

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
Land Division  
Honolulu, Hawaii 96813

August 12, 2022

Board of Land and Natural Resources  
State of Hawaii  
Honolulu, Hawaii

PSF No.: 22SD-008

Island of Hawaii

Sale of Water License at Public Auction for the Non-Consumptive Use of Water from the Wailuku River for Hydroelectric Generation Purposes, Pi`ihonua, South Hilo, Island of Hawaii, Tax Map Key: (3) 2-6-009; 2-6-029; and Acceptance of Wailuku Watershed Management Plan

LEGAL REFERENCE:

Sections 171-14, -16, -17, -58 and other applicable sections of Chapter 171, Hawaii Revised Statutes (HRS), as amended.

LOCATION:

Portion of Government water of the Wailuku River situated at Pi`ihonua, South Hilo, Island of Hawaii, identified by Tax Map Key: (3) 2-6-009 & 029, as shown on the attached map labeled **Exhibit A**.

TRUST LAND STATUS:

Section 5(b) lands of the Hawaii Admission Act

DHHL 30% entitlement lands pursuant to the Hawaii State Constitution: YES

CURRENT USE STATUS:

Encumbered by Revocable Permit No. S-7463, Hawaii Electric Light Company, Inc. (HELCO), Permittee, for hydroelectric generation purposes.

CHARACTER OF USE:

Hydroelectric generation purposes

LICENSE TERM:

Thirty (30) years

COMMENCEMENT DATE:

The date of sale if the current permittee is the successful bidder, otherwise, sixty (60) days after the date of sale; provided that if such date is not on the first day of any month, the commencement date shall be the first day of the month following such date; and further provided that the Chairperson may amend the commencement date.

MINIMUM UPSET ANNUAL RENT:

The rate assessed by the Federal Energy Regulatory Commission (FERC), which equals **\$0.001 per kwh** as determined by independent appraisal multiplied by the amount of power generated annually by the winning bidder's hydroelectric project.

ANNUAL RENT:

The rate amount of the successful bid at public auction multiplied by the amount of power generated annually by the winning bidder's hydroelectric project.

METHOD OF PAYMENT:

Annual rent to be paid by January 31<sup>st</sup> of each year following the first year of the license.

RENTAL REOPENINGS:

10<sup>th</sup> and 20<sup>th</sup> years of the license.

PERFORMANCE BOND OR SECURITY DEPOSIT:

\$30,000.00.

CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:

The Final Environmental Assessment for the subject project was published in the Environmental Review Program's The Environmental Notice on March 8, 2018, with a finding of no significant impact (FONSI).

REMARKS:

BACKGROUND

On August 16, 2016, applicant Hawaii Electric Light Company, Inc. (HELCO) submitted an application for a long-term water license for the use of water from the Wailuku River for the purpose of generating hydroelectric power. HELCO currently holds Revocable

Permit (RP) No. S-7463 for the same purpose. Under the RP, the water is used in a non-consumptive manner to operate HELCO's Waiiau and Pu'ue`o hydroelectric power plants. Water is diverted via intakes located at approximately one mile upstream of the respective powerhouses and is fully returned to the Wailuku River once run through the generators. As the improvements for both power plants, including the intakes, channels and powerhouses are located on land owned by HELCO, the public auction would involve the disposition of a license solely for the use of water.<sup>1</sup> HELCO desires to conduct upgrades to the plants that would increase productivity and seeks a long-term license to justify the investment in the plants. A draft license document is attached as **Exhibit B**.

### WATER LICENSE REQUIREMENTS<sup>2</sup>

Pursuant to Section 171-58, Hawaii Revised Statutes (HRS), aside from the public auction, the water leasing process is subject to several additional statutory requirements. HELCO has worked with Land Division staff to complete these requirements. The requirements, along with the status of their completion, are discussed hereafter.

#### Department of Hawaiian Home Lands Reservation and Interim Instream Flow Standards

HRS Section 171-58(g) requires that the department work with the Department of Hawaiian Home Lands (DHHL) to consult with affected beneficiaries, and jointly develop a reservation of water rights sufficient to support current and future homestead needs. On August 15, 2017, Land Division staff participated in a beneficiary consultation meeting in Hilo along with DHHL staff and HELCO representatives. At its meetings on October 16 and 17, 2017, under agenda item G-2, the Hawaiian Homes Commission (HHC) approved the DHHL staff's beneficiary consultation report as the official record of beneficiary issues, questions, concerns and comments regarding the requested water license and DHHL's proposed reservation. The HHC also authorized the DHHL Chairperson to formally request a water reservation from the Commission on Water Resource Management (CWRM).

On October 8, 2018, the DHHL Chairperson submitted a written request to CWRM for a water reservation in the amount of 1.740 million gallons per day (mgd) from the Wailuku River for Hawaiian home lands in lower Pi'ihonua. At its meeting on March 17, 2020, under agenda item B-2, CWRM approved a surface water reservation for DHHL in an amount of 1.60 mgd, based on medium range demands as identified in the 2017 State Water Projects Plan, to meet DHHL's non-potable water needs. Under the same item, CWRM also approved interim instream flow standards (IIFS) for four tributaries of the Wailuku River. In consultation with CWRM staff, the updated IIFS is sufficient to address the issue

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<sup>1</sup> A small portion of the diversion for the Waiiau hydroelectric plant is located on land owned by the Department of Hawaiian Home Lands (DHHL). HELCO has requested an easement from DHHL to resolve the encroachment.

<sup>2</sup> While HRS Section 171-58 refers to a disposition of water rights as a lease, the term "water license" is used in Article XII, Section 1 of the Hawaii State Constitution. As this disposition involves solely the use of public water, staff opts to use the term "license" for this disposition.



for the proposed water license as well as the DHHL reservation. As DHHL has determined a water reservation that is appropriate, which has been approved by CWRM, staff believes that the department is in compliance with this statutory provision.

#### Watershed Management Plan

HRS Section 171-58(e) requires that any new lease of water rights shall contain a covenant that requires the licensee and the Department to jointly develop and implement a watershed management plan. At its meeting on October 11, 2019, under agenda item D-2, the Board approved the minimum content of the watershed management plan and delegated authority to Department staff to jointly develop the watershed management plans with water licensees to ensure that plans align with the goal of watershed protection to maintain watershed function and water yield and to restore or maintain a certain level of biological integrity that is the foundation of a healthy watershed. The submittal can be accessed through the following link:

<https://dlnr.hawaii.gov/wp-content/uploads/2019/10/D-2.pdf>

Land Division, with CWRM, assisted the Division of Forestry and Wildlife (DOFAW) to develop a draft watershed management plan, attached as **Exhibit C**. As part of the planning process, the Department determined the specific management actions, based on the site-specific needs, that will result in the prevention and degradation of surface water and ground water quantity and quality within the water lease area. Those actions, described within the plan, were informed by existing watershed management plans for the Wailuku area that had been developed as part of DHHL's 'Aina Mauna Legacy Plan as well as the Mauna Kea Watershed Alliance's plan. Actions specific to the Wailuku watershed that are proposed for the next ten-year timeframe were consolidated after consultation with DOFAW staff and partners.

According to the draft plan, the annual budget for these actions equals \$617,500. While much more could be done to protect and restore the forests of this watershed, this plan represents a conservative approach by focusing on the top-priority needs. Current management funding is inadequate for the budgeted action items. In addition to the funding proposed to be contributed by licensee, additional grants will be needed to supplement the yearly costs of managing this watershed and reach the goals of the plan.

To determine the appropriate amount that the licensee should contribute to the implementation of the watershed management plan, Department staff recommends that the contribution should be based on the proportion of available water in the Wailuku River used by the licensee. As an example of determining an appropriate contribution amount, the draft plan assumes HELCO as the winning bidder of the public auction. HELCO's power plants are estimated to divert approximately 56 mgd, with an estimated median flow of the Wailuku River at 250 mgd, resulting in an approximate use of 22.4% ( $56 \text{ mgd}/250 \text{ mgd} = .224 \times 100 = 22.4\%$ ). As previously noted, the annual Wailuku watershed management costs are approximately \$617,500, so the contribution based on the licensee's

expected use would be \$138,320 (.224 x \$617,500=\$138,320).

However, since the proposed use of water under the license is of a non-consumptive nature, staff also believes that a discount should be applied to the contribution. As this is a renewable energy project, staff believes that it would be appropriate to calculate a discount based on 1) the equivalent amount of carbon emissions offset by the project, 2) the amount of forest acreage needed to sequester the amount of carbon emissions and 3) the pro-rated management costs for the subject acreage. Over the past 20-year period from 2002 to 2021, the average power generation from the Waiau and Pu'ue'o plants was 16,512,893 kilowatt hours (kwh).

According to the U.S. Environmental Protection Agency's (EPA) Greenhouse Gases Equivalencies Calculator,<sup>3</sup> as of March 2022, the 16,512,893 kwh of energy produced by the Waiau and Pu'ue'o plants are equivalent to approximately 11,702 metric tons of carbon dioxide avoided through renewable energy. The EPA also notes that one acre of forest sequesters approximately 0.84 metric tons of carbon dioxide per year. Therefore, the power plants save the captured carbon equivalence of approximately 13,931 acres per year. The Wailuku watershed covers approximately 80,211.2 acres, so the per acre management cost for the Wailuku watershed is approximately \$7.698 (\$617,500 annual watershed cost/80,211.2 acres = \$7.698 per acre). This results in a discount of \$107,240 (\$7.698 x 13,931 acres of forest = \$107,240), and a total management cost share contribution in amount of **\$31,080.00** per year (rounded) (\$138,320 undiscounted cost share - \$107,240 discount = \$31,080).

