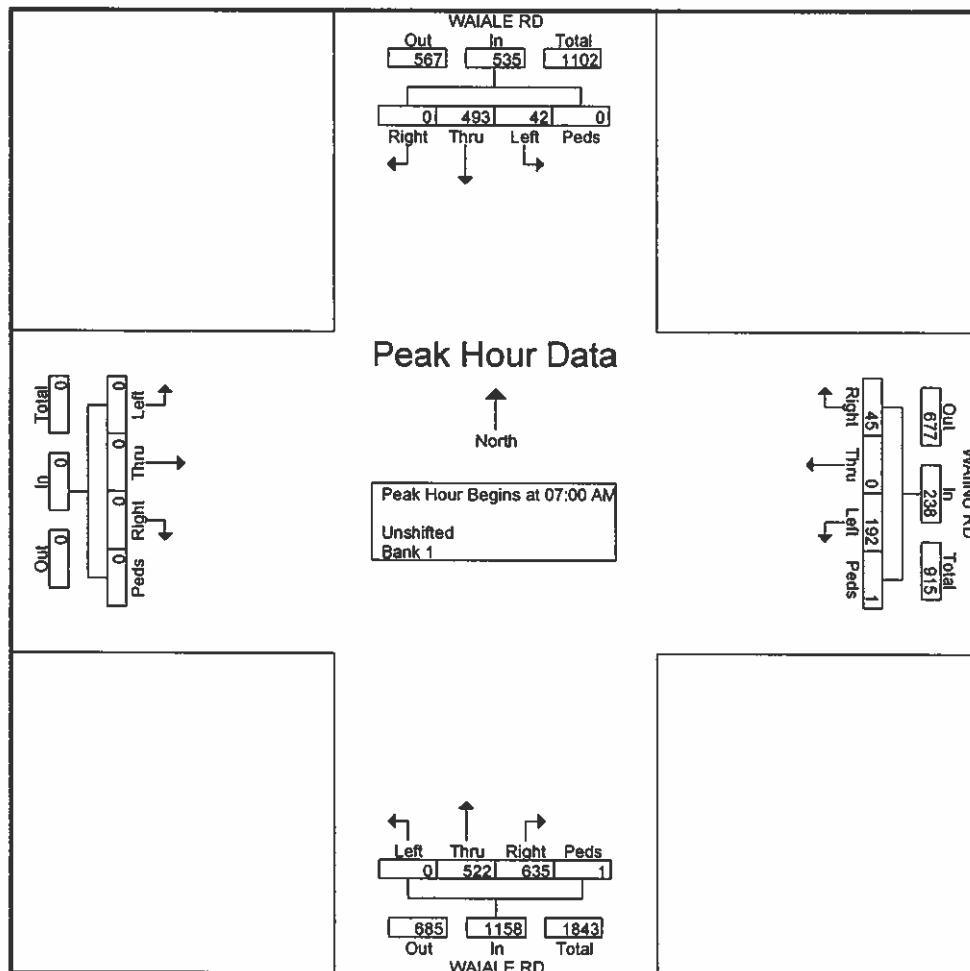
File Name : AM_Waiale Rd - Waiinu Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIINU RD Westbound					WAIALE RD Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	14	100	0	0	114	50	0	7	0	57	0	117	123	0	240	0	0	0	0	0	411
07:15 AM	6	140	0	0	146	41	0	12	0	53	0	120	166	0	286	0	0	0	0	0	485
07:30 AM	13	122	0	0	135	63	0	18	1	73	0	148	182	0	331	0	0	0	0	0	539
07:45 AM	9	131	0	0	140	48	0	7	0	55	0	136	164	1	301	0	0	0	0	0	496
Total Volume	42	493	0	0	535	192	0	45	1	238	0	522	635	1	1158	0	0	0	0	0	1931
% App. Total	7.9	92.1	0	0		80.7	0	18.9	0.4		0	45.1	54.8	0.1		0	0	0	0	0	
PHF	.750	.880	.000	.000	.916	.906	.000	.592	.250	.815	.000	.876	.872	.250	.875	.000	.000	.000	.000	.000	.896



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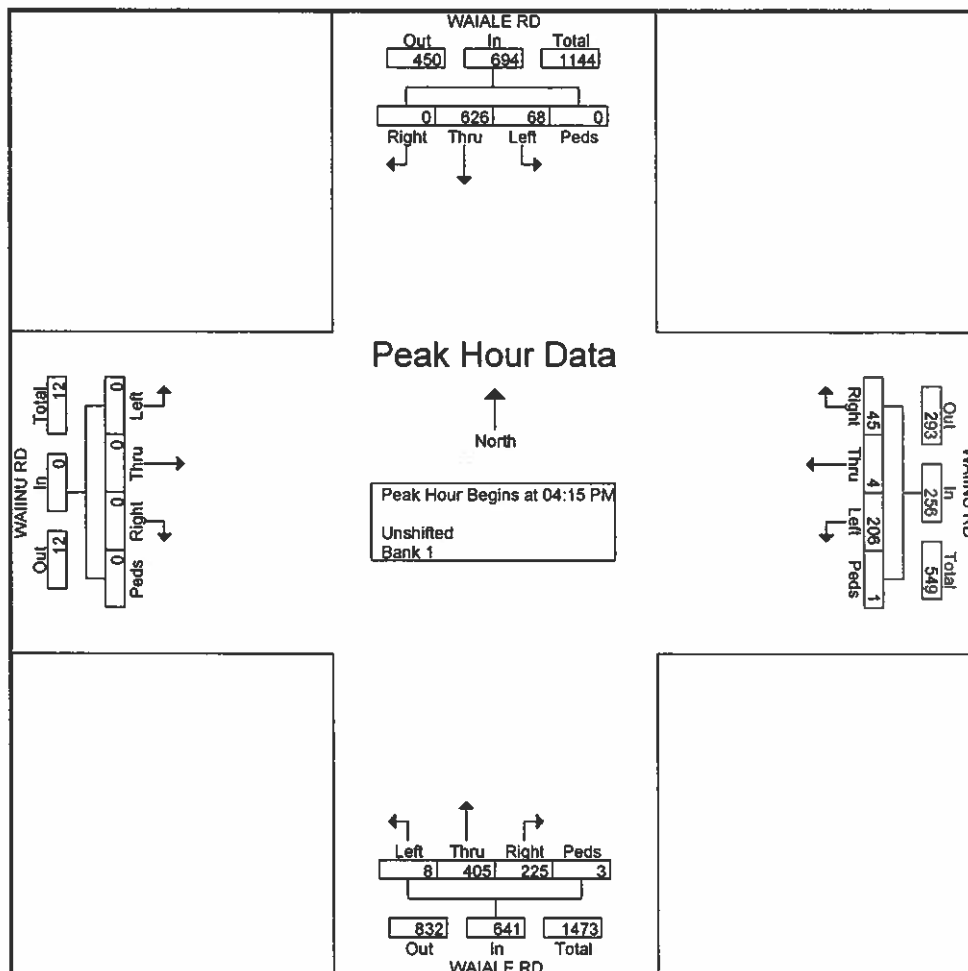
File Name : PM_Waiale Rd - Waiinu Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIINU RD Westbound					WAIALE RD Northbound					WAIINU RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	13	137	0	0	150	54	1	14	0	69	0	115	51	0	172	0	0	0	0	0	391
04:30 PM	24	182	0	0	206	42	0	9	0	51	1	99	52	0	152	0	0	0	0	0	409
04:45 PM	17	143	0	0	160	48	2	7	1	58	0	109	59	0	168	0	0	0	0	0	388
05:00 PM	14	184	0	0	178	62	1	15	0	78	1	82	63	3	149	0	0	0	0	0	405
Total Volume	68	626	0	0	694	206	4	45	1	256	8	405	225	3	641	0	0	0	0	0	1591
% App. Total	9.8	90.2	0	0		80.5	1.6	17.6	0.4		1.2	63.2	35.1	0.5		0	0	0	0	0	
PHF	.708	.860	.000	.000	.842	.831	.500	.750	.250	.821	.333	.880	.893	.250	.932	.000	.000	.000	.000	.000	.972



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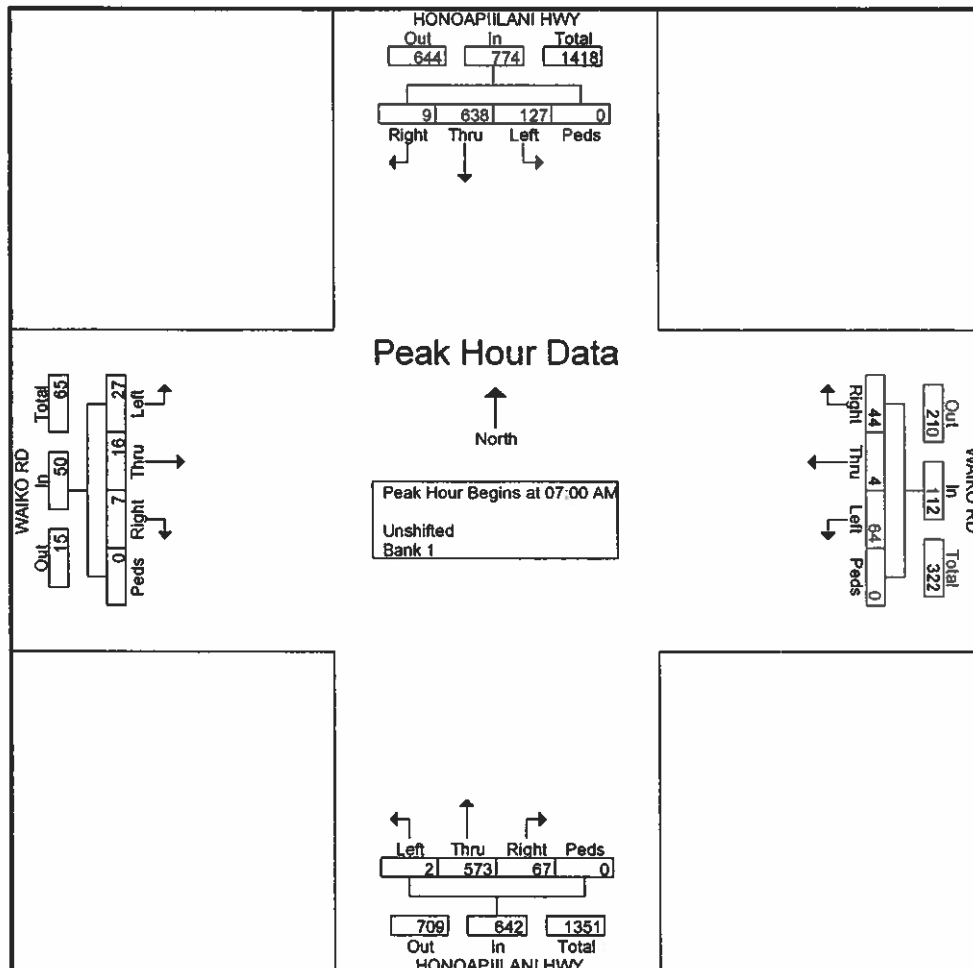
File Name : AM_Honoapiilani Hwy - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					WAIKO RD Westbound					HONOAPIILANI HWY Northbound					WAIKO RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	18	182	1	0	181	19	0	5	0	24	0	130	11	0	141	6	7	0	0	13	359
07:15 AM	32	182	2	0	196	16	1	17	0	34	2	182	15	0	179	10	4	1	0	15	424
07:30 AM	40	153	2	0	204	17	2	13	0	32	0	182	21	0	183	6	4	4	0	14	433
07:45 AM	28	181	4	0	193	12	1	9	0	22	0	119	20	0	139	5	1	2	0	8	362
Total Volume	127	638	9	0	774	64	4	44	0	112	2	573	67	0	642	27	18	7	0	50	1578
% App. Total	16.4	82.4	1.2	0		57.1	3.6	39.3	0		0.3	89.3	10.4	0		54	32	14	0		
PHF	.648	.985	.583	.000	.949	.842	.500	.647	.000	.824	.250	.884	.798	.000	.877	.875	.571	.438	.000	.833	.911



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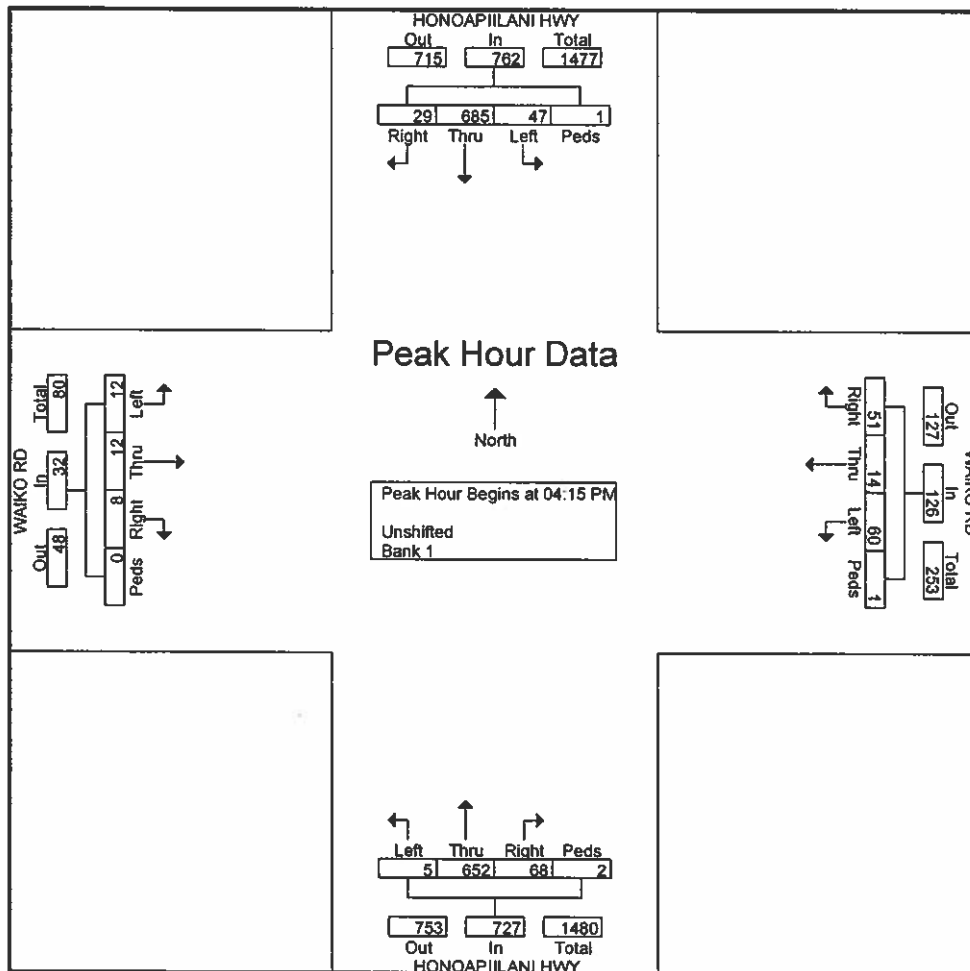
File Name : PM_Honoapiilani Hwy - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					WAIKO RD Westbound					HONOAPIILANI HWY Northbound					WAIKO RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	12	135	8	0	155	13	3	11	1	28	2	194	15	0	211	1	4	3	0	8	402
04:30 PM	9	198	8	1	215	7	4	14	0	25	0	182	17	0	179	3	3	4	0	10	429
04:45 PM	18	172	6	0	191	29	3	14	0	46	1	131	17	0	149	4	1	0	0	5	385
05:00 PM	13	182	6	0	201	17	4	12	0	33	2	165	18	2	188	4	4	1	0	9	431
Total Volume	47	685	29	1	762	60	14	51	1	126	5	652	68	2	727	12	12	8	0	32	1847
% App. Total	6.2	89.9	3.8	0.1		47.6	11.1	40.5	0.8		0.7	89.7	9.4	0.3		37.5	37.5	25	0		
PHF	.904	.874	.806	.250	.886	.652	.875	.911	.250	.788	.625	.840	.895	.250	.861	.750	.750	.500	.000	.800	.955



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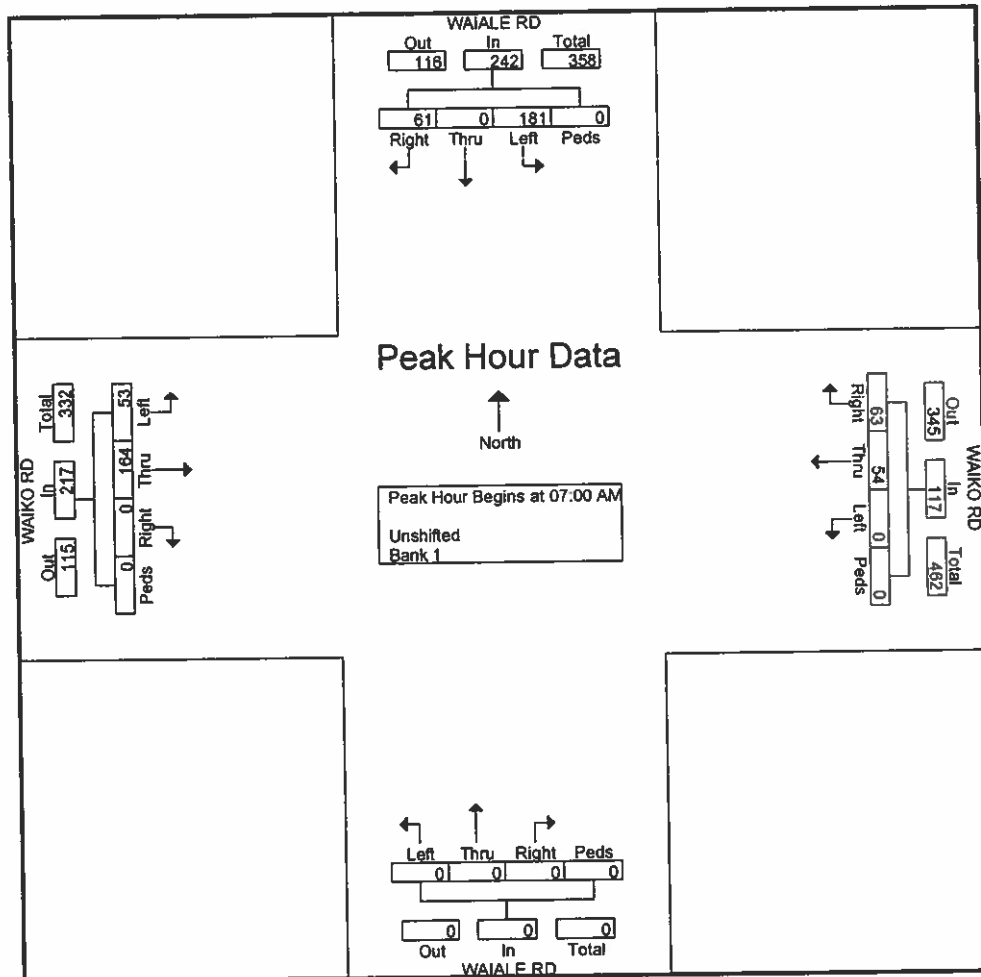
File Name : AM_Waiale Rd - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIKOLE RD Southbound					WAIKOLE RD Westbound					WAIKOLE RD Northbound					WAIKOLE RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	37	0	19	0	56	0	6	17	0	23	0	0	0	0	0	6	23	0	0	29	108
07:15 AM	58	0	13	0	71	0	17	15	0	32	0	0	0	0	0	15	43	0	0	58	181
07:30 AM	43	0	14	0	57	0	14	17	0	31	0	0	0	0	0	16	57	0	0	73	181
07:45 AM	43	0	15	0	58	0	17	14	0	31	0	0	0	0	0	16	41	0	0	57	146
Total Volume	181	0	61	0	242	0	54	63	0	117	0	0	0	0	0	53	184	0	0	217	576
% App. Total	74.8	0	25.2	0		0	46.2	53.8	0		0	0	0	0	0	24.4	75.6	0	0		
PHF	.780	.000	.803	.000	.852	.000	.794	.926	.000	.914	.000	.000	.000	.000	.000	.828	.719	.000	.000	.743	.894



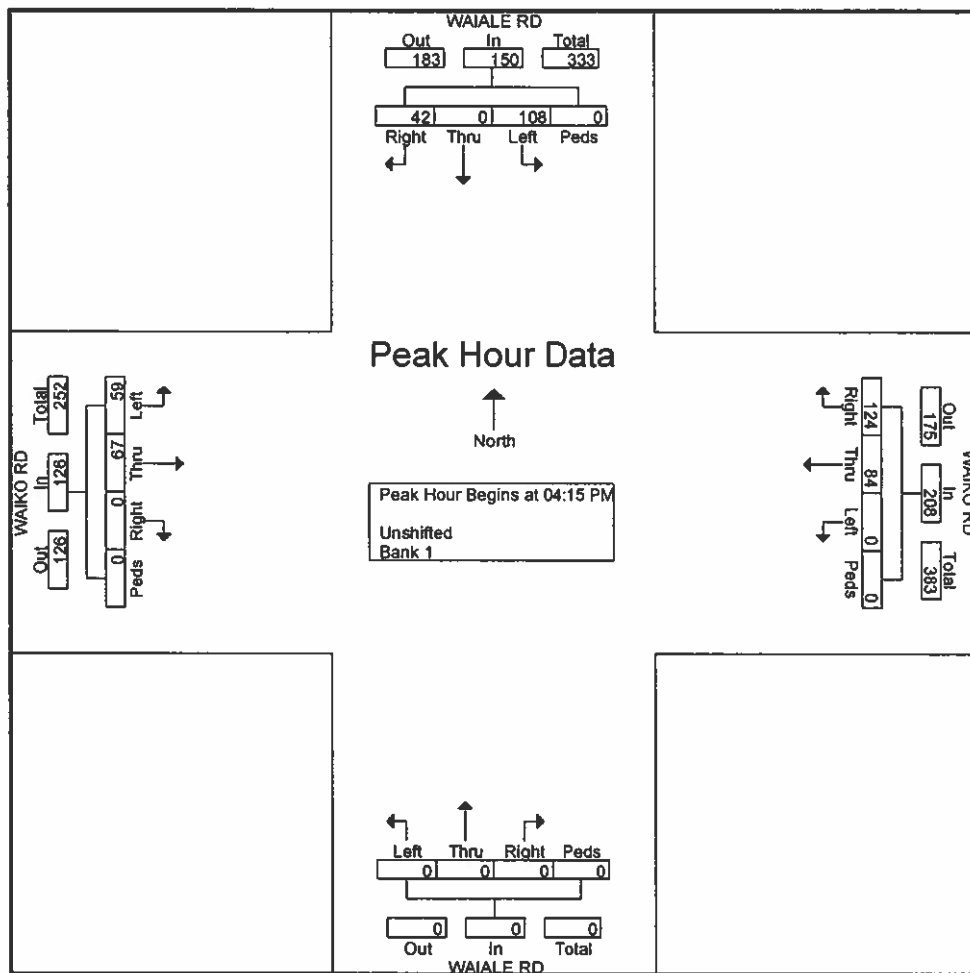
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File Name : PM_Waiale Rd - Waiko Rd
Site Code : 00000000
Start Date : 3/15/2017
Page No : 2

	WAIALE RD Southbound					WAIKO RD Westbound					WAIALE RD Northbound					WAIKO RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	26	0	13	0	39	0	21	34	0	55	0	0	0	0	0	21	16	0	0	37	131
04:30 PM	38	0	5	0	41	0	15	35	0	50	0	0	0	0	0	12	14	0	0	26	117
04:45 PM	25	0	13	0	38	0	28	30	0	58	0	0	0	0	0	11	18	0	0	29	126
05:00 PM	21	0	11	0	32	0	19	25	0	44	0	0	0	0	0	15	19	0	0	34	110
Total Volume	108	0	42	0	150	0	84	124	0	208	0	0	0	0	0	59	67	0	0	126	484
% App. Total	72	0	28	0		0	40.4	59.6	0		0	0	0	0	0	46.8	53.2	0	0		
PHF	.750	.000	.808	.000	.915	.000	.724	.886	.000	.881	.000	.000	.000	.000	.000	.702	.882	.000	.000	.851	.924



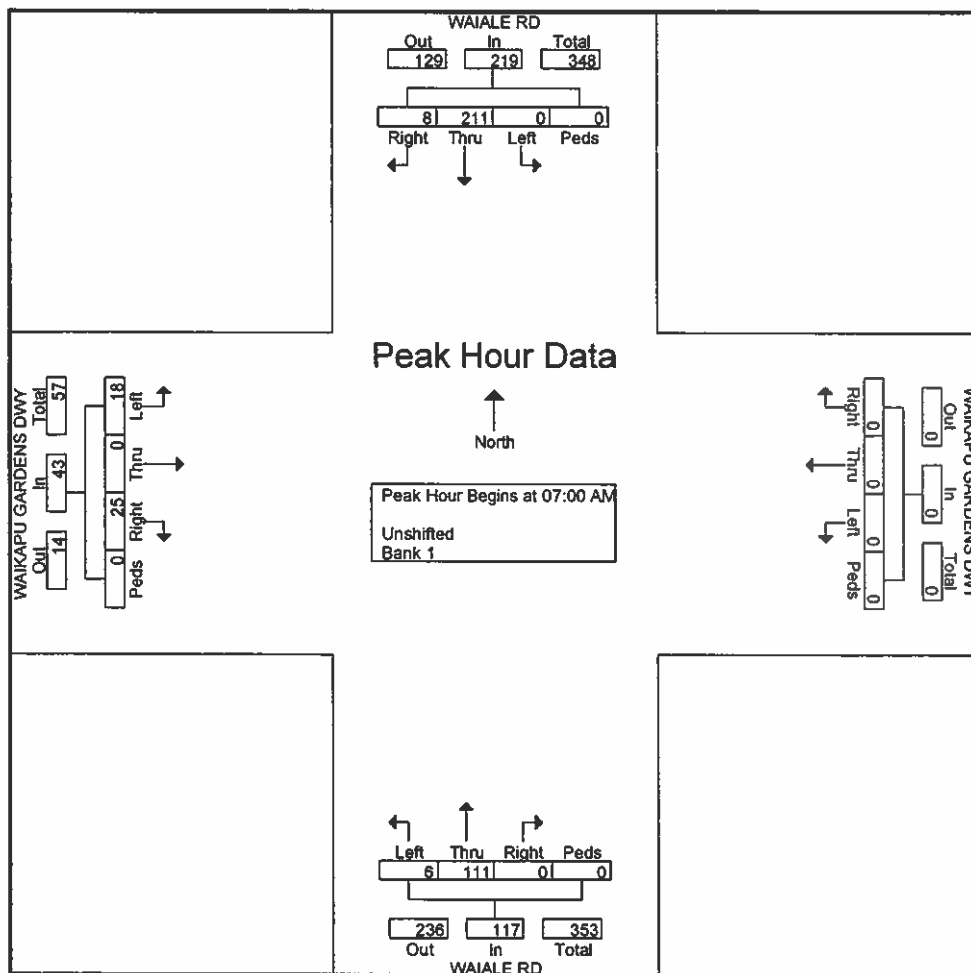
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File Name : AM_Waiale Rd - Waikapu Gardens Dwy
Site Code : 00000000
Start Date : 3/15/2017
Page No : 2

	WAIKAPU GARDENS DWY Southbound					WAIKAPU GARDENS DWY Westbound					WAIKAPU GARDENS DWY Northbound					WAIKAPU GARDENS DWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	46	2	0	48	0	0	0	0	0	0	24	0	0	24	4	0	10	0	14	88
07:15 AM	0	66	2	0	68	0	0	0	0	0	0	29	0	0	29	8	0	5	0	13	110
07:30 AM	0	50	2	0	52	0	0	0	0	0	2	31	0	0	33	3	0	3	0	6	91
07:45 AM	0	49	2	0	51	0	0	0	0	0	4	27	0	0	31	3	0	7	0	10	92
Total Volume	0	211	8	0	219	0	0	0	0	0	6	111	0	0	117	18	0	25	0	43	379
% App. Total	0	96.3	3.7	0		0	0	0	0	0	5.1	94.9	0	0		41.9	0	58.1	0		
PHF	.000	.799	1.00	.000	.805	.000	.000	.000	.000	.000	.375	.895	.000	.000	.886	.563	.000	.625	.000	.768	.861



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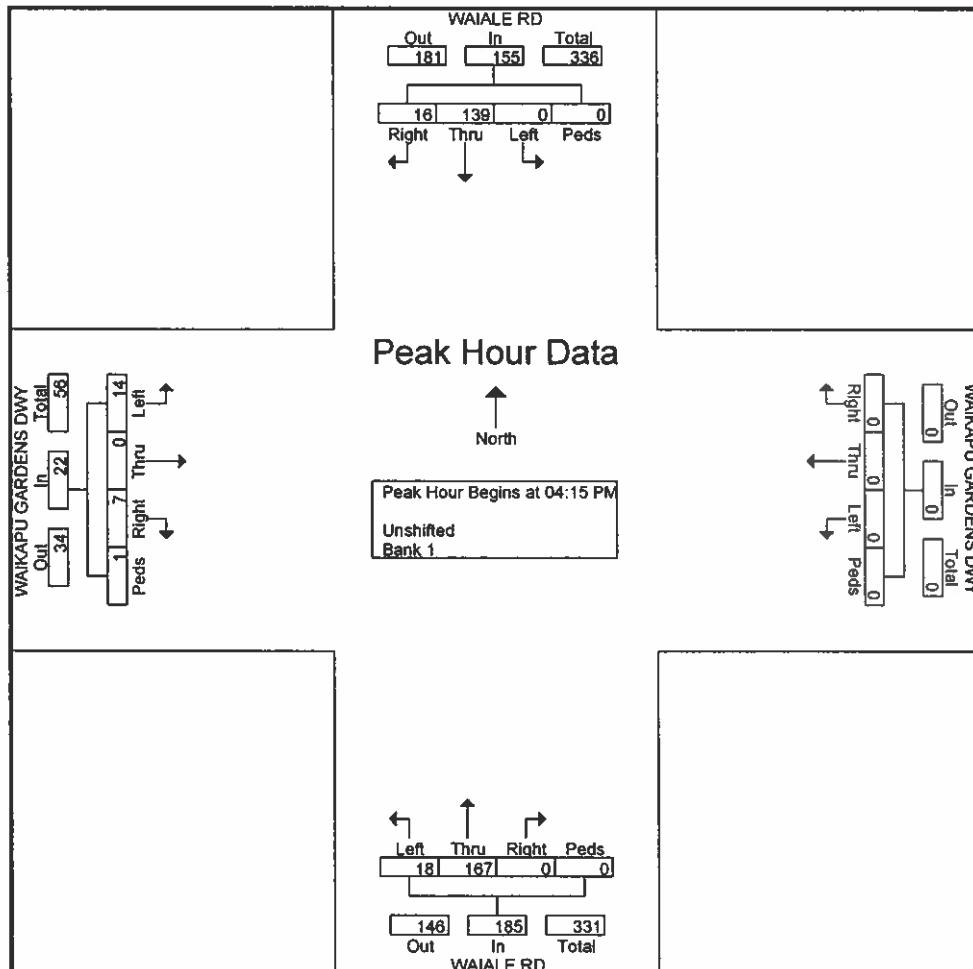
File Name : PM_Waiale Rd - Waikapu Gardens Dwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIKAPU GARDENS DWY Westbound					WAIALE RD Northbound					WAIKAPU GARDENS DWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	37	4	0	41	0	0	0	0	0	3	48	0	0	51	4	0	2	0	6	98
04:30 PM	0	38	5	0	43	0	0	0	0	0	7	48	0	0	55	3	0	2	1	6	104
04:45 PM	0	30	4	0	34	0	0	0	0	0	4	33	0	0	37	3	0	2	0	5	78
05:00 PM	0	34	3	0	37	0	0	0	0	0	4	38	0	0	42	4	0	1	0	5	84
Total Volume	0	139	16	0	155	0	0	0	0	0	18	167	0	0	185	14	0	7	1	22	382
% App. Total	0	89.7	10.3	0		0	0	0	0		9.7	90.3	0	0		63.6	0	31.8	4.5		
PHF	.000	.914	.800	.000	.901	.000	.000	.000	.000	.000	.843	.870	.000	.000	.841	.875	.000	.875	.250	.917	.870



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File Name : AM_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 1

Groups Printed- Unshifted

Start Time	NOKEKULA LP Eastbound				NOKEKULA LP Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	2	0	8	0	0	0	0	0	1	10	0	0	0	58	1	0	80
Total	2	0	8	0	0	0	0	0	1	10	0	0	0	58	1	0	80
07:00 AM	11	0	8	0	0	0	0	0	1	29	0	0	0	46	1	0	96
07:15 AM	6	0	2	0	0	0	0	0	1	25	0	0	0	48	0	0	82
07:30 AM	5	0	2	0	0	0	0	0	0	47	0	0	0	52	2	0	108
07:45 AM	2	0	7	0	0	0	0	0	1	21	0	0	0	48	5	0	84
Total	24	0	19	0	0	0	0	0	3	122	0	0	0	194	8	0	370
08:00 AM	3	0	1	0	0	0	0	0	1	19	0	0	0	25	3	0	52
08:15 AM	2	0	3	0	0	0	0	0	2	32	0	0	0	20	3	0	62
Grand Total	31	0	31	0	0	0	0	0	7	183	0	0	0	297	15	0	564
Approch %	50	0	50	0	0	0	0	0	3.7	96.3	0	0	0	95.2	4.8	0	
Total %	5.5	0	5.5	0	0	0	0	0	1.2	32.4	0	0	0	52.7	2.7	0	

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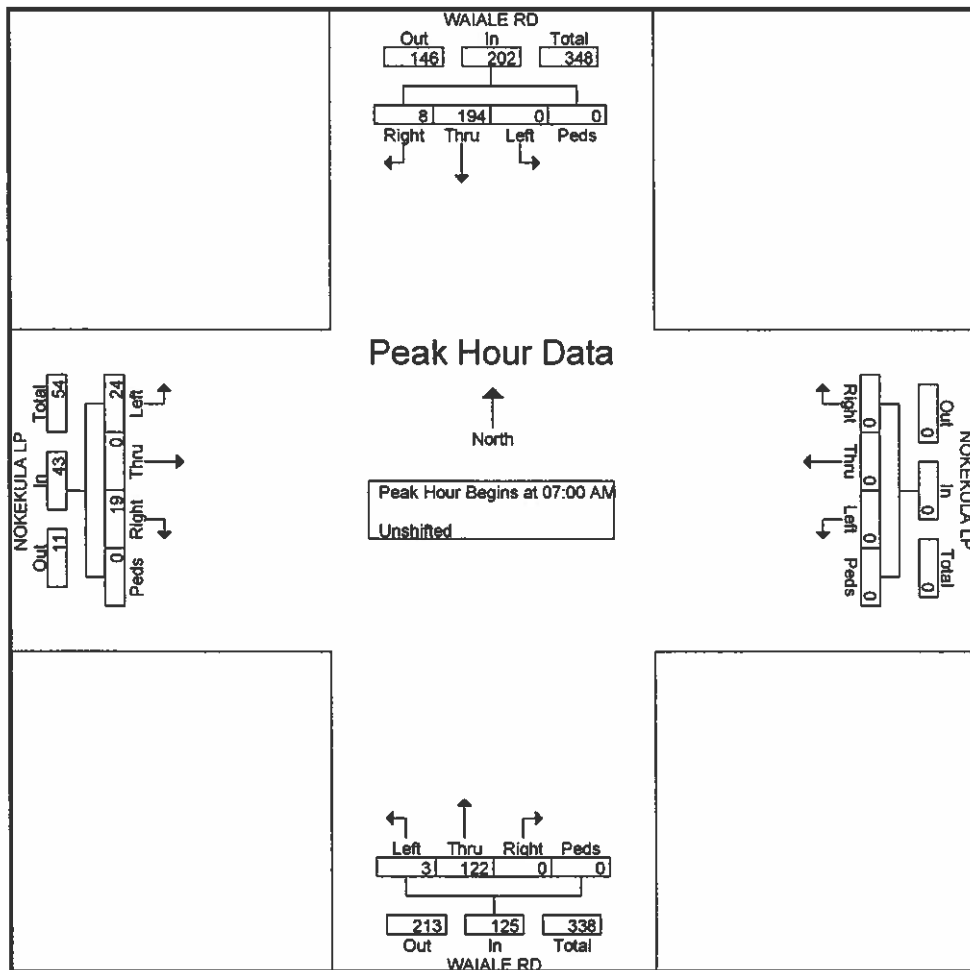
File Name : AM_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	NOKEKULA LP Eastbound					NOKEKULA LP Westbound					WAIALE RD Northbound					WAIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	11	0	8	0	19	0	0	0	0	0	1	29	0	0	30	0	46	1	0	47	96
07:15 AM	6	0	2	0	8	0	0	0	0	0	1	25	0	0	26	0	48	0	0	48	82
07:30 AM	5	0	2	0	7	0	0	0	0	0	0	47	0	0	47	0	52	2	0	54	108
07:45 AM	2	0	7	0	9	0	0	0	0	0	1	21	0	0	22	0	48	5	0	53	84
Total Volume	24	0	19	0	43	0	0	0	0	0	3	122	0	0	125	0	194	8	0	202	370
% App. Total	55.8	0	44.2	0		0	0	0	0	0	2.4	97.6	0	0		0	96	4	0		
PHF	.545	.000	.594	.000	.566	.000	.000	.000	.000	.000	.750	.649	.000	.000	.665	.000	.933	.400	.000	.935	.856



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Site Code : 00000000

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Groups Printed- Unshifted

Start Time	NOKEKULA LP Eastbound				NOKEKULA LP Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:30 PM	3	0	0	0	0	0	0	0	2	27	0	0	0	23	1	0	56
03:45 PM	0	0	1	0	0	0	0	0	4	49	0	0	0	27	2	0	83
Total	3	0	1	0	0	0	0	0	6	76	0	0	0	50	3	0	139
04:00 PM	0	0	4	0	0	0	0	0	2	34	0	0	0	29	5	0	74
04:15 PM	2	0	0	0	0	0	0	0	8	26	0	0	0	30	4	0	70
04:30 PM	2	0	4	0	0	0	0	0	7	34	0	0	0	37	4	0	88
04:45 PM	2	0	3	0	0	0	0	0	3	47	0	0	0	42	4	0	101
Total	6	0	11	0	0	0	0	0	20	141	0	0	0	138	17	0	333
05:00 PM	4	0	5	0	0	0	0	0	3	38	0	0	0	33	5	0	88
05:15 PM	3	0	2	0	0	0	0	0	2	38	0	0	0	34	2	0	81
Grand Total	16	0	19	0	0	0	0	0	31	293	0	0	0	255	27	0	641
Apprch %	45.7	0	54.3	0	0	0	0	0	9.6	90.4	0	0	0	90.4	9.6	0	
Total %	2.5	0	3	0	0	0	0	0	4.8	45.7	0	0	0	39.8	4.2	0	

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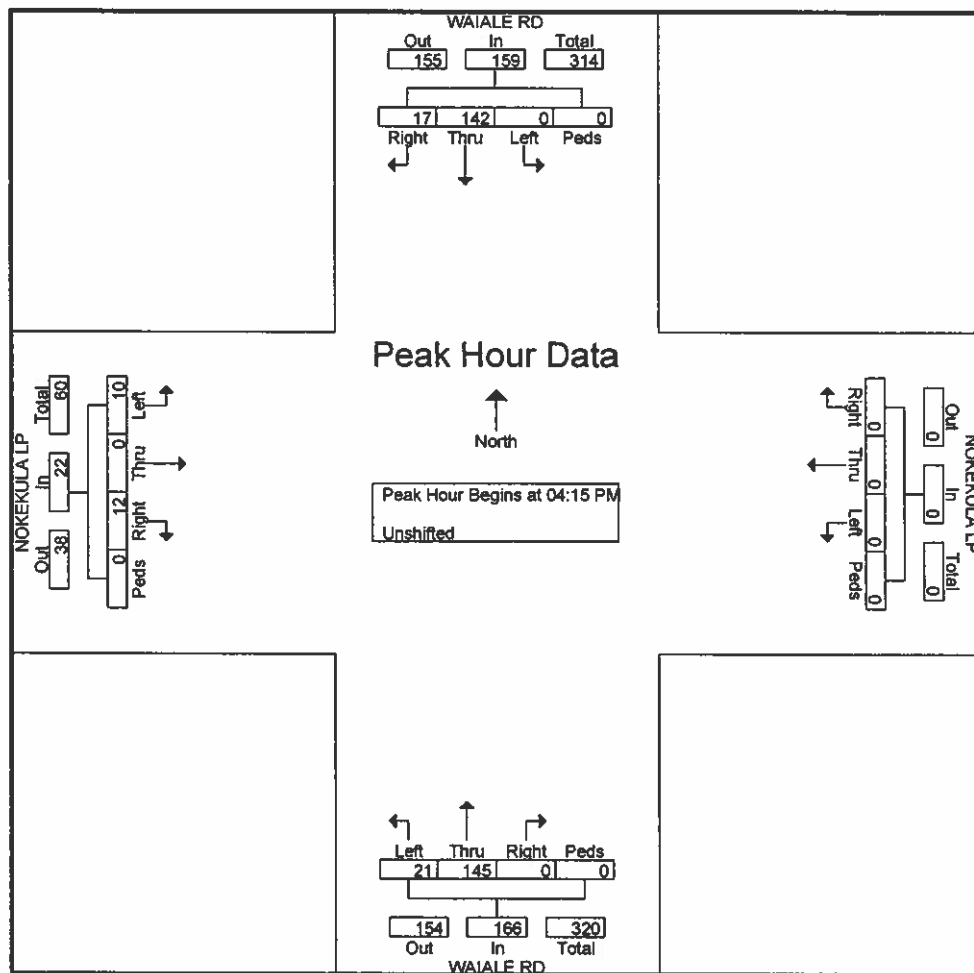
File Name : PM_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	NOKEKULA LP Eastbound					NOKEKULA LP Westbound					WAIKALE RD Northbound					WAIKALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	0	0	0	2	0	0	0	0	0	8	26	0	0	34	0	30	4	0	34	70
04:30 PM	2	0	4	0	6	0	0	0	0	0	7	34	0	0	41	0	37	4	0	41	88
04:45 PM	2	0	3	0	5	0	0	0	0	0	3	47	0	0	50	0	42	4	0	46	101
05:00 PM	4	0	5	0	9	0	0	0	0	0	3	38	0	0	41	0	33	5	0	38	88
Total Volume	10	0	12	0	22	0	0	0	0	0	21	145	0	0	166	0	142	17	0	159	347
% App. Total	45.5	0	54.5	0		0	0	0	0	0	12.7	87.3	0	0		0	89.3	10.7	0		
PHF	.625	.000	.600	.000	.611	.000	.000	.000	.000	.000	.656	.771	.000	.000	.830	.000	.845	.850	.000	.864	.859



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Site Code : 00000000

Start Date : 10/22/2015

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Groups Printed- Unshifted

Start Time	HAAWI ST Eastbound				HAAWI ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	21	0	19	0	0	0	0	0	3	9	0	0	0	40	3	0	95
Total	21	0	19	0	0	0	0	0	3	9	0	0	0	40	3	0	95
07:00 AM	22	0	21	0	0	0	0	0	2	38	0	0	0	26	6	0	115
07:15 AM	30	0	20	0	0	0	0	0	2	29	0	0	0	28	10	0	119
07:30 AM	15	0	21	0	0	0	0	0	4	48	0	0	0	33	8	0	129
07:45 AM	7	0	15	0	0	0	0	0	3	20	0	0	0	38	11	0	94
Total	74	0	77	0	0	0	0	0	11	135	0	0	0	125	35	0	457
08:00 AM	5	0	3	0	0	0	0	0	1	21	0	0	0	25	11	0	66
08:15 AM	8	0	9	0	0	0	0	0	7	27	0	0	0	14	6	0	71
Grand Total	108	0	108	0	0	0	0	0	22	192	0	0	0	204	55	0	689
Apprch %	50	0	50	0	0	0	0	0	10.3	89.7	0	0	0	78.8	21.2	0	
Total %	15.7	0	15.7	0	0	0	0	0	3.2	27.9	0	0	0	29.6	8	0	

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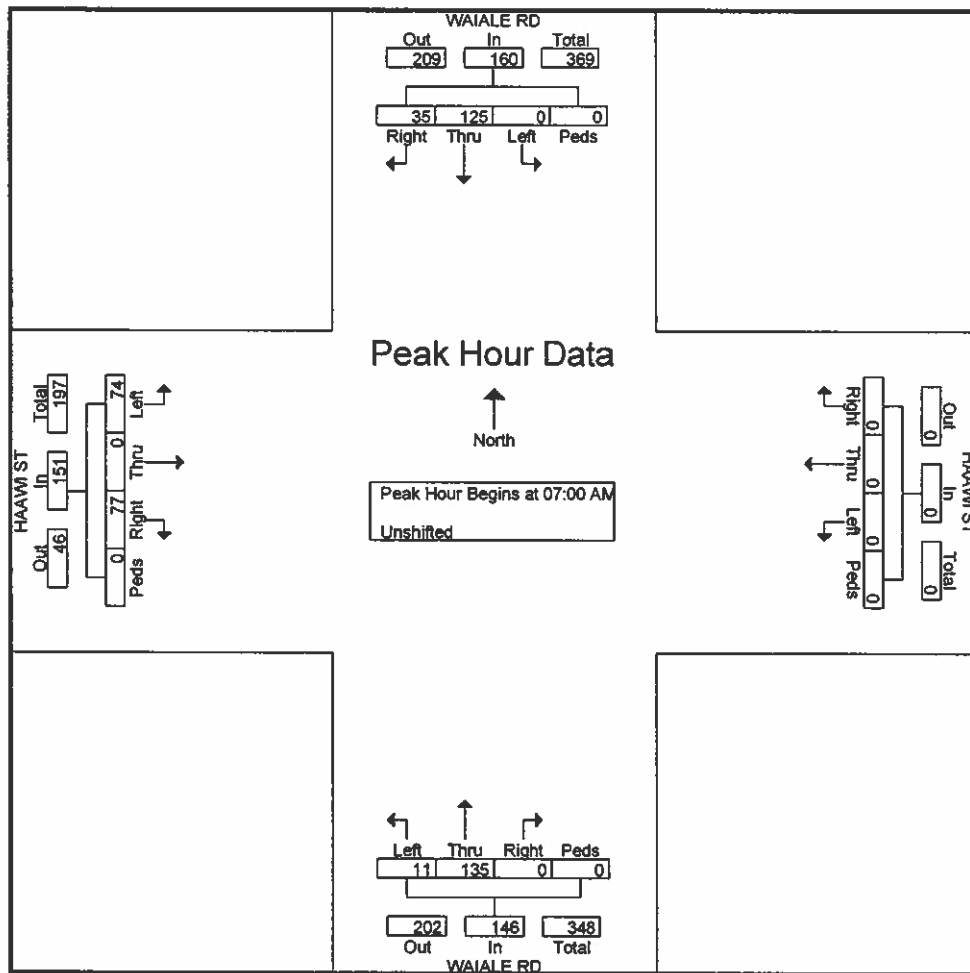
File Name : AM_Waiale Rd - Haawi St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	HAAWI ST Eastbound					HAAWI ST Westbound					WAIKALE RD Northbound					WAIKALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	22	0	21	0	43	0	0	0	0	0	2	38	0	0	40	0	26	6	0	32	115
07:15 AM	30	0	20	0	50	0	0	0	0	0	2	29	0	0	31	0	28	10	0	38	119
07:30 AM	15	0	21	0	36	0	0	0	0	0	4	48	0	0	52	0	33	8	0	41	129
07:45 AM	7	0	15	0	22	0	0	0	0	0	3	20	0	0	23	0	38	11	0	49	94
Total Volume	74	0	77	0	151	0	0	0	0	0	11	135	0	0	146	0	125	35	0	160	457
% App. Total	49	0	51	0		0	0	0	0	0	7.5	92.5	0	0		0	78.1	21.9	0		
PHF	.617	.000	.917	.000	.755	.000	.000	.000	.000	.000	.688	.703	.000	.000	.702	.000	.822	.795	.000	.816	.886



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Page No : 1

Groups Printed- Unshifted

	HAAWI ST Eastbound				HAAWI ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	12	0	10	0	0	0	0	0	7	23	0	0	0	14	16	0	82
03:45 PM	10	0	3	0	0	0	0	0	9	40	0	0	0	26	10	0	98
Total	22	0	13	0	0	0	0	0	16	63	0	0	0	40	26	0	180
04:00 PM	14	0	3	0	0	0	0	0	15	19	0	0	0	31	13	0	95
04:15 PM	12	0	5	0	0	0	0	0	1	27	0	0	0	29	16	0	90
04:30 PM	14	0	12	0	0	0	0	0	16	20	0	0	0	29	18	0	109
04:45 PM	14	0	15	0	0	0	0	0	11	38	0	0	0	31	20	0	129
Total	54	0	35	0	0	0	0	0	43	104	0	0	0	120	67	0	423
05:00 PM	10	0	7	0	0	0	0	0	10	32	0	0	0	31	22	0	112
05:15 PM	7	0	4	0	0	0	0	0	17	24	0	0	0	32	15	0	99
Grand Total	93	0	59	0	0	0	0	0	86	223	0	0	0	223	130	0	814
Apprch %	61.2	0	38.8	0	0	0	0	0	27.8	72.2	0	0	0	63.2	36.8	0	
Total %	11.4	0	7.2	0	0	0	0	0	10.6	27.4	0	0	0	27.4	16	0	

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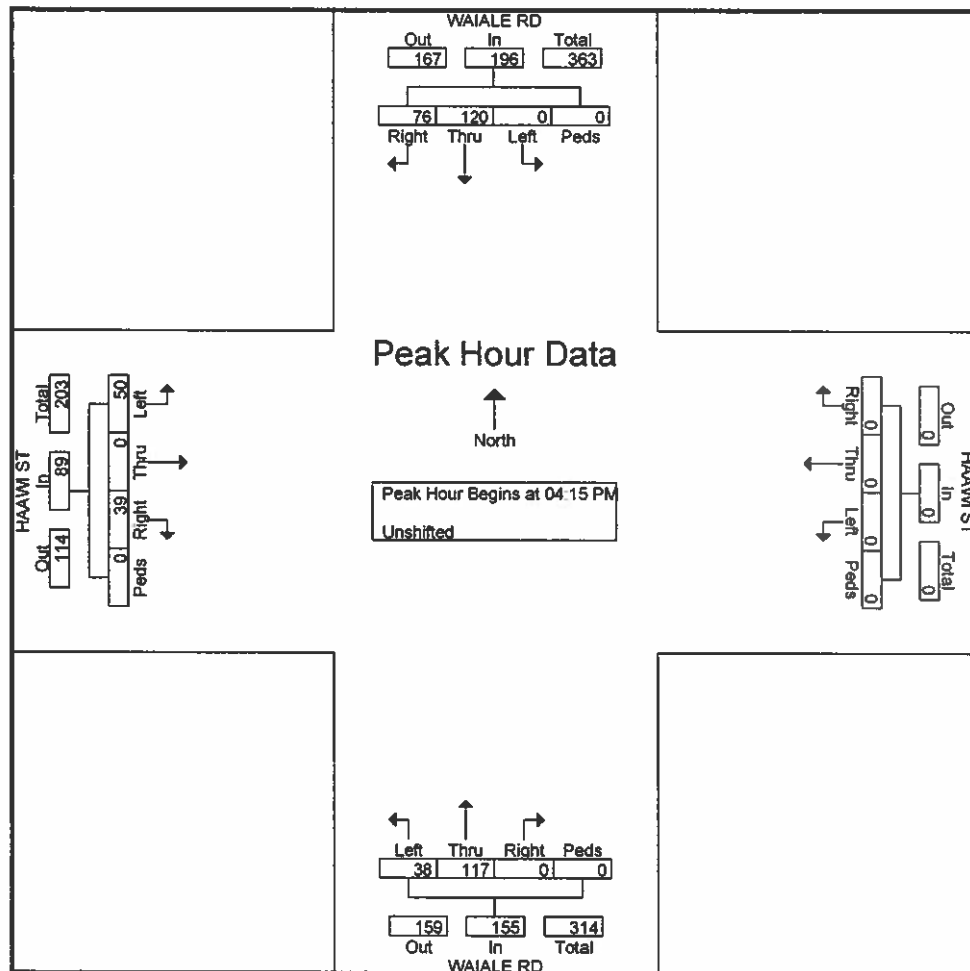
File Name : PM_Waiale Rd - Haawi St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	HAAWI ST Eastbound					HAAWI ST Westbound					WAIKALE RD Northbound					WAIKALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	12	0	5	0	17	0	0	0	0	0	1	27	0	0	28	0	29	16	0	45	90
04:30 PM	14	0	12	0	26	0	0	0	0	0	16	20	0	0	36	0	29	18	0	47	109
04:45 PM	14	0	15	0	29	0	0	0	0	0	11	38	0	0	49	0	31	20	0	51	129
05:00 PM	10	0	7	0	17	0	0	0	0	0	10	32	0	0	42	0	31	22	0	53	112
Total Volume	50	0	39	0	89	0	0	0	0	0	38	117	0	0	155	0	120	76	0	196	440
% App. Total	56.2	0	43.8	0		0	0	0	0	0	24.5	75.5	0	0		0	61.2	38.8	0		
PHF	.893	.000	.650	.000	.767	.000	.000	.000	.000	.000	.594	.770	.000	.000	.791	.000	.968	.864	.000	.925	.853



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Site Code : 00000000

Start Date : 10/22/2015

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Groups Printed- Unshifted

Start Time	KOKOLOLIO ST Eastbound				KOKOLOLIO ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	23	0	6	0	0	0	0	0	1	29	0	0	0	37	4	0	100
Total	23	0	6	0	0	0	0	0	1	29	0	0	0	37	4	0	100
07:00 AM	20	0	6	0	0	0	0	0	1	59	0	0	0	26	6	0	118
07:15 AM	36	0	7	0	0	0	0	0	1	58	0	0	0	31	9	0	142
07:30 AM	29	0	5	0	0	0	0	0	2	61	0	0	0	36	6	0	139
07:45 AM	12	0	3	0	0	0	0	0	1	26	0	0	0	46	12	0	100
Total	97	0	21	0	0	0	0	0	5	204	0	0	0	139	33	0	499
08:00 AM	10	0	1	0	0	0	0	0	0	26	0	0	0	35	8	0	80
08:15 AM	9	0	1	0	0	0	0	0	2	33	0	0	0	19	7	0	71
Grand Total	139	0	29	0	0	0	0	0	8	292	0	0	0	230	52	0	750
Apprch %	82.7	0	17.3	0	0	0	0	0	2.7	97.3	0	0	0	81.6	18.4	0	
Total %	18.5	0	3.9	0	0	0	0	0	1.1	38.9	0	0	0	30.7	6.9	0	

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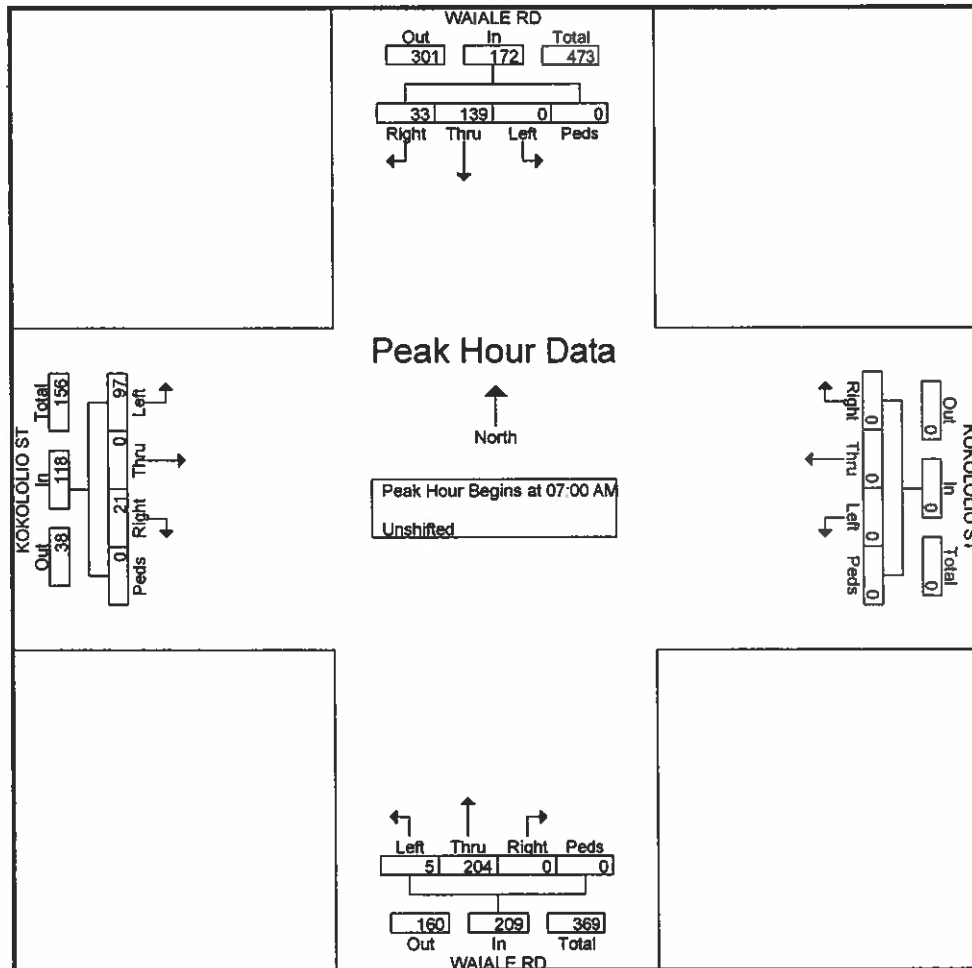
File Name : AM_Waiale Rd - Kokololio St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	KOKOLOLIO ST Eastbound					KOKOLOLIO ST Westbound					WAIALE RD Northbound					WAIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	20	0	6	0	26	0	0	0	0	0	1	59	0	0	60	0	26	6	0	32	118
07:15 AM	36	0	7	0	43	0	0	0	0	0	1	58	0	0	59	0	31	9	0	40	142
07:30 AM	29	0	5	0	34	0	0	0	0	0	2	61	0	0	63	0	36	6	0	42	139
07:45 AM	12	0	3	0	15	0	0	0	0	0	1	26	0	0	27	0	46	12	0	58	100
Total Volume	97	0	21	0	118	0	0	0	0	0	5	204	0	0	209	0	139	33	0	172	499
% App. Total	82.2	0	17.8	0		0	0	0	0	0	2.4	97.6	0	0		0	80.8	19.2	0		
PHF	.674	.000	.750	.000	.686	.000	.000	.000	.000	.000	.625	.836	.000	.000	.829	.000	.755	.688	.000	.741	.879



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Groups Printed- Unshifted

Start Time	KOKOLOLIO ST Eastbound				KOKOLOLIO ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:30 PM	7	0	1	0	0	0	0	0	4	31	0	0	0	29	15	0	87
03:45 PM	17	0	4	0	0	0	0	0	4	46	0	0	0	32	15	0	118
Total	24	0	5	0	0	0	0	0	8	77	0	0	0	61	30	0	205
04:00 PM	17	0	6	0	0	0	0	0	4	29	0	0	0	38	13	0	107
04:15 PM	13	0	1	0	0	0	0	0	3	36	0	0	0	44	13	0	110
04:30 PM	17	0	2	0	0	0	0	0	3	31	0	0	0	45	22	0	120
04:45 PM	14	0	2	0	0	0	0	0	5	47	0	0	0	49	21	0	138
Total	61	0	11	0	0	0	0	0	15	143	0	0	0	176	69	0	475
05:00 PM	13	0	1	0	0	0	0	0	4	38	0	0	0	52	17	0	125
05:15 PM	12	0	6	0	0	0	0	0	9	22	0	0	0	41	16	0	106
Grand Total	110	0	23	0	0	0	0	0	36	280	0	0	0	330	132	0	911
Apprch %	82.7	0	17.3	0	0	0	0	0	11.4	88.6	0	0	0	71.4	28.6	0	
Total %	12.1	0	2.5	0	0	0	0	0	4	30.7	0	0	0	36.2	14.5	0	

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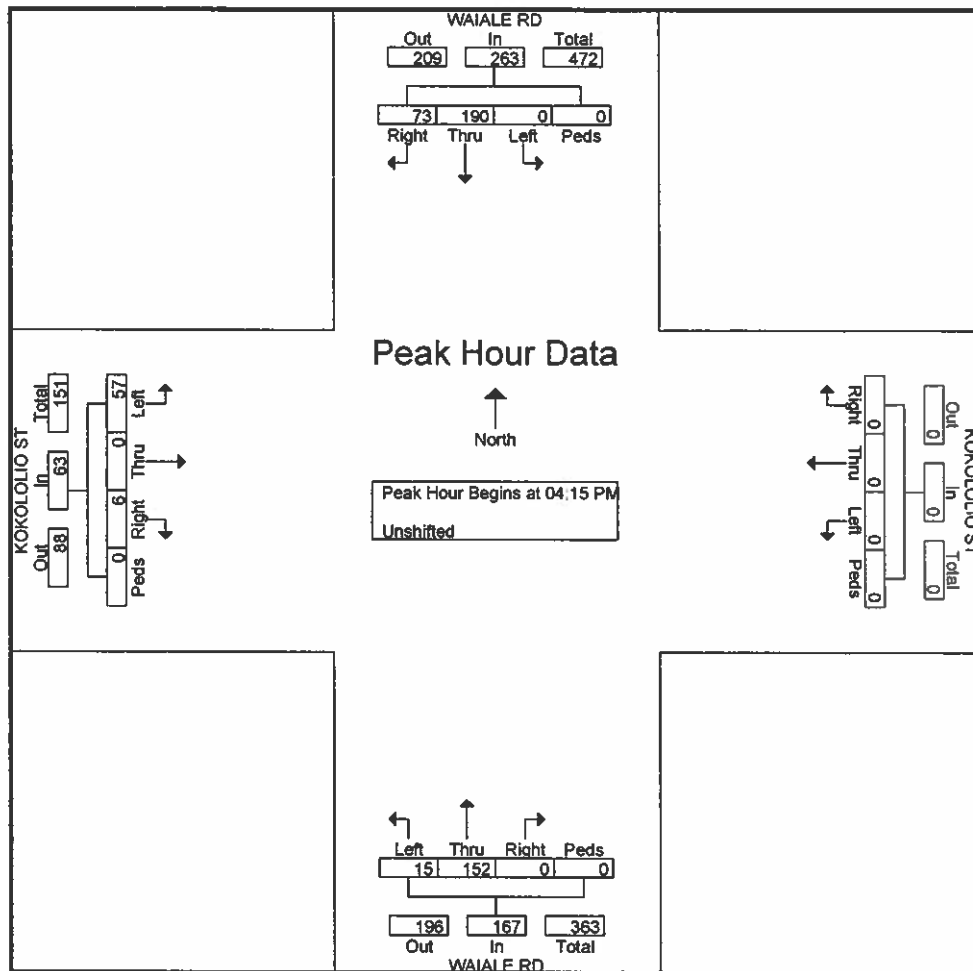
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Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	KOKOLOLIO ST Eastbound					KOKOLOLIO ST Westbound					WIALE RD Northbound					WIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	13	0	1	0	14	0	0	0	0	0	3	36	0	0	39	0	44	13	0	57	110
04:30 PM	17	0	2	0	19	0	0	0	0	0	3	31	0	0	34	0	45	22	0	67	120
04:45 PM	14	0	2	0	16	0	0	0	0	0	5	47	0	0	52	0	49	21	0	70	138
05:00 PM	13	0	1	0	14	0	0	0	0	0	4	38	0	0	42	0	52	17	0	69	125
Total Volume	57	0	6	0	63	0	0	0	0	0	15	152	0	0	167	0	190	73	0	263	493
% App. Total	90.5	0	9.5	0		0	0	0	0	0	9	91	0	0		0	72.2	27.8	0		
PHF	.838	.000	.750	.000	.829	.000	.000	.000	.000	.000	.750	.809	.000	.000	.803	.000	.913	.830	.000	.939	.893





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CIVIL ENGINEERS • SURVEYORS

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



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APPENDIX C

























LEVEL OF SERVICE CALCULATIONS

- Existing Conditions AM
-

HCM 2010 Signalized Intersection Summary

1: Honoapiilani Hwy & Kehalani Pkwy

























04/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	196	333	28	172	110	215	460	10	40	334	99
Future Volume (veh/h)	283	196	333	28	172	110	215	460	10	40	334	99
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	1545	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	404	213	165	30	187	32	234	500	0	43	363	0
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.70	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, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	525	446	296	254	216	439	735	625	305	603	513
Arrive On Green	0.17	0.28	0.28	0.03	0.14	0.14	0.11	0.39	0.00	0.04	0.32	0.00
Sat Flow, veh/h	1472	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	404	213	165	30	187	32	234	500	0	43	363	0
Grp Sat Flow(s), veh/h/ln	1472	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	15.0	8.0	7.2	1.2	8.3	1.5	7.1	19.0	0.0	1.4	14.0	0.0
Cycle Q Clear(g_c), s	15.0	8.0	7.2	1.2	8.3	1.5	7.1	19.0	0.0	1.4	14.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	381	525	446	296	254	216	439	735	625	305	603	513
V/C Ratio(X)	1.06	0.41	0.37	0.10	0.74	0.15	0.53	0.68	0.00	0.14	0.60	0.00
Avail Cap(c_a), veh/h	381	525	446	553	521	443	660	1064	904	652	1064	904
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	25.0	24.7	30.3	35.5	32.6	16.6	21.5	0.0	19.0	24.4	0.0
Incr Delay (d2), s/veh	62.9	0.2	0.2	0.1	1.6	0.1	0.4	2.4	0.0	0.1	2.1	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	9.5	4.1	3.2	0.6	4.4	0.7	3.5	10.2	0.0	0.7	7.5	0.0
LnGrp Delay(d),s/veh	91.3	25.2	24.9	30.4	37.1	32.8	17.0	23.8	0.0	19.0	26.4	0.0
LnGrp LOS	F	C	C	C	D	C	B	C		B	C	
Approach Vol, veh/h		782			249			734			406	
Approach Delay, s/veh		59.3			35.7			21.7			25.6	
Approach LOS		E			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	39.9	7.6	30.2	14.3	33.8	20.0	17.7				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+1), s	3.4	21.0	3.2	10.0	9.1	16.0	17.0	10.3				
Green Ext Time (p_c), s	0.0	10.9	0.0	1.7	0.2	11.7	0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			37.6									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

