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#### BEFORE THE LAND USE COMMISSION

#### OF THE STATE OF HAWAI'I

In the Matter of the Petition ) DOCKET NO. A15-798 of:

WAIKAPU PROPERTIES, LLC; MTP LAND PARTNERS, LLC; WILLIAM S. FILIOS, Trustee of the William S. Filios Separate Property Trust dated APRIL 3, 2000; and WAIALE 905 PARTNERS, LLC,

WAIALE 905 PARTNERS, LLC,

To Amend the Agricultural Land
Use District Boundaries into

the Rural Land Use District for certain lands situate at Waikapu, District of Wailuku, Island and County of Maui, State of Hawaii, consisting of 92.394 acres and 57.454 acres, bearing Tax Map Key No. (2) 3-6-004:003 (por) and to Amend the Agricultural Land Use District Boundaries into the Urban Land Use District for certain lands situate at Waikapu, District of Wailuku,

236.326 acres, 53.775 acres, and 45.054 acres, bearing Tax Map Key No. (2) 3-6-002:003

(por), (2) 3-6-004:006 and (2)

State of Hawaii, consisting of

Island and County of Maui,

3-6-005:007 (por).

DIRECT TESTIMONY OF STACY A. OTOMO

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# DIRECT TESTIMONY OF STACY A. OTOMO

- 1 My name is Stacy A. Otomo and my business address is 305 S.
- 2 High Street, Suite 102, Wailuku, Hawaii 96793.
- I am the President of Otomo Engineering, Inc. and have been
- 4 in business since 1991. I am a licensed civil engineer since
- 5 1981, license number 5115-C.
- 6 I obtained a Bachelor of Science degree in Civil Engineering
- 7 from the University of Hawaii at Manoa in 1977 and a Master of
- 8 Science degree in Civil Engineering from the University of Hawaii
- 9 at Manoa in 1979.
- I am a member of the Hawaii Society of Professional
- 11 Engineers, Maui Chapter (past Secretary, Treasurer, Vice-
- 12 President, President and State Director). I previously served on
- 13 the New Construction Committee of the Kaanapali Golf Estates and
- 14 the Design Review Committee of the Wailuku Country Estates
- 15 Subdivision. I am a past member of the Maui County Design Review
- 16 Board, a past Chairman of the Central Maui Advancement Committee
- 17 (Boy Scouts of America), a past President of the Iao School Band
- 18 Boosters, and am a current Member of the Design Review Committee
- 19 for the Kaanapali Operations Association, Inc.
- I have testified as a civil engineer before the State Land
- 21 Use Commission in the following matters: (1) Pulelehua; (2)
- 22 Waikapu Gardens; (3) Kula Ridge Affordable Housing Project; (4)
- 23 Consolidated Baseyard Subdivision; (5) Waiko Light Industrial

- 1 Subdivision; and (6) Puunene Heavy Industrial Subdivision.
- Otomo Engineering, Inc. was retained by Waikapu Partners,
- 3 LLC to prepare a Preliminary Engineering Report (PER) concerning
- 4 the infrastructure requirements for a proposed residential and
- 5 commercial development near the town of Waikapu which is in
- 6 central Maui.
- 7 The purpose of the PER was to provide information on the
- 8 existing infrastructure that will be serving the Project, and
- 9 evaluate the adequacy of that infrastructure, and determine what
- 10 improvements will be required to support the development of the
- 11 Project.
- 12 To prepare the report, my firm met with the Department of
- 13 Public Works for the County of Maui, the State Department of
- 14 Transportation, the County of Maui Department of Environmental
- 15 Management and the Department of Water Supply. In addition, we
- 16 reviewed information that was provided by Waikapu Partners, LLC
- 17 including well drilling and test pump data, and consulted with
- 18 the traffic engineering firm that was hired by Waikapu Partners,
- 19 LLC to receive information on roadways. The purpose of the
- 20 meetings, review and consultation was to obtain the information
- 21 that was available on the existing wastewater infrastructure
- 22 that
- 23 Following the analysis of this information, my firm

