State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Engineering Division
Honolulu, Hawaii 96813

August 23, 2024

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

Request Approval of Kapalaalaea Reservoir (MA-0094) Dam Safety Permit Application and Authorization for the Chairperson and Department to Issue the Dam Safety Permit No. 88 for Removal with Stipulated Terms and Conditions Pursuant to Hawaii Revised Statutes Chapter 179D and Applicable Chapter 13-190.1, Hawaii Administrative Rules, Haiku, Maui, Hawaii, TMK (2) 2-8-007:001.

The Engineering Division (Division) recommends approval of the subject Dam Safety permit application and authorization for the Chairperson and Department to issue the Dam Safety Permit No. 88 with stipulated terms and conditions for the Kapalaalaea Reservoir removal project, pursuant to Hawaii Revised Statutes Chapter 179D and current Administrative Rules.

APPLICANTS and LAND OWNERS
East Maui Irrigation Company, LLC
Mark Vaught, Director, Water Resources
P.O. Box 1104
Pu'unene, HI 96784

SUMMARY OF REQUEST
The Kapalaalaea Reservoir dam will be breached to remove the downstream risk of a dam failure. The breach will remove the majority of the embankment with the excavated material regraded onto the site, avoiding the natural stream channel. The disturbed areas will be seeded, and the excavated breach slopes will be protected with riprap up to the 100-year flood level. The site will be allowed to return to its pre-dam condition. (See Exhibit 1 for the dam safety permit application.)

LOCATION
Haiku, Maui, Hawaii, TMK: (2) 2-8-007:001. (See Exhibit 2 for maps)

BACKGROUND
The Kapalaalaea Reservoir was originally constructed in 1885 and is a state-regulated dam (MA-0094), under the jurisdiction of the State of Hawaii Department of Land and Natural Resources (DLNR) dam and reservoir safety program. The DLNR dam and reservoir safety program is authorized under HRS 179D and administered by Hawaii Administrative Rules, Title 13, Chapter 190.1 – Dams and Reservoirs. Kapalaalaea Reservoir is one of the many (approximately 55) reservoirs located on Maui that were

constructed by Alexander & Baldwin, Inc. (A&B) during the late nineteenth and early twentieth centuries to provide water supply for an island-wide irrigation system for sugar cane fields. Mahi Pono, LLC currently owns and maintains the Kapalaalaea Reservoir. The Kapalaalaea Reservoir is located between the towns of Haiku and Huelo in Maui County, Hawaii, situated along the northern slopes of the Haleakalā Volcano. The Kapalaalaea Reservoir consists of an earthen embankment dam, a reservoir, a regulated low-level outlet, an uncontrolled spillway, and a regulated inlet. The embankment dam has a maximum height of 48 feet and is approximately 230 feet long. The dam can impound up to approximately 153 acre-feet of water at the spillway crest, with a maximum capacity of 197 acre-feet at the embankment crest. Water inflow comes from the Lowrie Ditch, which is part of the irrigation system, and from a small upstream watershed of approximately 0.89 square miles. The reservoir drains to Papalua Stream, which flows north to Pilale Bay of the Pacific Ocean.

The dam is classified by DLNR as an intermediately sized dam with a “High” hazard classification, meaning that the failure of the dam or reservoir will result in probable loss of human life. However, the reservoir has been drained since 2007 after a sinkhole was discovered in the upstream face of the dam. During an investigation into the cause of the sinkhole, GEI Consultants (GEI), who performed the Phase I Inspection of the dam and reservoir in 2007 (with the report dated 2010), indicated that the problem may lie with the outlet works being compromised and have allowed the embankment’s interior to be eroded, describing this as a “very serious potential dam safety deficiency” (GEI, 2010). Until this outlet works issue is addressed, GEI recommended that the reservoir remain empty. Mahi Pono has continued to keep the low-level outlet open to allow water to pass through the site. However, during annual DLNR inspections, water has been impounded in the reservoir during and after rain events.

DESCRIPTION

The owners propose to remove to the dam structure and return the site to its pre-dam condition. The reservoir will be breached to remove the downstream risk of a dam failure. The breach will remove the majority of the embankment with the excavated material regraded onto the site, avoiding the natural stream channel. The disturbed areas will be seeded, and the excavated breach slopes will be protected with riprap up to the 100-year flood level. (See Exhibit 3 for construction plans.)

CHAPTER 343 - HRS – ENVIRONMENTAL ASSESSMENT

East Maui Irrigation Company, LLC conducted an HRS-343 environmental assessment evaluation of the project and concluded the proposed action does not trigger an environmental assessment. (See Exhibit 4.)

HAWAII REVISED STATUTES CHAPTER 6E-8 HISTORIC PRESERVATION REVIEW

The Division consulted with the State Historic Preservation Division (SHPD) for compliance with Chapter 6E-8 requirements. SHPD reviewed the proposed project, designated as SHPD Project No. 2022PR01311 named Kapalaalaea Reservoir (MA-0094) Removal. The ILS (Intensive Level Survey) has been accepted by SHPD and

notified both DLNR Engineering and USACE the project initiation may begin. (See Exhibit 5 for SHPD's MOA).

AGENCY CONSULTATION

The Division distributed notices to various agencies for their comments on this application. A summary of their responses is included in Exhibit 6.

KA PA'AKAI ANALYSIS

In consultation with Ahu Moku, the Division conducted a Ka Pa'akai Pre-Assessment analysis of the proposed project and determined the project will not impact Native Hawaiian traditional cultural resources or practices. Aha Moku confirmed a more detailed DLNR Ka Pa'akai Consultation Assessment is not required. (See Exhibit 7.)

REMARKS

The applicant/owner completed a design report and construction plans, and requests approval of a dam safety permit. The Division has reviewed the documents and concluded it is sufficient for its intended purposes. Staff recommends approval of this permit application with the Dam Safety General Permit Conditions. (See Exhibit 8.)

GENERAL DAM INFORMATION

General dam information on Kapalaalaea Reservoir (MA-0094) from the State of Hawaii Dam Safety office is provided in Exhibit 9 for reference.

RECOMMENDATION

1. Authorize the approval and issuance of Dam Safety Permit No. 88 for the Kapalaalaea Reservoir Removal Project (MA-0094).
2. Authorize the Chairperson to issue a Dam Safety Permit for removal of the Kapalaalaea Reservoir (MA-0094), subject to such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.
3. Authorize the Department to oversee performance of the permitted work and take appropriate action including, but not limited to, amending the permit, issuance of fines and/or revocation of the permit, if necessary.
4. Authorize the Department to remove the Kapalaalaea Reservior (MA-0094) from the Hawaii dam inventory of regulated dams as stipulated in Hawaii Revised Statutes Chapter 179D, upon satisfactory completion of the construction project and acceptance of final compliance documentation.

Respectfully submitted,

CARTY S. CHANG
Chief Engineer

APPROVED FOR SUBMITTAL:

DAWN N.S. CHANG, Chairperson
Board of Land and Natural Resources

Exhibits:
1. Owner's dam safety permit application
2. Location map
3. Construction drawing pages
4. Chapter 343-HRS exemption
5. HRS Chapter 6E-8 Historic Preservation review
6. Agency consultation summary
7. Ka Pa'akai Pre-Assessment Form
8. General permit conditions
9. Kapalaalaea Reservoir Dam Safety overview summary

EXHIBIT 1

APPLICATION FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR THE CONSTRUCTION, ENLARGEMENT, REPAIR, ALTERATION, OR REMOVAL OF DAMS IN THE STATE OF HAWAII

Introduction

The Department of Land and Natural Resources (DLNR) Engineering Division administers the State Dam and Reservoir Program as authorized under Hawaii Revised Statutes Chapter 179D (HRS) and Hawaii Administrative Rules Title 13, Department of Land and Natural Resources, Sub-Title 7 – Water and Land Development, Chapter 190.1 – Dams and Reservoirs, (HAR). Requirements for obtaining an approval for the construction, enlargement, repair, alteration, or removal of dams and reservoirs are derived from the (HRS) and Hawaii Administrative Rules (HAR) and the steps for obtaining a dam safety permit are outlined in this application form. Any omissions or errors in this document do not relieve the Applicant from complying with applicable sections of the HAR.

All applications should be addressed to:

Chairperson, Board of Land and Natural Resources
Department of Land and Natural Resources
Engineering Division
P.O. Box 373
Honolulu, Hawaii 96809
Telephone: (808) 587-0230

Instructions

An Applicant is encouraged to contact the Department to if they are interested in a pre-application meeting. The pre-application meeting allows for discussion of the Applicants conceptual plan and the requirements of the Board for specific applications and gives the Applicant an opportunity to ask questions.

A separate project dam safety permit application form shall be used for each dam structure. All information on the application form should be typed or printed. If a specific item does not apply it should be marked NA (not applicable). All owners of the facility shall sign an "Owners Signature" page for this site and project.

The Department shall accept and take action on applications only if the fee for the application is paid. The fee is based upon two percent of the total project costs associated with the design and construction of the dam and appurtenant works as in accordance with Chapter 13-190.1-50.

Review steps:
1. Administrative completeness review
2. Permit technical review
3. Approval by Board of Land and Natural Resources
4. Issuance of Permit

Any questions pertaining to completion of this form should be directed to the Engineering Division, Dam Safety Program at (808) 587-0254.

Hawaii Dam and Reservoir Safety Program
DAM SAFETY PERMIT

Dam Name: Kapala'alaea Dam Project Type: Removal

DAM SAFETY PERMIT APPLICATION FORM

Fill in the following information for the specified dam safety permit project. One application shall be used for each dam or reservoir structure.

Project Information	*Application Date*	September 13, 2022
	Applicant Name (Attachment 1)	East Maui Irrigation Company, LLC
Dam Name	Kapala'alaea Reservoir	
Dam ID No. (State) (if New Dam enter N/A)	MA-0094	
Type of Project (check one)	_____ New Construction _____ Improvement (repair/rehabilitation/alteration) _____ Reduction (alteration to below regulatory jurisdiction) ___X___ Removal (breach, no pond)	
Dam/Reservoir Location (City)	Haiku, HI	
Dam/Reservoir Location (Latitude/Longitude)	20.9132 N / -156.2580 W	
TMK(s)	(2) 2-8-007:001	
Island/County	Maui	
State Land Use District (check all applicable)	___X___ Agriculture _____ Rural _____ Urban _____ Conservation	

Application Package	Included (Y/N)
1. Dam Safety Permit Application Form (with each owner's signature page) [Ref. 13-190.1-20(d)(1)]	Yes
2. Design Report(s) [Ref. 13-190.1-20(d)(2)]	Yes
3. Documentation for compliance with Chapter 343 Environmental Review	Yes
4. Documentation for compliance with State Historic Preservation Division (SHPD) See SHPD website for HRS 6E Intake form to be submitted with backup documentation and determination. Government entities shall complete the 6E-08 review. (http://dlnr.hawaii.gov/shpd/review-compliance/forms/)	Yes
5. Construction Plans (2 sets) [Ref. 13-190.1-20(d)(3)]	Yes
6. Construction Specifications (2 sets) [Ref. 13-190.1-20(d)(3)]	Yes
7. Construction Quality Assurance Plan [Ref. 13-190.1-20(d)(4)]	Yes
8. Detailed Cost Estimate [Ref. 13-190.1-20(d)(5)]	Yes
9. Filing fee calculation [Ref. 13-190.1-20(d)(6)]	Yes
10. Filing fee (check) [Ref. 13-190.1-20(d)(6)]	Yes
11. Other Supporting Documents	None
12. Electronic copy of all of the above on CD/DVD/USB flash drive/other	Yes

Hawaii Dam and Reservoir Safety Program
DAM SAFETY PERMIT

Dam Name: Kapala'alaea Dam Project Type: Removal

Technical Information	
Drainage Area (sq. miles/acres)	0.89 square miles
Type of Structure (Earthen/Concrete, etc.)	Earthen
Size Classification of Dam	Intermediate
Hazard Classification	High
Purpose of Structure (Water supply, irrigation, recreation, real estate development, etc...)	Irrigation
Maximum Capacity (existing volume)	197.0 acre-feet
Maximum Capacity (revised volume after project completed)	0 acre-feet
Year completed/last modified	1885

Description of Work to be performed (describe construction work to be done on dam and reservoir facility)

The Kapala'alaea Dam was built in approximately 1885 and consists of an approximately 230-foot long, 48-foot tall earthen embankment with an approximately 15-foot wide crest. Kapala'alaea Dam will be breached according to Hawaii DLNR Dam Safety guidelines. The bottom width of the breach channel will be approximately 193 feet at the upstream toe, and then taper to approximately 100 feet at the downstream toe, and the slopes cut to a 3H:1V side slope. The breach will be lined with riprap for a minimum thickness of 4 feet and will extend upslope to the 100-year flood elevation. Additionally, the riprap will extend downstream of the breach for an additional 100 feet within the stream channel. Immediately upstream of the breach, an 8-foot deep trench of riprap will be used as a grade control structure that will reduce headcutting and sediment movement downstream.

The embankment materials from the excavated section will be graded onto upland areas on EMI property adjacent to the reservoir and outside of the Ordinary High Water Mark (OHWM). The breached channel will be protected from erosion and scour by riprap, and the disturbed areas will be seeded to allow for vegetation growth after construction is completed. The site will be returned to a condition similar to what existed before the dam was constructed.

Anticipated effect of proposed structure on natural environment:

With the structure removed, the natural environment will be returned to its pre-dam condition. The stream will be allowed to return to its original drainage configuration and risks of a dam failure to the downstream area will be eliminated with the removal of the structure. The disturbed ground will be reseeded to allow vegetation to take hold and erosion protection measures will be installed at the dam breach location to prevent significant erosion of the breached slopes.

Dam Name: Kapala'alaea Dam Project Type: Removal

List all parties who share ownership of the parcels where the dam and reservoir are located and identify their interest in the property. All owners herein listed below shall sign **Attachment 2 – Owner Signature** and concur with the work proposed within this application by the applicant.

Owner Information	
Owner 1 Name: East Maui Irrigation Company, LLC Company:	TMK: (2) 2-8-007:001
Owner 2 Name: Company:	TMK:
Owner 3 Name: Company:	TMK:
Owner 4 Name: Company:	TMK:

Hawaii Dam and Reservoir Safety Program
DAM SAFETY PERMIT

Dam Name: Kapala'alaea Dam Project Type: Removal

Attachment 1

APPLICANT CONTACT INFORMATION

Applicant Information (primary contact for Dam Safety Permit process)	
Applicant Contact Name	Mark Vaught
Firm/Company	East Maui Irrigation Company, LLC
Mailing Address	PO Box 1104, Puunene, HI 96784
Telephone	(808) 579-9516
Fax	(808) 856-4515
Email	Mark.Vaught@mahipono.com

I, Mark Vaught (print name), the applicant, hereby certify that the information herein is true and factual to the best of my knowledge. Signing below indicates that the applicant understands that, if the permit requested is granted by the Board of Land and Natural Resources, the proposed work is to be initiated and completed within five (5) years of the approval date, unless specifically permitted in the approved permit terms and conditions.