The cost share amount would be adjusted every five years by the cumulative Consumer Price Index (CPI) for the Metropolitan Statistical Area of Honolulu, Hawaii for the previous five (5) year period. For example, if the lease were executed in 2022, the cost share amount would be first adjusted in 2027 by the cumulative CPI for the years 2022-2026, and subsequently adjusted every five years thereafter until the expiration of the license. Staff believes that this is a fair result for both the Department and the licensee, as the CPI adjustment would be an objective measure that allows the licensee to anticipate future costs. Furthermore, it would provide DOFAW with a stable income stream to support ongoing management activities in the event of a budget reduction. DOFAW would have the discretion to determine with the licensee the method by which the cost share is tendered, either by monetary payment or provision of appropriate in-kind services. Section 39 of the draft license requires that the licensee enter into an agreement with the Department for the implementation of the watershed management plan within 60 days of the execution of the license.

### Stream Monitoring

Finally, although not a statutory requirement, after consultation with CWRM, staff

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<sup>3</sup> The Greenhouse Gas Equivalencies Calculator converts renewable energy to fossil fuel electricity and equates the numbers into different types of measurable units.

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>



recommends that the Board require that, within 60 days of the execution of the license, the licensee shall work with CWRM to determine an appropriate cost share for the installation and maintenance of stream monitoring equipment. This would provide data for CWRM to more effectively manage the surface water resources affected by the license. Like the watershed management plan, CWRM would be accorded the discretion to negotiate an agreement to both its satisfaction and the licensee's.

#### DETERMINATION OF RENT

Pursuant to HRS Section 171-17(a), the upset rent for a public auction must be determined by an appraisal, and Land Division accordingly contracted for an appraisal to determine the minimum upset rent.<sup>4</sup> After extensive research conducted by the appraiser, Land Division staff and HELCO, the appraiser independently determined the value of water used in a non-consumptive manner for hydroelectric generation purposes to be the rate assessed by the Federal Energy Regulatory Commission (FERC), which equals \$0.001 per kwh for the level of productivity of the HELCO power plants. The purpose of the FERC rate is to charge licensees for regulatory program costs and for the use of government lands and dams.<sup>5</sup> Furthermore, while the HELCO plants are not subject to FERC jurisdiction, there is precedent for using the FERC rate to charge for water for hydropower generation purposes. The FERC rate is used to determine rent for water use under General Lease No. S-5220 to the Wailuku River Hydroelectric Limited Partnership, whose plant is located upstream from the HELCO plants.<sup>6</sup> Finally, in researching charges for similar water uses assessed by other States, the appraiser discovered that all of them would result in lower revenue than use of the FERC rate.

As required by the license, the rent shall be determined by multiplying the FERC rate, or higher as bid at public auction, by the amount of power generated by the licensee's project annually per kwh. For rental re-openings in the 10<sup>th</sup> and 20<sup>th</sup> years of the license, the rent would be set by the prevailing FERC rate at the time of the re-opening. In the event that the winning auction bid is higher than the FERC rate, the re-opening rate will be increased by the same percentage increase between the prevailing FERC rate at the time of re-opening to the FERC rate at the commencement of the license.

#### AGENCY COMMENTS

HELCO reached out to both DHHL and OHA to schedule meetings to discuss the proposed

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4 This is different from standard practice of contracting for an appraisal after approval of the public auction. Given the unique and significant nature of the proposed disposition, staff believes that it was appropriate to address the valuation issue to provide greater transparency and assist the Board in its decision making.

5 Staff notes that the definition of land in Section 171-1, HRS includes all interests and natural resources therein including water.

6 Under that lease, the use of the FERC rate was approved by the Board to be paid in the event it was greater than the minimum rent, which was valued at \$0.30 per mgd. The FERC rate resulted in a higher rent amount than the minimum rent.

water license and public auction. HELCO was unable to schedule a meeting with OHA but did appear before the Hawaiian Homes Commission (HHC) at its meeting on May 17, 2022, under agenda item G-1, to provide an informational briefing and update. The meeting can be viewed at the following link starting at roughly the 40:00 mark:

<https://www.youtube.com/watch?v=Iyvkc0CWrvk>

Based on comments from HHC members, it appears that the primary concern is the use of the FERC rate to determine license rent resulting in DHHL not receiving the revenues it believes to be entitled to from the water license. Staff acknowledges DHHL's concerns and responds that regardless of how DHHL believes that water should be appraised, HRS Sections 171-17 and 58 require that the water be valued by appraisal, which is what was done in this instance. The State's appraiser independently concluded that the FERC rate was an appropriate upset rent. While DHHL may favor alternative approaches to value water such as shared net benefit or avoided costs, DHHL has not provided an appraisal that supports those approaches as fair market value nor is staff aware of any precedent that utilizes those approaches to value water.

#### PUBLIC TRUST DOCTRINE

Title to water resources is held in trust by the State for the benefit of its people. Pursuant to *In re Water Use Permits*, 94 Hawaii 97, 9 P.3d 409 (2000) (*Waiāhole I*), and *In re Wai'ola O Moloka'i, Inc.*, 103 Hawai'i 401, 83 P.3d 664 (2004) the Hawai'i Supreme Court has identified four public trust purposes with respect to water:

1. Maintenance of waters in their natural state;
2. Domestic water use of the general public, particularly drinking water;
3. The exercise of Native Hawaiian and traditional and customary rights, including appurtenant rights; and
4. Reservations for Hawaiian home lands.

In addition, the Courts have indicated that the "dual mandate" of the public trust not only calls for the protection of water resources, but also requires the Board to promote the reasonable and beneficial use<sup>7</sup> of water resources in order to maximize their social and economic benefits to the people of this state. *Waiāhole I*, 94 Hawai'i at 139, 141, 9 P.3d at 451, 453 ("The public has a definite interest in the development and use of water resources for various reasonable and beneficial public and private off-stream purposes, including agriculture."). In order to satisfy its public trust obligations, the Board must balance the proposed use of water against the foregoing public trust purposes, as well as competing

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<sup>7</sup> As defined in HRS Section 174C-3, "Reasonable-beneficial use" means the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest.



uses.

The hydroelectric use of water allows utility companies to provide clean energy to domestic and commercial users. This method of energy production also supports Hawaii's Clean Energy Initiative, which sets goals for the state to achieve 100 percent clean energy by 2045 coming from locally generated renewable sources. Although hydroelectric projects are not an identified public trust use of State water, staff believes that the public trust concerns have been addressed in the processing of this water license application under HRS Section 171-58.

As previously noted, HELCO has worked with Department staff to complete the water leasing requirements, including an environmental assessment with a finding of no significant impact for the project. Further, the non-consumptive use of water for hydropower generation returns the diverted water to the same stream source from which it was drawn and minimally impacts the public trust purposes and competing uses of water. Staff believes that allowing the non-consumptive use of water is appropriate in consideration of the State's renewable energy goals. In view of these considerations, staff believes that approving the public auction for a license for the non-consumptive use of water for hydropower generation purposes under the terms and conditions discussed in support of the State's renewable energy goals is consistent with the public trust.

RECOMMENDATION: That the Board:

1. Find that the disposition of a license for the non-consumptive use of water from the Wailuku River, Island of Hawaii, for hydroelectric generation purposes is consistent with the public trust doctrine.
2. Find the area to be an economic unit in terms of the intended use.
3. Find that the subject area is not suitable for hunting, nor will it become so during the term of the lease.
4. Authorize the sale of a license at public auction for the non-consumptive use of water from the Wailuku River, Island of Hawaii, for hydroelectric generation purposes under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:
  - a. The attached draft water license form, as may be amended from time to time;
  - b. Review and approval by the Department of the Attorney General; and
  - c. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.



3. Accept the proposed Wailuku Watershed Management Plan.

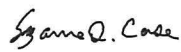
Respectfully Submitted,



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Ian Hirokawa  
Special Projects Coordinator

APPROVED FOR SUBMITTAL:



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Suzanne D. Case, Chairperson *RT*