- 1 prepared the study which is entitled "Preliminary Engineering
- 2 Report for Waikapu Country Town" (PER). The study was revised
- 3 in November, 2016 because of updated information received from
- 4 the County of Maui concerning the treatment of wastewater that
- 5 is expected to be generated by the project.
- A copy of the PER is attached as Appendix "H" to the Final
- 7 Environmental Impact Statement which is Exhibit "25."
- 8 I would like to highlight some of the information that is
- 9 contained in the PER. First, I will discuss the existing
- 10 conditions concerning Roadways, Drainage, Wastewater and Water.
- 11 Roadways
- 12 The primary regional access to the Waikapu area is
- 13 provided by Honoapiilani Highway, which divides the Waikapu
- 14 Country Town Project ("Project") into mauka and makai sections.
- 15 The roadway is a two-lane undivided State Highway running in a
- 16 north-south direction between Wailuku and Maalaea. A left turn
- 17 lane exists at the intersection of the roadway with the entrance
- 18 to the Maui Tropical Plantation (MTP).
- 19 Kuihelani Highway, which provides access from Kahului
- 20 to Maalaea, is located east of the Project. The southern
- 21 terminus of Kuihelani Highway is its intersection with
- 22 Honoapiilani Highway. The northern terminus is the intersection
- 23 of Kuihelani Highway with Puunene Avenue, where the Highway

- 1 turns into Dairy Road. A traffic signal exists at the
- 2 intersection of Kuihelani Highway and Waiko Road.
- Waiko Road, a two-lane County-owned collector roadway,
- 4 runs in an east-west direction, connecting Honoapiilani Highway
- 5 and Kuihelani Highway. Immediately east of its intersection
- 6 with Honoapiilani Highway, Waiko Road provides access to a
- 7 residential community. Further east, Waiko Road provides access
- 8 to industrial properties and for livestock land uses.
- 9 Waiale Road, a two-lane road, whose southern terminus
- 10 is at Waiko Road and whose northern terminus is near Kaahumanu
- 11 Avenue in Wailuku where Waiale Road turns into Lower Main
- 12 Street. The section of Waiale Road from Waiko Road north to
- 13 Kuikahi Drive is privately owned; the remainder of Waiale Road
- 14 from Kuikahi Drive to Lower Main Street is County owned and used
- 15 as a collector road.
- 16 Kuikahi Drive is an east-west collector road. Lying
- 17 about 1,000 feet east of Honoapiilani Highway, Kuikahi Drive
- 18 intersects with Waiale Road. The eastern terminus of Kuikahi
- 19 Drive is Maui Lani Parkway.

## 20 Drainage

- 21 The elevation on the mauka development site ranges
- 22 from approximately 350 feet above mean sea level at its
- 23 southeasterly corner to approximately 710 feet above mean sea

- 1 level at its northwesterly corner, with a slope averaging
- 2 approximately 8 %. The elevation on the makai development site
- 3 ranges from approximately 256 feet above mean sea level at a low
- 4 point along the southerly border to approximately 408 feet above
- 5 mean sea level at the northwesterly corner, with a slope
- 6 averaging approximately 4 %. The land within the agriculture
- 7 preserve areas will remain undeveloped.
- 8 According to the Flood Insurance Rate Maps, prepared
- 9 by the United States Federal Emergency Management Agency, the
- 10 project site is situated in Flood Zones X, XS, AE, and AEF.
- 11 The vast majority of the site is situated in Flood
- 12 Zone X. Flood Zone X represents areas that are outside of the
- 13 0.2% annual chance flood plain.
- 14 Flood Zones AE, AEF, and XS are located along the
- 15 eastern boundary of both the mauka and makai sites, where the
- 16 Waikapu Stream is located. No development is proposed in the
- 17 areas with Flood Zones AE, AEF and XS.
- 18 The agricultural preserve and a park border Waikapu
- 19 Stream on the mauka and makai sites, respectively.
- 20 Onsite runoff generally sheet flows in a west to east
- 21 direction. Seven (7) diversion berms exist along the upper most
- 22 portion of the mauka site which were designed to intercept
- 23 surface runoff and direct the runoff into Waikapu Stream. The