Mark Vaught
Applicant Signature

Date: 09/12/2022

Director, Water Resources
Applicant Title

ENGINEER CONTACT INFORMATION

Licensed Engineer Contact Information	
Registered Hawaii Professional Engineer	Michael Eller
Registration No.	17039
Firm/Company	Kleinschmidt Associates
Mailing Address	1500 NE Irving Street, Suite 550, Portland, OR 97232
Telephone	971.236.5817
Mobile/Other	530.515.7601
Fax	NA
Email	Michael.Eller@KleinschmidtGroup.com

Hawaii Dam and Reservoir Safety Program
DAM SAFETY PERMIT

Dam Name: Kapala'alaea Dam Project Type: Removal

Attachment 2

OWNER INFORMATION/SIGNATURE

A separate signature page is required for each and all owners of the dam and reservoir for the subject project. The Owner herein listed below concurs with the work proposed within this application by the applicant and by signing hereto, the owner of the land extends to the Board of Land and Natural Resources, and its designated representatives, a right-of-entry onto the project site to conduct any investigations or inspections required in compliance with the provisions of Chapter 13-190.1, Hawaii Administrative Rules. (Submit copies of this sheet for each owner)

Owner Information	
Owner Contact Name	Mark Vaught
Firm/Company	East Maui Irrigation Company, LLC
Mailing Address	PO Box 1104, Puunene, HI 96784
Telephone	(808) 579-9516
Mobile/Other	(808) 264-5902
Fax	(808) 856-4515
Email	mark.vaught@mahipono.com
TMK for dam/reservoir property	(2) 2-8-007:001

Owner Signature

Mark Vaught
Print Name of Owner

Mark Vaught
Signature of Owner

09/12/2022
Date

Dam Name: Kapala'alaea Dam Project Type: Removal

Attachment 3

FEE REQUIREMENTS/FILING FEE CALCULATION

Payment of the filing fee is required pursuant to HRS §179D-6 and §13-190.1-50 for all applications. The Department shall accept and take action on the following applications and filings only if the fee shown for the application or filing is paid at the time the application or filing is submitted. The fee is based upon two percent of the total project costs associated with construction of the dam and appurtenant works integral to the design and safe operation of the dam.

The applicant or owner shall submit with the application for construction, enlargement, alteration, repair, or removal a fee calculation sheet and the application fee in the amount equal to two per cent of the estimated cost of construction including engineering costs. The estimated cost of the construction, enlargement, alteration, repair, or removal shall include the cost of all labor and materials entering into the construction of the dam and appurtenant works or reservoir, the cost of preliminary investigations and surveys, the cost of the construction plans properly chargeable to the cost of the dam or reservoir, and any and all other items entering directly into the cost of the construction, enlargement, alteration, repair or removal. The costs of right-of-way, detached powerhouses, electrical generating machinery, and roads and railroads affording access to the dam or reservoir shall not be included among the items used in the determination of cost.

An application shall not be considered by the department until the application fee is received. In the event the actual cost exceeds the estimated cost by more than 15 percent, a further fee shall be required by the board before final approval and shall be two per cent of the amount the actual cost exceeded the estimated cost of the construction, enlargement, alteration, repair, or removal. No further fee shall be required, if such fee is to be computed at less than twenty dollars ($20).

FILING FEE CALCULATION

Engineering costs (studies, plans, specifications, etc.…)	$221,200
Estimated Construction cost	$2,078,800
Total estimated costs	$2,300,000
Initial Application fee = 2% x Total estimated costs	$46,000

Hawaii Dam and Reservoir Safety Program
DAM SAFETY PERMIT

Dam Name: Kapala'alaea Dam Project Type: Removal

CONDITIONS OF APPROVAL

Construction work shall commence within five years of the date of the approved application.
A licensed engineer in the State of Hawaii shall be in charge of the inspection of the construction.

One set of final plans and specifications with the County approval (signature) shall be submitted to the Department prior to the start of the work.

The Department shall be notified five (5) calendar days prior to the commencement of the construction, and a construction schedule shall be provided, which includes the notice to proceed date and estimated project duration.

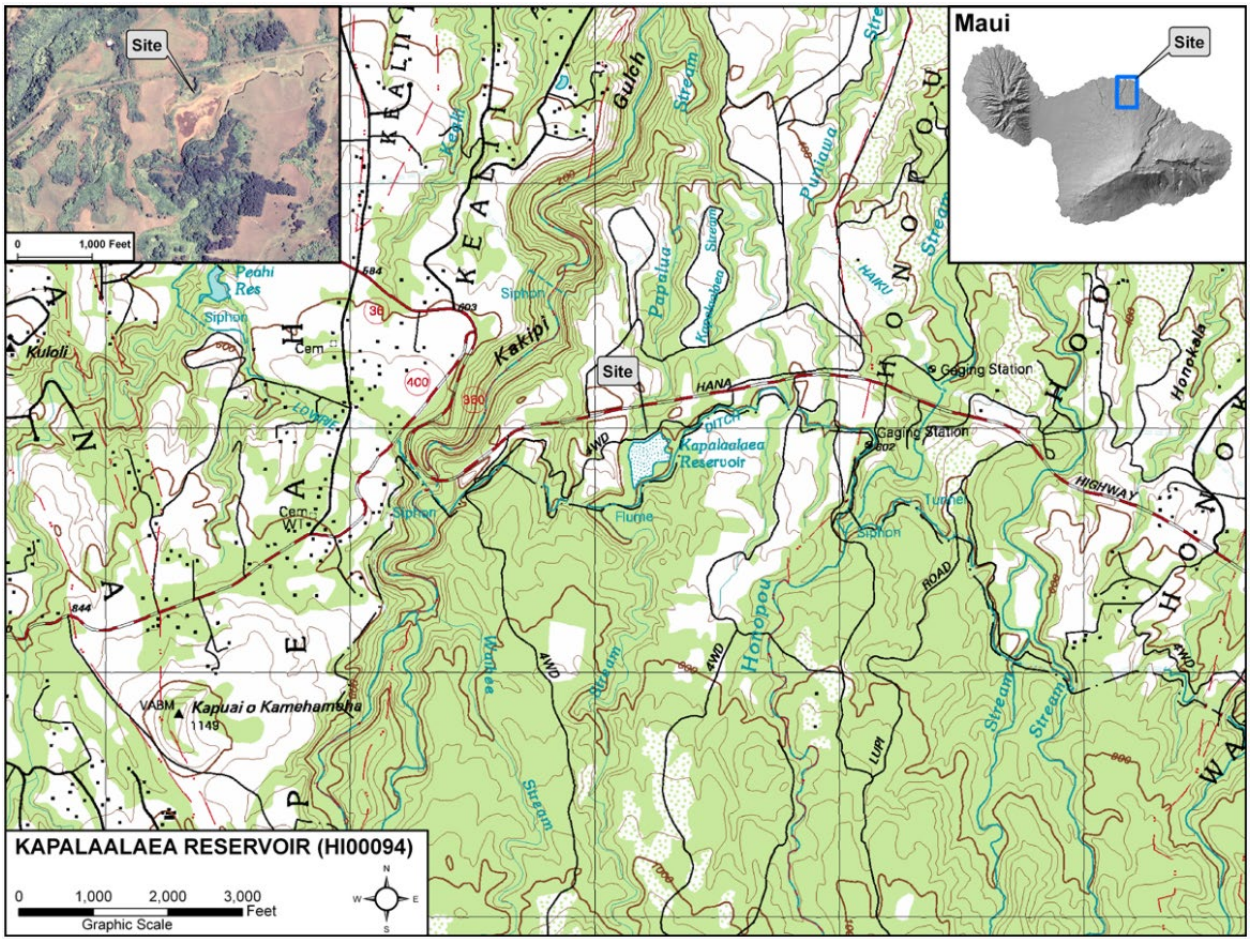
Changes and/or modifications to the plans shall be sent to DLNR Dam Safety Program in the form of shop drawings and/or plans that are approved and stamped by a licensed engineer. Changes and/or modifications shall not be implemented until approved by DLNR Dam Safety Program.

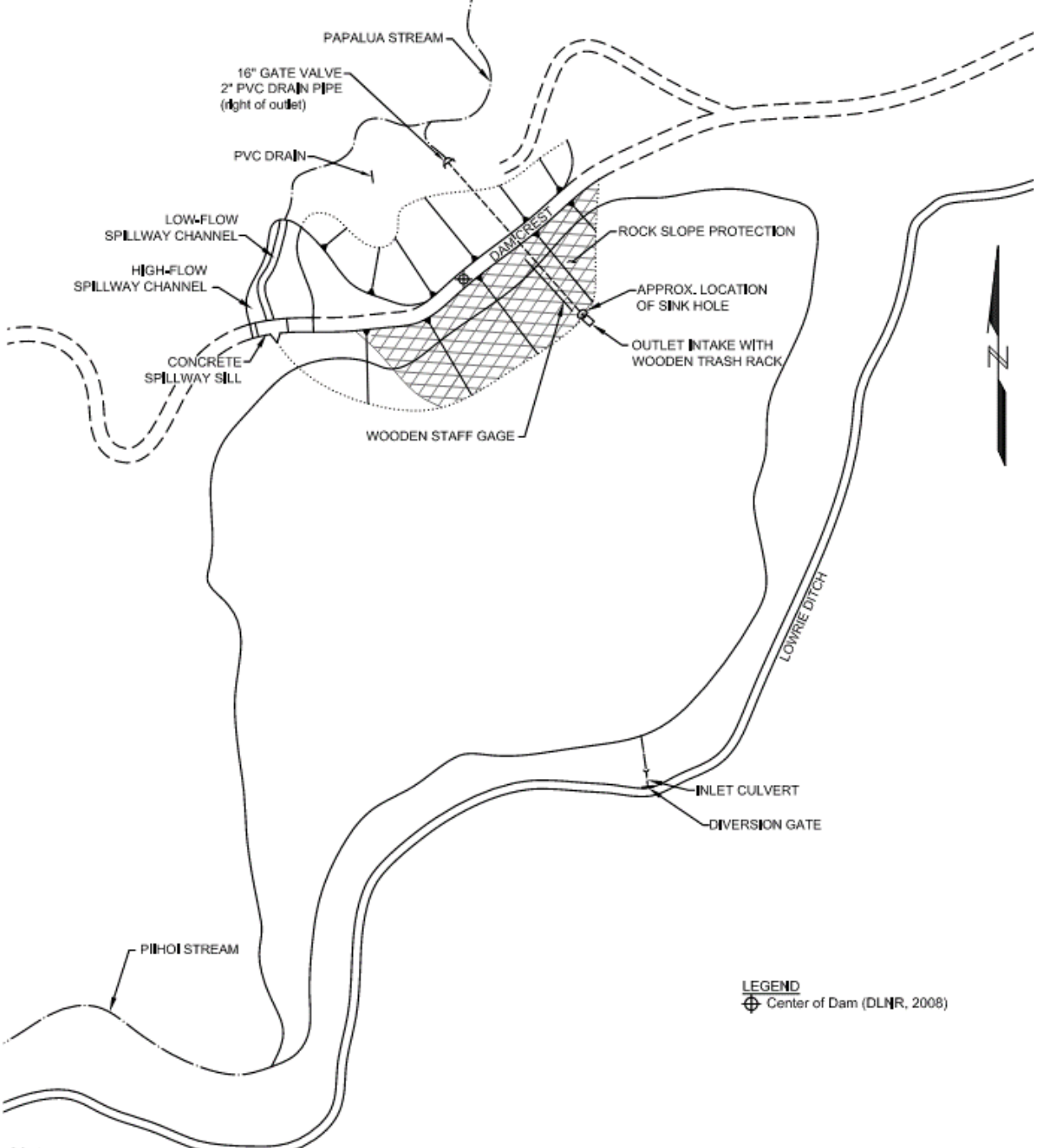
The owner or owner's representative shall submit a copy of the dam safety application and the plans and specifications of the proposed improvements to the County Engineer of the County for which the dam resides for compliance with County codes.