2: Honoapiilani Highway & Kuikahi Drive

04/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	127	63	263	57	221	14	435	331	270	457	7
Future Volume (veh/h)	51	127	63	263	57	221	14	435	331	270	457	7
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	1909	1909	1909	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	55	138	22	286	62	82	15	473	0	293	497	4
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	187	176	420	423	556	359	664	826	438	875	802
Arrive On Green	0.04	0.10	0.10	0.17	0.23	0.23	0.01	0.36	0.00	0.12	0.47	0.47
Sat Flow, veh/h	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	55	138	22	286	62	82	15	473	0	293	497	4
Grp Sat Flow(s),veh/h/ln	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.1	5.5	1.0	10.7	2.1	2.8	0.4	17.1	0.0	7.6	15.1	0.1
Cycle Q Clear(g_c), s	2.1	5.5	1.0	10.7	2.1	2.8	0.4	17.1	0.0	7.6	15.1	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	187	176	420	423	556	359	664	826	438	875	802
V/C Ratio(X)	0.19	0.74	0.12	0.68	0.15	0.15	0.04	0.71	0.00	0.67	0.57	0.00
Avail Cap(c_a), veh/h	319	220	204	490	501	622	477	811	952	468	930	849
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	34.2	31.5	24.0	24.1	17.3	16.0	21.7	0.0	14.9	15.0	9.5
Incr Delay (d2), s/veh	0.3	8.0	0.1	3.1	0.1	0.0	0.0	3.6	0.0	2.5	1.3	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	1.1	3.3	0.4	5.5	1.1	1.2	0.2	9.5	0.0	4.0	8.1	0.0
LnGrp Delay(d),s/veh	30.5	42.2	31.6	27.1	24.2	17.4	16.0	25.3	0.0	17.4	16.3	9.5
LnGrp LOS	C	D	C	C	C	B	B	C		B	B	A
Approach Vol, veh/h		215			430			488			794	
Approach Delay, s/veh		38.1			24.8			25.0			16.7	
Approach LOS		D			C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	3.7	33.8	16.9	13.6	4.8	42.7	6.9	23.7				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	34.0	16.0	9.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+I), s	19.1	12.7	7.5	2.4	17.1	4.1	4.8					
Green Ext Time (p_c), s	0.1	8.7	0.3	0.2	0.0	11.3	0.0	0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			23.0									
HCM 2010 LOS			C									

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↖	↗
Traffic Vol, veh/h	64	632	463	58	29	89
Future Vol, veh/h	64	632	463	58	29	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	145	-	-	-	0	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	70	687	503	63	32	97
























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	566	0	1361
Stage 1	-	-	535
Stage 2	-	-	826
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
Pot Cap-1 Maneuver	1006	-	163
Stage 1	-	-	587
Stage 2	-	-	430
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1006	-	152
Mov Cap-2 Maneuver	-	-	152
Stage 1	-	-	587
Stage 2	-	-	400

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1006	-	-	-	152	545
HCM Lane V/C Ratio	0.069	-	-	-	0.207	0.178
HCM Control Delay (s)	8.8	-	-	-	34.8	13
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.6

HCM 2010 Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	289	47	29	241	219	112	167	61	249	125	179
Future Volume (veh/h)	360	289	47	29	241	219	112	167	61	249	125	179
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	1814	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	450	314	46	32	262	37	122	182	52	271	136	142
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.80	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	558	640	94	336	367	312	332	253	72	403	204	213
Arrive On Green	0.23	0.40	0.40	0.03	0.20	0.20	0.08	0.18	0.18	0.14	0.24	0.24
Sat Flow, veh/h	1727	1589	233	1774	1863	1583	1774	1394	398	1774	836	873
Grp Volume(v), veh/h	450	0	360	32	262	37	122	0	234	271	0	278
Grp Sat Flow(s),veh/h/ln	1727	0	1822	1774	1863	1583	1774	0	1792	1774	0	1709
Q Serve(g_s), s	15.3	0.0	11.7	1.1	10.4	1.5	4.4	0.0	9.8	9.4	0.0	11.7
Cycle Q Clear(g_c), s	15.3	0.0	11.7	1.1	10.4	1.5	4.4	0.0	9.8	9.4	0.0	11.7
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.22	1.00		0.51
Lane Grp Cap(c), veh/h	558	0	733	336	367	312	332	0	325	403	0	417
V/C Ratio(X)	0.81	0.00	0.49	0.10	0.71	0.12	0.37	0.00	0.72	0.67	0.00	0.67
Avail Cap(c_a), veh/h	725	0	895	537	563	479	443	0	542	403	0	516
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	0.0	17.7	24.4	29.8	26.2	23.8	0.0	30.6	21.2	0.0	27.1
Incr Delay (d2), s/veh	5.1	0.0	0.5	0.1	2.6	0.2	0.7	0.0	3.0	4.3	0.0	2.3
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	8.0	0.0	5.9	0.6	5.6	0.7	2.2	0.0	5.1	5.0	0.0	5.8
LnGrp Delay(d),s/veh	22.7	0.0	18.2	24.6	32.4	26.4	24.5	0.0	33.6	25.5	0.0	29.4
LnGrp LOS	C		B	C	C	C	C		C	C		C
Approach Vol, veh/h	810			331			356			549		
Approach Delay, s/veh	20.7			30.9			30.5			27.5		
Approach LOS	C			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	20.4	6.0	38.0	10.0	25.4	22.3	21.7				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	11.0	24.0	11.0	39.0	11.0	24.0	26.0	24.0				
Max Q Clear Time (g_c+I1), s	11.4	11.8	3.1	13.7	6.4	13.7	17.3	12.4				
Green Ext Time (p_c), s	0.0	2.7	0.0	4.4	0.1	2.4	1.0	3.2				
Intersection Summary												
HCM 2010 Ctrl Delay				25.9								
HCM 2010 LOS				C								

HCM 2010 AWSC

5: Kamehameha Ave & Maui Lani Pkwy

04/27/2017

Intersection

Intersection Delay, s/veh62.1

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations			↔				↔			↖	↗			↖	↗	
Traffic Vol, veh/h	0	153	116	101	0	50	147	127	0	176	241	71	0	169	179	203
Future Vol, veh/h	0	153	116	101	0	50	147	127	0	176	241	71	0	169	179	203
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	166	126	110	0	54	160	138	0	191	262	77	0	184	195	221
Number of Lanes	0	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	82.3	57.4	43.3	68.1
HCM LOS	F	F	E	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	41%	15%	100%	0%
Vol Thru, %	0%	77%	31%	45%	0%	47%
Vol Right, %	0%	23%	27%	39%	0%	53%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	176	312	370	324	169	382
LT Vol	176	0	153	50	169	0
Through Vol	0	241	116	147	0	179
RT Vol	0	71	101	127	0	203
Lane Flow Rate	191	339	402	352	184	415
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.536	0.885	1.018	0.906	0.507	1.041
Departure Headway (Hd)	10.41	9.715	9.42	9.587	10.253	9.334
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	348	376	390	380	355	390
Service Time	8.11	7.415	7.42	7.587	7.953	7.034
HCM Lane V/C Ratio	0.549	0.902	1.031	0.926	0.518	1.064
HCM Control Delay	24.5	53.9	82.3	57.4	23	88
HCM Lane LOS	C	F	F	F	C	F
HCM 95th-tile Q	3	8.7	12.5	9.3	2.7	13.3

HCM 2010 TWSC
6: Waiale Rd & Waiinu Rd

04/27/2017

Intersection

Int Delay, s/veh 49

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	192	45	522	635	42	493
Future Vol, veh/h	192	45	522	635	42	493
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	145	-	-	-	-
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	209	49	567	690	46	536

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1539	912	0
Stage 1	912	-	-
Stage 2	627	-	-
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	~ 127	332	553
Stage 1	392	-	-
Stage 2	532	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 112	332	553
Mov Cap-2 Maneuver	~ 112	-	-
Stage 1	392	-	-
Stage 2	469	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 396.8	0	0.9
HCM LOS	F		




















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	112	332	553	-
HCM Lane V/C Ratio	-	-	1.863	0.147	0.083	-
HCM Control Delay (s)	-	-	\$ 485.7	17.7	12.1	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	16.8	0.5	0.3	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	16	7	64	4	44	2	573	67	127	638	9
Future Volume (veh/h)	27	16	7	64	4	44	2	573	67	127	638	9
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	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	29	17	0	70	4	13	2	623	69	138	693	6
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	130	303	295	21	42	382	873	97	428	1153	980
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.19	0.00	0.53	0.53	0.09	0.62	0.62
Sat Flow, veh/h	927	678	1583	1141	111	220	1774	1648	183	1774	1863	1583
Grp Volume(v), veh/h	46	0	0	87	0	0	2	0	692	138	693	6
Grp Sat Flow(s), veh/h/ln	1604	0	1583	1472	0	0	1774	0	1831	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	24.3	2.6	19.2	0.1
Cycle Q Clear(g_c), s	1.8	0.0	0.0	4.0	0.0	0.0	0.0	0.0	24.3	2.6	19.2	0.1
Prop In Lane	0.63		1.00	0.80		0.15	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	376	0	303	358	0	0	382	0	970	428	1153	980
V/C Ratio(X)	0.12	0.00	0.00	0.24	0.00	0.00	0.01	0.00	0.71	0.32	0.60	0.01
Avail Cap(c_a), veh/h	516	0	447	489	0	0	713	0	970	601	1153	980
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	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	0.0	29.3	0.0	0.0	10.1	0.0	15.1	10.8	9.8	6.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	4.5	0.2	2.3	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	0.9	0.0	0.0	1.8	0.0	0.0	0.0	0.0	13.3	1.2	10.6	0.1
LnGrp Delay(d),s/veh	28.6	0.0	0.0	29.4	0.0	0.0	10.1	0.0	19.6	11.0	12.2	6.2
LnGrp LOS	C			C			B		B	B	B	A
Approach Vol, veh/h		46			87			694			837	
Approach Delay, s/veh		28.6			29.4			19.5			11.9	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	51.0		22.3	4.1	58.6		22.3				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+1), s	4.6	26.3		3.8	2.0	21.2		6.0				
Green Ext Time (p_c), s	0.1	2.4		0.4	0.0	6.7		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			16.5									
HCM 2010 LOS			B									

HCM 2010 TWSC
8: E Waiko Rd & Waiale Rd

04/27/2017

Intersection

Int Delay, s/veh 6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↗		↖	
Traffic Vol, veh/h	53	164	54	63	181	61
Future Vol, veh/h	53	164	54	63	181	61
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, %	2	2	2	2	2	2
Mvmt Flow	58	178	59	68	197	66

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	127	0	386
Stage 1	-	-	93
Stage 2	-	-	293
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
Pot Cap-1 Maneuver	1459	-	617
Stage 1	-	-	931
Stage 2	-	-	757
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1459	-	590
Mov Cap-2 Maneuver	-	-	590
Stage 1	-	-	931
Stage 2	-	-	724

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1459	-	-	-	654
HCM Lane V/C Ratio	0.039	-	-	-	0.402
HCM Control Delay (s)	7.6	0	-	-	14.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.9

HCM 2010 TWSC
9: Waiale Rd & Ohana Hana Loop

04/27/2017

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	1	1		1	1	
Traffic Vol, veh/h	18	25	6	111	211	8
Future Vol, veh/h	18	25	6	111	211	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	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	20	27	7	121	229	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	368	234	238	0	-	0
Stage 1	234	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	7.12	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	588	805	1329	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	585	805	1329	-	-	-
Mov Cap-2 Maneuver	585	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	864	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	10.4		0.4		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1329	-	585	805	-	-
HCM Lane V/C Ratio	0.005	-	0.033	0.034	-	-
HCM Control Delay (s)	7.7	0	11.4	9.6	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM 2010 TWSC
10: Waiale Rd & Nokekula Lp

04/27/2017

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰			↱	↱	
Traffic Vol, veh/h	24	19	3	122	194	8
Future Vol, veh/h	24	19	3	122	194	8
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	26	21	3	133	211	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	354	215	220	0	-	0
Stage 1	215	-	-	-	-	-
Stage 2	139	-	-	-	-	-
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	644	825	1349	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	643	825	1349	-	-	-
Mov Cap-2 Maneuver	643	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	886	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	10.4		0.2		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1349	-	712	-	-
HCM Lane V/C Ratio	0.002	-	0.066	-	-
HCM Control Delay (s)	7.7	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 2010 TWSC
11: Waiale Rd & Haawi St

04/27/2017

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	74	77	11	135	125	35
Future Vol, veh/h	74	77	11	135	125	35
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	80	84	12	147	136	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	326	155	174	0	-	0
Stage 1	155	-	-	-	-	-
Stage 2	171	-	-	-	-	-
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	668	891	1403	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	662	891	1403	-	-	-
Mov Cap-2 Maneuver	662	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	851	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1403	-	762	-	-
HCM Lane V/C Ratio	0.009	-	0.215	-	-
HCM Control Delay (s)	7.6	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

HCM 2010 TWSC
12: Waiale Rd & Kokololio St

04/27/2017

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↰	
Traffic Vol, veh/h	97	21	5	204	139	33
Future Vol, veh/h	97	21	5	204	139	33
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	50	-	-	-	-
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	105	23	5	222	151	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	402	169	187	0	-	0
Stage 1	169	-	-	-	-	-
Stage 2	233	-	-	-	-	-
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	604	875	1387	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	602	875	1387	-	-	-
Mov Cap-2 Maneuver	602	-	-	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1387	-	602	875	-	-
HCM Lane V/C Ratio	0.004	-	0.175	0.026	-	-
HCM Control Delay (s)	7.6	0	12.2	9.2	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.6	0.1	-	-



APPENDIX C

























LEVEL OF SERVICE CALCULATIONS

- Existing Conditions PM
-

HCM 2010 Signalized Intersection Summary

1: Honoapiilani Hwy & Kehalani Pkwy

























4/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	53	118	13	88	71	133	378	25	96	504	194
Future Volume (veh/h)	106	53	118	13	88	71	133	378	25	96	504	194
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	115	58	128	14	96	77	145	411	0	104	548	0
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	301	284	242	262	172	146	397	811	690	490	798	678
Arrive On Green	0.08	0.15	0.15	0.02	0.09	0.09	0.07	0.44	0.00	0.06	0.43	0.00
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	115	58	128	14	96	77	145	411	0	104	548	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.8	1.8	5.0	0.5	3.3	3.1	3.0	10.6	0.0	2.1	15.9	0.0
Cycle Q Clear(g_c), s	3.8	1.8	5.0	0.5	3.3	3.1	3.0	10.6	0.0	2.1	15.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	284	242	262	172	146	397	811	690	490	798	678
V/C Ratio(X)	0.38	0.20	0.53	0.05	0.56	0.53	0.36	0.51	0.00	0.21	0.69	0.00
Avail Cap(c_a), veh/h	564	672	571	632	672	571	804	1091	928	909	1091	928
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.8	24.7	26.0	26.6	28.9	28.8	11.3	13.6	0.0	10.0	15.4	0.0
Incr Delay (d2), s/veh	0.3	0.1	0.7	0.0	1.1	1.1	0.2	1.0	0.0	0.1	2.3	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	1.8	0.9	2.2	0.2	1.7	1.4	1.4	5.6	0.0	1.0	8.6	0.0
LnGrp Delay(d),s/veh	24.1	24.8	26.7	26.6	30.0	29.9	11.6	14.7	0.0	10.1	17.7	0.0
LnGrp LOS	C	C	C	C	C	C	B	B		B	B	
Approach Vol, veh/h	301			187			556			652		
Approach Delay, s/veh	25.3			29.7			13.8			16.5		
Approach LOS	C			C			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	35.0	6.1	16.2	9.8	34.5	10.2	12.2				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	4.1	12.6	2.5	7.0	5.0	17.9	5.8	5.3				
Green Ext Time (p_c), s	0.1	12.1	0.0	0.9	0.1	10.6	0.1	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				18.6								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

2: Honoapiilani Highway & Kuikahi Drive

4/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	66	24	391	97	169	37	371	339	190	442	31
Future Volume (veh/h)	8	66	24	391	97	169	37	371	339	190	442	31
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	1909	1909	1909	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	9	72	26	425	105	184	40	403	0	207	480	34
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	149	164	537	531	607	328	628	876	422	767	666
Arrive On Green	0.01	0.08	0.08	0.22	0.29	0.29	0.02	0.34	0.00	0.10	0.41	0.41
Sat Flow, veh/h	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	9	72	26	425	105	184	40	403	0	207	480	34
Grp Sat Flow(s), veh/h/ln	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	0.3	2.7	1.1	15.8	3.2	6.0	1.1	13.5	0.0	5.3	15.1	0.9
Cycle Q Clear(g_c), s	0.3	2.7	1.1	15.8	3.2	6.0	1.1	13.5	0.0	5.3	15.1	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	216	149	164	537	531	607	328	628	876	422	767	666
V/C Ratio(X)	0.04	0.48	0.16	0.79	0.20	0.30	0.12	0.64	0.00	0.49	0.63	0.05
Avail Cap(c_a), veh/h	298	232	236	537	531	607	430	857	1071	512	983	850
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	32.7	30.3	22.6	20.0	15.9	16.1	20.7	0.0	14.2	17.2	12.7
Incr Delay (d2), s/veh	0.1	0.9	0.2	7.9	0.1	0.1	0.1	2.3	0.0	0.3	1.8	0.1
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	0.2	1.4	0.5	8.9	1.6	2.6	0.5	7.3	0.0	2.5	8.1	0.4
LnGrp Delay(d),s/veh	31.0	33.6	30.5	30.5	20.1	16.0	16.2	23.1	0.0	14.5	19.0	12.7
LnGrp LOS	C	C	C	C	C	B	B	C		B	B	B
Approach Vol, veh/h		107			714			443			721	
Approach Delay, s/veh		32.6			25.2			22.5			17.4	
Approach LOS		C			C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.3	30.9	20.0	11.8	5.7	36.4	4.7	27.1				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	34.0	16.0	9.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+I_T), s	15.5	17.8	4.7	3.1	17.1	2.3	8.0					
Green Ext Time (p_c), s	0.1	9.4	0.0	0.2	0.0	10.4	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				22.2								
HCM 2010 LOS				C								

HCM 2010 TWSC
3: Kuikahi Dr & Kehalani Village Dr

4/24/2017

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↰		↰	↑
Traffic Vol, veh/h	97	469	482	82	34	130
Future Vol, veh/h	97	469	482	82	34	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	145	-	-	-	0	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	105	510	524	89	37	141






















Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	613	0	1289
Stage 1	-	-	568
Stage 2	-	-	721
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
Pot Cap-1 Maneuver	966	-	181
Stage 1	-	-	567
Stage 2	-	-	482
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	966	-	161
Mov Cap-2 Maneuver	-	-	161
Stage 1	-	-	567
Stage 2	-	-	430

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	966	-	-	-	161	522
HCM Lane V/C Ratio	0.109	-	-	-	0.23	0.271
HCM Control Delay (s)	9.2	-	-	-	33.9	14.4
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.8	1.1

HCM 2010 Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

4/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	195	55	65	307	237	46	110	33	283	163	233
Future Volume (veh/h)	249	195	55	65	307	237	46	110	33	283	163	233
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	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	271	212	48	71	334	8	50	120	23	308	177	198
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	0
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	501	113	442	446	379	248	229	44	497	225	251
Arrive On Green	0.15	0.34	0.34	0.04	0.24	0.24	0.04	0.15	0.15	0.16	0.28	0.28
Sat Flow, veh/h	1774	1471	333	1774	1863	1583	1774	1520	291	1774	804	900
Grp Volume(v), veh/h	271	0	260	71	334	8	50	0	143	308	0	375
Grp Sat Flow(s),veh/h/ln	1774	0	1804	1774	1863	1583	1774	0	1811	1774	0	1704
Q Serve(g _s), s	7.0	0.0	7.4	2.0	11.1	0.3	1.6	0.0	4.9	9.2	0.0	13.6
Cycle Q Clear(g _c), s	7.0	0.0	7.4	2.0	11.1	0.3	1.6	0.0	4.9	9.2	0.0	13.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.16	1.00		0.53
Lane Grp Cap(c), veh/h	442	0	614	442	446	379	248	0	273	497	0	476
V/C Ratio(X)	0.61	0.00	0.42	0.16	0.75	0.02	0.20	0.00	0.52	0.62	0.00	0.79
Avail Cap(c _a), veh/h	874	0	1054	656	670	569	477	0	651	497	0	612
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	17.0	17.8	23.5	19.4	22.9	0.0	26.1	17.8	0.0	22.2
Incr Delay (d2), s/veh	1.4	0.0	0.5	0.2	2.6	0.0	0.4	0.0	1.5	2.3	0.0	5.2
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	3.5	0.0	3.8	1.0	6.0	0.1	0.8	0.0	2.5	4.7	0.0	7.0
LnGrp Delay(d),s/veh	16.6	0.0	17.4	18.0	26.1	19.4	23.3	0.0	27.7	20.1	0.0	27.4
LnGrp LOS	B		B	B	C	B	C		C	C		C
Approach Vol, veh/h	531				413				193		683	
Approach Delay, s/veh	17.0				24.6				26.5		24.1	
Approach LOS	B				C				C		C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	16.1	7.0	28.7	6.4	24.7	13.7	22.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	11.0	24.0	11.0	39.0	11.0	24.0	26.0	24.0				
Max Q Clear Time (g _c +I1), s	11.2	6.9	4.0	9.4	3.6	15.6	9.0	13.1				
Green Ext Time (p _c), s	0.0	3.2	0.1	4.2	0.0	2.2	0.7	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay	22.4											
HCM 2010 LOS	C											

HCM 2010 AWSC
5: Kamehameha Ave & Maui Lani Pkwy

4/24/2017

Intersection

Intersection Delay, s/veh 67.7

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations			↔				↔			↗	↘			↗	↘	
Traffic Vol, veh/h	0	206	171	75	0	46	177	208	0	62	99	27	0	153	112	255
Future Vol, veh/h	0	206	171	75	0	46	177	208	0	62	99	27	0	153	112	255
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	224	186	82	0	50	192	226	0	67	108	29	0	166	122	277
Number of Lanes	0	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	109.2	76.9	17.4	42.2
HCM LOS	F	F	C	E





Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	46%	11%	100%	0%
Vol Thru, %	0%	79%	38%	41%	0%	31%
Vol Right, %	0%	21%	17%	48%	0%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	126	452	431	153	367
LT Vol	62	0	206	46	153	0
Through Vol	0	99	171	177	0	112
RT Vol	0	27	75	208	0	255
Lane Flow Rate	67	137	491	468	166	399
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.189	0.359	1.122	1.018	0.421	0.9
Departure Headway (Hd)	10.689	10.002	8.221	8.25	9.62	8.586
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	338	362	442	445	378	427
Service Time	8.389	7.702	6.321	6.25	7.32	6.286
HCM Lane V/C Ratio	0.198	0.378	1.111	1.052	0.439	0.934
HCM Control Delay	15.9	18.2	109.2	76.9	19.1	51.9
HCM Lane LOS	C	C	F	F	C	F
HCM 95th-tile Q	0.7	1.6	17.2	13.4	2	9.6

HCM 2010 TWSC
6: Waiale Rd & Waiinu Rd

4/24/2017

Intersection

Int Delay, s/veh 76.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	206	45	405	225	68	626
Future Vol, veh/h	206	45	405	225	68	626
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	145	-	-	-	-
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	224	49	440	245	74	680

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1391	563	0	0	685	0
Stage 1	563	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Critical Hdwy	7.12	6.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 120	526	-	-	908	-
Stage 1	511	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 108	526	-	-	908	-
Mov Cap-2 Maneuver	~ 108	-	-	-	-	-
Stage 1	511	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 477.3	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	108	526	908	-
HCM Lane V/C Ratio	-	-	2.073	0.093	0.081	-
HCM Control Delay (s)	-	-	\$ 578.8	12.5	9.3	0
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	18.9	0.3	0.3	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary
7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

4/24/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪		↩↪		↩	↪		↩	↪	↪
Traffic Volume (veh/h)	12	12	8	60	14	51	5	652	68	47	685	29
Future Volume (veh/h)	12	12	8	60	14	51	5	652	68	47	685	29
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	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	13	13	9	65	15	55	5	709	74	51	745	32
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	207	187	318	191	56	125	335	896	94	340	1123	954
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.54	0.54	0.07	0.60	0.60
Sat Flow, veh/h	709	932	1583	631	278	625	1774	1659	173	1774	1863	1583
Grp Volume(v), veh/h	26	0	9	135	0	0	5	0	783	51	745	32
Grp Sat Flow(s), veh/h/ln	1641	0	1583	1534	0	0	1774	0	1832	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.4	4.0	0.0	0.0	0.1	0.0	28.5	0.9	22.0	0.7
Cycle Q Clear(g_c), s	0.9	0.0	0.4	6.2	0.0	0.0	0.1	0.0	28.5	0.9	22.0	0.7
Prop In Lane	0.50		1.00	0.48		0.41	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	394	0	318	372	0	0	335	0	989	340	1123	954
V/C Ratio(X)	0.07	0.00	0.03	0.36	0.00	0.00	0.01	0.00	0.79	0.15	0.66	0.03
Avail Cap(c_a), veh/h	531	0	458	505	0	0	669	0	1081	564	1123	954
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	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	26.7	28.9	0.0	0.0	10.4	0.0	15.3	11.9	10.9	6.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	4.6	0.1	2.0	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	0.5	0.0	0.2	2.7	0.0	0.0	0.1	0.0	15.4	0.5	11.8	0.3
LnGrp Delay(d),s/veh	26.9	0.0	26.7	29.1	0.0	0.0	10.4	0.0	20.0	12.0	12.9	6.7
LnGrp LOS	C		C	C			B		B	B	B	A
Approach Vol, veh/h		35			135			788			828	
Approach Delay, s/veh		26.9			29.1			19.9			12.6	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	50.8		22.7	4.3	56.1		22.7				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	49.0		24.0	16.0	49.0		24.0				
Max Q Clear Time (g_c+I1), s	2.9	30.5		2.9	2.1	24.0		8.2				
Green Ext Time (p_c), s	0.0	14.3		0.6	0.0	19.9		0.5				

Intersection Summary

HCM 2010 Ctrl Delay 17.4
HCM 2010 LOS B

HCM 2010 TWSC
8: E Waiko Rd & Waiale Rd

4/24/2017

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↗		↖	
Traffic Vol, veh/h	59	67	84	124	108	42
Future Vol, veh/h	59	67	84	124	108	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	-	-	-	-	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	64	73	91	135	117	46

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	226	0	360
Stage 1	-	-	159
Stage 2	-	-	201
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
Pot Cap-1 Maneuver	1342	-	639
Stage 1	-	-	870
Stage 2	-	-	833
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1342	-	607
Mov Cap-2 Maneuver	-	-	607
Stage 1	-	-	870
Stage 2	-	-	791

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1342	-	-	-	666
HCM Lane V/C Ratio	0.048	-	-	-	0.245
HCM Control Delay (s)	7.8	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

HCM 2010 TWSC
9: Waiale Rd & Ohana Hana Loop

4/24/2017

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↱	↰	
Traffic Vol, veh/h	14	7	18	167	139	16
Future Vol, veh/h	14	7	18	167	139	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	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	15	8	20	182	151	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	381	160	168	0	-	0
Stage 1	160	-	-	-	-	-
Stage 2	221	-	-	-	-	-
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	621	885	1410	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	611	885	1410	-	-	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.7	0
HCM LOS	B		




Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1410	-	611	885	-	-
HCM Lane V/C Ratio	0.014	-	0.025	0.009	-	-
HCM Control Delay (s)	7.6	0	11	9.1	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM 2010 TWSC
10: Waiale Rd & Nokekula Lp

4/24/2017

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	12	21	145	142	17
Future Vol, veh/h	10	12	21	145	142	17
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	13	23	158	154	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	367	164	173	0	-	0
Stage 1	164	-	-	-	-	-
Stage 2	203	-	-	-	-	-
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	633	881	1404	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	622	881	1404	-	-	-
Mov Cap-2 Maneuver	622	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	816	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	1	0
HCM LOS	B		




Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1404	-	741	-	-
HCM Lane V/C Ratio	0.016	-	0.032	-	-
HCM Control Delay (s)	7.6	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

HCM 2010 TWSC
11: Waiale Rd & Haawi St

4/24/2017

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	50	39	38	117	120	76
Future Vol, veh/h	50	39	38	117	120	76
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	54	42	41	127	130	83

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	382	172	213	0	-	0
Stage 1	172	-	-	-	-	-
Stage 2	210	-	-	-	-	-
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	620	872	1357	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	600	872	1357	-	-	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1357	-	695	-	-
HCM Lane V/C Ratio	0.03	-	0.139	-	-
HCM Control Delay (s)	7.7	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

HCM 2010 TWSC
12: Waiale Rd & Kokololio St

4/24/2017

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	57	6	15	152	190	73
Future Vol, veh/h	57	6	15	152	190	73
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	50	-	-	-	-
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	62	7	16	165	207	79

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	444	246	286	0	-	0
Stage 1	246	-	-	-	-	-
Stage 2	198	-	-	-	-	-
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	571	793	1276	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	563	793	1276	-	-	-
Mov Cap-2 Maneuver	563	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1276	-	563	793	-	-
HCM Lane V/C Ratio	0.013	-	0.11	0.008	-	-
HCM Control Delay (s)	7.9	0	12.2	9.6	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0	-	-



APPENDIX C

























LEVEL OF SERVICE CALCULATIONS

- Base Year 2020 AM
-

HCM 2010 Signalized Intersection Summary

1: Honoapiilani Hwy & Kehalani Pkwy

06/21/2017

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	225	440	30	190	110	255	540	10	40	395	110
Future Volume (veh/h)	325	225	440	30	190	110	255	540	10	40	395	110
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	1545	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	464	245	281	33	207	32	277	587	0	43	429	0
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.70	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, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	491	417	284	253	215	441	816	694	288	664	564
Arrive On Green	0.16	0.26	0.26	0.03	0.14	0.14	0.12	0.44	0.00	0.04	0.36	0.00
Sat Flow, veh/h	1472	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	464	245	281	33	207	32	277	587	0	43	429	0
Grp Sat Flow(s),veh/h/ln	1472	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	15.0	10.6	15.1	1.5	10.2	1.7	8.9	24.5	0.0	1.4	18.2	0.0
Cycle Q Clear(g_c), s	15.0	10.6	15.1	1.5	10.2	1.7	8.9	24.5	0.0	1.4	18.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	336	491	417	284	253	215	441	816	694	288	664	564
V/C Ratio(X)	1.38	0.50	0.67	0.12	0.82	0.15	0.63	0.72	0.00	0.15	0.65	0.00
Avail Cap(c_a), veh/h	336	491	417	510	472	401	607	963	819	598	963	819
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.8	29.6	31.3	33.5	39.8	36.1	17.4	21.8	0.0	19.5	25.5	0.0
Incr Delay (d2), s/veh	189.3	0.3	3.5	0.1	2.5	0.1	0.6	3.2	0.0	0.1	2.3	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	20.3	5.5	6.9	0.7	5.5	0.7	4.4	13.3	0.0	0.7	9.7	0.0
LnGrp Delay(d),s/veh	221.0	29.9	34.7	33.6	42.3	36.2	17.9	25.0	0.0	19.6	27.8	0.0
LnGrp LOS	F	C	C	C	D	D	B	C		B	C	
Approach Vol, veh/h	990				272				864			
Approach Delay, s/veh	120.8				40.5				22.8			
Approach LOS	F				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	47.5	7.9	31.0	16.1	39.8	20.0	18.9				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	3.4	26.5	3.5	17.1	10.9	20.2	17.0	12.2				
Green Ext Time (p_c), s	0.0	11.8	0.0	1.6	0.3	13.5	0.0	0.6				

Intersection Summary

HCM 2010 Ctrl Delay 62.8
 HCM 2010 LOS E

HCM 2010 Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	160	75	300	70	295	20	475	390	335	595	10
Future Volume (veh/h)	60	160	75	300	70	295	20	475	390	335	595	10
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	1909	1909	1909	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	65	174	36	326	76	163	22	516	0	364	647	7
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	220	210	410	442	581	256	659	822	409	874	811
Arrive On Green	0.04	0.12	0.12	0.17	0.24	0.24	0.01	0.35	0.00	0.13	0.47	0.47
Sat Flow, veh/h	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	65	174	36	326	76	163	22	516	0	364	647	7
Grp Sat Flow(s),veh/h/ln	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.6	7.5	1.7	13.3	2.7	6.2	0.7	21.0	0.0	10.8	23.9	0.2
Cycle Q Clear(g_c), s	2.6	7.5	1.7	13.3	2.7	6.2	0.7	21.0	0.0	10.8	23.9	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	220	210	410	442	581	256	659	822	409	874	811
V/C Ratio(X)	0.20	0.79	0.17	0.80	0.17	0.28	0.09	0.78	0.00	0.89	0.74	0.01
Avail Cap(c_a), veh/h	326	248	234	410	462	598	356	747	897	409	874	811
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	36.5	32.8	25.9	25.7	18.9	18.3	24.5	0.0	17.8	18.3	10.1
Incr Delay (d2), s/veh	0.3	12.4	0.1	10.4	0.1	0.1	0.1	6.2	0.0	20.2	4.1	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	1.3	4.7	0.8	7.6	1.4	2.7	0.3	11.9	0.0	7.4	13.2	0.1
LnGrp Delay(d),s/veh	31.5	48.9	33.0	36.3	25.8	19.0	18.4	30.7	0.0	38.1	22.4	10.1
LnGrp LOS	C	D	C	D	C	B	B	C		D	C	B
Approach Vol, veh/h	275			565			538			1018		
Approach Delay, s/veh	42.7			29.9			30.2			27.9		
Approach LOS	D			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	36.0	18.0	15.8	5.2	45.8	7.6	26.1				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	34.0	14.0	11.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+1/2), s	23.0	15.3	9.5	2.7	25.9	4.6	8.2					
Green Ext Time (p_c), s	0.0	7.0	0.0	0.2	0.0	9.2	0.0	1.1				
Intersection Summary												
HCM 2010 Ctrl Delay	30.6											
HCM 2010 LOS	C											

HCM 2010 TWSC

3: Kuikahi Dr & Kehalani Village Dr

06/21/2017

Intersection

Int Delay, s/veh 7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱		↰	↑	↱		
Traffic Vol, veh/h	80	765	10	10	545	65	30	5	30	30	5	105
Future Vol, veh/h	80	765	10	10	545	65	30	5	30	30	5	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	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	87	832	11	11	592	71	33	5	33	33	5	114
























Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	663	0	0	842	0	0	1663	1696	837	1663	1665	628
Stage 1	-	-	-	-	-	-	1011	1011	-	649	649	-
Stage 2	-	-	-	-	-	-	652	685	-	1014	1016	-
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	926	-	-	794	-	-	77	93	367	77	97	483
Stage 1	-	-	-	-	-	-	289	317	-	458	466	-
Stage 2	-	-	-	-	-	-	457	448	-	288	315	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	926	-	-	794	-	-	51	83	367	61	87	483
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	83	-	61	87	-
Stage 1	-	-	-	-	-	-	262	287	-	415	460	-
Stage 2	-	-	-	-	-	-	340	442	-	233	285	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	96.1	41.7
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	54	367	926	-	-	794	-	-	64	483
HCM Lane V/C Ratio	0.705	0.089	0.094	-	-	0.014	-	-	0.594	0.236
HCM Control Delay (s)	165	15.8	9.3	-	-	9.6	-	-	122.9	14.7
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	2.9	0.3	0.3	-	-	0	-	-	2.5	0.9

HCM 2010 Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	415	380	70	60	290	245	140	225	105	285	190	200
Future Volume (veh/h)	415	380	70	60	290	245	140	225	105	285	190	200
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	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	519	413	68	65	315	28	152	245	99	310	207	132
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.80	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	555	649	107	322	381	324	316	287	116	355	326	208
Arrive On Green	0.25	0.42	0.42	0.04	0.20	0.20	0.06	0.23	0.23	0.14	0.31	0.31
Sat Flow, veh/h	1774	1560	257	1774	1863	1583	1774	1263	510	1774	1064	679
Grp Volume(v), veh/h	519	0	481	65	315	28	152	0	344	310	0	339
Grp Sat Flow(s),veh/h/ln	1774	0	1817	1774	1863	1583	1774	0	1773	1774	0	1743
Q Serve(g_s), s	25.5	0.0	24.0	3.3	18.5	1.6	7.0	0.0	21.2	14.8	0.0	19.1
Cycle Q Clear(g_c), s	25.5	0.0	24.0	3.3	18.5	1.6	7.0	0.0	21.2	14.8	0.0	19.1
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.29	1.00		0.39
Lane Grp Cap(c), veh/h	555	0	756	322	381	324	316	0	404	355	0	534
V/C Ratio(X)	0.94	0.00	0.64	0.20	0.83	0.09	0.48	0.00	0.85	0.87	0.00	0.63
Avail Cap(c_a), veh/h	667	0	813	436	441	375	316	0	482	355	0	611
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	26.5	33.7	43.4	36.7	32.7	0.0	42.2	29.2	0.0	34.0
Incr Delay (d2), s/veh	18.7	0.0	1.5	0.3	10.9	0.1	1.1	0.0	12.0	20.6	0.0	1.7
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	18.7	0.0	12.3	1.6	10.7	0.7	0.9	0.0	11.8	9.2	0.0	9.4
LnGrp Delay(d),s/veh	44.9	0.0	27.9	34.0	54.4	36.9	33.9	0.0	54.2	49.8	0.0	35.8
LnGrp LOS	D		C	C	D	D	C		D	D		D
Approach Vol, veh/h	1000				408			496			649	
Approach Delay, s/veh	36.8				49.9			48.0			42.5	
Approach LOS	D				D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	32.0	8.7	53.4	11.0	41.0	32.8	29.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	31.0	12.0	51.0	7.0	40.0	36.0	27.0				
Max Q Clear Time (g_c+I1), s	16.8	23.2	5.3	26.0	9.0	21.1	27.5	20.5				
Green Ext Time (p_c), s	0.0	2.8	0.1	5.9	0.0	4.5	1.2	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay	42.5											
HCM 2010 LOS	D											

HCM 2010 Roundabout
5: Kamehameha Ave & Maui Lani Pkwy

06/21/2017

Intersection

Intersection Delay, s/veh 52.6

Intersection LOS F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	543	412	604	707
Demand Flow Rate, veh/h	553	420	617	722
Vehicles Circulating, veh/h	494	754	587	515
Vehicles Exiting, veh/h	743	450	460	659
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	27.3	32.1	57.7	79.6
Approach LOS	D	D	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	553	420	617	722
Cap Entry Lane, veh/h	689	532	628	675
Entry HV Adj Factor	0.981	0.980	0.979	0.979
Flow Entry, veh/h	543	412	604	707
Cap Entry, veh/h	676	521	615	661
V/C Ratio	0.802	0.790	0.982	1.069
Control Delay, s/veh	27.3	32.1	57.7	79.6
LOS	D	D	F	F
95th %tile Queue, veh	8	7	14	19

HCM 2010 TWSC
6: Waiale Rd & Waiinu Rd

06/21/2017

Intersection

Int Delay, s/veh 158

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	225	45	580	710	45	575
Future Vol, veh/h	225	45	580	710	45	575
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	145	-	-	-	-
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	245	49	630	772	49	625

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1739	1016	0
Stage 1	1016	-	-
Stage 2	723	-	-
Critical Hdwy	7.12	6.22	4.12
Critical Hdwy Stg 1	6.12	-	-
Critical Hdwy Stg 2	6.12	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	~ 68	289	487
Stage 1	287	-	-
Stage 2	417	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 60	289	487
Mov Cap-2 Maneuver	~ 60	-	-
Stage 1	287	-	-
Stage 2	353	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 1273.8	0	1
HCM LOS	F		




















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	60	289	487	-
HCM Lane V/C Ratio	-	-	4.076	0.169	0.1	-
HCM Control Delay (s)	-	\$	1524.6	20	13.2	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	26.5	0.6	0.3	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	10	90	5	55	5	655	105	170	775	10
Future Volume (veh/h)	30	20	10	90	5	55	5	655	105	170	775	10
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	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	33	22	1	98	5	31	5	712	109	185	842	7
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	143	313	254	21	61	279	823	126	334	1136	966
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.52	0.52	0.09	0.61	0.61
Sat Flow, veh/h	865	724	1583	915	107	307	1774	1578	242	1774	1863	1583
Grp Volume(v), veh/h	55	0	1	134	0	0	5	0	821	185	842	7
Grp Sat Flow(s),veh/h/ln	1589	0	1583	1329	0	0	1774	0	1820	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.0	6.2	0.0	0.0	0.1	0.0	33.5	3.6	27.3	0.1
Cycle Q Clear(g_c), s	2.2	0.0	0.0	8.4	0.0	0.0	0.1	0.0	33.5	3.6	27.3	0.1
Prop In Lane	0.60		1.00	0.73		0.23	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	382	0	313	336	0	0	279	0	948	334	1136	966
V/C Ratio(X)	0.14	0.00	0.00	0.40	0.00	0.00	0.02	0.00	0.87	0.55	0.74	0.01
Avail Cap(c_a), veh/h	511	0	447	458	0	0	606	0	948	503	1136	966
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	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	27.4	31.1	0.0	0.0	11.9	0.0	17.8	16.4	11.8	6.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	10.4	0.5	4.4	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	1.1	0.0	0.0	2.9	0.0	0.0	0.1	0.0	19.4	2.4	15.2	0.1
LnGrp Delay(d),s/veh	28.3	0.0	27.4	31.4	0.0	0.0	11.9	0.0	28.2	16.9	16.2	6.5
LnGrp LOS	C		C	C			B		C	B	B	A
Approach Vol, veh/h	56			134			826			1034		
Approach Delay, s/veh	28.3			31.4			28.1			16.2		
Approach LOS	C			C			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	11.9	50.3		22.8	4.3	57.9		22.8				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+I1), s	5.6	35.5		4.2	2.1	29.3		10.4				
Green Ext Time (p_c), s	0.2	0.0		0.7	0.0	0.0		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				22.3								
HCM 2010 LOS				C								

HCM 2010 TWSC
8: E Waiko Rd & Waiale Rd

06/21/2017

Intersection

Int Delay, s/veh 13.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰		↰	
Traffic Vol, veh/h	70	235	75	100	285	80
Future Vol, veh/h	70	235	75	100	285	80
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, %	2	2	2	2	2	2
Mvmt Flow	76	255	82	109	310	87

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	190	0	544
Stage 1	-	-	136
Stage 2	-	-	408
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
Pot Cap-1 Maneuver	1384	-	500
Stage 1	-	-	890
Stage 2	-	-	671
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1384	-	468
Mov Cap-2 Maneuver	-	-	468
Stage 1	-	-	890
Stage 2	-	-	628

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	30.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1384	-	-	-	524
HCM Lane V/C Ratio	0.055	-	-	-	0.757
HCM Control Delay (s)	7.8	0	-	-	30.2
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	6.6

HCM 2010 TWSC
9: Waiale Rd & Ohana Hana Loop

06/21/2017

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↰	
Traffic Vol, veh/h	20	25	10	160	310	10
Future Vol, veh/h	20	25	10	160	310	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	50	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	27	11	174	337	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	538	342	348
Stage 1	342	-	-
Stage 2	196	-	-
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	504	701	1211
Stage 1	719	-	-
Stage 2	837	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	499	701	1211
Mov Cap-2 Maneuver	499	-	-
Stage 1	719	-	-
Stage 2	829	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1211	-	499	701	-	-
HCM Lane V/C Ratio	0.009	-	0.044	0.039	-	-
HCM Control Delay (s)	8	0	12.5	10.3	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM 2010 TWSC
10: Waiale Rd & Nokekula Lp

06/21/2017

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	3			4	1	
Traffic Vol, veh/h	25	20	5	175	320	10
Future Vol, veh/h	25	20	5	175	320	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	27	22	5	190	348	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	554	353	359	0	-	0
Stage 1	353	-	-	-	-	-
Stage 2	201	-	-	-	-	-
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	493	691	1200	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	491	691	1200	-	-	-
Mov Cap-2 Maneuver	491	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1200	-	563	-	-
HCM Lane V/C Ratio	0.005	-	0.087	-	-
HCM Control Delay (s)	8	0	12	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

HCM 2010 TWSC
11: Waiale Rd & Haawi St

06/21/2017

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	75	80	15	190	250	35
Future Vol, veh/h	75	80	15	190	250	35
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	82	87	16	207	272	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	530	291	310	0	-	0
Stage 1	291	-	-	-	-	-
Stage 2	239	-	-	-	-	-
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	510	748	1250	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	503	748	1250	-	-	-
Mov Cap-2 Maneuver	503	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1250	-	605	-	-
HCM Lane V/C Ratio	0.013	-	0.278	-	-
HCM Control Delay (s)	7.9	0	13.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

HCM 2010 TWSC
12: Waiale Rd & Kokololio St

06/21/2017

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↰	↱
Traffic Vol, veh/h	100	25	5	255	265	35
Future Vol, veh/h	100	25	5	255	265	35
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	50	-	-	-	-
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	109	27	5	277	288	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	595	307	326	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Critical Hdwy	7.12	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	416	733	1234	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	414	733	1234	-	-	-
Mov Cap-2 Maneuver	414	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.5	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1234	-	414	733	-	-
HCM Lane V/C Ratio	0.004	-	0.263	0.037	-	-
HCM Control Delay (s)	7.9	0	16.8	10.1	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	1	0.1	-	-



APPENDIX C

























LEVEL OF SERVICE CALCULATIONS

- Base Year 2020 PM
-

HCM 2010 Signalized Intersection Summary

1: Honoapiilani Hwy & Kehalani Pkwy

























06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	95	170	15	125	75	195	490	25	100	585	270
Future Volume (veh/h)	125	95	170	15	125	75	195	490	25	100	585	270
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	136	103	185	16	136	82	212	533	0	109	636	0
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	333	283	266	207	176	365	875	744	415	812	690
Arrive On Green	0.09	0.18	0.18	0.02	0.11	0.11	0.09	0.47	0.00	0.06	0.44	0.00
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	136	103	185	16	136	82	212	533	0	109	636	0
Grp Sat Flow(s), veh/h/ln	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	5.2	3.8	8.7	0.6	5.6	3.9	5.1	17.0	0.0	2.7	23.4	0.0
Cycle Q Clear(g_c), s	5.2	3.8	8.7	0.6	5.6	3.9	5.1	17.0	0.0	2.7	23.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	333	283	266	207	176	365	875	744	415	812	690
V/C Ratio(X)	0.46	0.31	0.65	0.06	0.66	0.47	0.58	0.61	0.00	0.26	0.78	0.00
Avail Cap(c_a), veh/h	475	560	476	566	560	476	647	910	773	758	910	773
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.5	28.5	30.5	30.5	34.0	33.3	14.8	15.7	0.0	12.4	19.3	0.0
Incr Delay (d2), s/veh	0.4	0.2	1.0	0.0	1.3	0.7	0.5	1.8	0.0	0.1	5.2	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	2.6	2.0	3.9	0.3	2.9	1.7	2.5	9.0	0.0	1.3	13.0	0.0
LnGrp Delay(d),s/veh	27.0	28.7	31.4	30.5	35.3	34.0	15.4	17.5	0.0	12.5	24.5	0.0
LnGrp LOS	C	C	C	C	D	C	B	B		B	C	
Approach Vol, veh/h		424			234			745			745	
Approach Delay, s/veh		29.3			34.5			16.9			22.7	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	43.5	6.5	20.3	12.3	40.8	11.9	14.9				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	4.7	19.0	2.6	10.7	7.1	25.4	7.2	7.6				
Green Ext Time (p_c), s	0.1	12.6	0.0	1.2	0.2	9.4	0.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			23.3									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

2: Honoapiilani Highway & Kuikahi Drive

06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	95	35	465	150	290	50	425	420	260	505	40
Future Volume (veh/h)	15	95	35	465	150	290	50	425	420	260	505	40
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	1909	1909	1909	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	16	103	38	505	163	315	54	462	0	283	549	43
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	209	148	178	577	600	712	264	559	885	375	737	650
Arrive On Green	0.01	0.08	0.08	0.26	0.32	0.32	0.03	0.30	0.00	0.13	0.40	0.40
Sat Flow, veh/h	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	16	103	38	505	163	315	54	462	0	283	549	43
Grp Sat Flow(s), veh/h/ln	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	0.7	4.5	1.8	21.6	5.5	11.6	1.8	19.6	0.0	8.8	21.4	1.4
Cycle Q Clear(g_c), s	0.7	4.5	1.8	21.6	5.5	11.6	1.8	19.6	0.0	8.8	21.4	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	148	178	577	600	712	264	559	885	375	737	650
V/C Ratio(X)	0.08	0.70	0.21	0.88	0.27	0.44	0.20	0.83	0.00	0.75	0.75	0.07
Avail Cap(c_a), veh/h	396	202	224	577	600	712	332	614	932	379	737	650
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	38.2	34.5	24.7	21.4	16.1	20.6	27.7	0.0	19.0	22.0	15.2
Incr Delay (d2), s/veh	0.2	2.6	0.2	14.1	0.1	0.2	0.1	10.0	0.0	7.4	5.0	0.1
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	2.5	0.8	12.6	2.9	5.1	0.9	11.6	0.0	5.0	12.0	0.6
LnGrp Delay(d),s/veh	35.4	40.8	34.7	38.8	21.5	16.2	20.8	37.6	0.0	26.4	27.0	15.3
LnGrp LOS	D	D	C	D	C	B	C	D		C	C	B
Approach Vol, veh/h	157			983			516			875		
Approach Delay, s/veh	38.8			28.7			35.9			26.2		
Approach LOS	D			C			D			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	34.8	31.5	26.0	12.6	6.7	39.6	5.3	33.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	28.0	22.0	9.0	6.0	33.0	10.0	21.0					
Max Q Clear Time (g_c+M), s	21.6	23.6	6.5	3.8	23.4	2.7	13.6					
Green Ext Time (p_c), s	0.0	3.9	0.0	0.1	0.0	6.5	0.0	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				29.9								
HCM 2010 LOS				C								

HCM 2010 TWSC

3: Kuikahi Dr & Kehalani Village Dr

06/21/2017

Intersection

Int Delay, s/veh 14.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑			↑	↱		↑	↱
Traffic Vol, veh/h	135	570	30	30	660	90	15	5	15	45	5	185
Future Vol, veh/h	135	570	30	30	660	90	15	5	15	45	5	185
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	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	147	620	33	33	717	98	16	5	16	49	5	201
























Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	815	0	0	652	0	0	1763	1809	636	1764	1778	766
Stage 1	-	-	-	-	-	-	929	929	-	832	832	-
Stage 2	-	-	-	-	-	-	834	880	-	932	946	-
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	812	-	-	935	-	-	66	79	478	66	82	403
Stage 1	-	-	-	-	-	-	321	346	-	363	384	-
Stage 2	-	-	-	-	-	-	362	365	-	320	340	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	812	-	-	935	-	-	26	62	478	50	65	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	62	-	50	65	-
Stage 1	-	-	-	-	-	-	263	283	-	297	370	-
Stage 2	-	-	-	-	-	-	172	352	-	248	278	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	159.9	76.2
HCM LOS	F	F	F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	30	478	812	-	-	935	-	-	51	403
HCM Lane V/C Ratio	0.725	0.034	0.181	-	-	0.035	-	-	1.066	0.499
HCM Control Delay (s)	270.3	12.8	10.4	-	-	9	-	-	274.9	22.5
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	2.4	0.1	0.7	-	-	0.1	-	-	4.7	2.7

HCM 2010 Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	270	80	135	420	285	100	215	95	325	255	280
Future Volume (veh/h)	280	270	80	135	420	285	100	215	95	325	255	280
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	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	304	293	75	147	457	60	109	234	90	353	277	249
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	0
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	351	494	127	376	528	449	212	303	116	428	316	284
Arrive On Green	0.14	0.35	0.35	0.08	0.28	0.28	0.05	0.24	0.24	0.17	0.35	0.35
Sat Flow, veh/h	1774	1432	366	1774	1863	1583	1774	1282	493	1774	905	814
Grp Volume(v), veh/h	304	0	368	147	457	60	109	0	324	353	0	526
Grp Sat Flow(s), veh/h/ln	1774	0	1798	1774	1863	1583	1774	0	1776	1774	0	1719
Q Serve(g_s), s	13.1	0.0	19.0	6.5	26.3	3.2	5.3	0.0	19.2	16.3	0.0	32.4
Cycle Q Clear(g_c), s	13.1	0.0	19.0	6.5	26.3	3.2	5.3	0.0	19.2	16.3	0.0	32.4
Prop In Lane	1.00		0.20	1.00		1.00	1.00		0.28	1.00		0.47
Lane Grp Cap(c), veh/h	351	0	621	376	528	449	212	0	419	428	0	600
V/C Ratio(X)	0.87	0.00	0.59	0.39	0.87	0.13	0.51	0.00	0.77	0.83	0.00	0.88
Avail Cap(c_a), veh/h	407	0	749	384	611	519	212	0	488	494	0	731
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	30.4	26.1	38.4	30.1	32.3	0.0	40.3	26.6	0.0	34.4
Incr Delay (d2), s/veh	15.7	0.0	0.9	0.7	11.2	0.1	2.1	0.0	6.5	9.8	0.0	10.1
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	7.9	0.0	9.6	3.2	15.1	1.4	2.7	0.0	10.2	9.1	0.0	17.0
LnGrp Delay(d),s/veh	41.9	0.0	31.3	26.7	49.6	30.3	34.4	0.0	46.8	36.4	0.0	44.5
LnGrp LOS	D		C	C	D	C	C		D	D		D
Approach Vol, veh/h		672			664			433			879	
Approach Delay, s/veh		36.1			42.8			43.7			41.2	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.8	32.6	12.5	45.0	10.0	45.4	19.5	38.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	23.0	31.0	9.0	47.0	6.0	48.0	19.0	37.0				
Max Q Clear Time (g_c+I1), s	18.3	21.2	8.5	21.0	7.3	34.4	15.1	28.3				
Green Ext Time (p_c), s	0.5	4.1	0.0	6.3	0.0	5.0	0.4	3.7				

Intersection Summary

HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D

HCM 2010 Roundabout
5: Kamehameha Ave & Maui Lani Pkwy

06/21/2017

Intersection

Intersection Delay, s/veh 49.5

Intersection LOS E

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	728	548	327	712
Demand Flow Rate, veh/h	743	559	333	726
Vehicles Circulating, veh/h	415	615	770	448
Vehicles Exiting, veh/h	759	488	388	726
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	55.9	44.8	21.7	59.3
Approach LOS	F	E	C	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	743	559	333	726
Cap Entry Lane, veh/h	746	611	523	722
Entry HV Adj Factor	0.980	0.980	0.981	0.981
Flow Entry, veh/h	728	548	327	712
Cap Entry, veh/h	732	599	513	708
V/C Ratio	0.996	0.915	0.636	1.006
Control Delay, s/veh	55.9	44.8	21.7	59.3
LOS	F	E	C	F
95th %tile Queue, veh	16	12	4	17

HCM 2010 TWSC
6: Waiale Rd & Waiinu Rd

06/21/2017

Intersection

Int Delay, s/veh 166.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	265	45	520	295	70	750
Future Vol, veh/h	265	45	520	295	70	750
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	145	-	-	-	-
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	288	49	565	321	76	815

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1693	726	0
Stage 1	726	-	-
Stage 2	967	-	-
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	~ 102	425	764
Stage 1	479	-	-
Stage 2	369	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 83	425	764
Mov Cap-2 Maneuver	~ 83	-	-
Stage 1	479	-	-
Stage 2	302	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 1043.3	0	0.9
HCM LOS	F		





















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	83	425	764	-
HCM Lane V/C Ratio	-	-	3.47	0.115	0.1	-
HCM Control Delay (s)	-	-	\$ 1218	14.6	10.2	0
HCM Lane LOS	-	-	F	B	B	A
HCM 95th %tile Q(veh)	-	-	29.3	0.4	0.3	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary
7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

06/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	15	10	145	20	130	5	720	155	115	760	30
Future Volume (veh/h)	15	15	10	145	20	130	5	720	155	115	760	30
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	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	16	16	1	158	22	112	5	783	160	125	826	19
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	184	170	355	216	27	122	298	864	176	244	1187	1009
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.00	0.58	0.58	0.07	0.64	0.64
Sat Flow, veh/h	617	757	1583	757	119	545	1774	1502	307	1774	1863	1583
Grp Volume(v), veh/h	32	0	1	292	0	0	5	0	943	125	826	19
Grp Sat Flow(s), veh/h/ln	1374	0	1583	1421	0	0	1774	0	1809	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.1	22.4	0.0	0.0	0.1	0.0	55.0	3.1	34.3	0.5
Cycle Q Clear(g_c), s	1.6	0.0	0.1	24.0	0.0	0.0	0.1	0.0	55.0	3.1	34.3	0.5
Prop In Lane	0.50		1.00	0.54		0.38	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	353	0	355	365	0	0	298	0	1040	244	1187	1009
V/C Ratio(X)	0.09	0.00	0.00	0.80	0.00	0.00	0.02	0.00	0.91	0.51	0.70	0.02
Avail Cap(c_a), veh/h	408	0	413	420	0	0	336	0	1065	246	1187	1009
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	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	35.8	45.7	0.0	0.0	13.6	0.0	22.4	24.8	14.0	7.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	11.6	0.7	2.3	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	0.8	0.0	0.0	10.2	0.0	0.0	0.1	0.0	30.6	2.5	18.2	0.2
LnGrp Delay(d),s/veh	36.4	0.0	35.8	53.6	0.0	0.0	13.6	0.0	34.0	25.5	16.3	7.9
LnGrp LOS	D		D	D			B		C	C	B	A
Approach Vol, veh/h		33			292			948			970	
Approach Delay, s/veh		36.4			53.6			33.9			17.3	
Approach LOS		D			D			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	11.9	74.4		32.6	4.5	81.8		32.6				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	70.0		31.0	3.0	75.0		31.0				
Max Q Clear Time (g_c+1), s	5.1	57.0		3.6	2.1	36.3		26.0				
Green Ext Time (p_c), s	0.0	11.3		1.4	0.0	32.1		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			29.3									
HCM 2010 LOS			C									

HCM 2010 TWSC
8: E Waiko Rd & Waiale Rd

06/21/2017

Intersection

Int Delay, s/veh 11.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	85	205	235	305	195	60
Future Vol, veh/h	85	205	235	305	195	60
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, %	2	2	2	2	2	2
Mvmt Flow	92	223	255	332	212	65

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	587	0	829
Stage 1	-	-	421
Stage 2	-	-	408
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
Pot Cap-1 Maneuver	988	-	340
Stage 1	-	-	662
Stage 2	-	-	671
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	988	-	304
Mov Cap-2 Maneuver	-	-	304
Stage 1	-	-	662
Stage 2	-	-	600

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	46.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	988	-	-	-	346
HCM Lane V/C Ratio	0.094	-	-	-	0.801
HCM Control Delay (s)	9	0	-	-	46.5
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.3	-	-	-	6.8

HCM 2010 TWSC
9: Waiale Rd & Ohana Hana Loop

06/21/2017

Intersection							
Int Delay, s/veh	0.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	↰	↱		↰	↰		
Traffic Vol, veh/h	15	10	20	350	235	20	
Future Vol, veh/h	15	10	20	350	235	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	50	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	16	11	22	380	255	22	

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	690	266	277	0	-	0
Stage 1	266	-	-	-	-	-
Stage 2	424	-	-	-	-	-
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	411	773	1286	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	402	773	1286	-	-	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1286	-	402	773	-	-
HCM Lane V/C Ratio	0.017	-	0.041	0.014	-	-
HCM Control Delay (s)	7.8	0	14.3	9.7	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

HCM 2010 TWSC
10: Waiale Rd & Nokekula Lp

06/21/2017

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	3			4	1	
Traffic Vol, veh/h	10	15	25	350	250	20
Future Vol, veh/h	10	15	25	350	250	20
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	16	27	380	272	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	718	283	293	0	-	0
Stage 1	283	-	-	-	-	-
Stage 2	435	-	-	-	-	-
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	396	756	1269	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	385	756	1269	-	-	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	635	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	546	-	-
HCM Lane V/C Ratio	0.021	-	0.05	-	-
HCM Control Delay (s)	7.9	0	11.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

HCM 2010 TWSC
11: Waiale Rd & Haawi St

06/21/2017

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	50	40	40	320	225	80
Future Vol, veh/h	50	40	40	320	225	80
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	54	43	43	348	245	87

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	723	288	332	0	-	0
Stage 1	288	-	-	-	-	-
Stage 2	435	-	-	-	-	-
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	393	751	1227	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	376	751	1227	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1227	-	483	-	-
HCM Lane V/C Ratio	0.035	-	0.203	-	-
HCM Control Delay (s)	8	0	14.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

HCM 2010 TWSC
12: Waiale Rd & Kokololio St

06/21/2017

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↰	↱
Traffic Vol, veh/h	60	10	15	355	295	75
Future Vol, veh/h	60	10	15	355	295	75
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	50	-	-	-	-
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	65	11	16	386	321	82

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	779	361	402	0	-	0
Stage 1	361	-	-	-	-	-
Stage 2	418	-	-	-	-	-
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	364	684	1157	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	357	684	1157	-	-	-
Mov Cap-2 Maneuver	357	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	652	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1157	-	357	684	-	-
HCM Lane V/C Ratio	0.014	-	0.183	0.016	-	-
HCM Control Delay (s)	8.2	0	17.3	10.3	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	0	-	-



APPENDIX C

























LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 AM
-

HCM 2010 Signalized Intersection Summary

1: Honoapiilani Hwy & Kehalani Pkwy

07/19/2017

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	225	440	30	190	110	260	545	10	40	395	110
Future Volume (veh/h)	330	225	440	30	190	110	260	545	10	40	395	110
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	1545	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	471	245	281	33	207	32	283	592	0	43	429	0
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.70	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, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	489	416	283	253	215	444	820	697	286	664	564
Arrive On Green	0.16	0.26	0.26	0.03	0.14	0.14	0.12	0.44	0.00	0.04	0.36	0.00
Sat Flow, veh/h	1472	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	471	245	281	33	207	32	283	592	0	43	429	0
Grp Sat Flow(s),veh/h/ln	1472	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	15.0	10.6	15.1	1.5	10.3	1.7	9.1	24.8	0.0	1.4	18.3	0.0
Cycle Q Clear(g_c), s	15.0	10.6	15.1	1.5	10.3	1.7	9.1	24.8	0.0	1.4	18.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	334	489	416	283	253	215	444	820	697	286	664	564
V/C Ratio(X)	1.41	0.50	0.68	0.12	0.82	0.15	0.64	0.72	0.00	0.15	0.65	0.00
Avail Cap(c_a), veh/h	334	489	416	508	470	399	605	959	815	595	959	815
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.0	29.8	31.5	33.7	40.0	36.3	17.4	21.9	0.0	19.6	25.6	0.0
Incr Delay (d2), s/veh	201.0	0.3	3.6	0.1	2.5	0.1	0.6	3.3	0.0	0.1	2.3	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	21.4	5.5	7.0	0.7	5.5	0.7	4.4	13.4	0.0	0.7	9.8	0.0
LnGrp Delay(d),s/veh	232.9	30.1	35.0	33.8	42.5	36.4	18.0	25.2	0.0	19.7	27.9	0.0
LnGrp LOS	F	C	D	C	D	D	B	C		B	C	
Approach Vol, veh/h		997			272			875			472	
Approach Delay, s/veh		127.3			40.7			22.8			27.1	
Approach LOS		F			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	47.9	7.9	31.0	16.4	39.9	20.0	18.9				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	3.4	26.8	3.5	17.1	11.1	20.3	17.0	12.3				
Green Ext Time (p_c), s	0.0	11.7	0.0	1.6	0.3	13.6	0.0	0.6				

Intersection Summary

HCM 2010 Ctrl Delay 65.3
 HCM 2010 LOS E

HCM 2010 Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

07/19/2017









												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	160	75	300	70	310	20	475	390	335	595	10
Future Volume (veh/h)	60	160	75	300	70	310	20	475	390	335	595	10
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	1909	1909	1909	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	65	174	36	326	76	179	22	516	0	364	647	7
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	220	210	410	442	582	256	659	822	409	874	811
Arrive On Green	0.04	0.12	0.12	0.17	0.24	0.24	0.01	0.35	0.00	0.13	0.47	0.47
Sat Flow, veh/h	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	65	174	36	326	76	179	22	516	0	364	647	7
Grp Sat Flow(s),veh/h/ln	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.6	7.5	1.7	13.3	2.7	6.8	0.7	21.0	0.0	10.8	23.9	0.2
Cycle Q Clear(g_c), s	2.6	7.5	1.7	13.3	2.7	6.8	0.7	21.0	0.0	10.8	23.9	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	220	210	410	442	582	256	659	822	409	874	811
V/C Ratio(X)	0.20	0.79	0.17	0.80	0.17	0.31	0.09	0.78	0.00	0.89	0.74	0.01
Avail Cap(c_a), veh/h	327	248	234	410	461	598	356	747	897	409	874	811
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	36.5	32.8	25.9	25.7	19.1	18.4	24.5	0.0	17.8	18.3	10.1
Incr Delay (d2), s/veh	0.3	12.3	0.1	10.4	0.1	0.1	0.1	6.2	0.0	20.3	4.1	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	1.3	4.7	0.8	7.6	1.4	3.0	0.3	11.9	0.0	7.4	13.2	0.1
LnGrp Delay(d),s/veh	31.5	48.8	33.0	36.2	25.8	19.2	18.4	30.7	0.0	38.1	22.4	10.1
LnGrp LOS	C	D	C	D	C	B	B	C		D	C	B
Approach Vol, veh/h	275			581			538			1018		
Approach Delay, s/veh	42.6			29.6			30.2			27.9		
Approach LOS	D			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	36.0	18.0	15.8	5.2	45.8	7.6	26.1				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	34.0	14.0	11.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+M2), s	23.0	15.3	9.5	2.7	25.9	4.6	8.8					
Green Ext Time (p_c), s	0.0	7.0	0.0	0.3	0.0	9.2	0.0	1.1				
Intersection Summary												
HCM 2010 Ctrl Delay	30.5											
HCM 2010 LOS	C											

HCM 2010 TWSC
3: Kuikahi Dr & Kehalani Village Dr

07/19/2017

Intersection

Int Delay, s/veh 7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	770	10	10	555	65	30	5	30	30	5	105
Future Vol, veh/h	80	770	10	10	555	65	30	5	30	30	5	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	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	87	837	11	11	603	71	33	5	33	33	5	114

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	674	0	0	848	0	0	1679	1712	842	1679	1682	639
Stage 1	-	-	-	-	-	-	1016	1016	-	660	660	-
Stage 2	-	-	-	-	-	-	663	696	-	1019	1022	-
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	917	-	-	790	-	-	75	90	364	75	94	476
Stage 1	-	-	-	-	-	-	287	315	-	452	460	-
Stage 2	-	-	-	-	-	-	450	443	-	286	313	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	917	-	-	790	-	-	50	80	364	59	84	476
Mov Cap-2 Maneuver	-	-	-	-	-	-	50	80	-	59	84	-
Stage 1	-	-	-	-	-	-	260	285	-	409	454	-
Stage 2	-	-	-	-	-	-	333	437	-	231	283	-
























Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	99.2	43.6
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	53	364	917	-	-	790	-	-	62	476
HCM Lane V/C Ratio	0.718	0.09	0.095	-	-	0.014	-	-	0.614	0.24
HCM Control Delay (s)	170.6	15.9	9.3	-	-	9.6	-	-	129.7	14.9
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	3	0.3	0.3	-	-	0	-	-	2.6	0.9

HCM 2010 Signalized Intersection Summary

4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

07/19/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	415	380	70	60	290	245	150	240	110	285	190	200
Future Volume (veh/h)	415	380	70	60	290	245	150	240	110	285	190	200
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	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	519	413	68	65	315	28	163	261	105	310	207	132
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.80	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	553	648	107	318	377	321	320	298	120	342	333	212
Arrive On Green	0.25	0.42	0.42	0.04	0.20	0.20	0.06	0.24	0.24	0.14	0.31	0.31
Sat Flow, veh/h	1774	1560	257	1774	1863	1583	1774	1264	509	1774	1064	679
Grp Volume(v), veh/h	519	0	481	65	315	28	163	0	366	310	0	339
Grp Sat Flow(s),veh/h/ln	1774	0	1817	1774	1863	1583	1774	0	1773	1774	0	1743
Q Serve(g_s), s	26.4	0.0	24.6	3.4	18.9	1.7	7.0	0.0	23.2	15.1	0.0	19.4
Cycle Q Clear(g_c), s	26.4	0.0	24.6	3.4	18.9	1.7	7.0	0.0	23.2	15.1	0.0	19.4
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.29	1.00		0.39
Lane Grp Cap(c), veh/h	553	0	755	318	377	321	320	0	418	342	0	545
V/C Ratio(X)	0.94	0.00	0.64	0.20	0.84	0.09	0.51	0.00	0.88	0.91	0.00	0.62
Avail Cap(c_a), veh/h	650	0	794	428	431	366	320	0	471	342	0	597
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	27.1	34.7	44.7	37.8	33.9	0.0	43.0	29.8	0.0	34.2
Incr Delay (d2), s/veh	19.8	0.0	1.6	0.3	12.0	0.1	1.3	0.0	15.5	26.7	0.0	1.7
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	19.3	0.0	12.6	1.7	11.0	0.7	1.3	0.0	13.2	9.9	0.0	9.6
LnGrp Delay(d),s/veh	47.1	0.0	28.7	35.0	56.7	37.9	35.2	0.0	58.5	56.5	0.0	36.0
LnGrp LOS	D		C	D	E	D	D		E	E		D
Approach Vol, veh/h	1000			408			529			649		
Approach Delay, s/veh	38.3			52.0			51.3			45.8		
Approach LOS	D			D			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	33.5	8.8	54.5	11.0	42.5	33.6	29.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	31.0	12.0	51.0	7.0	40.0	36.0	27.0				
Max Q Clear Time (g_c+I1), s	17.1	25.2	5.4	26.6	9.0	21.4	28.4	20.9				
Green Ext Time (p_c), s	0.0	2.3	0.1	5.9	0.0	4.6	1.2	2.7				
Intersection Summary												
HCM 2010 Ctrl Delay				45.0								
HCM 2010 LOS				D								

HCM 2010 Roundabout
5: Kamehameha Ave & Maui Lani Pkwy

07/19/2017

Intersection

Intersection Delay, s/veh 52.6

Intersection LOS F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	543	412	604	707
Demand Flow Rate, veh/h	553	420	617	722
Vehicles Circulating, veh/h	494	754	587	515
Vehicles Exiting, veh/h	743	450	460	659
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	27.3	32.1	57.7	79.6
Approach LOS	D	D	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	553	420	617	722
Cap Entry Lane, veh/h	689	532	628	675
Entry HV Adj Factor	0.981	0.980	0.979	0.979
Flow Entry, veh/h	543	412	604	707
Cap Entry, veh/h	676	521	615	661
V/C Ratio	0.802	0.790	0.982	1.069
Control Delay, s/veh	27.3	32.1	57.7	79.6
LOS	D	D	F	F
95th %tile Queue, veh	8	7	14	19

HCM 2010 TWSC
6: Waiale Rd & Waiinu Rd

07/19/2017

Intersection

Int Delay, s/veh 110.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰
Traffic Vol, veh/h	225	45	590	720	45	580
Future Vol, veh/h	225	45	590	720	45	580
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	145	-	-	-	-
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	245	49	641	783	49	630

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1761	1033	0
Stage 1	1033	-	-
Stage 2	728	-	-
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	~ 93	282	478
Stage 1	343	-	-
Stage 2	478	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 78	282	478
Mov Cap-2 Maneuver	~ 78	-	-
Stage 1	343	-	-
Stage 2	402	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 899.8	0	1
HCM LOS	F		





















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	78	282	478	-
HCM Lane V/C Ratio	-	-	3.135	0.173	0.102	-
HCM Control Delay (s)	-	\$	1075.7	20.4	13.4	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	24.6	0.6	0.3	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

07/19/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	10	95	5	55	5	655	105	170	775	10
Future Volume (veh/h)	30	20	10	95	5	55	5	655	105	170	775	10
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	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	33	22	1	103	5	31	5	712	109	185	842	7
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	143	313	257	20	58	279	822	126	334	1136	966
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.52	0.52	0.09	0.61	0.61
Sat Flow, veh/h	865	724	1583	926	103	295	1774	1578	242	1774	1863	1583
Grp Volume(v), veh/h	55	0	1	139	0	0	5	0	821	185	842	7
Grp Sat Flow(s), veh/h/ln	1590	0	1583	1324	0	0	1774	0	1820	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.0	6.6	0.0	0.0	0.1	0.0	33.5	3.6	27.4	0.1
Cycle Q Clear(g_c), s	2.2	0.0	0.0	8.8	0.0	0.0	0.1	0.0	33.5	3.6	27.4	0.1
Prop In Lane	0.60		1.00	0.74		0.22	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	383	0	313	336	0	0	279	0	948	334	1136	966
V/C Ratio(X)	0.14	0.00	0.00	0.41	0.00	0.00	0.02	0.00	0.87	0.55	0.74	0.01
Avail Cap(c_a), veh/h	512	0	447	457	0	0	606	0	948	503	1136	966
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	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	27.4	31.3	0.0	0.0	11.9	0.0	17.8	16.4	11.8	6.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	10.5	0.5	4.4	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	1.1	0.0	0.0	3.0	0.0	0.0	0.1	0.0	19.4	2.4	15.2	0.1
LnGrp Delay(d),s/veh	28.2	0.0	27.4	31.6	0.0	0.0	12.0	0.0	28.2	16.9	16.2	6.5
LnGrp LOS	C		C	C			B		C	B	B	A
Approach Vol, veh/h	56			139			826			1034		
Approach Delay, s/veh	28.2			31.6			28.1			16.2		
Approach LOS	C			C			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	11.9	50.3		22.8	4.3	57.8		22.8				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+I1), s	5.6	35.5		4.2	2.1	29.4		10.8				
Green Ext Time (p_c), s	0.2	0.0		0.7	0.0	0.0		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				22.4								
HCM 2010 LOS				C								

HCM 2010 TWSC
8: E Waiko Rd & Waiale Rd

07/19/2017

Intersection

Int Delay, s/veh 15.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	70	235	75	105	295	85
Future Vol, veh/h	70	235	75	105	295	85
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, %	2	2	2	2	2	2
Mvmt Flow	76	255	82	114	321	92

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	196	0	547
Stage 1	-	-	139
Stage 2	-	-	408
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
Pot Cap-1 Maneuver	1377	-	498
Stage 1	-	-	888
Stage 2	-	-	671
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1377	-	466
Mov Cap-2 Maneuver	-	-	466
Stage 1	-	-	888
Stage 2	-	-	628

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	33
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1377	-	-	-	523
HCM Lane V/C Ratio	0.055	-	-	-	0.79
HCM Control Delay (s)	7.8	0	-	-	33
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	7.3

HCM 2010 TWSC
9: Waiale Rd & Ohana Hana Loop

07/19/2017

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	20	25	10	165	345	10
Future Vol, veh/h	20	25	10	165	345	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	50	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	27	11	179	375	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	581	380	386	0	-	0
Stage 1	380	-	-	-	-	-
Stage 2	201	-	-	-	-	-
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	476	667	1172	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	471	667	1172	-	-	-
Mov Cap-2 Maneuver	471	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	825	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1172	-	471	667	-	-
HCM Lane V/C Ratio	0.009	-	0.046	0.041	-	-
HCM Control Delay (s)	8.1	0	13	10.6	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM 2010 TWSC
10: Waiale Rd & Nokekula Lp

07/19/2017

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖			↗	↖	
Traffic Vol, veh/h	25	20	5	180	325	10
Future Vol, veh/h	25	20	5	180	325	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	27	22	5	196	353	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	566	359	364	0	-	0
Stage 1	359	-	-	-	-	-
Stage 2	207	-	-	-	-	-
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	486	685	1195	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	484	685	1195	-	-	-
Mov Cap-2 Maneuver	484	-	-	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	824	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1195	-	557	-	-
HCM Lane V/C Ratio	0.005	-	0.088	-	-
HCM Control Delay (s)	8	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

HCM 2010 TWSC
11: Waiale Rd & Haawi St

07/19/2017

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	75	80	15	190	260	35
Future Vol, veh/h	75	80	15	190	260	35
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	82	87	16	207	283	38

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	541	302	321 0
Stage 1	302	-	-
Stage 2	239	-	-
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	502	738	1239 -
Stage 1	750	-	-
Stage 2	801	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	494	738	1239 -
Mov Cap-2 Maneuver	494	-	-
Stage 1	750	-	-
Stage 2	789	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1239	-	596	-	-
HCM Lane V/C Ratio	0.013	-	0.283	-	-
HCM Control Delay (s)	7.9	0	13.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

HCM 2010 TWSC
12: Waiale Rd & Kokololio St

07/19/2017

Intersection

Int Delay, s/veh 2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	1	1	1	1	1	1
Traffic Vol, veh/h	100	25	5	260	270	35
Future Vol, veh/h	100	25	5	260	270	35
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	50	-	-	-	-
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	109	27	5	283	293	38

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	606	313	332
Stage 1	313	-	-
Stage 2	293	-	-
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	460	727	1227
Stage 1	741	-	-
Stage 2	757	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	458	727	1227
Mov Cap-2 Maneuver	458	-	-
Stage 1	741	-	-
Stage 2	753	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1227	-	458	727	-	-
HCM Lane V/C Ratio	0.004	-	0.237	0.037	-	-
HCM Control Delay (s)	7.9	0	15.3	10.1	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.9	0.1	-	-

HCM 2010 TWSC
13: Waiale Rd & Project Access II

07/19/2017

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	20	10	5	380	290	5
Future Vol, veh/h	20	10	5	380	290	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	-	50	-	-	-
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	11	5	413	315	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	742	318	321	0	-	0
Stage 1	318	-	-	-	-	-
Stage 2	424	-	-	-	-	-
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	383	723	1239	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	381	723	1239	-	-	-
Mov Cap-2 Maneuver	381	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	657	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1239	-	452	-	-
HCM Lane V/C Ratio	0.004	-	0.072	-	-
HCM Control Delay (s)	7.9	-	13.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 2010 TWSC
14: Waiale Rd & Project Access I

07/19/2017

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰		↰	↱	↱	
Traffic Vol, veh/h	20	10	5	395	290	10
Future Vol, veh/h	20	10	5	395	290	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	-	50	-	-	-
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	11	5	429	315	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	761	321	326	0	-	0
Stage 1	321	-	-	-	-	-
Stage 2	440	-	-	-	-	-
Critical Hdwy	7.12	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	322	720	1234	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	321	720	1234	-	-	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1234	-	394	-	-
HCM Lane V/C Ratio	0.004	-	0.083	-	-
HCM Control Delay (s)	7.9	-	15	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-



APPENDIX C

























LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 PM
-

HCM 2010 Signalized Intersection Summary

























1: Honoapiilani Hwy & Kehalani Pkwy

07/19/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	95	170	15	125	75	200	490	25	100	585	270
Future Volume (veh/h)	125	95	170	15	125	75	200	490	25	100	585	270
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	136	103	185	16	136	82	217	533	0	109	636	0
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	333	283	266	207	176	367	877	746	415	810	689
Arrive On Green	0.09	0.18	0.18	0.02	0.11	0.11	0.09	0.47	0.00	0.06	0.43	0.00
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	136	103	185	16	136	82	217	533	0	109	636	0
Grp Sat Flow(s), veh/h/ln	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	5.2	3.8	8.7	0.6	5.6	3.9	5.3	17.0	0.0	2.7	23.5	0.0
Cycle Q Clear(g_c), s	5.2	3.8	8.7	0.6	5.6	3.9	5.3	17.0	0.0	2.7	23.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	333	283	266	207	176	367	877	746	415	810	689
V/C Ratio(X)	0.46	0.31	0.65	0.06	0.66	0.47	0.59	0.61	0.00	0.26	0.79	0.00
Avail Cap(c_a), veh/h	473	558	474	565	558	474	645	907	771	757	907	771
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.6	28.6	30.6	30.6	34.1	33.4	14.9	15.7	0.0	12.4	19.4	0.0
Incr Delay (d2), s/veh	0.4	0.2	1.0	0.0	1.3	0.7	0.6	1.8	0.0	0.1	5.2	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	2.6	2.0	3.9	0.3	2.9	1.7	2.6	9.0	0.0	1.3	13.2	0.0
LnGrp Delay(d),s/veh	27.0	28.8	31.5	30.6	35.5	34.1	15.5	17.5	0.0	12.6	24.6	0.0
LnGrp LOS	C	C	C	C	D	C	B	B		B	C	
Approach Vol, veh/h		424			234			750			745	
Approach Delay, s/veh		29.4			34.7			16.9			22.9	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	43.7	6.5	20.3	12.4	40.8	11.9	14.9				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0				
Max Q Clear Time (g_c+1), s	4.7	19.0	2.6	10.7	7.3	25.5	7.2	7.6				
Green Ext Time (p_c), s	0.1	12.6	0.0	1.2	0.2	9.4	0.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			23.4									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

07/19/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	95	35	465	150	295	50	425	420	265	505	40
Future Volume (veh/h)	15	95	35	465	150	295	50	425	420	265	505	40
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	1909	1909	1909	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	16	103	38	505	163	321	54	462	0	288	549	43
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	148	178	576	599	714	265	557	883	377	738	651
Arrive On Green	0.01	0.08	0.08	0.26	0.32	0.32	0.03	0.30	0.00	0.13	0.40	0.40
Sat Flow, veh/h	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	16	103	38	505	163	321	54	462	0	288	549	43
Grp Sat Flow(s),veh/h/ln	1818	1909	1623	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	0.7	4.5	1.8	21.6	5.5	11.9	1.8	19.7	0.0	9.0	21.4	1.4
Cycle Q Clear(g_c), s	0.7	4.5	1.8	21.6	5.5	11.9	1.8	19.7	0.0	9.0	21.4	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	148	178	576	599	714	265	557	883	377	738	651
V/C Ratio(X)	0.08	0.70	0.21	0.88	0.27	0.45	0.20	0.83	0.00	0.76	0.74	0.07
Avail Cap(c_a), veh/h	396	202	224	576	599	714	333	614	932	377	738	651
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	38.2	34.5	24.7	21.4	16.1	20.7	27.8	0.0	19.0	22.0	15.2
Incr Delay (d2), s/veh	0.2	2.7	0.2	14.2	0.1	0.2	0.1	10.2	0.0	8.1	4.9	0.1
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	0.4	2.5	0.8	12.8	2.9	5.2	0.9	11.6	0.0	5.2	12.0	0.6
LnGrp Delay(d),s/veh	35.5	40.9	34.7	39.0	21.5	16.2	20.8	38.0	0.0	27.2	26.9	15.2
LnGrp LOS	D	D	C	D	C	B	C	D		C	C	B
Approach Vol, veh/h	157			989			516			880		
Approach Delay, s/veh	38.8			28.7			36.2			26.4		
Approach LOS	D			C			D			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.4	26.0	12.6	6.7	39.7	5.3	33.3					
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	28.0	22.0	9.0	6.0	33.0	10.0	21.0					
Max Q Clear Time (g_c+ff), s	21.7	23.6	6.5	3.8	23.4	2.7	13.9					
Green Ext Time (p_c), s	0.0	3.7	0.0	0.1	0.0	6.5	0.0	1.1				

Intersection Summary

HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

HCM 2010 TWSC

3: Kuikahi Dr & Kehalani Village Dr

07/19/2017

Intersection

Int Delay, s/veh 14.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑			↑	↱		↑	↱
Traffic Vol, veh/h	135	575	30	30	660	90	15	5	15	45	5	185
Future Vol, veh/h	135	575	30	30	660	90	15	5	15	45	5	185
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	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	147	625	33	33	717	98	16	5	16	49	5	201
























Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	815	0	0	658	0	0	1769	1815	641	1770	1783	766
Stage 1	-	-	-	-	-	-	935	935	-	832	832	-
Stage 2	-	-	-	-	-	-	834	880	-	938	951	-
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	812	-	-	930	-	-	65	78	475	65	82	403
Stage 1	-	-	-	-	-	-	318	344	-	363	384	-
Stage 2	-	-	-	-	-	-	362	365	-	317	338	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	812	-	-	930	-	-	26	62	475	49	65	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	62	-	49	65	-
Stage 1	-	-	-	-	-	-	260	282	-	297	370	-
Stage 2	-	-	-	-	-	-	172	352	-	246	277	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	159.9	78.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	30	475	812	-	-	930	-	-	50	403
HCM Lane V/C Ratio	0.725	0.034	0.181	-	-	0.035	-	-	1.087	0.499
HCM Control Delay (s)	270.3	12.8	10.4	-	-	9	-	-	285.2	22.5
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	2.4	0.1	0.7	-	-	0.1	-	-	4.8	2.7

HCM 2010 Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

07/19/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	270	80	140	420	285	105	225	100	325	265	280
Future Volume (veh/h)	280	270	80	140	420	285	105	225	100	325	265	280
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	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	304	293	75	152	457	60	114	245	96	353	288	249
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	0
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	490	125	374	525	447	208	307	120	418	327	282
Arrive On Green	0.14	0.34	0.34	0.08	0.28	0.28	0.05	0.24	0.24	0.17	0.35	0.35
Sat Flow, veh/h	1774	1432	366	1774	1863	1583	1774	1275	500	1774	923	798
Grp Volume(v), veh/h	304	0	368	152	457	60	114	0	341	353	0	537
Grp Sat Flow(s),veh/h/ln	1774	0	1798	1774	1863	1583	1774	0	1775	1774	0	1722
Q Serve(g_s), s	13.3	0.0	19.4	6.9	26.7	3.2	5.6	0.0	20.7	16.4	0.0	33.5
Cycle Q Clear(g_c), s	13.3	0.0	19.4	6.9	26.7	3.2	5.6	0.0	20.7	16.4	0.0	33.5
Prop In Lane	1.00		0.20	1.00		1.00	1.00		0.28	1.00		0.46
Lane Grp Cap(c), veh/h	349	0	615	374	525	447	208	0	428	418	0	609
V/C Ratio(X)	0.87	0.00	0.60	0.41	0.87	0.13	0.55	0.00	0.80	0.84	0.00	0.88
Avail Cap(c_a), veh/h	400	0	739	377	602	512	208	0	481	482	0	722
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	31.1	26.5	39.1	30.6	32.7	0.0	40.8	26.9	0.0	34.7
Incr Delay (d2), s/veh	16.9	0.0	0.9	0.7	11.8	0.1	3.0	0.0	8.3	11.6	0.0	10.9
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	8.1	0.0	9.8	3.4	15.4	1.4	2.9	0.0	11.1	9.3	0.0	17.8
LnGrp Delay(d),s/veh	43.5	0.0	32.1	27.2	50.9	30.8	35.6	0.0	49.0	38.5	0.0	45.7
LnGrp LOS	D		C	C	D	C	D		D	D		D
Approach Vol, veh/h	672			669			455			890		
Approach Delay, s/veh	37.2			43.7			45.7			42.8		
Approach LOS	D			D			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.9	33.6	12.8	45.1	10.0	46.5	19.7	38.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	23.0	31.0	9.0	47.0	6.0	48.0	19.0	37.0				
Max Q Clear Time (g_c+I1), s	18.4	22.7	8.9	21.4	7.6	35.5	15.3	28.7				
Green Ext Time (p_c), s	0.5	3.8	0.0	6.3	0.0	4.9	0.3	3.6				
Intersection Summary												
HCM 2010 Ctrl Delay				42.1								
HCM 2010 LOS				D								

HCM 2010 Roundabout
5: Kamehameha Ave & Maui Lani Pkwy

07/19/2017

Intersection

Intersection Delay, s/veh 51.8

Intersection LOS F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	733	554	327	717
Demand Flow Rate, veh/h	748	565	333	731
Vehicles Circulating, veh/h	415	620	775	454
Vehicles Exiting, veh/h	770	488	388	731
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	57.6	47.6	21.9	62.9
Approach LOS	F	E	C	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	748	565	333	731
Cap Entry Lane, veh/h	746	608	521	718
Entry HV Adj Factor	0.981	0.980	0.981	0.981
Flow Entry, veh/h	733	554	327	717
Cap Entry, veh/h	732	596	510	704
V/C Ratio	1.002	0.930	0.640	1.019
Control Delay, s/veh	57.6	47.6	21.9	62.9
LOS	F	E	C	F
95th %tile Queue, veh	17	12	4	17

HCM 2010 TWSC
6: Waiale Rd & Waiinu Rd

07/19/2017

Intersection

Int Delay, s/veh 175.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	1	1	1	1	1	1
Traffic Vol, veh/h	270	45	525	295	70	755
Future Vol, veh/h	270	45	525	295	70	755
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	145	-	-	-	-
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	293	49	571	321	76	821

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1704	731	0 0 891 0
Stage 1	731	-	- - - -
Stage 2	973	-	- - - -
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	~ 101	422	- - 761 -
Stage 1	476	-	- - - -
Stage 2	366	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	~ 82	422	- - 761 -
Mov Cap-2 Maneuver	~ 82	-	- - - -
Stage 1	476	-	- - - -
Stage 2	299	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	\$ 1088.5	0	0.9
HCM LOS	F		





















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	82	422	761	-
HCM Lane V/C Ratio	-	-	3.579	0.116	0.1	-
HCM Control Delay (s)	-	\$	1267.5	14.6	10.3	0
HCM Lane LOS	-	-	F	B	B	A
HCM 95th %tile Q(veh)	-	-	30.1	0.4	0.3	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

07/19/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	15	10	145	20	130	5	720	160	115	760	30
Future Volume (veh/h)	15	15	10	145	20	130	5	720	160	115	760	30
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	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	16	16	1	158	22	112	5	783	166	125	826	19
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	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	2	2	2	2	2	2	2	2	2
Cap, veh/h	184	170	355	216	27	122	298	858	182	240	1188	1009
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.00	0.58	0.58	0.07	0.64	0.64
Sat Flow, veh/h	617	757	1583	757	119	545	1774	1491	316	1774	1863	1583
Grp Volume(v), veh/h	32	0	1	292	0	0	5	0	949	125	826	19
Grp Sat Flow(s), veh/h/ln	1374	0	1583	1421	0	0	1774	0	1807	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.1	22.4	0.0	0.0	0.1	0.0	55.9	3.1	34.4	0.5
Cycle Q Clear(g_c), s	1.6	0.0	0.1	24.0	0.0	0.0	0.1	0.0	55.9	3.1	34.4	0.5
Prop In Lane	0.50		1.00	0.54		0.38	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	353	0	355	365	0	0	298	0	1039	240	1188	1009
V/C Ratio(X)	0.09	0.00	0.00	0.80	0.00	0.00	0.02	0.00	0.91	0.52	0.70	0.02
Avail Cap(c_a), veh/h	408	0	413	419	0	0	336	0	1063	242	1188	1009
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	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	35.8	45.7	0.0	0.0	13.6	0.0	22.6	25.2	14.0	7.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	12.2	0.9	2.3	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	0.8	0.0	0.0	10.2	0.0	0.0	0.1	0.0	31.2	2.5	18.2	0.2
LnGrp Delay(d),s/veh	36.5	0.0	35.8	53.7	0.0	0.0	13.7	0.0	34.9	26.1	16.3	7.9
LnGrp LOS	D		D	D			B		C	C	B	A
Approach Vol, veh/h		33			292			954			970	
Approach Delay, s/veh		36.5			53.7			34.7			17.4	
Approach LOS		D			D			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	11.9	74.4		32.7	4.5	81.8		32.7				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	70.0		31.0	3.0	75.0		31.0				
Max Q Clear Time (g_c+I1), s	5.1	57.9		3.6	2.1	36.4		26.0				
Green Ext Time (p_c), s	0.0	10.5		1.4	0.0	32.2		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			29.8									
HCM 2010 LOS			C									

HCM 2010 TWSC
8: E Waiko Rd & Waiale Rd

07/19/2017

Intersection

Int Delay, s/veh 13.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4	4		4	
Traffic Vol, veh/h	90	205	235	310	200	65
Future Vol, veh/h	90	205	235	310	200	65
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, %	2	2	2	2	2	2
Mvmt Flow	98	223	255	337	217	71

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	592	0	842
Stage 1	-	-	424
Stage 2	-	-	418
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
Pot Cap-1 Maneuver	984	-	334
Stage 1	-	-	660
Stage 2	-	-	664
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	984	-	296
Mov Cap-2 Maneuver	-	-	296
Stage 1	-	-	660
Stage 2	-	-	588

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	53.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	984	-	-	-	340
HCM Lane V/C Ratio	0.099	-	-	-	0.847
HCM Control Delay (s)	9.1	0	-	-	53.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	7.6

HCM 2010 TWSC
9: Waiale Rd & Ohana Hana Loop

07/19/2017

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	15	10	20	380	250	20
Future Vol, veh/h	15	10	20	380	250	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	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	16	11	22	413	272	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	740	283	293	0	-	0
Stage 1	283	-	-	-	-	-
Stage 2	457	-	-	-	-	-
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	384	756	1269	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	376	756	1269	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1269	-	376	756	-	-
HCM Lane V/C Ratio	0.017	-	0.043	0.014	-	-
HCM Control Delay (s)	7.9	0	15	9.8	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

HCM 2010 TWSC
10: Waiale Rd & Nokekula Lp

07/19/2017

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰			↱	↰	
Traffic Vol, veh/h	10	15	25	355	255	20
Future Vol, veh/h	10	15	25	355	255	20
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	16	27	386	277	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	728	288	299	0	-	0
Stage 1	288	-	-	-	-	-
Stage 2	440	-	-	-	-	-
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	390	751	1262	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	379	751	1262	-	-	-
Mov Cap-2 Maneuver	379	-	-	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	631	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1262	-	539	-	-
HCM Lane V/C Ratio	0.022	-	0.05	-	-
HCM Control Delay (s)	7.9	0	12	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

HCM 2010 TWSC
11: Waiale Rd & Haawi St

07/19/2017

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	50	40	40	330	230	80
Future Vol, veh/h	50	40	40	330	230	80
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	54	43	43	359	250	87

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	739	293	337	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	446	-	-	-	-	-
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	385	746	1222	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	368	746	1222	-	-	-
Mov Cap-2 Maneuver	368	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	617	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.5	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1222	-	475	-	-
HCM Lane V/C Ratio	0.036	-	0.206	-	-
HCM Control Delay (s)	8.1	0	14.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

HCM 2010 TWSC
12: Waiale Rd & Kokololio St

07/19/2017

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	1	1		1	1	
Traffic Vol, veh/h	60	10	15	365	300	75
Future Vol, veh/h	60	10	15	365	300	75
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	50	-	-	-	-
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	65	11	16	397	326	82

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	796	367	408	0	-	0
Stage 1	367	-	-	-	-	-
Stage 2	429	-	-	-	-	-
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	356	678	1151	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	350	678	1151	-	-	-
Mov Cap-2 Maneuver	350	-	-	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1151	-	350	678	-	-
HCM Lane V/C Ratio	0.014	-	0.186	0.016	-	-
HCM Control Delay (s)	8.2	0	17.6	10.4	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	0	-	-

HCM 2010 TWSC
13: Waiale Rd & Project Access II

07/19/2017

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰		↰	↱	↱	
Traffic Vol, veh/h	10	5	10	415	395	20
Future Vol, veh/h	10	5	10	415	395	20
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	-	50	-	-	-
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	5	11	451	429	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	913	440	451
Stage 1	440	-	-
Stage 2	473	-	-
Critical Hdwy	7.12	6.22	4.12
Critical Hdwy Stg 1	6.12	-	-
Critical Hdwy Stg 2	6.12	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	254	617	1109
Stage 1	596	-	-
Stage 2	572	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	252	617	1109
Mov Cap-2 Maneuver	252	-	-
Stage 1	590	-	-
Stage 2	566	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1109	-	314	-	-
HCM Lane V/C Ratio	0.01	-	0.052	-	-
HCM Control Delay (s)	8.3	-	17.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 2010 TWSC
14: Waiale Rd & Project Access I

07/19/2017

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	15	10	10	425	395	20
Future Vol, veh/h	15	10	10	425	395	20
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	-	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	16	11	11	462	429	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	924	440	451	0	-	0
Stage 1	440	-	-	-	-	-
Stage 2	484	-	-	-	-	-
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	299	617	1109	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	296	617	1109	-	-	-
Mov Cap-2 Maneuver	296	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	614	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	15.4		0.2		0
HCM LOS	C				

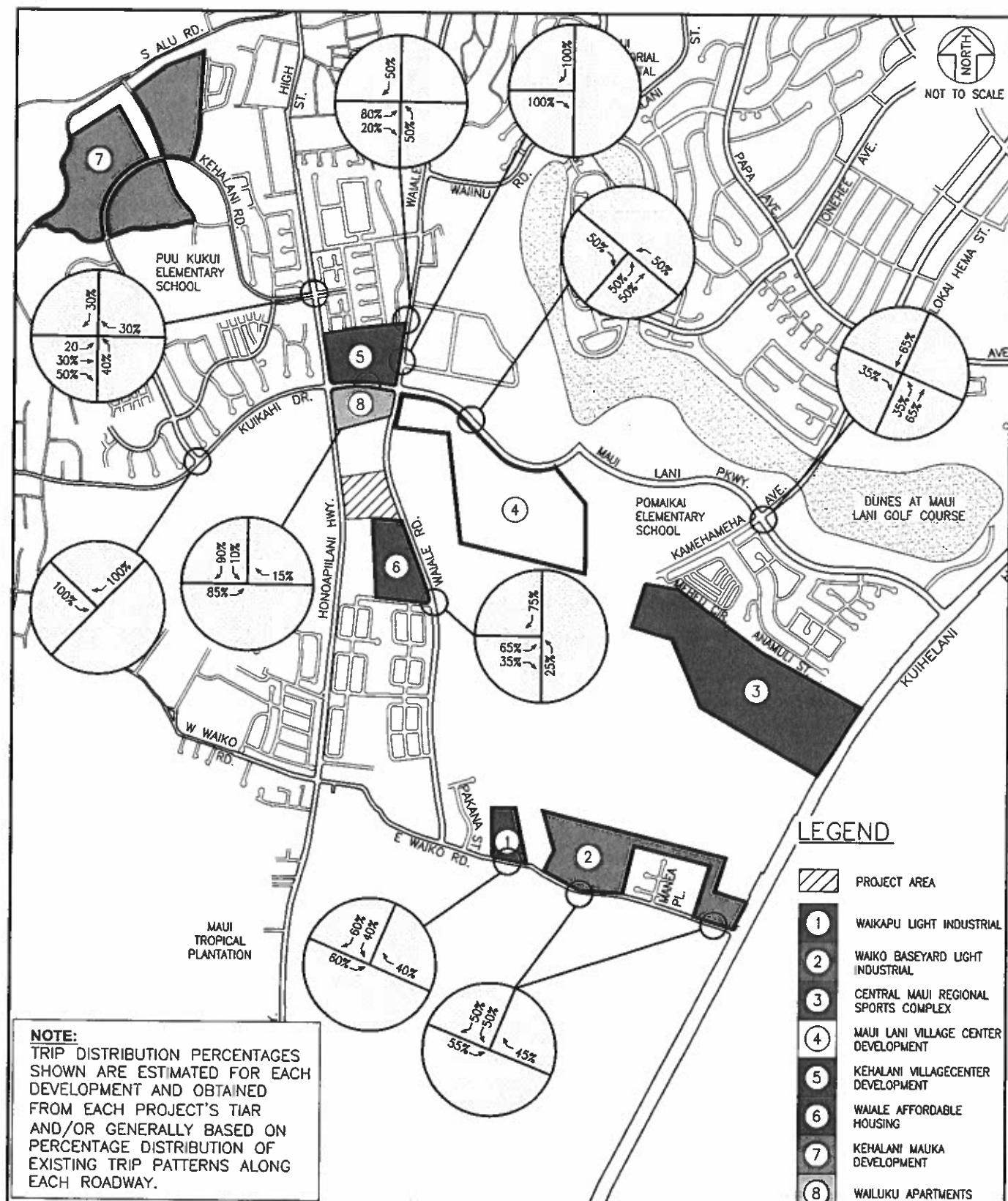
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1109	-	374	-	-
HCM Lane V/C Ratio	0.01	-	0.073	-	-
HCM Control Delay (s)	8.3	-	15.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



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APPENDIX D

BACKGROUND PROJECT TRIPS



WAIKAPU 201-H
AFFORDABLE HOUSING

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

**DISTRIBUTION OF BACKGROUND DEVELOPMENT
TRIPS IN PROJECT VICINITY**

FIGURE

D

Appendix I

Biological Resources Survey

BIOLOGICAL RESOURCES SURVEY
for the
WAIKAPŪ DEVELOPMENT VENTURE 201-H
WAIKAPŪ, MAUI, HAWAII

by
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July 2017

Prepared for:
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FLORA AND FAUNA SURVEY
WAIKAPŪ DEVELOPMENT VENTURE 201-H
WAIKAPU, MAUI, HAWAII

INTRODUCTION

The Waikapū Development Venture 201-H project is located between Wailuku and Waikapū in Central Maui. It lies between Honoapiilani Highway and Waiale Road, and encompasses 12.50 acres of undeveloped land, TMK (2) 3-5-02:011 (see figure 1). This biological resources study of the project area was initiated by the owners in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

The project area lies on gently sloping land on the lower eastern slopes of the West Maui Mountains. The vegetation consists of dense grassland with scattered shrubs and small trees. Elevations range between 370 and 390 feet above sea level. The soil is characterized as Iao silty clay, 0 – 3% slopes (IaA) with moderate amounts of windblown sand intermixed (Foote et al, 1972). Rainfall averages 25 inches per year with winter maximums, (Armstrong, 1983).

BIOLOGICAL HISTORY

The original vegetation in this area consisted of a dense low statured native forest and shrubland with such components as 'ōhi'a (*Metrosideros polymorpha*), 'a'ali'i (*Dodonaea viscosa*), olopua (*Nestegis sandwicensis*), lama (*Diospyros sandwicensis*), halapepe (*Chrysodracon auwahiensis*), and a variety of ferns, vines and herbaceous plants.

Hawaiians lived in the area for several centuries, farming in the valley bottoms and lowlands and utilizing forest plants for food, construction materials, tools, fiber and medicines. They altered the landscape somewhat through cultivation and burning. This area is situated on farming lands that were irrigated with waters from the ancient Kama Ditch.

During the mid-1800's this area was cleared for sugar cane agriculture and the area was plowed, planted, burned and harvested in continuous cycles for over 100 years. Native ecosystems were replaced by sugar cane and increasing numbers of agricultural weeds.

When sugar production ended in the 1990s this area was converted to cattle grazing. All of these practices, along with recent fires that have swept through the grass lands, have resulted in an environment that is now nearly totally lacking in native plants and animal species.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the proposed Waikapū Development Venture 201-H Affordable Housing project which was conducted in July 2017. 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 covering the entire project area. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

A special focus was on identifying any native species and ascertaining if there were any Endangered or Threatened species (USFWS, 2017) that would require special focus. A complete plant species list is presented herein.

DESCRIPTION OF THE VEGETATION

The vegetation in the project area is dominated by two non-native species: Guinea grass (*Megathyrsus maximus*) which can grow in dense stands to eight feet deep, and glycine (*Neonotonia wightii*), a twining vine that forms tangles of growth over and through other vegetation. Also common were koa haole (*Leucaena leucocephala*), 'opiuma (*Pithecellobium dulce*) and marunggay (*Moringa oleifera*).

A total of 48 plant species were recorded during the survey during two site visits to the project area. Just one common indigenous native plant species was found, the widespread 'uhaloa (*Waltheria indica*). The remaining 47 plants were all non-native pasture plants or agricultural weeds.

DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the project area is dominated by non-native species that are of no particular environmental interest or concern. Just one common indigenous plant, 'uhaloa was found growing in the area. No federally listed Endangered or Threatened plant species (USFWS, 2017) were found, nor do any plants that are candidates for such status occur on the project area. No special plant habitats occur on or near the project and no potential wetlands occur in this dry upland site.

This project is not expected to have any significant negative impacts on the botanical resources in this part of West Maui. No recommendations regarding botanical resources are deemed necessary or appropriate.

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 (Monocots and Dicots) 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).

Polynesian = all those plants brought to Hawaii during the course of Polynesian migrations

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			
POACEAE (Grass Family)			
<i>Cenchrus ciliaris</i> L.	buffelgrass	non-native	uncommon
<i>Cenchrus purpureus</i> (Schumach.) Morrone	Napier grass	non-native	uncommon
<i>Chloris barbata</i> (L.) Sw.	swollen fingergrass	non-native	rare
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	non-native	rare
<i>Eragrostis pectinacea</i> (Michx.) Nees	Carolina lovegrass	non-native	rare
<i>Megathyrsus maximus</i> (Jacq.) Simon & Jacobs	Guinea grass	non-native	abundant
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	non-native	rare
DICOTS			
ANACARDIACEAE (Mango Family)			
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	non-native	uncommon
APOCYNACEAE (Dogbane Family)			
<i>Asclepias physocarpa</i> (E. Mey.) Schlechter	balloon plant	non-native	rare
ASTERACEAE (Sunflower Family)			
<i>Conyza bonariensis</i> (L.) Cronq.	hairy horseweed	non-native	uncommon
<i>Conyza canadensis</i> (L.) Cronq.	horseweed	non-native	rare
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	non-native	rare
<i>Senecio madagascariensis</i> Poir.	fireweed	non-native	rare
<i>Tridax procumbens</i> L.	coat buttons	non-native	uncommon
<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.	golden crown-beard	non-native	uncommon
BIGNONIACEAE (Bignonia Family)			
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	non-native	uncommon
BORAGINACEAE (Borage Family)			
<i>Heliotropium procumbens</i> Mill.	fourspike heliotrope	non-native	rare
COMBRETACEAE (Combretum Family)			
<i>Terminalia catappa</i> L.	Indian almond	non-native	uncommon
CUCURBITACEAE (Gourd Family)			
<i>Momordica charantia</i> L.	bitter melon	non-native	rare
EUPHORBIACEAE (Spurge Family)			
<i>Euphorbia hypericifolia</i> L.	graceful spurge	non-native	rare
<i>Macaranga tanarius</i> (L.) Mull. Arg.	parasol leaf tree	non-native	uncommon
<i>Ricinus communis</i> L.	Castor bean	non-native	uncommon
FABACEAE (Pea Family)			
<i>Bauhinia monandra</i> Kurz	St. Thomas tree	non-native	rare
<i>Canavalia cathartica</i> Thouars	maunaloa	non-native	rare
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	non-native	rare
<i>Crotalaria incana</i> L.	fuzzy rattlepod	non-native	rare
<i>Crotalaria pallida</i> Aiton	smooth rattlepod	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Desmanthus pernambucanus</i> (L.) Thellung	slender mimosa	non-native	uncommon
<i>Indigofera spicata</i> Forssk.	creeping indigo	non-native	rare
<i>Indigofera suffruticosa</i> Mill.	inikō	non-native	rare
<i>Lablab purpureus</i> (L.) Sweet	pāpapa bean	non-native	rare
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole	non-native	common
<i>Macroptilium atropurpureum</i> (DC.) Urb.	siratro	non-native	uncommon
<i>Macroptilium lathyroides</i> (L.) Urb.	wild bean	non-native	rare
<i>Neonotonia wightii</i> (Wight & Arnott) Lackey	glycine	non-native	abundant
<i>Pithcellobium dulce</i> (Roxb.) Benth.	ōpiuma	non-native	common
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	kiawe	non-native	uncommon
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	non-native	rare
MALVACEAE (Mallow Family)			
<i>Abutilon grandifolium</i>	hairy abutilon	non-native	rare
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	non-native	uncommon
<i>Sida rhombifolia</i> L.	arrowleaf sida	non-native	uncommon
<i>Waltheria indica</i> L.	'uhaloa	indigenous	uncommon
MORACEAE (Mulberry Family)			
<i>Broussonetia luzonicus</i> (Blanca) Bureau	alokon	non-native	uncommon
MORINGACEAE (Drumstick Tree Family)			
<i>Moringa oleifera</i> Lamarck	marunggay, horeradish tree	non-native	common
MYRTACEAE (Myrtle Family)			
<i>Psidium guajava</i> L.	common guava	non-native	rare
<i>Syzygium cumini</i> (L.) Skeels	Java plum	non-native	uncommon
PROTEACEAE (Protea Family)			
<i>Grevillia robusta</i> A. Cunn. Ex R. Br.	silk oak	non-native	rare
SOLANACEAE (Nightshade Family)			
<i>Solanum torvum</i> Sw.	pea aubergine	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through 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

Two mammal species were recorded in the project area. Taxonomy and nomenclature follow Tomich (1986). Most common was the axis deer (*Axis axis*). While not seen, their trails, tracks, scent, signs of feeding and abundant droppings all testify to regular and recent use of this area.

The evening survey revealed presence of the endemic and endangered 'ōpe'ape'a or Hawaiian hoary bat in the project area. A bat detector (Batbox IIID) was employed, set to the frequency of 27,000 Hertz which is the frequency these bats are known to emit when echolocating for nocturnal flying insect prey.

Other non-native mammals likely to be found here include mongoose (*Herpestes auropunctatus*), roof rat (*Rattus rattus*), mice (*Mus domesticus*) and domestic cats (*Felis catus*).

BIRDS

Birdlife was modest in both species diversity and in total numbers. Just seven species of non-native birds were recorded during two site visits. Taxonomy and nomenclature follow American Ornithologists Union (2017). Most common was the zebra dove (*Geopelia striata*), while the spotted dove (*Streptopelia chinensis*) was uncommon. An additional five species were rare. No native birds were seen. The migratory Pacific golden-plover (*Pluvialis fulva*) might show up during the winter months.

INSECTS

Insect life was rather modest in this dense grassland. Just twelve insect species were recorded during two site visits. Taxonomy and nomenclature follow Nishida et al (1992). Just two species were of common occurrence: the sleepy orange butterfly (*Eurema nicippe*) and the dung fly (*Musca sorbens*). Five species were uncommon and five more species were rare. One of these was the indigenous native globe skimmer dragonfly (*Pantala flavescens*).

REPTILES

One non-native gecko, the mourning gecko (*Lepidodactylus lugubris*) was recorded during the evening survey.

DISCUSSION AND RECOMMENDATIONS

The wildlife within the project was composed primarily of non-native species. Just two species were native in Hawaii: the endemic and endangered Hawaiian hoary bat and the indigenous globe skimmer dragonfly.

The Hawaiian hoary bat is a cryptic nocturnal creature that can be neither seen nor heard by humans when they are active at night. Little is known of their population and movements. With bat detectors we can determine when they are nearby at particular locations, but they often move about with shifting food resources.

A single bat was detected in one portion of the project area, indicating that these bats are likely to use this habitat at least occasionally. Because of its federally endangered status the standard U.S. Fish and Wildlife Service guidance designed to protect this bat and its young during its vulnerable breeding and pupping season requires that trees greater than 15 feet in height should not be removed between the months between April and mid-September. The Service can be consulted for any further guidance.

The globe skimmer dragonfly is common throughout Hawaii and is found throughout the tropics and subtropics nearly worldwide. It carries no protective status and is of no particular environmental concern.

The endemic and endangered Blackburn's sphinx moth (*Manduca blackburni*) was not found during the survey and none of its specific host plants were found either.

No nēnē or Hawaiian goose (*Branta sandvicensis*) were seen in or around this project area. The deep, dense grass provides no suitable habitat for these birds and there are no suitable wet habitats for them either.

While no protected seabirds were found on the property, the Endangered ua'u (*Pterodroma sanwicensis*) and Threatened 'a'o (*Puffinus newelli*) are known to overfly the area at dawn and dusk to their burrows high in the mountains between the months of March and November. In late fall, young birds fledge from their burrows to take their first tentative flights out to sea. These inexperienced birds are easily confused and distracted by bright lights and often crash to the ground where they are particularly vulnerable to being run over by vehicles or killed by predators. It is recommended that any significant outdoor lighting such as street lights or flood lights that are incorporated into the project design be shielded to direct the light downward so that it is not visible from above.

As a result of these findings, it is determined that there is little of environmental concern beyond the recommendations offered with regard to animal life within the proposed project. The development of this project is not expected to have a significant negative impact on the native wildlife resources in this part of West Maui.

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, Insects and Reptiles. 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			
CERVIDAE (Deer Family)			
<i>Axis axis</i> Erxleben	axis deer	non-native	common
VESPERTILIONIDAE (Bat Family)			
<i>Lasiurus cinereus semotus</i> H. Allen	'ōpe'ape'a, Hawaiian hoary bat	endemic	rare
BIRDS			
COLUMBIDAE (Dove Family)			
<i>Geopelia striata</i> L.	zebra dove	non-native	common
<i>Streptopelia chinensis</i> Scopoli	spotted dove	non-native	uncommon
FRINGILLIDAE (True Finch Family)			
<i>Carpodacus mexicanus</i> Muller	house finch	non-native	rare
STURNIDAE (Starling Family)			
<i>Acridotheres tristis</i> L.	common myna	non-native	rare
ESTRILDIDAE (Estrildid Finch Family)			
<i>Lonchura punctulata</i> L.	nutmeg mannikin	non-native	rare
ZOSTEROPIDAE (White-eye Family)			
<i>Zosterops japonicus</i> Temminck & Schlegel	Japanese white-eye	non-native	rare
THRAUPIDAE (Tanager Family)			
<i>Paroaria coronata</i> Miller	red-crested cardinal	non-native	rare

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE
INSECTS			
Order ARANAE - true spiders			
ARANEIDAE (Orb-Weaver Family)			
<i>Angiope appensa</i> Walkenaer	common garden spider	non-native	uncommon
<i>Gasteracantha mammosa</i> Koch	Asian spiny-backed spider	non-native	uncommon
Order COLEOPTERA - beetles			
COCCINELLIDAE (Lady Beetle Family)			
<i>Coccinella septempunctata brucki</i> Mulstant	seven-spot lady beetle	non-native	rare
Order DIPTERA - flies			
MUSCIDAE (Housefly Family)			
<i>Musca sorbens</i> Wiedemann	dung fly	non-native	common
Order LEPIDOPTERA - butterflies, moths			
LYCAENIDAE (Gossamer-winged Butterfly Family)			
<i>Lampdies boeticus</i> L.	long-tailed blue butterfly	non-native	uncommon
NOCTUIDAE (Owlet Moth Family)			
<i>Achaea janata</i> L.	Castor semi-looper	non-native	rare
NYMPHALIDAE (Brush-footed Butterfly Family)			
<i>Danaus plexippus</i> L.	monarch butterfly	non-native	rare
PIERIDAE (White and Sulphur Butterfly Family)			
<i>Eurema nicippe</i> Cramer	sleepy orange butterfly	non-native	common
<i>Pieris rapae</i> L.	cabbage butterfly	non-native	uncommon
Order ODONATA - dragonflies & damselflies			
LIBELLULIDAE (Skipper Dragonfly Family)			
<i>Pantala flavescens</i> Fabricius	globe skimmer	indigenous	rare
Order ORTHOPTERA - grasshoppers, crickets			
ACRIDIDAE (Grasshopper Family)			
<i>Oedaleus abruptus</i> Thunberg	short-horned grasshopper	non-native	uncommon
TETTIGONIIDAE (Katydid Family)			
<i>Elimaea punctifera</i> Walker	katydid	non-native	rare

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE
REPTILES			
GEKKONIDAE (Gecko Family)			
<i>Lepidodactylus lugubris</i> Dumeril & Bibron	mourning gecko	non-native	rare

EXHIBIT NO. _____
201-H APPLICATION
WAIKAPU DEVELOPMENT VENTURE, LLC

SUBJECT PROPERTY
APPROX. 12.5 ACRES;
TO BE ACQUIRED BY WDV, LLC FOR PROPOSED
201-H AFFORDABLE HOUSING PROJECT

LOT A
25.263 ACS.
TMK: 3-5-02: 011
*(Will be Subdivided
into LOTS A-1 A-2

LOT A-2
12.763 ACS.

LOT A-1
12.50 ACS.

NEW VALLEY ISLE
FELLOWSHIP CHURCH

201-H AFFORDABLE
HOUSING PROJECT

SPENCER'S AFFORDABLE HOUSING
WAIKAPU GARDENS

MAUI COUNTY REAL PROPERTY TAX DIVISION
TAX MAP PLAT (2) 3-5-002

Figure 1. Project Area Location

Literature Cited

- American Ornithologists' Union, 2017. 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.M. & G.A. Samuelson, J.S. Strazanac & K.S. Kami. 1992. Hawaiian Terrestrial Arthropod Checklist. Hawaiian Biological Survey.
- Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.
- U.S. Fish and Wildlife Service. 2017. Endangered and threatened wildlife and Plants. Listings and Occurrences for Hawaii www.fws.gov/endangered
- Wagner, W. L., D.R. Herbst, and S. H. Sohmer, 1999. Manual of the flowering plants of Hawai'i. Univ. of Hawai'i Press and Bishop Museum Press. Honolulu.

Appendix J

Aerial Photo and View Photos of Project Site

Aerial Photo of Project Site

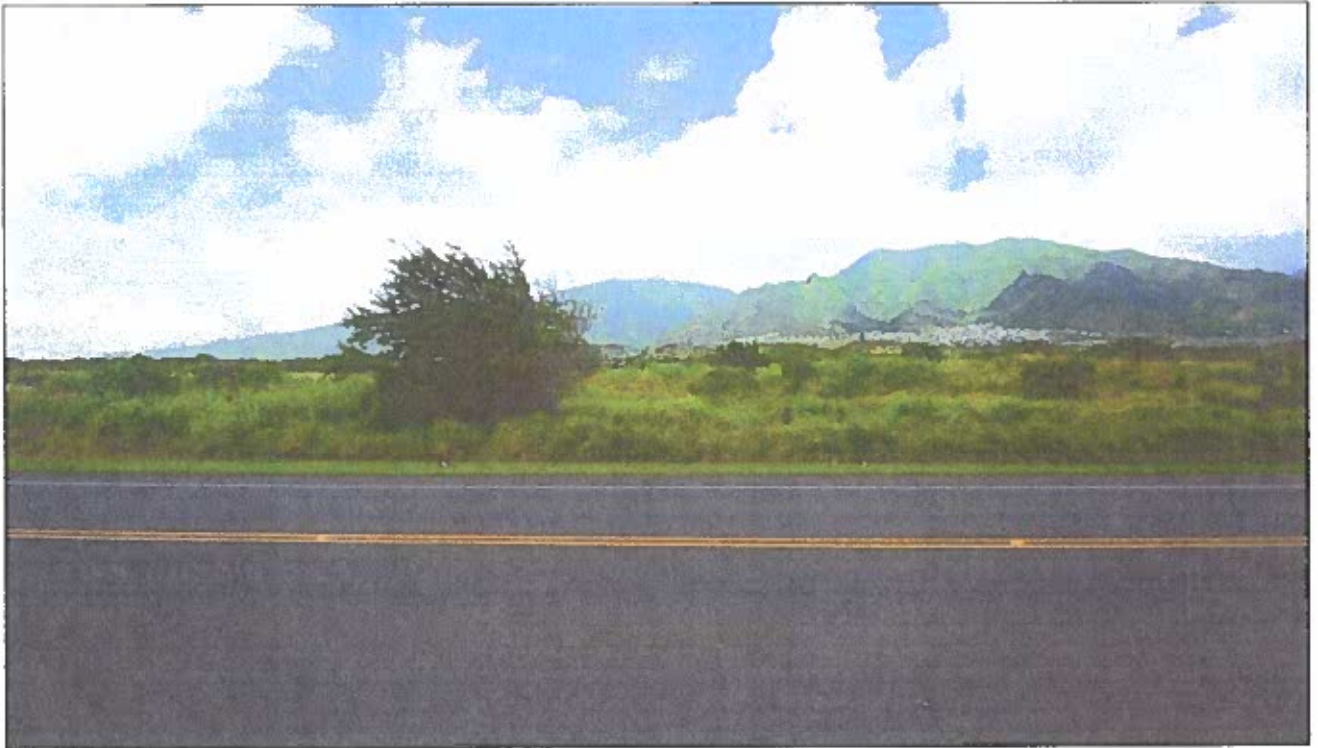




Ⓐ View facing West from Wai'ale Road on boundary of Kīhei Garden & Landscaping Co.



Ⓑ View facing West from Wai'ale Road on boundary of Kīhei Garden & Landscaping Co.



© View facing West from Wai'ale Road on boundary of Kīhei Garden & Landscaping Co.



© View facing North from South adjoining property Valley Isle Fellowship Church



③ View facing North from South adjoining property Valley Isle Fellowship Church



④ View facing North from South adjoining property Valley Isle Fellowship Church



© View facing East from Western boundary of property on Honoapi'ilani Highway



© View facing East from Western boundary of property on Honoapi'ilani Highway



① View facing East from Western boundary of property on Honoapi'ilani Highway

Image
T/K

② View facing South from Northern boundary of property

Appendix K

Market Demand Analysis Report

*Market Demand Study for an For-Sale 80-Unit
Proposed 201H-38 Home Affordable Housing
Project, Wailea Road, Waikapu,
Island and County of Maui, Hawaii
TMKs (2) 3-5-2-11 (portion)*

Prepared For
WAIKAPU DEVELOPMENT VENTURE, LLC
William Frampton - Project Manager
56 Paliuli Place
Kula, Hawaii 96790

R.W. SPANGLER LLC
Real Estate Analysis

08.11.17

WAIKAPU DEVELOPMENT VENTURE, LLC

William Frampton
Project Manager
56 Paliuli Place
Kula, Hawaii 96790

RE: Market demand study for proposed 201H-38 Affordable Housing Development Project
Wailea Road, Waikapu, Island and County of Maui, State of Hawaii 96793
TMKs (2) 3-5-2-11 (portion)

Dear Mr. William Frampton:

In accordance with your request and authorization, I have conducted an affordable housing market study in relation to your proposed 80-unit for-sale affordable development to be processed as a 201-H application under Chapter 2.96, Maui County Code.

Waikapu Development Venture, LLC is a proposed 80-unit affordable single-family residential housing development and a neighborhood park pursuant to 201H-38, Hawaii Revised Statutes (HRS). The housing units will be affordably-priced to families making 71 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38, Hawaii Revised Statutes. These exemptions request by the Applicant will be processed through the County of Maui with approval to be granted by the Maui County Council.

The proposed development is located at Waiale Road, Wailuku, Maui, Hawaii further identified as TMK: (2) 3-5-2-11 (portion). The subject property consists of approximately 12.5 acres. The proposed subdivided single-family residential lots will have a lot sizes ranging from 3,200 to 5,400 square feet. The following report presents the findings of the market study as of the effective date of the report on August 11, 2017.

Respectfully submitted,



Robert W. Spangler, MAI
Hawaii State Certified General Appraiser, CGA-967
Expiration Date December 31, 2017

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Summary of Proposed Project

SUMMARY OF PROPOSED PROJECT

Property Location: Wailea Road/Honoapiilani Highway, Waikapu, Island and County of Maui, State of Hawaii 96793

Tax Map Keys: (2) 3-5-2-11 (portion)

Land Description:

Area: Gross area – 12.5 AC

Shape: Rectangular

Topography: Modest upward slope from makai to mauka; curb grade

Utilities and off-sites: All to site

Zoning: The project is being processed under 201H-38, HRS exemptions precluding amendment of the community plan, zoning and other land use regulations

State Land Use District – Urban

Maui Island Plan – Urban growth boundary

County Zoning – Public/Quasi-Public (P-1)

Wailuku-Kahului Community Plan – Public/Quasi-Public

Special Designations – not within SMA district

Flood zone: Zone X; no mandatory flood insurance required

Proposed Project Description: The project manager provided the following description of the proposed development

Summary of Proposed Project

UNIT TYPE	LOT SIZE	DWELLING SIZE / LOT SIZE	UNIT COUNT
S.F. Dwelling and Lot	5,400 Sq.Ft. (54' x 100')	1 or 2 Story Dwellings; 3-4 Bed/2-Bath; 1 Car Garage (fire-wall) & Stacked Parking.	28
S.F. Dwelling and Lot	4,860 Sq.Ft. (54' x 90')	1 or 2 Story Dwellings; 2- 4 Bed/2 Bath; 2 Car Garage or Carport.	8
S.F. Dwelling and Lot	3,200 Sq.Ft. (40' x 80')	1 or 2 Story Dwellings; 2 or 3 Beds/1 or 2 Baths; 2 Car Garage or Carport.	32
Duplex Dwelling (CPR Shared Lot)	3,200 Sq.Ft. (40' x 80')	2 Unit/2-Story Duplex Dwellings; 2 or 3 Beds / 1 or 2 Baths; 2 Car Garage or Carport.	12
Total Unit Count:			80

The project manager provided the following distribution of the proposed development units by AMI %

INCOME RANGE	NO. UNITS	PERCENT OF TOTAL UNITS
70%-80%	12 Units*	15%
81%-100%	12 Units	15%
101%-120%	40 Units	50%
121%-140%	16 Units	20%

*NOTE: These Units will be Duplex Units.

EXECUTIVE SUMMARY

BACKGROUND

Waikapu Development Venture, LLC is a proposed 80-unit affordable single-family residential housing development and a neighborhood park pursuant to 201H-38, Hawaii Revised Statutes (HRS). The housing units will be affordably-priced to families making 71 percent to 140 percent of Maui County's median family income subject to the County of Maui Department of Housing and Human Concerns Affordable Sales Price Guidelines.

The proposed development is located at Waiale Road, Wailuku, Maui, Hawaii further identified as TMK: (2) 3-5-2-11 (portion). The subject property consists of approximately 12.5 acres. The proposed subdivided single-family residential lots will have a lot sizes ranging from 3,200 to 5,400 square feet.

The proposed development will consist of 80 total units comprised of 68 detached single-family homes and twelve duplex homes. The detached houses will be a mix of one- and two-story dwellings of two to four bedrooms and one to two bathrooms, while the duplex product will be two or three bedrooms and one or two bathrooms. Parking will be a mix of carport and garage stalls.

STUDY OBJECTIVES

R.W. Spangler LLC was retained by Mr. William Frampton, Project Manager for Waikapu Development Venture, LLC, to prepare a market demand study in relation to the application for the proposed development. The scope of work was comprised of the following:

1. Delineation of the market area that the proposed development will serve
2. Analysis of market area supply and demand characteristics applicable to the proposed development
3. Determination of sufficiency of market demand for the proposed development

CONCLUSION

The market demand study concluded that the proposed development will be well received by the local market and will be an incremental, yet important source of supply of affordable for-sale housing to address the substantive shortage of entry-level housing for Central Maui households priced within 71% to 140% of Area Median Income (AMI). The findings are detailed and supported in the body of the report with the following representing a high-level executive summary of factors and conclusions illustrating strong demand for the proposed development.

Executive Summary

1. Strong local new housing demand
 - a. One-third of the projected annual new supply requirement of 1,437 to 1,670 units to meet the ten-year projected housing demand is from buyers under 141% of AMI
 - b. Active ongoing land acquisitions and subdivision development of market-rate and affordable for-sale homes
2. Suitability of the proposed project's physical characteristics relative to Central Maui demand preferences (two-to four-bedrooms, principally detached single-family, etc.)
3. Significant housing price inflation inhibiting the ability of many households to purchase market-rate housing
 - a. Rapid decoupling of the median home value in Central Maui from the affordable prices based on county guidelines. Through June 2017, the differential between the Central Maui median single-family home value and the affordable price of a three-bedroom house at 100% AMI and 4.5% interest rate was \$204,100 or 53%. The differential was only \$7,840 or 2% as recently as 2013.
 - b. Annualized matched-pair house sale inflation ranging from 5% to 12% between 2010 and 2017
 - c. New subdivision and condominium sales absorption achieving 49% to 59% unit value (\$/SF) price inflation from 2012 through 2017
4. Proposed project's pricing is consistent with 57% of the single-family and condominium sales in Wailuku year-to-date 2017
5. Proposed project size is only 2.5% of the projected Maui housing demand through 2025 for 71% to 140% of AMI
6. Excess demand for affordable projects clearly evident by their complete pre-sale absorption prior to construction within the local markets
7. Shortage of new development and inventory
 - a. The cumulative entitled and planned single- and multi-family housing in the Maui Island Plan totals 16,857, which is minimally sufficient to meet the projected housing demand
 - b. Less than six months of single-family inventory available for sale at present; down from a standing supply in 2011 of over 18 months
 - c. Seven-year standard entitlement period for new residential subdivision projects, which limits the supply of housing
8. Strong value price support (bracketing) for the anticipated sale prices of the proposed development as measured by re-sales and new absorption sales of projects in the local market.

Executive Summary

9. Anticipated full pre-sale absorption of the subject based on precedence of unilateral affordable project pre-sales and strong pre-sale activity for similar market-rate housing.

CERTIFICATION

I, Robert W. Spangler, certify that, to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- My engagement in this assignment was not contingent upon developing or reporting predetermined results.
- My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the *Uniform Standards of Professional Appraisal Practice*.
- The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
- I have not made a personal inspection of the property that is the subject of this report.
- No one provided significant real property appraisal assistance to the person signing this certification.
- The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.
- As of the date of this report, I have completed the requirements of the continuing education program for Designated Members of the Appraisal Institute and am also certified as a general real estate appraiser in the State of Hawaii, identification number CGA-967, with an expiration date of December 31, 2017.
- I have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.

Respectfully submitted,



Robert W. Spangler, MAI
Hawaii State Certified General Appraiser, CGA-967
Expiration Date December 31, 2017

ASSUMPTIONS AND LIMITING CONDITIONS

Per the Uniform Standards of Professional Practice (USPAP), it is necessary to “clearly and accurately disclose any extraordinary assumptions, hypothetical condition, or limiting condition that directly affects the appraisal and indicate its impact on value.” In this instance, there were no hypothetical conditions or extraordinary assumptions. The assumptions and limiting conditions of the appraisal are detailed as follows:

1. No opinion as to title of the subject is rendered. No preliminary title report was made available for the assignment. Title is assumed to be marketable and free of all liens, encumbrances and restrictions except those specifically discussed in the report.
2. Unless otherwise stated in this report, the existence of hazardous material, which may or may not be present on the property, was not observed by the appraiser. The appraiser has no knowledge of the existence of such materials on or in the property. The appraiser, however, is not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation or other potentially hazardous materials may adversely affect the value of the property. The value estimate in this report is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No responsibility is assumed for any such conditions, or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.
3. The property is appraised assuming it to be in full compliance with all applicable federal, state, and local environmental regulations and laws, unless otherwise stated.
4. The property is appraised assuming that all applicable zoning and use regulations and restrictions have been complied with, unless otherwise stated.
5. The property is appraised assuming that all required licenses, certificates of occupancy, consents or other legislative or administrative authority from any local, state or national government or private entity or organization have been, can be obtained or renewed for any use on which the value estimate contained in this report is based, unless otherwise stated.
6. The property is appraised assuming it to be under responsible ownership and competent management, and available for its highest and best use.
7. The appraiser assumes no responsibility for economic, physical or demographic factors that may affect or alter the opinions in this report which occur after the date of the letter transmitting the report. The appraiser is not obligated to predict future political, economic or social events.

Assumptions and Limiting Conditions

8. In the appraisal of real estate, forecasts and projections are generally required to support reasonable value conclusions. Forecasts relate to supply, demand and market equilibrium; projections relate to income and expenses. These forecasts and projections are not predictions of the future, but are the best estimate of the current market perception regarding future trends. The appraiser makes no warranty in connection with forecasts and projections.
9. The information furnished by others is believed to be reliable. However, no warranty, either expressed or implied, is given for its accuracy and the appraiser assumes no responsibility for information relied upon later found to have been inaccurate. The appraiser reserves the right to make such adjustments to the analyses, opinions and conclusions set forth in this report as may be required by consideration of additional data or more reliable data that may become available.
10. The appraiser assumes no responsibility for hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for arranging for engineering, geologic or environmental studies that may be required to discover them.
11. No engineering survey has been made by the appraiser. Except as specifically stated, data relative to size and area were taken from sources considered reliable and no encroachment of real property improvements is considered to exist.
12. No opinion is expressed as to the value of subsurface oil, gas or mineral rights or whether the property is subject to surface entry for the exploration or removal of such materials except as is expressly stated.
13. Maps, plats and exhibits included in this report are for illustration only as an aid in visualizing matters discussed within the report. They should not be considered as surveys or relied upon for any other purpose, nor should they be removed from, reproduced, or used apart from the report.
14. No opinion is intended to be expressed for matters that require legal expertise or specialized investigation or knowledge beyond that customarily employed by real estate appraisers.
15. The distribution, if any, of the total valuation in this report between land and improvements applies only under the stated program of utilization. The separate allocations for land and buildings must not be used in conjunction with any other appraisal and are invalid if so used.
16. Possession of this report, or a copy of it, does not carry with it the right of publication. It may not be used for any purpose by any person other than the party to whom it is addressed without the written consent of the appraiser, and in any event only with proper written qualification and only in its entirety.

Assumptions and Limiting Conditions

17. No detailed soil or geologic studies covering the subject property were available to the appraiser. The appraiser assumes no responsibility for the presence of any soils or geological conditions on or near the subject, nor for any expertise or engineering knowledge required to discover the presence of such conditions. Soils and geological conditions such as load bearing capacity, site stability and drainage are assumed to be adequate for most probable uses.
18. The subject is within a geographic area prone to earthquakes and other seismic disturbances. Except as specifically indicated in the report, no seismic or geologic studies have been provided to the appraiser concerning the seismic and/or geologic condition of the subject. The appraiser assumes no responsibility for the possible effect on the subject or seismic activity and/or earthquake or for assessing the reliability of the seismic qualifications of structures on the subject.
19. Testimony or attendance in court or at any other hearing is not required by reason of rendering this appraisal unless such arrangements are made a reasonable time in advance. Further, unless otherwise indicated, separate arrangements shall be made considering compensation for the appraiser's time and expertise to prepare for and attend any such hearing.
20. No consideration has been given in this appraisal as to the value of the property located on the premises considered by the appraiser to be personal property, nor has he given consideration to the cost of moving or relocating such personal property; only the real property has been considered.
21. No archaeological reports were provided. It was assumed that there are no adverse archaeological conditions that would negatively influence the development or marketability of the subject.