- 1 diversion berms, constructed when the property was used for
- 2 pineapple cultivation, is in an area that will not be developed,
- 3 will remain in place and will function to direct runoff into
- 4 detention basins. The berms are protected by various grasses
- 5 and weeds, which help to maintain a low runoff velocity as well
- 6 as to filter sediments that are carried by the runoff.
- 7 In determining the amount of storm water runoff that
- 8 must be handled by a drainage system, the County of Maui
- 9 requires that the waters generated by a 50-year 1-hour storm be
- 10 used for the design of the drainage system. While there are
- 11 different storm events that can be used for design standards,
- 12 the County of Maui has designated the 50-year, 1-hour storm as
- 13 the event by which a drainage system must be designed for areas
- 14 of less than 100 acres that have a sump or tailwater effect.
- 15 Since the drainage area covered by the berms is less
- 16 than 100 acres, using a 50-year, 1-hour storm event, the
- 17 existing diversion berms intercept approximately 157.4 cubic
- 18 feet per second (cfs), corresponding to a runoff volume of
- 19 140,509 cubic feet. These diversion berms prevent runoff from
- 20 sheet flowing into the proposed development areas.
- 21 Some of the existing runoff sheet flows into the
- 22 Waihee Ditch, which traverses along the western boundary of
- 23 T.M.K.: (2) 3-6-005:007. The ditch flows in a southerly

- 1 direction toward Maalaea and supplies water to existing
- 2 agricultural reservoirs.
- Runoff from the areas below the existing diversion
- 4 berms generally sheet flows in a west to east direction toward
- 5 Honoapiilani Highway. There are several small culverts that
- 6 divert runoff under Honoapiilani Highway, discharging the runoff
- 7 into the existing cane fields on the makai side of the highway.
- 8 A grass swale traverses across the Maui Tropical
- 9 Plantation (MTP) site parallel to Honoapiilani Highway from the
- 10 northeast corner of the project site. Runoff that sheet flows
- 11 across the mauka side of the project site is captured by the
- 12 grass swale and diverted in a southerly direction under
- 13 Honoapiilani Highway through an existing 72-inch culvert located
- 14 1,000 feet to the south of the MTP entrance. Runoff within the
- 15 grass swale is conveyed across the MTP entrance by a 30-inch
- 16 culvert.
- 17 For drainage areas of more than 100 acres, the County
- 18 of Maui requires the system design to cover a 100-year, 24-hour
- 19 storm event. As the drainage area for the Project is more than
- 20 100-acres, the runoff generated from a 100-year, 24-hours storm
- 21 event was used to determine the quantity of storm water that
- 22 must be accommodated by the drainage system.

- 1 The runoff generated from a 100-year, 24-hour storm
- 2 event on the existing lands in the project site that is mauka of
- 3 Honoapiilani Highway is 452 cfs for Phase I of the project which
- 4 corresponds to a runoff volume of 2,418,629 cubic feet.
- 5 Similarly, the runoff volume generated from a 100-year, 24-hour
- 6 storm event for the lands of the project site that are makai of
- 7 Honoapiilani Highway is 373 cfs which corresponds to a runoff
- 8 volume of 2,133,808 cubic feet.
- 9 For Phase II of the project site that is mauka of
- 10 Honoapiilani Highway, a 100-year, 24-hour storm event would
- 11 generate a runoff of 447 cfs, corresponding to a runoff volume
- 12 of 2,916,206 cubic feet. The portion of the project site being
- 13 developed in Phase II that is makai of Honoapiilani Highway will
- 14 generate a runoff of 361cfs, corresponding to a runoff volume of
- 15 2,062,681 cubic feet.
- Presently, onsite runoff sheet flows across the
- 17 project site in a west to east direction, across Honoapiilani
- 18 Highway and into the existing sugar cane fields towards
- 19 Kuihelani Highway and eventually discharges into Kealia Pond in
- 20 North Kihei.
- 21 Wastewater
- 22 There are County sewerlines on the north side of
- 23 Waikapu Stream. The MTP is serviced by a private sewer system