This permit does not relieve the owner or owner's representative of their obligations to comply with all applicable Federal, State, and County regulations. These may include but may not be limited to:

- **National Pollution Discharge Elimination System (NPDES) Permit** – Department of Health (DOH), Environmental Management Division, Clean Water Branch (CWB), Engineering Section.
- **US Army Corps of Engineers Permits (404 Permit)** – USACE, DOH, CWB, Engineering Section
- **Threatened and Endangered Species Review Request** – U.S. Fish and Wildlife Service
- **'No Effects' Letter** – DLNR, State Historic Preservation Division (SHPD)
- **DLNR Stream Channel Permit** – DLNR, Commission on Water Resource Management
- **DOH 401 Permit** – DOH, CWB, Engineering Section
- **Grading Permit** – County, Department of Public Works (DPW), Engineering Division
- **Grubbing Permit** – County, Department of Public Works (DPW), Engineering Division
- **Work Within the County Right-of-Way** – County, Department of Public Works (DPW), Engineering Division
- **Stockpiling Permit** – County, Department of Public Works (DPW), Engineering Division
- **Private Waterline Permit** – County, Department of Public Works (DPW), Engineering Division
- **Building Permit** – County, Department of Public Works (DPW), Building Division
- **Planning Approval** – County, Planning Division
- **Community Noise Permit** – State of Hawaii, DOH, Environmental Management Division, Indoor and Radiological (IRH) Branch

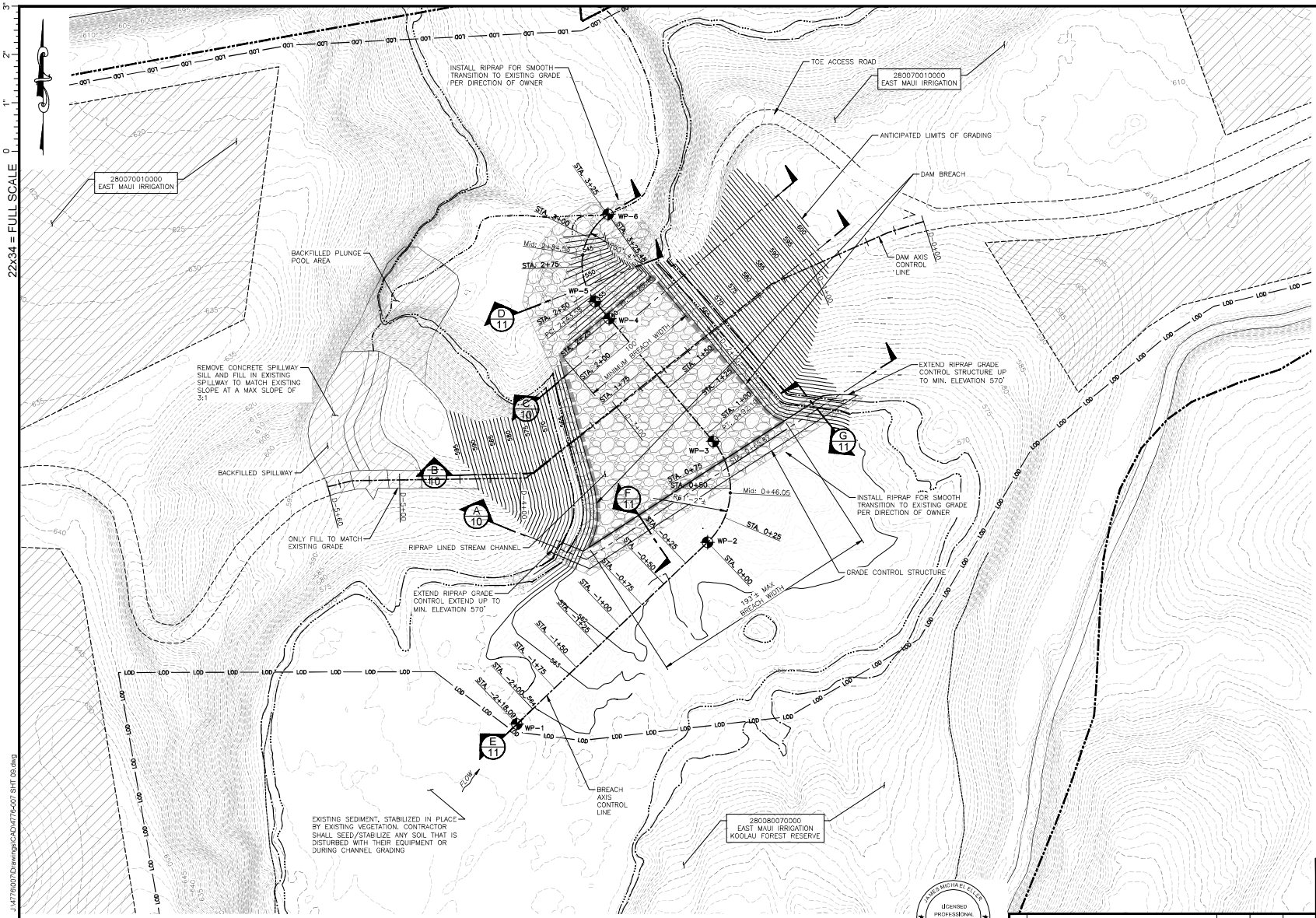
EXHIBIT 2


Site
0 1,000 Feet
Maui
Site
KAPALAALAEA RESERVOIR (HI00094)
0 1,000 2,000 3,000 Feet
Graphic Scale
N
W
E
S
Kapalaalaea Reservoir
Site
Peahi Res
Kuloli
Kakipi
Kapuai o Kamehameha
1149
HANA
HIGHWAY
Gaging Station
Flume
Tunnel
Siphon
Stream
Gulch
ROAD
4WD
LUPI



Notes:
Unless noted, all dimensions and locations are approximate.

EXHIBIT 3



PLAN
1"= 40'

40 0 40 80
SCALE IN FEET

WORK POINT	NORTHING	EASTING
WP-1	210499.68	1779810.66
WP-2	210650.12	1779968.56
WP-3	210733.63	1779973.24
WP-4	210835.37	1779887.12
WP-5	210849.28	1779875.41
WP-6	210921.64	1779886.24

NOTES:
1. ALL COORDINATES IN NAD83 DATUM. HORIZONTAL CONTROL BASED ON HARN/HI. HAWAI'I STATE PLANE, ZONE 2, U.S. FOOT. ALL ELEVATIONS ARE BASED ON GEOID MODEL 12B TIED TO LOCAL MEAN SEA LEVEL DATUM..

NOT FOR CONSTRUCTION

JAMES MICHAEL SLACK
LICENSED PROFESSIONAL ENGINEER
No. 17036-C
HAWAII, U.S.A.
License Expires 4/30/2024
This work was prepared by me or under my supervision

No.	Revision	Date	Drawn	Checked
1	100% DESIGN FOR PERMITTING, REV 1	05-05-23	SFG	JME
0	100% DESIGN FOR PERMITTING REVIEW	09-26-22	JCH	JME

Designed	Drawn	Checked
BCT	CFT	JME

EAST MAUI IRRIGATION, LLC
MAUI COUNTY, HI

KAPALA'ALAEA DAM
DECOMMISSIONING DESIGN

PROPOSED CONDITIONS
LAYOUT PLAN

Kleinschmidt
1500 NE Irving Street, Suite 550
Portland, Oregon 97232
503-345-7956
KleinschmidtGroup.com

Project No.	Date Revised	Drawing No.
4776-007	05-05-23	09

PRINTED: May 3, 2023 - 2:59 PM
J:\4776\007\Drawings\CAD\4776-007 SHT 09.dwg
22x34 = FULL SCALE

Dam Safety Program
CHAPTER 343 ANALYSIS

EXHIBIT 4

Dam Name: Kapala'alaea Reservoir
Dam ID Number: State ID = MA-0094, National ID = HI00094
Type of Project: Dam Removal
Brief Description of Project: The Kapala'alaea Reservoir dam will be breached to remove the downstream risk of a dam failure. The breach will remove the majority of the embankment with the excavated material regraded onto the site, avoiding the natural stream channel. The disturbed areas will be seeded, and the excavated breach slopes will be protected with riprap up to the 100-year flood level. The site will be allowed to return to its pre-dam condition.

TMK's: (2) 2-8-007:001

Reviewer Name: Jesse Colandrea Date of Review: 10/1/2022
Reviewer Title: Civil Engineer
Reviewer Company: State of Hawaii - DLNR

TRIGGERS (HRS §343-5(a))
Is there an "action" that triggers the need for an EA?

Action

An "action" is a program or project:

___ Initiated by an agency

X Initiated by an "applicant"

Any person who, pursuant to statute, ordinance, or rule, officially requests "approval" for a proposed action (discretionary consent required from an agency prior to actual implementation of an action, distinguished from a ministerial consent)

HRS 179D Statute
____ Ordinance
____ Rule

Triggers

Yes	No	
___	X	Use of state or county lands or funds
___	X	Use of conservation district lands
___	X	Use within shoreline setback area
___	X	Use of historic site designated on the National or Hawaii registers
___	X	Use of land in the Waikiki Special District
___	X	Amendment to county general plan which would result in designations other than agriculture, conservation, or preservation unless initiated by a county
	X	Reclassification of conservation lands by the Land Use Commission
	X	Construction or modification of helicopter facilities that may affect conservation district lands, a shoreline setback area, or a historic site
	X	Wastewater facilities, waste-to-energy facility, landfill, oil refinery, or power-generating facility

Triggers summary:
Is there a trigger? Yes ___ No_X___
If Yes, **Go to Exemptions**
If No, Environmental Assessment is NOT required. **Go to Summary**.

EXEMPTIONS
Two sources of exemptions: exemption lists or exemptions contained in HAR §11-200-8(a)

1. Exemption Lists
   - Division exemption lists
   - Department-wide exemption list

   Explain (which exemption list, which exemption, how it applies):
   _____
   _____
   _____

2. HAR §11-200-8(a) exemptions
   - Operations, repairs, or maintenance of existing structures, facilities, equipment, or topographical features, involving *negligible or no expansion or change of use* beyond that previously existing

   - Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have *substantially the same purpose, capacity, density, height, and dimensions* as the structure replaced

   - Construction and location of a single*, new, small facilities* or structures and the alteration and modification of the same and installation of new, small, equipment and facilities and the alteration and modification of same, including, but not limited to:
     (a) *Single family residences less than 3,500 square feet* not in conjunction with the building of two or more such units;
     (b) Multi-unit structures designed for *not more than four dwelling units* if not in conjunction with the building of two or more such structures;
     (c) Stores, offices, and restaurants designed for total occupant load of *twenty persons or less* per structure, if not in conjunction with the building of two or more such structures; and
     (d) Water, sewage, electrical, gas, telephone, and other essential public utility services extensions *to serve such structures* or facilities; accessory or appurtenant structures including garages, carports, patios, swimming pools, and fences; and acquisition of utility easements

   ____ *Minor alterations* in the conditions of land, water, or vegetation

   - Basic data collection, research, experimental management, and resource evaluation activities that *do not result in a serious or major disturbance* to an environmental resource

   - Construction or placement of *minor structures accessory* to existing facilities

____ *Interior alterations* involving things such as partitions, plumbing, and electrical conveyances

_ Demolition of structures, *except* those structures located on any *historic site* as designated on the National or Hawaii registers

_ Zoning variances *except shoreline* set-back variances

_ Continuing administrative activities including, but not limited to purchase of supplies and personnel related actions; and

_ Acquisition of land and existing structures, including single or multi-unit dwelling units, for the provision of *affordable housing*, involving *no material change of use* beyond that previously existing, and for which the *legislature has appropriated* or otherwise authorized *funding*

Explain (how the exemption indicated above applies):

_____

_____

_____

Exemptions summary:
Does the Project qualify for an exemption? Yes _ No _

If Yes, Exemption noted above, No Environmental Assessment required
If No, Project does not qualify for exemption and requires an Environmental Assessment

CUMULATIVE IMPACT
Exemptions are inapplicable when the cumulative impact of planned successive actions in the same place, over time, is significant, or when an action that is normally insignificant in its impact on the environment may be significant in a particularly sensitive environment.

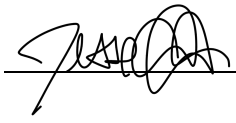
SUMMARY
Is Environmental Assessment required?

Yes ____
Has an Environmental Assessment been completed?
Yes _____OEQC Published date: _____

No X

Comments: _____

Reviewer Printed Name: Jesse Colandrea

Reviewer Signature: 

Date: 10/1/2022

EXHIBIT 5

MEMORANDUM OF AGREEMENT

Among the

U.S. ARMY CORPS OF ENGINEERS,

THE HAWAII STATE HISTORIC PRESERVATION OFFICER

And the

EAST MAUI IRRIGATION COMPANY

Regarding the

THE KAPALA'ALAEA RESERVOIR (MA-0094) REMOVAL

HALEHAKU AHUPUA'A, HĀMĀKUALOA DISTRICT, ISLAND OF MAUI, HAWAI'I

WHEREAS, the Honolulu District, U.S. Army Corps of Engineers (USACE), Regulatory Office received a Department of the Army (DA) permit application (designated as Permit Application No. POH-2022-00023) from East Maui Irrigation Company (EMI) associated with the Kapala'alaea Reservoir (State Dam ID No. MA-0094) Removal project located at Latitude 20.9132° N, Longitude -156.2580° W; Tax Map Key (2) 2-8-007:001; within the Papalua Stream, 225 Peahi Road, Haiku, Island of Maui, Hawai'i; and

WHEREAS, the USACE has determined that the project is an Undertaking, as defined in 36 Code of Federal Regulations (CFR) 800.16(y), due to necessity for the USACE's issuance of a permit pursuant to Section 404 of the Clean Water Act and, thus is subject to review and consultation with the Hawai'i State Historic Preservation Officer (SHPO) and other interested parties under Section 106 of the National Historic Preservation Act, 16 U.S.C. (NHPA), and its implementing regulations (36 Code of Federal Register (CFR) § 800; and

WHEREAS, the proposed Undertaking to decommission the earthen dam associated with the privately-owned Kapala'alaea Reservoir would include the breaching of the dam embankment according to the State of Hawaii Department of Land and Natural Resources (DLNR) Guidelines, in order to remove the reservoir's ability to impound water and return the site to something approximating its pre-dam conditions. An excavator and bulldozer would be used to breach the dam creating a 193-foot-wide (at the bottom of the maximum breach width) and 40-foot-tall opening through the main embankment. Up to 23,200 cubic yards (CY) of dam embankment material would be removed, with 2,861 CY of material deposited into 0.24 acre below the ordinary high-water mark (OHWM) inside a "sink hole" depression and the rest would be deposited in upland areas. Up to 6,500 CY of clean riprap would be used to line the breached approach and discharge channel. Of the 6,500 CY of riprap, up to 1,935 CY would be deposited into 0.06 acre below the OHWM. The breached channel would be protected from erosion and scour by riprap, and the disturbed areas would be seeded to allow for vegetation growth after construction is completed. The site would be returned to a condition similar to what existed before the dam was constructed; and

WHEREAS, the USACE has defined the permit area and the Area of Potential Effects (APE) as synonymous and as comprising approximately 24 acres within Tax Map Key (TMK) (2) 2-8-007:001. The APE is described as being within the "limits of disturbance" (LOD) boundary outlined in the *Drawing Sheet – Limit of Disturbance (LOD) Defining Project Area/APE* provided by the USACE.

The SHPO concurred with the Undertaking's APE in a letter dated July 6, 2023 (SHPD HICRIS Project No. 2022PR01311, Doc. No. 2307MA03).

WHEREAS, a Secretary of the Interior (SOI)-qualified historical architect has identified and evaluated the Kapala'alaea Reservoir (State Inventory of Historic Places [SIHP] 50-50-06-09010) to be a historic property eligible for listing in the National Register of Historic Places (NRHP) as meeting the requirements of age, significance, and integrity under 36 CFR § 60.4; and

WHEREAS, the USACE identified two historic properties within the APE, the Kapala'alaea Reservoir (SIHP 50-50-06-09010) and the Lowrie Ditch (SIHP 50-50-10-01508), and it has been determined that the Undertaking will have an *adverse effect* on the NRHP-eligible Kapala'alaea Reservoir (SIHP 50-50-06-09010), per 36 CFR § 800.5(a)(1), to which the SHPO has concurred; and

WHEREAS, per 36 CFR § 800.4(d)(2) the USACE has consulted with the Office of Hawaiian Affairs (OHA), and other Native Hawaiian Organizations (NHOs) and interested parties regarding the effects of the Undertaking on historic properties; and

WHEREAS, pursuant to 36 CFR § 800.6(c)(2), and because of their role as the applicant for the DA permit, the USACE invited the EMI to sign this Memorandum of Agreement (MOA) as an Invited Signatory; and

WHEREAS, the USACE consulted with the SHPO and the EMI in accordance with Section 106 of the NHPA and 16 USC § 470, to resolve the effects of the Undertaking on historic properties; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(1), the USACE has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination and provided the specified documentation, and the ACHP has chosen not to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

NOW, THEREFORE, the USACE, the SHPO, and the EMI agree that should the Undertaking move forward to construction, the following USACE-enforced stipulations aim to resolve adverse effects to historic properties associated with the Undertaking, and that these stipulations shall govern the Undertaking and all of its parts unless this MOA expires or is amended or is terminated.