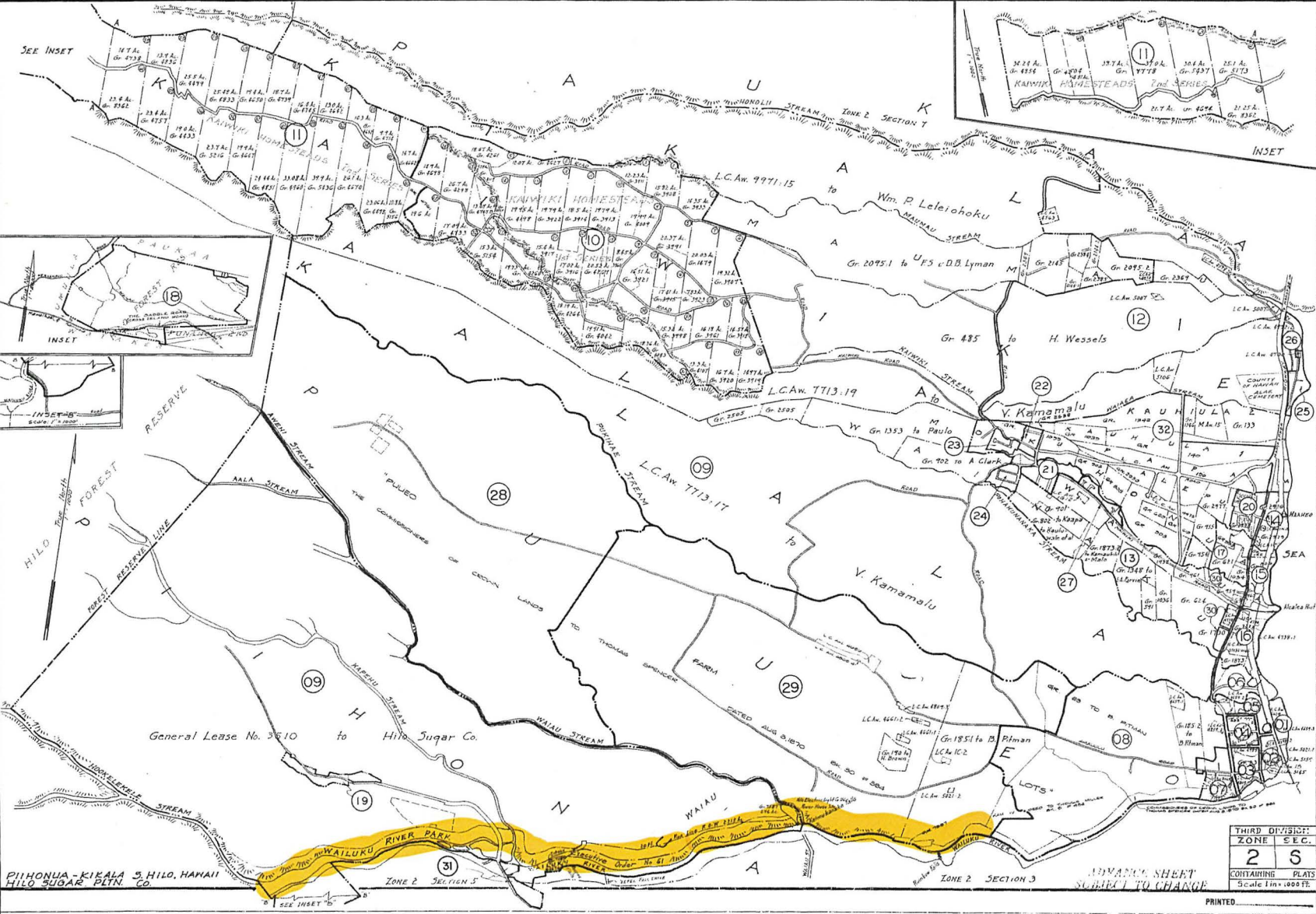
# EXHIBIT A



SEP-11-1913  
SEP-23-1914

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Source: Hawaiian Maps



THIRD DIVISION:
ZONE 2 SEC.
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CONTAINING PLATS
Scale 1 in = 1000 ft.

# EXHIBIT A



# EXHIBIT B



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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

WATER LICENSE NO. S-

THIS WATER LICENSE ("License"), made this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, by and between the STATE OF HAWAII, hereinafter referred to as the "Licensor," by its Board of Land and Natural Resources, called the "Board," and \_\_\_\_\_, whose address is \_\_\_\_\_, hereinafter referred to as the "Licensee."

WITNESSETH:

The Licensor, pursuant to Sections 171-14 and 58(c), Hawaii Revised Statutes, for and in consideration of the rent to be paid and of the terms, covenants and conditions herein contained, all on the part of the Licensee to be kept, observed and performed, does license unto the Licensee, and the Licensee does license from the Licensor the right to divert, impound, transmit, and use in a non-consumptive manner, surface water from the Wailuku River at Pihonua, South Hilo, Island of Hawai'i, Hawai'i, at Diversion Point(s), and return such water to the Wailuku River at Return Point(s); all more particularly described in Exhibit "A" and as shown on the map marked Exhibit "B," attached hereto and made parts hereof, hereinafter referred to as the "Water Resource".

TO HAVE AND TO HOLD the licensed rights unto the Licensee for the term of thirty (30) years, commencing on the day of \_\_\_\_\_, 20\_\_, up to and including the day of \_\_\_\_\_, \_\_\_\_\_, unless sooner terminated as hereinafter provided, the Licensor reserving and the Licensee yielding and paying to the Licensor at the Department of Land and Natural Resources, Fiscal Office, P.O. Box 621 Honolulu, Hawai'i, 96809 an annual rental as provided hereinbelow, payable in advance, without notice or demand, on the 31<sup>st</sup> day of January of each and every year following the first year of the license, beginning January 31<sup>st</sup>, 202\_ and ending on January 31<sup>st</sup>, 205\_ as follows:

- A. For the first ten (10) years, the annual rental

amount shall be paid by the Licensee in an amount based on the annual kilowatt hours generated as of the end of the calendar year during the term of the License multiplied by the prevailing FERC rate or the higher rate as established by the winning bid at public auction.

B. Every ten years, the rent shall be increased to be equal to the prevailing FERC rate at the time of reopening applied to the amount of kilowatt hours generated on an annual basis. In the event the winning bid at auction was higher than the prevailing FERC rate at the commencement of the license, the rent shall reflect the same percentage increase as the prevailing FERC rate at the time of reopening to the FERC rate at the commencement of the license.

C. The interest rate on any and all unpaid or delinquent rentals shall be at one percent (1%) per month, plus a service charge of FIFTY AND NO/100 DOLLARS (\$50.00) a month for each delinquent payment.

#### RESERVATIONS:

1. Minerals and waters. (a) All minerals as hereinafter defined, in, on or under the premises and the right, on its own behalf or through persons authorized by it, to prospect for, mine and remove the minerals and to occupy and use so much of the surface of the ground as may be required for all purposes reasonably extending to the mining and removal of the minerals by any means whatsoever, including strip mining. "Minerals," as used herein, shall mean any or all oil, gas, coal, phosphate, sodium, sulphur, iron, titanium, gold, silver, bauxite, bauxitic clay, diaspore, boehmite, laterite, gibbsite, alumina, all ores of aluminum and, without limitation thereon, all other mineral substances and ore deposits, whether solid, gaseous or liquid, including all geothermal resources, in, on, or under the land, fast or submerged; provided, that "minerals" shall not include sand, gravel, rock or other material suitable for use and used in general construction in furtherance of the Licensee's permitted activities on the premises and not for sale to others. (b) All surface and ground waters not specifically granted by this Lease; provided, however, that as a condition precedent to the exercise by the Licensor of the rights reserved in this paragraph, just compensation shall be paid to the Licensee for any of Licensee's improvements taken.



2. Right to withdraw. Licensor reserves the right to withdraw the Water Resource or any portion thereof to meet the following requirements as the Licensor in its sole discretion may determine:

- a. Constitutionally protected water rights; reservations, including but not limited to the \_\_\_ gallons per day reserved by the Department of Hawaiian Home Lands from the Wailuku River to meet the Department of Hawaiian Home Lands' rights under Section 221 of the Hawaiian Homes Commission Act; as well as other statutorily or judicially recognized interests relating to the right to withdraw water for the purposes of and in accordance with the provisions of Section 171-58(d), Hawaii Revised Statutes; and
- b. Amounts of water necessary to remain in the Wailuku River to satisfy instream flow standards, as set by the Commission on Water Resource Management;

Provided, however, that if any portion of the Water Resource should be withdrawn for any purpose which diminishes the minimum kilowatt hours described in paragraph A above, the base rent shall be reduced in proportion to the value of the portion of the Water Resource that is being withdrawn; provided further that where the portion withdrawn renders the remainder unsuitable or of inadequate quantity or flow for the use or uses for which the Water Resource was licensed, the determination of unsuitability being within Licensee's sole discretion, the Licensee shall have the option to surrender this license and be discharged and relieved from any further liability.

#### AGREEMENTS AND COVENANTS BETWEEN PARTIES:

1. Payment of rent. The Licensee shall pay the rent to the Licensor at the times and in the manner and form provided in this license, and at the place specified above, or at any other place the Licensor may from time to time designate, in legal tender of the United States of America.

2. Taxes, assessments, etc. The Licensee shall pay or cause to be paid, when due, the amount of all taxes, rates, and assessments of every description associated with the use of the Water Resource or any part, which the Licensor or Licensee, are now or may be assessed or become liable by authority of law during the term of this license.

3. Utility services. The Licensee shall be responsible for obtaining any utility services and shall pay when due all charges, duties and rates of every description, including water, sewer, gas, refuse collection or any other charges, associated with the use of the Water Resource or any part, for which the Licensor or Licensee may become liable for during the term, whether assessed to or payable by the Licensor or Licensee.

4. Covenant against discrimination. The use and enjoyment of the Water Resource shall not be in support of any policy which discriminates against anyone based upon race, creed, sex, color, national origin, religion, marital status, familial status, ancestry, physical handicap, disability, age or HIV (human immunodeficiency virus) infection.

5. Water quality. In using the Water Resource, the Licensee shall do all things reasonably necessary to prevent the degradation by Licensee of the quality of the water in the Wailuku River and Licensee is expressly prohibited from engaging in any acts or omissions that may endanger the public health, safety, and welfare with respect to the use of the Water Resource.

6. Waste and unlawful, improper or offensive use of Water Resource. The Licensee shall not commit, suffer or permit to be committed any waste, nuisance, strip, or unlawful, improper or offensive use of the Water Resource or any part.

7. Compliance with laws. The Licensee shall comply with all of the requirements of all municipal, state, and federal authorities and observe all municipal, state and federal laws applicable to the Water Resource, now in force or which may be in force.