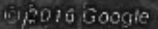
INTRODUCTION

IDENTIFICATION OF THE SUBJECT

Waikapu Development Venture, LLC is a proposed 80-unit affordable single-family residential housing development and a neighborhood park pursuant to 201H-38, Hawaii Revised Statutes (HRS). The proposed development is located at Waiale Road, Wailuku, Maui, Hawaii further identified as TMK: (2) 3-5-2-11 (portion). The subject property consists of approximately 12.5 acres.

The project will be developed under the 210H, HRS and the housing units will be affordably-priced to families making 71 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38, Hawaii Revised Statutes. These exemptions request by the Applicant will be processed through the County of Maui with approval to be granted by the Maui County Council. The proposed subdivided single-family residential lots will have a lot sizes ranging from 3,200 to 5,400 square feet.

- *Location:* The subject is located in Waikapu, Island and County of Maui, State of Hawaii. More specifically, the subject spans between Waiale Road and Honoapiilani Highway between Kokilolio Street and Kuikahi Drive. The site is identified on the Hawaii Tax maps as Second Division Map Key 3-5-2-11 (portion), which is illustrated in the following map.



**PROPOSED 201-H AFFORDABLE HOUSING PROJECT
WAIKAPU DEVELOPMENT VENTURE, LLC
WAIKAPU, MAUI, HAWAII
TAX MAP KEY: (2) 3-5-002: 11 (Portion)**

9

Introduction

INTENDED USE AND USERS

The market demand study will be utilized exclusively by WAIKAPU DEVELOPMENT VENTURE, LLC for processing of a 201-H Affordable Housing Project application. No other use is intended by the appraiser. The intended users of this report are the client, WAIKAPU DEVELOPMENT VENTURE, LLC, its officers, administrators, employees and/or affiliates, and the appropriate regulatory agencies. This market demand study has been prepared for the exclusive benefit of the above-named clients and stated intended users. No other users are intended by the appraiser. Any party who uses or relies upon any information in this report without the preparer's written consent does so at their own risk.

SCOPE OF THE ASSIGNMENT

The scope of work was comprised of the following:

1. Delineation of the market area that the proposed development will serve
 2. Analysis of market area supply and demand characteristics applicable to the proposed development
 3. Determination of sufficiency of market demand for the proposed development
- *Reporting Process:* The market demand study is presented in accordance with the reporting requirements set forth by the Uniform Standards of Professional Appraisal Practice (USPAP).

MAUI COUNTY OVERVIEW

The subject is located within Maui County and the following section provides an overview of the area as part of the delineation of the market area that the proposed development will serve.

Maui County, the second largest of the four counties in Hawaii, is comprised of the inhabited islands of Maui, Molokai and Lanai and the uninhabited island of Kahoolawe. In Maui County, there are no subordinate or separate municipal entities. Maui County is governed by provision of a County Charter with the executive power of the county vested in the mayor and legislative power vested in the County Council.

Maui is a worldwide tourism destination with West and South Maui comprising the island's major resort areas and Central Maui, the market area most likely to attract prospective buyers from that represents the population and business center.

The following table provides a summary of key economic data for the County of Maui.

SERIES	1st QUARTER			YEAR-TO-DATE		
	2016	2017	% CHANGE	2016	2017	% CHANGE
Civilian labor force, NSA (persons) 1/	85,000	87,000	2.4	85,000	87,000	2.4
Civilian employed	82,250	84,350	2.6	82,250	84,350	2.6
Civilian unemployed	2,800	2,700	-3.6	2,800	2,700	-3.6
Unemployment rate, NSA (%) 1/ 2/	3.3	3.1	-0.2	3.3	3.1	-0.2
Total wage and salary jobs	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Total non-agric. wage & salary jobs	74,200	75,200	1.3	74,200	75,200	1.3
Nat. Resources, Mining, Constr.	3,800	4,000	5.3	3,800	4,000	5.3
Manufacturing	1,200	1,100	-8.3	1,200	1,100	-8.3
Wholesale Trade	1,500	1,500	0.0	1,500	1,500	0.0
Retail Trade	9,800	9,700	-1.0	9,800	9,700	-1.0
Transp., Warehousing, Util.	4,100	4,200	2.4	4,100	4,200	2.4
Information	500	600	20.0	500	600	20.0
Financial Activities	3,000	3,100	3.3	3,000	3,100	3.3
Professional & Business Services	7,000	7,100	1.4	7,000	7,100	1.4
Educational Services	1,100	1,200	9.1	1,100	1,200	9.1
Health Care & Social Assistance	5,500	5,600	1.8	5,500	5,600	1.8
Arts, Entertainment & Recreation	2,100	2,600	23.8	2,100	2,600	23.8
Accommodation	12,000	11,800	-1.7	12,000	11,800	-1.7
Food Services & Drinking Places	9,800	9,800	0.0	9,800	9,800	0.0
Other Services	3,100	3,100	0.0	3,100	3,100	0.0
Government	9,700	9,800	1.0	9,700	9,800	1.0
Federal	800	900	12.5	800	900	12.5

Maui County Overview

SERIES	1st QUARTER			YEAR-TO-DATE		
	2016	2017	% CHANGE	2016	2017	% CHANGE
State	6,300	6,300	0.0	6,300	6,300	0.0
Local	2,600	2,700	3.8	2,600	2,700	3.8
Agriculture wage and salary jobs	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
General excise & use tax rev. (\$1,000)	54,503	(NA)	(NA)	54,503	(NA)	(NA)
Income-individual	20,351	(NA)	(NA)	20,351	(NA)	(NA)
Declaration estimated taxes	7,227	(NA)	(NA)	7,227	(NA)	(NA)
Payment with returns	4,138	(NA)	(NA)	4,138	(NA)	(NA)
Withholding tax on wages	20,847	(NA)	(NA)	20,847	(NA)	(NA)
Refunds	-11,860	(NA)	(NA)	-11,860	(NA)	(NA)
Transient accommodations tax	10,543	(NA)	(NA)	10,543	(NA)	(NA)
Honolulu County Surcharge 3/	370	(NA)	(NA)	370	(NA)	(NA)
Private Building Permits (\$1,000)	92,120	127,429	38.3	92,120	127,429	38.3
Residential	46,418	59,045	27.2	46,418	59,045	27.2
Commercial & industrial	15,451	35,211	127.9	15,451	35,211	127.9
Additions & alterations	30,251	33,173	9.7	30,251	33,173	9.7
Visitor Days - by air	5,938,663	5,901,057	-0.6	5,938,663	5,901,057	-0.6
Domestic visitor days - by air	4,620,099	4,648,294	0.6	4,620,099	4,648,294	0.6
International visitor days - by air	1,318,564	1,252,763	-5.0	1,318,564	1,252,763	-5.0
Visitor arrivals by air - by air	665,338	671,671	1.0	665,338	671,671	1.0
Domestic flight visitors - by air	515,452	524,130	1.7	515,452	524,130	1.7
International flight visitors - by air	149,886	147,541	-1.6	149,886	147,541	-1.6
Visitor expenditures - by air (\$1,000)	1,280,179	1,328,152	3.7	1,280,179	1,328,152	3.7
Hotel occupancy rates 2/	79..3	(NA)	(NA)	79..3	(NA)	(NA)

NA Not available.

1/ Labor force and jobs are Hawaii DLIR monthly and annual data. Quarterly averages computed by the Hawaii DBEDT.

2/ Change represents absolute change in rates rather than percentage change in rates.

3/ 0.5% added to the general excise tax to pay for Oahu's mass transit system and took effect January 1, 2007.

Includes taxpayers who have business activities on Oahu but whose businesses are located outside Oahu.

Source: Hawaii State Department of Business, Economic Development, & Tourism <<http://www.hawaii.gov/dbedt/info/>>,

Hawaii State Department of Labor & Industrial Relations <<http://www.hawaii.gov/dli/dataanalysis/PAGEID=94>>;

Hawaii State Department of Taxation <http://www.hawaii.gov/tax/a5_3txcolrpt.htm> and Hospitality Advisors, LLC.

Gradual ongoing improvement in the local economy is evidenced by the decline in unemployment rate and improvement in construction permits.

The University of Hawaii Economic Research Organization (UHARO) indicated a positive outlook for Hawaii's economy through the remainder of 2017. The presentation of their update 2017 forecast was summarized in a recent Hawaii Business Journal article¹ as follows:

Hawaii's economic outlook for this year remains favorable, despite uncertainty on the national front, according to the University of Hawaii Economic Research Organization's state forecast update released today (May 5, 2017).

"Hawaii's economy has started the year in fine form," the report says. "Moderate job and income growth are continuing, and generally favorable global and national conditions are maintaining impressive tourism numbers."

Carl Bonham, executive director of UHARO and co-author of the forecast, told Pacific Business News despite the positive outlook for the state, events in Washington are creating an element of uncertainty for Hawaii.

The report said while developments in Washington could hurt the state, "for now, prospects look good for continued growth, if at a less rapid pace than we have seen in recent years."

"The bottom line on what is going on in Washington is it's creating uncertainty," said Bonham. "We don't know what will come out. It feels even more uncertain because of all the sound bites and tweets."

With the Trump administration's plans for tax reform and changes to health care, Bonham said there is still much to be seen in terms of how legislation in Washington will impact the Aloha State. "The short-term federal hiring freeze has been lifted, and I don't think we'll see a big boost in federal, military spending, which would mostly impact salaries for federal employees. I don't expect to see a big build up in troops here," he added.

Bonham said the report found that job counts on Oahu have been declining, driven by the plateau in construction projects.

In the report, UHARO says the multi-year ramp-up of construction has ended, with industry jobs topping out early last year and in March running more than 2 percent lower than year-earlier levels.

"However, there is enough activity in the pipeline to maintain employment near the current level for the next several years," the report said. "Statewide construction employment will remain near 38,000 workers through 2018, before easing lower as the current cycle begins to wind down." The report said seven years of economic expansion has led to improved household finances in the state.

¹<http://www.bizjournals.com/pacific/news/2017/05/05/economy-outlook-favorable-as-per-capita-income.html?s=print>

Maui County Overview

"The latest figures on personal income illustrate both the gains to date and point to continuing moderate expansion," UHERO says. "Now that recovery is complete and inflation is beginning to pick up, further gains will be smaller."

According to the report, real personal income growth will slow to 1.6 percent this year and 1.3 percent by 2019.

"We're seeing growth in real per-capita income," Bonham said. "People's standards of living are improving."

The study also said Hawaii's labor market is at full employment conditions, meaning, "unemployment has receded to the normal level consistent with an economy growing along its long-term trend path."

The latest unemployment rate for the state, released by the Hawaii State Department of Labor & Industrial Relations last month, was 2.7 percent, the lowest figure in 10 years.

While the visitor industry continues to be strong, UHERO predicts growth will slow below 1 percent by the end of the decade "as capacity constraints bite."

"Still, despite slowing growth, the state's visitor industry will continue to operate at robust levels of activity, with visitor volumes at all time highs in all counties," the report adds.

POPULATION

According to the December 2009 draft Maui Island Plan, Maui's resident population is expected to grow from 129,471 in 2005 to 176,687 in 2030. This is a 1.46% annual growth rate which equates to a 36.5% increase in population over the 25-year period. These projections indicate a population increase of 16% between 2010 and 2020, and an increase of 12% between 2020 and 2030.

Maui's population was 164,726 in 2015 representing 12% of the state's total. The population increased on Maui at a rate of 0.8% matching the state's overall growth rate.

Maui County Overview

	State of Hawaii	C & C Honolulu	Hawaii County	Maui County 1/	Kauai County
Population, 2015	1,431,603	998,714	196,428	164,726	71,735
Population, 2014	1,420,257	992,082	194,016	163,487	70,672
Numeric change	11,346	6,632	2,412	1,239	1,063
% change	0.8	0.7	1.2	0.8	1.5
Percent of total	100%	0.6976194	14%	12%	5%

1/ Maui County includes Kalawao County.

Source: U.S. Census Bureau, Population Division; compiled by the Hawaii State Department of Business, Economic Development & Tourism, Research and Economic Analysis Division.

The following table provides a geographic breakdown of historic and projected population in Maui. The Wailuku-Kahului district represents the largest population center with 37% of the islands residents.

Table 1 - 2: Community Plan Area Population 2000 – 2030

Community Plan Area	2000	2005	2010	2015	2020	2025	2030
West Maui	17,967	19,852	22,156	29,103	31,410	33,743	36,058
Kihui-Makena	22,870	25,609	27,244	37,850	40,850	43,885	46,896
Wailuku-Kahului	41,503	46,626	54,433	52,343	56,492	60,689	64,853
Makawao-Pukalani-Kula	21,571	23,176	25,198	23,919	25,815	27,732	29,635
Pā'ia-Ha'ikū	11,866	12,210	13,122	11,332	12,230	13,139	14,040
Hāna	1,867	1,998	2,291	2,541	2,743	2,947	3,149
Total Maui Island	117,644	129,471	144,444	157,087	169,540	182,135	194,630

EMPLOYMENT

The strength of the economy is largely measured by job growth, which exhibited signs of improvement. Maui County saw a net gain of 1,000 jobs or a 1.3 percent increase in the first quarter of 2017 over the same quarter of 2016. Jobs gained the most in Arts, Entertainment & Recreation (500 jobs), followed by Natural Resources, Mining, and Construction (200 jobs). The largest private sector job losses occurred in Accommodation (200 jobs lost). Government added 100 jobs in the quarter.

Maui County employment is heavily concentrated in government and the hospitality industry as evidenced by the following table of the largest employers. The table from the Maui County Annual Financial Report, dated June 20, 2013, provides a comparison of principal employers in 2016 vs. nine years ago.

Maui County Overview

COUNTY OF MAUI PRINCIPAL EMPLOYERS FISCAL YEARS 2016 AND NINE YEARS AGO - (UNAUDITED)

Employer	2016			2007		
	Employees ³	Rank	Percentage of Total County Employment	Employees ¹	Rank	Percentage of Total County Employment
State of Hawaii ²	6,400 ³	1	7.90%	5,673 ¹	1	8.35%
County Government	2,419 ²	2	2.98%	2,309 ²	2	3.83%
Town Realty of Hawaii	2,001	3	2.47%			
Grand Wailea-Waldorf Astoria	1,400	4	1.73%			
Ritz-Carlton-Kapalua	1,000	5	1.23%			
Federal Government ²	800 ¹	6	0.99%	776	6	1.14%
Four Seasons Resort-Maui	800	6	0.99%	810	5	1.19%
Maui Brand Sugar	800	6	0.99%			
Maui Memorial Medical Center	800	6	0.99%			
Four Seasons Resort-Lanai	700	7	0.86%			
Westin-Maui Resort & Spa	700	7	0.86%			
Fairmont-Kea Lani Maui	600	8	0.74%			
Hyatt Regency-Maui Resort & Spa	600	8	0.74%			
Makena Beach & Golf Resort	518	9	0.64%			
Kaanapali Beach Club	500	10	0.62%			
Royal Lahaina Resort	500	10	0.62%			
Walmart	500	10	0.62%			
TS Restaurant of Hawaii & California				1,800	3	2.65%
Maui Land & Pineapple Co., Inc.				1,275	4	1.88%
Hale Makua				450	7	0.66%
West Maui Resort Partners LP				440	8	0.65%
Dorvin D. Leis Co., Inc.				375	9	0.55%
Maui Medical Group				237	10	0.35%
Total	21,038		25.97%	14,145		21.25%

¹ Maui County Data Book 2008 & 2016

² 2007, 2016 County of Maui actual employee count

³ Hawaii Business Research Library

The following table provides a more recent survey conducted by the Pacific Business News of private employers ranking the top ten as of year-end 2015 in descending order. Note that only two of the top ten companies are outside of the tourism business.

No.	Company	# Employees Year End 2015
1	Grand Wailea	1,320
3	Four Seasons Resort Maui at Wailea	900
2	Hyatt Regency Maui Resort & Spa	759
4	The Fairmont Kea Lani	720
5	The Westin Maui Resort & Spa Kaanapali	676
6	Four Seasons Resort Lanai	658
7	Kamehameha Schools Maui	497
8	Monsanto Hawaii	479
9	Hale Makua Health Services	462
10	Safeway	446

Maui County Overview

Two County Council bills are cited as detrimental to the local jobs market. The workforce housing policy, passed in 2006, requires projects with fewer than half of the homes to be sold for more than \$600,000 to provide 40% of their units at affordable prices. Developments with half or more of the homes to be priced above \$600,000 would have a 50% affordable requirement.

Importantly, the Maui County Council voted in December 2014 to relax its workforce housing rules to require between 20 and 25 percent affordable housing in projects from developers - down from a 50 percent requirement. The lack of new affordable housing actually built at a time of rising demand was cited by the council members as rational for the change.

The 2007 "show me the water bill" requires subdivision and condominium developers to prove to Maui County they have a long-term source of water. The ordinance was revised in April 2011, exempting infill development (10 residential dwellings or less) within areas already developed and having consistent land use; residential workforce housing units built by a qualified housing provider; residential development projects with 100 percent affordable units; and public or quasi-public development projects. The exemptions are only applicable within areas serviced by the Water Department's Central or West Maui water systems.

Developers have indicated that these bills have had significant negative repercussions on home building and job creation. According to industry sources, newer projects are having a difficult time getting off the ground not just because of the economy, but because of the show me the water and workforce housing ordinances. These ordinances are making new water meters almost impossible to obtain and the high workforce housing requirement makes project financing unfeasible.

The agricultural industry also plays an important role in the local economy. Ongoing water shortages and the slow economy have resulted in a negative business environment for the largest agricultural employers.

- After 97 years of operations, Maui Land & Pineapple Company announced in November 2009 that it will immediately stop planting pineapple and will cease pineapple operations by the end of the year. An estimated 285 layoffs were planned by the end.

Fortunately, Hali'imaile Pineapple Company purchased and licensed key assets, and leased farm land, equipment and buildings from ML&P with plans to serve the Hawaii market. "Hali'imaile Pineapple Company brings new hope for a new year by immediately saving 65 agricultural jobs with an expectation of adding more in the future.

- Hawaii Commercial and Sugar (HC&S), a division of Alexander Baldwin (A&B), directly supported 800 jobs in this rural community, paying more than \$47 million a year in wages and benefits to its employees and retirees. HC&S infused a total of \$100 million into the economy each year, primarily on Maui.

Maui County Overview

A&B made a business decision to phase out standard sugar operations with a final harvest in 2016. Hundreds of employees were terminated in 2017. The company will instead pursue a diversified agricultural model the results of which are unknown. However, despite the end of the sugar era on Maui, the unemployment rate remains exceedingly low.

UNEMPLOYMENT

The Island of Maui recorded a 2.9 percent unemployment rate in April 2017, up from 2.8 percent rate recorded in March, and unchanged from the 2.9 percent rate reported in April of last year. Important to note, the State Department of Labor and Industrial Relations is attributing the Maui Region hospital privatization as being mostly responsible for a large growth of workers in the educational and health services jobs sector in July 2017. The educational and health services category increased by 2,300, according to the report. Maui County unemployment rate dipped to 2.7 percent in July, down from 3.4 percent in June and from 3.3 percent a year ago, the State Department of Labor and Industrial Relations reported. According to recent report, Maui County's economic picture is marked by impressive tourism industry rebound, which is the major economic drivers for Maui's economy.

TOURISM

Tourism represents the largest sector of the local economy. Growth in visitor days (+8.6%) and higher daily spending (+2.4% to \$210 per person) contributed to a sizeable gain in visitor spending in April 2017 (+11.2% to \$371.2 million). Visitor arrivals rose (+7% to 226,511), with increases from Canada (+17.2%), U.S. West (+8%), U.S. East (+6.6) and Japan (+4.2%). Through April 2017, both visitor spending (+4.5% to \$1.7 billion) and arrivals (+2.6% to 886,859) surpassed year-to-date 2016.

	TOTAL VISITORS BY AIR					
	<i>April</i>			<i>YEAR-TO-DATE</i>		
	<i>2017P</i>	<i>2016</i>	<i>% CHANGE</i>	<i>2017P</i>	<i>2016</i>	<i>% CHANGE</i>
VISITOR DAYS	737,783	677,671	8.9	2,961,721	2,851,017	3.9
TOTAL VISITORS	499,197	459,184	8.7	1,950,338	1,887,048	3.4
DOMESTIC	238,586	218,487	9.2	1,011,383	963,969	4.9
INTERNATIONAL	6,411,268	5,875,417	9.1	27,567,196	26,478,999	4.1
AVERAGE DAILY CENSUS	213,709	195,847	9.1	229,727	218,835	5.0
TOTAL AIR SEATS (EST)	978,406	974,939	0.4	3,966,364	4,012,169	-1.1
TOTAL LOAD FACTOR (EST)	86.9	80.9	7.4	86.1	83.2	3.5
ISLANDS VISITED						
Oahu	437,436	408,319	7.1	1,769,001	1,707,731	3.6
Oahu only	329,934	310,644	6.2	1,334,284	1,307,856	2.0
Maui County	229,708	215,291	6.7	901,379	880,630	2.4
Maui	226,511	211,613	7.0	886,859	864,292	2.6
Maui only	152,419	139,146	9.5	579,668	571,715	1.4

Source: <http://hawaii.gov/dbedt/info/visitor-stats/tourism/>

Maui County Overview

Statewide room revenue for hotels in Hawaii hit \$1.07 billion during the first quarter of 2017, according to preliminary data from Hospitality Advisors LLC and STR Inc. When compared with preliminary data released last year, revenue per available room for Hawaii hotels jumped 6.7 percent to \$222.78 during the first quarter. But a spokesman for Hospitality Advisors said last year's data may be changed to reflect new information when the company releases its finalized report of first quarter hotel figures, expected to come out next month.

According to the preliminary figures, occupancy for Hawaii hotels in the first quarter reached 81.7 percent, while the statewide average daily rate hit \$272.72. Maui had the highest revenue per available room, or RevPAR, at \$300.93, with an average daily rate reaching \$375.99.

On Oahu, RevPar hit \$193.16, with an average daily rate of \$233.39. Oahu hotels were 82.8 percent occupied during the first three months of the year.

Kauai hotels had RevPAR of \$218.49, while average daily room rates were \$218.49, with an occupancy of 80.7 percent.

On the Big Island, RevPAR was \$212.59, hotel occupancy was 80.7 percent and room rates averaged at \$263.53.

INCOME LEVELS

The median household income by location in demand of workforce housing in Maui is as follows:

- Lahaina - \$67,362
- Wailuku - \$69,768
- Kahului - \$66,625
- Kihei - \$64,747

RESIDENTIAL MARKET CONDITIONS – VALUE TRENDS, ABSORPTION, ETC.

Maui County residential market conditions for annual 2016 were generally improved but still well below peak levels. The following table provides a summary of absolute residential market sales and value trends for Maui County between 2004 and 2016, while the second table provides a summary of the rate of annual change. The peak data, which occurred from 2005 through 2007, are in bold figures in the following table.

Maui County Overview

MAUI COUNTY RESIDENTIAL SALES DATA Absolute Amounts - 2004-2016

	<i>Sales SFR</i>	<i>Sales Condo</i>	<i>Sales Total</i>	<i>Dollars SFR</i>	<i>Dollars Condo</i>	<i>Dollars Total</i>	<i>Median SFR</i>	<i>Median Condo</i>
2004	1,221	1,933	3,154	\$891,652,502	\$847,147,291	\$1,738,799,793	\$550,000	\$310,000
2005	1,317	2,000	3,317	\$1,221,325,592	\$1,100,762,199	\$2,322,087,791	\$679,000	\$390,000
2006	1,088	1,210	2,298	\$1,024,279,861	\$935,590,294	\$1,959,870,155	\$693,000	\$505,000
2007	1,138	1,179	2,317	\$1,047,878,879	\$963,086,267	\$2,010,965,146	\$630,069	\$550,000
2008	907	788	1,695	\$754,102,000	\$725,797,356	\$1,479,899,356	\$577,867	\$549,500
2009	693	824	1,517	\$494,764,887	\$593,273,850	\$1,088,038,737	\$498,106	\$450,000
2010	814	1,147	1,961	\$608,783,134	\$743,305,403	\$1,352,088,537	\$460,000	\$377,500
2011	898	1,155	2,053	\$707,221,757	\$561,184,549	\$1,268,406,306	\$433,500	\$310,000
2012	933	1,248	2,181	\$660,301,782	\$587,326,038	\$1,247,627,820	\$470,000	\$358,995
2013	984	1,333	2,317	\$774,983,738	\$758,403,883	\$1,533,387,621	\$530,000	\$373,000
2014	943	1,199	2,142	\$822,520,160	\$753,772,368	\$1,576,292,528	\$570,000	\$415,000
2015	1,089	1,199	2,288	\$931,646,757	\$763,806,071	\$1,695,452,828	\$580,000	\$410,000
2016	1,076	1,310	2,386	\$1,040,936,510	\$808,166,264	\$1,849,102,774	\$636,750	\$415,000

MAUI COUNTY RESIDENTIAL SALES DATA Rate of Annual Change - 2005-2016

	<i>Change Sales SFR</i>	<i>Change Sales Condo</i>	<i>Change Sales Total</i>	<i>Change Dollars SFR</i>	<i>Change Dollars Condo</i>	<i>Change Dollars Total</i>	<i>Change Median SFR</i>	<i>Change Median Condo</i>
2005	7.86%	3.47%	5.17%	36.97%	29.94%	33.55%	23.45%	25.81%
2006	-17.39%	-39.50%	-30.72%	-16.13%	-15.01%	-15.60%	2.06%	29.49%
2007	4.60%	-2.56%	0.83%	2.30%	2.94%	2.61%	-9.08%	8.91%
2008	-20.30%	-33.16%	-26.85%	-28.04%	-24.64%	-26.41%	-8.29%	-0.09%
2009	-23.59%	4.57%	-10.50%	-34.39%	-18.26%	-26.48%	-13.80%	-18.11%
2010	17.46%	39.20%	29.27%	23.04%	25.29%	24.27%	-7.65%	-16.11%
2011	10.32%	0.70%	4.69%	16.17%	-24.50%	-6.19%	-5.76%	-17.88%
2012	3.90%	8.05%	6.23%	-6.63%	4.66%	-1.64%	8.42%	15.80%
2013	5.04%	6.89%	6.10%	16.18%	29.78%	22.58%	12.77%	4.32%
2014	-4.17%	-10.05%	-7.55%	6.13%	-0.61%	2.80%	7.55%	11.26%
2015	15.36%	-0.33%	6.57%	13.27%	1.33%	7.56%	1.75%	-1.20%
2016	-1.28%	10.18%	4.70%	11.73%	5.81%	9.06%	9.78%	1.22%

Maui County Overview

The following table provides a summary of matched-pair sales as a more precise measure of home value appreciation in the past several years. The annualized rates of change from 2010 through 2017 ranged from 5% to 12%.

New Traditions	91 Mehue		61 Mehue		210 Alake		63 Mehue	
Date Range	3/28/2014	12/21/2016	11/30/2012	6/21/2016	11/24/2014	9/22/2016	7/9/2015	7/1/2016
Price Range	\$399,105	\$519,000	\$412,125	\$525,000	\$459,045	\$527,000	\$485,000	\$545,000
Difference	\$119,895		\$112,875		\$67,955		\$60,000	
% Difference	30%		27%		15%		12%	
Months Between Sales	33		43		22		12	
Annualized Rate of Change	11%		8%		8%		12%	

New Traditions	63 Mehue		361 Uluna		102 Meheu		83 Meheu	
Date Range	1/25/2013	7/1/2016	9/17/2013	8/30/2016	9/6/2013	7/22/2016	4/5/2013	4/1/2016
Price Range	\$416,426	\$545,000	\$427,401	\$565,000	\$413,500	\$529,000	\$413,333	\$565,000
Difference	\$128,574		\$137,599		\$115,500		\$151,667	
% Difference	31%		32%		28%		37%	
Months Between Sales	41		34		35		36	
Annualized Rate of Change	9%		11%		10%		12%	

Milo Court	Unit 77		Unit 92		Unit 82		Unit 57	
Date Range	10/14/2011	6/27/2016	11/12/2010	9/23/2016	3/28/2014	12/2/2016	3/6/2014	3/10/2017
Price Range	\$347,990	\$460,000	\$349,990	\$495,000	\$430,000	\$500,500	\$439,000	\$510,000
Difference	\$112,010		\$145,010		\$70,500		\$71,000	
% Difference	32%		41%		16%		16%	
Months Between Sales	56		73		32		36	
Annualized Rate of Change	7%		7%		6%		5%	

Milo Court	Unit 76	
Date Range	10/17/2012	7/6/2017
Price Range	\$360,000	\$524,000
Difference	\$164,000	
% Difference	46%	
Months Between Sales	52	
Annualized Rate of Change	11%	

The following table provides a summary of annual sales trends at three recent/ongoing for-sale residential projects. Price escalation has been evident ever since 2013.

Maui County Overview

AVERAGE \$/SF VALUE TRENDS AT NEW DEVELOPMENTS

New Traditions	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Sales	--	--	--	7	47	60	32	5	5
Average SF	--	--	--	1,401	1,338	1,282	1,278	1,283	1,307
Average Sale Price	--	--	--	\$418,961	\$415,999	\$435,059	\$485,363	\$535,200	\$580,600
Average \$/SF	--	--	--	\$299	\$311	\$339	\$380	\$417	\$444
% Change	--	--	--	--	4%	9%	12%	10%	6%
2012 to 2017 - Average \$/SF Increase									49%
Parkways	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Sales	--	--	--	--	--	6	32	43	18
Average SF	--	--	--	--	--	2,045	1,914	1,802	1,783
Average Sale Price	--	--	--	--	--	\$631,569	\$608,655	\$614,963	\$644,390
Average \$/SF	--	--	--	--	--	\$309	\$318	\$341	\$361
% Change	--	--	--	--	--	--	3%	7%	6%
2014 to 2017 Avg. \$/SF Inc.									17%
Villas	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Sales	13	10	11	6	1	25	23	31	2
Average SF	1,615	1,738	1,547	1,746	1,853	1,627	1,642	1,668	1,446
Average Sale Price	\$484,092	\$493,260	\$434,064	\$481,667	\$612,500	\$566,072	\$607,904	\$647,694	\$633,500
Average \$/SF	\$300	\$284	\$281	\$276	\$331	\$348	\$370	\$388	\$438
% Change	--	-5%	-1%	-2%	20%	5%	6%	5%	13%
2012 to 2017 - Average \$/SF Increase									59%

ABSORPTION

The following table provides a summary of absorption rates for market-rate single-family and condominium product in Central Maui between 2010 and the present. The monthly absorption rates varied from 1.1 to 4.9 per month.

Importantly, these projects are all market-rate lacking the pre-sale capacity of the affordable projects. Kamani at Kehalani is the best market-rate representation of the subject based on its pricing within the subject projections of less than \$538,800. Kamani, a duplex condominium product, is being constructed by Towne Development in phases with each newly released phase sold out well in advance of completion of construction. An even faster absorption could be achieved with quicker construction.

Affordable housing projects generally pre-sell before ground breaking as illustrated by the current projects:

Maui County Overview

New Traditions

Initial Listing	3/12/2012
Final Sale	11/25/2015
Sales Period (months)	44
Homes Sold	143
Monthly Absorption Rate (sales/mo.)	3.3

Villas at Kehalani

Initial Listing	6/21/2007
Final Sale	Current
Sales Period (months)	114
Homes Sold (including escrows)	121
Monthly Absorption Rate (sales/mo.)	1.1

Parkways

Initial Listing	12/18/2013
Final Sale	Current
Sales Period (months)	36
Homes Sold (including escrows)	144
Monthly Absorption Rate (sales/mo.)	4.0

Kamani at Kehalani

Initial Listing	3/4/2016
Final Sale	Current
Sales Period (months)	17
Homes Sold (including escrows)	83
Monthly Absorption Rate (sales/mo.)	4.9

Milo Court

Initial Listing	1/25/2010
Final Sale	4/21/2014
Sales Period (months)	51
Homes Sold	94
Monthly Absorption Rate (sales/mo.)	1.8

New development in Central Maui priced from the high \$400,000 to the low \$700,000s have been pre-selling in phases prior to the completion of construction, as exemplified by ongoing Towne and DR Horton projects in Kehalani and Maui Lani.

Demand for subdivision lots was illustrated by the recent pre-sale event for Kualono, a 49-lot market-rate residential subdivision in Makawao. All 49 lots pre-sold on September 11, 2016 at prices ranging from \$270,000 to the high \$300,000s. A total of 73 qualified buyers participated in the lot selection event resulting in the pre-sales. The project has lot sizes ranging from 18,074 to 35,465 square feet with an average of 19,821 square feet. Importantly, the conditions of approval preclude ohana units.

MAUI COMMERCIAL REAL ESTATE SUMMARY STATISTICS

The following page provides a summary of investment and market sector statistics from the Colliers International Maui Market Report Year-End 2016.

**COLLIERS INTERNATIONAL
MAUI MARKET REPORT
YEAR-END 2016**

INVESTMENT SALES 2016

Property Type	# Transaction	Sales Volume	% of Sales Volume	% of Sale Count
Multi-Family	0	\$0	0.0%	0.0%
Development Land	13	\$54,765,940	11.5%	37.1%
Industrial Warehouse	8	\$24,439,000	5.1%	22.9%
Resort/Golf	1	\$210,000,000	44.2%	2.9%
Office	5	\$14,650,000	3.1%	14.3%
Retail	8	\$170,988,905	36.0%	22.9%
Totals	35	\$474,843,845	100.0%	100.0%

2016 RETAIL MARKET STATISTICS

Trade Area	Inventory	Available Space	Vacancy Rate	Net Absorption (SF)	Avg. Low Asking Rent (\$/SF/mo.)	Avg. High Asking Rent (\$/SF/mo.)	Avg. Operating Expenses (\$/SF/Mo.)
Central Maui	1,429,243	206,314	14.44%	(90,032)	\$2.39	\$3.67	\$0.99
South Maui	823,165	76,394	9.28%	33,714	\$2.56	\$2.96	\$1.13
West Maui	887,853	89,988	10.14%	353	\$3.25	\$4.14	\$1.61
Totals	3,140,261	372,696	11.87%	(55,985)	\$2.71	\$3.56	\$1.25

2016 OFFICE MARKET STATISTICS

Trade Area	Inventory	Available Space	Vacancy Rate	Net Absorption (SF)	Avg. Asking Rent (\$/SF/mo.)	Avg. Operating Expenses (\$/SF/Mo.)	Avg. Operating Expenses (\$/SF/Mo.)
Kahului	260,040	21,916	8.43%	400	\$1.92	\$1.96	\$1.30
Wailuku	297,096	46,873	15.78%	(9,935)	\$1.46	\$1.64	\$0.89
Kihei	415,157	129,037	31.08%	(33,109)	\$1.73	\$1.93	\$0.92
Totals	972,293	197,826	20.35%	(42,644)	\$1.70	\$1.85	\$1.02

2016 INDUSTRIAL MARKET STATISTICS

Trade Area	Inventory	Available Space	Vacancy Rate	Net Absorption (SF)	Avg. Asking Rent (\$/SF/mo.)	Avg. Operating Expenses (\$/SF/Mo.)
Wailuku	1,324,706	31,070	2.35%	(9,246)	\$1.11	\$0.24
Kahului	3,869,421	38,582	1.00%	49,697	\$1.26	\$0.28
South Maui	209,611	7,625	3.64%	15,589	\$1.27	\$0.46
West Maui	502,120	5,964	1.19%	1,501	\$1.50	\$0.49
Totals	5,905,858	83,241	1.41%	57,541	\$1.24	\$0.29

Source: Colliers International Maui Market Report Year-End 2016

RETAIL MARKET CONDITIONS

The Maui retail market is comprised of 3.14 million square feet of inventory, of which 46% is concentrated in Central Maui. The other large compositions are in South Maui (26%) and West Maui (28%).

Maui's retail market posted a negative 55,985 square feet of absorption as vacancy rose to 11.87%, its highest level in seventeen years. Much of this lost occupancy occurred in the Central Maui market, which experienced a record high vacancy rate of 14.4%. Most of the Central Maui vacancies occurred at Queen Kaahumanu Center, Maui Marketplace, Maui Mall and Kahului Shopping Center.

Central Maui is the location of two new large-scale shopping centers of note. The Maui Lani Shopping Center, a 103,000-square-foot Safeway anchored retail center in Wailuku, was completed in September 2013. Absorption remains relatively slow with only eight additional leases in the in-line and pad building spaces. The junior anchor space remains vacant.

Target anchors the Puunene Shopping Center, a 273,280 square-foot center located in Kahului. Target employs about 200 people to staff its new 140,000-square-foot store, which opened in March 2015. Besides the Target store, the shopping center will include both local and national retailers, including inline retail space, pad and restaurant space and mid-box opportunities. Petco is reported to be relocating to Puunene Shopping Center from Maui Marketplace. Asking rate vary from \$3.00 to \$5.50 per square foot.

Maui Marketplace, the 16th largest shopping center in Hawaii at 262,978 square feet, has two dark anchors with the recent bankruptcy of Sports Authority (vacated August 2016) and the relocation of Lowes to its new store next to Target. Apparently, Lowes still has a relatively long lease term and is attempting to sublet the original space. The remaining anchors include OfficeMax and Old Navy. The former Sports Authority space is being marketed as two demised spaces of 20,000 and 32,000 square feet at a negotiable rate.

While market softness was experienced in Central Maui, South Maui and West Maui both posted occupancy gains of 33,714 square feet and 353 square feet, respectively.

The average asking retail base rents for Maui trade areas have been generally downward trending since 2008 but did increase in the most recent period.

Despite new records for Maui air passenger arrivals and visitor expenditures, total retail sales (inclusive of visitor retail expenditures) for Maui County posted a 12.3% decline from \$1.55 billion for 2015 and \$1.36 billion for October 2016 YTD as residents cut spending. Unfortunately, this continues the downward trend that started in 2013.

Regardless, developers are optimistic that South Maui will continue to post strong retail demand as both Downtown Kihei and Wailea Village projects have begun their pre-leasing efforts for a combined total of 191,000 square feet of space.

Alexander & Baldwin also recently announced it will be building a new shopping center in the Maui Business Park, which will be anchored by a Safeway grocery store and gas station. The 94,000-square-foot Hookele Shopping Center will be located on the Paia side of the Hookele Street-Hana Highway intersection. The center is on the opposite end of Hookele Street from Target and the Puunene Shopping Center. Construction is expected to begin in the first quarter of 2018 and to be completed by the second quarter of 2019.

In general, the retail market has been improving for several years characterized by escalating transactional rental rates (despite the decline in asking rates), declining vacancy and new, large-scale development. However, the introduction of new supply has resulted in a reversal of declining vacancy in Central Maui. Real estate sales activity in the retail sector declined in 2016 after significant volume in 2015.

OFFICE MARKET CONDITIONS

The Maui office market is comprised of roughly 970,000 square feet of inventory, of which 58% is located in Central Maui. Kihei comprises the remainder.

Of the primary commercial land uses, the office market has recovered the least from the recent recession with a market-wide office vacancy rate of 20.4%, a rate that has been upward trending since 2009.

Maui's office market posted its seventh consecutive year of lost occupancy as the island-wide vacancy rate rose to its highest level in fifteen years. Although the Kahului office submarket generated positive net absorption for the year, continued soft market conditions in the Kihei and Wailuku submarkets resulted in a negative 38,198 square feet of island-wide absorption as vacancy rates rose to 20.35%. Premier Place lost Boeing Company as a tenant resulting in 22,000 square feet of negative net absorption and Kihei's office vacancy rate rising to a record high of 31.81%.

Maui office submarkets are also prone to volatility as the small inventory size (less than 1.0 million square feet) makes them vulnerable to even small changes in demand. Vacancy rates for Kihei remained elevated above 31% as overbuilding during the past decade has kept this market from recovering. The Central Maui office markets of Kahului and Wailuku fared better than the Kihei market, as County government offices and many of Maui's principal businesses have fueled nominal office demand. Similar to vacancy rates, average asking base rents also tend to fluctuate. The Kahului average asking base rent rose by a healthy 20.5% over the past year from \$1.61 psf/mo to \$1.94 psf/mo. The Kihei office market posted a healthy gain of 11.9% as rents rose from \$1.63 psf/mo to \$1.82 psf/mo. The Wailuku office market posted a loss of 7.6%, falling from \$1.67 psf/mo to \$1.54 psf/mo.

Not captured in the Collier's data is owner/user acquisition demand - a market highlight. Owner/user acquisitions in 2016/17 are detailed in the following table, which summarizes recent sales activity within four of the newest office condominium projects in Maui. The data and interviews with brokers actively marketing the projects indicate that sales demand is strong. The limited supply of available units inflates the values of the Wailea units.

Maui County Overview

Newer, previously unsold units sell in shell condition based on the new construction at Maui Lani and their business model along with unsold inventory from construction at the market peak.

Absent the Maui Lani Village construction, the office supply in Central Maui is older. Significant development of new office product during the peak of the market in South Maui boosted inventory absent real demand. South Maui remains overbuilt with softer market conditions that are improving based on the owner/user demand.

Maui County Overview

OFFICE BUILDING AND CONDOMINIUM SALES IN NEWER MAUI PROJECTS

Location	# 2016-17 Sales/Escrows	Size Range (SF)	<u>Shell Condition Acquisitions</u>		Comments
			\$ Amount	\$/SF	
Maui Lani Village Center, Kahului	3	2,859	\$999,000	\$349	New construction; larger sized; sold in shell condition with TIs ranging from \$102 to \$118/SF
Keawe Business Center Lahaina	1	1,305	\$514,000	\$394	New construction; 4 units sold to TS Restaurants totaling 4,293 SF; sold in shell condition with TIs ranging from \$90 to \$150/SF
Park Plaza Kihei	7	674-3,258	Confidential	Confidential	Shell condition with medical office build out of up to \$208/SF
Wailea Town Center Wailea	2	1,908-23110	\$1.335-\$1.48m	\$640-\$700	Resales with existing interior buildout

INDUSTRIAL MARKET CONDITIONS

Maui has two primary and two decidedly secondary submarkets. The Kahului and Wailuku submarkets contain 66% and 22% of the Maui's industrial inventory. As there is no clear delineation between the two, these submarkets are often referred to as Central Maui.

The Central Maui market area is the most vital to the economic engine for the island with its proximity to the Kahului deep draft harbor where all ocean shipped containers arrive and the Kahului International Airport which handles approximately 98% of all passenger and air freight into and out of the island.

The eight submarket industrial areas in Central Maui are:

- Maui Business Park - 75 Acres
- Maui Business Park II - 121 Acres
- Kahului Industrial Area - 200 Acres
- Maui Lani - 50 Acres
- Wailuku Industrial Park - 55 Acres
- Millyard Industrial Subdivision - 30 Acres
- Consolidated Baseyards - 23 Acres and Waiko Baseyard - 19 Acres
- Central Maui Base Yards - 43 Acre

The industrial market represents the healthiest sector on Maui characterized by low vacancy rates, escalating rents and demand for new construction and repositioning properties. Despite the slow recovery in the residential home building industry, industrial market conditions have improved significantly over the past several years with particular emphasis in the past six to twelve months.

Tight market conditions persisted as Maui's industrial vacancy rate fell to 1.41%, its lowest level in four years. Healthy demand for warehouse space generated nearly 58,000 square feet of new occupancy for 2016. The Kahului and South Maui markets posted the largest gains in net absorption for the year with 49,697 square feet and 15,589 square feet, respectively.

The recent surge in construction activity, helped to boost contracting sales for fiscal year-end 2016 to \$788.18 million, a healthy 12.5% jump in activity over fiscal year-end 2015 levels. The construction sector is a primary driver of Maui's economy and is instrumental in boosting warehouse demand. The 1st quarter 2017 increase in construction building permits is a positive sign for the industrial market.

Wholesalers constitute the largest segment of users of Maui's industrial space with a heavy concentration located in Kahului near the harbor. Wholesale/distributor sales revenue for fiscal year-end 2016 (July to June) declined by 1% from \$438.61 million to \$434.17 million over the past year. This slowdown coincides with the reduction in retail sales reported earlier.

Maui County Overview

During the past year, the direct weighted average asking base rent for warehouse space on Maui declined 3.2% from \$1.24 psf/mo to \$1.20 psf/mo. While the average asking rent has remained between \$1.19 and \$1.24 psf/mo for the past four years, the severe shortage of warehouse spaces, coupled with strong tenant demand, will likely push rents upward by 5% to 7% over the next year.

Colliers anticipates that current market conditions will likely persist for the mid-term time horizon (i.e., one to three years). While speculative construction has started on a few projects, developers are finding that current land prices and rising construction costs make the financial feasibility of a new warehouse project difficult. For tenants with available capital that are unable to find a suitable space to lease for their business, build-to-suit opportunities will likely be more seriously considered if current market conditions persist.

One additional observation of note is the abundance of industrial zoned land. The unsold inventory in Maui Lani Village Center alone approximates 31 acres, while A & B's new Maui Business Park Phase II added 121 acres of finished lot product at the end 2013 for a total of 152 acres. The land supply will support approximately 2.2 million square feet of additional building area or roughly 37% of the existing inventory. It appears that the industrial land market in central Maui will be over supplied for years to come based on current and historical absorption.

As the industrial subdivision land supply is controlled by only two entities, there may not be much influence on land values as evidenced by their sales amounts.

To date, 32.8 acres at Maui Business Park Phase II have closed or are in escrow to eleven buyers representing 40% of the total sellable lot area released to date. Nearly all of the sold inventory remains undeveloped. The pricing ranges from \$42 to \$60 per square foot. A future phase totaling an additional 37.8 acres along the south side of Hookele Street have yet to be released. Initial closings commenced in November 2014 following contract dates in mid 2014. The listing broker reported that the sales to date have exceeded the seller's expectations. The unit values obtained reflect the high end of the market.

Maui Lani Village Center has 38 lots remaining ranging from 9,950 square feet to 7.5 acres and listed from \$50 to \$60 per square foot. The developer has attempted to maintain original high unit values, which has produced virtually no absorption in the past few years.

In contrast, the Pulehuniu Heavy Industrial Park has experienced substantive pre-sale demand. The new 28-lot subdivision offering M-3 heavy industrial lots with prices ranging between \$16 to \$24 per square foot. M-3 zoning allows uses such as construction and lumber baseyards, manufacturing, recycling, stockpiling, crushing, and heavy equipment storage. Construction to start in the 2nd quarter of 2017 with delivery of the lots in 2018. Only 12 lots remaining available.

Lastly, Lowe's moved its Maui store from one A & B property to another at the Maui Business Park II next to the Valley Isle's first Target store. This follows the land purchase by the local Lexus and Subaru dealership that will be relocating from their existing, smaller facility near Costco to Maui Business Park II. These transactions appear to highlight a market trend toward new or renovated/repositioned commercial/industrial properties from older, more depreciated properties. The market's capacity to absorb the abandoned buildings remains unclear.

INVESTMENT MARKET

Maui commercial real estate investment activity registered a total sales volume of nearly \$475 million for 2016. This is a drop of 34.6% from \$726 million that was sold in 2015. Despite this decline in sales volume, the number of transactions increased for the second consecutive year, rising from 23 for 2014 to 35 for 2016, a jump of 52% during this two-year period. Prime resort and retail properties constituted the majority of the dollars spent on commercial real estate on Maui with a combined \$380 million which represented more than 80% of the total dollar volume for the year. Development land, inclusive of agricultural zoned and residential zoned parcels, was the most popular property type acquired with 13 (37%) of the 35 transactions of the year.

Prime resort and retail properties constituted the majority of the dollars spent on commercial real estate on Maui with a combined \$380 million which represented more than 80% of the total dollar volume for the year. Development land, inclusive of agricultural zoned and residential zoned parcels, was the most popular property type acquired with 13 (37%) of the 35 transactions of the year. Off shore money provided the majority of the capital for acquisition with \$397.7 million or 82.5% of the total. While off shore money acquired many of the big-ticket properties, local investors also were very active. Of the 35 transactions, 28 were by local investors. The average transaction size for off shore buyers (\$55.93 million) was nearly 20 times larger than the average transaction size by local investors (\$2.97 million).

The most expensive acquisition for the year was for the Ritz Carton Kapalua by a consortium including Trinity Investments, Ares Property Partners, SMW Hospitality and Wafra Investment Advisory Group. The group purchased this property from Woodbridge Capital and Colony Capital for \$210 million in November 2016. This transaction included a total of 297 hotel rooms and 107 resort condominiums.

Colliers projects that Maui's prime hotels and retail centers will continue to be an attractive target for off shore and international investors seeking to place their capital in safe haven investments. The recent increase in the number of land acquisitions on Maui will hopefully fuel additional development activity and boost the island's construction sector. The outlook for Maui remains optimistic as economic factors are projected to remain healthy for 2017.

CONCLUSION

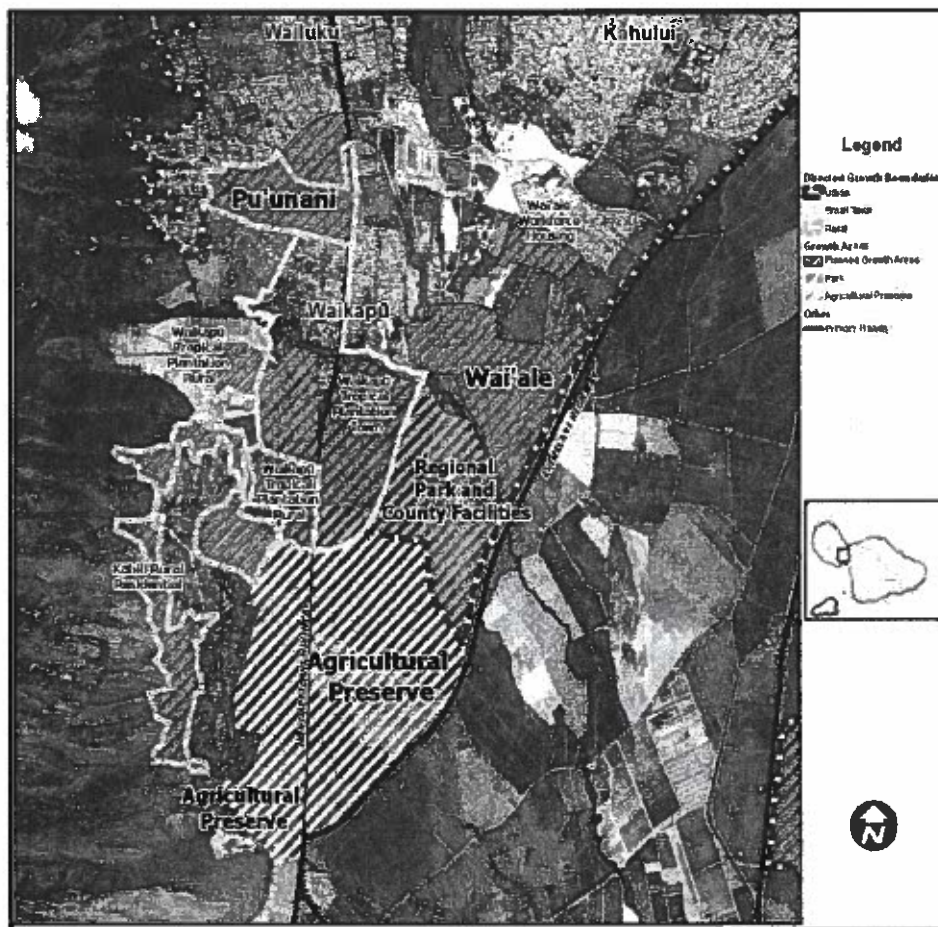
The local economy has made significant improvements from the recent recession with tourism leading the resurgence. All real estate market sections of exhibited strong growth but have yet to fully recover from the market peak. Residential subdivision development is returning with the re-emergence of land acquisition on a speculative basis and rapid absorption of new for-sale subdivision product. Affordable housing projects have become a significant component of new and proposed projects signaling strong demand this product type. Moderate economic growth is anticipated throughout 2017 and beyond aided by low fuel costs.

MARKET AREA

LOCATION

The subject is located within Central Maui primarily comprised of Wailuku and Kahului. Within Central Maui, the subject is located in Waikapu, a small rural town between Wailuku and Maalaea on Honoapiilani Highway. The town is primarily residential with a small commercial component. Historically, Waikapu has been surrounded by sugarcane fields, providing a clear distinction between the town and other nearby communities. As Wailuku and Kahului grow southward, the separation between these sub-regions and Waikapu is being diminished.

The following map from the Maui Island Plan illustrates the long-term planned supply of housing in the subject area. The planned growth areas of Waiale, Puunani and Tropical Plantation are intended for the additional supply of 4,437 units of houses and apartments over the next several decades. The timing of these large-scale planned development areas is well beyond the anticipated availability of the proposed subject units as early as the first quarter of 2020.



Market Area

It is important to understand that the proposed subject development will effectively serve all of Central Maui based on its geographic concentration, large population and employment base and predominance of households within the local working community.

The neighborhood is positively influenced by two master-planned communities – Maui Lani and Kehalani. Maui Lani is a 1,012-acre master planned community located in the heart of Central Maui, within minutes of the airport, Kahului Harbor, schools, churches, medical facilities, recreational amenities, shopping and business. Within Maui Lani, the Maui Lani Village Center, a mixed-use commercial and residential center with 79 commercial lots ranging from 7,500 to 328,000 square feet immediately east from the subject. To date, 44% of the commercial lot area has been sold by the developer.

Zoning allows for multiple uses including light industrial, office, and retail to be integrated with single-family and multi-family uses along a newly constructed regional roadway that will serve as a major connector to all parts of the island.

A partial list of owners and occupants within the Maui Lani Village Center include:

Walgreens	Paradise Beverages
Oceanic Time Warner Cable	GP Roadway Solutions
76 Gas	Retina Institute of Hawaii
Marmac Ace Hardware	Group Builders
Commercial Plumbing	Menehune Water

Kehalani is a master-planned community of 2,400 homes on 550 acres located immediately south of Wailuku Town at the base of the West Maui Mountains. The residential portion of Kehalani is approximately 70% built out with a wide variety of for-sale housing ranging from condominiums to luxury homes in a gated community.

The commercial components of Maui Lani and Kehalani are bisected by Waiale Road just one block north from the subject. Development progress for the Maui Lani Village Center is much farther along with finished lots and a number of recently constructed buildings. Construction commenced in 2011 on Kehalani's \$50 million, 200,000 square-foot commercial component known as Kehalani's Village Center. The project developer, Stanford Carr, lost the project to the lender in January 2013. Completed buildings include Longs Drug, Aloha Gas, Foodland and McDonalds.

ACCESSIBILITY

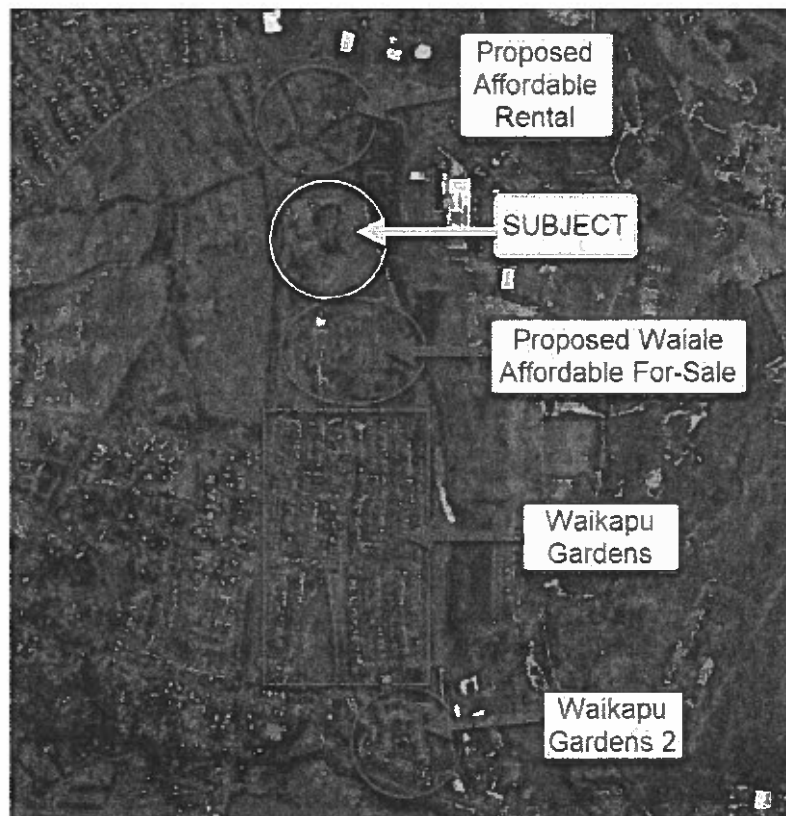
The subject market area accessibility is good due to its proximity to the main commercial arterial, Honoapiilani Highway and Maui Lani Parkway.

Market Area

NEIGHBORHOOD

The subject neighborhood is largely comprised of for-sale residential housing comprised of a mix of newer affordable and older market rate and a mixed-use commercial/industrial subdivision, Maui Lani Village Center.

- *Trends:* Trends in the neighborhood include land acquisition for affordable housing development.
- *Surrounding Land Uses:* The subject is surrounded by four affordable housing projects illustrated by the following aerial. The two existing projects, Waikapu Gardens and Waikapu Gardens II, sold out as successful and popular projects with excess demand. The abutting proposed Waiale project (to the south) recently received Maui County Council Land Use Committee fast-track approval for a 70-home single-family project in 2016. A proposed 324-unit workforce rental apartment was recently proposed abutting the subject to the north.



- *Conclusion:* The subject location is highly suitable for residential uses inclusive of the proposed affordable for-sale project.

AFFORDABLE FOR-SALE HOUSING MARKET OVERVIEW

AFFORDABLE PROGRAMS

The subject project will be a Section 201H-38, HRS application processed through the Maui County Department of Human Concerns consistent with Chapter 2.96 of the Maui County Code.

MARKET HOME SALE COMPOSITION APPROXIMATING CURRENT AFFORDABLE PRICING

The maximum allowable subject home sale price ranges from \$228,990 to \$538,800 per the 2017 guidelines as detailed in the following table. Importantly, 57% of all house and condominium sales 2017 year-to-date in Wailuku were within this range.

AMI %	2-Bed.	3-Bed.	
71%-80%	\$228,990	--	--
81%-100%	--	\$346,400	\$384,900
101%-120%	--	\$423,300	\$461,800
121%-140%	--	\$500,300	\$538,800

The following table provides a summary of year-to-date 2017 single-family and condominium sales in Central Maui districts of Wailuku and Kahului through July 24, 2017. The table contains a summary of sales volume in \$50,000 increments from \$200,000 through \$550,000, an amount bracketing the maximum allowable at the subject based on an assumed 4.5% interest rate to illustrate the respective home sale character.

WAILUKU KAHULUI YTD HOUSE AND CONDO SALES BY \$50,000 INCREMENT

Wailuku - YTD SF Home Sales Thru 7.24.17

# Sold	Low	High	Median
108	\$275,000	\$1,400,000	\$611,000

# Sold	Low	High	% of Total
0	\$0	\$200,000	0%
0	\$200,001	\$250,000	0%
3	\$250,001	\$300,000	3%
5	\$300,001	\$350,000	5%
3	\$350,001	\$400,000	3%
8	\$400,001	\$450,000	7%
8	\$450,001	\$500,000	7%
<u>13</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>12%</u>
40	--	--	37%

Kahului - YTD SF Home Sales Thru 7.24.17

# Sold	Low	High	Median
81	\$350,000	\$1,125,000	\$589,000

# Sold	Low	High	% of Total
0	\$0	\$200,000	0%
0	\$200,001	\$250,000	0%
0	\$250,001	\$300,000	0%
1	\$300,001	\$350,000	1%
2	\$350,001	\$400,000	2%
2	\$400,001	\$450,000	2%
6	\$450,001	\$500,000	7%
<u>11</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>14%</u>
22	--	--	27%

Wailuku - YTD Condo Sales Thru 7.24.17

# Sold	Low	High	Median
66	\$115,000	\$641,000	\$405,267

# Sold	Low	High	% of Total
3	\$0	\$200,000	5%
10	\$200,001	\$250,000	15%
8	\$250,001	\$300,000	12%
2	\$300,001	\$350,000	3%
9	\$350,001	\$400,000	14%
6	\$400,001	\$450,000	9%
20	\$450,001	\$500,000	30%
<u>5</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>8%</u>
63	--	--	95%

Kahului - YTD Condo Sales Thru 7.24.17

# Sold	Low	High	Median
18	\$74,000	\$280,000	\$95,000

# Sold	Low	High	% of Total
15	\$0	\$200,000	83%
1	\$200,001	\$250,000	6%
2	\$250,001	\$300,000	11%
0	\$300,001	\$350,000	0%
0	\$350,001	\$400,000	0%
0	\$400,001	\$450,000	0%
0	\$450,001	\$500,000	0%
<u>0</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>0%</u>
18	--	--	100%

Wailuku - YTD Total Residential Sales Thru 7.24.17

# Sold	Low	High	Median
174	\$115,000	\$1,400,000	\$503,600

# Sold	Low	High	% of Total
3	\$0	\$200,000	2%
10	\$200,001	\$250,000	6%
11	\$250,001	\$300,000	6%
7	\$300,001	\$350,000	4%
12	\$350,001	\$400,000	7%
14	\$400,001	\$450,000	8%
28	\$450,001	\$500,000	16%
<u>18</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>10%</u>
103	--	--	59%

Kahului - YTD Ctotal Residential Sales Thru 7.24.17

# Sold	Low	High	Median
99	\$74,000	\$1,125,000	\$570,000

# Sold	Low	High	% of Total
15	\$0	\$200,000	15%
1	\$200,001	\$250,000	1%
2	\$250,001	\$300,000	2%
1	\$300,001	\$350,000	1%
2	\$350,001	\$400,000	2%
2	\$400,001	\$450,000	2%
6	\$450,001	\$500,000	6%
<u>11</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>11%</u>
40	--	--	40%

Source: Maui MLS

SUPPLY AND DEMAND CHARACTERISTICS - INTERVIEWS WITH MARKET PARTICIPANTS

Interviews with the following market participants indicated that Maui County has extensive excess demand for affordable for-sale housing with virtually no currently available supply and limited pending supply.

- Susie Thieman, Executive Director of Lokahi Pacific
- Cassandra J. Leolani Abdul, Executive Director of Na Hale O Maui
- Vince Bagoyo, Principal with Development Consulting Group
- Steve Baker, listing broker for A & B's Kamalani project in Kihei

Susie Thieman indicated that they have all 16 homes at an affordable project located in Happy Valley in escrow at \$380,000 with a wait list. Buyers are restricted to 81% to 120% of area median income (AMI). Construction and closings are scheduled to occur between September and December 2017. The three-bedroom/two-bathroom homes will be 1,116 square feet in livable area with a one-car garage on an average lot size of 4,018 square feet.

Cassandra J. Leolani Abdul indicated that they have a standing list of 60 families pre-qualified with 10% to 15% expressing interest for every home they have available.

Vince Bagoyo recently pre-sold 56 affordable homes at Waikapu Gardens II based on a pre-approval list of 800. His recently approved 201H project with 70 affordable, single-family homes has a wait list of 150 based solely on interest generated from newspaper coverage.

Steve Baker indicated that A & B's marketing gathered 1,500 web site registrations leading to 350-400 prospective buyers that took (and paid for) an 8-hour mandatory homebuyer education course resulting in 43 qualified applications. This amount was low due to demand for homes in the \$200,000s of which there are none and many disqualifications stemming from a misunderstanding with county regarding income limitations. The inaugural sales weekend produced 22 sale contracts for the 49 available units. Once qualified, the initial weekend of sales produced sales for over 50% of the qualified buyers.

RE-SALE ENCUMBRANCES

The re-sale encumbrances appear to vary markedly by project and development type as characterized as follows:

- The period of restrictions varies from five years to 25 years for fee simple property rights and into perpetuity for leasehold
- Maximum allowable re-sale appreciation varies from 7% of cash equity to 25% of difference between appraisals with some phased and others fully available from day one

Importantly, all of the developers of affordable housing indicated that the re-sale encumbrances are not material to the buyers based on the limited availability of substitutable options and overwhelming priority of simply gaining entry into homeownership. Re-sale is a secondary or tertiary consideration at best and highly speculative.

SUMMARY OF RELEVANT FOR-SALE AFFORDABLE PROJECTS

The following section details a wide variety of for-sale affordable projects on Maui spanning from entitled but not commenced to recently completed and sold out in order to better characterize current market conditions for affordable for-sale housing in Central Maui.

Mokuhau, Happy Valley – Under Construction Lokahi Pacific

All 16 houses pre-sold and are in escrow at a sales price of \$380,000 or \$341 per square foot. The houses are two-store, single-family, detached with a one-car garage. The livable area is 1,116 square feet with a 303-square-foot garage. The lot sizes average 4,018 square feet. The project has a waitlist since the closing on these houses will not take place until September (4), October (4), November (4) and the final four in December 2017. This project is being developed by Lokahi Pacific, a non-profit housing and community development corporation, in association with the County of Maui's Department of Housing & Human Concerns. The proposed development is subject to a Residential Workforce Housing Agreement.

The project is designed in accordance with Maui County Code (MCC) Title 19.84 R-O Lot Line Overlay District, which allows for increased density for affordable housing projects. The housing will be offered to first-time homebuyers and subject to occupancy requirements and resale restrictions consistent with market practice for affordable for-sale housing. Importantly, the feasibility of this project was only made viable with the assistance of over \$2 million in government funding.

Waikapu Gardens II – Completed and Sold by January 2016 Spencer Homes

The project features 56 affordable, single-family homes and a small neighborhood park located on 10.5 acres on Waiale Road and Waiko roads, Wailuku. The subdivision was originally 48 homes and commercial, which was reconfigured without the commercial components. The project received in 2013 HRS Section 201H-38 approval by The County of Maui and was built and sold by January 2016. The following table provides a summary of the average sales by bedroom count.

Market Area

<i>Bed Count</i>	<i># Homes</i>	<i>Average Livable Area</i>	<i>Average Lot Area</i>	<i>Average Price</i>	<i>Average \$/SF</i>
3	39	1,517	6,231	\$422,332	\$278
4	17	1,853	6,524	\$506,093	\$273
Total	56	1,619	6,320	\$447,759	\$277

The development best serves to illustrate the excess demand for affordable housing based on its extensive pre-qualification list and 100% pre-sale results.