STIPULATIONS

I. MITIGATION COMMITMENTS

The USACE shall ensure that the following commitments are carried out to avoid, minimize, or mitigate the adverse effects on historic properties:

A. EMI was responsible for ensuring that an Architectural Intensive-Level Survey (ILS) Report was completed that provided documentation of the Kapala'alaea Reservoir (SIHP 50-50-06-09010) and the Lowrie Ditch (SIHP 50-50-10-01508), within the APE, and submittal of the draft ILS Report to SHPD HICRIS Project No. 2022PR01311 for SHPD's review and approval. The ILS Report was completed by a SOI-qualified architectural historian. The ILS Report provides the full history of the Kapala'alaea Reservoir and the Lowrie Ditch and includes an assessment of the seven aspects of integrity and site significance for both historic properties on their own and as contributing elements of the East Maui Irrigation Company ditches, and for eligibility to be listed

in the National Register of Historic Places in accordance with Criteria A–D per 36 CFR 60. The ILS Report also assessed the potential impacts of the Undertaking on the character defining features of the Kapala'alaea Reservoir and the Lowrie Ditch and recommended appropriate mitigation measures.

B. In fulfillment of this stipulation, Dee Ruzicka, an SOI-qualified architectural historian with Mason Architects, completed the ILS report on behalf of East Maui Irrigation Company. The ILS Report, titled *Final Intensive Level Survey, Kapala'alaea Reservoir, Halehaku Ahupua'a, Hamakualoa District, Maui County TMK [2] 2-8-007: 001 (por.)* (MASON, February 2024) documented Kapala'alaea Reservoir and the Lowrie Ditch sections adjacent to Kapala'alaea Reservoir. The report examined the reservoir and ditch for historical significance and found they met significance criteria. The report recommends Architectural Recordation as mitigation for the historic property affected, Kapala'alaea Reservoir, and further recommends the ILS Report as sufficient recordation to serve as mitigation as it documents the historic properties' historical development and context, design and physical alterations, and architectural characteristics, including character-defining features, and contains excellent views of the reservoir basin, upstream and downstream slopes, and the crest of the dam.

C. The SHPD reviewed the draft ILS Report and agreed with MASON's significance and integrity evaluations for the Kapala'alaea Reservoir (SIHP 50-50-06-09010) and adjacent Lowrie Ditch (SIHP 50-50-10-01508). Additionally, the SHPD agreed that the Final ILS report and the accompanying SIHP requests constitute sufficient mitigation, in the form of architectural recordation of the historic properties to be affected (per Hawaii Administrative [HAR] 13-284-8(a)(1)(B) as stated in SHPD's letter dated March 28, 2024 (Doc. No. 2403MA06).

II. DURATION

This MOA will expire if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, the USACE may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation VI below.

III. POST-REVIEW DISCOVERIES

If potential historic properties or human burials are discovered or unanticipated effects on historic properties occur, the EMI shall ensure all project work ceases in the vicinity of the find (minimum 10 foot-wide buffer around find) and comply with the following:

A. If previously unidentified non-burial historic properties, or unanticipated effects are discovered, the EMI shall follow Hawaii Administrative Rules (HAR) Chapter 13-280 "Rules Governing General Procedures for Inadvertent Discoveries of Historic Properties During a Project Covered by the Historic Preservation Review Process" and the USACE shall follow the 36 CFR 800.13 *Post-review discoveries*.

B. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find. The SHPO will be notified and consulted in writing per III.A. of this Memorandum of Agreement.

C. If human remains are discovered, the remains shall be covered and protected in place in such a way that minimizes further exposure or damage. Further disturbances and activities shall cease in any area or nearby area suspected to contain human remains. The SHPD and Police Department shall be contacted immediately. The EMI shall follow HAR 13-300-40 "Inadvertent Discovery of Human Remains" and SHPD's written directives.

D. No work shall proceed in the vicinity of an inadvertent find without written concurrence from the SHPO.

IV. MONITORING AND REPORTING

Each calendar year following the execution of this MOA until it expires or is terminated, the EMI shall provide all parties to this MOA a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in USACE's efforts to carry out the terms of this MOA.

A. All parties to this MOA will have thirty (30) calendar days to review the summary report and provide comments and identify any additional or unforeseen adverse effects to historic properties.

B. If, after review of the summary report, any party to this MOA identifies that the Undertaking resulted in additional, previously unforeseen, effects to historic properties, they shall notify the SHPO and the USACE.

C. If no parties to this MOA respond within thirty (30) calendar days, the USACE may assume concurrence with the summary report.

V. DISPUTE RESOLUTION

Should any Signatory or Invited Signatory to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the USACE shall consult with the objecting party(ies) to resolve the objection. If the USACE determines, within thirty (30) calendar days, that such objection(s) cannot be resolved, the USACE will:

A. Forward all documentation relevant to the dispute, including the USACE's proposed resolution, to the ACHP in accordance with 36 CFR § 800.2(b)(2). The ACHP shall provide the USACE with its advice on the resolution of the objection within thirty (30) calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories, and Invited Signatories, and provide them with a copy of this written response.

B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day-time period, the USACE may make a final decision and proceed accordingly. Prior to reaching such a final decision, the USACE shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories and Invited Signatories to the MOA and provide them and the ACHP with a copy of such response.

C. The USACE's responsibility to carry out all other actions subject to the terms of this

MOA that are not the subject of the dispute remain unchanged.

VI. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all Signatories. The amendment will be effective on the date a copy signed by all of the Signatories is filed with the ACHP.

VII. TERMINATION

If any Signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation VI, above. If within thirty (30) calendar days (or another time period agreed to by all Signatories) an amendment cannot be reached, any Signatory may terminate the MOA upon written notification to the other Signatories.

Once the MOA is terminated, and prior to work continuing on the Undertaking, the USACE must either (a) execute an MOA pursuant to 36 CFR § 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. The USACE shall notify the Signatories as to the course of action it will pursue.

If any Signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation VI, above. If within thirty (30) calendar days (or another time period agreed to by all Signatories) an amendment cannot be reached, any Signatory may terminate the MOA upon written notification to the other Signatories. Once the MOA is terminated, and prior to work continuing on the Undertaking, the USACE must either (a) execute an MOA pursuant to 36 CFR § 800.6, or (b) request to take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. The USACE shall notify the Signatories as to the course of action it will pursue.

VIII. EXECUTION

EXECUTION of this MOA by the USACE, SHPO, and EMI has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment. The USACE must submit a copy of the executed MOA, along with the documentation that is specified in 36 CFR § 800.11(f) to the ACHP prior to approving the Undertaking in order to meet the requirements of Section 106 and 36 CFR § 800.6(b)(1)(iv).

Note: Signatures start on next page.

SIGNATORIES

HONOLULU DISTRICT, U.S. ARMY CORPS OF ENGINEERS

By Jen Martin Date: July 17, 2024

Title:

Jen Martin
Chief, Regulatory Office
U.S. Army Corps of Engineers
Honolulu District

ON BEHALF OF:

Adrian Biggerstaff, Ph.D., P.E., PMP
Lieutenant Colonel, U.S. Army
District Engineer

Contact Information:

Kirsten Lara
Regulatory Specialist
U.S. Army Corps of Engineers
Honolulu District Office, Building 252
Fort Shafter, Hawaii 96858
Phone: 808-835-4307
Email: Kirsten.F.Lara@usace.army.mil

Note: Signatures continue on next page.

HAWAII STATE HISTORIC PRESERVATION OFFICER

By _____ Date: Jul 24, 2024

Title:

Dawn N. S. Chang, Esq.
State Historic Preservation Officer

Contact Information:

Dawn N. S. Chang, Esq.
State Historic Preservation Officer
DLNR Chairperson
DLNR Main Office
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813
Phone: (808) 587-0400
Email: Dawn.Chang@hawaii.gov

INVITED SIGNATORIES

EAST MAUI IRRIGATION COMPANY

By Mark K. Vaught Date: 7/18/2024

Title:

Mark K. Vaught
Director, Water Resources

Contact Information:

Mark K. Vaught
Director, Water Resources East
Maui Irrigation Company
P.O. Box 1104
Pu'unene, Hawaii 96784
Phone: 808-579-9516
Email: Mark.Vaught@mahipono.com

STATE OF HAWAII | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

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

July 6, 2023

IN REPLY REFER TO:
Project No.: 2022PR01311
Doc. No.: 2307MA03
Archaeology, Architecture

Carty S. Chang, Chief Engineer
State of Hawaiʻi
Department of Land and Natural Resources
Engineering Division
P.O. Box 373
Honolulu, Hawaiʻi 96809
c/o Jesse Colandrea
Email: jesse.k.colandrea@hawaii.gov

Kaleo L. Manuel, Deputy Director for Water Resource Management
State of Hawaiʻi
Department of Land and Natural Resources
1151 Punchbowl Street, Room 227
Honolulu, Hawaii 96813
Email: kaleo.l.manuel@hawaii.gov

CJ Cayanan, Regulatory Specialist
Department of the Army
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawaiʻi 96858-5440
Email: cristian.j.cayanan@usace.army.mil

Dear Carty S. Chang, Kaleo L. Manuel, and CJ Cayanan:

SUBJECT: **HRS Chapter 6E-42 and NHPA Section 106 Historic Preservation Review –**
Section 106 Consultation and Additional Information (Department of the Army File No. POH-2022-00023)
Dam Safety Permit 88
Stream Diversion Works Permit (Application No. SDWP.5951.6)
Kapalaʻalaea Reservoir (MA-0094) Removal
Halehaku Ahupuaʻa, Hāmākualoa District, Island of Maui
TMK: (2) 2-8-007:001 por.

The State Historic Preservation Division (SHPD) received a letter dated June 9, 2023 from the United States Army Corps of Engineers (USACE) to consult on the permit area/area of potential effects (permit area/APE) for the Kapalaʻalaea Reservoir (MA-0094) Removal (DA File No. POH-2022-00023) undertaking on the island of Maui, and provide additional information as requested in a previous SHPD review letter dated May 16, 2023 (Doc. No. 2304MA04). This USACE letter and supporting material was received by SHPD on June 14, 2023 (HICRIS Submission No. 2022PR01311.006).

In light of this additional information, **the SHPO concurs with the undertaking's APE** of approximately 24 acres within the 'limits of disturbance' (LOD) boundary as outlined in the *Drawing Sheet – Limit of Disturbance (LOD) Defining Project Area/APE* project document on HICRIS. The SHPO agrees with USACE's argument that an expansion of the APE is not justified, as hydrologic and hydraulic analyses of 25-year, 100-year, and Probable Maximum Flood events—as reported on in the submitted *Dam Decommissioning Design Report* (Kleinschmidt Associates 2023)—demonstrate that the decommissioning design will cause neither an increase in floodway extent nor increase in water velocity where the spillway channel discharges into the natural river channel of Papalua stream. It was also pointed out that any additional discharge of floodwater makai of Hana Highway will be *de minimis* (too minor to merit consideration) due to attenuation of those waters by the culverted highway embankment. The decommissioning design also includes measures (riprap) to limit erosion along the breached channel.

Additionally, **the SHPO agrees** that the USACE has demonstrated due diligence in consulting with Native Hawaiian Organizations and their local representatives, and has provided SHPD with adequate documentation of these consultations, up through 36 CFR 800.4, the identification of historic properties stage of the Section 106 Review Process. In an enclosure to their June 2023 letter, the USACE conveyed the concerns of Ms. Joyclynn Costa, Hāmākualoa Moku representative for the Aha Moku Advisory Council, that traditional Hawaiian historic properties (including burials) "in direct alignment" will be impacted by this project. The SHPO agrees with the USACE that her comments and questions have been adequately addressed and answered with the information provided concerning the lack of impact that flood events will have downstream/makai of Kapala'alaea Reservoir and the Hana Highway, given analyses conducted on the decommissioning design (Kleinschmidt Associates 2023). The SHPO still encourages USACE to consider all comments made as public testimony at the April 18, 2023 Commission on Water Resource Management (CWRM) meeting pertaining to this undertaking under Stream Diversion Works Permit Application No. SDWP.5951.6. These should be documented and addressed as public involvement, which is a standard part of the Section 106 consultation process. The comments of Ms. Costa and Lucienne de Naie, of the Sierra Club Maui, should both become part of the record of consultation, and both should both be afforded consulting party status.

The SHPD looks forward to receiving and reviewing the requested architectural Intensive Level Survey (ILS) report and State Inventory of Historic Property (SIHP) Requests from the applicant (East Maui Irrigation Company, LLC.) before the SHPO resumes consultation with USACE regarding the NHPA Section 106 effect determination of the undertaking, or continues the HRS 6E-42 Historic Preservation Review process. See previous SHPD review letter (Doc. No. 2304MA04) for details of these requests. Please submit materials to HICRIS Project No. 2022PR01311 using the Project Supplement option.

DLNR Engineering Division and CWRM will be notified once the HRS §6E-42 Historic Preservation Review process has been completed. Both the HRS 6E-42 Historic Preservation Review and Section 106 Consultation must be concluded before ground-disturbing work for the project/undertaking may commence.

The USACE is the office of record for this undertaking per NHPA Section 106. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Mary Kodama, Historic Architect, at mary.kodama@hawaii.gov for any matters regarding architectural resources; and Megan Alvarez, SHPD Archaeologist IV, at megan.alvarez@hawaii.gov for any matters regarding archaeological resources and this letter.

Aloha,

Susan A.Lebo

Signed For
Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc:	Dean Uyeno, DLNR CWRM	dean.d.uyeno@hawaii.gov
	Lance Nakamura, County of Maui DSA	dsa.engineering@mauicounty.gov
	Kristi Fluker, USACE	kristi.d.fluker@usace.army.mil
	Mark Vaught, Mahi Pono/East Maui Irrigation Company	mark.vaught@mahipono.com
	Jason Kent, Kleinschmidt	jason.kent@kleinschmidtgroup.com

Draft Intensive Level Survey,
Kapala'alaea Reservoir
Halehaku Ahupua'a, Hamakualoa District, Maui County

TMK [2] 2-8-007: 001 (por.)