8. Inspection by Licensor. (a) The Licensee shall permit the Licensor and its agents, at all reasonable times during the license term, access to the diversion works and

hydroelectric generating facility for which the Water Resource is being used and permit the Licensor and its agents at reasonable times during the term of this license to conduct such examinations as may be reasonably related to this license solely for the purpose of confirming Licensee's compliance with the terms and conditions of this license; provided that in the exercise of these rights, the Licensor shall not interfere unreasonably with the Licensee or Licensee's use and enjoyment of the Water Resource.

(b) Licensor shall have reasonable access to the hydroelectric generating facility for purposes of inspecting the same and shall be subject to the requirement that Licensor shall give Licensee prior written notice of at least seventy-two (72) hours of any such inspection, and Licensor shall conduct such inspections in accordance with such reasonable guidelines as Licensee shall provide to protect the security and integrity of such facility.

9. Modification of water works. Prior to any expansion or modification of any works applicable to the Water Resource, the Licensee shall document all such proposed expansions or modifications and obtain all required governmental permits and approvals.

10. Liens. The Licensee shall not commit or suffer any act or neglect which results in the Water Resource or the licensed interest of the Licensee becoming subject to any attachment, lien, charge, or encumbrance, except as provided in this license, and shall release, indemnify, defend, and hold the Licensor harmless from and against all attachments, liens, charges, and encumbrances and all resulting expenses.

11. Character of use. The Licensee shall use or allow the Water Resource licensed to be used solely for hydroelectric generation purpose(s).

12. Assignments, etc. The Licensee shall not transfer, assign, or permit any other person or entities to use the Water Resource, or any portion, or transfer or assign this license or any interest, either voluntarily or by operation of law, except by way of devise, bequest, or intestate succession, and any transfer or assignment made shall be null and void; provided that with the prior written approval of the Board the assignment and transfer of this license, or any portion, may be



made in accordance with current industry standards, as determined by the Board.

If the Licensee is a partnership, joint venture or corporation, the sale or transfer of 20% or more of ownership interest or stocks by dissolution, merger or any other means shall be deemed an assignment for purposes of this paragraph.

Notwithstanding the foregoing, if Licensee is a party to any transaction involving a merger or corporate reorganization with an affiliate entity, meaning any entity that directly or indirectly owns, is owned by or is under common ownership with Licensee, such transaction shall not be deemed an assignment for purposes of this Paragraph 12 (Assignments, etc.).

13. Subletting. The Licensee shall not sublet the whole or any part of the Water Resource except with the approval of the Board; provided that prior to the approval, the Board shall have the right to review and approve the rent to be charged to the sublessee; provided further that in the case where the Licensee is required to pay rent based on a percentage of its gross receipts, the receipts of the sublessee shall be included as part of the Licensee's gross receipts; provided further that the Board shall have the right to review and, if necessary, revise the rent of the Water Resource based upon the rental rate charged to the sublessee including the percentage rent, if applicable, and provided that the rent may not be revised downward.

14. Release and indemnity. The Licensee shall release, indemnify, defend, and hold the Licensor harmless from and against any claim or demand for loss, liability, or damage, including claims for bodily injury, wrongful death, or property damage, arising out of or resulting from: 1) any act or omission on the part of Licensee relating to Licensee's use or enjoyment of the Water Resource; 2) any failure on the part of the Licensee to protect the quality of the Water Resource; and 3) from and against all actions, suits, damages, and claims by whomsoever brought or made by reason of the Licensee's non-observance or non-performance of any of the terms, covenants, and conditions of this license or the rules, regulations, ordinances, and laws of the federal, state, municipal or county governments.

15. Costs of litigation. In case the Licensor shall, without any fault on Licensor's part, be made a party to any litigation commenced by or against the Licensee (other than condemnation proceedings), the Licensee shall pay all costs, including reasonable attorney's fees, and expenses incurred by or imposed on the Licensor; furthermore, the Licensee shall pay all costs, including reasonable attorney's fees, and expenses which may be incurred by or paid by the Licensor in enforcing the covenants and agreements of this license, in recovering possession of the premises, or in the collection of delinquent rental, taxes, and any and all other charges.

16. Liability insurance. The Licensee shall procure and maintain, at its cost and expense and acceptable to the Licensor, in full force and effect throughout the term of this license, general liability insurance, or its equivalent, with an insurance company or companies licensed or authorized to do business in the State of Hawaii with an AM Best rating of not less than "A- VIII" or other comparable and equivalent industry rating, in an amount of at least \$1,000,000.00 for each occurrence and \$2,000,000.00 aggregate, and with coverage terms acceptable to the Chairperson of the Board. The policy or policies of insurance shall name the State of Hawaii as an additional insured. A Certificate of Insurance required by the Licensor shall be filed with the State of Hawaii, Department of Land and Natural Resources.

The Licensee, prior to the use of the Water Resource or within fifteen (15) days from the effective date of this license, whichever is sooner, shall furnish the Licensor with a Certificate of Insurance required by the Licensor showing the policy(s) to be initially in force, keep the Certificate of Insurance required by the Licensor on deposit during the entire license term, and furnish a Certificate of Insurance required by the Licensor upon each renewal of the policy(s). This insurance shall not be cancelled, limited in scope of coverage, or nonrenewed until after thirty (30) days written notice has been given to the Licensor. The Licensor may at any time require the Licensee to provide Licensor with copies of the insurance policy(s) that are or were in effect during the license period or other documentation required by the Licensor.

The Licensor shall retain the right at any time to review the coverage, form, and amount of the insurance required by this license. If, in the opinion of the Licensor, the

insurance provisions in this license do not provide adequate protection for the Licensor, the Licensor may require Licensee to obtain insurance sufficient in coverage, form, and amount to provide adequate protection. The Licensor's requirements shall be reasonable and shall be designed to assure protection for and against the kind and extent of risks which exist at the time a change in insurance is required. The Licensor shall notify Licensee in writing of changes in the insurance requirements and Licensee shall deposit copies of acceptable Certificate of Insurance with the Licensor no later than thirty (30) days after receipt of the notice.

The procuring of the required policy(s) of insurance shall not be construed to limit Licensee's liability under this license nor to release or relieve the Licensee of the indemnification provisions and requirements of this license. Notwithstanding the policy(s) of insurance, Licensee shall be obligated for the full and total amount of any damage, injury, or loss caused by Licensee's negligence or neglect connected with this license.

It is agreed that any insurance maintained by the Licensor will apply in excess of, and not contribute with, insurance provided by Licensee's policy.

17. Bond or security deposit; Performance. The Licensee shall, at its own cost and expense, within fifteen (15) days from the effective date of this license, procure and deposit with Licensor and thereafter keep in full force and effect during the term of this license a good and sufficient surety bond, conditioned upon the full and faithful observance and performance by Licensee of all the terms, conditions, and covenants of this license, in the amount of \$30,000.00. This bond shall provide that in case of a breach or default of any of the license terms, covenants, conditions, and agreements, the full amount of the bond shall be paid to the Licensor as liquidated and ascertained damages and not as a penalty.

In the alternative, Licensee may deposit a security deposit, in the amount of \$30,000.00, in lieu of a surety bond. The Licensor shall be authorized to withdraw amounts from the security deposit in case of a breach or default of any of the license terms, covenants, conditions, and agreements, and the costs, expenses or loss incurred by Licensor as a result of such breach or default, on the condition that (a) Licensor provides

at least three (3) days prior notice to Licensee of its intent to withdraw from the security deposit and (b) if Licensee disputes Licensor's right to such withdrawal, any such withdrawal by Licensor shall be without prejudice to claims by Licensee that such withdrawal was not appropriate or warranted by Licensor.

18. Breach. Time is of the essence in this agreement. If the Licensee shall fail to pay the rent, or any part thereof, at the times and in the manner provided in this license and this failure shall continue for a period of more than thirty (30) days after delivery by the Licensor of a written notice of breach or default and demand for cure, by personal service, registered mail or certified mail to the Licensee, or if the Licensee shall become bankrupt, or shall abandon the diversion infrastructure associated with the Diversion Points or the hydroelectric generation facilities associated with this license, or if this license and Water Resource shall be attached or taken by operation of law, or if Licensee shall fail to observe and perform any of the covenants, terms, and conditions contained in this license and on its part to be observed and performed, and this failure shall continue for a period of more than sixty (60) days after delivery by the Licensor of a written notice of breach or default and demand for cure, by personal service, registered mail or certified mail to the Licensee at its last known address, the Licensor may, subject to the provisions of Section 171-21, Hawaii Revised Statutes, at once terminate this license without prejudice to any other remedy or right of action for arrears of rent or for any preceding or other breach of contract; and in the event of termination Licensor shall retain all rent paid in advance to be applied to any damages.

19. Condemnation. If at any time, during the term of this license, any portion of the Water Resource should be condemned, or required for public purposes by any county or city and county, the rent shall be reduced in proportion to the value of the portion of the premises condemned. The Licensee shall not by reason of the condemnation be entitled to any claim against the Licensor for condemnation or indemnity for leasehold interest and all compensation payable or to be paid for or on account of the leasehold interest by reason of the condemnation shall be payable to and be the sole property of the Licensor. The foregoing rights of the Licensee shall not be exclusive of any other to which Licensee may be entitled by law. Where the



portion taken renders the remainder unsuitable for the use or uses for which the Water Resource was licensed, the Licensee shall have the option to surrender this license and be discharged and relieved from any further liability.