- 1 which connects to the County's sewer system on Waiko Road near
- 2 Waikapu Town.
- 3 The MTP sewer system consists of a 6-inch sewerline
- 4 and manholes from the existing buildings, crossing Honoapiilani
- 5 Highway to a sewer pump station located approximately 500 feet
- 6 east of Honoapiilani Highway. A 4-inch forcemain conveys the
- 7 wastewater from the sewer pump station through the cane fields,
- 8 across Waikapu Stream, up on Waiko Road and connects to a sewer
- 9 manhole on Waiko Road east of Waikapu town. There is an 8-inch
- 10 gravity sewerline from the existing sewer manhole which connects
- 11 to a County-owned sewer manhole east of Waikapu Town.
- 12 The MTP sewer system is maintained by the MTP. The
- 13 County's sewer system traverses from the manhole on Waiko Road
- 14 through the Waikapu Gardens Subdivision, through privately owned
- 15 properties, onto Waiale Road, down Lower Main Street and
- 16 discharges into the Wailuku Sewer Pump Station near the
- 17 intersection of Kahului Beach Road, Lower Main Street and Waiehu
- 18 Beach Road. Sewer collected at the Wailuku Sewer Pump Station
- 19 is pumped to the Kahului Wastewater Reclamation Facility (KWRF)
- 20 in Kanaha.
- 21 According to the Wastewater Reclamation Division,
- 22 County of Maui, as of July 31, 2016, the KWRF has a capacity of
- 7.9 million gallons per day (mgd). The average flow into the

- 1 KWRF is 5.2 mgd and the allocated capacity is 6.55 mgd. The
- 2 remaining wastewater capacity at the KWRF is approximately 1.35
- 3 mgd.
- 4 Water
- 5 Water service in the vicinity of the project site is
- 6 provided by the County's water system consisting of a 12-inch
- 7 waterline from the 300,000-gallon tank near the mauka terminus
- 8 of Waiko Road. The storage tank is at an elevation of 764 feet.
- 9 A 12-inch waterline crosses Honoapiilani Highway and
- 10 terminates to the east of Waikapu town in the vicinity of the
- 11 industrial area. A 4-inch waterline connects to the 12-inch
- 12 waterline on Honoapiilani Highway and traverses in a southerly
- 13 direction and ends near the northerly boundary of the MTP. The
- 14 MTP site is currently being serviced by two 5/8-inch water
- 15 meters located at the northeast corner of the mauka property.
- 16 Fire protection for the MTP is presently provided by a
- 17 private system consisting of a gravity fireline from the
- 18 existing lagoon located immediately to the west of the MTP
- 19 restaurant. Non-potable water from the lagoon is fed to fire
- 20 pumps located on the exterior of the existing buildings which
- 21 supplies water to the fire sprinkler systems in the buildings.
- 22 There are also fire hydrants located on the grounds of the MTP.

- 1 However, the fire hydrants may not have adequate pressure and
- 2 capacity.
- Now I will discuss the proposed improvements for the
- 4 project which include paved roadways, a private water system,
- 5 landscaping, underground water, sewer and drainage systems. The
- 6 infrastructure improvements will be described in the following
- 7 subheadings: (i) roadways; (ii) drainage; (iii) sewer and (iv)
- 8 water.
- 9 Roadways
- Access for the project will be from the roadway
- 11 connections on Honoapiilani Highway for both the mauka and makai
- 12 development sites, as well as the future Waiale Road extension
- 13 for the makai development.
- The developers of WCT subdivided an 80-feet wide
- 15 right-of-way for the future Waiale Road extension from Waiko
- 16 Road to Honoapiilani Highway. The right-of-way has been
- 17 dedicated to the County for the development of the Waiale Road
- 18 extension.
- The proposed improvements for the Waiale Road
- 20 extension includes two (2) 12-foot travel lanes, 6-foot paved
- 21 shoulders on both sides, 6-foot grassed swales on both sides,
- 22 and a 10-feet wide bike/pedestrian path on one side.