Prepared by MASON under contract to

Mahi Pono, LLC

HICRIS No. 2022PR01311

December 2023

Table of Contents

Introduction

Mason Architects, Inc. (MASON) was hired by Mahi Pono, LLC to develop an Intensive Level Survey (ILS) report for the Kapala'alaea Reservoir and adjacent Lowrie Ditch, located east of Haiku, Maui. The ILS was requested by the Hawai'i State Historic Preservation Division (SHPD) in letters dated May 16, 2023 (Doc. No. 2304MA04) and July 6, 2023 (Doc. No. 2307MA03) to the Hawai'i Department of Land and Natural Resources (DLNR) and U.S. Army Corps of Engineers (USACOE), Honolulu District. DLNR plans to remove (decommission) the Kapala'alaea Reservoir Dam by breaching. Project drawings were developed by Kleinschmidt Group, of Portland, OR.

The ILS documents the reservoir and a portion of the Lowrie Ditch (Hawai'i State Inventory of Historic Places [SIHP] number 50-50-10-01508) that is adjacent to the reservoir. The approximately 8.7-acre reservoir and Lowrie Ditch section are located on a portion of TMK [2] 2-8-007: 001 (61 acres) owned by East Maui Irrigation Co. MASON evaluated the reservoir and ditch for historical significance and found they meet HAR §13-284-6 significance criteria. For a summary of data and findings, see Table 1.

- HICRIS No. 2022PR01311
- SIHP No. for the Kapala'alaea Reservoir [pending]
- SIHP No. for the Lowrie Ditch 50-50-10-015108

Project Objectives

This ILS is intended to fulfill historic property identification and significance evaluation requirements for HRS §6E-42 review undertaken by the SHPD. This ILS was requested by SHPD in advance of DLNR and USACOE plans to decommission the dam by creating a wide excavation through it.

Methodology

MASON visited the site on October 24th and 25th, 2023 to survey the structures and take digital photographs. Historical research on the dam and ditch to evaluate their historical context was undertaken at various repositories including the Alexander & Baldwin (A&B) Sugar Museum.

MASON evaluated the features' integrity and significance per HAR per HAR §13-284-6 Criteria a-d. MASON did not evaluate the features for Criterion e ("having important value to the native Hawaiian people or to other ethnic group") as MASON is not qualified or scoped to undertake ethnographic studies.

Prior to undertaking the field work, MASON coordinated with SHPD Historical Architect Mary Kodama to determine the appropriate Survey Area for this ILS. Through this communication, the Survey Area was determined to include the Kapala'alaea Dam and Reservoir and the section of Lowrie Ditch adjacent to it. See Figure 1. However, during the field work, additional sections of the ditch were surveyed several hundred feet above and below the section adjacent to the ditch. This was done to give a fuller picture of the ditch in proximity to the reservoir. See Figure 1 for a representation of the extent of the field Survey Area of Lowrie Ditch above and below the reservoir.

Project Area and Survey Area (Boundary Explanation and Justification)

The Survey Area for this RLS is the Kapala'alaea Reservoir and dam and the section of the Lowrie Ditch adjacent to the Reservoir. See Figure 1. The Project Area of the dam breaching project is 24 acres within the 61.145 acre parcel of TMK [2] 2-8-007: 001 that are marked "Limits of Disturbance" on the September 22, 2022 drawing "Kapala'alaea Dam Decommissioning Proposed Conditions Overall Site" produced by Kleinschmidt Group. See Figure 2.

Setting

The Project Area and Survey Area are located just east of Kakipi Gulch in the swale of the Piiloi and Papalua Streams in the uplands of Halehaku, Maui about midway between the small communities of Haiku and Huelo. The Piiloi Stream feeds into the reservoir and the stream that extends downslope from the reservoir outlet is called Papalua Stream. This rural area is hilly terrain sloping to the ocean. It is a mix of woodlands and open grasslands with few structures along the section of Hāna Highway (Hawai'i Route 360), which runs east-west just downslope of the reservoir. The reservoir basin is kept dry of water accumulation for most of the year as a result of the outlet pipe being kept open and the Lowrie Ditch intake kept closed. The reservoir basin is overgrown with tall grass, shrubs, and trees.

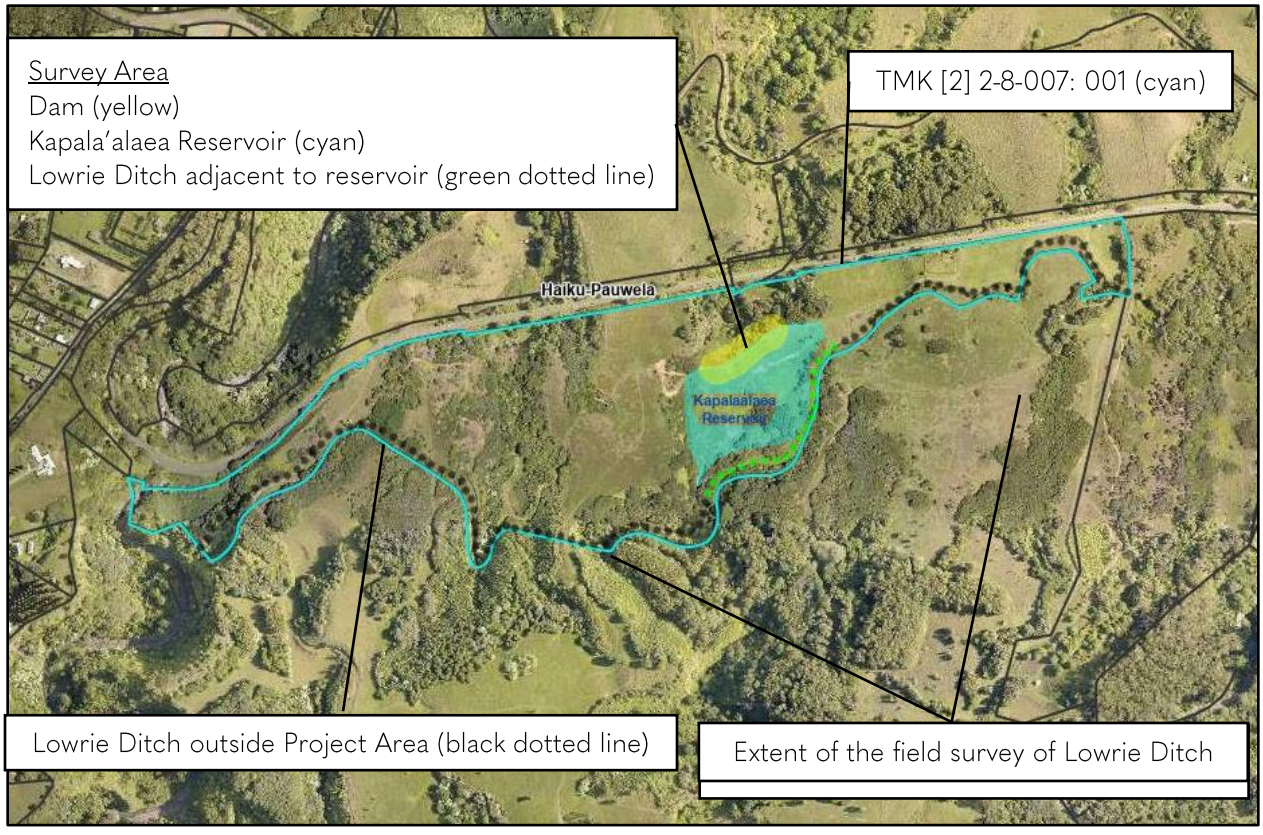


Figure 1 Survey Area for this ILS report within the parcel TMK. North at top. *Source: MASON on County of Maui TMK map. 2023.*

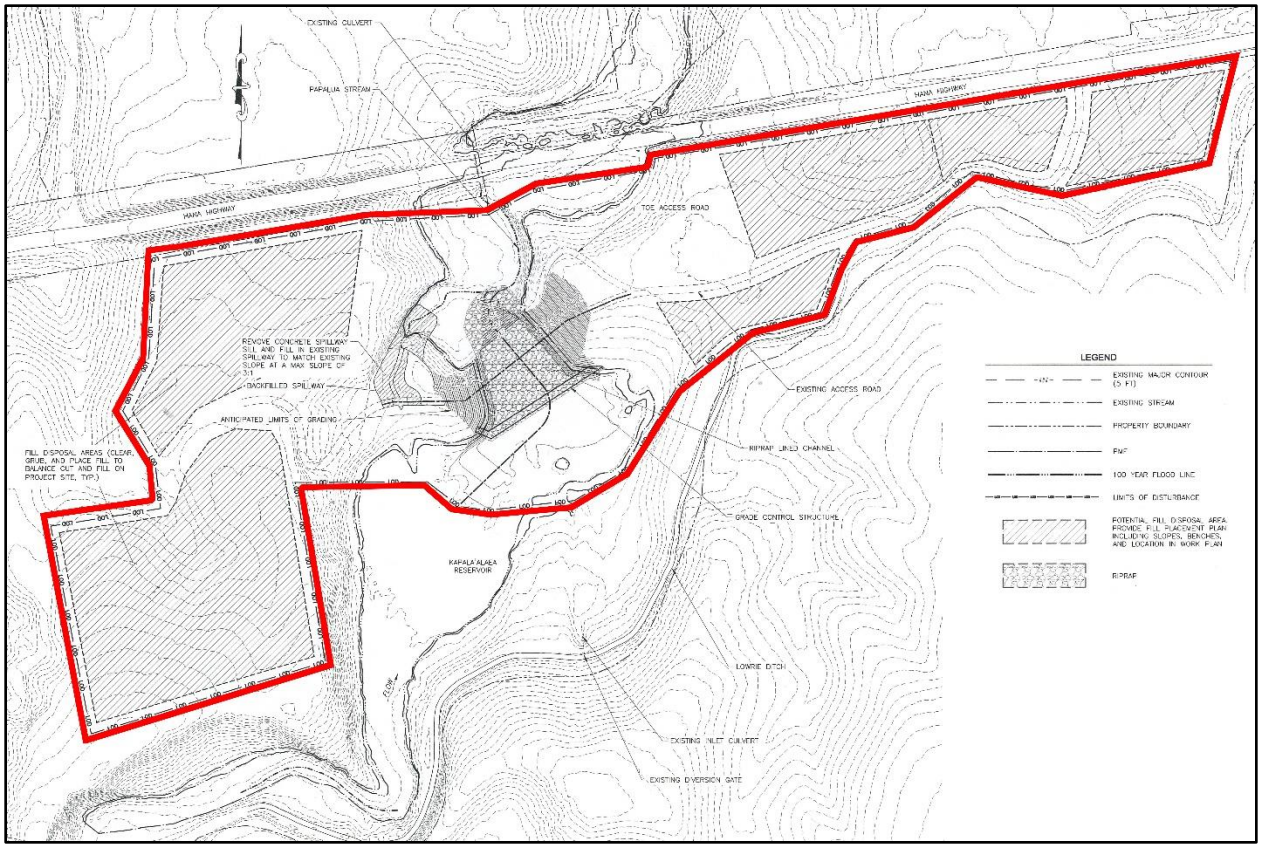


Figure 2: Portion of the drawing "Kapala'alaea Dam Decommissioning Proposed Conditions Overall Site" produced by Kleinschmidt Group. The Project Area, designated on the drawing as the "Limits of Disturbance" has been highlighted in red. North at top. *Source: Base drawing Kleinschmidt Group.*

Historical Context

Introduction

The two resources that are the subject of this Intensive Level Survey (ILS) are associated with Maui's most well-known sugar magnates; Claus Spreckels and Alexander & Baldwin. Kapala'alaea Reservoir was built by Claus Spreckels' HC&S in 1885 to store irrigation water for his sugar cane fields. Fifteen years later, in 1900, after Alexander & Baldwin's Hāmākua Ditch Co., had acquired HC&S from Spreckels, the Lowrie Ditch was completed to transport East Maui water to A&B's HC&S cane fields.

Hamakua Ditch Co. (founded 1876) and the Hamakua Ditch (1878)

Hamakua Ditch Co. was founded in 1876 by Henry P. Baldwin and Samuel T. Alexander. That year the two men obtained a license from King Kalakaua's Hawaiian government for the Hamakua Ditch Co. to take water from the watershed of East Maui and transport it (via ditch) to where the sugarcane was growing to the west. The Reciprocity Treaty of 1876, which allowed duty-free importation of Hawaii's sugar into the United States, attracted this type of large, private investment in the sugar industry. The development of surface and groundwater for irrigation, such as by Alexander and Baldwin's ditch company, was a major focus of this investment. Although this was a private investment that allowed water to be taken out of the watershed, the ditch developments were supported by the Hawaiian Government. The Hamakua Ditch Co. was the first license granted that allowed this.

Hamakua Ditch was built along the north slope of Haleakalā to irrigate sugar plantation operations near Makawao. The Hamakua Ditch Co. completed a seventeen-mile-long unlined section of the Hamakua Ditch in 1878 that cost about $80,000 and brought East Maui water to the cane fields of four plantations (including the Alexander & Baldwin Plantation) near Haiku.

Claus Spreckels and HC&S

Claus Spreckels arrived in Hawai'i on August 24, 1876, aboard the vessel *City of San Francisco*, as the ship delivered the news to Hawai'i that the Reciprocity Treaty had been signed by President Grant nine days earlier. This treaty gave Hawaiian cane sugar an advantage on the mainland market that was not available to other foreign producers. Spreckels, then operating a beet sugar refinery in San Francisco, used this knowledge to go about buying up a huge segment of Hawai'i's anticipated 1877 sugar crop. Operating as a sugar buyer over the next few years, Spreckels soon became interested in gaining control over Hawai'i's sugar production. Through social and political maneuvering, Spreckels courted Hawai'i's King Kalākaua, loaning him money on favorable terms. Using his government connections, Spreckels was able to acquire land on Maui and persuade the King to grant him water rights there. This enabled Spreckels to begin a massive sugar plantation and mill that would become HC&S (Hawaiian Commercial & Sugar Co.) at Spreckelsville.[1]

[1] Jacob Adler, *Claus Spreckels, The Sugar King in Hawai'i.* (Honolulu: University of Hawai'i Press). 1966. Carol Wilcox, *Sugar Water: Hawai'i's Plantation Ditches*. (Honolulu: University of Hawai'i Press). 1996. 61.