20. Acceptance of rent not a waiver. The acceptance of rent by the Licensor shall not be deemed a waiver of any breach by the Licensee of any term, covenant, or condition of this license, nor of the Licensor's right to declare and enforce a forfeiture for any breach, and the failure of the Licensor to insist upon strict performance of any term, covenant, or condition, or to exercise any option conferred, in any one or more instances, shall not be construed as a waiver or relinquishment of any term, covenant, condition, or option.

21. Extension of time. Notwithstanding any provision contained in this license, when applicable, the Board may for good cause shown, allow additional time beyond the time or times specified in this license for the Licensee to comply, observe, and perform any of the license terms, conditions, and covenants.

22. Justification of sureties. Any bonds required by this license shall be supported by the obligation of a corporate surety organized for the purpose of being a surety and qualified to do business in the State of Hawaii, or by not less than two personal sureties, corporate or individual, for which justifications shall be filed as provided in Section 78-20, Hawaii Revised Statutes; provided, however, the Licensee may furnish a bond in like amount, conditioned as aforesaid, executed by it alone as obligor, if, in lieu of any surety or sureties, it shall also furnish and at all times thereafter keep and maintain on deposit with the Licensor security in certified checks, certificates of deposit (payable on demand or after a period the Licensor may stipulate), bonds, stocks or other negotiable securities properly endorsed, or execute and deliver to the Licensor a deed or deeds of trust of real property, all of a character which is satisfactory to Licensor and valued in the aggregate at not less than the principal amount of the bond. It is agreed that the value of any securities which may be accepted and at any time thereafter held by the Licensor shall be determined by the Licensor, and that the Licensee may, with the approval of the Licensor, exchange other securities or money for any of the deposited securities if in the judgment of the Licensor the substitute securities or money shall be at least equal in value to those withdrawn. It is further agreed that

substitution of sureties or the substitution of a deposit of security for the obligation of a surety or sureties may be made by the Licensee, but only upon the written consent of the Licensor and that until this consent is granted, which shall be discretionary with the Licensor, no surety shall be released or relieved from any obligation.

23. Waiver, modification, reimposition of bond and liability insurance provisions. Upon substantial compliance by the Licensee with the terms, covenants, and conditions contained in this license on its part to be observed or performed, the Licensor at its discretion may in writing, waive or suspend the performance bond requirements or may, in writing, modify the particular bond(s) or liability insurance requirements by reducing its amount; provided, however, that the Licensor reserves the right to reactivate the bonds or reimpose the bond(s) or liability insurance in and to their original tenor and form at any time throughout the term of this license.

24. Quiet enjoyment. The Licensor covenants and agrees with the Licensee that upon payment of the rent at the times and in the manner provided and the observance and performance of these covenants, terms, and conditions on the part of the Licensee to be observed and performed, the Licensee shall have use of the Water Resource for the term of the license, without hindrance or interruption by the Licensor or any other person or persons lawfully claiming by, through, or under it.

25. Surrender. The Licensee shall, at the end of the term or other sooner termination of this license, peaceably cease the use of the Water Resource. Furthermore, upon the expiration, termination, or revocation of this license, should the Licensee fail to cease the use of the Water Resource, the Licensee shall be liable for and shall pay to Licensor an amount that is equal to the annual rental amount in effect on the date of termination, prorated on a daily basis for the period from the date of termination of this license to the date that Licensee ceases the use of the Water Resource. This provision shall survive the termination of the license.

26. Non-warranty. The Licensor does not warrant the availability or quality of the Water Resource. Availability of the quantity of water is subject to Paragraph 2 (Right to Withdraw) above.

27. Hazardous materials. Licensee shall not cause or permit the escape, disposal or release of any hazardous materials except as permitted by law. Licensee shall not allow the storage or use of such materials in the vicinity of the Diversion Point(s) or Return Point(s) in any manner not sanctioned by law or by the highest standards prevailing in the industry for the storage and use of such materials. If any lender or governmental agency shall ever require testing to ascertain whether or not there has been any release of hazardous materials by Licensee, then the Licensee shall be responsible for the reasonable costs thereof. In addition, Licensee shall execute affidavits, representations and the like from time to time at Licensor's request concerning Licensee's best knowledge and belief regarding the presence of hazardous materials in or near the Wailuku River placed or released by Licensee.

Licensee agrees to release, indemnify, defend, and hold Licensor harmless, from any damages and claims resulting from the release of hazardous materials in or near the Wailuku River during the term of this license and in association with the use of the Water Resource. These covenants shall survive the expiration or earlier termination of the license.

For the purpose of this license "hazardous material" shall mean any pollutant, toxic substance, hazardous waste, hazardous material, hazardous substance, or oil as defined in or pursuant to the Resource Conservation and Recovery Act, as amended, the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, the Federal Clean Water Act, or any other federal, state, or local environmental law, regulation, ordinance, rule, or by-law, whether existing as of the date hereof, previously enforced, or subsequently enacted.

28. Hawaii law. This license shall be construed, interpreted, and governed by the laws of the State of Hawaii.

29. Exhibits - Incorporation in license. All exhibits referred to are attached to this license and hereby are deemed incorporated by reference.

30. Headings. The article and paragraph headings herein are inserted only for convenience and reference and shall in no way define, describe or limit the scope or intent of any provision of this license.

31. Partial invalidity. If any term, provision, covenant or condition of this license should be held to be invalid, void or unenforceable, the remainder of this license shall continue in full force and effect and shall in no way be affected, impaired or invalidated thereby.

32. Force Majeure. If either party believes an event of Force Majeure, including, without limitation, an act of God, acts of war, terrorism, civil disorders, strikes, government regulation, civil or military authority or any other cause beyond the reasonable control of a party, which excuses performance of either party hereunder is likely to be permanent, such party may notify the other party of such belief. Such notice shall state the reasons for the belief that the event of Force Majeure will be permanent and why there are no steps which can be taken at a commercially reasonable cost to eliminate such Force Majeure event. The party receiving such notice shall respond within thirty (30) days stating either (i) that it concurs that the Force Majeure event is likely to be permanent, or (ii) that it disagrees that such Force Majeure event is likely to be permanent and its reasons therefor. Unless otherwise mutually agreed, this license shall be terminated if both parties concur that the Force Majeure event is likely to be permanent.

33. Counterparts. This license may be executed in two or more counterparts, each of which when so executed and delivered shall be deemed to be an original and all of which together shall be deemed to be one and the same instrument.

34. Incorporation by reference. References in this license to various parcels of land are in accordance with those designated in the Notice of Sale and the Instructions to Bidders which, together with the Notice to Bidders, are incorporated and made a part of this license. The terms of this license shall govern where there is any inconsistency between the license terms and the terms contained in the Notice to Bidders.

#### SPECIAL CONDITIONS

35. Clearances. The Licensee shall be responsible for obtaining all necessary federal, state or county clearances.



36. Audit of Water Resource. The Licensee shall, at all reasonable times, permit the Licensor or its authorized agents and employees, upon reasonable notice of at least seventy-two (72) hours given by the Licensor, to audit, examine and to make copies of information relating to Licensee's use of the Water Resource for hydroelectric generation purposes, which shall include the electrical output in kilowatt hours generated by the use of the Water Resource, and any measurements collected by Licensee relating to the use of the Water Resource for hydroelectric generation purposes. Licensor shall not have the right to audit any other records of Licensee.

37. Environmental regulations. Licensee shall comply with all applicable federal, state and county environmental impact regulations, including but not limited to chapter 343, Hawaii Revised Statutes, as amended, and regulations governing historic preservation.

38. Assignment to bondholders. The Licensee shall be allowed to assign the license to the trustee for the bondholders subject to the prior approval of the Board.

39. Watershed Management Plan. No later than sixty (60) days following the effective date of this license, Licensee shall enter into written agreement with the Licensor for the implementation of a watershed management plan which management plan shall include, but not be limited to, the prevention of degradation of surface water quality of the Wailuku River to the extent that degradation can be avoided using reasonable management practices.

40. Stream Monitoring Equipment. Licensee shall work with the Commission on Water Resource Management to determine the appropriate stream monitoring equipment and develop a cost share for such equipment to assist with determining the amounts of water necessary to remain in the Wailuku River per Section 2.b (Right to Withdraw) of this License.

41. Water for farm, ranch and other public uses. Pursuant to section 171-58(d), Hawai'i Revised Statutes, as amended, Licensee shall provide from the Water Resource to any farmer or rancher engaged in irrigated pasture operations, crop farming, pen feeding operations, or raising of grain and forage crops, or to those public uses and purposes as may be determined by the board, at the same rental price paid under this license,

plus the proportionate actual costs, as determined by the board, to make this Water Resource available, so much of the Water Resource as is determined by the board to be surplus to Licensee's needs and for that minimum period as the board shall accordingly determine; provided, however, that in lieu of the payment for the Water Resource or such portion as may be taken for public uses and purposes, the board may elect to reduce the rental price under this license in proportion to the value of the Water Resource and the proportionate actual costs of making the water available. Pursuant to Paragraph 2 (Right to Withdraw), Licensee shall also have the option to surrender this license and be discharged and relieved from any further liability if the portion withdrawn renders the remainder unsuitable or of inadequate quantity for the use or uses for which the Water Resource was licensed.

#### Definitions.

1. The use of any gender shall include all genders, and if there is more than one lessee, then all words used in the singular shall extend to and include the plural.

2. As used in this license, unless clearly repugnant to the context:

(a) "Chairperson" means the Chairperson of the Board of Land and Natural Resources of the State of Hawaii or his/her successor.

(b) "Licensee" means and includes the Licensee, its officers, employees, invitees, successors or permitted assigns.