- 1 The main onsite roadway from the Waiale Road Extension
- 2 into the MTP will have a right-of-way of 80 feet (major
- 3 arterial). The major collector road makai of and parallel to
- 4 Honoapiilani Highway will have a right-of-way of 60 feet. All
- 5 residential streets will have a right-of-way of 48 feet (minor
- 6 urban street), and the roadways serving rural areas will have a
- 7 40 feet right-of-way (minor rural street). All roadways will be
- 8 improved to County standards. The cul-de-sacs will have an edge
- 9 of pavement radius of 40 feet and a right-of-way radius of 50
- 10 feet to accommodate the larger fire trucks in the Central Maui
- 11 district.
- 12 A Transportation Impact Analysis Report (TIAR) was
- 13 completed for the project on December 2014 by Fehr & Peers,
- 14 which provided the following summary:
- The TIAR recommended the following intersection
- 16 mitigation measures for mid-term 2022: Intersection 1:
- 17 Honoapiilani Highway & Kuikahi Drive add separate left turn
- 18 lane on south bound Honoapiilani Highway onto Kuikahi Drive and
- 19 separate left turn and straight through lanes west bound on
- 20 Kuikahi Drive. No mitigation was required at the intersection
- 21 of Kuihelani Highway and Waiko Road and at the intersection of
- 22 Honoapiilani Highway and Waiale Road.

- 1 The recommended intersection mitigation measures for
- 2 buildout 2026 are: Create separate left and right turn lanes
- 3 east bound on Waiko Road onto Kuihelani Highway.
- 4 After coordination with local and state agencies
- 5 during the early preparation stages of the TIAR, it was assumed
- 6 that the Waiale Bypass would be completed and used in the
- 7 study's future analysis scenarios. However, during the Draft
- 8 EIS public circulation period, comments were raised about the
- 9 impacts on the project design and the study area's
- 10 transportation facilities if the Waiale Bypass was not funded
- 11 and constructed in time for the project. In response, Fehr &
- 12 Peers developed and analyzed forecast traffic volumes in Year
- 13 2026 without the Waiale Bypass in place, both before and after
- 14 the addition of project traffic.
- 15 Fehr & Peers outlined the full range of improvements
- 16 that address both project-related and/or cumulative traffic
- 17 impacts in their October 17, 2016 Memorandum (without the Waiale
- 18 Bypass). They concluded that three more study intersections
- 19 would be significantly impacted under this scenario than in the
- 20 "with Bypass" scenario analyzed in the TIAR, a level of service
- 21 of D can be achieved at the locations with an expanded program
- 22 of roadway improvements as mitigation.

- 1 The State Department of Transportation's (SDOT) 2035
- 2 Transportation Plans for the Maui District includes the widening
- 3 of Honoapiilani Highway fronting the project site. Two
- 4 additional travel lanes are planned. In anticipation of the
- 5 future widening of Honoapiilani Highway, the planned development
- 6 on the mauka and makai sides of Honoapiilani will include a
- 7 landscape buffer between the highway and the proposed
- 8 development. The width of the landscape buffer will be
- 9 coordinated with the SDOT to accommodate the future additional
- 10 two lanes.