HC&S was formed by Spreckels in San Francisco on September 30, 1878. It was created to build and maintain irrigation ditches in Hawai'i, and also to cultivate and mill sugar that would be shipped to his California refinery. Spreckels moved quickly and had about 500 acres of sugar planted in 1879. These were irrigated by the Haiku Ditch and harvested the following year to produce about 3,000 tons of cane. In 1882 HC&S built sugar mills at Spreckelsville and Paia to serve the plantation, which initially produced between 5-6 tons of sugar per acre.[2]

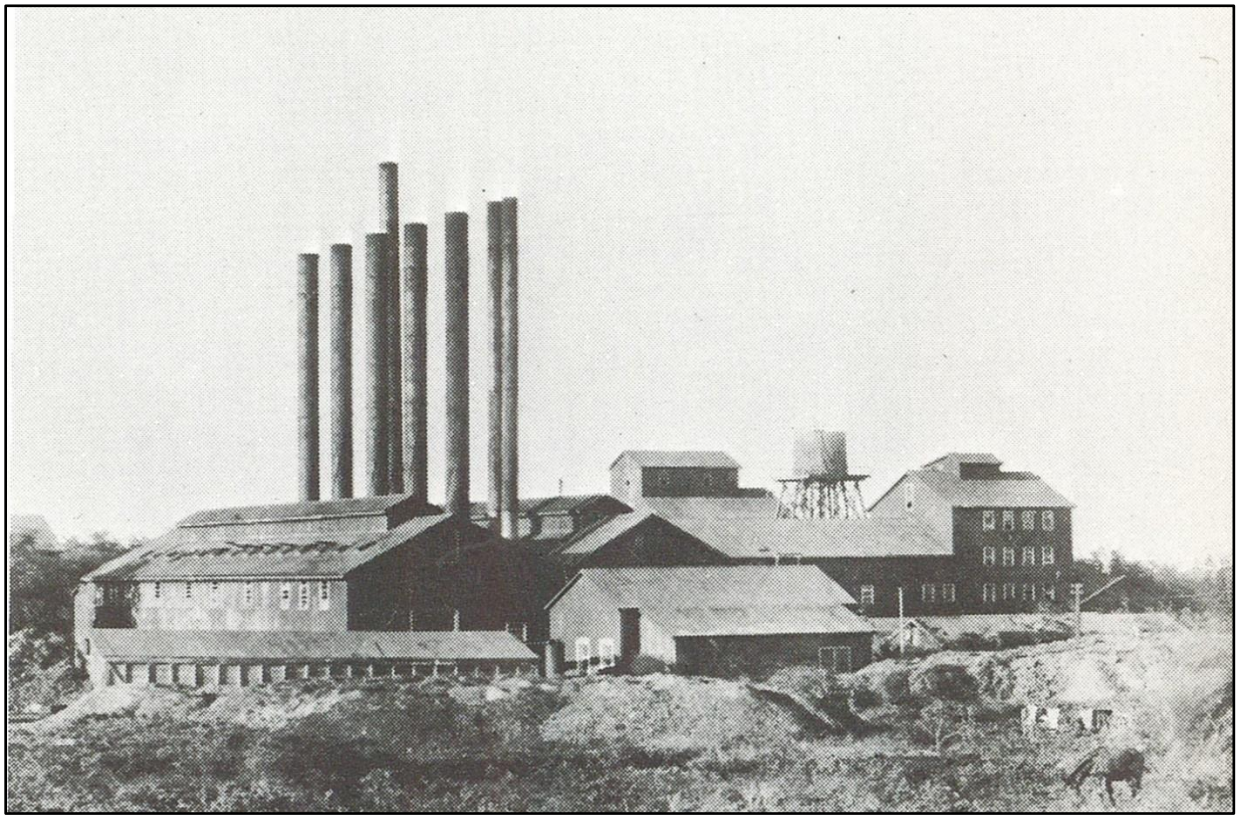


Figure 4. The HC&S mill at Spreckelsville in the early 1890s. *Adler, Claus Spreckels. Ca. 1890.*

Haiku (Spreckels) Ditch (1879)

The water rights acquired by Spreckels included a successful July 1878 petition to the Hawaiian Government to grant him usage of water from the north slopes of Haleakalā. In October 1878 Spreckels retained Henry Schussler, an irrigation engineer from California, to survey and construct an approximately 30-mile-long ditch to bring Haleakalā's north slope water (in the East Maui watershed) to his cane lands in central Maui. This undertaking would become the 1879 Haiku (Spreckels) Ditch.

Construction on the ditch began in November 1878 and was finished about one year later. It originated at Honomanu Stream and extended for roughly 30 miles through tunnels, flumes, and

[2] Adler, *Claus Spreckels.* 70-71. "Maui Notes," Pacific Commercial Advertiser. April 15, 1882. 3.

open ditch and terminated at a large reservoir near the cane fields of the Spreckelsville Plantation in a region of Maui's isthmus known as the Wailuku and Waikapu Commons.[3]

Spreckels' 1879 Haiku Ditch collected water from a level several hundred feet lower in elevation than the Hamakua Ditch, which was completed the year prior. Spreckels built the Haiku (Spreckels) Ditch between Haiku and Huelo, at about the 450' elevation level, which allowed it to capture water flowing down the streams below the level of the Hamakua Ditch.

Kapala'alaea Reservoir (built 1885)

Kapala'alaea Reservoir was one of two reservoirs built by Spreckels' HC&S to capture stream flows below the level of A&B's Hamakua Ditch (Kapala'alaea was built just below 600' elevation.). See Figure 3. The other was the Kaupakalua Reservoir, built just above 600' elevation (decommissioned in 2021). Both reservoirs stored water from streams that the Haiku Ditch was not able to carry. They could be opened as needed to route water down the streambeds to the Haiku Ditch intakes below. That ditch brought the water west to another large reservoir near Spreckelsville where it was collected at night and sent to HC&S cane fields during the day. [4]

The 1885 construction date of the Kapala'alaea Reservoir comes from the DLNR Dam Inventory System database and was confirmed by the former Operations Manager of EMI.[5] The reservoir is listed in the DLNR database as Reservoir # MA-0094. A nearby reservoir, Kaupakalua Reservoir, about 2.5 miles west, is also listed with an 1885 construction date in the DLNR database, and its construction date was confirmed in an 1885 newspaper article.[6] The newspaper article assigned ownership of Kaupakalua Reservoir to HC&S.[7] No mention was found of the Kapala'alaea Reservoir in historical newspaper articles.

The Kapala'alaea and Kaupakalua Reservoirs were both located in a watershed where water rights were assigned to Claus Spreckels.

Contentious Water Rights

Spreckels' 1878 water license permitted him to take water from the same watershed that was not already being taken under the Alexander and Baldwin water grant that was carried in the Hamakua Ditch. This consisted of any water existing at an elevation below the level of the Hamakua Ditch. In the area of East Maui between Haiku and Huelo, the 1878 Hamakua Ditch extends across the slope at about the 1,100' elevation level. Below that elevation, no water was collected under Alexander and Baldwin's license, it was all considered "unused" for the purposes of Spreckels' license.

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[3] "Mr. Spreckels Projected Enterprise on Maui," *Pacific Commercial Advertiser*. October 12, 1878. 3. MASON, "Hāli'imaile Subdivision – Hāli'imaile Residential Large Lot Subdivision Lot 2, Architectural Historic Context Study." (Honolulu: Prepared for 'Āina Lani LLC). November 2022. 20-21.

[4] "The Hawaiian Commercial and Sugar Company," *Honolulu Advertiser*. December 1, 1885. 4. "Maui Notes," Pacific Commercial Advertiser. April 15, 1882. 3.

[5] During field work, the former Operations Manager for EMI confirmed that EMI records indicate an 1885 year-built date for the reservoir.

[6] "The Hawaiian Commercial and Sugar Company," *Honolulu Advertiser*. December 1, 1885. 4.

[7] "The Hawaiian Commercial and Sugar Company," *Honolulu Advertiser*. December 1, 1885. 4.

Some East Maui residents reacted unfavorably to Claus Spreckels' 1879 ditch. In September 1881, thirteen people of Honomanu, Keanae, and Wailua wrote to the Hawaiian Government's Commissioners of Crown Lands to protest the granting of water rights and issuance of a water license to Spreckels. Residents J.W. Kehuhu, K. Makaena, J.K. Hueu, S. Kamakahiki, K.E.

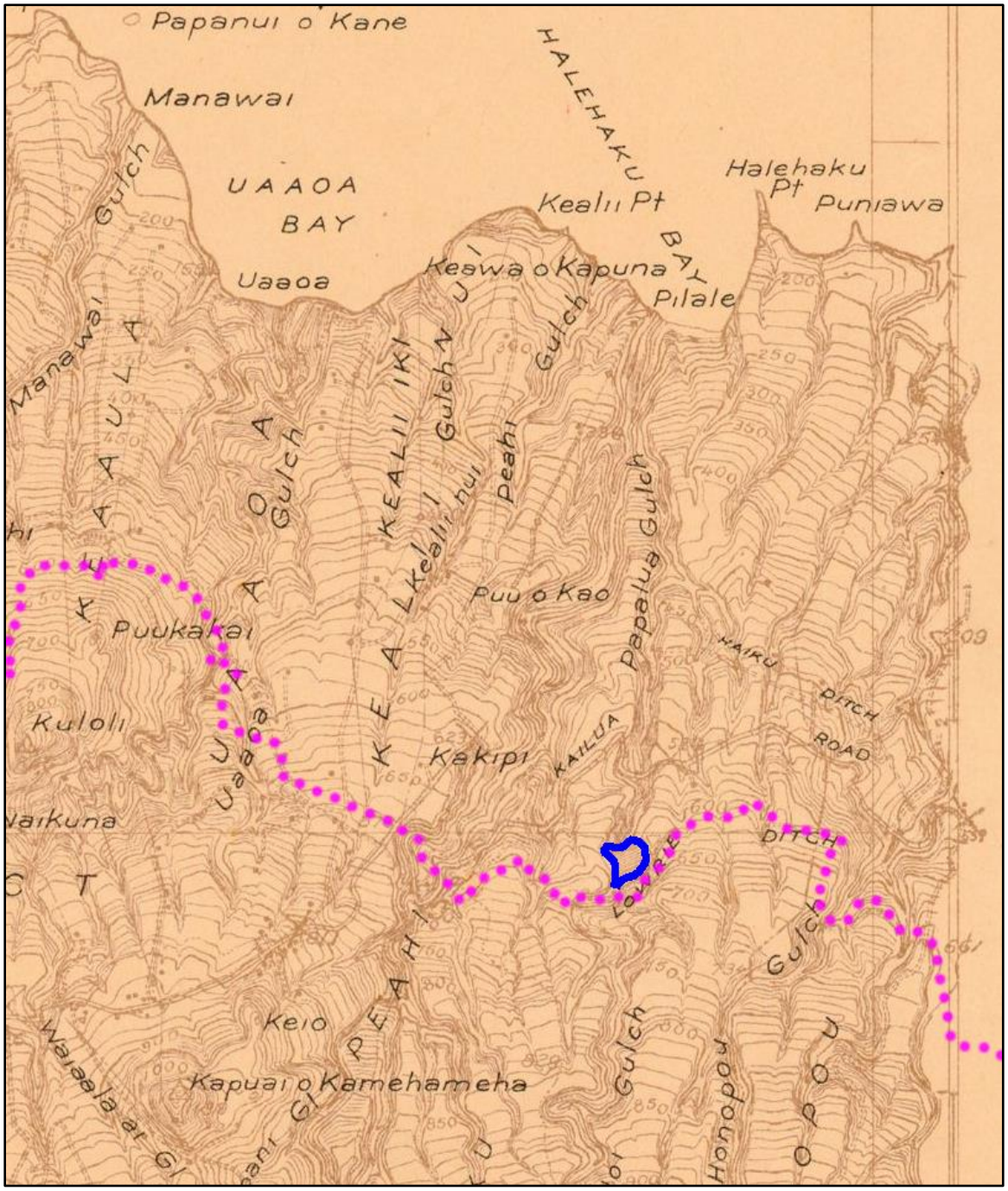


Figure 3. 1922 topographic map of the area surrounding the Kapala'alaea Reservoir. Added blue shape marks location of the reservoir and the dotted magenta line indicates the route of the Lowrie Ditch. *USGS, Haiku Quadrangle. 1922.*

Maialilua, D.W. Napiha, M. Kaleba, B.B. Kalilimoku, Kamanele, J.S. Lono, J. Kuluhiawa, Kelii, and J.B. Kaakamoke wrote in Hawaiian to commissioners Henry A.P. Carter and J.S. Walker:

> We...request of your kindness not to dispose of any of the water rights of the Crown Lands, that is from Honomanu, Keanae, Wailua, to the millionaire (Claus Spreckels), of Kamaomao. Because, if any of the water rights of the above-described Crown Lands are disposed of, then the king's subjects, living on said lands, will be in trouble. Because, what the millionaire has done with the waters of other lands is well known, and on account of this trouble which is known, that is why we make this application. It is not proper to come for the water of the lands above described.[8]

Notwithstanding the pleas of the thirteen residents who relied on the water, Spreckels was granted a license to remove water from the watershed. The conflict between residents and the non-resident holders of East Maui's water rights remained.

Until 1900 the Hāmākua Ditch and the Haiku (Spreckels) Ditch were the only two major irrigation ditches in East Maui. They functionally divided the waters of the north slope of Haleakalā between the plantations of Claus Spreckels and those of Alexander and Baldwin.[9]

In 1883, Alexander and Baldwin Plantation was incorporated as the Paia Plantation and included Hāli'imaile Plantation (also known as Grove Ranch), East Maui Plantation, and Seaside Farm.

HC&S (Acquired by Alexander & Baldwin in 1898)

Spreckels' HC&S became the largest sugar producer in Hawai'i during the 1880s and competition ensued between Spreckels' venture and Alexander and Baldwin's Maui plantations. Spreckels invested heavily in new technology at his HC&S sugar mill, pioneering the use of improved crushers, extraction methods, a railroad, and worker housing. See Figure 4. Despite this investment – and perhaps because of it - Speckels attempts to corner the market in Hawaiian sugar failed; his Maui operation became debt ridden. Maintenance was deferred, and with equipment run down, his company's stock dropped in value. In June, 1893 Spreckels received a death threat, posted on the front door of his home in Honolulu, apparently for his efforts to attempt to restore the Hawaiian Monarchy and place Queen Lili'uokalani back on the throne. Spreckels left Honolulu shortly after, returning to San Francisco. He visited Hawai'i only twice after that, in 1905.