(c) "Wailuku River" shall mean the Wailuku River at Piihonua, South Hilo, Island of Hawai'i, Hawai'i.

(d) "Waste" includes, but is not limited to, (1) utilizing the Water Resource in an uneconomic and inefficient manner; (2) for a purpose not authorized under this license; and (3) permitting significant degradation in the quality of the Water Resource.

(e) "Days" shall mean calendar days, unless otherwise specified.

(f) "Board" shall mean the Board of Land and Natural Resources.

[Remainder of page intentionally left blank;  
signatures follow on next page]

DRAFT

IN WITNESS WHEREOF, the STATE OF HAWAII, by its Board of Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and the parties hereto have caused these presents to be executed the day, month and year first above written.

STATE OF HAWAII

Approved by the Board of Land and Natural Resources at its meeting held on \_\_\_\_\_.

By  
SUZANNE D. CASE  
Chairperson  
Board of Land and  
Natural Resources

LESSOR

LESSEE

APPROVED AS TO FORM:

\_\_\_\_\_  
Deputy Attorney General

Dated:



STATE OF HAWAII )  
 ) SS.  
COUNTY OF )

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me personally appeared \_\_\_\_\_ and \_\_\_\_\_, to me known to be the person(s) described in and who executed the foregoing instrument and acknowledged that \_\_\_\_\_ executed the same as free act and deed.

Notary Public, State of Hawaii

My commission expires:

STATE OF HAWAII )  
 ) SS.  
COUNTY OF )

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me appeared \_\_\_\_\_ and \_\_\_\_\_, to me personally known, who, being by me duly sworn, did say that they are the \_\_\_\_\_ and \_\_\_\_\_, respectively of \_\_\_\_\_, a Hawaii corporation, and that said instrument was signed in behalf of said corporation by authority of its Board of Directors, and the said \_\_\_\_\_ and \_\_\_\_\_ acknowledged said instrument to be the free act and deed of said corporation.

Notary Public, State of Hawaii

My commission expires:

STATE OF HAWAII )  
 ) SS.  
COUNTY OF )

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
before me personally appeared  
and \_\_\_\_\_, 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 capacity shown,  
having been duly authorized to execute such instrument in such  
capacity.

Notary Public, State of Hawaii

\_\_\_\_\_  
My commission expires:

# EXHIBIT C

# Wailuku Watershed Management Plan

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2022

Prepared by:

The State of Hawai'i  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
1151 Punchbowl Street  
Honolulu, Hawai'i 96813

AND

[Name and Address of Water Lessee]

Pursuant to:

§171-58(e) Hawai'i Revised Statutes

Watershed(s): Wailuku, Hawai'i Island

Water Lease No. \_\_\_\_\_



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## Part 1. Purpose

Hawaii's watershed forests directly contribute to fresh water supply and must be properly managed in order to protect current and future fresh water resources.<sup>1</sup> As part of the water lease requirements, pursuant to section 171-58(e) of Hawaii Revised Statutes (HRS), water lessees must jointly develop and implement a watershed management plan with the Department in order to prevent the degradation of surface water and ground water quantity and quality within the water lease area.

Through this lens, [Name of Water Lessee], in partnership with the Department of Land and Natural Resources (Department) has developed this plan to satisfy the requirements of HRS section 171-58(e). This plan is specific to the watershed(s) associated with the lease (the sources that feed the lease area) and management is based on current needs and estimated costs associated with implementation. Management actions are informed by the following existing watershed management plans, which are referenced herein and attached as appendices.

- ❖ Mauna Kea Watershed Alliance (MKWA), Mauna Kea Watershed Management Plan (2010)
- ❖ Department of Hawaiian Home Lands (DHHL), `Āina Mauna Legacy Program (2009)
- ❖ Division of Forestry and Wildlife (DOFAW), Hilo Forest Reserve Management Plan (Draft)

[Paragraph to explain who the water lessee is and why they need the water]

Under Water Lease No. \_\_\_\_\_ (Water Lease), [Name of Water Lessee] proposes to use \_\_\_\_\_ million gallons of water per day (MGD).

This plan is considered a living document and will be updated every five (5) years during the term of the Water Lease. Management actions and management costs are subject to change as discussed below in Part 4. Budget – Wailuku Watershed.

Successful implementation of the plan will increase water supplies in the Wailuku River that contribute to hydropower as well as continuous flow that sustains stream life and the cultural importance of the river. While climate change will be the main factor affecting stream flow, land cover in the watershed also dramatically influences water quantity as well as the stability of flow. Numerous studies have documented the effects of vegetation, particularly multi-storied ecosystems, which lead to water infiltration into aquifers rather than run-off into streams –

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<sup>1</sup> <https://dlnr.hawaii.gov/rain/files/2014/02/The-Rain-Follows-the-Forest.pdf>

increasing stable baseflow levels while reducing harmful flash flooding events.<sup>2</sup> In Hawai'i, native forests are characterized by these multi-storied vegetation structures with canopy, mid-level plants, and ground cover. Invasive vegetation in Hawai'i rarely exhibits these characteristics as they tend to have a mono-type overstory that shades out all ground cover. The multi-story native ecosystem is also more conducive to absorbing large quantities of cloud moisture into the aquifer.<sup>3</sup> Finally, common invasives in Hawai'i such as strawberry guava have been shown to evapotranspire more than native 'ōhi'a trees, further emphasizing the need to protect and restore the native forests that have evolved over millennia on the flanks of Mauna Kea.

The goals of this plan are consistent with Chapter 195D, Hawaii Revised Statutes, which seeks to protect indigenous plants and wildlife.

## Part 2. Watershed Inventory

Mauna Kea, Hawai'i Island's tallest mountain, provides the primary source of water for the Wailuku watershed area. Primary water inputs to Mauna Kea's ground and surface water resources are rainfall, snow, and fog drip. The wet forests of Mauna Kea are vital to the capture of rainfall that fills the aquifer and streams. The Wailuku River is the second longest perennial river in the state of Hawai'i (total stream length is 196 miles) and the largest source of surface water to Hilo Bay. An average of 275 million gallons of water flows through the Wailuku to Hilo every day. During intense storms, the discharge can be more than 20 times greater.

Multiple watershed plans have described in detail the natural resources of the Wailuku watershed, linked at the end of this document. In summary, the Wailuku River is habitat for three native species of fish, and 35 species of invertebrates, primarily insects. The Wailuku watershed contains approximately 80,000 acres of native forest, home to multiple endangered plant, insect, and forest bird species. This plan aims at preventing further degradation of the existing native forest, as well as outplanting to restore degraded areas.

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<sup>2</sup> Berio Fortini, L., Leopold, C.R., Perkins, K.S. Chadwick, O., Yelenik, S., Jacobi, J., Bishaw, K., Gregg, M., Rosa, S., 2021. Landscape level effects of invasive plants and animals on water infiltration through Hawaiian tropical forests. *Biol Invasions*. <https://doi.org/10.1007/s10530-021-02494-8>

<sup>3</sup> Takahashi, M., Giambelluca, T. W., Mudd, R. G., DeLay, J. K., Nullet, M. A. and Asner, G. P. 2011. Rainfall partitioning and cloud water interception in native forest and invaded forest in Hawai'i Volcanoes National Park. *Hydrological Processes*, 25: 448–464. doi: 10.1002/hyp.7797.

# Wailuku Watershed

## Legend

- Barren
- Human-dominated landscape
- Non-native forest or grassland
- Native forest