An interview with Vince Bagoyo, the project contractor, indicated the following:

- Sale resulted from a pre-qualified list of over 800
- Initial sales in 2015
- Last move-in January 2016
- 56 units of 3 and 4 bedrooms
- 30% 81-100%
- 30% 101-120%
- 40% 121-140%; approximates market values
- Average unit size 1,600 SF (excluding garage)
- Smallest plan 3+2; single story; 1,300 SF (+460 SF garage)
- Maximum sale prices of just above \$577,300
- 10-year restriction on re-sales based on 7% maximum increase on the cash equity; county given first option to re-purchase; developer given 2nd option to repurchase; if neither exercise option, owner can sell at market
- Strength of local market at \$575,000 and below
- 101-140% good market; best approximates market pricing and availability of profit
- \$175-180/SF vertical construction cost (inclusive of garage) for the cheapest; county sponsorship may require higher cost due to prevailing wage requirement
- Land values - \$125,000 to \$130,000/lot with infrastructure vs. raw land of \$25,000 to \$30,000/acre; infrastructure cost of \$60,000 to \$65,000/lot
- Minimum return on investment of 15%
- Waikapu Gardens I has some units with expired affordable re-sale restrictions with the rest within 1 year
- Waikapu Gardens II received \$800,000 in exemptions

**Waiale Affordable Housing Project – Newly Approved
Bagoyo Development Consulting Group**

The project features 70 affordable, single-family homes and a small neighborhood park located on 10.36 acres on Waiale Road in Wailuku, north of the Waikapu Gardens subdivision. Housing prices are dependent on median family incomes and prevailing mortgage rates, but they will range from roughly \$338,000 to \$465,000 according to the developers.

The subdivision would be primarily three-bedroom, two-bathroom homes ranging from lot sizes of 3,900 to 7,000 square feet. Twenty one homes (30%) would be priced for families earning 80 to 100 percent of Maui's median income. Another 21 (30%) would be sold to families making from 101 to 120 percent of median, while 28 (40%) would go to those earning from 121 to 140 percent.

The project is expected to take three years to complete, barring any unexpected delays. Elements of the proposed project include the following:

- HRS Section 201H-38 approval by The County of Maui granted June 3, 2016
- \$1.4 million purchase price or \$20,000 per lot
- State and County AG zoning; received exemption per the 201-H approval
- June 29, 2015 date of purchase agreement
- \$14 million vertical construction cost estimate or \$200,000 per home
- \$4.5 million subdivision improvement cost or \$64,286 per home
- 150 on wait list prior to any formal advertising

**Kamalani, Kihei – Recently Commenced Construction
A & B**

Kamalani is a new planned community of attached and detached condominium homes in north Kihei that recently commenced construction. Completion of the affordable phase is anticipated between April and August 2017. Kamalani is planned to include approximately 600 units to be developed in multiple increments and phases with parks and other recreational amenities, linked by a cycle track, pedestrian walkways and common area landscaping. The first neighborhood (Increment 1) will consist of 170, two- and three-bedroom condominium flats and townhomes that will be offered as residential workforce housing with priority given to Maui County residents that are income eligible under rules established by the County of Maui.

Residential Workforce Housing ("RWH") was established by the Maui County Council under Chapter 2.96, Maui County Code ("MCC"). The RWH Units will be located within a combination of 2- and 3-bedroom condominiums, including 3-bedroom townhomes within Increment 1 of the Project. The 2- and 3-bedroom condominiums are designated initially for the "below-moderate income" and "moderate income" categories, while the 3-bedroom townhomes are designated initially for the "above-moderate income" category.

Market Area

The RWH condominium units in Kamalani will be developed and sold in multiple phases. The initial phase will be comprised of 41 condominium homes. Future homes will be made available in phases as construction and sales progress. The table below identifies the RWH unit types available in the initial phase of Kamalani's Increment 1, with starting prices by model type. Please note that the maximum annual income shown is based on AMI figures for 2016.

Maximum RWH Income	Wait List Category	Model Type	Floor	Net Living Area (sq. ft.)	Covered Lanai (sq. ft.)	Yard Area (sq. ft.)	Bdrms	Bath	Starting Price
\$81,500	A	Flat A-1	FIRST	755	40	74	2	1.5	\$299,210
\$81,500	A	Flat A-2	SECOND	755	-	105-115	2	1.5	\$296,210
\$81,500	A	Flat B-1	FIRST	925	40	74	3	2	\$352,600
\$81,500	A	Flat B-2	SECOND	925	-	105-115	3	2	\$346,600
\$97,800	B	Flat C-1	FIRST	804	40	74	2	2	\$340,000
\$97,800	B	Flat C-2	SECOND	804	-	115	2	2	\$335,000
\$97,800	B	Flat D-1	FIRST	1022	40	74	3	2	\$400,000
\$97,800	B	Flat D-2	SECOND	1022	-	115	3	2	\$393,000
\$141,100	C	Townhome E	-	1174	-	257-918	3	2.5	\$456,600
\$141,100	C	Townhome F	-	1180	-	226-372	3	2.5	\$446,600

An interview with Steve Baker, the project selling broker, indicated the following:

- 1) 1,500 web site registrations
- 2) Of the 1,500, 350-400 took and paid for 8-hour mandatory homebuyer education course
- 3) Of the 350-400 that took the course, there were 43 qualified applications
 - a) Reduction due to the demand for homes in the \$200,000s of which there are essentially none
 - b) Many disqualified based misunderstanding with county regarding income limitations (rental vs. ownership); will call back and hopefully increase eligibility count
- 4) 7/16-7/17 firm contracts with \$5,000 down and 30-day rescission; additional \$5,000 down at end of recession with the \$10,000 contractually non-refundable
- 5) 22 (of 49 offered) units went into contract in initial weekend 7/16-7/17, including four townhouse contracts with three of the four to the 81-100% of AMI bracket and the fourth in the 102-140% of AMI bracket; with only 26 currently under contract
- 6) Base pricing
 - a) 2+1.5 - \$296,210
 - b) 2+2 - \$335,000
 - c) 3+2 (small) - \$346,600
 - d) 3+2 (large) - \$393,000
 - e) 3+2.5TH - \$446,600 and \$456,600
- 7) End of 2017 for completion of five buildings comprised of April-August 2017 completion date for phase 1 of increment 1

Market Area

Importantly, the largest units most approximating the subject have been available for three months to the general public without residential workforce housing restrictions at a price range of \$482,300 to \$487,700 for 1,180 square feet, as summarized in the table below. The sales agent indicated that 2nd home buyers have been the predominant demographic interested in the market priced units but that none have sold. He cited several disadvantages as rationale for the lack of sales, which include: (1) the lack of a model and any completed vertical construction; and (2) affordable stigma for market buyers.

KAMALANI INCREMENT 1 CONDOMINIUM HOMES NOW AVAILABLE

Previously reserved only for Maui residents and first-time homeowners with income restrictions, these condominium homes are now available to the public without Residential Workforce Housing restrictions:

BLDG. NO.	BLDG TYPE	UNIT NO.	MODEL TYPE	BEDROOMS /BATHROOMS	NET LIVING AREA	PORCH AREA	GARAGE AREA	YARD AREA	SALES PRICE	MONTHLY MAINT. FEE
19	4-PLEX	1902	F	3/2.5	1180	64	209	226	\$482,300	\$393.52
19	4-PLEX	1903	FR	3/2.5	1180	64	209	226	\$482,300	\$393.52
21	4-PLEX	2102	F	3/2.5	1180	64	209	226	\$487,700	\$393.52
21	4-PLEX	2103	FR	3/2.5	1180	64	209	226	\$487,700	\$393.52

Kahoma Village – Recently Commenced Construction Stanford Carr

Stanford Carr Development recently broke ground on a \$90 million residential neighborhood Makai from the subject. The Kahoma Village project is a mix of affordable and market rate for-sale housing that includes 101 three- and four-bedroom single-family homes and 102 two- and three-bedroom townhouses for a total of 203 homes. Stanford Carr's SCD Kahoma Village LLC recently purchased the project's 22-acre vacant parcel between Honoapiilani Highway and Front Street from The Harry & Jeanette Weinberg Foundation for \$14 million.

Construction on Kahoma Village, which is located south of the Safeway and Longs Drugs-anchored Lahaina Cannery Mall, is scheduled to take about two years to complete. This project will not directly compete with the subject.

Pulelehua – Entitled Project

Maui Oceanview LP, a partnership led by USA Infrastructure Investments

In June 2016, Maui Land & Pineapple Co. sold a 304-acre, fully entitled working-class community project located in West Maui, commonly referred to as Pulelehua, for \$15.0 million. The sale resulted in a gain of approximately \$14.3 million. Proceeds from the sale were used to pay down the Company's long-term debt that was due.

Pulelehua, near the Kapalua West Maui Airport, has been more than a decade in the making with calls for community involvement in the planning of the project going back to 2004. In its latest annual report, ML&P said that the project was designed for 882 single-family and multi-family residences, 95,000 square feet of commercial and retail space, an elementary school, churches and a community center. The site has conforming state and county land use designations, according to the annual report. Per the Maui Land & Pineapple Co. 2016 annual report, projected costs to complete ranged from \$300 million to \$500 million. Completion of any housing is years away.

Kai A Ulu – Pending Groundbreaking

Kaanapali

Aina Lani Pacific LLC

Kaiaulu at Kaanapali is a proposed 100 percent workforce housing development with a pending groundbreaking. Located on 7.65 acres mauka of Honoapiilani Highway approximately 800 feet north of the Kaanapali Parkway intersection, Kaiaulu is a 33-unit affordable single-family residential housing subdivision comprised of three- and four-bedroom homes varying from 1,118 to 1,641 square feet. Individual lot sizes will be approximately 5,286 square feet.

"The entire proposed project will be 100 percent affordable and sold as house and lot packages in fee simple initial offering with pricing based on 80% to 140% area median income levels. The homes were all presold at auction held in October 2016 at prices ranging from \$395,150 to \$650,500 totaling 95% of the maximum allowable amounts.

Kahoma Residential Subdivision – Land Development Recently Completed

68-Lot Residential Workforce Housing Development

Lahaina

West Maui Land

The Kahoma Residential Subdivision is a 100% affordable 68-lot residential subdivision approved under 201H-38, HRS. The development, which received final subdivision approval on November 29, 2016, has all off-site and land development improvements completed. The 68 lots vary from 6,047 to 8,459 square feet.

Market Area

The development is subject to a Residential Workforce Housing Agreement inclusive of the 2015 affordable sale price guidelines established by the Maui County Housing Division, Department of Housing and Human Concerns along with County Resolution 11-126, which addressed affordable housing credits associated with the larger project.

The project will offer affordably priced housing to qualified owner/occupant buyers per the agreement regarding residential workforce housing requirements, which remain in place for ten years after the closing of the initial sale. The housing will be offered subject to occupancy requirements and resale restrictions consistent with market practice for affordable for-sale housing.

Kahoma Homes is an income-qualified project for Maui's workforce who meet the basic eligibility criteria established by the County of Maui including but not limited to the following:

- A citizen of the United States or a permanent resident alien of the County of Maui;
- Is 18 years of age or older;
- A gross annual family income which does not exceed 160% of the County's median income as established by HUD;
- Assets that do not exceed 160% of the County's median income as established by HUD;
- No ownership or joint ownership that was 50% or more of a property in fee or leasehold in the United States for 3 years before submittal of the buyer interest form.

The proposed development is conditioned based on the Residential Workforce Housing Agreement with the County of Maui. The agreement documents the development approval and related encumbrances. The agreement is standard for affordable for-sale housing.

The maximum sales prices were established based on the 2015 affordable guidelines as follows:

No. of Units	Percentage of Project	HUD Income Range	Annual Household Income ¹⁾	1 Bedroom House & Lot	2 Bedroom House & Lot	3 Bedroom House & Lot	4 Bedroom House & Lot	Lot Only ³⁾
10	15%	< 80%	\$ 60,080	\$ 231,840	\$ 281,520	\$ 331,200	\$ 380,880	\$ 165,600
12	12%	< 100%	\$ 75,100	\$ 289,800	\$ 351,900	\$ 414,000	\$ 476,100	\$ 207,000
13	25%	<120%	\$ 90,120	\$ 347,760	\$ 422,280	\$ 496,800	\$ 571,320	\$ 248,400
10	15%	< 140%	\$ 105,140	\$ 405,650	\$ 492,575	\$ 579,500	\$ 666,425	\$ 289,750
23	33%	< 160%	\$ 120,160	\$ 463,610	\$ 562,955	\$ 662,300	\$ 761,645	\$ 331,150

¹⁾ Based on 2015 Affordable Sales Price Guidelines prepared by Housing Division, Dept. of Housing and Human Concerns, County of Maui, Effective May 1, 2015 with an assumed interest rate of 4%.

²⁾ Annual Household Income is based on a family of four and in accordance with the 2015 Affordable Sales Price Guidelines prepared by Housing Division, Dept. of Housing and Human Concerns, County of Maui, Effective May 1, 2015.

³⁾ Lot only prices are based on 50% of the sales price of a 3 bedroom house & lot.

FINANCING

It is important to note that the subject location is eligible for USDA financing for home buyers. The USDA program allows for more affordable loan terms than conventional lenders with no down payment requirement with the buyer only responsible for closing costs and PMI for any loan-to-value above 80%. The current USDA interest rates approximate 3.375% for a 30-year amortization. In contrast, conventional finance terms for affordable home purchases include a down payment as little as 3% to 5% (with PMI applicable for anything under 20%) and 30-year fixed interest rate approximating 4.0% to 4.25% with zero points. The low down payment options and relatively low interest rates are favorable to home ownership of any kind.

CONCLUSION

The proposed subject development will fill a small portion of the substantive shortfall in available for-sale affordable residential housing.

SUPPLY AND DEMAND CHARACTERISTICS

SUPPLY

The future supply of new housing as measured by the entitled, partially entitled and plan only single- and multi-family projects (see tables below) totaled nearly 28,000 effective May 1, 2016 per the Maui County Planning Department. Of the total, only 11,752 were entitled and 16,857 were at least partially entitled. The anticipated Maui housing demand would be satisfied if all of the entitled and partially entitled projects are completed by 2025. The ability to add additional large-scale supply not reflected in the table prior to 2025 is questionable (other than fast-track affordable projects) based on the recent comments by County Department of Planning Director William Spence that the entitlement process to develop housing takes an average of about seven years².

<i>Unit Type</i>	<i>Total SF & MF Units</i>
Entitled	11,752
Partially Entitled	5,105
Plan Only	<u>10,990</u>
Total	27,847 ³

Source: Maui County Department of Planning

	<i>Entitled</i>		<i>Partially Entitled</i>		<i>Plan Only</i>		<i>Total</i>
	<i>SF</i>	<i>MF</i>	<i>SFD</i>	<i>MF</i>	<i>SFD</i>	<i>MF</i>	
Kapalua - North Lahaina	2,119	1,164	875	930	635	630	6,353
South Lahaina - Ukumehame	0	0	0	0	4,100	360	4,460
Waihee - Wailuku - Kahului	806	1,550	360	0	150	45	2,911
Waikapu - Maalaea - North Kihei	1,571	2,071	1,300	605	2,665	1,515	9,727
South Kihei - Makena - Ulupalakua	881	1,117	149	600	0	0	2,747
Paia - Haiku - Haliimaile	148	0	16	0	825	65	1,054
Makawao - Pukalani - North Kula	194	131	170	0	0	0	495
South Kula - Keokea	0	0	0	36	0	0	36
Nahiku - Hana	<u>0</u>	<u>0</u>	<u>43</u>	<u>21</u>	<u>0</u>	<u>0</u>	<u>64</u>
Total	5,719	6,033	2,913	2,192	8,375	2,615	27,847

Source: Maui County Department of Planning

² <http://www.mauinews.com/news/local-news/2017/07/summit-focuses-on-affordable-housing-hurdles/>

³ Excludes Hale Mua and Olowalu

Supply and Demand Characteristics

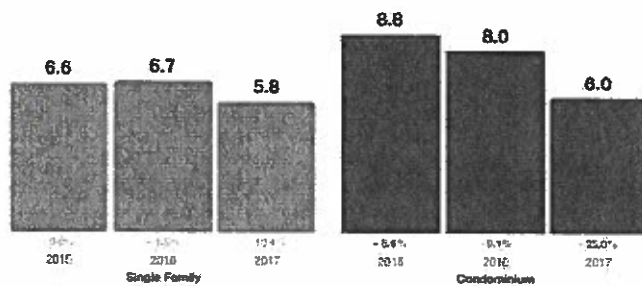
Recent statistics from the Realtors Association of Maui illustrates a shrinking supply of standing inventory declining to only 5.8 months, down 13.4% year-over-year. In contrast, the monthly supply of inventory was nearly 18 months as recently as the first quarter 2011.

Months Supply of Inventory

The inventory of homes for sale is calculated as a year's worth of sales, divided by the average monthly sales. When the ratio is 12, it means the current inventory would last 12 months at the current sales rate.

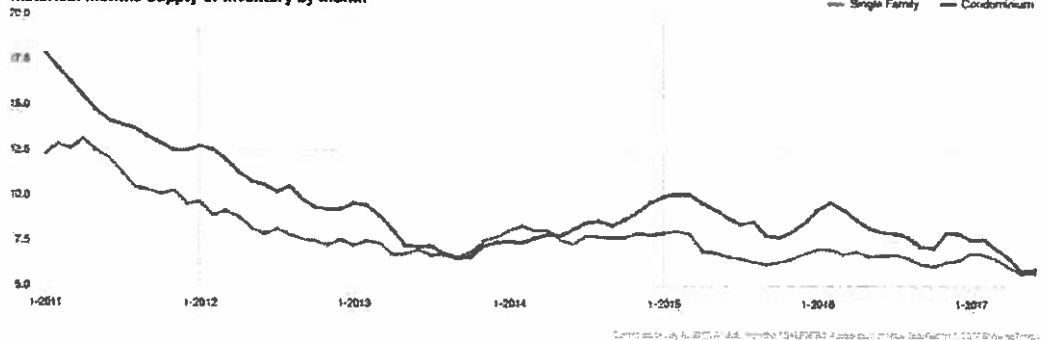


June



Month	Single Family	Year-Over-Year Change	Condominium	Year-Over-Year Change
Jul-2016	6.7	+ 3.1%	7.9	+ 6.0%
Aug-2016	6.6	+ 4.8%	7.7	+ 10.5%
Sep-2016	6.2	0.0%	7.2	+ 7.7%
Oct-2016	6.1	- 3.2%	7.1	+ 7.8%
Nov-2016	6.4	+ 1.5%	8.0	0.0%
Dec-2016	6.4	- 6.9%	7.9	+ 7.1%
Jan-2017	6.8	+ 2.9%	7.6	+ 17.4%
Feb-2017	6.7	- 4.3%	7.6	+ 20.8%
Mar-2017	6.5	- 4.4%	7.1	+ 22.8%
Apr-2017	6.1	- 11.6%	6.6	+ 24.1%
May-2017	5.7	- 13.8%	5.8	+ 29.3%
Jun-2017	5.8	+ 13.4%	6.0	+ 25.0%
12-Month Avg*	6.4	+ 12.0%	7.3	+ 14.8%

Historical Months Supply of Inventory by Month



DEMAND

The projected housing demand or Maui County from 2015 through 2025 was estimated at 14,373 to 16,698 units by the Department of Business, Economic Development and Tourism⁴ as summarized by the following table.

⁴ Department of Business, Economic Development & Tourism, Research and Economic Analysis Division, March 2015, "Measuring Housing Demand in Hawaii, 2015-2025", 30

Supply and Demand Characteristics

Table 4.20: Estimated Future Housing Demand for Maui County, 2015-2025

	Baseline Scenario	Middle Scenario	Aggressive Scenario
Household Growth	11,512	11,512	11,512
Change in Vacant Unit Demand	2,437	2,652	3,496
Total	13,949	14,164	15,008
By Ratio of Completions to Household Growth	14,373	15,237	16,698

Source: DBEDT, calculations based on methods suggested by the Harvard Center for Housing Studies

The Hawaii Housing Planning Study, 2016 further refines the housing demand from 2015 through 2025 by HUD income classification (% of area median income or AMI)⁵. The AMIs planned to be served by the subject are outlined in red.

Table 27b. Housing Demand by HUD Income Classification, Counties & State of Hawai'i, 2016-2026

	HUD Income Classification (% of Area Median Income)								Total
	Less than 30%	30-50%	50-60%	60-80%	80-120%	120-140%	140-180%	More than 180%	
Maui	2,947	2,775	1,414	2,393	1,626	1,493	500	801	13,949
Ownership Units	1,079	824	351	1,151	1,308	1,292	469	766	7,240
Single-Family	1,022	783	234	1,022	1,112	1,032	368	610	6,183
Multi-Family	57	41	117	129	196	260	101	156	1,057
Rental Units	1,868	1,951	1,063	1,242	318	201	31	35	6,709
Single-Family	1,295	1,226	771	1,050	239	156	17	30	4,784
Multi-Family	573	725	292	192	79	45	14	6	1,926

Source: Hawaii Housing Planning Study

The proposed subject represents only 2.5% of the total ten-year demand estimate by AMI percentage. The anticipated timing of the project is within the initial five years of the period of forecasted demand and collectively, the project pipeline of current and future supply will not remotely approach exceeding demand within the anticipated project timeline.

# of Subject Units	AMI %	Maui Demand 2015-2025	Subject As % of Total
12	71%-80%	1,022	1.2%
52	81%-120%	1,112	4.7%
<u>16</u>	121%-140%	<u>1,032</u>	<u>1.6%</u>
80		3,166	2.5%

⁵ SMS Research & Marketing Services, Inc., December 2916 "Hawaii Housing Planning Study, 2016, 34

Supply and Demand Characteristics

The Hawaii Housing Planning Study, 2016 survey results indicated that raw demand for Maui households with the intention to move is 52.3% with 20.6% in year one and 19.9% in year two.⁶

The proposed subject development has favorable demand characteristics summarized as follows:

- Preferred number of proposed bedrooms (2 to 4) accounts for 97.8% of surveyed demand— two (18.1%), three (56.1%) and four (23.6%)
- Per Housing Demand Survey, the proposed pricing for the subject will capture roughly 80%⁷ of respondents regarding what they can afford for monthly housing costs
- Wailuku housing stock is 76.2% single family, which is consistent with the majority of the proposed development

Recent sales activity at two local projects serve to provide an excellent illustration of demand for for-sale housing that brackets the pricing and product quality of the proposed development: (1) Kehalani Gardens on the lower end; and (2) Kamani at Kehalani on the upper end.

Kehalani Gardens, which is located ¼ miles north of the subject, was developed in 2005 by Stanford Carr as a 132-unit condominium with most unit sales subject to affordable restrictions. The townhouse-style units are comprised of two- and three-bedroom floor plans in clusters of six adjoining units with one carport and one open stall for dedicated parking. The unit sizes range from 935 to 1,133 square feet. Importantly, the affordable encumbrances have expired and all of the homes are now part of the market housing supply.

The following table provides a summary of annual sales statistics at Kehalani Gardens by bedroom count. Importantly, the three-bedroom units, which are the most representative of the proposed subject product, have increased in average sale price and declined in days on market in 2016 and year-to-date 2017. The two-bedroom sale prices have also escalated with one aberrant listing inordinately influencing the year-to-date days on market.

<i>Two-Bedroom Units</i>				<i>Three-Bedroom Units</i>		
<i>Year</i>	<i># Sales</i>	<i>Avg. Sale Price</i>	<i>DOM</i>	<i># Sales</i>	<i>Avg. Sale Price</i>	<i>DOM</i>
2017 YTD	3	\$333,333	183	3	\$383,000	52
2016	6	\$331,667	126	10	\$372,800	89
2015	8	\$303,531	98	6	\$325,333	121
2014	6	\$311,667	120	--	--	--

⁶ SMS Research & Marketing Services, Inc., December 2916 "Hawaii Housing Planning Study, 2016, 100
⁷ Monthly mortgage payments of at 80% LTV, 4.25% interest rate and 30-year amortization

Supply and Demand Characteristics

The subject three-bedroom units are projected to be priced from \$346,400 to \$538,800, which overlaps the lower end of the Kehalani Gardens sales. The subject two-bedroom units will be priced below the range of the Kehalani Gardens sales at \$228,900. Importantly, Kehalani Gardens is a markedly inferior property based on its 12-year-old construction and condominium ownership and location across from the county prison.

Kamani at Kehalani is a duplex CPR product with 138 units of three bedrooms ranging from 1,425 to 1,465 square feet. The project commenced sales in March 2016 with 83 homes sold or in escrow. The standard sales practice is for release of project phases prior to completion of construction, so that all homes are pre-sold pending completion. The project pricing has spanned from \$479,000 to \$513,000 with each subsequent phase resulting in incremental price escalations. The ability to raise prices and maintain strong pre-sales serves to illustrate the strength of the local market for the for-sale product approximating the subject.

Clearly, the strong demand exhibited at Kehalani Gardens re-sales and pre-sales at Kamani at Kehalani illustrate the shortage of affordable ownership opportunities in the subject market.

AFFORDABILITY

Market priced housing has escalated considerably since 2012 with the strong economic recovery resulting in a greater spread between the affordable pricing. The following table illustrates the rapid decoupling of the median home value in Central Maui from the affordable price based on county guidelines. Through June 2017, the Central Maui median single-family home value was \$204,100 or 53% more than the affordable price of a three-bedroom house per the Maui County affordability guidelines at 100% AMI and 4.5% interest rate.

Supply and Demand Characteristics

<i>Year</i>	<i>Central Maui Median Price⁸</i>	<i>Affordable Price⁹</i>	<i>Median-to-Affordable Price Premium</i>	
			<i>Absolute</i>	<i>Percentage</i>
2010	\$430,000	\$394,700	\$35,300	9%
2011	\$375,000	\$394,700	-\$19,700	-5%
2012	\$380,000	\$400,400	-\$20,400	-5%
2013	\$416,040	\$408,200	\$7,840	2%
2014	\$445,000	\$393,700	\$51,300	13%
2015	\$507,381	\$390,000	\$117,381	30%
2016	\$557,000	\$423,300	\$133,700	32%
2017	\$589,000	\$384,900	\$204,100	53%

Availability of affordable for-sale projects, such as the subject project, will serve to satisfy pent-up demand for genuine buyers of meeting the income and other eligibility requirements.

⁸ Realtors Association of Maui; 2017 figure is year-to-date through June 2017

⁹ County of Maui Department of Housing and Human Concerns, Housing Division; 3-bedroom single-family dwelling at 100% AMI and 4.5% interest rate

CONCLUSION

The market demand study concluded that the proposed development will be well received by the local market and will be an incremental, yet important source of supply of affordable for-sale housing to address the substantive shortage of entry-level housing for Central Maui households priced within 71% to 140% of Area Median Income (AMI).

The findings are detailed and supported by the following:

1. Strong local new housing demand
 - a. One-third of the projected annual new supply requirement of 1,437 to 1,670 units to meet the ten-year projected housing demand is from buyers under 141% of AMI
 - b. Active ongoing land acquisitions and subdivision development of market-rate and affordable for-sale homes
2. Suitability of the proposed project's physical characteristics relative to Central Maui demand preferences (two-to four-bedrooms, principally detached single-family, etc.)
3. Significant housing price inflation inhibiting the ability of many households to purchase market-rate housing
 - a. Rapid decoupling of the median home value in Central Maui from the affordable prices based on county guidelines. Through June 2017, the differential between the Central Maui median single-family home value and the affordable price of a three-bedroom house at 100% AMI and 4.5% interest rate was \$204,100 or 53%. The differential was only \$7,840 or 2% as recently as 2013.
 - b. Annualized matched-pair house sale inflation ranging from 5% to 12% between 2010 and 2017
 - c. New subdivision and condominium sales absorption achieving 49% to 59% unit value (\$/SF) price inflation from 2012 through 2017
4. Proposed project's pricing is consistent with 57% of the single-family and condominium sales in Wailuku year-to-date 2017
5. Proposed project size is only 2.5% of the projected Maui housing demand through 2025 for 71% to 140% of AMI
6. Excess demand for affordable projects clearly evident by their complete pre-sale absorption prior to construction within the local markets
7. Shortage of new development and inventory

Conclusion

- a. The cumulative entitled and planned single- and multi-family housing in the Maui Island Plan totals 16,857, which is minimally sufficient to meet the projected housing demand
 - b. Less than six months of single-family inventory available for sale at present; down from a standing supply in 2011 of over 18 months
 - c. Seven-year standard entitlement period for new residential subdivision projects, which limits the supply of housing
8. Strong value price support (bracketing) for the anticipated sale prices of the proposed development as measured by re-sales and new absorption sales of projects in the local market.
 9. Anticipated full pre-sale absorption of the subject based on precedence of unilateral affordable project pre-sales and strong pre-sale activity for similar market-rate housing.

Qualifications Summary

ROBERT W. SPANGLER, MAI

EDUCATION: **University of Southern California**, Los Angeles, California
Master of Real Estate Development; finance emphasis, May 1997; graduated with honors

Claremont McKenna College, Claremont, California
Bachelor of Arts in Mathematics and Economics, May 1990; graduated Cum Laude

King's College University, London, England; January to June 1989

EXPERIENCE: **R.W. SPANGLER LLC** (previously incorporated) February 2004-Present
Southern California commercial appraisal specialist relocated to Hawaii in 2010 with core competencies allowing broad geographic and property type coverage; recently completed assignments in all Hawaii counties, Alabama, Arizona, Florida, Mississippi, Nevada, Texas and Washington

Extensive focus on complex valuation and disposition analysis of troubled assets

Recent appraisal and consulting experience with the following property types:

- | | | |
|--------------|------------------------|---------------------------|
| ▪ Apartment | ▪ Proposed development | ▪ Casino |
| ▪ Retail | > Apartment | ▪ Land |
| ▪ Office | > Condominium | > Residential infill |
| ▪ Industrial | > Independent living | > Residential subdivision |
| ▪ Hotel | > Self-storage | > Residential acreage |
| ▪ Marina | > Retail | > Commercial infill |

Eichel, Inc., 1990-2004

Performed commercial real estate appraisals and consulting service throughout the greater Southern California area, Northern California, Arizona, Florida, Nevada and Washington

- Property types appraised include, but are not limited to, marinas, office buildings, shopping centers, industrial buildings, residential subdivisions, apartments, infill and hillside acreage land, proposed construction of apartments, condominiums, self-storage, office, etc.
- Extensive involvement in valuation and analysis of complex litigation assignments, including full takes, part takes and rights of way for public agencies

LICENSES/OTHER: Member, Appraisal Institute (11580)

Certified General License (967) - State of Hawaii

Former Board Member: Regatta Seaside HOA, a 224-unit high-rise condominium

Appendix L

House Floor Plan Models



WAIKAPU AFFORDABLE HOUSING

MODEL A - 2 STORY, 4 BED RM. / 2 BATH
APPROX. 1,900 SQ. FT. INTERIOR LIVING SPACE
240 SQ. FT. SINGLE CAR GARAGE

artel INC.

SCALE
1/8" = 1'-0"



DATE
07-10-17

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WAIKAPU AFFORDABLE HOUSING

MODEL B - 1 STORY, 3 BED RM. / 2 BATH
APPROX. 1,200 SQ. FT. INTERIOR LIVING SPACE
240 SQ. FT. SINGLE CAR GARAGE

artel INC.

SCALE
1/8" = 1'-0"



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WAIKAPU AFFORDABLE HOUSING

MODEL C - 2 STORY, 3 BED RM. / 2 BATH

- 2 STORY, 4 BED RM. / 2 BATH

APPROX. 1,200 - 1,400 SQ. FT. INTERIOR LIVING SPACE

400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

SCALE
1/8" = 1'-0"



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WAIKAPU AFFORDABLE HOUSING

MODEL D - 1 STORY, 2 BED RM. / 1 BATH
APPROX. 700 SQ. FT. INTERIOR LIVING SPACE
400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

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SCALE
1/8" = 1'-0"



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WAIKAPU AFFORDABLE HOUSING

MODEL E - 1 STORY, 3 BED RM. / 2 BATH

APPROX. 900 SQ. FT. INTERIOR LIVING SPACE

400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel^{INC.}

SCALE
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WAIKAPU AFFORDABLE HOUSING

MODEL F - 2 STORY - DUPLEX, 2 BED RM. / 1 BATH - EACH
APPROX. 600-700 SQ. FT. INTERIOR LIVING SPACE

400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

SCALE
1/8" = 1'-0"



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WAIKAPU AFFORDABLE HOUSING

MODEL G - 2 STORY - DUPLEX, 3 BED RM. / 2 BATH - EACH
APPROX. 800 - 900 SQ. FT. INTERIOR LIVING SPACE
400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

SCALE
1/8" = 1'-0"



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WAIKAPU AFFORDABLE HOUSING

DETACHED TWO CAR GARAGE OR CARPORT
APPROX. 400 SQ. FT. GARAGE / CARPORT

artel INC.

SCALE
1/8" = 1'-0"



DATE
07-10-17

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Appendix M

Zoning and Flood Confirmation Form



17/1321-SN

ZONING AND FLOOD CONFIRMATION FORM

(This section to be completed by the Applicant)

APPLICANT NAME Vince Bago

TELEPHONE (808) 357-3842

PROJECT NAME _____

E-MAIL vbagap-dargroup@hawaii.com

PROPERTY ADDRESS WAILUKU, ISLAND OF MAUI

TAX MAP KEY (2) 3-5-002:011

☐ 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 18.04.03(B), MGC?
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 PLAN Growth Boundary: ☒ Urban ☐ Small Town ☐ Rural ☐ Planned Growth Area ☐ Outside Growth Boundaries

Protected Area: ☐ Preservation ☐ Park ☐ Greenbelt ☐ Greenway ☐ Sensitive Land ☒ Outside Protected Areas

COMMUNITY PLAN: Public/Growth - Public

COUNTY ZONING: Public/Growth - Public District

OTHER/COMMENTS:

FEMA FLOOD INFORMATION: A Flood Development Permit is required if any portion of a parcel is designated V, VE, A, AO, AE, AH, D, or Floodway, and the project is on that portion.

FLOOD HAZARD AREA ZONES ³ Zone X
& BASE FLOOD ELEVATIONS:

☐ FEMA DESIGNATED FLOODWAY

For Flood Zone AO, FLOOD DEPTH:

☐ (PD)
Planned
Development
☐ (PH)
Project District
☐ See
Additional
Comments (Pg.2)
☐ See
Attached LUD Map

SUBDIVISION LAND USE CONSISTENCY: ☐ Not Consistent, (LUDs appear to have NO permitted uses in common).

☐ Not Applicable, (Due to processing under consistency exemption No. ☐1, ☐2, ☐3, ☐4, ☐5).

(Signature)

☐ 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)

3/14/17
(Date)

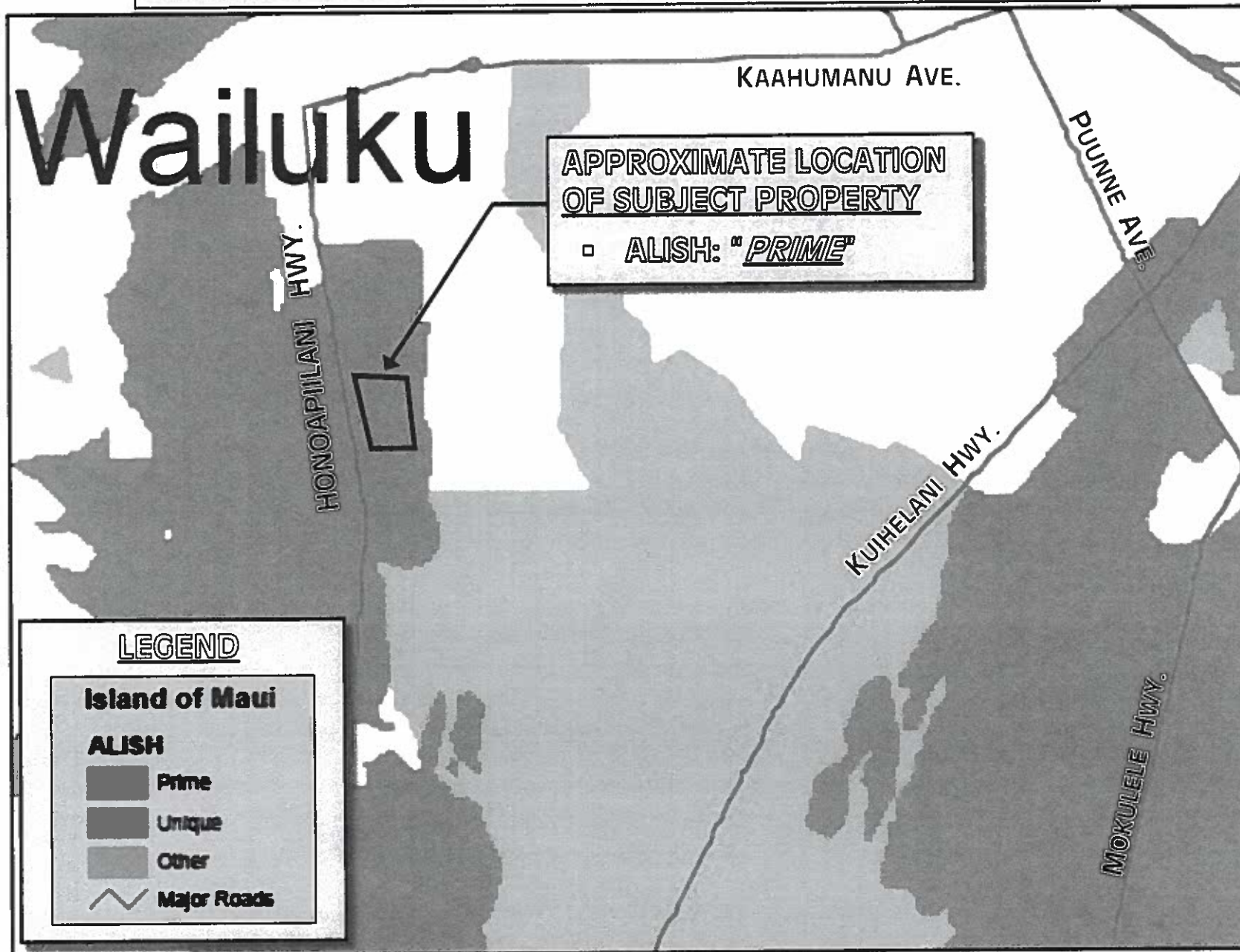
For: John S Rapacz, Planning Program Administrator, Zoning Administration and Enforcement Division

Appendix N

ALISH Map

AGRICULTURAL LANDS OF IMPORTANCE TO THE STATE OF HAWAII ("ALISH")

PROPOSED 201-H AFFORDABLE HOUSING PROJECT BY: WAIKAPU DEVELOPMENT VENTURES, LLC.
LOCATED IN VICINITY OF WAIKAPU, ISLAND OF MAUI, HAWAII // TAX MAP KEY: (2) 3-5-002: **11** (portion)



SOURCE: STATE OF HAWAII, OFFICE OF STATE PLANNING WEB-SITE
STATE DEPARTMENT OF AGRICULTURE, 1977

Appendix O

Phase I Environmental Site Assessment



Consultants, Inc.

Environmental Site Assessment: *Phase I Investigation*



Subject Site:

UNDEVELOPED, AGRICULTURAL LAND
Honoapiilani Highway
(Southeast of Kuikahi Drive)
Wailuku, Hawaii
T.M.K. (2) 3-5-02:1

Prepared for:

EMMANUEL LUTHERAN CHURCH
AND VALLEY ISLE FELLOWSHIP
c/o Carlsmith Ball, LLP
One Main Plaza, Suite 400
2200 Main Street
Wailuku, Hawaii 96793
Attn: Mr. Tom Leuteneker

Conducted and Compiled by:

Vuich Environmental Consultants, Inc.
VEC Project Number #0403-760
May 14, 2004

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Consultants, Inc.

Environmental Site Assessment: Phase I Investigation



Property: UNDEVELOPED, AGRICULTURAL LAND
Honoapiilani Highway
(Southeast of Kuikahi Drive)
Wailuku, Hawaii
T.M.K. (2) 3-5-02:1

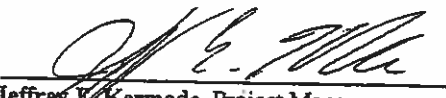
Prepared for: EMMANUEL LUTHERAN CHURCH
AND VALLEY ISLE FELLOWSHIP
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One Main Plaza, Suite 400
2200 Main Street
Wailuku, Hawaii 96793
Attn: Mr. Tom Leuteneker

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared by the investigator under direct supervision and provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances.


Joseph Beaulieu, Site Investigator

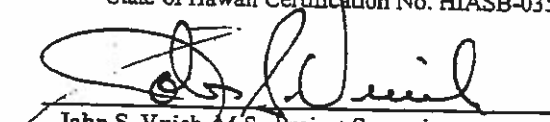
- B.A. (Environmental Science and Geography)

5/13/04
Date


Jeffrey E. Kermode, Project Manager

- B.A. (Geography), B.Tech. (Environmental Engineering)
- Lead-Based Paint Inspector (EPA Accredited Course)
EPA Certification No. HI-03-0920045008
- Asbestos Building Inspector (AHERA Accredited Course)
State of Hawaii Certification No. HIASB-0351

5/13/04
Date


John S. Vuich, M.S., Project Supervisor
➤ Registered Environmental Assessor
Registration No. 1433 (State of California)

5/13/04
Date

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End of Section

Disclosure

This document contains the results of services performed on this Project by **Vuich Environmental Consultants, Inc. (VEC)** pursuant to Agreement. The results represent the application of a variety of scientific and analytical disciplines that have been rendered using the standard of care, skill, and diligence normally provided by professionals in the performance of similar services under similar circumstances.

VEC assessments are intended to reduce, but not eliminate, uncertainty regarding recognized environmental conditions in connection with the Subject Site, as conducted within reasonable limits of time and cost. A general consensus of EPA's guidance on landowner liability is that *no environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property.*

The use of this document and the results reported are limited to the services performed and areas examined as described in this document and no inferences are intended with respect to anything not described herein.

VEC is not responsible for conditions or consequences arising from relevant data, facts, and information that were concealed, missing, withheld, not fully disclosed, or not reasonably available at the time these services were performed. VEC is not responsible for any indirect, incidental, or consequential damages of any nature arising from any cause.

VEC has no beneficial economic interest in the Project other than as an independent professional organization performing the agreed services. VEC's warranties are as described above and there are no other warranties of any kind, expressed or implied, regarding the services.

2.0 SITE AND REGIONAL DESCRIPTION

Refer to Figure 1, Regional Setting Map, in Appendix A, for a depiction of the general site setting of the subject property in relation to topographic features. Also depicted are the projected groundwater flows, regional surface water flows, and locations of other significant physical features or structures.

2.1 Location and Legal Description

The subject site is located one (1) mile south of the community of Wailuku, Maui, Hawaii. It lies on the east side of Honoapiilani Highway, southeast of the intersection of Kuikahi Drive. The site is further described on the Tax Maps of the State of Hawaii as a portion of Division 2, Zone 3, Section 5, Plat 02, Parcel 01 (See Figure 3, Appendix B). Property access is from Honoapiilani Highway and Waiale Road.

2.2 Site and Vicinity General Characteristics

The property consists of two (2) parcels of land, irregular in shape, measuring approximately twenty-five (25) acres each. The property is essentially agricultural land. Small tenant farmers use approximately eighty (80) percent of the property with the remainder being fallow fields. The predominant vegetation consists of tall grasses, fruit trees and mixed agricultural fields (See Figure 2, Appendix A). No commercial or industrial activities are currently taking place on the subject site.

The northern adjoining property is being used temporarily as a construction field office area for Goodfellow Brothers. Beyond this to the north is Kuikahi Drive. The eastern adjoining property is the future Waikapu Bypass beyond which are a commercial nursery and a former county landfill. Some trenching and earth moving has begun for this future roadway. The southern adjoining property consists of fallow fields. The Honoapiilani Highway is located along the western property boundary beyond which is fallow agricultural land. (See Figure 2, Appendix A).

Wailuku is Maui's traditional population center located on the eastern slopes of the West Maui Mountains. (See Figure 1, Appendix A). Kahului Bay on the Pacific Ocean is located approximately two (2) miles northeast of the subject property.

2.3 Description of Structures, Roads, Other Improvements

A network of unpaved agricultural roads has been established on the property. Several building structures were located on-site at the time of VEC's site reconnaissance. The majority of these are wood frame and plywood banana shacks. Two (2) more substantial buildings appeared to be residential. Several chicken coops were also located on site (See Figure 2 and Photo # 1, 15, and 16, Appendix A).

2.4 Current Use of the Property

The subject site consists primarily of mixed use tenant farming operations and heavily vegetated fallow agricultural land. No commercial or industrial activities are currently being conducted on-site. Some banana shacks located on-site appear to be residential in nature. The Maui County Planning Department currently describes the land's zoning as "Agricultural".

2.5 Current Uses of the Adjoining Properties

The current uses of the adjoining properties as observed by the investigator during the site reconnaissance are as follows (see also Figure 2, Site Plan, in Appendix A):

▪ <i>Northern Adjoining Property:</i>	Goodfellow Brothers construction office area beyond which is Kuikahi Drive.
▪ <i>Eastern Adjacent Property:</i>	Planned Waikapu Bypass, beyond which is a plant nursery and a former county landfill (Waikapu Landfill).
▪ <i>Southern Adjoining Property:</i>	Fallow agricultural land.
▪ <i>Western Adjacent Property:</i>	Honoapiʻilani Highway, beyond which is fallow agricultural land.



End of Section

3.0 USER PROVIDED INFORMATION

a standard of practice, the following information was requested from the Client during the preliminary phases of this investigation:

- Title records and knowledge of environmental liens;
- Personal, specialized knowledge or experience in regard to *recognized environmental conditions* concerning the property; and
- If applicable, actual knowledge of a significant, low purchase price for the property, and explanation for the lower price.

The purpose of this information is to help identify the possibility of *recognized environmental conditions* in connection with the property. These tasks do not require the technical expertise of an environmental professional and are generally not performed by environmental professionals performing the Phase I ESA. VEC submits a Preliminary Environmental Investigation questionnaire to the Client for this information. The completed questionnaire is attached in Appendix B.

According to information provided by the Client in the Preliminary Environmental Investigation, the Client is not aware of any environmental liens, proceedings, or investigations against the subject property as of the date of this ESA.



End of Section

4.0 RECORDS REVIEW

The purpose of a record review is to obtain and review records that will help identify *recognized environmental conditions* in connection with the subject property. The service of Environmental Data Resources, Inc. (EDR) was utilized to compile the database listings.

4.1 Standard Environmental Record Sources

The subject property and properties within the minimum search distances were reviewed from the following record sources (see below). Risk sites, if any, that may be located on or adjacent to the subject property, or are within close proximity to the subject site are described. Refer to Appendix B, EDR Radius Map Report, for a complete listing and description of all sites located within the designated search distances, details, and government agency database release dates.

The EDR Report bases the location of the listed risk sites on longitude/latitude information provided by the respective government agency. VEC confirms the locations of risk sites within close proximity to the subject site during the site visit. When the VEC site visit contradicts the EDR Report, it has been so stated.

THE SUBJECT SITE IS NOT LISTED ON ANY OF THE FOLLOWING FEDERAL OR STATE DATABASE LISTINGS OF THE EDR REPORT.

Federal Database Listings

▼ **National Priorities List (NPL or Superfund) and Proposed NPL, EPA.** The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program.

- *The EDR database report indicates no listings within the one-mile search radius of the subject site.*

▼ **Comprehensive Environmental Response, Compensation and Liability Information System List (CERCLIS), EPA.** The CERCLIS list contains data on potentially hazardous waste sites that have been reported to EPA by states, municipalities, private companies and private persons, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites that are either proposed to or on the NPL and sites, which are in the screening and assessment phase for possible inclusion on the NPL.

- *The EDR Report indicates no listing within the 1/2-mile search radius of the subject site.*

► **CERCLIS – No Further Remedial Action Planned (NFRAP), EPA.** NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.

- *The EDR Report indicates one (1) listing within the 1/4-mile search radius of the subject site.*

The EDR Report (amended) indicates one (1) listing within the 1/4-mile search radius of the subject site. The former Maui County Waikapu Dump is located immediately southeast of the subject site. See the amended EDR Report, Appendix B. CERCLIS listings indicate facilities that have a known or suspect abandoned, inactive or uncontrolled hazardous waste site.

▼ **Corrective Action Report (CORRACTS), EPA.** The CORRACTS report lists hazardous waste handlers with RCRA corrective action activity.

- *The EDR Report indicates no listings within the one-mile search radius of the subject site.*

▼ **Resource Conservation and Recovery Information System (RCRIS), EPA/NTIS.** RCRIS includes selective information on sites that generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

- The EDR Report indicates no listings of RCRIS treatment, storage and disposal (TSD) site within the 1/2-mile search radius of the subject site.
- The EDR Report indicates no listing for the subject property and no listing for a RCRIS large quantity generators within the 1/4-mile search radius of the subject site. Large quantity generators are entities that generate at least 1,000 kg/month of non-acutely hazardous waste or 1.0 kg/month of acutely hazardous waste (Lg. Quan. Gen. - LQG).
- The EDR Report indicates no listing for the subject property and no listings for a RCRIS small quantity generator (Sm. Quan. Gen. - SQG) within 1/4-mile of the subject site. RCRIS small quantity generators are entities that generate less than 1,000 kg/month of non-acutely hazardous waste.

▼ **Emergency Response Notification System (ERNS), EPA/NTIS.** Records and stores information on reported releases of oil and hazardous substances.

- The subject site is not listed.

State of Hawaii Database Listings

► **Sites List (SHWS), DOH.** A list of facilities, sites, or areas in which the Office of Hazard Evaluation and Emergency Response (HEER) has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

- The subject site is not listed.
- The EDR Report indicates one (1) listing within the 1-mile search radius of the subject site.

The Waiale Ash Pile is located northeast of the subject property (See EDR report, Appendix B). Also, see CERCLIS (NFRAP) listing above.

► **Permitted Landfills in the State of Hawaii (SWF/LF), DOH.** An inventory of solid waste disposal facilities or landfills in the State of Hawaii. These may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

- The subject site is not listed.
- The EDR Report indicates no listing within the 1/2-mile search radius of the subject site.

See amended EDR Report, Waikapu Dump (Appendix B) and CERCLIS (NFRAP) listing above.

▼ **Leaking Underground Storage Tank (LUST) database, DOH.** An inventory of reported leaking underground storage tank incidents.

- The subject site is not listed.
- The EDR Report indicates no listings within a 1/2-mile radius of the subject site.

▼ **Underground Storage Tank (UST) database, DOH.** USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with DOH.

- The subject site is not listed.
- The EDR Report indicates no listings within 1/4-mile of the subject property.

4.2 Additional Environmental Record Sources

The subject property and properties within the minimum search distances were reviewed from the following record sources. Refer to Appendix B, EDR Radius Map Report, for a complete listing and description of all sites located within the designated search distances, details, and database release dates.

Federal Database Listings

- ▼ **Superfund (CERCLA) Consent Decrees (CONSENT), EPA Regional Offices.** Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites.
 - *The subject site is not listed.*
 - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **Records of Decisions (ROD), EPA.** ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.
 - *The subject site is not listed.*
 - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **National Priority List Deletions (De-listed NPL), EPA.** A list of sites that have been deleted from the NPL where no further response is appropriate.
 - *The subject site is not listed.*
 - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **Facility Index System/Facility Identification Initiative Program Summary Report (FINDS), EPA.** Contains both facility information and 'pointers' to other sources that contain more detail.
 - *The subject site is not listed.*
- ▼ **Hazardous Materials Information Reporting System (HMIRS) DOT.** A list of hazardous material spill incidents reported to DOT.
 - *The subject site is not listed.*
- ▼ **Material Licensing Tracking System (MLTS), Nuclear Regulatory Commission (NRC).** A list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements.
 - *The subject site is not listed.*
- ▼ **Mines Master Index File (MINES), Department of Labor, Mine Safety and Health Administration.** Contains both facility information and 'pointers' to other sources that contain more detail.
 - *The subject site is not listed.*
 - *The EDR Report indicates no listings within the 1/4-mile search radius of the subject site.*
- ▼ **Federal Superfund Liens (NPL Liens), EPA.** A list of properties whereby the EPA has filed liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability.
 - *The subject site is not listed.*
- ▼ **PCB Activity Database System (PADS).** Identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required to notify EPA of such activities.
 - *The subject site is not listed.*
- ▼ **RCRA Administrative Action Tracking System (RAATS), EPA.** A historical archived database containing records on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by EPA. The database was discontinued on September 30, 1995.
 - *The subject site is not listed.*
- ▼ **Toxic Chemical Release Inventory System (TRIS), EPA.** A list of facilities which release toxic chemicals to the air, water, and land in reportable quantities under SARA Title III, Section 313.
 - *The subject site is not listed.*

- ▼ **Toxic Substances Control Act (TSCA), EPA.** Identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list.
 - *The subject site is not listed.*
- ▼ **Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/TSCA Tracking System (FTTS INSP and FTTS), EPA – Office of Prevention, Pesticides and Toxic Substances.** FTTS tracks administrative cases, pesticide enforcement actions, and compliance activities related to FIFRA, TSCA, and Emergency Planning and Community Right-to-Know Act (EPCRA).
 - *The subject site is not listed.*

State of Hawaii Database Listings

- ▼ **Release Notifications (SPILLS), DOH.** Releases of hazardous substances to the environment reported to the HEER Office. The following databases are included in the HEER Spill List:
 Release Notification Report: a compilation of releases reported to HEER.
 Hawaii Emergency Planning and Community Right-to-Know Act (HEPCRA): a list of facilities that have submitted Tier II and Form Rs as a reporting requirement.
 - *The subject site is not listed.*
- ▼ **Registered Wells and Dry Wells, DLNR.** (See Section 5.5.6). There are no registered wells listed for the subject property. (2002 DLNR data).
- ▼ **Air Quality Permit, DOH.** Current activities conducted on-site do not require an air quality permit.
- ▼ **Storm Water Discharge (NPDES) Permit, DOH.** Current activities conducted on-site do not require a NPDES permit.

County and Other Database Listings

Other local records of environmental interest that were reviewed or considered for review by VEC included:

- ▼ **Fire Department, County of Maui.** The Maui County Fire Department (MCFD) maintains file material that is not on a database. MCFD was contacted for an inquiry on the subject property.
- ▼ **Former Manufactured Gas (Coal Gas) Sites.** EDR provides exclusive information regarding the existence and location of Coal Gas sites.
 - The EDR Report indicates no listings within the one-mile search radius.
- ▼ **Grading/Grubbing Permit, County of Maui.** The current activities being conducted on-site do not require a grading/grubbing permit.
- ▼ **Hazardous Waste Disposal Documents.** VEC did not review any hazardous waste disposal documents.
- ▼ **Maui Electric Company.** Maintains records on county power transformers regarding PCB-containing equipment and equipment maintenance. One (1) pole-mounted electrical transformer was observed at the northeast corner of Lot 1 of the subject property (See Photo #20 and Figure 2, Appendix A).
- ▼ **Other Environmental Reports.** Environmental site assessment reports that were previously completed by VEC in close proximity to the subject site were reviewed.
- ▼ **Planning & Zoning, County of Maui.** According to the Maui County Department of Planning, the subject site's zoning is "Agricultural" and is **not** within the boundaries of the Special Management Area (SMA).

- ▼ **Property Tax Office, County of Maui.** The Maui County Property Tax Office maintains records of past ownership, maps, sketches and other information as it pertains to the subject property. (See also Section 7.1). The property owner is listed as Wailuku Agribusiness Company, Inc.
- ▼ **Wastewater Discharge Permit, County of Maui.** VEC did not identify any wastewater discharge permits registered to the subject property.

4.3 Physical Setting Source(s)

The following sources were reviewed for physical setting information (refer to Section 7.0 for a complete listing):

- Atlas of Hawaii;
- Civil Defense Tsunami Evacuation Map;
- Geologic and Topographic Map (Hawaii Atlas & Gazetteer);
- Groundwater Map and Water Quality Plan for State of Hawaii;
- U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, HI;
- U.S. Geological Survey, 7.5 Minute Topographic Map, Wailuku Quadrangle, 1983.

These data sources were used to provide information regarding physical characteristics of the subject site and surrounding area. This information is typically used in analysis of potential geological trends, which might impact environmental conditions of the subject site. Note that this investigation is not intended to identify geologic hazards associated with the subject property.

4.4 Historical Use Information Regarding the Property and Adjoining Properties

The following historical data sources were reviewed for this report (refer to Section 7.0 for a complete listing):

- Aerial Photographs;
- Department of Planning and Zoning, County of Maui;
- Maui County Fire Department (Fire Prevention Bureau / Hazardous Materials Division);
- Maui County Real Property Tax Records;
- Personal Interviews;
- Sanborn Maps (no coverage);
- State of Hawaii, Department of Health, Environmental Management Division;
- Environmental Data Resources (EDR).

Historic Aerial Photographs

A series of aerial photographs with coverage of the subject property and surrounding areas were examined. See Figure 2, Appendix A, for clarification of specific locations.

Table 1.0: Historical Aerial Photograph Analysis		
Date	Aerial Photo Analysis	
12/20/50	SS: N, S, W: E: RG:	Agricultural land use (sugarcane). Agricultural land use (sugarcane). Undeveloped vegetated land. Agricultural land use with undeveloped land to the east.
6/2/64	SS: N, E, S, W: RG:	No changes noted. No changes noted. No changes noted.
1/30/77	SS: N, S, W: E: RG:	No changes noted. No changes noted. Agricultural land use (sugarcane). County landfill noted to the southeast. Water tank noted to the northeast.
9/11/85	SS: N: E, S, W: RG:	No changes noted. Kuikahi Drive added. No changes noted. Agricultural land with increasing residential growth.
10/8/90	SS: N, S, W: E: RG:	Crop changed from sugarcane to pineapple. Crop changed from sugarcane to pineapple. Agricultural land use changed to commercial nursery. County landfill appears to be closed. Agricultural land with increasing residential.
5/3/97	SS: N, S, W: E: RG:	Agricultural use has changed to small fields with banana shacks evident. No changes noted. Agricultural use has changed to small fields with banana shacks evident. Agricultural use with increased residential development.
Notes: SS: Subject Site N: Northern Adjoining Property E: Eastern Adjoining Property S: Southern Adjoining Property W: Western Adjoining Property RG: Regional Area		

VEC did not observe any features on aerial photographs examined that would suggest the presence of significant vegetative stress, soil staining, or bulk storage of chemicals such as drums or tanks.



End of Section

the groundwater management area as the *Iao Aquifer System* within the *Wailuku Aquifer Sector*. The groundwater underlying the subject site is defined as follows:

Table 4.0: Aquifer Classification of the subject site

Aquifer	Aquifer Type: Hydrology & Geology	Status of Groundwater				
		Development Status	Utility	Salinity (mg/L Cl)	Uniqueness	Vulnerability to Contamination
Upper	Unconfined basal aquifer occurring in horizontally extensive lavas (Flank)	Currently Used	Drinking	Fresh	Irreplaceable	High

The following are descriptions of the aquifer classification codes, according to Water Quality Plan of 1992:

Aquifer Type Hydrogeology (basal, high level, unconfined, confined, or confined/unconfined: basal – freshwater in contact with seawater; *high level* – freshwater not in contact with seawater; *unconfined* – water table is the upper surface of the saturated aquifer; *confined* – aquifer is bounded by impermeable or poorly permeable formations; and *confined or unconfined* – the actual condition is uncertain.

Aquifer Type Geology: flank, dike, flank/dike, perched, dike/perched, and sedimentary.

Development Stage – currently used, potential use, no potential use: Aquifers are differentiated according to those already being used (currently used), those with potential utility (potential use), and those having no potential for development.

Utility – drinking, ecologically important, neither: Identifies aquifers by use.

Salinity – fresh, low, moderate, high and seawater: The gradation of groundwater from fresh to seawater is a feature of all basal aquifers in Hawaii. The upper limit of the standard for drinking water is 250 mg/l Chlorine (Cl) (fresh) and true seawater has a chloride content of 18,980 mg/l.

Uniqueness – irreplaceable and replaceable: The classes irreplaceable and replaceable are direct EPA derivatives. Virtually all-potable water in the state of Hawaii should be considered irreplaceable over the long term.

Vulnerability to Contamination – high, moderate, low, none: Because of the geographical limits of resources, interconnection among groundwater sources and the relatively rapid time of groundwater travel, aquifers can be described as being either vulnerable or not vulnerable to contamination.

The estimated depth to the basal groundwater ranges from approximately 300 to 350 feet below the ground surface, depending on the location on the subject property. The flow direction is expected to be in an easterly direction.

The subject site is located makai (below) of the Underground Injection Control (UIC) line. The UIC line is the designated boundary that divides protected inland areas situated over drinking water sources from seaward areas located over non-potable water sources. Sites makai of the UIC line are not considered drinking water sources and permit limitations are imposed by Maui County, Clean Water Branch (CWB).

5.2.7 Potable Water Supply and Sewage Disposal System

The property is undeveloped at this time. The shacks on-site could not be accessed to determine what water supply and sewage disposal systems they used, if any.

5.3 Interior and Exterior Observations

5.3.1 Hazardous/Regulated Substances and Petroleum Products in Connection with Identified Uses.

VEC did not identify any hazardous/regulated substances and/or petroleum products in connection with identified current uses as visually and physically observed on the property at the time of the site visit. However, VEC was limited in their investigation of the entire site (See Section 1.4). While no bulk storage

of regulated substances was observed, it should be noted that small farming operations, like those observed on-site, do commonly use fertilizers and pesticides. VEC observed limited containers of petroleum products that were empty. No bulk storage of petroleum products and associated soil staining was noted.

5.3.2 Hazardous/Regulated Substances and Petroleum Products/Containers (not in connection with identified current uses).

VEC did not identify any hazardous/regulated substances and/or petroleum products that are not in connection with identified current uses as visually and physically observed on the property at the time of the site visit. There is no evidence of any historic misuse, improper bulk storage, or significant spills of hazardous or regulated substances on the subject property. However, VEC was limited in their investigation of the entire site (See Section 1.4).

A review of the historical information identified the subject property to be part of the Wailuku Sugar Company's Plantation that has been operating in this area for several decades. It was also discovered that Maui Land and Pineapple company leased the property for pineapple cultivation for several years up until 1998. Hazardous materials potentially associated with sugarcane and pineapple cultivation include pesticides and herbicides. The U.S. Environmental Protection Agency (EPA) has long recognized these chemicals as a contaminant to surface soils and ground water. Clayton Suzuki, Land Manager for Wailuku Agribusiness has provided a list of chemicals potentially used on site (See letter in Appendix B).

5.3.3 Unidentified Substance Containers

VEC did not observe any unidentified substances suspected of being possible hazardous/regulated substances or petroleum products as visually and physically observed on the property at the time of the site visit.

5.3.4 Storage Tanks

No indication regarding the historic or current presence of underground storage tanks (USTs) on the subject site was obtained through our review of regulatory databases, interviews or through VEC's site reconnaissance.

5.3.5 Odors

VEC identified no suspect odors on the subject property.

5.3.6 Pools of Liquid

The investigators did not observe any pools or sumps of liquids likely to be hazardous substances or petroleum products to the extent visually and/or physically observed on the subject property at the time of the site visit or from interviews or records review.

5.3.7 Indications of PCBs

Pole or pad-mounted transformers numbered 7777 or above are considered non-PCB containing by the Maui Electric Company. One (1) pole-mounted electrical transformer was observed on the subject property at the northeast corner of Lot 1. This transformer was determined to be non-PCB containing based on its ID number (See Photo # 20 and Figure 2 in Appendix A). This transformer appeared to be in good condition with no sign of leaking or staining.

Background Information:

Polychlorinated biphenyls (PCBs) are groups of manufactured organic chemicals that contain 209 individual chlorinated chemicals (known as congeners) and were introduced in 1929. PCBs have been used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. Products

containing PCBs are old fluorescent lighting fixtures, electrical appliances containing PCB capacitors, old microscope oil, and hydraulic fluids.

The manufacture of PCBs stopped in the United States in 1977 because of evidence that they build up in the environment and cause harmful effects. The distribution in commerce of PCB containing items was banned in 1979 (40 CFR 761.20). The EPA aggressively enforces regulations concerning PCB manufacturing, use, distribution, release and disposal under the Toxic Substance Control Act (TSCA). This federal agency extensively regulates the use, servicing, and disposal of PCBs in electrical equipment by enforcing marking, notification, inspection, and record keeping requirements.

5.4 Interior Observations

5.4.1 Heating and Cooling Systems of On-site Building Structures

VEC identified several small shacks related to the tenant farming activities that did not have any heating or cooling systems. However, VEC was limited in their investigation of the entire site (See Section 1.4).

5.4.2 Stains and Corrosion

VEC did not identify any significant staining or corrosion in the shacks on the subject property. However, VEC was limited in their investigation of the entire site (See Section 1.4).

5.4.3 Indoor Wastewater Drains, Sumps and Grease Interceptors

No drains, sumps or grease interceptors were noted by VEC during the site reconnaissance.

5.5 Exterior Observations

5.5.1 Pits, Ponds, and Lagoons

There were no areas identified as man-made or natural depressions that are, or would have been, likely to hold waste liquids or sludge from industrial operations or other activities.

5.5.2 Stained Soil or Pavement

No significant petroleum-like staining was noted on the subject property. However, VEC was limited in their investigation of the entire site (See Section 1.4).

5.5.3 Stressed Vegetation

There were no areas of stressed vegetation identified on the subject property at the time of the site visit that are, or would have been, likely caused from something other than insufficient water (or flooding).

5.5.4 Solid Waste

There were no indications of significant solid waste dumping or suspect fill materials, mounds, depressions or excavations, observed on this property during the site reconnaissance, nor on historic aerial photographs. Historical on-site disposal practices are unknown. A limited amount of earth moving and filling activities have been undertaken by Goodfellow Brothers in the northeast corner of Lot 1. This is related to adjacent infrastructure improvements and is not considered a significant environmental concern. Agricultural tilling and grading has taken place on the subject property.

The following solid wastes were noted during the site reconnaissance (See Photos #4, #17, #19, #21):

- Landscape debris (i.e. tree limbs, palm fronds, grasses, shrubs, etc.);
- Construction debris (i.e. concrete, lumber, metal, plastics);
- Soil stockpiles of less than 10 square meters (no odors or staining were detected);
- Road material stockpile of less than 10 square meters (tarmac odor detected);

- White goods (discarded washers, dryers or refrigerators, etc.);
- Several abandoned vehicles are located on the subject property.