Meanwhile the firm of Alexander & Baldwin, Inc. (A&B) was established in 1894 as a sugar agency. During the 1890s Spreckels' HC&S stock rebounded somewhat in value, and A&B was able to secure a majority interest of Spreckels' HC&S shares in 1898 through the efforts of

[8] Environment Hawaii, "Complex Legal Issues Surrounding A&B's Taking of East Maui Water." Website www.environment-hawaii.org. Accessed June 25, 2018.
[9] USGS, "Topographic Map, Haiku Quadrangle, 1/24,000 scale."1957. MASON, "Hāli'imaile." 29.

James B. Castle. This 1898 acquisition of HC&S gave A&B control of much of Maui's sugar acreage and the water to cultivate it.[10]

Alexander & Baldwin's license to divert water, granted by the Kingdom of Hawaii, lasted until September 30, 1898, approximately 20 years after they completed the Hamakua Ditch.

Lowrie Ditch (completed in 1900)

Shortly after acquiring HC&S, A&B started on the construction of the Lowrie Ditch, which began near Nailiilihaele Stream at an elevation several hundred feet below the A&B 1878 Hamakua Ditch. See Figure 5. The Lowrie Ditch was designed by engineer E.L. VanDerNeillen and completed in 1900.[11] It had two flow sources. The first source was a reservoir at Papaaea that was fed by two short ditches approximately 2 miles long, the Center Ditch and the Manuel Luis Ditch (both constructed ca. 1900) that collected nearby stream water. The second was Nailiilihaele Stream where a diversion intercepted water. The Lowrie Ditch was named after William J. Lowrie, manager of HC&S' plantation and mills. Work on the ditch system was primarily accomplished by a team of Japanese laborers, with contracting beginning in 1899 and construction concluding in late-1900. Upon completion, the Lowrie Ditch accounted for a twenty-two-mile system, three quarters of which was open ditch, much of it unlined. It had a total capacity of 60 million gallons per day (MGD) and was capable of irrigating up to 6,000 acres. The Lowrie Ditch ended at the 475' elevation on the slope of Haleakala northwest of Kihei.[12]

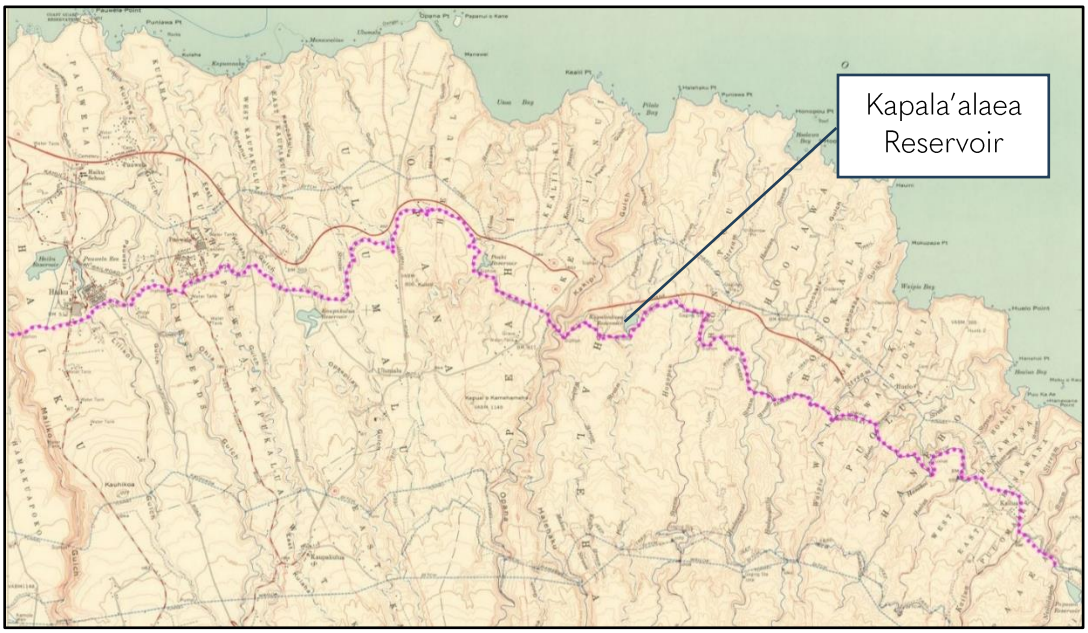


Figure 5. 1957 Topographic map with added dotted line showing the route of the Lowrie Ditch. *USGS, Topographic maps. 1957.*

[10] Arthur L. Dean, *Alexander & Baldwin, LTD. and the Predecessor Partnerships*. (Honolulu: A&B, Ltd.). 1950. P. 64-66. Adler, *Claus Spreckels.* 276, 285.

[11] Carol Wilcox, Sugar Water: Hawai'i's Plantation Ditches. Honolulu: University of Hawai'i Press. 1996. P. 115.

[12] Dee Ruzicka, "East Maui Irrigation System, Draft Intensive Level Survey." (Honolulu: Mason Architects, Inc.) July 2018.

The Lowrie Ditch closely follows the boundary of the southeast side of the Kapala'alaea Reservoir. An inlet to the reservoir from the ditch controlled by a Ratchet Type sluice gate was built into the west bank of the ditch.

In February 1902, as A&B negotiated with the Territory of Hawai'i for a renewal of their (1876) original lease, residents of East Maui once again protested, requesting that the public auction for the lease renewal be stopped. Twenty-seven residents of Nahiku petitioned Governor Sanford B. Dole to halt the auction. The petitioners stated they had struggled and invested greatly to "develop this previously uncultivated tract and to make homes for [them]selves." The document further stated that control of the water should belong to the district and not "the highest bidder." One of the signatories, H.L Handy, delivered the petition to the territorial government in Honolulu on February 24, 1902. However, the auction proceeded, and two days later A&B prevailed as the only bidder. A provision in the lease noted that the rights to take water granted to the lessor are subject to the vested water interests of landowners.[13]

East Maui Irrigation Co. (Formed in 1908)

On June 23, 1908, A&B formed East Maui Irrigation Co. (EMI) to succeed the Hamakua Ditch Company. EMI's purpose was to develop and administer the surface water for all the plantations owned, controlled, or managed by A&B, which by this time had grown considerably.

EMI's boundaries extended from Nāhiku to Māliko gulch, and included the area where surface water was developed. Under EMI, ditch building continued with the construction of the New Haiku Ditch in 1914, the Kauhikoa Ditch in 1915, and the Wailoa Ditch in 1923. By 1920, an EMI foreman was living in Keanae, and by 1930, EMI laborers and truck drivers formed a large portion of the population there. Some parts have been retired and intakes have been added, but the ditch system has not been significantly expanded since the Waiola Ditch was completed in 1923.[14]

EMI is the largest privately owned water company in the United States. It comprises a massive, sprawling system of irrigation infrastructure. In all, approximately 388 separate intakes, over 24 miles of ditches, and 50 miles of tunnels, as well as numerous small dams, intakes, and flumes fell under the administration of EMI, which collectively came to comprise what is sometimes referred to as the EMI Aqueduct System. See Figure 6.

This system primarily collects surface runoff from a watershed area of about 56,000 acres in the four licensed areas. EMI retained the right to water from the four watershed areas of (east to west) Nahiku, Keanae, Honomanu, and Huelo. In 1938, an agreement between the Territory of Hawai'i and EMI allowed easements for the ditch system on portions of land owned by each party. This enabled truly competitive bidding on water leases by permitting a prospective Territorial lessee the right to convey their share of water over the jointly owned system. In 1965,

[13] Environment Hawaii, "Complex Legal Issues."

[14] Group 70 International, Inc., Davianna McGregor, and Cultural Surveys Hawaii, *Kalo Kanu O KA Aina, A Cultural Landscape Study of Keanae and Wailuanui, Island of Maui.* (County of Maui Planning Department). July 1995. P. 37. Note: The 1878 Haiku Ditch (Spreckels Ditch) was abandoned by EMI between 1912 and 1929.

Figure 6. A typical EMI irrigation ditch from the early 20th century. *R.J. Baker, A&B Sugar Museum. Baker Collection/Bishop Museum. N.d.*

the Hawai'i State Legislature amended the laws pertaining to the assignment of leases for water rights by allowing one-year temporary holdover tenancy if a public auction was not held at expiration of a water lease. These one-year permits were sometimes issued in succession, in the absence of a public auction.[15]

Although A&B and EMI continued to own the leases for the area's water rights "with a minimum of controversy" for decades, challenges to the status quo began in the 1970s. Eleven years after the 1965 ruling that permitted one-year holdover tenancies of expired leases in the absence of public auctions, the environmental advocacy organization Life of the Land voiced objections to the process to DLNR. Life of the Land stated that the intent of the 1965 ruling, to prevent exploitive use of state water leases, was twisted when the water is sold for a public purpose, as EMI has done to Maui County.[16] In addition, the propriety of re-issuing holdover tenancy, year

[15] Environment Hawaii, "Complex Legal Issues Surrounding A&B's Taking of East Maui Water. Website www.environment-hawaii.org. Accessed June 25, 2018.

[16] In Hawaii, the State Commission on Water Resource Management (Water Commission) is responsible for deciding the allocation of water resources, the DLNR is responsible for administering the leases granted to execute those allocations.

after year, to the same company, EMI, was called into question.[17] The last water lease held by EMI expired in 1986.[18]
In response to Life of the Land's objections, EMI indicated to the DLNR that their profit from selling water to the county was vastly overestimated by Life of the Land. The Hawaii Attorney General's response to DLNR was that holdover tenancies and revocable permits were lawful, "under conditions which will best serve the interests of the state."[19] Although most all parties agree that long-term leases are desirable, the competitive bidding process that could put water rights into unknown hands gives them cause for concern and the DLNR never acted on Life of the Land's request for change. In 1997, it was understood that if the leased water's ultimate use changed "substantially," the DLNR's administration of the leases or revocable permits would be usurped by the Hawaii Water Commission, which decides "significant water disputes."[20] This has happened with the 2016 closing of the HC&S sugar plantation and mill, which was the consumer of EMI water.

On June 24, 2018, the Hawaii State Commission on Water Resource Management ruled that stream flow should be fully restored on ten streams in East Maui that have historically supported taro cultivation: Makapipi, Waiohue, West Wailuaiki, Wailuanui, Waiokamilo, Palahulu, Piinaau, Hanehoi, Puolua, and Honopuo. This ends over 100 years of diversion for most of these streams. In addition, the commission ruled that seven other streams in East Maui that provide habitat for native fish and other stream life have limited or no diversions: Honomanu, Waikamoi, East Wailua Ili, West Wailua Iki, Ko Pilula, Kolea, and Wai O Hue.[21]

[17] Environment Hawaii, "Complex Legal Issues."
[18] Wilson Okamoto Corp. *Proposed Lease (Water Lease) for the Nahiku, Ke'anae, Honomanu, and Huelo License Areas Environmental Impact Statement Preparation Notice.* February 2017.
[19] Environment Hawaii, "Complex Legal Issues."
[20] Environment Hawaii, "Complex Legal Issues."
[21] "Taro growers, practitioners elated with E. Maui water rights decision." *The Maui News*. June 26, 2018. P. 1.

Architectural Descriptions

The architectural descriptions that follow individually describe the Kapala'alaea Reservoir and Lowrie Ditch, which are interrelated resources. The Kapala'alaea Reservoir was built to capture and store water from Piiloi Stream that was flowing below the elevation level of the Hāmākua Ditch. Initially, this reservoir stored stream water that could later be released into the stream bed to flow down to the Haiku (Spreckels) Ditch, which brought the water westward to irrigate sugar cane fields. The Lowrie Ditch was built to bring additional irrigation water from East Maui westward to cane fields. The Lowrie Ditch was routed along the upper edge of the Kapala'alaea Reservoir and a diversion gate intake was provided to the reservoir from the ditch so that Lowrie Ditch water could also be stored in the reservoir. See Appendix B for full map of EMI.

Kapala'alaea Reservoir and Dam (1885)

Figure 7. Kapala'alaea Reservoir basin, with the dam in the background. View facing north. *MASON, 2023.*

Description

The Kapala'alaea Reservoir is an irregularly shaped, unlined earthen reservoir with a maximum storage capacity of 197 acre-feet. See Figure 7 and Figure 10. The reservoir has a surface area of 8.7 acres. The reservoir is impounded by an earthen dam, covered with tall grass, shrubs, and trees, about 230' long that extends across the Piiloi/ Papalua Stream gulch. The dam is about 48' high, with a dam crest about 15' wide with a one lane vehicle path along its length. See Figure 8. At the southwest end, the dam has an earthen spillway 7' below the crest that is about 20' wide. See Figure 9. The spillway drops into a natural rock plunge pool at the toe of the dam. The outlet portal on the down stream slope is a large diameter pipe (approximately 18" diameter) that is concealed by fallen stones and appears set in ungrouted rip rap. See Figure 12. The reservoir's inlets are the uncontrolled inflow of Piiloi Stream and an inlet from Lowrie Ditch that is controlled by a Ratchet Type sluice gate. The reservoir outlet pipe flows into the bed of Papalua Stream (Note that this stream, below the reservoir, is called out on some maps as Kapala'alaea Stream). At the time of the field visit, October 24 & 25, 2023, virtually no water was entering the reservoir, the Lowrie Ditch inlet gate was shut and the Piiloi Stream was not flowing. See Figure 11 and Figure 18

Figure 8. The reservoir basin with the dam crest vehicle pathway on the left. View facing southeast. *MASON, 2023.*

Figure 9. The dam spillway. Looking up the spillway toward the reservoir basin. View facing south. *MASON, 2023.*

Figure 10. The downstream slope of the dam. Note the dam crest in the right background. View facing northeast. *MASON, 2023.*

Figure 11. Piiloi Stream inlet to the Kapala'alaea Reservoir. Note that the stream is not flowing, and no water is entering the reservoir. View facing north. *MASON, 2023.*

Figure 12. Outlet portal of the reservoir on the downstream slope of the dam. *MASON, 2023.*

Alterations

- A wireless, supervisory control and data acquisition (SCADA) terminal has been added on the crest of the dam.

Character Defining Features

- Earthen, unlined reservoir, dam, and spillway;
- Spillway empties into a natural rock plunge pool;
- Outlet portal set in un-grouted rip rap.

Lowrie Ditch (1900)

Figure 13. Lowrie Ditch, a typical section of the ditch along the east side of the Kapala'alaea Reservoir. View facing north. *MASON, 2023.*

Description

The section of the Lowrie Ditch surveyed for this RLS in proximity to the Kapala'alaea Reservoir is shown in Figure 1. Here, the ditch is an unlined, earthen irrigation channel typically 5'-6' across at the floor of the ditch. See Figure 13. The sloping ditch sides vary in height, due to the uneven terrain, and are typically between 5' -9' high. The water in the ditch has an imperceptible flow and appears stagnant in most places. The portion of the ditch upstream of the reservoir traverses open pastureland that is now fallow. See Figure 15 Figure aaaa, and Figure bbbb.. As the ditch nears the reservoir the terrain becomes thickly wooded, which continues well past the reservoir. See Figure 13 and Figure 14.