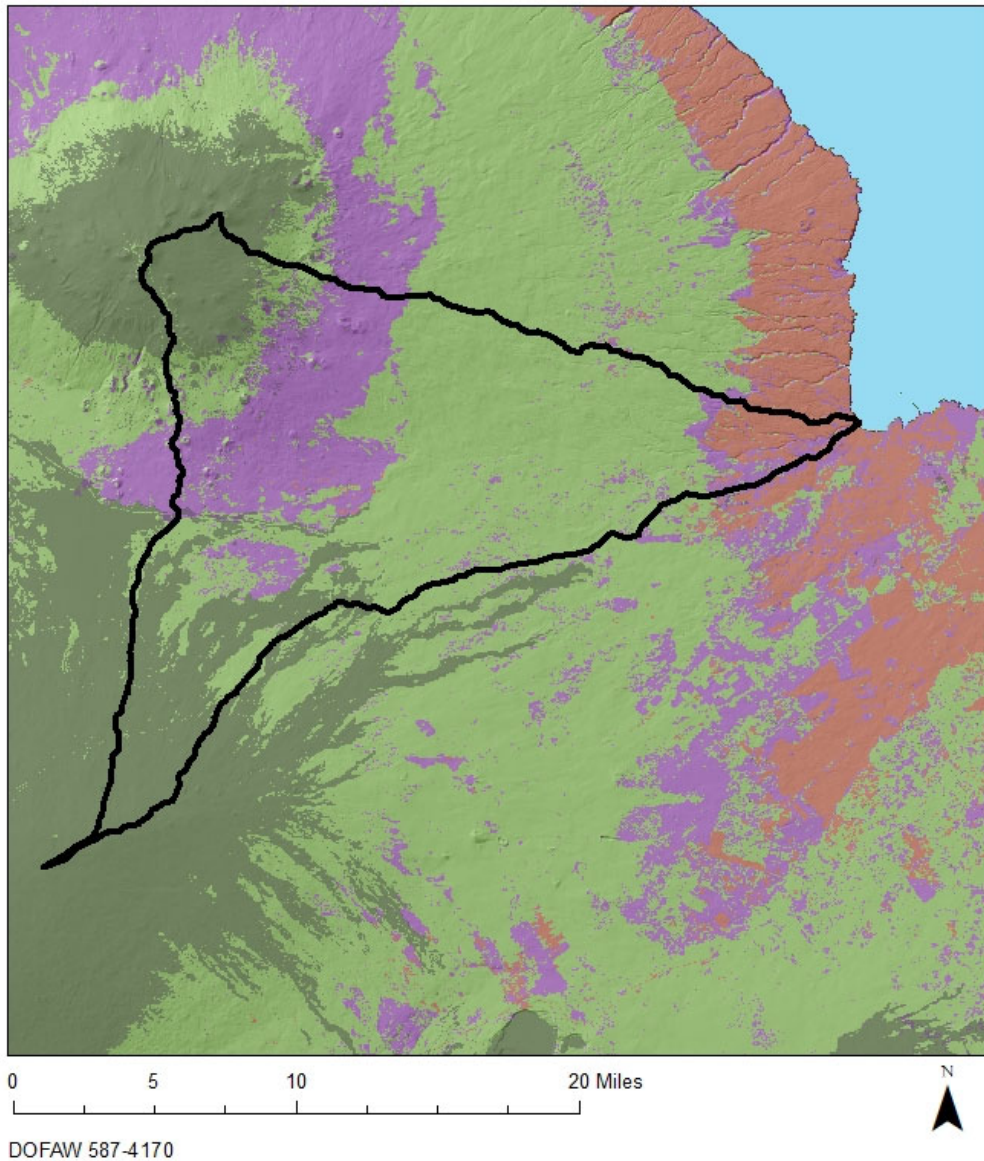
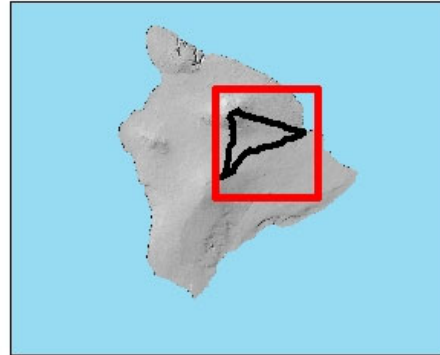


Figure 1 Habitat quality in the Wailuku Watershed

This plan seeks to maintain and stabilize stream flow by protecting native vegetation within the watershed. The main threats to the native vegetation in the Wailuku watershed are invasive plants such as gorse and strawberry guava and ungulates such as feral pigs, sheep, goats and cattle. These feral animals wound trees through rubbing, digging, tusking, and trampling, creating sites for the infection of rapid 'ōhi'a death (ROD). Within the 142,000-acre watershed, approximately 19,000 acres is fenced from feral sheep and goats as part of the palila critical habitat fence. However, this area is largely barren and receives little moisture. An additional 3,000 acres is protected from feral animals within the Hakalau Forest National Wildlife Refuge and the Waimau (a.k.a.: Waipahoehoe) fence unit. DOFAW and DHHL have been attempting to remove feral cattle from the forest and are constructing cattle-proof fences and offering public hunts. However, there are still significant wild populations of these destructive animals.

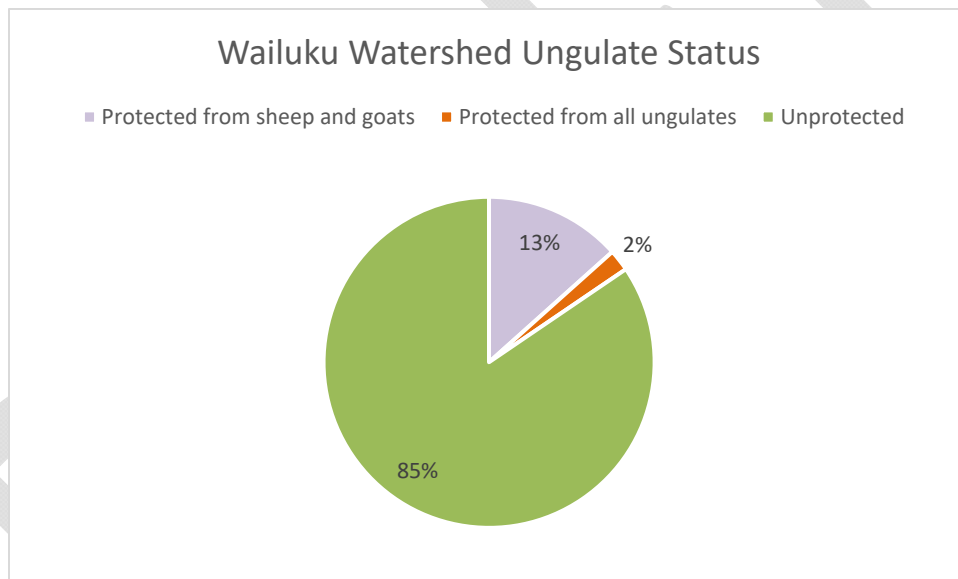


Figure 2 Ungulate status across 142,000-acre watershed

Invasive vegetation constitutes approximately 25,000 acres of the Wailuku watershed. This largely constitutes grasslands invaded by gorse in the upland elevation, and strawberry guava-dominated vegetation in the lowlands near human-dominated landscapes.



## Part 3. Goals, Objectives, Management Actions, Methods, and Monitoring

In Hawai'i, it is understood that "The Rain Follows the Forest". Forests act like a sponge, collecting rain and moisture, slowly delivering fresh water into streams and aquifers. Without forests, there is no water. In order to increase water security, the upland native forest and vegetation must be kept healthy and robust. In practice, maintenance of the upper elevations where habitat is more intact is far more cost effective than trying to restore native biodiversity in areas where the native forest has been totally removed. In general, the goal of watershed protection is to identify priority outcomes essential to maintain or restore watershed integrity to the maximum function and yield. The goals and actions are focused on:

- a. Directing intensive effort to contain and reduce target invasive species (i.e. gorse) at upper elevation areas while they are incipient, keeping their numbers as low as practicable.
- b. Directing management effort at degraded areas where native canopy still exists as needed to maintain and increase native biodiversity and watershed function, prevent further degradation, and/or target selected species that pose special threats.

<b>Goal 1. Removal and control of non-native hooved animals (pigs, goats, deer, sheep, cattle) from important watershed forests.</b>			
<b>Action</b>	<b>Metric</b>	<b>Timeline</b>	<b>Lead</b>
1a. Construct new Nukupahu watershed fence	1,000 acres	2023	DOFAW
1b. Construct new cattle fences (Pi'ihonua)	3175 acres	2021	DHHL
1c. Remove feral cattle from Hilo Forest Reserve and fenced areas.	Zero detections in aerial and ground monitoring	2025	DOFAW/DHHL/MKWA
1d. Maintain existing and new fence units and remove ungulates (Waimau, Hakalau, Mauna Kea, and cattle fences)	Approx. 36 miles	Yearly	DOFAW/DHHL/MKWA

<b>Goal 2: Removal or containment of damaging invasive plants that threaten important watershed forests.</b>			
<b>Action</b>	<b>Metric</b>	<b>Timeline</b>	<b>Lead</b>
2a. Contain gorse population through ground and aerial methods	100 acres	Yearly	DHHL/MKWA

<b>Goal 3: Monitoring and controlling other forest threats including fires, predators, and plant diseases.</b>			
<b>Action</b>	<b>Metric</b>	<b>Timeline</b>	<b>Lead</b>
3a. Aerial mapping and ground mapping of vegetation condition	30,000 acres surveyed	Every 5 years	DOFAW
3b. ROD mapping and monitoring	As needed	Yearly	DOFAW
3c. Installation of two water tanks for fire suppression	2 water tanks installed	2022	MKWA
3d. Maintenance of existing roads for wildfire breaks and access	3 miles/year	Yearly	DOFAW/MKWA