Some wastes may be considered "Special Wastes" according to the Hawaii Administrative Rules (HAR) on Solid Waste, Title 11, Chapter 58.1. Special wastes are those wastes that do not fit in the mixed municipal solid waste (MMSW) category, either by general nature or because of special handling requirements. Special waste categories include: asbestos, sludge, medical waste, used oil, batteries, agricultural wastes, tires, derelict vehicles and white goods (i.e., appliances). Locally, the County of Maui, Department of Public Works, Solid Waste Division administers the disposal of these materials. These wastes need to be disposed of in a permitted solid waste landfill such as the Maui County Central Landfill. Special wastes' management needs to be performed in a manner that complies with all local, state, and federal regulations as applicable to the specific waste type.

5.5.5 Wastewater or Storm Water – Discharge Drains, Dry Wells, Drainage Ways, and Retention Basins

VEC did not identify any storm water drains located along the property boundaries. Some ditches and sewer manholes were noted along the eastern property boundary. These relate to the future Waikapu Bypass (See Figure 2, Appendix A).

Any future grubbing or grading activity that may take place on the subject site (especially if > 1 acre of soil disturbance) will likely require, both a Maui County Grading Permit and a Department of Health, Clean Water Branch, NPDES (National Pollutant Discharge Elimination System) permit.

5.5.6 Wells

From VEC's observations and database search, there are no production, domestic, abandoned, irrigation or monitor wells located on the subject site. Wells located near the subject property are mainly used for irrigation purposes or are unused at this time. See Figure 1, Appendix A for well locations.

5.5.7 Septic and Cesspool Systems

VEC did not obtain evidence of any current or historic septic or cesspool system located on the subject site. However, VEC was limited in their investigation of the entire site (See Section 1.4).

5.6 Non-Scope Considerations

The concerns listed below are not normally considered relevant under CERCLA, however, they may be considered regulated under other environmental laws and ordinances and may present a potential liability to the property owner.

5.6.1 Asbestos-Containing Materials (ACM)

The on-site structures inspected by VEC did not appear to consist of any asbestos-containing building materials. VEC did not note any significant quantities of construction debris that may contain asbestos. However, VEC was limited in their investigation of the entire site (See Section 1.4).

Background Information:

Asbestos was widely used in building materials and in fire retardant applications up through the 1980s. Asbestos use in the United States did not start to decline until the EPA banned the spray-applied materials during 1973-1978. Further restrictions on U.S. manufactured asbestos products continued into the 1990s. The EPA ban rule and phase-out of all asbestos-containing materials (ACMs) was to be implemented in stages from 1990 to 1997, but the Rule was overturned in federal court.

Asbestos is a known health hazard causing progressive lung scarring and cancer. Asbestos related conditions usually develop within 15 to 40 years after exposure. Exposed smokers have an increased risk factor of 50 to 90 times that of the non-smoking population.

State and federal rules have established standards for the use and control of ACM. These standards apply to worker protection, notification procedures, renovation/demolition activities, and construction debris (waste) management.

Under the EPA's Asbestos Hazard Emergency Response Act (AHERA), 40CFR763, asbestos-containing material (ACM) is defined as any substance whose asbestos content exceeds one percent (1%) of the total volume as determined by Polarized Light Microscopy (PLM) analysis. Building inspector training, sampling procedures and laboratory analysis are also addressed under this rule. Some aspects of this rule have been extended to public and commercial buildings. The Hawaii Administrative Rules 11-502 have essentially adopted EPA's AHERA standard.

Current OSHA regulations for occupational exposure to asbestos hazards require commercial building owners to *presume* all thermal system insulation, sprayed or textured surfacing materials and asphaltic and vinyl flooring installed in buildings constructed before 1981 to contain ACM. The Federal Occupational Safety and Health Act (OSHA) Construction Standard for Asbestos requires that building owners communicate any potential or actual asbestos hazards (29CFR1926.1101(k)). Owner/Operators must inform in-house employees and any outside contractor (workers) who apply or bid for work in or adjacent to areas known or *presumed* to contain asbestos. Included asbestos materials are Thermal system insulation (TSI), sprayed or troweled-on surfacing materials, and asphalt or vinyl flooring material installed prior to 1981. Hawaii Occupational Safety and Health (HIOSH) under HAR 12-141.1 has adopted the federal standard.

Under EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) 40CFR Part 61, are requirements for renovation and demolition work involving ACM.

5.6.2 Lead-Based Paint

Due to the age of the structures noted by VEC, some of the buildings may contain lead-based paints. VEC did not note any significant quantities of construction debris that may contain lead-based paint. However, VEC was limited in their investigation of the entire site (See Section 1.4).

Background Information:

Lead is a metal element in pure form but is found in other chemical compounds used within manufactured and formulated products. Among these are pipe solder, paint and other coatings and water pipes - items commonly found in older buildings and homes.

Lead becomes toxic to the human body even in low levels by chronic over exposure. The exposure may occur by breathing dust, eating dust (on food, tobacco, fingers, or eating paint chips (children)). Lead poisoning affects the brain and central nervous system; especially susceptible are young children. Lead is also known to impact kidney and liver functions.

The EPA/HUD defines lead-based paint as paint or other coatings containing lead equal to or in excess of 0.5% lead by weight or 1.0 mg/cm². The prevalence of lead-based paint in housing built before 1940 is especially high according to research conducted by the U.S. Department of Housing and Urban Development (HUD). After 1940, its use diminished until 1972 when U.S. manufactured housing paint became regulated at 0.5 percent lead by weight and "banned" in 1978; this means that paint could not be manufactured and sold for housing use if it contained lead above the U.S. Consumer Products Safety Commission's (CC) 0.06 percent by weight. The "ban" provided a basis for using the cut-off date of 1978 when disclosing the possibility of lead-containing paint in sales and rentals of housing units.

Any detected lead-level in paint below HUD and the CPSC's criteria remains an environmental concern under the U.S. Occupational Safety and Health Administration's (OSHA) Lead Standard for Construction Workers, 29CFR1926.62 and the HIOSH equivalent, HAR 12-148.1. Communication of lead-levels in

paint is required for worker safety, when conducting renovation or demolition, and for construction debris (waste) management.

5.6.3 Arsenic-Containing Substances

The on-site structures inspected by VEC did not appear to contain arsenic (canec). VEC did not note any significant quantities of construction debris that may contain elevated levels of arsenic. Pesticides historically used on-site could have included arsenic-containing compounds. However, VEC was limited in their investigation of the entire site (See Section 1.4).

Background Information

Arsenic, like several other heavy metals, tends to accumulate in the body. Ingestion of a small dose may seemingly exert no adverse effect at all, while ingestion of multiple small doses could cause death. In lesser amounts, arsenic-containing compounds cause other health problems, like mottling of the skin, skin lesions, nervous disorder, and severe, irreversible liver damage. Arsenic is a human carcinogen, causing skin tumors when ingested and lung tumors when inhaled.

Arsenic-containing compounds were once used as components of some inorganic pesticides. In the 1940s, these pesticides were used to control insects and rodents.

To protect against exposure to high arsenic concentrations, OSHA requires workers to use air-purifying respirators and to wear protective clothing in areas where airborne arsenic compounds are known to exist.

The Resource Conservation and Recovery Act (RCRA), Subtitle C lists arsenic and arsenic-containing compounds as a hazardous waste. Therefore, construction/demolition debris (waste) management should be conducted in accordance with all Federal, State, and Local regulations. This typically requires waste segregation into construction material and dust/debris waste. Sampling using the Toxicity Leach Characteristic Procedure (TCLP) for arsenic is required for hazardous waste determination.

5.6.4 Radon

VEC did not identify any man-made products on the subject property that are known or suspected to emit radioactive decay elements.

Background Information:

Radon is a colorless and odorless radioactive gas that can produce health effects such as cellular injury. Radon gas can occur in the natural environment as concentrations from certain rocks and geologic conditions have a high radon-emanation potential.

These surface rock types are not known to occur in Hawaii. It is possible that increased concentrations of Radon could occur in regions where geologic fault and volcanic rift zones may release gases from deeper earth sources. However, the State of Hawaii, Department of Health (DOH) has not addressed concerns for any significant levels of gas to occur anywhere in Hawaii. This was based on the 1992 and 1996 DOH investigations conducted in elementary schools throughout the State.

5.6.5 Lead in Drinking Water

The subject property is not developed for potable water. This section does not apply.

5.6.6 Ecological Resources, Endangered Species, Cultural and Historic Resources, and Wetlands

There are no known wetlands, critical habitats, or threatened and endangered species designated for the subject site. The subject site is not located within the County of Maui's Special Management Area (SMA).

5.6.7 Indoor Air Quality

VEC did not identify any building surfaces that had characteristics that resembled possible mold contamination at the time of the site visit. VEC did not observe any mold related odors. However, VEC was limited in their investigation of the entire site (See Section 1.4).

Background Information:

Indoor air quality (IAQ) problems primarily result from indoor pollution sources that release gases or airborne particles. The term "Sick Building Syndrome" (SBS) is used to describe situations in which building occupants experience acute health and discomfort effects that appear to be linked to time spent in a building and may be localized in a particular room or zone or may be widespread throughout the building. Frequently, problems result when a building is operated or maintained in a manner that is inconsistent with its original design or prescribed operating procedures or as a result of poor building design or occupant activities.

Sources of indoor air contaminants can originate from within the building or be drawn in from the outdoors. The following causes contribute to IAQ problems:

1. *Inadequate ventilation* – As a result of the oil embargo in 1973, national energy conservation measures called for a reduction in the amount of outdoor air provided for ventilation. In many cases the reduced outdoor air ventilation rates were found to be inadequate to maintain the health and comfort of building occupants. Potential air pollutant sources in ventilation or heating, ventilating, or air-conditioning (HVAC) systems include, but are not limited to: dust or dirt in ductwork; microbiological growth (i.e. mold, mildew, or bacteria); improper use of biocides, sealants, and cleaning compounds; improper venting of combustion products; and refrigerant leakage. Inadequate ventilation may increase the concentrations of these indoor air contaminants.
2. *Biological contaminants* – Bacteria, molds, pollen and viruses are types of biological contaminants. These contaminants may breed in stagnant water that has accumulated in ducts, humidifiers and drain pans, or where water has collected on ceiling tiles, carpeting, or insulation. Surfaces exposed to high humid conditions with limited air movement may also be subject to microbiological contamination.
3. *Chemical contaminants from indoor sources* – Most indoor air pollution comes from sources inside the building. Potential air pollutant sources of indoor chemical contaminants include, but are not limited to: adhesives, carpeting, upholstery, manufactured wood products, pesticides, combustion products (i.e. carbon monoxide, carbon dioxide, and nitrogen oxides), and cleaning agents emitting volatile organic compounds (VOCs). Tobacco smoke contributes high levels of VOCs, other toxic compounds, and respirable particulate matter. Research has shown that some VOCs can cause chronic and acute health effects at high concentrations, and some are known carcinogens.
4. *Chemical contaminants from outdoor sources* – The outdoor air that enters a building can be a source of indoor air pollution. Potential air pollutant sources of outdoor chemical contaminants include, but are not limited to: motor vehicle exhausts; plumbing vents; combustion products (i.e. carbon monoxide, carbon dioxide, and nitrogen oxides); and building exhausts (i.e. bathrooms and kitchens). These contaminants can enter the building through poorly located air intake vents, windows, and other openings.

Indicators of SBS or IAQ related health problems include, but are not limited to, headache, eye, nose, or throat irritation, dry cough, dry or itchy skin, dizziness or nausea, fatigue, and sensitivity to odors. Most complaints or symptoms are relieved soon after leaving the building.

5.6.8 High Voltage Transmission Lines

Transmission and or distribution lines are located along the northern, eastern and western property boundaries. These lines are not a concern to the subject property at this time and would unlikely be a

concern for any future development on site. However, an EMF (Electromagnetic Frequency) survey can be conducted by MECO (Maui Electric Company) if there is client concern.



End of Section

6.0 FINDINGS, OPINIONS, AND CONCLUSIONS

6.1 Recognized Environmental Conditions

Recognized environmental conditions, as defined by ASTM Standard E1527-00, are the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. **Recognized environmental conditions** are described with regard to (1) the nature and extent of the environmental condition, (2) potential or actual environmental threat, (3) potential for transport (migration) of any environmental conditions, and (4) consideration for further investigation. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

VEC has performed this Phase I Environmental Site Assessment in conformance with the scope and limitations of the ASTM Practice E 1527-00 for the property located southeast of the intersection of Honoapiilani Highway and Kuikahi Drive in the community of Wailuku, Maui (TMK Number (2) 3-5-02:01 portion, defined as the subject property. Any exceptions to or deletions from, this practice are described in Section 1.4, Limitations and Exceptions, of this report.

This assessment has revealed no evidence of **recognized environmental conditions** in connection with the property, except for the following:

6.1.1 Database Listings (See Section 4.0 & EDR Report, Appendix B)

Findings/Concerns:

The subject site is not listed on any Federal, State or County databases as a site with any recognized environmental concerns. There is one (1) nearby listed site (Waiale Ash Pile), as indicated by the EDR Report, within the appropriate search distance from the subject property. In addition, a former county landfill (Waikapu Dump) is located adjacent to the subject property (See Figure 2, Appendix A and EDR Report Addendum, Appendix B). These sites are located down gradient of the subject site.

Opinions and Conclusions:

Due to the close proximity of the former Waikapu Landfill relative to Lot 2 of the subject property it is possible that this site has or has had reasonable potential to adversely impact the environmental condition of Lot 2 of the subject property. However, due to the down gradient and predominantly down wind location of this landfill relative to Lot 2 of the subject property it is less likely that groundwater and or surface soils would contain contamination above regulated levels. Groundwater and or soil sampling could be conducted to confirm this.

6.1.2 Current and Historic Use or Storage of Hazardous and Regulated Substances (See Section 5.3.2)

Findings/Concerns:

There is no evidence of any historic or current significant misuse of hazardous or regulated substances on the subject property. Historically, pineapple and sugarcane agriculture had been occurring on, and adjacent to, the subject property for several decades. These operations have been associated with the application of pesticides and fertilizers.

Opinions and Conclusions:

While the use of pesticides and herbicides on and near the property does not necessarily result in adverse impacts to the environmental condition of the subject site, it is possible (yet unlikely) for residual amounts of these substances to accumulate to concentrations that present a potential threat to human health or the environment. Soil sampling and laboratory testing would provide additional information to evaluate

potential environmental effects from these agricultural activities. A standard, pro-active procedure would be to conduct such a survey prior to future development at this site. There is, however, no regulatory requirement to conduct this sampling.

6.2 Other Environmental Concerns

The concerns listed below may not be considered *recognized environmental conditions* by ASTM definition. However, they may be considered regulated under other environmental laws and ordinances and may present a potential liability to the property owner.

6.2.1 Solid Waste Management (See Section 5.5.4)

Findings/Concerns:

A moderate amount of "wildcat" dumping has taken place on-site. Some items noted included regulated items (white goods). Due to some heavily vegetated areas, the entire subject site and underlying soils were not visibly inspected.

Opinions and Conclusions:

Any waste disposal should be in a permitted solid waste landfill or recycled in a manner that complies with all local, state, and federal regulations as applicable to the specific waste type with special attention given to regulated items.

It is important to note that if additional clearing of the property commences and large amounts of construction debris or unidentifiable substances (containers) are further discovered, proper waste identification, testing and applicable waste handling/disposal procedures are followed.

6.2.2 Surface Waters and Area Aquifer Protection (See Section 5.5.5)

Findings/Concerns:

Development may be planned for the subject site. For any future grubbing and grading and construction activities planned for the site, the property owner should be aware of the potential for contaminants to run off-site and into on-site watercourses or adjacent storm water drains. Products of concern relating to any future development activity would be earthen material (silt), oils, antifreezes and other fluids from automobile or on-site machinery, or leaks from on-site stocked items.

Opinions and Conclusions:

Future land clearing projects will likely require a County of Maui grading/grubbing permit and if the size of a project creates greater than one (1) acre of soil disturbance, the developer will also require a National Pollution Discharge Elimination System (NPDES) General Permit (State of Hawaii, Department of Health, Clean Water Branch).

In order to minimize any potential regulatory profiling of the subject site as a potential responsible party for any newly discovered groundwater or surface water contamination, management may consider practicing conservative, proactive environmental policies. These policies might include written environmental protection contracts with any construction contractors and posted notices regarding any use, storage and handling of hazardous substances and/or petroleum product. Special attention should be addressed to storm water entering the nearby storm drains or drainageways.



End of Section

The conclusions stated above should not be construed to mean that any regulatory agency would have the same opinion as this author, nor is any implication proposed therefrom. The results of this environmental assessment are intended for general reference purposes only and are not intended as legal advice. The advice of legal counsel should be sought in regard to individual facts, circumstances and interpretation of environmental liability.

7.0 REFERENCES

7.1 Published References

1. American Standard of Testing and Materials, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E1527-00, 2000.
2. "Atlas of Hawaii", 2nd Edition, Department of Geography, University of Hawaii at Hilo, 1983, University of Hawaii Press.
3. "Atlas of Hawaii", 3rd Edition, Department of Geography, University of Hawaii at Hilo, 1998, University of Hawaii Press.
4. County of Maui, Real Property Tax Division, Historical Records for TMK Number (2) 3-5-02:01 (portion). April 21, 2004.
5. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 58.1, Solid Waste Management Control.
6. State of Hawaii, Department of Health, Solid and Hazardous Waste Branch, Underground Storage Tank Section, List of Leaking Underground Storage Tank Release Sites, August 2003.
7. State of Hawaii, Department of Health, Solid and Hazardous Waste Branch, Underground Storage Tank Section, List of Underground Storage Tank Facilities, August 2003.
8. State of Hawaii, Department of Health, Voluntary Response Program (VRP), List of Voluntary Response Program Sites, October 2003.
9. State of Hawaii, Department of Health, Office of Hazard Evaluation and Emergency Response, List of Release Notifications, September 2000.
10. State of Hawaii, Department of Health, Office of Hazard Evaluation and Emergency Response, List of Sites List, July 2001.
11. State of Hawaii, Department of Land and Natural Resources, Registered Wells and Dry Wells, 2002.
12. State of Hawaii, Department of Land and Natural Resources, "State of Hawaii Water Quality Plan and Groundwater Map", June 1990, Revised December 1991.
13. U.S. Department of Agriculture, Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii", 1972.
14. U.S. Environmental Protection Agency, Office of Air and Radiation et al., Indoor Air Facts No. 4 (revised) Sick Building Syndrome, April 1991.
15. U.S. Environmental Protection Agency, Building Air Quality: A Guide for Building Owners and Facility Managers, 1991.

7.2 Map and Other References

1. Environmental Data Resources, Inc., "The EDR Field Check Report", May 11, 2004.
2. Federal Emergency Management Agency, "Flood Insurance Rate Map", Number #150003 0170B dated June 1, 1981.
3. R.M. Towill Corporation, Aerial Photographs, Honolulu, Hawaii.
4. Air Survey Hawaii, Aerial Photographs, Honolulu, Hawaii.
5. Sanborn Maps (no coverage)
6. U.S. Geological Survey, 7.5 Minute Topographic Map, Wailuku Quadrangle, Hawaii 1983.
7. Site plan map provided by Carlsmith Ball, LLC.

7.3 Record of Personal Communications

Table 3.0 List of personal interviews conducted by VEC

Date	Interviewee	Title & Organization	Address	Phone Number
4/14/04	Mr. Thomas Leuteneker	Counsel, Carlsmith Ball, LLC.	One Main Plaza, 2200 Main St., Wailuku, HI 96793	(808)242-4535
4/22/04	Mr. Clayton Suzuki	Land Manager, Wailuku Agribusiness	255 Waiko Rd Wailuku, HI 96793	(808)244-2208
4/22/04	Ms. Jackie Takakura	Administrative Officer, Maui County Department of Water Supply	200 South High Street Wailuku, HI 96793	(808) 270-8046
4/26/04	Mr. Randall Moore	Manager, Hawaii Commercial & Sugar Company	Puunene, HI	(808) 877-6968
4/28/04	Mr. Derrick Heafey	Environmental Manager, Hawaii Commercial & Sugar Company	Puunene, HI	(808) 877-2958



End of Section

Appendix A:

Maps, Plans, and Photographs

FIGURE 1: REGIONAL SETTLING MAP

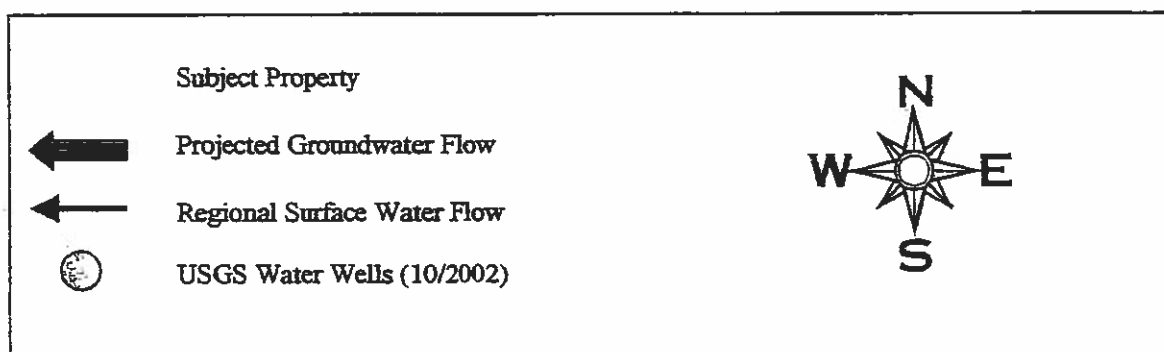
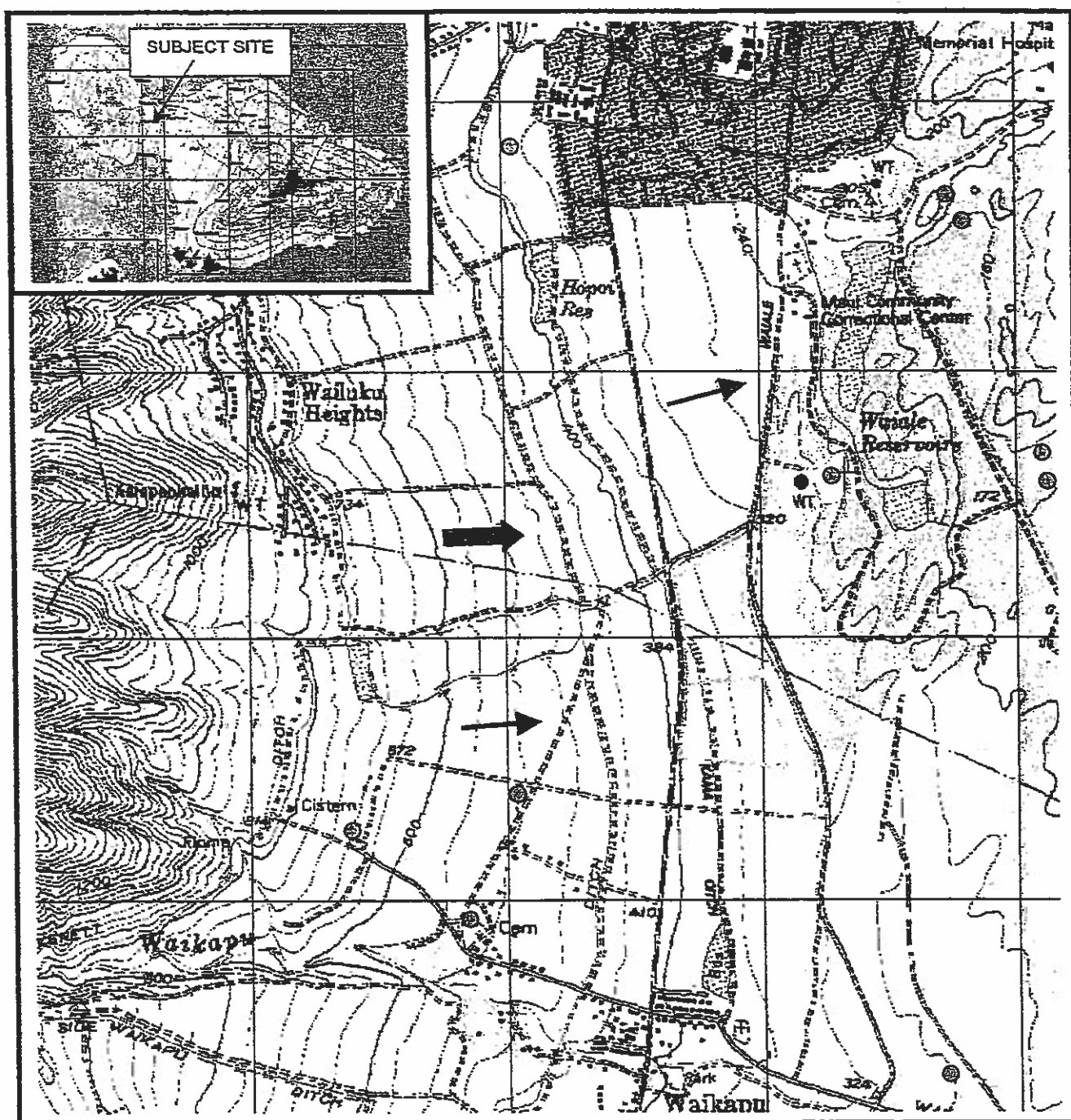
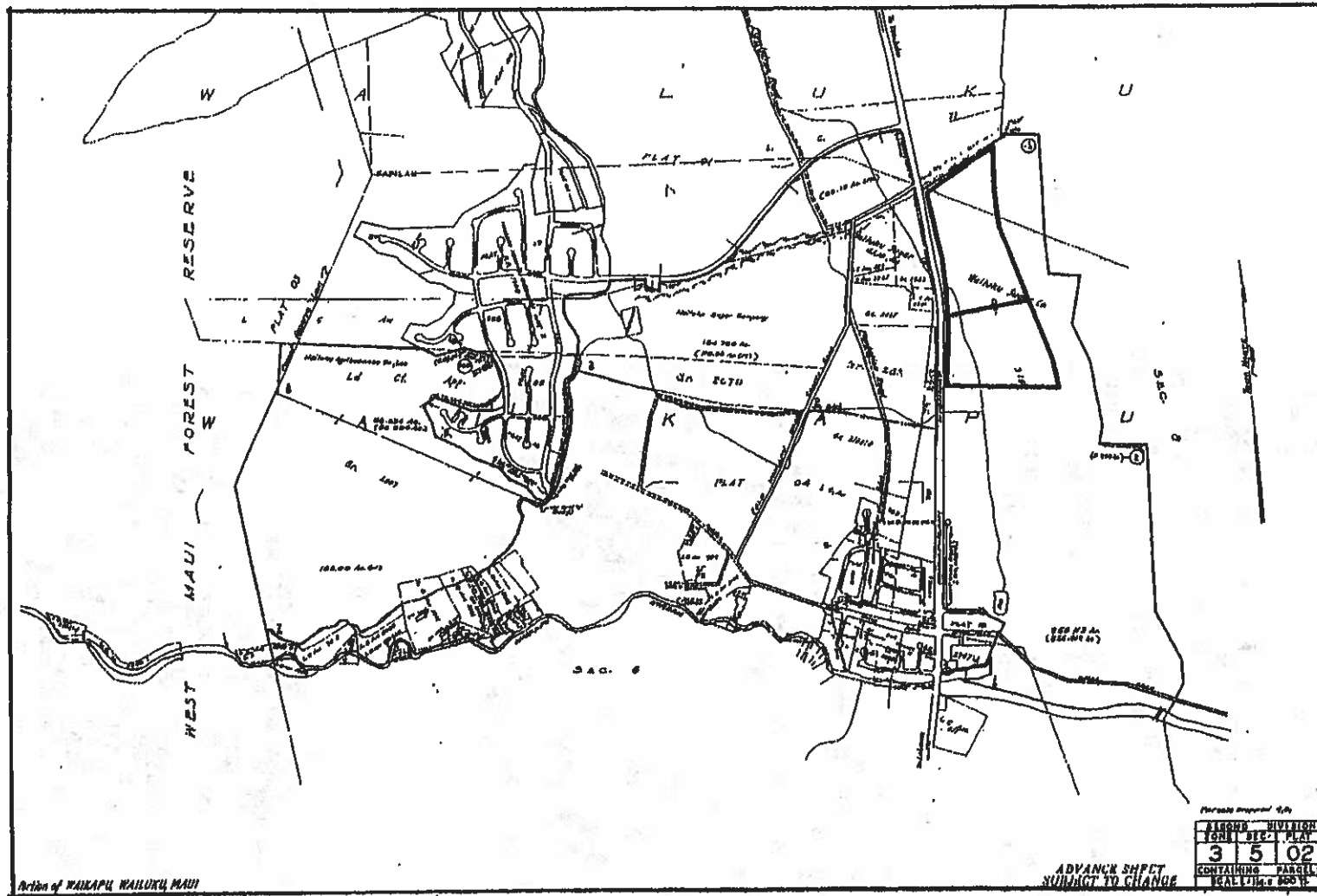


FIGURE 3: TAX MAP KEY

NORTH



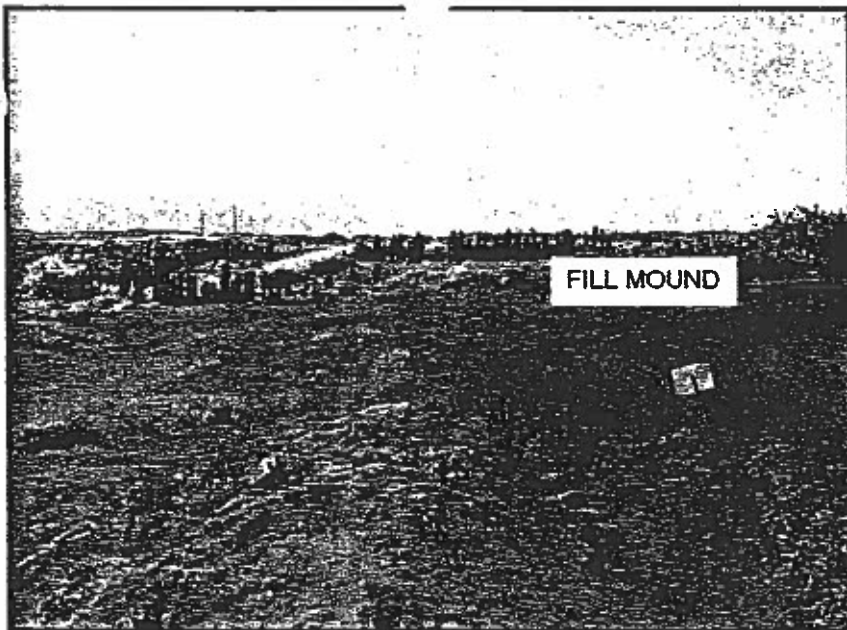


PHOTO 1

Northwesterly view of the central portion of Lot 1 of the subject property from the eastern property line.

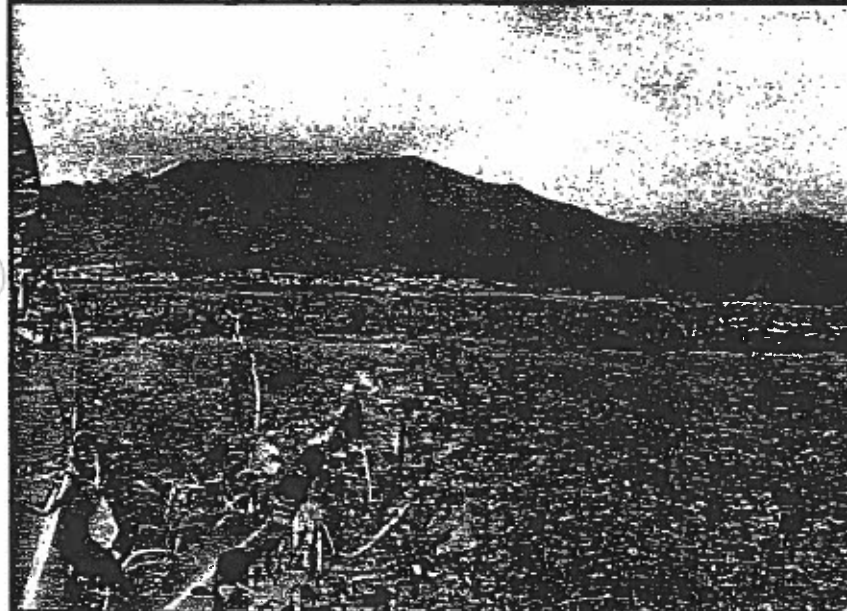


PHOTO 2

Westerly view of the eastern portion of Lot 2 from the eastern property line.

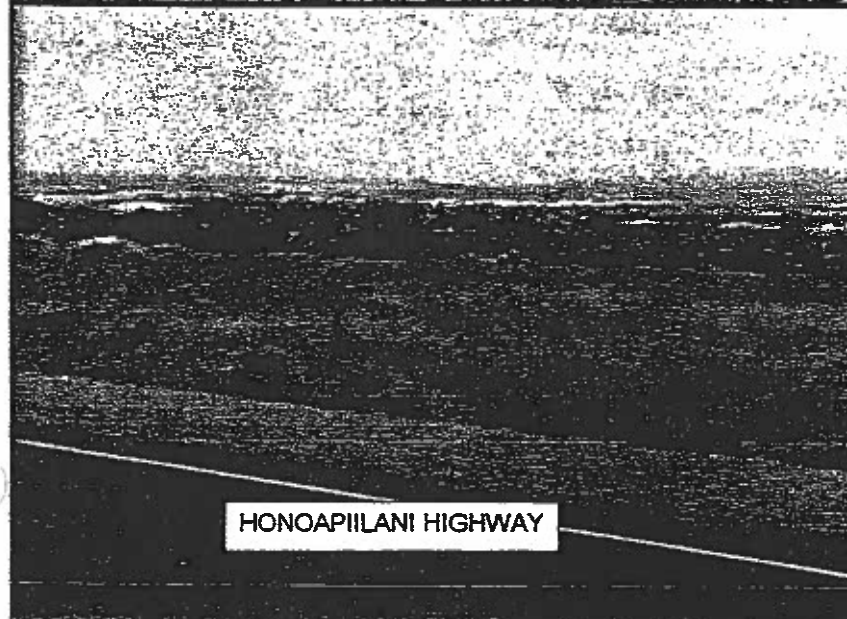


PHOTO 3

Northeasterly view of the south-western portion of Lot 2 of the subject property. The picture was taken from the southern portion of the western property line.

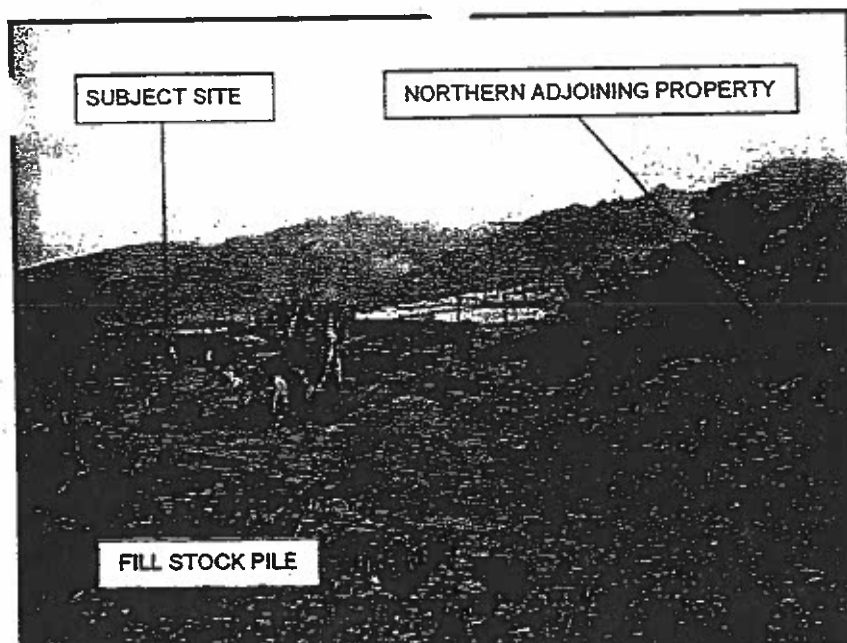


PHOTO 4

Westerly view of Lot 1's northern boundary line from the northeast property corner.

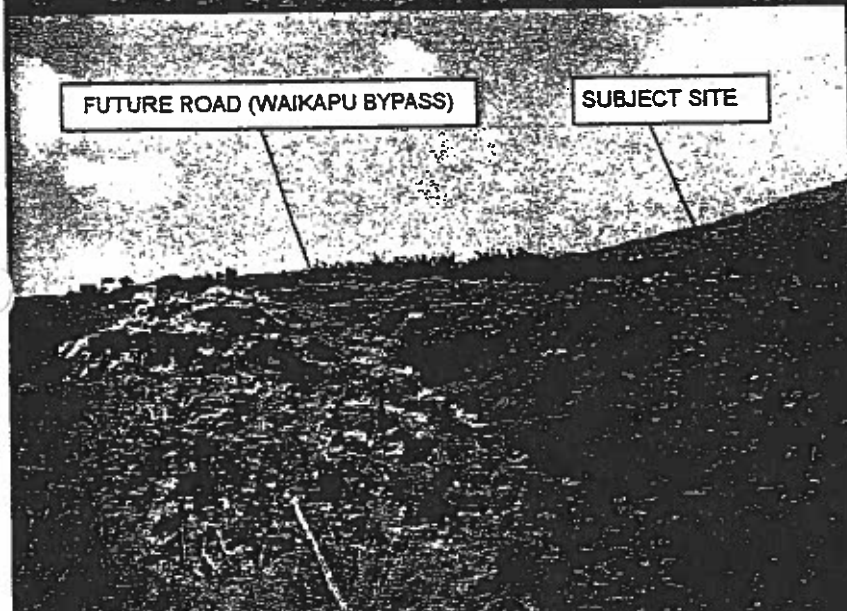


PHOTO 5

Southerly view of Lot 1's eastern property line from the northeast property corner.

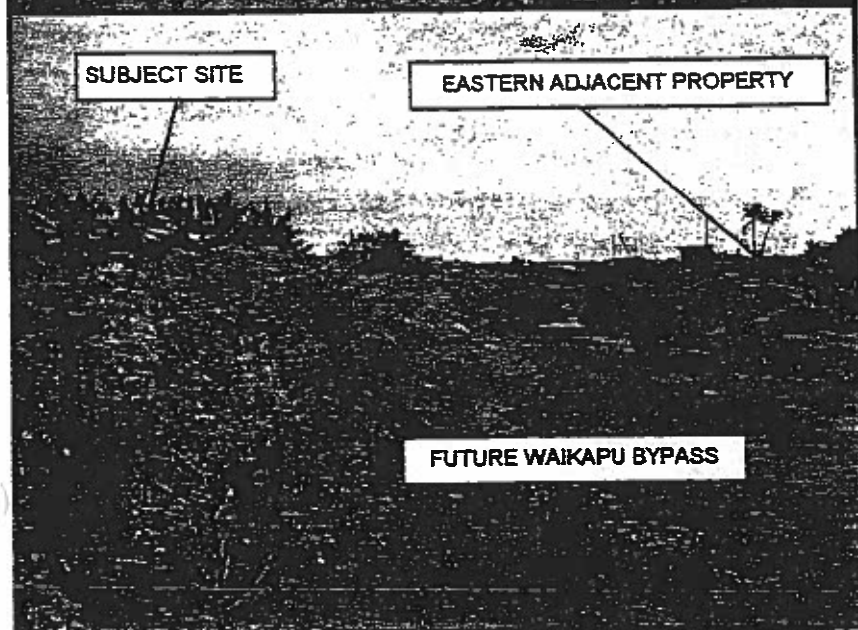


PHOTO 6

Northerly view of Lot 1's eastern property line from near the intersection of Lot 1 and Lot 2 on the eastern property line.

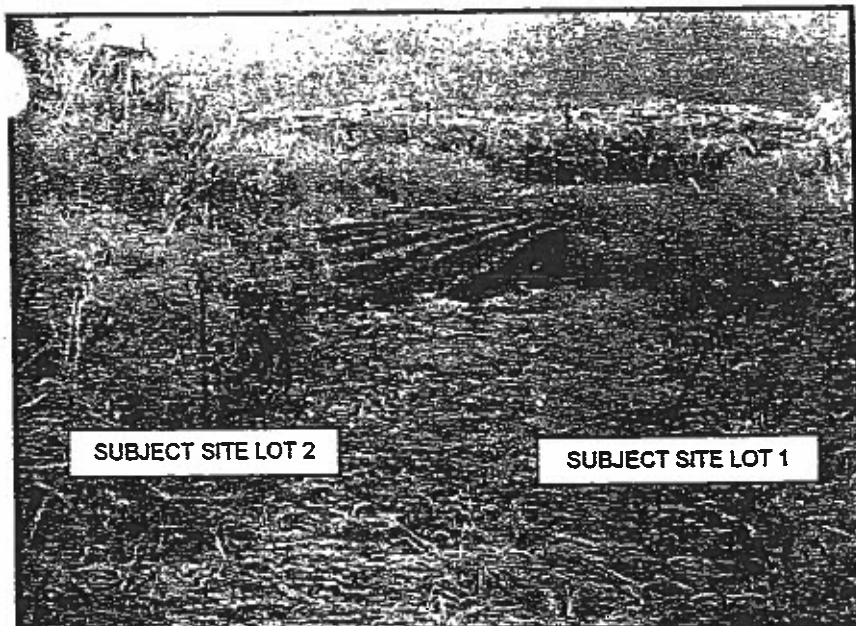


PHOTO 7

Easterly view along Lot 1's southern property line from the intersection of Lot 1 and Lot 2 on the eastern property line.

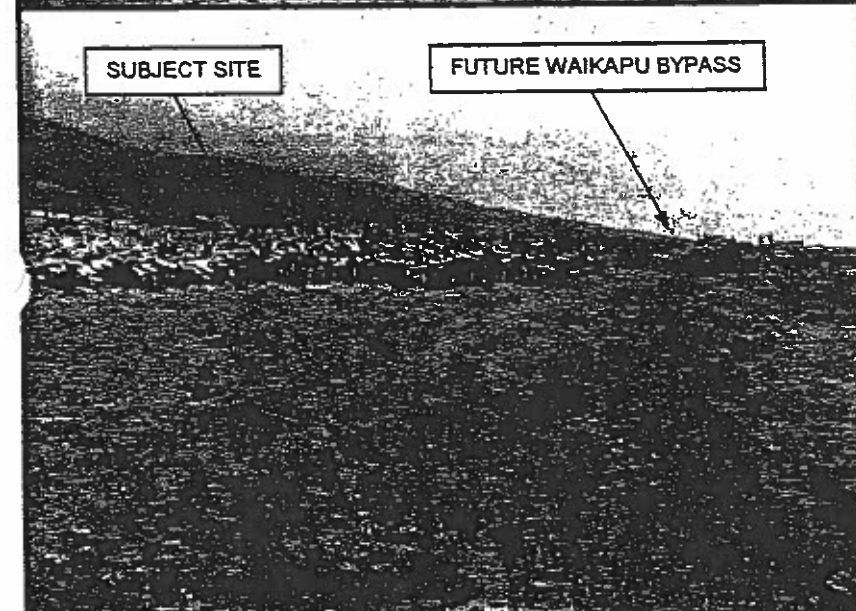


PHOTO 8

Northerly view of Lot 2's eastern property line from the southeast property corner.

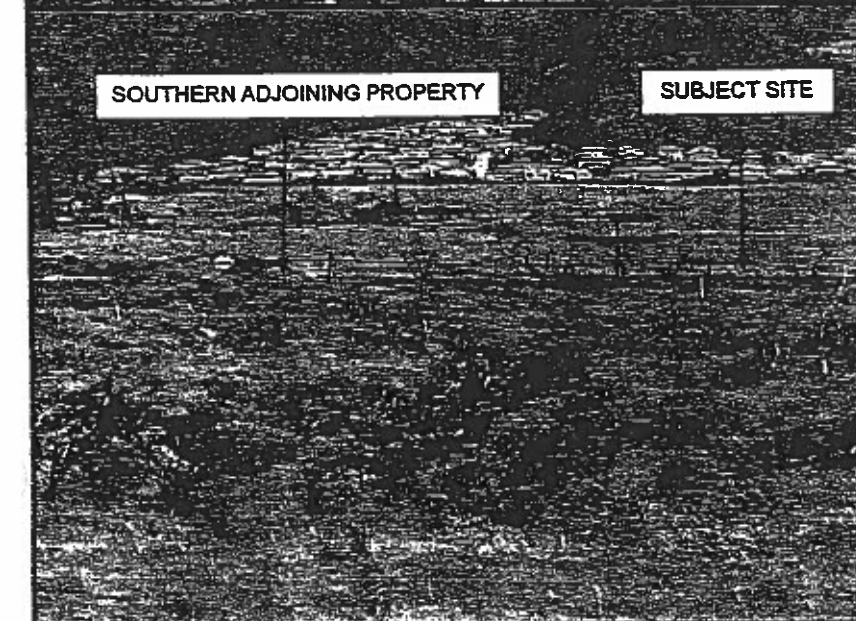


PHOTO 9

Easterly view along Lot 2's southern property line from the southeast property corner.

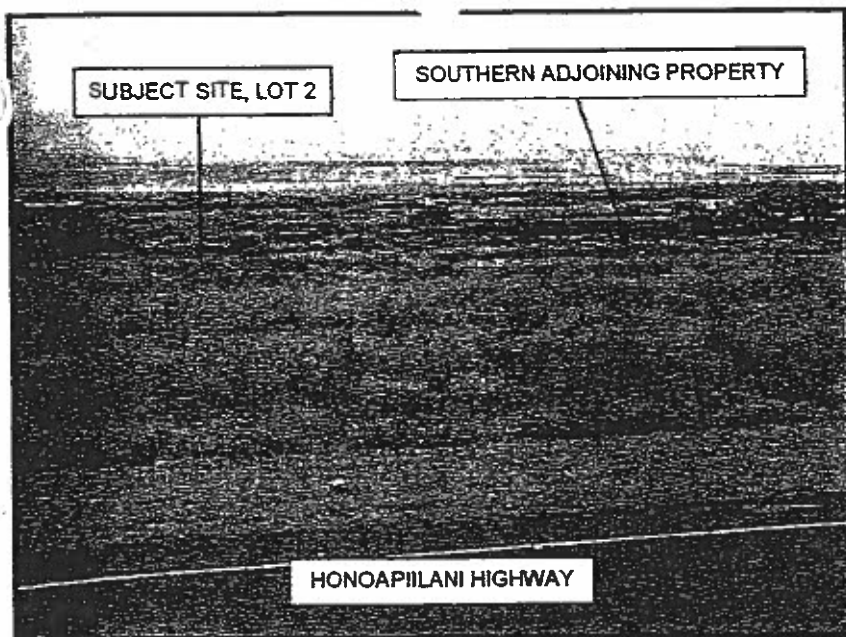


PHOTO 10

Easterly view of Lot 2's southern property line from the southwest property corner.

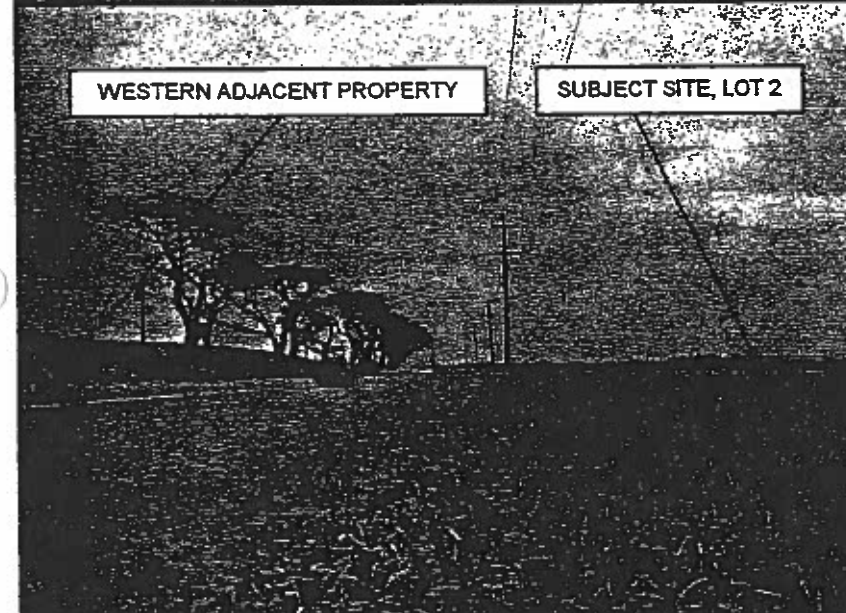


PHOTO 11

Northerly view of Lot 2's western boundary line from the southwest property corner.

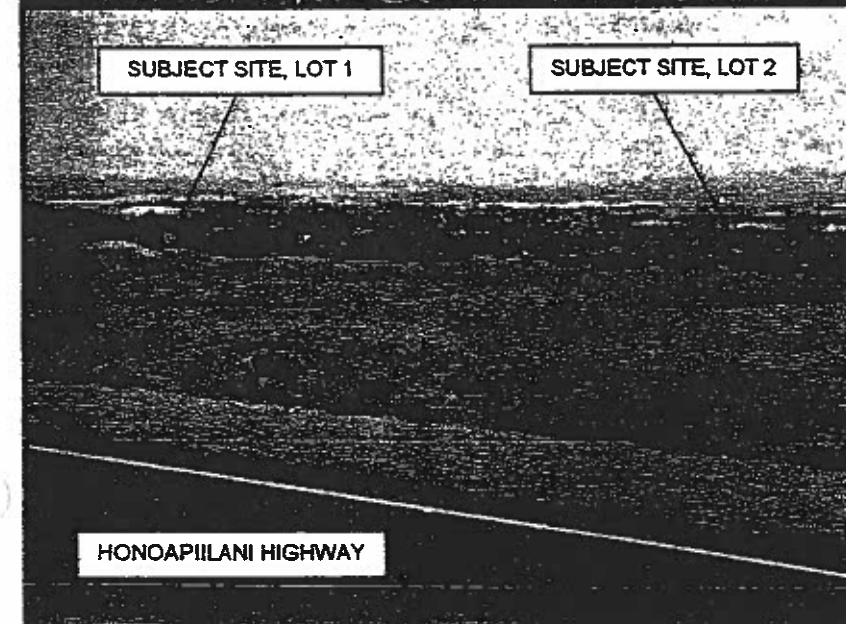


PHOTO 12

Easterly view along Lot 2's northern property line from near the intersection of Lot 1 and Lot 2 on the western property line.

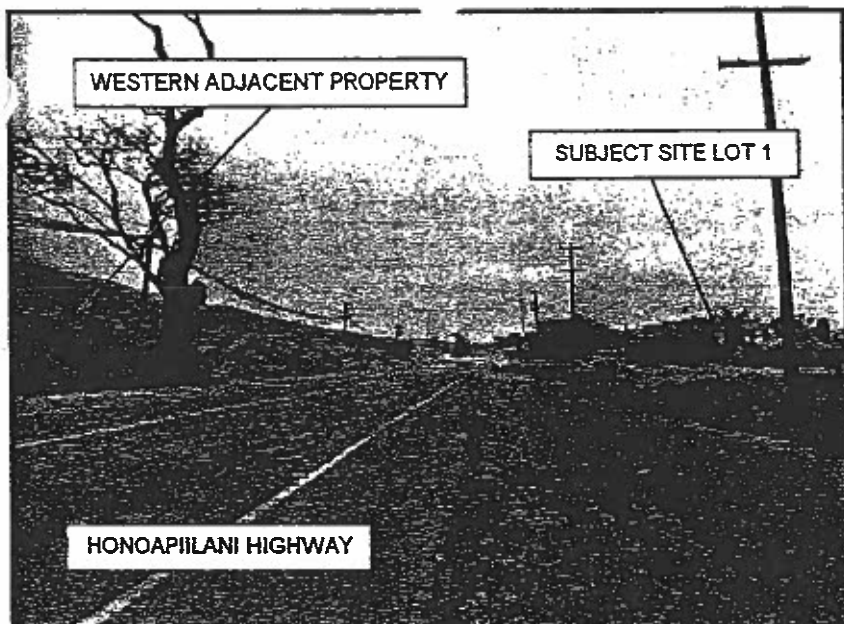


PHOTO 13

Northerly view along Lot 1's western property line from near the intersection of Lot 1 and Lot 2's western property line.

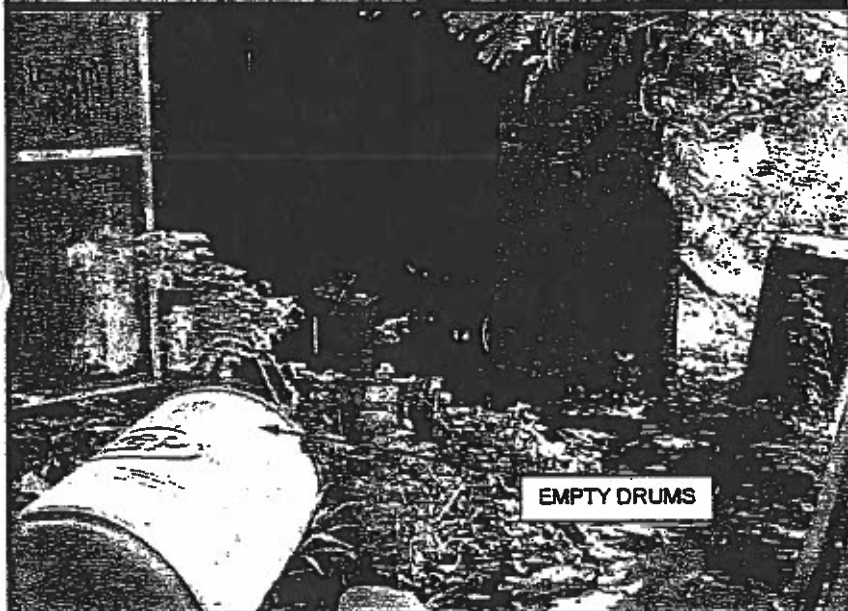


PHOTO 14

Agricultural shed located on the eastern portion of Lot 1. See Figure 2, Appendix A.



PHOTO 15

Typical small agricultural field located on Lot 1 and Lot 2 of the subject property.

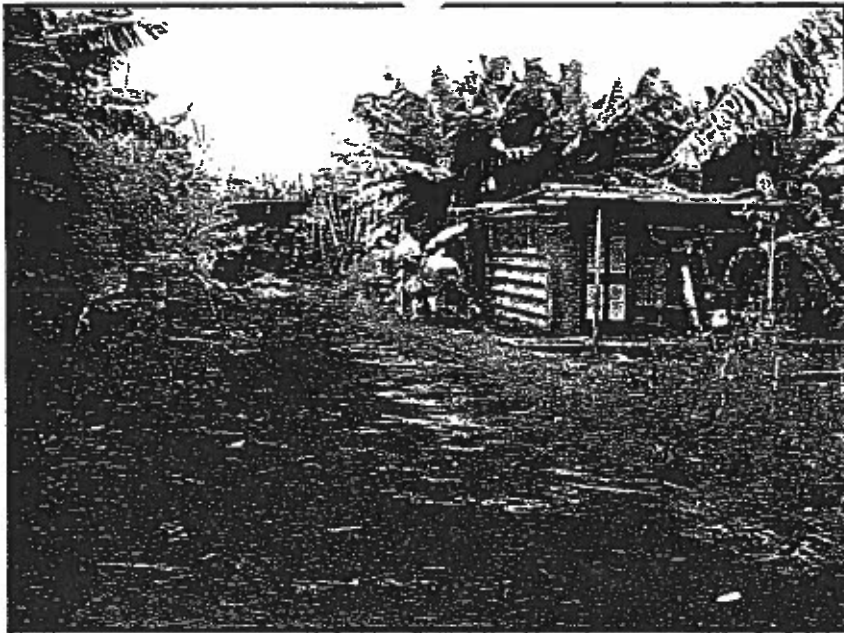


PHOTO 16

Typical banana shack located on Lot 2 of the subject site.



PHOTO 17

Fill stockpile of tarmac material located on Lot 2. See Figure 2, Appendix A.



PHOTO 18

Derelict vehicles located on the southern portion of Lot 2.



PHOTO 19

Derelict vehicles located on the central southern portion of Lot 1 of the subject property.

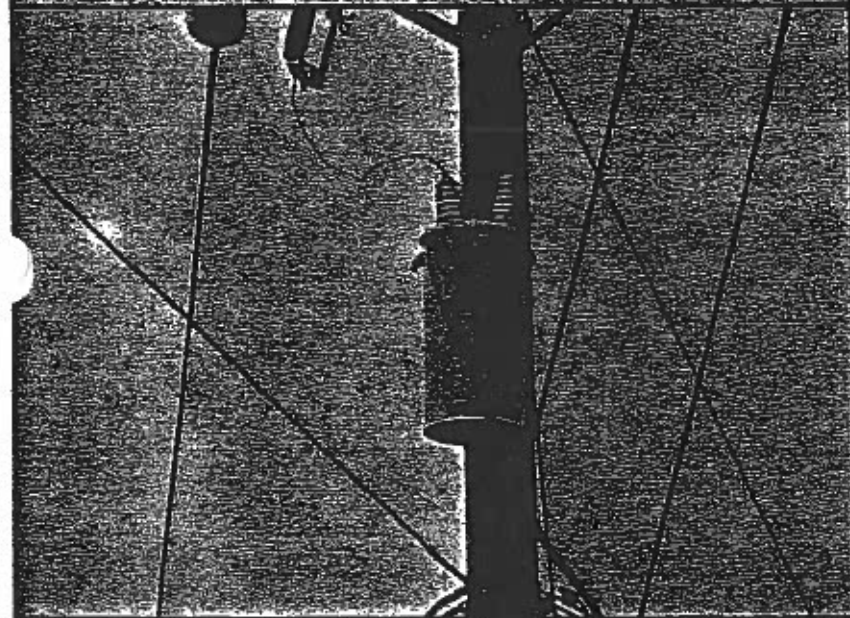


PHOTO 20

Pole-mounted transformer located at the northeast corner of Lot 1 of the subject property.



PHOTO 21

Miscellaneous debris located on the southeastern portion of Lot 1.

Appendix B:

Regulatory Records Documentation Site Specific Documentation



Preliminary Environmental Investigation

According to ASTM Standard 1527-00, the user's (or client's) responsibility in this investigation is to help identify the possibility of recognized environmental conditions in connection with the property. Please assist us by responding to the following request for data and information you may have, or of which you may have some specialized knowledge. This questionnaire will be included in the Appendices of the final report as an indication of user assistance.

Please Supply As Many of the Following Documents As Possible

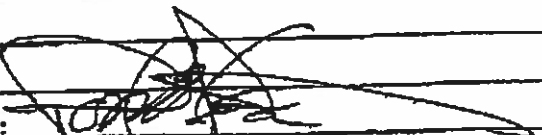
- A. ☐ Tax Map Key Number/Tax Code Number 3-5-02-1(2)
- B. ☐ Title Information (Current, and any previous ownership.) TITLE IS GOOD
- C. ☐ Property Legal Description (If Title Information is not available) DO NOT HAVE
- D. ☐ Tax Map and/or Site Development Drawing/Plat MAPS ENCLOSED
- E. ☐ Special Property Information (Well-development data, endangered species listings, historical registration or environmental deed restrictions.) NONE
- F. ☐ Real Estate Appraisal Report NONE
- G. ☐ Special Management Area Permit Report (SMA) NOT NECESSARY

Please Provide the Following Information to The Best Of Your Ability

1. **Environmental Site Assessments (ESA):** Are you aware of any previous assessments: Cleanup Closure Reports, Permit Characterization Reports, etc. conducted on the subject site or within the immediate area? If yes, please supply details. NO
2. **Local-State-Federal Inspections:** Are you aware of any environmental inspections conducted by any regulatory agency, i.e., Hawaii Dept. of Health (Environmental Health Services), OSHA, U.S. Army Corps of Engineers, Department of Land & Natural Resources, Fish & Wildlife Services, HUD, EPA, or County Wastewater or Solid Waste Division of the Public Works/Waste Management Department etc? If yes, please supply details. NO
- 3a. **Structures/Buildings:** Are there any as-built or other construction drawings available for review? Contact Name and Telephone Number: NO
- 3b. **Site improvements? (Renovation Date & Extent)** BANANA SHACKS ONLY
4. **Purchase Price:** Is the property's purchase price within a normal market range or significantly lower? If lower, please supply details.
PURCHASE PRICE IS \$675,000 / \$27,000 per acre - is below marker
Buyer is a non-profit church and school

5. Name of Current Owner: WAILUKU AGRIBUSINESS
6. Name of former Owner: _____
7. Proceedings Against the Property: Are you aware of any administrative or legal proceedings against the property for environmental concerns i.e., Compliance Orders, Notices of Violation? If yes, please supply details. NO
8. Property Liens: Are there any recorded liens or consent decrees on the property that is environmentally related, i.e., property clean-up, waste removal, asbestos abatement, wastewater issues, etc.? If yes please supply details. NONE THAT WE KNOW ABOUT
9. Specialized Historic Information: Are you aware of any previous owner, neighbor, business affiliate or other individual who might have knowledge of any special or unusual historic use of, and/or previous operations conducted on the subject property? Contact Name and Telephone Number: KNOW OF NONE
10. Manufacturing or Processing: If there are manufacturing or processing activities conducted on-site, is there an operation flow chart, diagram or procedures manual available for review? Contact Name and Telephone Number LAND WAS IN SUGAR CANE
11. This Report is Prepared For: (Please Print)
Attention: EMMANUEAL LUTHERAN CHURCH (north) VALLEY ISLE FELLOWSHIP (south)
Organization: TO TOM LEUTENEKER
Address: POBOX 1086 Wailuku Maui HI 96790
Phone no.: 242-4535 Fax no.: 244-4974
12. Please List Other Organizations (Lenders) Who Will Require a Listing as "Also Prepared For:" on the report cover and signature page. NONE
- (a) Attention: _____
Organization: _____
Address: _____
- (b) Attention: _____
Organization: _____
Address: _____
- We will submit 2 signed reports for each project. If additional copies are required, an additional fee will be charged for processing.

Who Prepared This Starter Package Information?

Name: (Please Print)	<u>TOM LEUTENEKER</u>	Title:	
Company/Organization:			
Address:			
Tel. No.:		Fax No.:	
Signature:		Date:	<u>4/7/2004</u>

WANDA LINGLE
DIRECTOR OF HAWAII



CHRYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD / CWB

04059ESM.04

April 21, 2004

Ms. Massy Cashen
Vuich Environmental Consultants, Inc.
1498 Lower Main Street, Suite C
Wailuku, Hawaii 96793

Dear Ms. Cashen:

Subject: Request for Public Records

The Department of Health, Clean Water Branch ("DOH-CWB") received your request for public records dated April 14, 2004. Our staff searched the DOH-CWB database and found a Notice of General Permit Coverage ("NGPC") No. R23A787 that maybe near to your following site(s):

- (1) Address: Vacant Land, Honoapiilani Highway
TMK: (2)3-5-02:01

Should you have any questions, please contact Mr. Michael Tsuji, Supervisor of the Enforcement Section, for enforcement concerns and Mr. Alec Wong, Supervisor of the Engineering Section, for permitting concerns, Clean Water Branch, at (808) 586-4309.

Sincerely,

A handwritten signature in black ink, appearing to read "Denis R. Lau".

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

Enclosure: NGPC No. R23A787

R23A787

~~EA 92~~ FILE COPY ^{up}
MST ~~10/2~~ _{aw}

October 9, 1997

Mr. Fredrick H. Kubota
Vice President
Brewer Environmental Industries, LLC
311 Pacific Street
Honolulu, Hawaii 96817

Dear Mr. Kubota:

Subject: Notice of General Permit Coverage (NGPC)
Brewer Environmental Industries Wailuku Facility
275 East Waiko Road
Wailuku, Maui, Hawaii 96793
TMK: (2)5-02-01
File No. HI R23A787

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. § 1251 et seq.; the "Act") and Chapter 342D, Hawaii Revised Statutes, and Chapters 11-54 and 11-55, Hawaii Administrative Rules ("HAR"), Department of Health, State of Hawaii,

BREWER ENVIRONMENTAL INDUSTRIES LLC

(hereinafter "PERMITTEE")

is authorized to discharge storm water runoff associated with industrial activity from its facility located at 275 East Waiko Road, Wailuku, Maui, Hawaii, 96793, TMK: (2)5-02-01, to the receiving waters named the Waikapu Stream, at coordinates Latitude 20°50'55"N, Longitude 156°30'15"W.

This Notice of General Permit Coverage (NGPC) is subject to compliance with the following regulations and conditions:

1. HAR Chapter 11-55, Appendix B, NPDES General Permit Authorizing Discharges of Storm Water Associated With Industrial Activities;
2. HAR Chapter 11-55, Appendix A, Department of Health Standard General Permit Conditions;

Mr. Fredrick H. Kubota
October 9, 1997
Page 2

3. HAR Sections 11-55-34.04(a), 11-55-34.07, 11-55-34.11, 11-55-34.12, and any other applicable sections of HAR Chapter 11-55;
4. Plans, reports, specifications and other related materials submitted in and with the Notice of Intent (NOI) dated September 25, 1997, and/or later amendments to the NOI;
5. A copy of this NGPC and its enclosures; and plans, reports, specifications and other related materials submitted in and with the NOI dated September 25, 1997, and/or later amendments to the NOI shall be kept at the facility until termination of subject activities;
6. Discharge quality data as required by NOI Form A shall be collected during the next representative rainfall event and submitted within 30 days of such sampling. Data shall include all parameters listed under Item 2.a and parameters listed under Item 2.b believed to be present in the discharge;
7. In accordance with HAR Chapter 11-55, Appendix B, Table 34.1, the discharge shall be limited and monitored by the Permittee as follows:

Parameter	Discharge Limitation	Acceptable Concentration	Units	Measurement Frequency	Type of Sample
Flow	N/L	N/A	MGD	Annually ¹	Calculated or Estimated
Biochemical Oxygen Demand (5-Day)	N/L	N/A	mg/l	Annually ¹	Composite or Grab
Chemical Oxygen Demand	N/L	N/A	mg/l	Annually ¹	Composite or Grab
Total Suspended Solids	N/L	N/A	mg/l	Annually ¹	Composite or Grab
Total Phosphorus	N/L	2.0	mg/l	Annually ¹	Composite or Grab
Total Nitrogen	N/L	N/A	mg/l	Annually ¹	Composite or Grab
Nitrate + Nitrite Nitrogen	N/L	0.68	mg/l	Annually ¹	Composite or Grab
Oil and Grease	15	N/A	mg/l	Annually ¹	Grab

Mr. Fredrick H. Kubota
October 9, 1997
Page 3

Parameter	Discharge Limitation	Cutoff Concentration	Units	Frequency	Type of Sample
pH Range	5.5 to 8.0	N/A	Standard Units	Annually ¹	Grab
Iron	N/L	1.0	mg/l	Annually ¹	Grab
Lead	N/L	0.0816	mg/l	Annually ¹	Grab
Zinc	N/L	0.117	mg/l	Annually ¹	Grab

N/L No Limitation at this time. Only monitoring and reporting required.