# 11 Drainage

- In general, the drainage design criteria minimize the
- 13 project's alteration to existing drainage patterns and volumes.
- 14 Since the project area is greater than 100 acres, the
- 15 NRCS Method will be used to compute and design the storm water
- 16 detention facilities. The Rational Method will be used to
- 17 design the onsite drainage systems with drainage areas less than
- 18 100 acres. For these onsite drainage systems, the 50-year, 1-
- 19 hour storm frequency will be used.
- It is estimated that the pre-development 100-year, 24-
- 21 hour storm runoff from the Phase I project site mauka of
- 22 Honoapiilani Highway is 452 cfs, corresponding to a runoff
- 23 volume of 2,418,629 cubic feet and 373 cfs, corresponding to a

- 1 runoff volume of 2,133,808 cubic feet from the Phase I project
- 2 site makai of Honoapiilani Highway. Similarly, it is estimated
- 3 that the pre-development 100-year, 24-hour storm runoff from the
- 4 Phase II project site mauka of Honoapiilani Highway is 447 cfs,
- 5 corresponding to a runoff volume of 2,916,206 cubic feet and 361
- 6 cfs, corresponding to a runoff volume of 2,062,681 cubic feet
- 7 from the Phase II project site makai of Honoapiilani Highway.
- 8 It is estimated that the post-development 100-year, 24-hour
- 9 storm runoff from the Phase I project site mauka of Honoapiilani
- 10 Highway is 497 cfs, corresponding to a runoff volume of
- 11 2,567,545 cubic feet and 639 cfs, corresponding to a runoff
- 12 volume of 2,905,771 cubic feet from the Phase I project site
- 13 makai of Honoapiilani Highway. Similarly, it is estimated that
- 14 the post-development 100-year, 24-hour storm runoff from the
- 15 Phase II project site mauka of Honoapiilani Highway is 507 cfs,
- 16 corresponding to a runoff volume of 3,131,436 cubic feet and 506
- 17 cfs, corresponding to a runoff volume of 2,454,805 cubic feet
- 18 from the Phase II project site makai of Honoapiilani Highway.
- 19 The project's drainage system will be designed in
- 20 accordance with the County's "Rules for the Design of Storm
- 21 Drainage Facilities" and Section 18.20.130 Post Construction
- 22 Storm Water Quality Best Management Practices of the Maui County
- 23 Code.

- 1 The proposed project contains a mix of residential,
- 2 apartment, commercial, school and open space. Runoff will be
- 3 collected by drainage systems within the roadways and grassed
- 4 swales within the landscaped areas and routed to eight onsite
- 5 detention basins.
- The drainage system will be designed to accommodate
- 7 the increase in surface runoff volume from a 100-year, 24-hour
- 8 storm created by the project and the volume required to meet the
- 9 post construction water quality standards.
- 10 The design of the detention basins will include an
- 11 overflow pipe which will allow a minimal discharge during a
- 12 storm event and fully drain the basin within 48 hours after each
- 13 storm event.
- 14 The drainage design criteria will be to minimize any
- 15 alterations to the drainage pattern of the existing onsite
- 16 surface runoff. No additional runoff will be allowed to sheet
- 17 flow toward Kealia Pond.
- 18 Sewer
- 19 The County Department of Environmental Management
- 20 (DEM) has projected that wastewater flows from the Waikapu
- 21 Growth Area may reach two million gallons per day. They have
- 22 stated that the preferred method of wastewater treatment from
- 23 this area would be by a wastewater treatment facility located in

- 1 the Waikapu area. This would eliminate the excessive energy
- 2 consumption for pumping, reduce the use of shoreline injection
- 3 wells for disposal and allow the reuse of treated water at the
- 4 proposed regional park and other nearby sites.
- In July 2013, the DEM reviewed the capacity situation
- 6 of their wastewater system in the Wailuku area. Included in
- 7 their review were the existing gravity sewer lines, pump station
- 8 and the treatment facility. It was determined that there is
- 9 limited capacity for additional units to connect to their
- 10 wastewater system.
- 11 The policy of the DEM is that wastewater capacity
- 12 cannot be reserved until a project is ready to receive building
- 13 permits. If capacity at the KWRF is available at the time
- 14 building permits are ready to be issued for the project, the
- 15 project may consider a temporary connection to the County's
- 16 sewer system and complete the required upgrades for the
- 17 connection in the Phase I development.
- 18 The Waikapu Country Town development will need to
- 19 construct a stand-alone private wastewater treatment facility or
- 20 partner with other projects in the Waikapu area, such as A&B's
- 21 Waiale project or the County of Maui to construct a regional
- 22 wastewater treatment facility. The planning and design of a
- 23 stand-alone or combined wastewater treatment facility will be