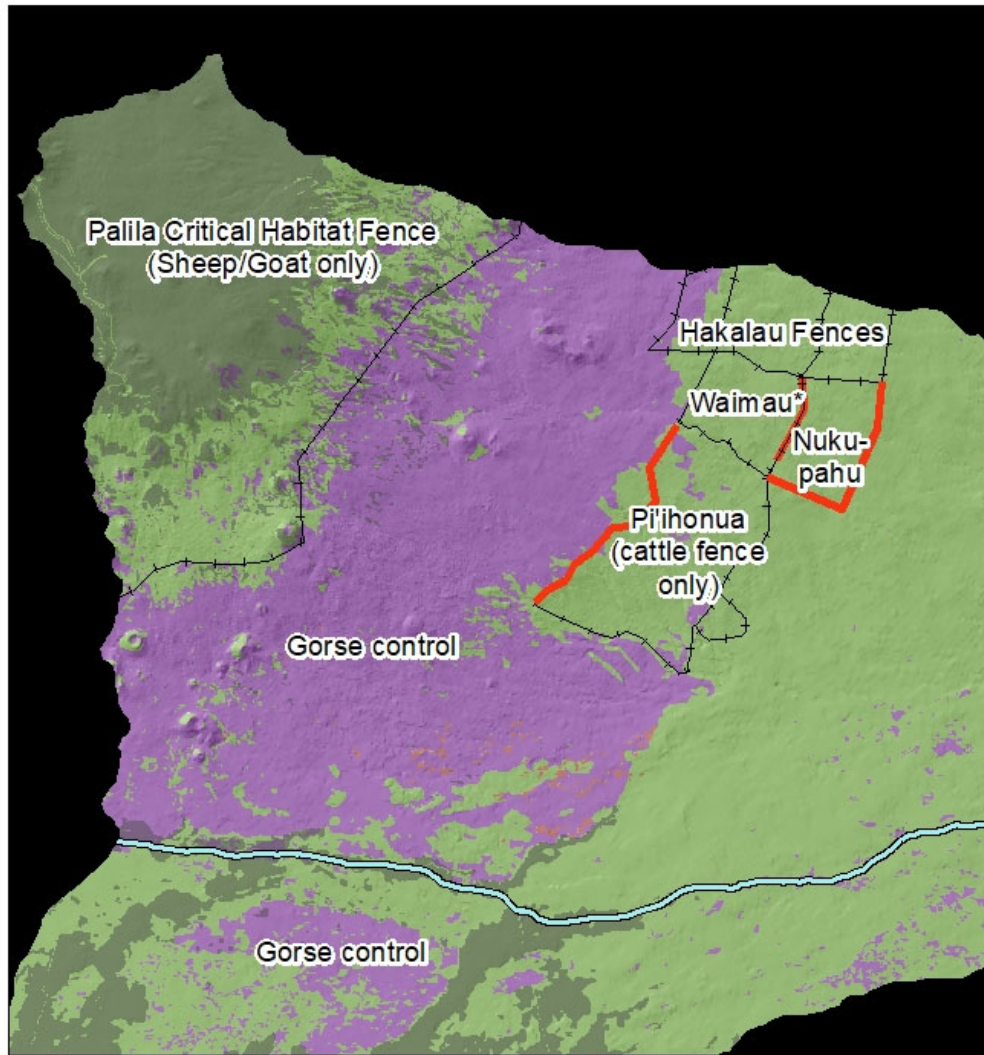
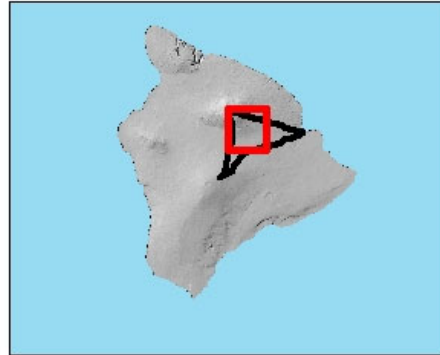
<b>Goal 4: Restoring and out-planting native species in important watershed areas and buffer zones as needed.</b>			
<b>Action</b>	<b>Metric</b>	<b>Timeline</b>	<b>Lead</b>
4a. Passive restoration through ungulate and weed suppression	See goals 1 & 2		
4b. Seed collection and propagation and outplanting (7,000 seedlings)	24 acres planted	Yearly	MKWA

<b>Goal 5: Communication, outreach and community education to build capacity for citizen-based watershed protection.</b>			
<b>Action</b>	<b>Metric</b>	<b>Timeline</b>	<b>Roles</b>
5a. Arrange for [Name of Water Lessee] employees to participate in MKWA activities, such as re-planting damaged forest areas, invasive plant removal, and educational field trips.	As needed	Yearly	DOFAW/MKWA/[Name of Water Lessee]

Partners will employ adaptive management strategies based on results from aerial and ground monitoring transects to determine the status of ungulate and weed population and distribution, seedling survivorship, and other indicators such as canopy cover of native forest compared to baseline and ROD detections.

# Wailuku Management

- +— Completed Fence
- Proposed Fence
- Barren
- Human-dominated landscape
- Non-native forest or grassland
- Native forest
- Daniel K. Inouye Highway



0 3 6 12 Miles

\*Waimau is an under construction fenced area where planting efforts will be focused.  
DOFAW 587-4170

## Part 4. Budget – Wailuku Watershed

Item	Cost/Year
Mauka Boundary Fence Replacement (10 miles)	\$ 50,000.00
ROD & invasive species monitoring	\$ 25,000.00
Proposed Nukupahu 1,000 Ac unit*	\$ 100,000.00
Nukupahu maintenance and ungulate removal	\$ 50,000.00
Cattle control	\$ 50,000.00
Half of field team (3 FTE, 2 interns)	\$ 110,000.00
Per diem weekly camping	\$ 15,000.00
Bulldozing, fuelbreaks, road maintenance ~3 miles annually	\$ 24,000.00
Helicopter time gorse control w/boom 100 acres/year	\$ 5,000.00
Helicopter time gorse control w/nozzle	\$ 10,000.00
Seed collection	\$ 2,000.00
Site prep for outplanting 24 acres/year	\$ 10,000.00
Procure 7,000 seedlings	\$ 21,000.00
Water catchment (2 tanks)*	\$ 5,000.00
Vehicles (repairs, fuel)	\$ 42,000.00
UTV/ATV (repairs, fuel)	\$ 28,000.00
Administration (0.5 FTE)	\$ 22,500.00
Equipment misc.	\$ 24,000.00
Supplies misc.	\$ 24,000.00
<b>ANNUAL MANAGEMENT COSTS</b>	<b>\$ 617,500.00</b>

\*One-time capital improvement costs amortized over a 10-year period.

### Proposed Watershed Management Cost-Share Contribution:

Sources of funding for these activities include State funding from the Division of Forestry and Wildlife, Department of Hawaiian Homes Lands, federal grants from U.S. Fish and Wildlife Service, U.S. Forest Service, and the Natural Resources Conservation Service.

Current management funding is inadequate for the budgeted action items. Approximately \$235,000 per year of operating funding is allocated to the Mauna Kea Watershed Alliance from the Division of Forestry and Wildlife, which works across the entire mountain. Similarly, \$700,000 of operational funding is provided to the DOFAW Hawaii island Forestry program. However, the Hilo Watershed Forest Reserve is approximately a tenth of the entire acreage of the forest reserve system on Hawaii island. Recent capital improvement project funding has been provided for cattle fence construction and the Waimau and Nukupahu fence unit. In addition to the

funding proposed to be contributed by lessee, additional grants will be needed to supplement the yearly costs of managing this watershed.

As referenced above in Part 1. Purpose, this plan will be updated every five (5) years during the term of the Water Lease. Following the initial 5-year period under the Water Lease (i.e., 2022-2027), the cost share amount to be paid by [Name of Water Lessee] shall be adjusted by the five (5) year cumulative Consumer Price Index (CPI) for the Metropolitan Statistical Area of Honolulu, Hawaii. Thereafter, the cost share amount shall be adjusted at the end of every fifth year by the cumulative CPI for the previous five (5) year period until the expiration or earlier termination of the Water Lease. Staff believes that this is a fair result for both the Department and the licensee, as the CPI adjustment would be an objective measure that allows the licensee to anticipate future costs. Furthermore, it would provide DOFAW with a stable income stream to support ongoing management activities in the event of a budget reduction.

**Watershed Management Cost-Share Formula =  
Usage (MGD) divided by available (MGD) multiplied by \$ Annual Management Cost**

[Name of Water Lessee] usage: 56 MGD  
Median Wailuku flow: 250 MGD  
Percentage of median stream flow used by [Name of Water Lessee]: 22.4%  
Annual management costs: \$617,500  
Proposed [Name of Water Lessee] contribution to management costs per year: \$ 138,320

#### Proposed Discount to Watershed Management Cost-Share Contribution:

Discounts are proposed for uses that are non-consumptive and reduce carbon emissions which is a key strategy for climate change mitigation and forest health. The forests represented in the annual management cost (\$617,500) occupy approximately 80,211.2 acres in the Wailuku hydrologic unit, resulting in a watershed management cost of \$7.698 per acre. According to the Environmental Protection Agency (EPA) generalized greenhouse gas emissions data<sup>4</sup>, each acre of forest sequesters the equivalent of 0.84 metric tons of carbon. The cost share discount will convert the tons of carbon saved<sup>5</sup> to forest acres, and then multiply that by the cost per acre to calculate a discount.

**Discount =  
Cost per Acre (\$) multiplied by Forested Acres of Carbon Captured**

<sup>4</sup> <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>

<sup>5</sup> For non-consumptive use (e.g.: hydropower), tons of carbon saved will be based on the MWhr generated per year. This may differ from year to year, resulting in a change to the discount rate. Discount rates will be reassessed annually.



Wailuku Watershed management cost per acre: \$617,500 divided by 80,211.2 acres = \$7.698  
Forested Acres of Carbon Captured: 13,931 acres \_\_\_\_\_  
Proposed [Name of Water Lessee] discount to management costs per year:  
\$107,240 \_\_\_\_\_

#### Final Watershed Management Cost-Share Contribution:

**Final Watershed Management Cost-Share =  
Watershed Management Cost-Share Amount minus Discount Amount**

[Name of Water Lessee] watershed cost-share: \$138,320 \_\_\_\_\_  
Carbon discount for non-consumptive use: \$ 107,240 \_\_\_\_\_  
[Name of Water Lessee] annual watershed management cost-share: **\$31,080.00 per year  
(rounded).** \_\_\_\_\_

#### Part 5. References, Sources, Appendices

Mauna Kea Watershed Management Plan

<https://drive.google.com/file/d/16KrnNZKV0-S6ukwXJf7iVsri100P-KjG/view?usp=sharing>

`Āina Mauna Legacy Program

<http://dhhl.hawaii.gov/po/beneficiary-consultation/beneficiary-consultation-archives/aina-mauna-legacy-program/>

Board of Land and Natural Resources, Submittal D-2, October 11, 2019

<https://dlnr.hawaii.gov/wp-content/uploads/2019/10/D-2.pdf>