N/A Not Applicable.

MGD Million gallons per day

mg/l Milligrams per liter

µg/l Micrograms per liter

¹ The monitoring year shall start on the effective date of this NGPC.

8. Reporting of monitoring results shall be in accordance with HAR Chapter 11-55, Appendix B, Section 9;
9. The Director may specify additional monitoring requirements and limitations, in addition to the monitoring requirements specified in Item 7 of this NGPC;
10. The Permittee shall submit a Storm Water Pollution Control Plan in accordance with HAR Chapter 11-55, Appendix B, Sections 5 and/or 6 within 120 days of issuance of this NGPC;
11. The Permittee shall revise their SWPCP should any discharge limitation or cutoff concentration be exceeded. The revisions shall include measures to reduce the amount of pollutants found to be in exceedance from entering storm water runoff;
12. The Permittee shall notify the Department of Health upon termination of the subject activities; and
13. The Permittee shall be responsible for ensuring that anyone working under this NGPC understands the NGPC's terms and conditions.

This NGPC will take effect on the date of this notice. This NGPC will expire at midnight, September 21, 2002, or when amendments to HAR Chapter 11-55, Appendix B are adopted, whichever occurs first.

Mr. Fredrick H. Kubota

October 9, 1997

Page 4

Should you have any questions regarding this NGPC, please contact Ms. Kris Poentis, Engineering Section of the Clean Water Branch, at (808)586-4309.

Sincerely,

Amis R. Lau

THOMAS E. ARIZUMI, P.E., CHIEF
Environmental Management Division

KP\cr

Enclosures: 1. HAR Chapter 11-55, Section 34, Appendices A and B
2. Discharge Monitoring Report Form
3. Title 40, Code of Federal Regulations Citations as referenced in Chapter 11-55, Appendix A



Consultants, Inc.

April 14, 2004

State of Hawaii Department of Health
Environmental Management Division
919 Ala Moana Boulevard, Room 309
Honolulu, HI 96814
Phone: (808) 586-4200
Fax: (808) 586-5800
Attn: Clean Air Branch

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:

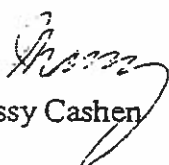
We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

SITE INFORMATION:

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,


Massy Cashen



Consultants, Inc.

April 14, 2004

State of Hawaii Department of Health
Environmental Management Division
919 Ala Moana Boulevard, Room 301
Honolulu, HI 96814
Phone: (808) 586-4309
Attn: Clean Water Branch

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:


We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

SITE INFORMATION:

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,


Massy Cashen



Consultants, Inc.

4/14/2004

State of Hawaii Department of Health
Environmental Management Division
919 Ala Moana Boulevard, Room 206
Honolulu, HI 96814
Phone: (808) 586-4249
*Attn: Office of Hazard Evaluation
& Emergency Response (HEER)*

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:

We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

SITE INFORMATION:

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,


Massy Cashen



Consultants, Inc.

4/14/2004

State of Hawaii Department of Health
Environmental Management Division
919 Ala Moana Boulevard, Room 308
Honolulu, HI 96814
Phone: (808) 586-4258
Fax: (808) 586-4370
Attn: Safe Drinking Water Branch

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:


We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

SITE INFORMATION:

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,


Massy Cashen



Consultants, Inc.

4/14/2004

State of Hawaii Department of Health
Environmental Management Division
919 Ala Moana Boulevard, Room 212
Honolulu, HI 96814

Phone: (808) 586-4226

Attn: Solid & Hazardous Waste Branch

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:

We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

SITE INFORMATION:

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,


Massy Cashen



April 14, 2004

Maui County Fire Department
Fire Prevention Bureau
21 Kinipopo Street
Wailuku, Hawaii 96793
Attn: Capt. Neal Bal
Via Fax No: 270-7889



RE: Request for Public Records for Vuich Environmental Consultants (VEC)

Dear Capt. Bal:

VEC is requesting any past or present information of environmental concern pertaining to the subject site and adjacent sites from the Maui County Fire Department's database. This could include information on environmental releases (spills), permits, citations, inspections, etc.

SITE INFORMATION:

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Thank you for your assistance.

Sincerely yours,

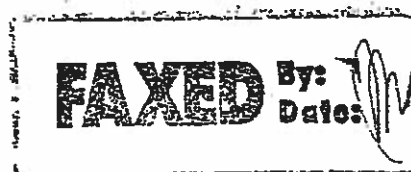

Massy Cashen

Attachment: TMK map



April 14, 2004

Maui County Fire Department
Hazardous Materials Division
200 Dairy Road
Kahului, Hawaii 96732
Attn: Mr. Jeffrey M. Kihune
Acting Officer
Via Fax No: 270-7919



RE: Request for Public Records for Vuich Environmental Consultants (VEC)

Dear Mr. Kihune:

VEC is requesting any past or present information of environmental concern pertaining to the subject site and adjacent sites from the Maui County Fire Department's database. This could include information on environmental releases (spills), permits, citations, inspections, etc.

SITE INFORMATION:

Project Number: 0403-760
Tax Map Key No.: (2) 3-5-02:01
Address: Vacant Land, Honoapiilani Highway
Current Owner: Wailuku Agribusiness Company, Inc.
Former Owner: N. A.
Current Occupant: Banana farmers
Type of Business: Agricultural

Thank you for your assistance.

Sincerely yours,


Massy Cashen

Attachment: TMK map

EDR FieldCheck™ Report



EDR™ Environmental
Data Resources Inc

**Emmanuel Lutheran Church
Honoapiilani Hwy
Wailuku, HI 96793**

Inquiry Number: 01189151.1r

May 11, 2004

**The Standard in
Environmental Risk
Management Information**

**440 Wheelers Farms Road
Milford, Connecticut 06460**

Nationwide Customer Service

**Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com**

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Map Findings.....	6
Orphan Summary.....	8
Government Records Searched/Data Currency Tracking.....	GR-1

GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Important information about The EDR FieldCheck(TM) Report

This is The EDR FieldCheck (TM) Report. Through its continuing emphasis in online technological advancements, EDR has developed the FieldCheck (TM) system, which enables EDR's customers to make certain online modifications to the maps and text contained in EDR Radius Map Reports. With FieldCheck (TM), an EDR customer can relocate and/or delete plotted sites and/or plot or delete orphan sites that would otherwise appear or be noted with an EDR Radius Map Report. Such modifications may be based on site visits, independent data verification and/or other actions taken or decisions made by EDR's customer. As a result, the maps and text contained in The EDR FieldCheck (TM) Report that you receive may have been so modified. Please note: EDR has not taken any action to verify any such modifications, and this report and the findings set forth herein must be read in light of this fact. VUICH ENVIRONMENTAL should be contacted for information concerning all such modifications.

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EXECUTIVE SUMMARY

At the request of VUICH ENVIRONMENTAL, a search of the environmental records covering the area detailed herein was conducted by Environmental Data Resources, Inc. (EDR). This report was derived from the results of such search, which, as conducted by EDR, met the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances were per ASTM standard or custom distances requested by the user.

NOTE: ALL MAPS AND TEXT INCLUDED HEREIN MAY HAVE BEEN MODIFIED BY VUICH ENVIRONMENTAL BASED ON SITE VISITS, INDEPENDENT DATA VERIFICATION AND/OR OTHER ACTIONS TAKEN OR DECISIONS MADE BY VUICH ENVIRONMENTAL. EDR HAS NOT TAKEN ANY ACTION TO VERIFY ANY OF SUCH MODIFICATIONS, AND THIS REPORT AND THE FINDINGS SET FORTH HEREIN MUST BE READ IN LIGHT OF THIS FACT. VUICH ENVIRONMENTAL SHOULD BE CONTACTED FOR INFORMATION CONCERNING ALL SUCH MODIFICATIONS.

TARGET PROPERTY INFORMATION

ADDRESS

HONOAPIILANI HWY
WAILUKU, HI 96793

COORDINATES

Latitude (North):	20.866800 - 20° 52' 0.5"
Longitude (West):	156.501300 - 156° 30' 4.7"
Universal Transverse Mercator:	Zone 4
UTM X (Meters):	759982.6
UTM Y (Meters):	2309290.0
Elevation:	355 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	20156-G5 LAHAINA, HI
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No sites were found in an online review and analysis by VUICH ENVIRONMENTAL of EDR's search of available ("reasonably ascertainable") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL.....	National Priority List
Proposed NPL.....	Proposed National Priority List Sites
CERCLIS.....	Comprehensive Environmental Response, Compensation, and Liability Information System

EXECUTIVE SUMMARY

CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
CORRACTS..... Corrective Action Report
RCRIS-TSD..... Resource Conservation and Recovery Information System
RCRIS-LQG..... Resource Conservation and Recovery Information System
RCRIS-SQG..... Resource Conservation and Recovery Information System
ERNS..... Emergency Response Notification System

STATE ASTM STANDARD

SWF/LF..... Permitted Landfills in the State of Hawaii
LUST..... Leaking Underground Storage Tank Database
UST..... Underground Storage Tank Database
VCP..... Voluntary Response Program Sites

FEDERAL ASTM SUPPLEMENTAL

CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision
Delisted NPL..... National Priority List Deletions
FINDS..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
PADS..... PCB Activity Database System
FUDS..... Formerly Used Defense Sites
INDIAN RESERV..... Indian Reservations
US BROWNFIELDS..... A Listing of Brownfields Sites
DOD..... Department of Defense Sites
RAATS..... RCRA Administrative Action Tracking System
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
SSTS..... Section 7 Tracking Systems
FTTS INSP..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

SPIILLS..... Release Notifications

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas..... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS..... A Listing of Brownfields Sites
BROWNFIELDS..... Brownfields Sites
VCP..... Voluntary Response Program Sites

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property. Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in *bold italics* are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

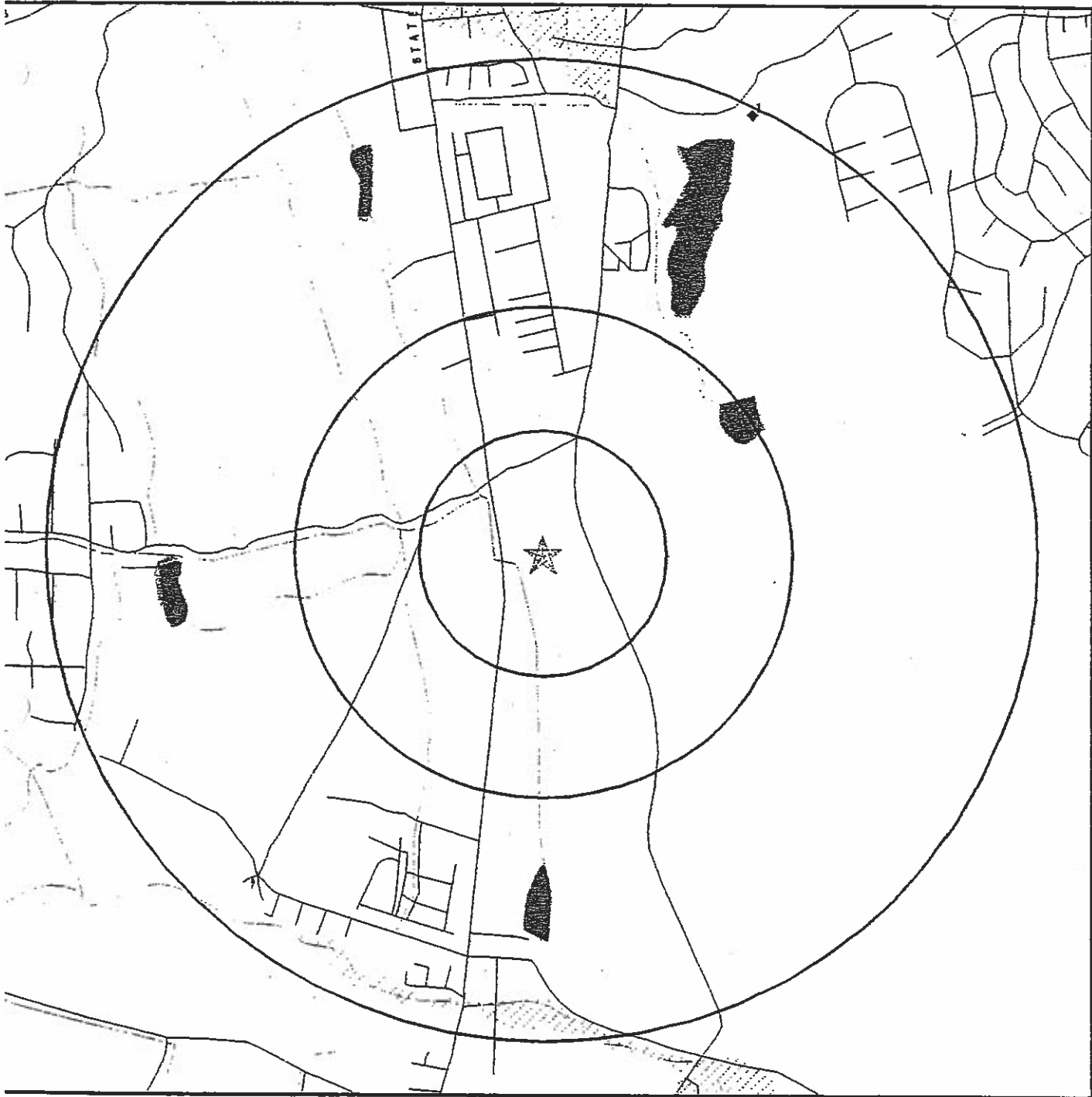
STATE ASTM STANDARD

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

An online review and analysis by VUICH ENVIRONMENTAL of the SHWS list, as provided by EDR, and dated 07/12/2001 has revealed that there is 1 SHWS site within approximately 1 mile of the target property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
WAIALE ASH PILE	WAIALE STREET	1/2 - 1 NNE	1	6

OVERVIEW IAP - 01189151.1r - Vuich Enviro nental



- * Target Property
- ▲ Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- ▲ Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

- Indian Reservations BIA
- ▲ Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands

TARGET PROPERTY: Emmanuel Lutheran Church
ADDRESS: Honoapiilani Hwy
CITY/STATE/ZIP: Wailuku HI 96793
LAT/LONG: 20.8668 / 156.5013

CUSTOMER: Vuich Environmental
CONTACT: Massy Cashen
INQUIRY #: 01189151.1r
DATE: May 11, 2004 5:58 pm

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[illegible]

-
- A horizontal scale bar with markings at 0, 1/16, 1/8, and 1/4 Miles.

CUSTOMER: Vuich Environmental
CONTACT: Massy Cashen
INQUIRY #: 01189151.1r
DATE: May 11, 2004 5:59 pm

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

<u>Site Name</u>	<u>Database(s)</u>
SMILE'S AUTO SPECIALISTS	SHWS
KANAHU POND EAST	CERC-NFRAP, SHWS
RAINBOW HAULING	SHWS
E & E BLACK CONTRACTORS	SHWS
HOBSON AVENUE AREA	SHWS, SPILLS
MAUI PALMS HOTEL UST	SHWS
ALEXANDER AND BALDWIN DUMP SITE	SHWS
MAUI MEAT FACILITY-FORMER	SHWS
KALAMAULA LANDFILL	SHWS
KAHOOLAWE ISLAND	SHWS
BEN FRANKLIN STORES PROPERTY	SHWS
LOWALU TRANSFER STATION	SHWS
PICRIC ACID AT MAUI COMMUNITY COLLEGE	SHWS
PICRIC ACID AT MAUI MEMORIAL HOSPITAL	SHWS
MAALAEA	SWF/LF
KAKAMAULA LANDFILL	SWF/LF
KALUAKOI LANDFILL	SWF/LF
MAUNALOA LANDFILL	SWF/LF
CENTRAL MAUI LF, PHASE I&II LF-0034-95)	SWF/LF
DAVID PICO CESSPOOL DIGGING	LUST, UST
PAIA SEWER PUMP STATION	UST

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<u>FEDERAL ASTM STANDARD</u>								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRIS-TSD		0.500	0	0	0	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
<u>STATE ASTM STANDARD</u>								
SHWS		1.000	0	0	0	1	NR	1
State Landfill		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	0	NR	NR	0
UST		0.250	0	0	NR	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
<u>FEDERAL ASTM SUPPLEMENTAL</u>								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
FUDS		1.000	0	0	0	0	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
<u>STATE OR LOCAL ASTM SUPPLEMENTAL</u>								
SPILLS		TP	NR	NR	NR	NR	NR	0
<u>EDR PROPRIETARY HISTORICAL DATABASES</u>								
Coal Gas		1.000	0	0	0	0	NR	0

MAP FINDINGS SUMMARY

<u>Database</u>	<u>Target Property</u>	<u>Search Distance (Miles)</u>	<u>< 1/8</u>	<u>1/8 - 1/4</u>	<u>1/4 - 1/2</u>	<u>1/2 - 1</u>	<u>> 1</u>	<u>Total Plotted</u>
<u>BROWNFIELDS DATABASES</u>								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
BROWNFIELDS		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID
Direction
Distance
Distance (ft.)
Elevation

MAP FINDINGS

Database(s)
EDR ID Number
EPA ID Number

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

1
NNE
1/2-1
5190 ft.

WAI'ALE ASH PILE
WAI'ALE STREET
WAILUKU, HI

SHWS S104657531
N/A

Relative:
Lower

SHWS:

Actual:
206 ft.

File Section :	Central
Type :	Not reported
Department 1 :	Not reported
Department 2 :	Not reported
Department 3 :	Not reported
Table :	Sitelist
Island :	Mau
Zip :	Not reported
Discovery Assesment and Remediation :	6/14/99
Initial Site Screening Team Lead :	Laura Young
ISST Assigned :	3/9/00
ISST Date :	8/10/00
ISST Priority :	High
ISST Letter :	Not reported
Env Justice Eligible :	Not reported
Preliminary Assesment :	No
PA Lead :	Not reported
PA Date :	Not reported
PA Result :	Not reported
Site Investigation :	No
SI Lead :	Not reported
SI Date :	Not reported
SI Result :	Not reported
Remediation Action Planned :	Not reported
VRP :	Not reported
Brownfields :	Not reported
Agreement :	Not reported
Remedial Investigation :	Not reported
RAA :	Not reported
Response Action Memo :	Not reported
REM Lead :	Not reported
REM Date :	Not reported
REM Last Update :	8/14/00
Input By :	Bryce
Case :	Not reported
Fed Id :	Not reported
UST :	Not reported
Permits :	Not reported
RCRA :	Not reported
Program :	Not reported
Priority :	Not reported
Lat/Long :	Not reported
Cost :	Not reported
CU QNTY Site :	Not reported
Enforcement :	Not reported
CU Method :	Not reported
Ownership :	Not reported
Tax Map Key :	Not reported
Form :	Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation

MAP FINDINGS

WAIALE ASH PILE (Continued)

Database(s)
EDR ID Number
EPA ID Number

S104657531

EPCRA :	Not reported
EPCRA FIL :	Not reported
Pathways :	Not reported
Targets :	Not reported
Manager :	Not reported
REM Result :	Not reported
Identifier :	Not reported
Site Code :	Not reported
Event :	Not reported
Event Type :	Not reported
Notes :	Not reported
Site :	Not reported
Site_ :	Not reported
Operator :	Not reported
Current :	Not reported
Compounds :	Dioxins, heavy metals
Oname :	Not reported

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
KAHULUI	1000816953	SMILE'S AUTO SPECIALISTS	AMALA PLACE	96732	SHWS
KAHULUI	1001475719	KANAHU POND EAST	AMALA PLACE	96732	CERC-NFRAP, SHWS
KAHULUI	1000659952	RAINBOW HAULING	AMALA PL	96732	SHWS
KAHULUI	1000816952	E & E BLACK CONTRACTORS	AMALA PL	96732	SHWS
KAHULUI	S104534208	HOBROH AVENUE AREA	HOBROH AVE	96732	SHWS, SPILLS
KAHULUI	S104534290	MAUI PALMS HOTEL UST	150 KAAHUMANU AVE	96732	SHWS
KAHULUI	U001236769	DAVID PICO CESSPOOL DIGGING	OLD HALEAKALA HWY	96732	LUST, UST
KAHULUI	1001032388	ALEXANDER AND BALDWIN DUMP SITE	W PAPA AVE	96732	SHWS
KAHULUI	U003222223	PAIA SEWER PUMP STATION	PUNA RD/HANA HWY	96732	UST
KAHULUI	S104534289	MAUI MEAT FACILITY-FORMER	801 2ND ST	96732	SHWS
KALAMAULA	S104534228	KALAMAULA LANDFILL	SOUTH MOLOKAI, KALAMAULA	96793	SHWS
MAUI COUNTY	S106100622	MAALAEA	INTERSECTION OF KIHEI RD AND HONOAPIILANI HWY		SWF/LF
MAUI COUNTY	S104534222	KAHOOLAWE ISLAND	KAHOOLAWE ISLAND	96732	SHWS
MAUI COUNTY	S103763653	KAKAMAULA LANDFILL	KALAMAULA MOLOKAI		SWF/LF
MAUI COUNTY	S103763654	KALUAKOI LANDFILL	KALUAKOI ROAD MAUNALO		SWF/LF
MAUI COUNTY	S104534094	BEN FRANKLIN STORES PROPERTY	KAUNAKAKAI, MOLOKAI		SHWS
MAUI COUNTY	S103763656	MAUNALO LANDFILL	MAUNALO MAUI		SWF/LF
MAUI COUNTY	S103763652	CENTRAL MAUI LF, PHASE I&II LF-0034-95)	PUNENE, MAUI		SWF/LF
OLOWALU	1000435092	OLOWALU TRANSFER STATION	OLOWALU	96793	SHWS
WAILUKU	S104657488	PICRIC ACID AT MAUI COMMUNITY COLLE	310 KAAHUMANU AVE	96793	SHWS
WAILUKU	S104657489	PICRIC ACID AT MAUI MEMORIAL HOSPIT	MAUI	96793	SHWS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List

Source: EPA

Telephone: N/A

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/29/04

Date Made Active at EDR: 02/27/04

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/04

Elapsed ASTM days: 21

Date of Last EDR Contact: 02/06/04

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)

Telephone: 202-564-7333

EPA Region 1

Telephone 617-918-1143

EPA Region 3

Telephone 215-814-5418

EPA Region 4

Telephone 404-562-8033

EPA Region 6

Telephone: 214-655-6659

EPA Region 8

Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites

Source: EPA

Telephone: N/A

Date of Government Version: 01/07/04

Date Made Active at EDR: 02/27/04

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/04

Elapsed ASTM days: 21

Date of Last EDR Contact: 02/06/04

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

Source: EPA

Telephone: 703-413-0223

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/26/04

Date Made Active at EDR: 04/02/04

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/22/04

Elapsed ASTM days: 11

Date of Last EDR Contact: 03/22/04

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Source: EPA

Telephone: 703-413-0223

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/26/04
Date Made Active at EDR: 04/02/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/22/04
Elapsed ASTM days: 11
Date of Last EDR Contact: 03/22/04

CORRACTS: Corrective Action Report

Source: EPA

Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/04
Date Made Active at EDR: 04/15/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 03/25/04
Elapsed ASTM days: 21
Date of Last EDR Contact: 03/08/04

RCRIS: Resource Conservation and Recovery Information System

Source: EPA

Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/04
Date Made Active at EDR: 04/02/04
Database Release Frequency: Varies

Date of Data Arrival at EDR: 03/18/04
Elapsed ASTM days: 15
Date of Last EDR Contact: 04/20/04

ERNS: Emergency Response Notification System

Source: National Response Center, United States Coast Guard

Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/03
Date Made Active at EDR: 03/12/04
Database Release Frequency: Annually

Date of Data Arrival at EDR: 01/26/04
Elapsed ASTM days: 46
Date of Last EDR Contact: 04/26/04

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System

Source: EPA/NTIS

Telephone: 800-424-9346

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/01
Database Release Frequency: Biennially

Date of Last EDR Contact: 03/16/04
Date of Next Scheduled EDR Contact: 06/14/04

CONSENT: Superfund (CERCLA) Consent Decrees

Source: EPA Regional Offices

Telephone: Varies

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ROD: Records Of Decision

Source: EPA

Telephone: 703-416-0223

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/09/04

Database Release Frequency: Annually

Date of Last EDR Contact: 04/05/04

Date of Next Scheduled EDR Contact: 07/05/04

DELISTED NPL: National Priority List Deletions

Source: EPA

Telephone: N/A

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/29/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/06/04

Date of Next Scheduled EDR Contact: 05/01/04

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report

Source: EPA

Telephone: N/A

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/08/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/04

Date of Next Scheduled EDR Contact: 07/05/04

HMIRS: Hazardous Materials Information Reporting System

Source: U.S. Department of Transportation

Telephone: 202-366-4555

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/18/03

Database Release Frequency: Annually

Date of Last EDR Contact: 04/20/04

Date of Next Scheduled EDR Contact: 07/19/04

MLTS: Material Licensing Tracking System

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/15/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/04

Date of Next Scheduled EDR Contact: 07/05/04

MINES: Mines Master Index File

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959

Date of Government Version: 03/05/04

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/04

Date of Next Scheduled EDR Contact: 06/28/04

NPL LIENS: Federal Superfund Liens

Source: EPA

Telephone: 202-564-4267

Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/12/04
Date of Next Scheduled EDR Contact: 05/24/04

PADS: PCB Activity Database System

Source: EPA

Telephone: 202-564-3887

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/30/03
Database Release Frequency: Annually

Date of Last EDR Contact: 02/09/04
Date of Next Scheduled EDR Contact: 05/10/04

DOD: Department of Defense Sites

Source: USGS

Telephone: 703-692-8801

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/02/04
Date of Next Scheduled EDR Contact: 05/10/04

STORMWATER: Storm Water General Permits

Source: Environmental Protection Agency

Telephone: 202 564-0746

A listing of all facilities with Storm Water General Permits.

Date of Government Version: N/A
Database Release Frequency: Quarterly

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

INDIAN RESERV: Indian Reservations

Source: USGS

Telephone: 202-208-3710

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/02/04
Date of Next Scheduled EDR Contact: 05/10/04

US BROWNFIELDS: A Listing of Brownfields Sites

Source: Environmental Protection Agency

Telephone: 202-566-2777

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities—especially those without EPA Brownfields Assessment Demonstration Pilots—minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients—States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 07/15/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/15/04
Date of Next Scheduled EDR Contact: 06/14/04

RMP: Risk Management Plans

Source: Environmental Protection Agency

Telephone: 202-564-8600

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A
Database Release Frequency: N/A

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

FUDS: Formerly Used Defense Sites

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 10/01/03
Database Release Frequency: Varies

Date of Last EDR Contact: 04/26/04
Date of Next Scheduled EDR Contact: 07/05/04

RAATS: RCRA Administrative Action Tracking System

Source: EPA
Telephone: 202-564-4104

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/08/04
Date of Next Scheduled EDR Contact: 06/07/04

TRIS: Toxic Chemical Release Inventory System

Source: EPA
Telephone: 202-566-0250

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 03/23/04
Date of Next Scheduled EDR Contact: 06/21/04

TSCA: Toxic Substances Control Act

Source: EPA
Telephone: 202-260-5521

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/02
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 03/05/04
Date of Next Scheduled EDR Contact: 06/07/04

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA
Telephone: 202-564-2501

Date of Government Version: 01/21/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/04
Date of Next Scheduled EDR Contact: 06/21/04

SSTS: Section 7 Tracking Systems

Source: EPA
Telephone: 202-564-5008

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 04/19/04
Date of Next Scheduled EDR Contact: 07/19/04

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA/Office of Prevention, Pesticides and Toxic Substances

Telephone: 202-564-2501

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA.

TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/30/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/04

Date of Next Scheduled EDR Contact: 06/21/04

STATE OF HAWAII ASTM STANDARD RECORDS

SHWS: Sites List

Source: Department of Health

Telephone: 808-586-4249

Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 07/12/01

Date Made Active at EDR: 10/16/01

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/24/01

Elapsed ASTM days: 22

Date of Last EDR Contact: 03/25/04

SWF/LF: Permitted Landfills in the State of Hawaii

Source: Department of Health

Telephone: 808-586-4245

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/01/03

Date Made Active at EDR: 01/13/04

Database Release Frequency: Varies

Date of Data Arrival at EDR: 11/24/03

Elapsed ASTM days: 50

Date of Last EDR Contact: 04/26/04

LUST: Leaking Underground Storage Tank Database

Source: Department of Health

Telephone: 808-586-4228

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 08/01/03

Date Made Active at EDR: 09/17/03

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/02/03

Elapsed ASTM days: 15

Date of Last EDR Contact: 03/30/04

UST: Underground Storage Tank Database

Source: Department of Health

Telephone: 808-586-4228

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 08/01/03

Date Made Active at EDR: 09/11/03

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/02/03

Elapsed ASTM days: 9

Date of Last EDR Contact: 03/30/04

VCP: Voluntary Response Program Sites

Source: Department of Health

Telephone: 808-586-4249

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/10/03
Date Made Active at EDR: 10/21/03
Database Release Frequency: Varies

Date of Data Arrival at EDR: 10/13/03
Elapsed ASTM days: 8
Date of Last EDR Contact: 03/22/04

STATE OF HAWAII ASTM SUPPLEMENTAL RECORDS

SPILLS: Release Notifications

Source: Department of Health
Telephone: 808-586-4249

Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency
Response since 1988.

Date of Government Version: 09/01/00
Database Release Frequency: Varies

Date of Last EDR Contact: 03/25/04
Date of Next Scheduled EDR Contact: 06/21/04

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

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BROWNFIELDS DATABASES

BROWNFIELDS: Brownfields Sites

Source: Department of Health
Telephone: 808-586-4249

Date of Government Version: 10/10/03
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/04
Date of Next Scheduled EDR Contact: 06/21/04

VCP: Voluntary Response Program Sites

Source: Department of Health
Telephone: 808-586-4249

Date of Government Version: 10/04/03
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/04
Date of Next Scheduled EDR Contact: 06/21/04

US BROWNFIELDS: A Listing of Brownfields Sites

Source: Environmental Protection Agency
Telephone: 202-566-2777

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities—especially those without EPA Brownfields Assessment Demonstration Pilots—minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients—States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: PennWell Corporation
Telephone: (800) 823-6277

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health
Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

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EDR® Environmental
Data Resources Inc

EDR Site Report™

**WAIKAPU DUMP-MAUI COUNTY DUMP
CENTRAL MAUI
KAHULULU, HI 96732**

Inquiry Number:

May 11, 2004

**The Standard in
Environmental Risk
Management Information**

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of over 4 million government records from more than 600 federal, state and local environmental databases. The report is divided into three sections:

Section 1: Facility Summary Page 3

Summary of facility filings including a review of the following areas: waste management, waste disposal, multi-media issues, and Superfund liability.

Section 2: Facility Detail Reports Page 4

All available detailed information from databases where sites are identified.

Section 3: Databases Searched and Update Information. Page 5

Name, source, update dates, contact phone number and description of each of the databases searched for this report.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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SECTION 1: FACILITY SUMMARY

FACILITY	FACILITY 1
AREA	WAIKAPU DUMP-MAUI COUNTY DUMP CENTRAL MAUI KAHULUI, HI 96732 EDR ID #1003879111 EPA #HID050340843
WASTE MANAGEMENT Facility generates hazardous waste (RCRIS)	NO
Facility treats, stores, or disposes of hazardous waste on-site (RCRIS/TSD)	NO
Facility has received Notices of Violations (RCRIS/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	NO
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	NO
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
WASTE DISPOSAL Facility is a Superfund Site (NPL)	NO
Facility has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	YES - p4 (NFRAP)
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
MULTIMEDIA Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility produces pesticides and has notified EPA under Section 7 of FIFRA (SSTS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has inspections under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	NO
Facility is listed in a county/local unique database (LOCAL)	NO
POTENTIAL SUPERFUND LIABILITY Facility has a list of potentially responsible parties PRP	NO
TOTAL (YES)	1

SECTION 2: FACILITY DETAIL REPORTS

WASTE DISPOSAL

DATABASE: No Further Remedial Action Planned (CERCLIS/NFRAP)

WAIKAPU DUMP-MAUI COUNTY DUMP
CENTRAL MAUI
KAHULUI, HI 96732
EDR ID #1003879111

CERC-NFRAP Name: WAIKAPU DUMP-MAUI COUNTY DUMP
CENTRAL MAUI
KAHULUI, HI 96732
MAUI County

Congressional Dist: Not reported

RCRA Facility: Not reported

IFMS ID: Not reported

SMSA Num: Not reported

USGS Hydro Unit: 20020000

Federal Facility: Not a Federal Facility

Non NPL Status: NFRAP

NPL Update Num: Not Reported

Federal Register Date: Not Reported

Fed Haz Waste: No

Site Incident: Not reported

EPA-ID: HID050340843

EPA Region: Region 9
r9cerc01.r09tok.epa.gov 204.47.91.37
75 Hawthorne St.
94

NPL Status: Not on the NPL

Ownership Status: Unknown

Classification: Not Reported

Site Description: Not Reported

ENFORCEMENT ACTIVITY

Action Type: DISCOVERY
Action Anomaly: Not reported
Planning Status: Not reported
Priority Level: Not reported
Operable Unit: SITEWIDE
Urgency: Not reported
Actual Start Date: Not reported
Actual Complete Date: 19791101
Primary Responsibility: EPA Fund-Financed

Action Type: ARCHIVE SITE
Action Anomaly: Not reported
Planning Status: Not reported
Priority Level: Not reported
Operable Unit: SITEWIDE
Urgency: Not reported
Actual Start Date: Not reported
Actual Complete Date: 19850101
Primary Responsibility: EPA In-House

Action Type: PRELIMINARY ASSESSMENT
Action Anomaly: Not reported
Planning Status: Not reported
Priority Level: NFRAP (No Further Remedial Action Planned)
Operable Unit: SITEWIDE
Urgency: Not reported
Actual Start Date: 19841001
Actual Complete Date: 19850101
Primary Responsibility: State, Fund Financed

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

WASTE MANAGEMENT

RCRIS: Resource Conservation and Recovery Information System

Source: EPA

Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/2004
Database Release Frequency: Varies

Date of Last EDR Contact: 04/20/2004
Date of Next Scheduled Update: 06/21/2004

BRS: Biennial Reporting System

Source: EPA/NTIS

Telephone: 800-424-9346

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/2001
Database Release Frequency: Biennially

Date of Last EDR Contact: 03/16/2004
Date of Next Scheduled Update: 06/14/2004

RAATS: RCRA Administrative Action Tracking System

Source: EPA

Telephone: 202-564-4104

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/08/2004
Date of Next Scheduled Update: 06/07/2004

CORRACTS: Corrective Action Report

Source: EPA

Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2004
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/08/2004
Date of Next Scheduled Update: 06/07/2004

PADS: PCB Activity Database System

Source: EPA

Telephone: 202-564-3887

PCB Activity Database. PADS identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/30/2003
Database Release Frequency: Annually

Date of Last EDR Contact: 02/09/2004
Date of Next Scheduled Update: 05/10/2004

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

MLTS: Material Licensing Tracking System

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/15/2004
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/2004
Date of Next Scheduled Update: 07/05/2004

HI UST: Underground Storage Tank Database

Source: Department of Health

Telephone: 808-586-4228

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 08/01/2003
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/2004
Date of Next Scheduled Update: 06/28/2004

HI LUST: Leaking Underground Storage Tank Database

Source: Department of Health

Telephone: 808-586-4228

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 08/01/2003
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/2004
Date of Next Scheduled Update: 06/28/2004

ERNS: Emergency Response Notification System

Source: National Response Center, United States Coast Guard

Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2003
Database Release Frequency: Annually

Date of Last EDR Contact: 04/26/2004
Date of Next Scheduled Update: 07/26/2004

HMIRS: Hazardous Materials Information Reporting System

Source: U.S. Department of Transportation

Telephone: 202-366-4555

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/18/2003
Database Release Frequency: Annually

Date of Last EDR Contact: 04/20/2004
Date of Next Scheduled Update: 07/19/2004

WASTE DISPOSAL

NPL: National Priority List

Source: EPA

Telephone: Not reported

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/29/2004
Date Made Active at EDR: 02/27/2004
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/2004
Elapsed ASTM Days: 21
Date of Last EDR Contact: 02/06/2004

PROPOSED NPL: Proposed National Priority List Sites

Source: EPA

Telephone: Not reported

Date of Government Version: 01/07/2004
Date Made Active at EDR: 02/27/2004
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/2004
Elapsed ASTM Days: 21
Date of Last EDR Contact: 02/06/2004

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

DELISTED NPL: National Priority List Deletions

Source: EPA

Telephone: Not reported

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/29/2004

Date Made Active at EDR: 02/27/2004

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 02/06/2004

Elapsed ASTM Days: 21

Date of Last EDR Contact: 02/06/2004

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

Source: EPA

Telephone: 703-413-0223

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/26/2004

Date Made Active at EDR: 04/02/2004

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/22/2004

Elapsed ASTM Days: 11

Date of Last EDR Contact: 03/22/2004

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Source: EPA

Telephone: 703-413-0223

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 02/26/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

NPL LIENS: Federal Superfund Liens

Source: EPA

Telephone: 202-564-4267

Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991

Date Made Active at EDR: 03/30/1994

Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 02/02/1994

Elapsed ASTM Days: 56

Date of Last EDR Contact: 03/12/2004

HI SHWS:

HI SWF/LF: Permitted Landfills in the State of Hawaii

Source: Department of Health

Telephone: 808-586-4245

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/01/2003

Database Release Frequency: Varies

Date of Last EDR Contact: 04/26/2004

Date of Next Scheduled Update: 07/26/2004

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

MULTIMEDIA

TRIS: Toxic Chemical Release Inventory System

Source: EPA

Telephone: 202-566-0250

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2001

Database Release Frequency: Annually

Date of Last EDR Contact: 03/23/2004

Date of Next Scheduled Update: 06/21/2004

SSTS: Section 7 Tracking Systems

Source: EPA

Telephone: 202-564-5008

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2001

Database Release Frequency: Annually

Date of Last EDR Contact: 04/19/2004

Date of Next Scheduled Update: 07/19/2004

TSCA: Toxic Substances Control Act

Source: EPA

Telephone: 202-260-5521

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002

Database Release Frequency: N/A

Date of Last EDR Contact: 03/05/2004

Date of Next Scheduled Update: 06/07/2004

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA/Office of Prevention, Pesticides and Toxic Substances

Telephone: 202-564-2501

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/30/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA

Telephone: 202-564-2501

Date of Government Version: 01/21/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report

Source: EPA

Telephone: Not reported

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/08/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/2004

Date of Next Scheduled Update: 07/05/2004

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

HI SPILLS: Release Notifications

Source: Department of Health

Telephone: 808-586-4249

Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 09/01/2000

Database Release Frequency: Varies

Date of Last EDR Contact: 03/25/2004

Date of Next Scheduled Update: 06/21/2004

HI BROWNFIELDS: Brownfields Sites

Source: Department of Health

Telephone: 808-586-4249

Date of Government Version: 10/10/2003

Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

HI VCP: Voluntary Response Program Sites

Source: Department of Health

Telephone: 808-586-4249

Date of Government Version: 10/10/2003

Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

GA SPILLS: Spills Information

Source: Department of Natural Resources

Telephone: 404-656-6905

Oil or Hazardous Material Spills or Releases.

Date of Government Version: 02/11/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/26/2004

Date of Next Scheduled Update: 07/26/2004

GA HIST LF:

GA NON-HSI: Non-Hazardous Site Inventory

Source: Rindt-McDuff Associates, Inc.

Telephone: Not reported

This list was obtained by EDR in 1998 and contains property listings that have reported contamination of soil or groundwater under the Georgia Hazardous Site Response Act (HSRA). These sites were not placed on the Georgia Priority list (Hazardous Site Inventory or HSI) because their hazard evaluation scores did not exceed the threshold levels established for sites posing an imminent threat to health or the environment. Disclaimer provided by Rindt-McDuff Associates - the database information has been obtained from publicly available sources produced by other entities. While reasonable steps have been taken to insure the accuracy of the data, RMA does not guarantee the accuracy of the data. No claim is made for the actual existence of pollution at any site. This data does not constitute a legal opinion.

Date of Government Version: 01/20/2004

Database Release Frequency: Annually

Date of Last EDR Contact: 04/05/2004

Date of Next Scheduled Update: 07/05/2004

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. (C) Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

POTENTIAL SUPERFUND LIABILITY

PRP: Potentially Responsible Parties

Source: EPA

Telephone: 202-564-6064

A listing of verified Potentially Responsible Parties

Date of Government Version: 04/22/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/23/2004

Date of Next Scheduled Update: 07/05/2004

CARLSMITH BALL LLP

A LIMITED LIABILITY LAW PARTNERSHIP

ONE MAIN PLAZA, SUITE 400
2200 MAIN STREET, P O BOX 1086
WAILUKU, MAUI, HAWAII 96793-1086
TELEPHONE 808 242-4535 FAX 808 244-4974
WWW.CARLSMITH.COM

FACSIMILE TRANSMISSION

UNLESS OTHERWISE INDICATED OR OBVIOUS FROM THE NATURE OF THE TRANSMITTAL, THE INFORMATION CONTAINED IN THIS FACSIMILE MESSAGE IS ATTORNEY PRIVILEGED AND CONFIDENTIAL INFORMATION INTENDED FOR THE USE OF THE INDIVIDUAL OR ENTITY NAMED BELOW. IF THE READER OF THIS MESSAGE IS NOT THE INTENDED RECIPIENT, OR THE EMPLOYEE OR AGENT RESPONSIBLE FOR DELIVERING IT TO THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION OR COPYING OF THIS COMMUNICATION IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR OR ARE NOT SURE WHETHER IT IS PRIVILEGED, PLEASE IMMEDIATELY NOTIFY US BY COLLECT TELEPHONE AND RETURN THE ORIGINAL MESSAGE TO US AT THE ABOVE ADDRESS VIA THE U.S. POSTAL SERVICE AT OUR EXPENSE. THANK YOU.

DATE: April 20, 2004

TO:	Name	Fax No.	Phone No.
Joe @Vuich		249-2778	

FROM: Tom C. Leuteneker

NUMBER OF PAGES INCLUDING THIS COVER SHEET: 2

CASE NAME: Emmanuel Lutheran Church

CASE NUMBER:

☐ ORIGINAL/COPY WILL BE MAILED

☐ ORIGINAL/COPY WILL NOT BE MAILED

MESSAGE: Attached is list showing chemicals and fertilizers that may have been used on TMK 3-5-02:01.



April 15, 2004

To: Tom Leuteneker, via fax
From: Clayton Suzuki

Subject: Tax Map Key: 3-5-02:01

The following chemicals may have been used during the cultivation of sugarcane on Tax Map Key: 3-5-02:01 in Waikapu.

Active Ingredient:	Brand Name:
Alrazine	Aatrex Nine-O
Ametryn	Evik 80W
2, 4-D	Formula 40
Diuron	Karmex DF
Glyphosate	Roundup
Metribuzin	Sinbar
Hexazinone	Velpar
Glyphosate	Polado

The following fertilizers were used in the cultivation of sugarcane.

Nitrogen
Potassium
Phosphorus
Calcium carbonate

The following chemicals may have been used during the cultivation of pineapple in the Waikapu fields.

Alletto	Ethrel
Amdro	Evik
Diazinon	Hyvar X
Karmex (Diuron)	Velpar DF
Roundup (non crop area)	Alrazine
Fruitone	Nemcur 3

The following fertilizers were used in the cultivation of pineapple.

Nitrogen	Sulfate of Potash
Iron Sulfate	Magnesium Sulfate
Zinc Sulfate	Sulfate of Amonia

Appendix C:

Qualifications of Environmental Professionals



Consultants, Inc.

STATEMENT OF QUALIFICATIONS

for

Joseph W. Beaulieu, B.A.

Company Position

Environmental Technician

Responsibilities and Duties:

- Phase I & II Environmental Site Assessments/Investigations
- Phase III Environmental Remediation Projects
- Underground Storage Tank (UST) Closures
- Erosion Control Management
- Indoor Air Quality Investigations
- Erosion Control Plan (BMP) Development
- Hazardous/Regulated Waste Management

Experience:

- Environmental Site Assessments
- Disaster Preparedness drills - GIS
- Cartographer – American Automobile Association
- 14 years with the State of New York Mapping and GIS program

Training & Education

- Bachelor of Arts, Environmental Science and Geography (double major), Planning (minor), Mapping Science (minor), Plattsburgh State University College, Plattsburgh, New York. 1986
- GIS Graduate course work, State University at Albany, New York
- GPS training



Consultants, Inc.

STATEMENT OF QUALIFICATIONS

for

Jeffrey E. Kermode, B.A., B. Tech.

Company Position

Vice President / Environmental Projects Manager

Responsibilities and Duties:

- Phase I & II Environmental Site Assessments/Investigations
- Phase III Remediation Projects
- Underground Storage Tank (UST) Closures
- Asbestos Inspections, Air Monitoring and Supervision of Removal
- Lead-Based Paint Inspections, Risk Assessments and Supervision of Removal
- Indoor Air Quality Investigations and Mold Remediation Project Management
- Erosion Control Plan (BMP) Development
- Site Safety Officer for Sampling/Remediation Projects

Experience:

- Soil and Groundwater Investigations/Remediation
- UST Removal and Closure
- Hazardous Materials Management
- Asbestos and Lead-Based Paint Projects (Inspections, Monitoring, Removal)
- Air Quality Sampling for Particulate and Microbiological Contaminants
- Wetland Delineation
- Erosion Control and Pollution Prevention Planning and Implementation for Large Scale Construction Projects
- Underground Injection Control (UIC) Permitting
- Environmental Report Writing and Compilation
- Conducted On-Site Oil Spill Response Training Courses, Assessed Clients' Response Preparedness, and Assisted in the Development of Oil Spill Contingency Plans
- Oil Spill Clean-Up Operations
- Pelagic and Coastal Fisheries Research as a Scientific Observer

Training & Education

- Bachelor of Technology, Environmental Engineering, B.C.I.T. Burnaby, B.C., 1999
- Bachelor of Arts, Geography, University of B.C., Vancouver, Canada, 1989
- AHERA (Asbestos Hazard Emergency Response Act) Inspector for Asbestos, US EPA Certified
- AHERA Asbestos Contractor Supervisor, US EPA Certified
- AHERA Project Monitor for Asbestos, US EPA Certified
- OSHA HAZWOPER Certification (40 Hr)
- On-Scene Incident Commander Certification (24 Hr), US EPA Certified
- Lead-Based Paint Inspector, US EPA Certified
- Lead-Based Paint Risk Assessor, US EPA Certified
- Lead-Based Paint Contractor Supervisor, US EPA Certified



Consultants, Inc.

JOHN S. VUICH
President & CEO

STATEMENT OF QUALIFICATIONS:

M. S. Geological Engineering, University of Arizona
B. S. Geological Engineering, University of Arizona
Registered Geologist (California)
Registered Environmental Assessor (California)
Certified Environmental Manager (Nevada)

AREAS OF EXPERTISE

ENVIRONMENTAL

- ▼ Site Assessments, Phase I, II, III Investigations
- ▼ Underground Storage Tank Closure
- ▼ Asbestos Inspection and Monitoring, Management Planning, and Abatement Project Design and Removal
- ▼ Lead-Containing Paint Surveys and Inspections, and Disturbance Design and Removal
- ▼ Site Characterization for Remedial Investigations
- ▼ Facility Operation Compliance Audits-ISO 14000 Audits
- ▼ Soils/Groundwater Remediation
- ▼ Hazardous Waste Management
- ▼ Risk Assessment Investigations
- ▼ RCRA Compliance and Closure Projects
- ▼ Expert Witness/Litigation Support
- ▼ Industrial Hygiene Qualified/Competent Person
- ▼ Mold/Fungi Sampling, Remediation and Abatement Design and Removal

GEOLOGICAL

- ▼ Hydrogeology
- ▼ Geologic Hazards Analysis
- ▼ Landuse Planning
- ▼ Subsurface Excavations and Drilling Investigations and Sampling

MANAGEMENT

- ▼ Program Director - Project Management
- ▼ Client - Agency Liaison
- ▼ Field Supervision - Administrative Supervisor

Rev. 6/03

Maui (Main) Office: 1498 Lower Main Street, Suite C, Wailuku, Maui, Hawaii 96793 • (808) 249-2777 Phone (808) 249-2778 Fax
Oahu Office: Hanua Industrial Complex, 91-110 Hanua Street, Unit 317, Kapolei, Oahu, Hawaii 96707
(808) 682-1611 Phone • (808) 682-1616 Fax • Inter-Island: (800) 572-1165 • www.vuichenvironmental.com

RELEVANT EXPERIENCE

Owner-President • Vuich Environmental Consultants, Inc.
Wailuku, Maui, and Honolulu, Oahu • (March, 1994 - Present)

Consulting services and project management for Abatement / Remediation Projects property transfers, sampling and site characterization plans, hazardous and toxic waste management, underground storage tanks, regulatory compliance, landfill sites, site remediation and closure plans, permit applications, litigation support, feasibility planning and contingency and emergency response plans.

Director • CEO Haztech Enviro-Systems
Tucson, AZ • July 1988 - February 1994)

Founder of professional environmental engineering and geological consulting firm. Services included site assessments, site contamination characterizations, facility audits, RCRA closure investigations and hazardous/regulated waste management, remediation projects, and asbestos surveys. Prepared regulatory documentation and permitting for Federal, State and local regulatory agencies on all projects. Supervised professional, technical, sales and administrative/clerical staff.

Project Engineer • Hazchem Environmental Services
Tucson, AZ • March 1987 - June 1988

Performed and supervised RCRA remedial projects and waste management projects.

Independent Consultant Geologist
Laguna Hills, CA and Tucson, AZ • 1982 - 1987

Conducted geological investigations in western United States and Mexico. Performed geochemical sampling and geologic mapping. Prepared technical reports for clients and regulatory agencies.

Environmental/Geotechnical Section Supervisor • TRW: Systems Engineering
Redondo Beach, CA • 1978 - 1981

Directed environmental project management for Department of Defense and Department of Energy related projects in Western U.S. Project, including site selection, planning and environmental impact statements. Supervised staff consisting of geologists and environmental scientists.

Assistant Geologist • Arizona Geological Survey
Tucson, AZ • 1972-1978

Participated in environmental impact studies, geologic hazards analysis, landuse planning. Author of several landuse planning technical publications.

Project Geologist and Staff Geologist • Various Geological Consulting & Mining Companies
Southwestern United States • 1968-1972

Performed geochemical sampling, subsurface investigations including drilling, mineral property valuation and geologic mapping. Prepared geologic reports and maps.

Rev. 6/03

OTHER CERTIFICATIONS, TRAINING AND SECURITY CLEARANCES

- ▼ Asbestos & Demolition Contractor (C-19, C-24) HI LIC #21212
- ▼ Certified Hazardous Materials First Responder, FEMA and Arizona Division of Emergency Services.
- ▼ OSHA Hazmat Worker and Supervisor
- ▼ Accredited Asbestos Building Inspector, Asbestos Contractor/Supervisor, Project Monitor, and Asbestos Abatement Project Designer.
- ▼ Accredited Lead Inspector and Lead Contractor Supervisor
- ▼ Continuing Education in Hazardous Materials Management, Environmental Studies and Environmental Regulations: 628 Classroom Hours since 1987 - Arizona State University, Tempe, AZ, Pima Community College, Tucson, AZ., & The Environmental Training Center Tucson, AZ.
- ▼ Security Clearance: Department of Defense, TOP SECRET (1980)
- ▼ Licensed Private Pilot - 1400 Hours, Single Engine, Land

Appendix D:

Acronyms and Abbreviations

Abbreviation	Definition
AST	Aboveground Storage Tank
AHERA	(Federal) Asbestos Hazard Emergency Response Act
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BLM	Bureau of Land Management
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAA	Clean Air Act: Regulates Air Quality
CAMU	Corrective Action management Unit
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act: Federal Superfund for Cleanup of Environmental Contamination (1980, 1986)
CERCLIS	CERCLA Information System (data base)
CESQG	Conditionally Exempt SQG: Hazardous Waste Generator less than 100 kg/mo.
C.F.R.	Code of Federal Regulations: National Standard Regulations
COLIWASA	Composite Liquid Waste Sampler
CRC	Chlorofluorocarbon
CMU	Concrete Masonry Unit
CWA	Clean Water Act: Regulates Water Quality (1972, 1987)
CZMA	Coastal Zone Management Act
DLNR	Department of Land and Natural Resources
DOT	Department of Transportation: Administers hazardous Waste Containers-Marking-Labeling-Placarding and Transportation Procedures.
DOH	Department Of Health (State Of Hawaii)
DRASTIC	EPA Standardized System for Evaluating Groundwater Pollution Potential Using Hydrogeologic Settings.
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency: Administers CERCLA, RCRA and SARA
FID	Flame Ionization Detector
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act: Regulates Pesticides (1972, 1988)
FSP	Field Sampling Plan
FWPCA	Federal Water Pollution Control Act
HAP	Hazardous Air Pollutant
HCS	(OSHA) Hazard Communication Standard
HSWA	(Federal) Hazardous and Solid Waste Amendments of 1984
LEL	Lower Explosive Limit
LQG	Large Quantity Generators; Hazardous Waste Generator in Excess of 100 kg/mo.
LUST	Leaking Underground Storage Tank.
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MSDS	Material Safety Data Sheets: Hazard Information Required for Chemical Substances by OSHA
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants (Under CAA Regulations)
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operating and Maintenance
OCS	Outer Continental Shelf
OSHA	Occupational Safety and Health Act: Established Hazard Communication Program and Employee Right-to-Know Law (1970)
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyls: Toxic Substance Used in Electric-Device Cooling.
PC/VI	Picocuries Per Liter
PEL	Permissible Airborne Exposure Level
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works

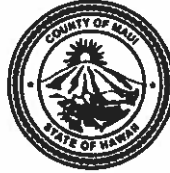
ppb	parts per billion
ppm	parts per million
PWP	Project Work Plan
PRPs	Potentially Responsible Parties...
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RBCA	Risk Based Corrective Action and Decision-Making at Sites with Contaminated Soil and Groundwater. (Hawaii DOH)
RCRA	Resource Conservation and Recovery Act: Federal Hazardous Waste Management Law. Regulates Waste Generation, Transportation, Treatment, Storage or Disposal Sites (1976, 1984)
RQ	Reportable Quantity
RUST	Registry of Underground Storage Tanks
SAP	Sampling & Analysis Plan
SARA	Superfund Amendments and Reauthorization Act: Amends CERCLA and includes Community Right to Know Law. Requires facilities report their chemical inventories and emissions (1986).
SDWA	Safe Drinking Water Act: Establishes maximum contaminant levels for drinking water (1974, 1986).
SHSP	Site Health & Safety Plan
SIC	Standard Industrial Classification
SIP	State implementation plan
SPCC	Spill Prevention Control and Countermeasure
SQG	Small Quantity Generator: Hazardous Waste Generator between 100-1000 kg/mo.
TCLP	Toxicity Characteristic Leaching Procedure: A toxicity test for certain substances declared hazardous by the EPA.
TMK	(Hawaii) Tax Map Key
TPH	Total Petroleum Hydrocarbons
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act: Regulates PCBs in electrical devices and chromium in evaporative cooling towers, asbestos in schools. (1976)
TSD	Treatment, Storage, and Disposal
UEL	Upper Explosive Limit
UIC	Underground Injection Control
USGS	United States Geological Survey
UST	Underground Storage Tank
VOA	Volatile Organic Analyses
VOC	Volatile Organic Compound: EPA listed toxic or carcinogenic organic substances.
Minimal, Minor or Not Significant	1) An unlikely or remote event, i.e., possible, but not anticipated under current conditions and observed features. 2) Insignificant when compared to regulatory acceptance levels, guideline action levels or when compared to background and/or baseline conditions of the local environment. 3) Any potential effect or impact attributed to the subject factor may be considered as the least likely source among a number of potentially responsible factors. 4) Any potential effect may not be measurable or detected by current technology. 5) Education, experience, and background of the investigator were utilized to conclude the situation or condition as trifle.

***VII. Letters Received and
Responses to Substantive
Comments***

ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director



COUNTY OF MAUI
DEPARTMENT OF PLANNING

March 3, 2018

Mr. Vince Bagoyo
1500 Kilinoe Place
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

**SUBJECT: PROPOSED 201H WAIKAPU AFFORDABLE WORKFORCE
HOUSING PROJECT AT TMK: (2) 3-5-002-011(POR.)
(RFC 2018/0006)**

This correspondence is in response to a request for comments from Carol Reimann, Director of Housing and Human Concerns, on the proposed 201H Waikapu Affordable Workforce Housing Project (Project), prepared for Waikapu Development Venture, LLC, by Bagoyo Development Consulting Group.

The County of Maui Department of Planning (Department) notes that the Project consists of eighty (80) workforce housing residential units, pursuant to the provisions of 201H, Hawaii Revised Statutes. There will be sixty-eight (68) single-family and twelve (12) duplex units. The Department further notes the project will be 100% affordable on 12.5 acres of land (TMK (2) 3-5-002:011(POR.)) to families making 70 percent (70%) to 140 percent (140%) of the County's median family income.

The entire parcel is owned by Emmanuel Lutheran Church and School. However, the Church intends to file a subdivision application, and after completion, will sell 12.5 acres to Waikapu Development Venture.

The Project fits in with the character of surrounding uses. An archaeological survey concluded no significant cultural remains were encountered. In addition, Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) accepted an Archaeological Monitoring Plan on May 22, 2017. As a result, the draft application states "Per archaeology monitoring plan, monitoring will be performed for all disturbing activities associated with the proposed subdivision."

By Ordinance 3686 (2009), the parcel received a Change in Zoning from Agricultural to P-1 Public/Quasi-Public.

The parcel is located in the State Urban District; Public/Quasi-Public Kahului Wailuku Community Plan designation; County Public/Quasi-Public Zoning District. The project is not in the Special Management Area.

The Department recommends the sentence on page 81, "Permitted Uses shall be based on Chapter 19.08, Residential District, and Chapter 19.10, Maui County Code (MCC), Two-Family (Duplex) District," be moved to replace the PERMITTED USES: "Single-family and Two-Family (Duplex) Residential Units." The Department further recommends on page 82 the term "Residential Lots" be replaced with the term "Single-Family Lots."

Mr. Vince Bagoyo
March 3, 2018
Page 2

The Maui County Council must approve the following Title 2 and Title 19, MCC exemptions for the Project to move forward:

- An exemption from Chapter 2.80B, MCC, relating to the General Plan and Community Plans, to allow the project to proceed without obtaining a Community Plan Amendment.
- An exemption from Chapter 19.31, MCC, Public/Quasi Public District, to allow for residential construction based on the provisions of Chapter 19.08, MCC, and Chapter 19.10, MCC; provided, the minimum lot size shall be 3,000 sq. ft., with a minimum lot width of forty (40) feet, and a variety of building setbacks.
- An exemption from Sections 19.31.050, MCC, relating to Development Standards.

The Department recommends the Applicant request an exemption from the provisions of Chapter 19.510, MCC.

If Council approves the Project with exemptions, the Department deems it appropriate to proceed with this much needed affordable workforce housing project.

Should you require further clarification, please contact Staff Planner Kimberley Willenbrink by email at kimberley.willenbrink@mauicounty.gov or by phone at (808) 270-5570.

Sincerely,



WILLIAM SPENCE
Planning Director

xc: Clayton I. Yoshida, AICP, Planning Program Administrator (PDF)
John S. Rapacz, Planning Program Administrator (PDF)
Pam Eaton, Planning Program Administrator (PDF)
Kathleen Aoki, Administrative Planning Officer (PDF)
Carol Reimann, Director, Department Housing and Human Concerns (PDF)
Kimberley C. Willenbrink, Staff Planner (PDF)
Project File

WRS:KCW:lk

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BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 15, 2018

Mr. William Spence
Director
Maui Planning Department
2200 Main Street, Suite 315
Wailuku, HI 96793

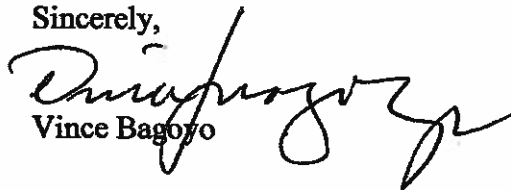
Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por), RFC 2018/0006

Dear Mr. Spence:

This is to acknowledge receipt of your letter dated March 3, 2018 regarding the above subject proposed affordable housing project. We appreciate your comments. As recommended in your letter, appropriate changes will be made on pages 81 and 82 in our final 201H, HRS application. Also, the applicant concurs with your recommendation to seek exemptions from Title 2 and Title 19, Maui County Code pursuant to 210H, HRS for the proposed project.

Thank you again for your kind comments and support for a much-needed affordable housing project for Maui's working families. Should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

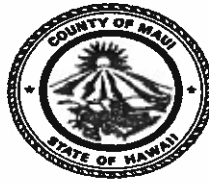
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842

VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA
MAYOR



JEFFREY A. MURRAY
FIRE CHIEF

LIONEL W. MONTALVO
DEPUTY CHIEF

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY
FIRE PREVENTION BUREAU

313 MANEA PLACE, WAILUKU, HAWAII 96793
(808) 876-4690, FAX (808) 244-1363

March 14, 2018

Vince Bagoyo
1500 Kilinoe Place
Wailuku, HI 96793

SUBJECT: Affordable Workforce Housing Project
Off Wai'ale Road, Wailuku, HI
TMK: (2) 3-5-002:011 (por.)

Dear Vince,

Thank you for allowing our office to provide comment on the subject proposed project. As per your request, comments are provided below:

- The proposed paved road widths of 20 feet meet the minimum road widths required by the fire code, but that is assuming that no parking is allowed on the street. The project needs come up with a plan to ensure that permanent parking on the street is prohibited.
- If the proposed water supply for fire protection are in-line with DWS standards, the water supply will meet the current requirements of the fire code.
- Our office does reserve the right to provide further comment on the proposed project during the building permit review process if building permits are routed to our office. At that time, fire department access, water supply for fire protection, and fire and life safety requirements will be addressed for the subject permits.
- Be advised that access and water supply improvements should be in place prior to construction of buildings or alternate provisions need to be provided.

If there are any questions or comments, please feel free to contact me at (808) 876-4693 or by email at paul.haake@mauicounty.gov.

Sincerely,

Paul Haake

A handwritten signature in black ink that reads "Paul Haake".

Captain - Fire Prevention Bureau



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 15, 2018

Mr. Paul Haake
Captain-Fire Prevention Bureau
313 Manea Place
Wailuku, HI 96793

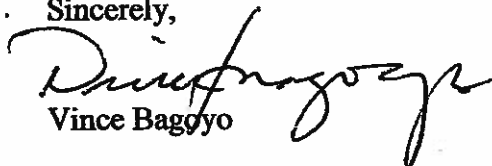
Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Haake:

This is to acknowledge receipt of your letter dated March 14, 2018 regarding the above subject proposed affordable housing project. We appreciate and concur with your comments. As noted in your letter, we are pleased to inform you that the proposed project's homeowners' association CC&R's will include provisions to prohibit permanent parking on the interior (20' wide) streets. Also, the water supply for fire protection for the project is proposed to be dedicated to the County and will be designed and constructed to meet DWS standards and fire code.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince BagoYo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842

VBAGOYO-DEVGROUP@HAWAII.RR.COM

DAVID Y. IGE
GOVERNOR



MAJOR GENERAL ARTHUR J. LOGAN
DIRECTOR OF EMERGENCY MANAGEMENT

BRIGADIER GENERAL MOSES KAOIWI, JR.
INTERIM ADMINISTRATOR OF EMERGENCY MANAGEMENT

PHONE (808) 733-4300
FAX (808) 733-4287

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF EMERGENCY MANAGEMENT / CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

February 7, 2018

Mr. Vince Bagoyo
1500 Kilinoe Place
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes (HRS)
Waiale Road, Wailuku, Hawaii TMK: (2) 3-5-02;11 (por)

Thank you for the opportunity to comment on this draft application.

After review of the documents provided for the subject project, we have determined that the proposed project area falls within coverage arcs of planned warning sirens.

We strongly recommend hardening of proposed units to be used as shelter space in an area with limited existing shelter space.

If you have any questions, please call Ms. Havinne Okamura, Hazard Mitigation Planner, at 733-4300, extension 556.

Sincerely,

A handwritten signature in black ink, appearing to read "Moses KAOIWI, JR.", written over the printed name and title.

MOSES KAOIWI, JR.
Brigadier General
Interim Administrator of Emergency Management



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 12, 2018

Mr. Moses Kaouiwi, Jr., Brigadier General
Interim Administrator of Emergency Management
State of Hawaii Department of Defense
3949 Diamond Road
Honolulu, HI 96816-4495

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Kaouiwi:

This is to acknowledge receipt of your letter dated March 7, 2018 commenting on the above subject project. Thank you for confirming that the proposed workforce housing project falls within the coverage area of planned warning systems.

Should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808)357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM

DAVID Y. IGE
GOVERNOR



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

JADE T. BUTAY
INTERIM DIRECTOR

Deputy Directors
ROY CATALANI
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

DIR 0049
STP 8.2304

February 6, 2018

Mr. Vince Bagoyo
Bagoyo Development Consultant Group
1500 Kilinoe Place
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: Waikapu Development Venture, LLC
Draft 201H Application for Proposed Workforce Housing Project
Wailuku, Hawaii
TMK: (2) 3-5-002:011 (por.)

The Department of Transportation has reviewed the subject draft 201H application for Waikapu Development Venture, LLC's proposed development of 80 affordable workforce residential housing units on a 12.5-acre site in the Waikapu area.

Comments on the subject project are as follows:

Highways Division

In reviewing the provided Traffic Impact Analysis Report dated August 11, 2017, it was determined that the project appears to have no significant impacts to State highway intersections.

Airports Division

1. The proposed project site is located approximately four miles from Runway 2 of the Kahului Airport. Any proposed development within five miles of an airport is subject to the State of Hawaii, Office of Planning, Technical Assistance Memorandum.

You can find out more details through this link:

http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf

If any of the project features attract hazardous wildlife, create glint and glare hazard, or create an aerial obstruction hazard to flight operations, the Applicant/Property Owner must coordinate with proper officials and agencies and must implement appropriate mitigation to address the hazards.


2. The drainage basin design shall mitigate potentially hazardous wildlife attraction by minimizing landscape that may be used for nesting and foraging. Stranding water shall be eliminated and water must be drained or pumped out within 48 hours of peak weather events.

It is strongly recommended that you consult the Federal Aviation Administration Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports* for guidance.