- 1 coordinated with the availability of capacity within the County
- 2 system. If required, a private wastewater treatment facility
- 3 will be designed, constructed and in operation upon completion
- 4 of the first home.
- In addition to any capacity that may be available in
- 6 the County's sewer system, the developers are considering
- 7 several private wastewater treatment facility alternatives. The
- 8 first is a conventional wastewater treatment facility. The
- 9 second and preferred wastewater treatment alternative is to
- 10 utilize Food Chain Reactor technology.
- 11 The Waikapu Country Town development could construct a
- 12 stand-alone private wastewater treatment plant. While the
- 13 treatment plant will be needed in the near term, the developers
- 14 will continue to work with the County and other projects within
- 15 the Waikapu area on a collaborative wastewater treatment
- 16 facility.
- 17 Water
- Water and fire protection for the project will be
- 19 provided from a private onsite water system. Five (5) wells
- 20 have been drilled on the site. Three (3) wells have been
- 21 designated for potable use and two (2) for non-potable purposes.
- 22 All the wells are located within the Waikapu Aguifer.

- 1 According to the Commission on Water Resource
- 2 Management, the sustainable yield of the Waikapu aquifer is 3.0
- 3 million gallons per day. The three potable water wells have
- 4 been approved by the State of Hawaii, Commission on Water
- 5 Resource Management for a total pumping capacity of 2,300
- 6 gallons per minute (gpm).
- 7 Water from the potable wells was tested by an approved
- 8 lab, in accordance with the requirements of the Hawaii
- 9 Department of Health for new potable water sources. The results
- 10 indicate that all three potable wells are capable of producing
- 11 potable water of excellent quality.
- 12 Water pumped from the non-potable wells will be
- 13 discharged into the Waihee Ditch or lined onsite reservoirs and
- 14 used for irrigation purposes for the residential lots,
- 15 agricultural farming, parks and open areas.
- Based on the water usage, the projected water
- 17 projected average daily water demand for Phase I is 311,033
- 18 gallons per day (gpd) and the maximum daily water demand is
- 19 466,550 gpd. Based on the commercial uses, the maximum fire
- 20 demand is 2,000 gpm. The projected average daily water demand
- 21 for Phase II is 334,475 gpd and the maximum daily water demand
- 22 501,713 gpd.

1 Water conservation measures such as low-flow toilets 2 and shower heads will be considered for use in the project, 3 which will decrease the water demand. Irrigation of the parks 4 and open space will be from the non-potable water source, which will also decrease the water demand. 5 6 A 1.0-million-gallon reservoir is required to 7 accommodate the two phases of the project. As an alternative, 8 the developer can also construct two storage reservoirs, each 9 with a storage volume of 0.50 million gallons. Each 0.50-10 million-gallon reservoir can be constructed at the beginning of 11 each phase. The two reservoir option can allow the second 12 reservoir to be constructed as the demand increases and allow 13 for more flexibility during maintenance and repair should one of 14 the reservoirs have to be taken out of service. 15 The 1.0 million gallons of water storage will be 16 constructed mauka of Well No. 5 at an elevation of approximately 17 800 feet MSL. This will allow for the entire project to be 18 serviced by gravity flow from the reservoir(s). 19 Thank you for the opportunity to speak to you. 20 DATED: Wailuku, Hawaii, October 27, 2017. 21 Staw a. Otmo 22 23