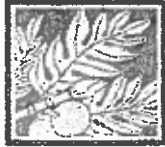
3. Although the project is located outside of the 55 Day-Night Sound Level noise contours on the 2008 Noise Exposure Map, the applicant and future residents should be aware of the proximity of the airport and potential single event noise from aircraft operations.

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

Sincerely,



JADE T. BUTAY
Interim Director of Transportation



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 13, 2018

Mr. Jade T. Butay
Director
State Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Butay:

This is to acknowledge receipt of your letter dated February 6, 2018 regarding the above subject proposed affordable housing project. As noted in your letter, SDOT Highways Division has determined that the proposed project have no significant impacts to the State highways intersections. In response to items 1 and 2 of your comment letter, we are pleased to inform you you're the drainage retention basins for the proposed project will be grassed and properly maintained to minimize attracting wildlife for nesting and foraging. Standing water will be allowed to evaporate and infiltrate into the ground. A maintenance plan will be in place to pump any standing water within 48 hours of a peak weather event to ensure the basin remains dry between storms. With regards to item 3 of your letter, please be assured that future residents of the project will be advised of the proximity of the airport and potential single event noise from aircraft operations.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,


Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808)357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA
Mayor



DON MEDEIROS
Director

MARC I. TAKAMORI
Deputy Director
(808) 270-7511

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
2145 Kaohu Street, Suite 102
Wailuku, Hawaii, USA 96793

February 5, 2018

Mr. Vince Bagoyo
1500 Kilinoe Place
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project Located at Waiale Road, Wailuku

Dear Mr. Bagoyo,

We appreciate the opportunity to provide comments on your draft application for proposed workforce housing project located at Waiale Road, Wailuku.

Three bus routes operate within the vicinity of the proposed project on Waiale Road in Wailuku, HI. The first two routes are the Wailuku Loop Route #1 and the Wailuku Loop Reverse Route #2. Both of these routes start and end at Queen Ka'ahumanu Center and circulate within Wailuku. The two stops nearest to this project are at Ka Hale A Ke Ola on Waiale Road and the other is on Kamole Street in the Kehalani Subdivision. The third route is the Lahaina Islander Route #20, which travels between Central Maui and Lahaina Town hourly. It does not stop near the development, but does pass the area as it travels along Honoapi'ilani Highway. Transit was not referenced within the application, but we wanted to share a little more detailed description of transit options near the proposed project.

While a bus stop isn't currently provided right next to the proposed project, providing interconnecting sidewalks between developments along Waiale Road and ample lighting in the evening is necessary for walkable communities and for the safety of potential public transit riders.

Please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Medeiros", is written over a light blue circular stamp.

Don Medeiros
Director



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 12, 2018

Mr. Don Medeiros
Director
Maui Department of Transportation
2145 Kaohu Street, Suite 102
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Medeiros:

This is to acknowledge receipt of your letter dated February 5, 2018 commenting on the above subject workforce housing project. We appreciate your comments on the draft 201H application and we will incorporate in the final draft your comments regarding the bus routes within the vicinity of the proposed project. With regards to your comment on interconnecting sidewalks, we are pleased to inform you that the proposed project will provide at grade sidewalk on Waiale fronting the proposed project (refer to attached typical section of a. Also, lightings will be provided within the two access entrances along Waiale Road to the project site.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

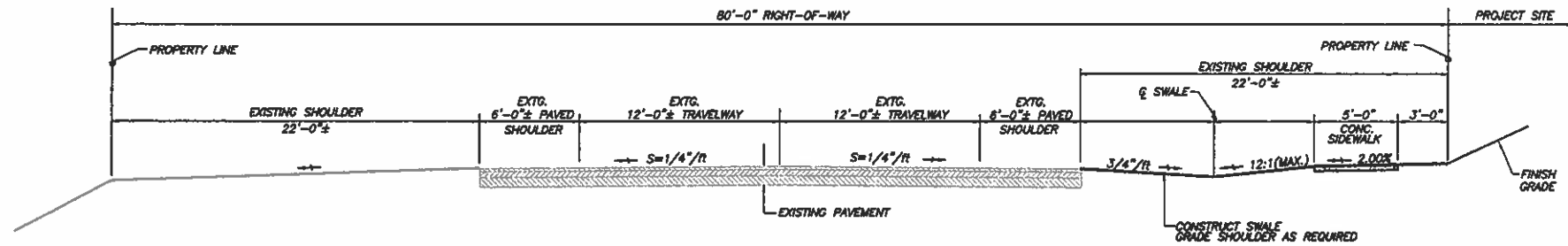
Sincerely,


Vince Bagoyo

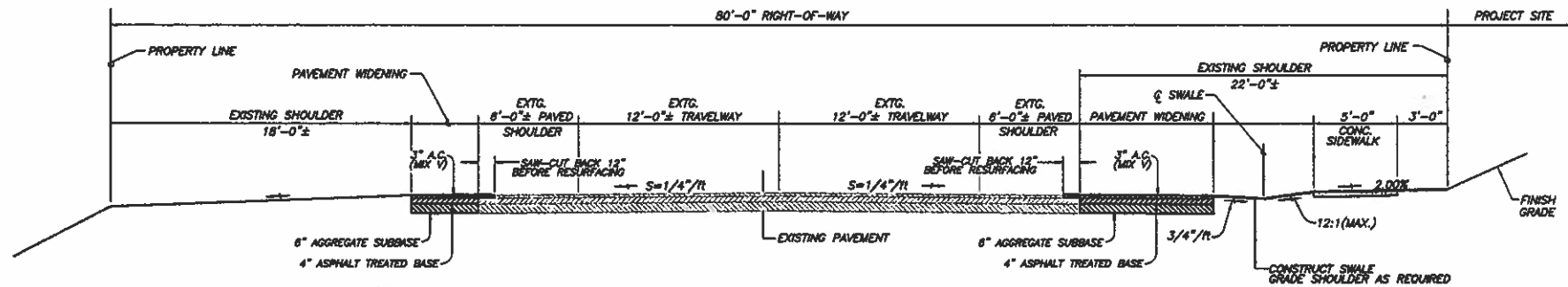
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM



TYPICAL SECTION - WAIALE ROAD (80 FT. RIGHT-OF-WAY)
NOT TO SCALE

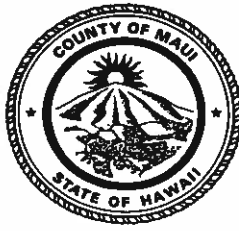


TYPICAL SECTION - WAIALE ROAD (80 FT. RIGHT-OF-WAY) W/ PAVEMENT WIDENING
NOT TO SCALE

ALAN M. ARAKAWA
Mayor

STEWART STANT
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 2B
WAILUKU, MAUI, HAWAII 96793

January 18, 2018

Mr. Vince Bagoyo
1500 Kilinoe Place
Wailuku, Hawaii 96793

**SUBJECT: WAIKAPU DEVELOPMENT VENTURE LLC
AFFORDABLE WORKFORCE HOUSING SUBDIVISION
DRAFT APPLICATION
TMK (2) 3-5-002:011 (POR.), WAILUKU**

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:
 - a. Refuse collection services cannot be ensured to be available when project is completed.
 - b. Developer must apply to the Central Maui Landfill to dispose of construction waste.
2. Wastewater Reclamation Division (WWRD) comments:
 - a. Although wastewater system capacity is currently available as of the date of this letter, the developer should be informed that wastewater system capacity cannot be ensured until the issuance of the building permit.
 - b. Wastewater contribution calculations are required before building permit is issued.
 - c. Developer is not required to pay assessment fees for this area at the current time.
 - d. Show or list minimum slope of new sewer laterals.
 - e. Plans should show the installation of a single service lateral and advanced riser for each lot. Any request for waiver of this requirement shall be made submitted in writing for approval by WWRD.
 - f. A single service lateral with property line cleanout shall be provided for each dwelling unit.

Mr. Vince Bagoyo
January 18, 2018
Page 2

- g. Sewerlines shall only be considered for dedication to the County if constructed in roadways and said roadways are accepted for maintenance by the County.
- h. Any sewer within or upstream of a new sewer easement will remain privately owned and maintained.
- i. No trees, structures, building overhangs or walls shall be planted/constructed in the existing sewer easement.
- j. Level vehicular access to all sewerlines and manholes (including those in easements) shall be provided for future maintenance and construction purposes.
- k. Existing sewerline shall be inspected with a CCTV camera prior to grading and at the completion of construction to verify no damage has occurred. CCTV files shall be provided to WWRD within ten (10) days of video work. Identified damage shall be corrected by the developer.
- l. Non-contact cooling water and condensate should not drain to the wastewater system.

If you have any questions regarding this letter, please contact Michael Miyamoto at 270-8230.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael M. Miyamoto", with a stylized flourish at the end.

MICHAEL M. MIYAMOTO
Deputy Director of Environmental Management



BAGOYO
DEVELOPMENT
CONSULTING GROUP

March 13, 2018

Mr. Michael M. Miyamoto
Deputy Director
Maui Department of Environmental Management
2050 Main Street, Suite 2B
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Miyamoto:

This is to acknowledge receipt of your letter dated January 18, 2018 regarding the above subject proposed affordable housing project and thank you for your comments. We do concur with your comments and recommendations as noted in your letter. A detailed construction plans for the proposed project will be provided for your review upon receipt of approval by the County Council of 201H, HRS application for the project.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM



STATE OF HAWAII
DEPARTMENT OF EDUCATION

P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

January 25, 2018

Mr. Vince Bagoyo
Bagoyo Development Consulting Group
1500 Kilinoe Place
Wailuku, Hawaii 96793

Re: Draft Application for Waikapu Development Venture LLC Affordable
Workforce Housing Project
Wailuku, Maui, Hawaii, TMK: 3-5-02: por. 11

Dear Mr. Bagoyo:

The Department of Education (DOE) has the following comments on the draft application for the proposed Waikapu Development Venture LLC Affordable Workforce Housing Project (Project). According to the draft application, the proposed project is for the development of 80 workforce housing units comprised of 68 single-family units and 12 duplex units on approximately 12.5 acres of land located at Wailuku, Maui, Hawaii, TMK: 3-5-02: por. 11.

When the Project is mature and unit turnover is stabilized, we would expect roughly 40 DOE students will reside there.

The DOE schools currently serving the proposed project are Puu Kukui Elementary, Maui Waena Intermediate, and Maui High School. Puu Kukui Elementary is currently over capacity by approximately 100 students. This over capacity condition is expected to remain over the next five years. Maui Waena Intermediate is over capacity by approximately 250 students. This over capacity condition is expected to remain over the next five years. Maui High School is over capacity by approximately 300 students. This over capacity condition is expected to increase to approximately 400 students over the next five years.

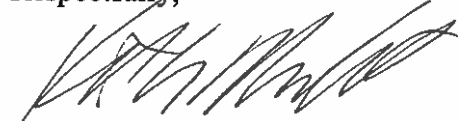
Waikapu Development Venture LLC acknowledges that the proposed Project is located within the Central Maui School Impact Fee District (District). This District and impact fee amounts were adopted by the Board of Education on November 18, 2010. The Project is located in the Wailuku Cost Area in which fee amounts are \$5,373 for single-family units and \$2,371 for multi-family units. Chapter 302A-1606, Hawaii Revised Statutes, requires that residential units with 50 or more units execute an agreement with the DOE. Waikapu Development Venture LLC is encouraged to meet with the DOE as early as possible to execute an Educational Contribution Agreement.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

Mr. Vince Bagoyo
January 25, 2018
Page 2

Thank you for the opportunity to comment. Should you have any questions, please contact Heidi Meeker of the Planning Section, Facilities Development Branch, at 784-5094.

Respectfully,

A handwritten signature in black ink, appearing to read 'Ken Masden II', written over a horizontal line.

Kenneth G. Masden II
Public Works Manager
Planning Section

KGM:jmb



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 12, 2018

Mr. Kenneth G. Masden II
Public Works Manager – Planning Section
State Department of Education
P.O. Box 2360
Honolulu, HI 96804

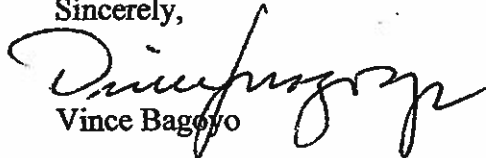
Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Masden:

This is to acknowledge receipt of your letter dated January 25, 2018 regarding the above subject proposed affordable housing project and thank you for your comments. The applicant for proposed workforce housing project will pay the appropriate DOE school impact fee pursuant to Chapter 302A, HRS. As noted in your letter, the applicant will execute an Educational Contribution Agreement with DOE upon approval of the applicant's 201H, HRS application for the proposed housing project.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

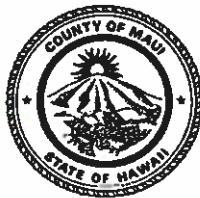
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808)357-3842

VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA
Mayor



KA'ALA BUENCONSEJO
Director

BRIANNE L. SAVAGE
Deputy Director

DEPARTMENT OF PARKS & RECREATION

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

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

January 10, 2018

Mr. Vince Bagoyo
1500 Kilinoe Place
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

**SUBJECT: DRAFT APPLICATION FOR PROPOSED WORKFORCE HOUSING PROJECT
PURSUANT TO 201H, HAWAII REVISED STATUTES ("HRS") LOCATED
WAIALE ROAD, WAILUKU, HAWAII, TMK: (2) 3-5-002:011 (POR)**

The Department of Parks and Recreation (DPR) does not have any comments or objections to the project.

Once the applicant provides DPR with a copy of the fully executed 201H HRS affordable housing agreement with the Department of Housing and Human Concerns, DPR will provide exemption. As stated in Maui County Code Section 18.16.320 Parks and Playgrounds, *"Subdivisions in which one hundred per cent of the lots or units resulting from the subdivision qualify as residential workforce housing units, as defined in section 2.96.020 of this code, shall be exempt from this section."*

Should you have any questions or concerns, please feel free to contact me or Robert Halvorson, Chief of Planning and Development, at (808) 270-7931.

Sincerely,

A handwritten signature in black ink, appearing to read "Ka'ala Buenconsejo", is written over a circular stamp. The stamp contains the text "KA'ALA BUENCONSEJO" and "Director of Parks & Recreation".

KA'ALA BUENCONSEJO
Director of Parks & Recreation

c: Robert Halvorson, Chief of Planning and Development

KB:RH:do



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 13, 2018

Mr. Ka'ala Buenconsejo
Director
Maui Department of Parks and Recreation
700 Hali'a Nakoa St., Unit 2
Wailuku, HI 96793

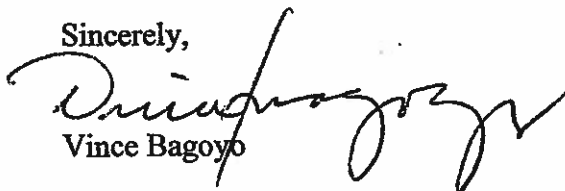
Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Buenconsejo:

This is to acknowledge receipt of your letter dated January 10, 2018 regarding the above subject proposed affordable housing project. As noted in your letter that your department does not have any comments or objections to the proposed project. Also, thank you for affirming that since the proposed 201H, HRS project is one hundred percent affordable as defined in MCC 2.96.020 will be exempt from Section 18.16.320, MCC.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



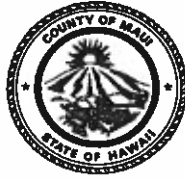
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA
Mayor



DAVID TAYLOR, P.E.
Director

GLADYS C. BAISA
Deputy Director

**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauewater.org**

January 24, 2018

Mr. Vince Bagoyo
Wailuku Development Venture LLC
1500 Kilinoe Place
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: DRAFT APPLICATION FOR AFFORDABLE WORKFORCE HOUSING
SUBDIVISION
TMK: (2) 3-5-002:011, Wailuku, Maui, Hawaii

We received a copy of the draft application for the proposed workforce housing project consisting of 68 single family residential units and 12 duplex residential units. According to Appendix G – Preliminary Engineering Report, in addition to these residential units, a neighborhood green lot and open space/retention basin will also be developed. Maui County Code, Chapter 14.12.030 allows residential development projects with one hundred percent affordable housing units an exemption from the County's "water availability policy." For the neighborhood green lot and open space/retention basin, the department requires documentation that those parcels shall remain in perpetuity for those specific uses.

If you have any questions, please feel free to contact Tammy Yeh at 270-7835.

Sincerely,

A handwritten signature in black ink, appearing to read "Wendy Taomoto".

WENDY TAOMOTO, P.E.
Engineering Program Manager

TY/smb

cc: Carol Reimann, Director; Department of Housing and Human Concerns

"By Water All Things Find Life"



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 12, 2018

Ms. Wendy Taomoto, P.E.
Engineering Program Manager
Maui Department of Water Supply
200 So. High Street
Wailuku, HI 96793-2155

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Ms. Taomoto:

This is to acknowledge receipt of your letter dated January 24, 2018 commenting on the above subject workforce housing project. We appreciate your comments and for confirming that the proposed one hundred percent affordable housing project is exempt from the County's "water availability policy" per Chapter 14.12.030, Maui County Code. With regards to the open space/retention basin on the project site, we are pleased to affirm that the basin will remain in perpetuity and documentation will be provided within a deed restriction upon the subdivision of the project site.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

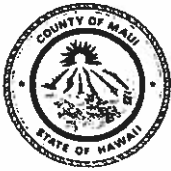
Sincerely,


Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842
VBAGOYO-DEVGROUP@HAWAII.RR.COM



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**

January 24, 2018



TIVOLI S. FAAUMU
CHIEF OF POLICE

DEAN M. RICKARD
DEPUTY CHIEF OF POLICE

Mr. Vince Bagoyo
Project Consultant
Waikapu Development Venture LLC
1500 Kilinoe Place
Wailuku, Hawaii 96793

Re: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located Waiale Road, Wailuku, Hawaii
TMK: (2) 3-5-02:11 (por.)

Dear Mr. Bagoyo:

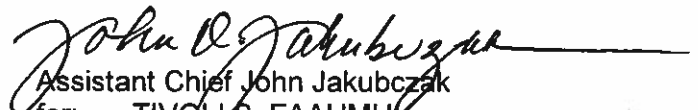
This is in response to Ms. Carol Reimann's memorandum dated January 5, 2018 requesting comments to the draft application.

In review of the submitted documents, concerns from the police perspective are upon the safety of pedestrians and vehicular movement. The project will run between Waiale Road and Honoapi'ilani Highway in Wailuku. The project location is approximately 25 acres, which will have the entry/exit on Waiale Road.

Currently the traffic flow has been increasing from the Spencer Home Development and will increase upon the completion of this development. Also, there will be an increase in calls for service for the Wailuku Patrol District with the increasing community members in the area, however, Maui is in need of affordable housing. As long as this development is off the roadway, traffic control will not be needed by police.

Thank you for giving us the opportunity to comment on this project.

Sincerely,


Assistant Chief John Jakubczak
for: TIVOLI S. FAAUMU
Chief of Police

c: Director Carol Reimann, DHHC
Mr. Buddy Almeida, Housing Administrator



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 12, 2018

Mr. Tivoli S. Faaumu
Chief of Police
Maui Police Department
55 Mahalani Street
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Chief Faaumu:

This is to acknowledge receipt of your letter dated January 24, 2018 regarding the above subject affordable housing project and thank you for your comments. As noted in our Traffic Impact Analysis Report (TIAR) prepared by Austin Tsutsumi and Associates, northbound through traffic on Waiale Road will continue to spill back to Waiale Road/Kuikahi Drive intersection in the AM peak hour. Based on the forecast trips, the Project will increase traffic at the intersection by approximately 1.5%. The more critical AM peak hour of traffic, the Project is forecast to add only 18 northbound through vehicles and 11 northbound left-turn vehicles along Waiale Road through the intersection. To mitigate this potential impact, the TIAR recommends installing two northbound left-turn storage lanes along Waiale Road for entrance into the two proposed Project accesses.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,


Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM

DAVID Y. IGE
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
54 HIGH STREET
WAILUKU, HAWAII 96793-3378

January 31, 2018

Mr. Vince Bagoyo
Bagoyo Development Consulting Group
1500 Kilinoe Place
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: Proposed Workforce Housing Project
Applicant: Waikapu Development Venture
TMK: (2) 3-5-02:11 (por.)
Address: Waiale Road, Wailuku, Hawaii
Description: 80 Affordable Workforce Residential Housing Units

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

This land was formerly in the production of pineapple and/or sugarcane. Chemicals associated with the pineapple or sugar industry persists in soil today and may be a threat to public health and the environment. Please contact the Department of Health, Hazard Evaluation and Emergency Response Office at 808 586-4249.

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 or email me at patricia.kitkowski@doh.hawaii.gov.

Sincerely,

A handwritten signature in cursive script that reads "Patti Kitkowski".

Patti Kitkowski
District Environmental Health Program Chief

c EPO



BAGOYO

DEVELOPMENT
CONSULTING GROUP

March 12, 2018

Ms. Patti Kitkowski
District Environmental Health Program Chief
State Department of Health
54 High Street
Wailuku, HI 96793-3378

Subject: Draft Application for Proposed Workforce Housing Project
Pursuant to 201H, Hawaii Revised Statutes ("HRS")
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Ms. Kitkowski:

This is to acknowledge receipt of your letter dated January 31, 2018 regarding the above subject proposed affordable housing project and thank you for your comments. As noted in the draft 201H application, Phase I Environmental Site Assessment was conducted for the subject property by Vuich Environmental Consultants, Inc. According to the environmental site assessment has revealed no evidence of recognized environmental conditions in connection with the property. Per your recommendation, the applicant will further contact the Department of Health, Hazard Evaluation and Emergency Response office prior to any development of the subject property to ensure compliance with all applicable rules and regulations.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

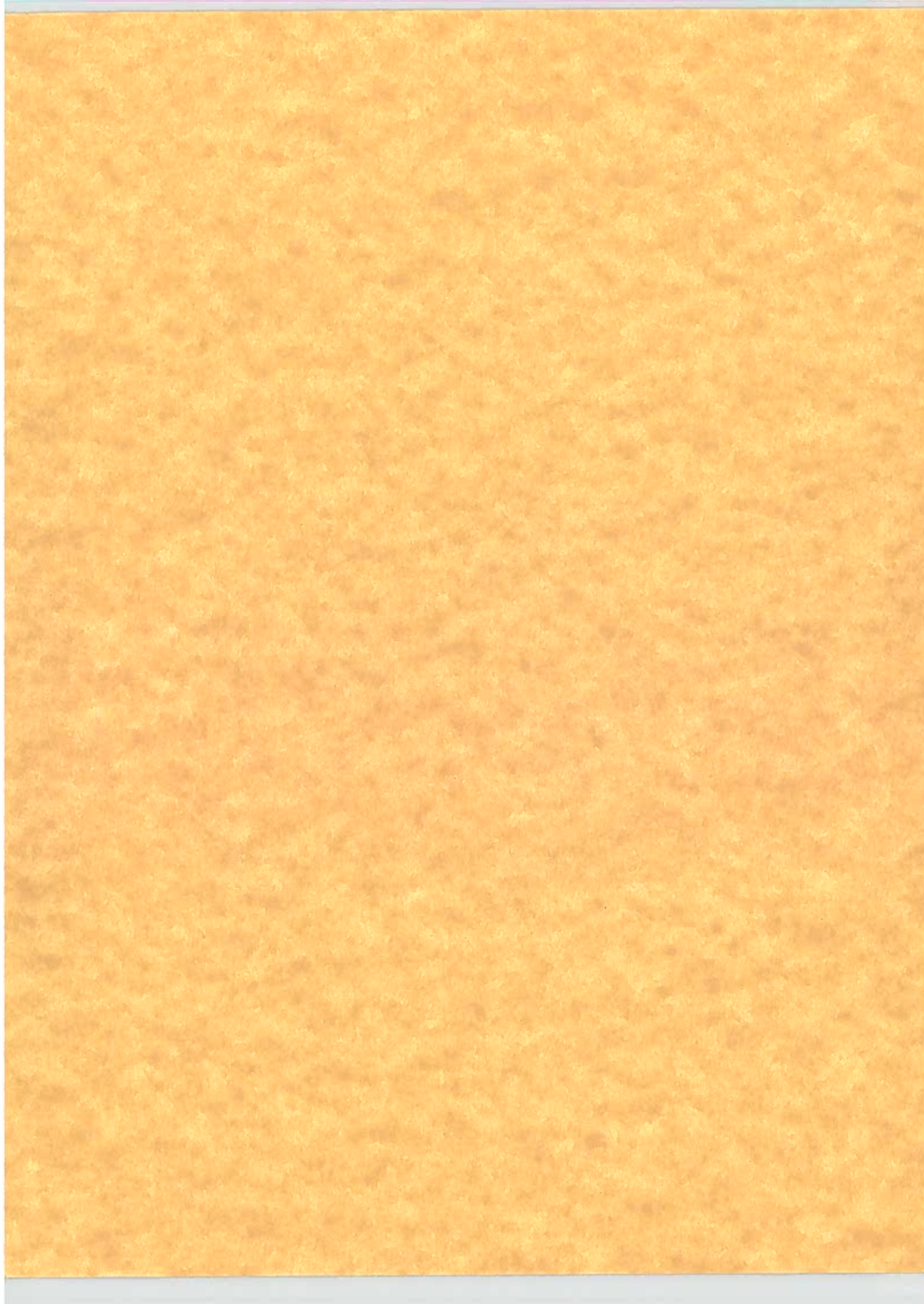
Sincerely,


Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)
Waikapu Development Venture LLC

1500 KILINOE PLACE
WAILUKU, HI 96793
(808) 357-3842
VBAGOYO-DEVGROU@HAWAII.RR.COM



PHONE (808) 594-1888

FAX (808) 594-1938



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

HRD18-8416

February 20, 2018

Vince Bagoyo
Bagoyo Development Consulting Group
1500 Kilinoe Place
Wailuku, HI 96793

Re: Comments on Draft 201H Application for Proposed Workforce Housing Project
Wailuku Ahupua'a, Pū'ali Komohana Moku, Maui Moku
Tax Map Key: (2) 3-5-002:011

Aloha e Mr. Bagoyo:

The Office of Hawaiian Affairs (OHA) has received your letter and draft application for an affordable workforce housing subdivision, pursuant to 201H-38, Hawai'i Revised Statutes (HRS). Waikapū Development Venture, LLC (the applicant) is proposing to develop eighty affordable workforce housing residential units on approximately 12.5 acres of a 50-acre parcel.

OHA appreciates the applicant's efforts to provide affordable housing in Hawai'i. OHA is concerned, however, that the proposed project doesn't adequately address the affordable housing needs of our Native Hawaiian beneficiaries, as well as other Maui families.

According to the application, the project will be 100 percent affordable and will be sold to qualified individuals/families earning 70% to 140% of Maui area median income (AMI) as set forth by Maui County Department of Housing and Human Concerns' Affordable Sales Price Guidelines. The application states that sixty-eight single family, three-bedroom/two-bath units and twelve duplex, two-bedroom/one-bathroom units will be constructed. The twelve duplex units will be reserved for families earning 70% to 80% AMI. According to the application, the single-family units will be reserved as follows: twelve units (15%) will be reserved for the 81% to 100% AMI level, forty units (50%) will be reserved for families earning 101% to 120% AMI, and twenty-four units (20%) will be reserved for families earning 121% to 140%. Please clarify the exact number of units that will be constructed. According to the allocation breakdown, a total of 88 units will be constructed.

Applicability of Hawai'i Revised Statutes § 201H-38

HRS § 201H-38(a) states, that the Hawai'i Housing Finance and Development Corporation (HHFDC)

may develop on behalf of the State or with an eligible developer, or may assist under a government assistance program in the development of, housing projects that shall be exempt from all statutes, ordinances, charter provisions, and rules of any government agency related to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon

Pursuant to HRS § 201H-38(b), a government assistance program is defined as “a housing program qualified by the corporation and administered or operated by the corporation or the United States or any of their political subdivisions, agencies, or instrumentalities, corporate or otherwise.

OHA is concerned that the exemptions under HRS § 201H-38(a) may not apply to the proposed project. The application states that the applicant, in coordination with County of Maui Department of Housing and Human Concerns will seek exemptions as provide by HRS § 201H-38 and that these exemptions will be processed through the County of Maui. Please clarify the applicability of HRS § 201H-38 to the proposed project. Please provide additional information as to how the applicant is an “eligible developer” or a “government assistance program” in accordance with HRS § 201H-38 and HHFDC's involvement in the proposed project.

Incomplete HRS § 201H-38 Application

HRS § 201H-38 application is missing critical information required for the HRS § 201H-38 application.¹ The application is missing information such as the number of years the project will commit to maintaining the project as affordable; an acknowledgement that the affordable units will be subject to HHFDC buyback and shared appreciation; and an indication of the number of units allotted for family, elderly, homeless, and tenants with special housing needs. Please include this and any information required for the HRS § 201H-38 application.

HHFDC requires that the developer conduct at least one public meeting to solicit community input on the proposed project.² Please include in the application information about the public meeting, including a summary of community input and the developers proposed mitigation for community concerns.

¹ See HHFDC 201H Application, available at <http://dbedt.hawaii.gov/hhfdc/201h-development-assistance/>.

² *Id.*

Affordable Housing

Maui's affordable housing crisis requires land use planning that prioritizes and maximizes affordable housing opportunities for local residents.³

Hawai'i families are in particular need of affordable housing units at or below low-moderate income levels. Notably, recent research shows that 32 percent of the single-family ownership housing demand in Maui is for units at or below 80% AMI. 21 percent of the housing demand is at 60% or below AMI. 36 percent of the Maui housing demand is for units that are at 80% AMI to 140% AMI, with only 16 percent of the demand at 120% AMI to 140% AMI.⁴ For Native Hawaiians, 51 percent of the housing demand for single-family ownership units on Maui is at 80% AMI or below.⁵ As such, OHA is concerned that the proposed project does not adequately address the need for affordable housing. As proposed, income levels of all of the units, while still deemed 'affordable', do not proportionately address of Maui residents.

The applicant is seeking numerous exemptions under HRS § 201H-38, including exemptions from permit, assessment and inspection fees. OHA seeks to ensure that the proposed project will truly meet the affordable housing needs of our Native Hawaiian beneficiaries, as well as families in Maui, before the exemptions are granted. OHA recommends that the developer consider funding alternatives (e.g. government grants or subsidies) that would allow the project to meet the needs of the community and offer single-family units to families/individuals below 80% AMI.

Impacts to Cultural Resources and Iwi Kūpuna

According to the application, soils within the project area are classified as Pu'uone sand and Iao silty clay. OHA is concerned about the project impacts to iwi kūpuna (human remains/burials) and cultural resources that may be located in the project area. OHA notes that it is common knowledge that there is a high likelihood of encountering iwi kūpuna when doing ground disturbing activities in and around sand deposits and dunes. For example, hundreds of iwi kūpuna have been disturbed by development activities related to Maui Lani east of the proposed project area, which is also underlain with Pu'uone sand.

An archaeological inventory survey (AIS) was conducted of the 50-acre parcel in 2004 by Archaeological Services Hawaii, LLC (ASH). According to the application, the AIS was updated in May 2016. Please clarify if additional survey was conducted in 2016 or if only the AIS report was updated. During the 2004 survey, a total of twenty-five trenches were excavated to depths ranging from 1.3 meters to 3.5 meters. According to the AIS report, subsurface testing was not conducted in areas of the parcel where active farming was occurring. Only one site, a historic ditch, was identified during the AIS. According to the report, archaeological monitoring

³ The 2016 Hawai'i Housing Planning Study shows very limited demand for market-rate housing. Instead, the majority of demand for Native Hawaiians, the State, as well as Maui County, is almost entirely for units that are affordable. See SMS, HAWAII HOUSING PLANNING STUDY 34 (2016), available at https://dbedt.hawaii.gov/hhfdc/files/2017/03/State_HHPS2016_Report_031317_final.pdf.

⁴ *Id.*

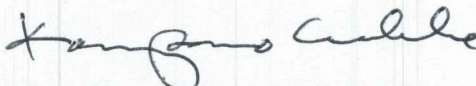
⁵ *Id.* at 75.

of all ground disturbing activities is proposed during the project development because of the “presence of numerous archaeological sites and native Hawaiian burials in neighboring parcels.” Given that cultural resources and iwi kūpuna have been identified in the vicinity of the project area, OHA is concerned that the subsurface testing conducted did not adequately attempt to identify iwi kūpuna in the project area.

Of the twenty-five test trenches, only two terminated at bedrock. The remaining trenches terminated at lithified sand or sterile subsoil. Eighteen test trenches were terminated at a depth of 1.8 meters or less. In 2008, an ASH archaeologist stated that burials identified in the Maui Lani area were identified as deep as approximately 5.5 meters below the surface and that the average depth of a burial was 1.82 meters to 2.4 meters.⁶ For example, one burial feature and one possible burial feature were identified in lithified sand 2.4 meters below the surface.⁷ OHA is concerned that iwi kūpuna could be located in the project area deeper than the excavated test trenches. OHA recommends conducting an addendum AIS with test trenches to adequately ensure that iwi kūpuna and cultural resources will not be disturbed by the proposed project.

Thank you for providing the opportunity to comment. We look forward to continuing consultation. Should you have any questions, please contact Teresa Kaneakua, OHA Lead Compliance Specialist, at (808) 594-0231 or teresak@oha.org.

‘O wau iho nō me ka ‘oia ‘i‘o,



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

KC:tk

⁶ July 31, 2008 Maui/Lanai Islands Burial Council Meeting Minutes, at 8.

⁷ Jeffrey Pantaleo and Diane Guerro, *Archaeological Inventory Survey Report Maui Lani Development Phase VI, and Maui Lani Parkway*, December 2005, at 56.

CARLSMITH BALL LLP

A LIMITED LIABILITY LAW PARTNERSHIP

ASB TOWER, SUITE 2100
1001 BISHOP STREET
HONOLULU, HAWAII 96813
TELEPHONE 808.523.2500 FAX 808.523.0842
WWW.CARLSMITH.COM

LAND USE COMMISSION
STATE OF HAWAII

2018 JAN -2 P 1:26

DIRECT DIAL NO.
808.523.2557

JLIM@CARLSMITH.COM

OUR REFERENCE NO.:
017016-00004

January 2, 2018

VIA HAND DELIVERY AND E-MAIL:

DANIEL.E.ORODENKER@HAWAII.GOV

Daniel E. Orodener
Executive Officer
State Land Use Commission
Leiopapa A Kamehameha Building
235 South Beretania Street, Room 406
Honolulu, Hawaii 96813

Re: Docket A07-773 Emmanuel Lutheran Church of Maui
Notification of Upcoming Maui County Council Processing of HRS 201H
Application for Waikapu Development Venture, LLC
Covering 12.50-Acre Portion of the 25.263-Acre Petition Area

Dear Executive Officer Orodener:

As you know, this firm represents Emmanuel Lutheran Church of Maui ("ELC"), a Hawaii nonprofit corporation. ELC was the Petitioner in the above noted Docket, wherein in 2008, the State Land Use Commission (the "**Commission**") approved a district boundary amendment reclassifying 25.263-acres of land in Wailuku, between Honoapiilani Highway, Waiale Road, and Kuikahi Drive, from the State Land Use Agricultural District to the State Land Use Urban District.

ELC sought the boundary amendment in order to develop a new campus for the Emmanuel Lutheran Church and School. ELC's existing campus, at 520 One Street in Kahului, serves children in preschool through grade 8. The preschool program has been in place since 1972 and the grade school program started in 1978. The Kahului campus has been in place since 1985. ELC is proud of its existing campus, but space is constrained and there are many more families who need the support and educational services that ELC provides. ELC purchased the Petition Area property in December 2004, and requested the district boundary amendment to the Urban District so that it could serve more students and families by developing a new campus in Wailuku.

HONOLULU

HILO

KONA

MAUI

LOS ANGELES

Petitioner's Exhibit C

ELC took several steps toward completing the development of the Petition Area, including getting the Petition Area rezoned by the Maui County Council in September 2009 (Ordinance No. 3686), from Agricultural District to P-1 Public/Quasi-Public District. However, due to a series of challenging events, including the global recession that came to light in September 2008, and the December 2014 death of Richard Sudheimer, who was the Chair of ELC's Land Use Committee, ELC has not been able to complete its development plans for the Petition Area. However, these challenges have created new opportunities for ELC and the greater Maui community.

As we discussed last month, ELC and Waikapu Development Venture, LLC ("WDV") have an agreement whereby WDV will purchase 12.5 acres of the Petition Area once subdivided. WDV's plan is to develop a 100% affordable and workforce housing project on the 12.5 acres. The WDV project is proposed to have 80 residential units that will be available for sale to qualified individuals earning within 70% to 140% of the Maui area median income.¹ WDV will be completing the vertical construction of the homes that will be sold in fee simple. In addition, the WDV community will have all necessary infrastructure and a neighborhood park. As reported at the 2017 Maui County Affordable Housing Summit, approximately 13,496 new affordable housing units are needed in Maui County to meet demand over the next 10 years. The urban growth boundaries designated around the main population centers of Kahului and Wailuku recognize both the existing need for these areas, as well as a plan to develop in a manner that matches inventory with existing and planned infrastructure.

In the very near term, WDV intends to submit an application in cooperation with the Maui County Department of Housing and Human Concerns pursuant to Hawaii Revised Statutes chapter 201H, to seek Maui County Council approval (via Resolution), for the development of the WDV project. Under HRS § 201H-38, the County Council has the authority to exempt affordable housing projects from all statutes, ordinances, charter provisions, and rules of any government agency relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon.

WDV will ask the Council to exempt the WDV project from certain County permit and fee requirements, as well as exemptions from the Community Plan, existing zoning, and a modification of lot sizes and related subdivision criteria. As we discussed, the Maui County Council has already reviewed and approved HRS 201H projects located adjacent to the Petition Area.

¹ As currently conceptualized, WDV's proposed breakdown is as follows:

AMI Range	Number of Units	Percentage of WDV Project
70% - 79% AMI	12	15%
80% - 100% AMI	12	15%
101% - 120% AMI	40	50%
121% - 140% AMI	16	20%
Total	80	

Daniel E. Orodenker

January 2, 2018

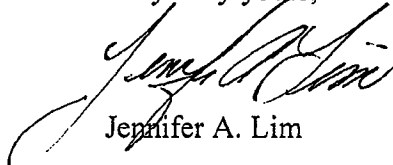
Page 3

No 201H exemptions will be sought for the 12.763-acre portion of the Petition Area that will be retained by ELC. Instead, ELC intends to pursue the school campus concept it originally presented to the Commission, but at a reduced scale suitable for the smaller land area.

Both ELC and WDV understand that the entire 25-acre Urban District Petition Area is currently subject to the Commission's jurisdiction under the Commission's Findings of Fact, Conclusions of Law, and Decision and Order, effective March 7, 2008. The Commission's Decision and Order granting the district boundary amendment was based upon, *inter alia*, findings related to the use of the Petition Area as initially proposed by ELC. As such, ELC and WDV understand that Commission approval will be required before construction on the WDV project can start, and in order for ELC to get approval for the reduced-scale school campus project. ELC must also request Commission approval for an extension of time to complete its development, and for permission to sell a portion of the Petition Area to WDV. To that end, ELC intends to file a Motion to Amend and Bifurcate with the Commission shortly after the Maui County Council takes final action on WDV's 201H application. ELC and WDV both understand that notwithstanding any action taken by the Maui County Council on the 201H application, the Commission retains discretion and authority under the 2008 Decision and Order.

We look forward to the opportunity to present this matter to the Commission in due course, and after the Maui County Council makes its final decision on WDV's 201H application. Please do not hesitate to contact me if you have any questions.

Very truly yours,



Jennifer A. Lim

JAL/jah

cc: Michael Reiley, Emmanuel Lutheran Church of Maui
Peter Horovitz, Esq.
Council Member Robert Carroll
Director Carol Reimann, Maui Department of Housing & Human Concerns
Director Leo R. Asuncion, Jr., Office of Planning, State of Hawaii
Director William Spence, Maui Department of Planning

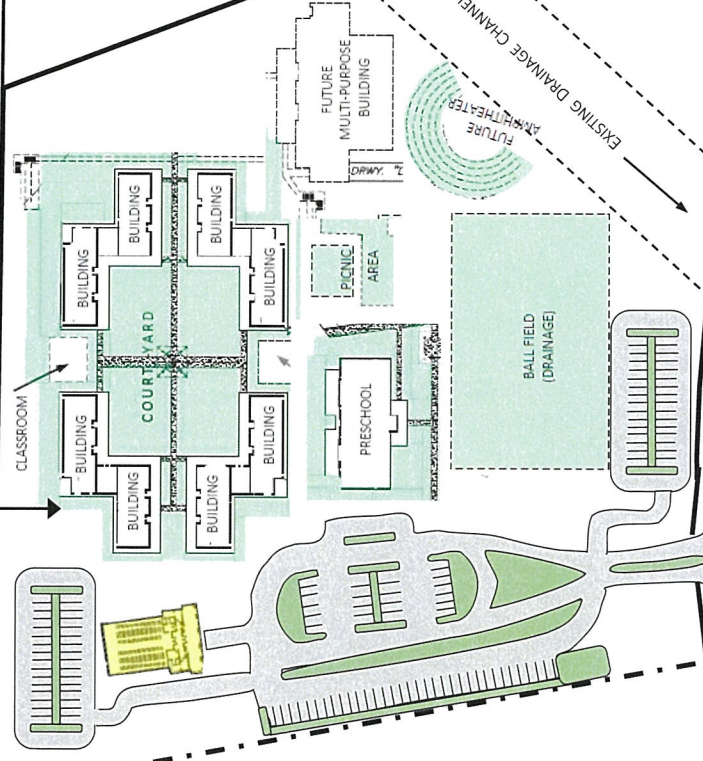
4838-9709-8328.3.017016-00004

**EMMANUEL LUTHERAN CHURCH
2018 UPDATED CONCEPT MASTER PLAN**

**PROPOSED LOT A-1
12.50 ACRES**

**PROPOSED LOT A-2
12.76 ACRES**

HONOAPIʻILANI HWY.



**PROPOSED 201-H AFFORDABLE
HOUSING PROJECT**

Petitioner's Exhibit D

ORDINANCE NO. 3686

BILL NO. 74 (2009)

A BILL FOR AN ORDINANCE TO CHANGE ZONING FROM AGRICULTURAL DISTRICT TO P-1 PUBLIC/QUASI-PUBLIC DISTRICT (CONDITIONAL ZONING) FOR PROPERTY SITUATED AT WAILUKU, MAUI, HAWAII


BE IT ORDAINED BY THE PEOPLE OF THE COUNTY OF MAUI:

SECTION 1. Pursuant to Chapters 19.31 and 19.510, Maui County Code, a change in zoning from Agricultural District to P-1 Public/Quasi-Public District (Conditional Zoning) is hereby granted for that certain parcel of land situated at Wailuku, Maui, Hawaii, and identified for real property tax purposes by Tax Map Key Number (2)3-5-002:011, comprising approximately 25.263 acres, and more particularly described in Exhibit "A", attached hereto and made a part hereof, and in Land Zoning Map No. L-423, which is on file at the Office of the County Clerk of the County of Maui, and by reference made a part hereof.

SECTION 2. Pursuant to Section 19.510.050, Maui County Code, the zoning granted by this ordinance is subject to the conditions set forth in Exhibit "B", attached hereto and made a part hereof, and the Unilateral Agreement and Declaration for Conditional Zoning, attached hereto and made a part hereof as Exhibit "C".

SECTION 3. This ordinance shall take effect upon its approval.

APPROVED AS TO FORM
AND LEGALITY



JAMES A. GIROUX
Deputy Corporation Counsel
County of Maui

S:\CLERICAL\LJN\ORD\CIZ\35002011.wpd

Petitioner's Exhibit E

EXHIBIT "A"

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Grant 3152 to Henry Cornwell and Grant 3343 to Claus Spreckels) situate, lying and being on the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) at Waikapu and Wailuku, Island and County of Maui, State of Hawaii, being LOT A of the "WAIKAPU EAST (LARGE-LOT) SUBDIVISION NO. 3" and thus bounded and described:

Beginning at a point at the southwesterly corner of this lot, being also the northwesterly corner of Lot B of Waikapu East (Large-Lot) Subdivision No. 3, the coordinates of said point of beginning referred to Government Survey Triangulation Station "LUKE" being 5,563.76 feet south and 2,085.73 feet west and running by azimuths measured clockwise from true South:

1. Thence along the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) on a curve to the left with the point of curvature azimuth from the radial point being: $271^{\circ} 55' 48''$ and the point of tangency azimuth from the radial point being: $262^{\circ} 39' 11''$, having a radius of 2,899.93 feet, the chord azimuth and distance being: $177^{\circ} 17' 29.5''$ 469.02 feet to a point;
2. $172^{\circ} 39' 11''$ 865.57 feet along same to a point;
3. $241^{\circ} 16'$ 878.02 feet along R. P. 4529-B and 4549, L. C. Aw. 71 to Michael J. Nowlein, being also along Lot 9-A of Waiale Road and Kuikahi Drive Extension Subdivision to a point;
4. Thence along the remainder of Grant 3343 to Claus Spreckels, being also along Lot L of Waikapu East (Large-Lot) Subdivision No. 3 on a curve to the right with the

point of curvature azimuth
from the radial point being:
104° 32' 45" and the point
of tangency azimuth from the
radial point being: 284°
39' 17", having a radius of
1,600.00 feet, the chord
azimuth and distance being:
14° 36' 01" 3.04 feet to a
point;

5. Thence along same on a curve to the left with the point of
curvature azimuth from the
radial point being: 104°
39' 17" and the point of
tangency azimuth from the
radial point being: 99°
00', having a radius of
1,600.00 feet, the chord
azimuth and distance being:
11° 49' 38.5" 157.85 feet
to a point;
6. 9° 00' 84.93 feet along same to a point;
7. Thence along same on a curve to the left, having a radius
of 1,560.00 feet, the chord
azimuth and distance being:
354° 03' 30" 804.45 feet
to a point;
8. 339° 07' 622.61 feet along the remainders of
Grant 3343 to Claus Spreckels
and Grant 3152 to Henry
Cornwell, being also along
Lot L of Waikapu East (Large-
Lot) Subdivision No. 3 to a
point;
9. 82° 00' 904.67 feet along the remainder of
Grant 3343 to Claus
Spreckels, being also along
Lot B of Waikapu East (Large-
Lot) Subdivision No. 3 to the
point of beginning and
containing an area of 25.263
acres, more or less.

EXHIBIT "B"

CONDITIONS OF ZONING

1. That, in order to prevent impacts to water resources, and all to the satisfaction of either the Department of Water Supply (DWS), the Department of Public Works (DPW), or the Department of Planning (Department), Emmanuel Lutheran Church of Maui shall employ construction mitigations as follows: adopt best management practices designed to minimize infiltration and runoff from construction and vehicle operations; prevent cement products, oil, fuel, and other toxic substances from falling or leaching into the water; properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work; retain ground cover until the last possible date; stabilize denuded areas by sodding or planting as soon as possible, which should involve replanting to include soil amendments, fertilizers, and temporary irrigation, and use of high seeding rates to ensure rapid stand establishment; avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical run-off; and keep run-off on-site.
2. That, in order to conserve water, and all to the satisfaction of either the DWS or the Department, Emmanuel Lutheran Church of Maui shall employ the following water conservation measures in project designs and/or construction: use climate adapted, drought tolerant, and non-invasive plantings; limit irrigated turf to 25 percent or less of total landscaped area except for active play or picnic areas; and use brackish and/or reclaimed water sources for dust control during construction and other non-potable uses, as well as for landscaping when such water is available.
3. That, in order to facilitate wastewater collection and treatment services for the site, and all to the satisfaction of the Department of Environmental Management, Emmanuel Lutheran Church of Maui shall: fund any necessary off-site improvements to the collection system and wastewater pump stations; indicate on plans the ownership of each easement (in favor of which party); prevent non-contact cooling water and condensate from

draining to the wastewater system; and show the installation of a service manhole near the property line prior to connection to the County sewer. Furthermore, kitchen facilities within the proposed project shall comply with pre-treatment requirements (including grease interceptors, sample boxes, screens, etc).

4. That, in order to mitigate construction waste, and to the satisfaction of the Department of Environmental Management, Emmanuel Lutheran Church of Maui shall submit and implement a plan for composting/disposal of cleared and grubbed material and recycling/reuse/disposal of construction waste.
5. That, in order to increase the safety of internal circulation, and to the satisfaction of the Department, Emmanuel Lutheran Church of Maui shall submit and implement a plan for internal circulation which keeps vehicular traffic from mixing with the students, such as by keeping vehicles along the outer periphery of the central campus area shown on the project's conceptual site development plans.
6. That, in order to provide improved access to the project site and its neighborhood, and to the satisfaction of the DPW, provide road widening lot/lots for future right-of-way. Such lot/lots shall be dedicated to the County.
7. That, in order to mitigate local traffic impacts and provide adequate circulation to and in the vicinity of the project site, and to the satisfaction of the DPW, the assumptions and methods for the preparation of the updated traffic impact assessment report (TIAR) to be prepared pursuant to condition no. 5 of the March 7, 2008 Decision and Order of the Hawaii Land Use Commission on Docket A07-773 shall first be approved by the DPW. The revised TIAR shall include the intersection of Waiale and Waiinu Roads, possibly leading to a fair-share assessment for the signalization of this intersection. Further, that as it relates to conditions of circulation beyond those on state highways, the DPW shall approve the revised TIAR, and Emmanuel Lutheran Church of Maui shall contribute to or construct all of its recommended circulation improvements prior to the issuance of

building permits for new buildings to be added following the preparation of the revised TIAR.

8. That, in order to mitigate regional traffic impacts, and to the satisfaction of the DPW, Emmanuel Lutheran Church of Maui shall participate in a future impact fee for traffic and roadway improvements in the Wailuku-Kahului Community Plan Area. Said Fee shall be established and implemented in accordance with Title 14, Article 4, Impact Fees, except that the fees shall be paid to the County upon issuance of the first building permit or the establishment of the fee, whichever occurs later. If all phases of the project are completed before the traffic impact fee is established, then the fees shall be waived.
9. That, in order to provide for safety in the vicinity of the drainageway within the northerly portion of the site, the top of the drainageway shall be fenced, and access for maintenance shall be provided.
10. That, given that development on the property is proposed to be carried out in phases, a compliance report shall be submitted and approved by the Department concurrently with the Revised TIAR in Condition No. 7. Approval of the Compliance Report will be required prior to the issuance of grading or building permits for development subsequent to the submittal of the Report, and a second compliance report shall be submitted and approved by the Department prior to the issuance of occupancy permits for the final phase of building development for the church and school.
11. That, as offered by Emmanuel Lutheran Church of Maui, Emmanuel Lutheran Church of Maui shall work with, and to the satisfaction of, the State Department of Transportation and DPW as appropriate, to enhance, or where currently adequate, retain pedestrian and bicycle facilities along Honoapiilani Highway and Waiale Road adjoining the property as contemplated in the "Bike Plan Hawaii" or similar plans of the State Department of Transportation.

OF THE DOCUMENT
AS FOLLOWS
STATE OF HAWAII

DEPARTMENT OF CONVEYANCES

Doc 2009-138944
SEP 10, 2009 08:02 AM

Doc 2009-138944
SEP 10, 2009 08:02 AM

REGULAR SYSTEM

LAND COURT SYSTEM

Return By Mail () Pickup (x) To:

Office of the County Clerk
County of Maui
200 South High Street
Wailuku, Hawai'i 96793

Total Number of Pages: 9

Affects Tax Map Key (Maui) (2) 3-5-002:011

UNILATERAL AGREEMENT AND DECLARATION FOR CONDITIONAL
ZONING

THIS INDENTURE, made this 21st day of August 2009, by Emmanuel Lutheran Church of Maui, a Hawaii nonprofit corporation, whose principal place of business is located in Kahului, Maui, Hawaii, and whose mailing address is 520 West One Street, Kahului, Hawaii, 96732, hereinafter referred to as "DECLARANT", and which is the owner of that certain parcel located at Waikapu, Maui, Hawai'i, comprised of approximately 25.263 acres, and identified for real property tax purposes by Tax Map Key No(s). (2) 3-5-002:011, hereinafter referred to as "PARCEL" (or "PROPERTY").

WITNESSETH:

WHEREAS, the Council of the County of Maui, State of Hawai'i, hereinafter referred to as "Council", is considering the establishment of zoning for the Parcel, comprised of approximately 25.263 acres which is more particularly described in Exhibit "1", which is attached hereto and made a part hereof, and which is more particularly identified in Land Zoning Map No. L-423, which is on file in the Office of the County Clerk of the County of Maui; and

WHEREAS, the Council recommends through its Land Use Committee, Committee Report No. 09-102, that said establishment of zoning be approved for passage on first reading subject to certain conditions pursuant to Section 19.510.050, Maui County Code; and

WHEREAS, the Declarant has agreed to execute this instrument pursuant to the conditional zoning provisions of Section 19.510.050, Maui County Code;

NOW, THEREFORE, the Declarant makes the following Declaration:

1. That this Declaration is made pursuant to the provisions of Section 19.510.050, Maui County Code relating to conditional zoning;

2. That until written release by the County of Maui, the Parcel, and all parts thereof, is and shall be held subject to the covenants, conditions and restrictions which shall be effective as to and shall run with the land as to the Parcel, from and after the recording of this Declaration with the Bureau of Conveyances or the Land Court of the State of Hawai'i, without the execution, delivery or recordation of any further deed, instrument, document, agreement, declaration, covenant or the like with respect thereto by the Declarant, the County of Maui, or any heir, devisee, executor, administrator, personal representative, successor, and assign; that the acquisition of any right, title or interest in or with respect to the Parcel by any person or persons, entity or entities, whomsoever, shall be deemed to constitute the acceptance of all of the covenants, conditions and restrictions of this Declaration by such person or persons, entity or entities; and that upon any transfer of any right, title or interest in or with respect to the Parcel the same shall be subject to, and the transferee shall assume and be bound and obligated to observe and perform all of the covenants, conditions and restrictions of this Declaration;

3. That this Declaration and all of the covenants, conditions and restrictions contained herein shall continue to be effective as to and run with the land in perpetuity, or until the Declarant notifies the appropriate County Department that any of said covenants, conditions and restrictions are satisfied by the Declarant, and the appropriate County Department verifies the satisfaction and provides a written release of the covenant, condition or restriction;

4. That the term "Declarant" and any pronoun in reference thereto, wherever used herein, shall be construed to mean the singular or the plural, the masculine or the feminine, or the neuter, and vice versa, and shall include any corporation, and shall be held to mean and include the "Declarant", the Declarant's heirs, devisees, executors, administrators, personal representatives, successors, and assigns;

5. That the Declaration shall become fully effective on the effective date of the zoning ordinance approving the establishment of P-1 Public/Quasi-Public District zoning and this Declaration shall be recorded in the Bureau of Conveyances or Land Court of the State of Hawai'i;

6. That the Declarant agrees to develop said Parcel in conformance with the conditions set forth in Exhibit "2", which is attached hereto and made a part hereof and which shall be made a part of the zoning ordinance;

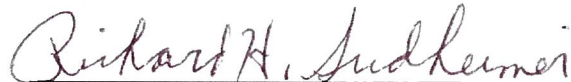
7. That the conditions imposed are reasonable and rationally relate to the objective of preserving the public health, safety and general welfare and such conditions fulfill the need for the public service demands created by the proposed use;

AND IT IS EXPRESSLY UNDERSTOOD AND AGREED that until released in writing by the County, the conditions imposed in this Declaration shall run with the land identified hereinabove and shall bind and constitute notice to all subsequent lessees, grantees, assignees, mortgagees, lienors and any other persons who claim an interest in said land, and the County of Maui shall have the right to enforce this Declaration by appropriate action at law or suit in equity against all such persons, provided that the Declarant or its successors and assigns may at any time file a petition for the removal of the conditions and terminate this Unilateral Agreement, such petition to be processed in the same manner as petitions for change in zoning.

IN WITNESS WHEREOF, the undersigned have executed this Declaration the day and year first above written.

DECLARANT:

Emmanuel Lutheran Church of Maui

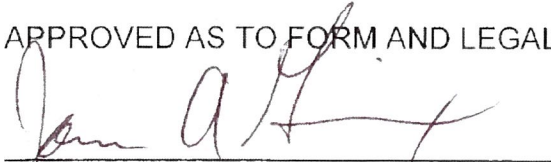


by: Richard H. Sudheimer
President



by: Waldo W. Ullerich
Treasurer

APPROVED AS TO FORM AND LEGALITY:



JAMES A. GIROUX
Deputy Corporation Counsel
County of Maui

STATE OF HAWAII

ISLAND AND COUNTY OF MAUI

SS:

On this 21 day of August, 2009, before me personally appeared Richard H. Sudheimer, to me personally known who being by me duly sworn, did say that he is the President of Emmanuel Lutheran Church of Maui, a Hawaii non-profit corporation, and that the instrument was signed on behalf of Emmanuel Lutheran Church of Maui, a Hawaii non-profit corporation, by authority of its board of directors, partners or trustees, and Richard H. Sudheimer acknowledged the instrument to be the free act and deed of Emmanuel Lutheran Church of Maui, a Hawaii non-profit corporation.

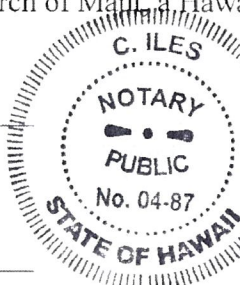
C. Iles
Signature of Notary

C. Iles
My Commission Expires 02/29/2012

Printed Name of Notary

Notary Public, State of Hawaii

My Commission Expires: My Commission Expires 02/29/2012



Doc. Date: 8-21-09 # Pages: 9
C. Iles
Doc. Description: Unilateral Agreement and Declaration for Conditional Zoning
Notary Signature: C. Iles Date: 8-21-09
NOTARY CERTIFICATION

STATE OF HAWAII

ISLAND AND COUNTY OF MAUI

SS:

On this 21 day of August, 2009, before me personally appeared Waldo W. Ullerich, to me personally known who being by me duly sworn, did say that he is the Treasurer of Emmanuel Lutheran Church of Maui, a Hawaii non-profit corporation, and that the instrument was signed on behalf of Emmanuel Lutheran Church of Maui, a Hawaii non-profit corporation, by authority of its board of directors, partners or trustees, and Waldo W. Ullerich acknowledged the instrument to be the free act and deed of Emmanuel Lutheran Church of Maui, a Hawaii non-profit corporation.

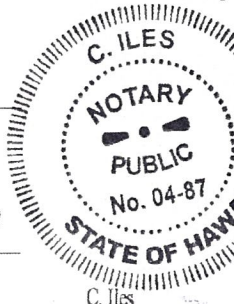
C. Iles
Signature of Notary

C. Iles
My Commission Expires 02/29/2012

Printed Name of Notary

Notary Public, State of Hawaii

My Commission Expires: My Commission Expires 02/29/2012



Doc. Date: 8-21-09 # Pages: 9
C. Iles
Doc. Description: Unilateral Agreement and Declaration for Conditional Zoning
Notary Signature: C. Iles Date: 8-21-09
NOTARY CERTIFICATION

EXHIBIT "1"

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Grant 3152 to Henry Cornwell and Grant 3343 to Claus Spreckels) situate, lying and being on the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) at Waikapu and Wailuku, Island and County of Maui, State of Hawaii, being LOT A of the "WAIKAPU EAST (LARGE-LOT) SUBDIVISION NO. 3" and thus bounded and described:

Beginning at a point at the southwesterly corner of this lot, being also the northwesterly corner of Lot B of Waikapu East (Large-Lot) Subdivision No. 3, the coordinates of said point of beginning referred to Government Survey Triangulation Station "LUKE" being 5,563.76 feet south and 2,085.73 feet west and running by azimuths measured clockwise from true South:

1. Thence along the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) on a curve to the left with the point of curvature azimuth from the radial point being: 271° 55' 48" and the point of tangency azimuth from the radial point being: 262° 39' 11", having a radius of 2,899.93 feet, the chord azimuth and distance being: 177° 17' 29.5" 469.02 feet to a point;
2. 172° 39' 11" 865.57 feet along same to a point;
3. 241° 16' 878.02 feet along R. P. 4529-B and 4549, L. C. Aw. 71 to Michael J. Nowlein, being also along Lot 9-A of Waiale Road and Kuikahi Drive Extension Subdivision to a point;
4. Thence along the remainder of Grant 3343 to Claus Spreckels, being also along Lot L of Waikapu East (Large-Lot) Subdivision No. 3 on a curve to the right with the

point of curvature azimuth from the radial point being: 104° 32' 45" and the point of tangency azimuth from the radial point being: 284° 39' 17", having a radius of 1,600.00 feet, the chord azimuth and distance being: 14° 36' 01" 3.04 feet to a point;

5. Thence along same on a curve to the left with the point of curvature azimuth from the radial point being: 104° 39' 17" and the point of tangency azimuth from the radial point being: 99° 00', having a radius of 1,600.00 feet, the chord azimuth and distance being: 11° 49' 38.5" 157.85 feet to a point;
6. 9° 00' 84.93 feet along same to a point;
7. Thence along same on a curve to the left, having a radius of 1,560.00 feet, the chord azimuth and distance being: 354° 03' 30" 804.45 feet to a point;
8. 339° 07' 622.61 feet along the remainders of Grant 3343 to Claus Spreckels and Grant 3152 to Henry Cornwell, being also along Lot L of Waikapu East (Large-Lot) Subdivision No. 3 to a point;
9. 82° 00' 904.67 feet along the remainder of Grant 3343 to Claus Spreckels, being also along Lot B of Waikapu East (Large-Lot) Subdivision No. 3 to the point of beginning and containing an area of 25.263 acres, more or less.

EXHIBIT "2"

CONDITIONS OF ZONING

1. That, in order to prevent impacts to water resources, and all to the satisfaction of either the Department of Water Supply (DWS), the Department of Public Works (DPW), or the Department of Planning (Department), Emmanuel Lutheran Church of Maui shall employ construction mitigations as follows: adopt best management practices designed to minimize infiltration and runoff from construction and vehicle operations; prevent cement products, oil, fuel, and other toxic substances from falling or leaching into the water; properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work; retain ground cover until the last possible date; stabilize denuded areas by sodding or planting as soon as possible, which should involve replanting to include soil amendments, fertilizers, and temporary irrigation, and use of high seeding rates to ensure rapid stand establishment; avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical run-off; and keep run-off on-site.
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7. That, in order to mitigate local traffic impacts and provide adequate circulation to and in the vicinity of the project site, and to the satisfaction of the DPW, the assumptions and methods for the preparation of the updated traffic impact assessment report (TIAR) to be prepared pursuant to condition no. 5 of the March 7, 2008 Decision and Order of the Hawaii Land Use Commission on Docket A07-773 shall first be approved by the DPW. The revised TIAR shall include the intersection of Waiale and Waiinu Roads, possibly leading to a fair-share assessment for the signalization of this intersection. Further, that as it relates to conditions of circulation beyond those on state highways, the DPW shall approve the revised TIAR, and Emmanuel Lutheran Church of Maui shall contribute to or construct all of its recommended circulation improvements prior to the issuance of building permits for new buildings to be added following the preparation of the revised TIAR.
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9. That, in order to provide for safety in the vicinity of the drainageway within the northerly portion of the site, the top of the drainageway shall be fenced, and access for maintenance shall be provided.
10. That, given that development on the property is proposed to be carried out in phases, a compliance report shall be submitted and approved by the Department concurrently with the Revised TIAR in Condition No. 7. Approval of the Compliance Report will be required prior to the issuance of grading or building permits for development subsequent to the submittal of the Report, and a second compliance report shall be submitted and approved by the Department prior to the issuance of occupancy permits for the final phase of building development for the church and school.
11. That, as offered by Emmanuel Lutheran Church of Maui, Emmanuel Lutheran Church of Maui shall work with, and to the satisfaction of, the State Department of Transportation and DPW as appropriate, to enhance, or where currently adequate, retain pedestrian and bicycle facilities along Honoapiilani Highway and Waiale Road adjoining the property as contemplated in the "Bike Plan Hawaii" or similar plans of the State Department of Transportation.

WE HEREBY CERTIFY that the foregoing BILL NO. 74 (2009)

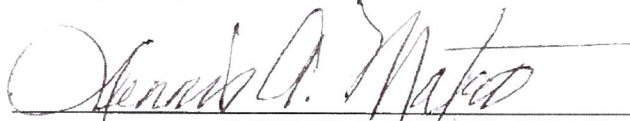
1. Passed FINAL READING at the meeting of the Council of the County of Maui, State of Hawaii, held on the 18th day of September, 2009, by the following vote:

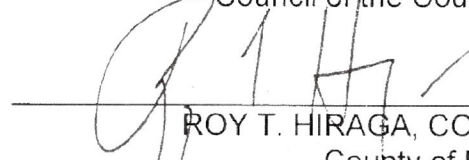
Dennis A. MATEO Chair	Michael J. MOLINA Vice-Chair	Gladys C. BAISA	Jo Anne JOHNSON	Solomon P. KAHO'OHALAHALA	William J. MEDEIROS	Wayne K. NISHIKI	Joseph PONTANILLA	Michael P. VICTORINO
Aye	Aye	Aye	Aye	Aye	Aye	Aye	Aye	Aye

2. Was transmitted to the Mayor of the County of Maui, State of Hawaii, on the 18th day of September, 2009.

DATED AT WAILUKU, MAUI, HAWAII, this 18th day of September, 2009.

RECEIVED
2009 SEP 18 PM 3:35
OFFICE OF THE MAYOR

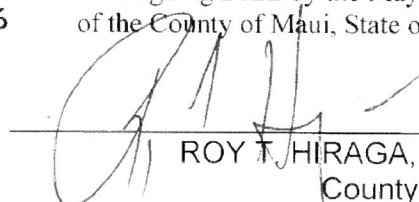

DENNIS A. MATEO, CHAIR
Council of the County of Maui


ROY T. HIRAGA, COUNTY CLERK
County of Maui

THE FOREGOING BILL IS HEREBY APPROVED THIS 21st DAY OF SEPTEMBER, 2009.


CHARMAINE TAVARES, MAYOR
County of Maui

I HEREBY CERTIFY that upon approval of the foregoing BILL by the Mayor of the County of Maui, the said BILL was designated as ORDINANCE NO. 3686 of the County of Maui, State of Hawaii.


ROY T. HIRAGA, COUNTY CLERK
County of Maui

Passed First Reading on September 4, 2009.
Effective date of Ordinance September 21, 2009.

RECEIVED
2009 SEP 21 AM 11:11
COUNTY CLERK

I HEREBY CERTIFY that the foregoing is a true and correct copy of Ordinance No. 3686, the original of which is on file in the Office of the County Clerk, County of Maui, State of Hawaii.

Dated at Wailuku, Hawaii, on

County Clerk, County of Maui