The overall extent of the Lowrie Ditch was not surveyed for this report, so a full description is not provided. However, other sources indicate the ditch is comprised of a combination of construction types (lined, unlined, and tunneled) and described as follows:

> Lowrie Ditch … conveys water for 12.4 miles from Nailiilihaele Stream near an altitude of 680 ft to Maliko Gulch near an altitude of 280 ft. About 4.6 miles (37 percent) of the ditch is tunnels and the remaining 7.8 miles is mostly unlined open ditches. The unlined open-ditch sections of the [nearby] Manuel Luis and Center Ditches are very similar with gravel

bottoms and walls made of earthen material on one side and stacked rocks on the other, whereas those of the Lowrie Ditch have mostly earthen walls and bottoms (fig. 9C). Lowrie Ditch had one of the last remaining wood flumes of the EMI diversion system, and it was replaced in October 2011 with a stainless-steel flume.[22]

Figure 14. A typical section of ditch southwest of Kapala'alaea Reservoir that is downstream of the Kapala'alaea intake to the Lowrie Ditch from Piiloi Stream. Note that the water entering the ditch from this inlet has created a downstream current. View facing west. *MASON, 2023.*

Figure 15. A typical section of ditch northeast of the Kapala'alaea Reservoir. This view shows the open land between the ditch and the highway, to the left. This area is proposed for depositing excavated dam material. View facing east. *MASON, 2023.*

[22] Chui Ling Cheng, *Measurements of Seepage Losses and Gains, East Maui Irrigation Diversion System, Maui, Hawai'i. Open-File Report 2012-115*. Prepared in cooperation with the State of Hawai'i Commission on Water Resource Management. U.S. Department of the Interior; U.S. Geological Survey, Reston, Virginia: 2012. P. 7.

Figure 16. Typical terrain along the ditch northeast of the Kapala'alaea Reservoir. This area is proposed for depositing excavated dam material. View facing east. *MASON, 2023.*

Figure 17. This view of the terrain northeast of the reservoir shows the open land between the road adjacent to the north of the ditch (left) and the highway (out of view to the right). This area is proposed for depositing excavated dam material. View facing west. *MASON, 2023.*

Ratchet Type Gate Inlet to Kapala'alaea Reservoir

Along the west bank of the ditch, about 650' south of the east end of the Kapala'alaea Dam, is a Ratchet Type sluice gate that formerly diverted water out of the ditch and into the Kapala'alaea Reservoir. See Figure 18 and Figure 19. This gate appears inoperable and is fixed in the closed position. The gate mechanism consists of a vertical steel spar with cross pins that are engaged by a pawl to incrementally raise the gate panel, which is fixed at the lower end of the spar. The pawl and brackets for the spar are fixed to the top of a concrete base, about 2'-6" high, with the spar extending down through the center of the base. The outlet of this gate, on the sloping bank of the reservoir west of the ratchet mechanism, is a concrete portal with an arched ceiling. See Figure 20. This portal is 14'-6" long, extending through the earthen bank of the ditch. It has a water channel 2'-6" wide and 3'-0" high that is covered by a 6' high arched concrete vault that shows the impressions of the boards used in forming. At the interior of this outlet, the steel door of the gate panel can be seen, in the closed position in the 2'-6" wide x 4' high opening that leads to the ditch.

Ratchet gates operate similarly to a type of automobile jack, using a pawl that engages cross pins that are set in a tall vertical spar fixed to the top of the gate panel. The spar is raised in short increments by a lever that is inserted to engage the cross pins, allowing the pawl to drop below each pin, arresting any downward movement so the lever can be re-engaged. To lower the spar, a lever-operated friction brake controls downward movement when the pawl is released.

Figure 18. Ratchet Type gate that formerly functioned to sluice water from the Lowrie Ditch into the Kapala'alaea Reservoir. This gate is now fixed in the closed position. View facing south. *MASON, 2023.*

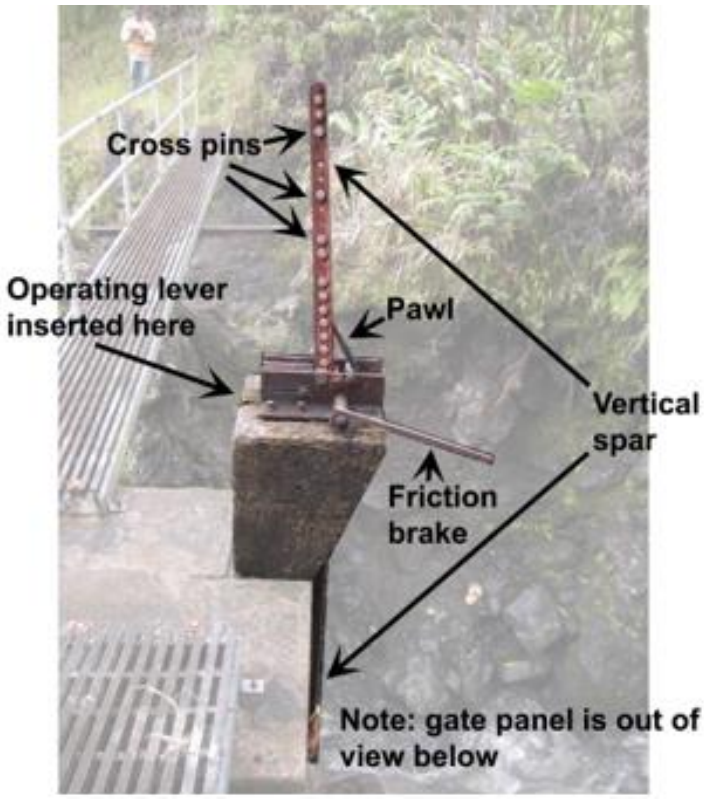


Figure 19. Illustration showing the operation of a Ratchet Type gate at EMI stream diversion at Makapipi. *MASON, 2018*.

Figure 20. Arched concrete outlet portal of the ratchet gate. Note the steel gate panel in the rear that is closed against the rectangular opening to the ditch. View facing east. *MASON, 2023*.

Ditch Intake from Piiloi Stream

Along the east bank of the ditch, about 900' south of the east end of the Kapala'alaea Dam is the portal of a ditch inlet that leads into a tunnel extending underground to the southeast that collects water from a diversion at Piiloi Stream, a short distance away. See Figure 21. This portal, of naturally excavated rock, is about 7' high and 3'-6" wide and is partially concealed by vegetation. A small flow of water is issuing from this portal into the Lowrie Ditch that provides a minimal, discernable water flow in the ditch going downstream. See Figure 14.

Figure 21. Kapala'alaea Intake to the Lowrie Ditch from Piiloi Stream. Note this intake provides water to create a downstream current in the ditch. View facing southeast. *MASON, 2023.*

Concrete Flume over Piiloi Stream

About 600′ southwest of the Kapala′alaea Reservoir, the Lowrie Ditch crosses Piiloi Stream via a concrete flume that is about 120′ long. See Figure 22. This flume is an open trough with a flat bottom and vertical sides that is about 5′ across and 5′ deep. Transverse concrete braces are spaced across the open top of the flume. The flume is supported about 8′ above the bed of the stream on square concrete posts that are set on transverse concrete bases. See Figure 23.

Figure 22. Concrete flume on the Lowrie Ditch. View facing southwest. *MASON, 2023.*

Figure 23. Concrete flume carrying Lowrie Ditch over the Piiloi Stream bed. View facing southeast. *MASON, 2023.*

Alterations

- Alterations to this section of the Lowrie Ditch are minimal.

Character Defining Features

- Unlined earthen irrigation ditch;
- Ratchet Type gate diversion into Kapala'alaea Reservoir;
- Naturally excavated rock portal at ditch intake;
- Open top concrete flume with transverse bracing across Piiloi Stream.

Evaluation of Significance and Integrity

Both resources are identified as historic properties since they exceed fifty years in age; Kapala'alaea Reservoir was built in 1885 and the Lowrie Ditch was built in 1900. Both resources are evaluated as meeting HAR §13-284-6 significance and integrity requirements as discussed below.

Kapala'alaea Reservoir

Significance

- Under HAR §13-284-6 significance Criterion a, Kapala'alaea Reservoir is significant for its association with the early years of HC&S under Claus Spreckels' leadership. The reservoir played an important part in the success of the plantation sugar cane lands of HC&S and the development of the sugar industry on Maui.
- Under HAR §13-284-6 significance Criterion b, Kapala'alaea Reservoir is not significant, having no known association with the lives of persons important in our past. The reservoir is not personally associated with Claus Spreckels.
- Under HAR §13-284-6 significance Criterion c, Kapala'alaea Reservoir is significant, embodying the distinctive characteristics of earthen dam and reservoir construction of the late 1800s.
- Under HAR §13-284-6 significance Criterion d, Kapala'alaea Reservoir is not significant, it is not likely to yield information important in history.

Integrity

- Integrity of Location is retained.
- Integrity of Setting is partially retained due to changes in surroundings such as the nearby highway and the former agricultural area at the highway entry to the site.
- Integrity of Design is mostly retained, there have been few apparent alterations to the reservoir and dam.
- Integrity of Materials is mostly retained, there have been few apparent alterations to the reservoir and dam.
- Integrity of Workmanship is mostly retained, there have been few apparent alterations to the reservoir and dam.
- Integrity of Feeling is mostly retained, although the setting is changed and the reservoir drained, the property generally expresses the historic sense of the period of its construction.
- Integrity of Association is mostly retained, although the reservoir is drained, the basin and dam form a link to their historic function.

Lowrie Ditch

Significance

- Under HAR §13-284-6 significance Criterion a, Lowrie Ditch is significant for its association with HC&S under A&B and as an important component of the Hamakua Ditch Co., the forerunner of East Maui Irrigation Co. The ditch played an important part in bringing water to HC&S cane lands and was a major feature of EMI's extensive water system.
- Under HAR §13-284-6 significance Criterion b, Lowrie Ditch is not significant, having no known association with the lives of persons important in our past.
- Under HAR §13-284-6 significance Criterion c, Lowrie Ditch is significant for embodying the distinctive characteristics of a Hawaiian sugar plantation irrigation ditch constructed at the turn of the 20th century, comprised of lined, unlined, and tunneled sections.
- Under HAR §13-284-6 significance Criterion d, Lowrie Ditch is not significant, it is not likely to yield information important in history.

Integrity

- Integrity of Location is retained.
- Integrity of Setting is partially retained due to changes in surroundings such as the nearby highway and the former agricultural area at the highway entry to the site.
- Integrity of Design is mostly retained, there have been few apparent alterations.
- Integrity of Materials is mostly retained, there have been few apparent alterations.
- Integrity of Workmanship is mostly retained, the skill of laborers is evident in the concrete work of the gate to the reservoir and the flume over the stream.
- Integrity of Feeling is mostly retained, despite some changes in the setting, the ditch evokes the historic sense of the period of its construction.
- Integrity of Association is mostly retained, although the ditch flow is currently slight, it retains a link to its historic function.

Table 1. Significance Evaluation and Integrity assessments

Resource Name/ Photo	Year Built	Evaluation of Significance (HAR §13-284-6)	Integrity Assessment* (HAR §13-284-6)
Kapala'alaea Reservoir 	1885	Meets Criterion a; Kapala'alaea Reservoir is significant for its association with the early years of HC&S sugar production under Claus Spreckels. Meets Criterion c; Kapala'alaea Reservoir embodies the distinctive characteristics of earthen dam construction.	Retains integrity of L. Integrity of S is partially retained due to changes in surroundings. Integrity of D, M,W, F, and A are mostly retained.
Lowrie Ditch 	1900	Meets Criterion a; Lowrie Ditch is significant for its association with HC&S sugar production under A&B and as an important component of the Hamakua Ditch Co., the forerunner of East Maui Irrigation Co. Meets Criterion c; Lowrie Ditch embodies the distinctive characteristics of a Hawaiian sugar plantation irrigation ditch constructed at the turn of the 20th century, comprised of lined, unlined, and tunneled sections.	Retains integrity of L. Integrity of S is partially retained due to changes in surroundings. Integrity of D, M,W, F, and A are mostly retained.

**Integrity assessments provided in the table are abbreviations for the aspects of integrity specified in Hawai'i Administrative Rules Chapter 13-284-6. The seven aspects of integrity are:*

L = Location
D = Design
S = Setting
M = Materials
W = Workmanship
F = Feeling
A = Association

Evaluation of Effect on Historic Properties

The proposed project will decommission the Kapala'alaea Reservoir Dam by breaching. An excavator and bulldozer will be used to create a 193' wide (at the bottom of the maximum breach width) and approximately 40' high opening in the 230' long, 48' high earthen dam. Approximately 23,200 cubic yards (CY) of material will be removed from the dam. Approximately 2,861 CY of this material will be deposited in a sink hole depression in the reservoir basin below the ordinary high water mark (OHWM). The remainder of the excavated material will be deposited and graded into five upland areas that lie adjacent to the dam to the east and west. Approximately 6,500 CY of clean riprap will be used to line the breach, including sections at the approach and discharge channel. Approximately 1,935 CY of this riprap will be used below the OHWM.[23] See Appendix E.

Criteria Used for Evaluations of Effect

The proposed project was evaluated for its effects on the integrity of historic properties against HAR §13-284-7 criteria. See Appendix C for more information.

HAR §13-284-7 - "Determining effects to significant historic properties" describes effects on historic properties as follows:

> Effects include, but are not limited to, partial or total destruction or alteration of the historic property, detrimental alteration of the properties' surrounding environment, detrimental visual, spatial, noise or atmospheric impingement, increasing access with the chances of resulting damage, and neglect resulting in deterioration or destruction.

Further, §13-284-7 - "Determining effects to significant historic properties" explains that one of two effect determinations must be established; "No historic properties affected" or "Effect, with agreed upon mitigation commitments."

Evaluations of Effect Findings

MASON found that the proposed project will result in a "Effect with proposed mitigation" finding under HAR §13-284-7, as follows:

Kapala'alaea Reservoir

For the Kapala'alaea Reservoir, which is evaluated as historically significant, the proposed work will change important characteristics of the property. A large section of the earthen dam will be demolished and lined with riprap. This demolition, along with subsequent filling of the earthen reservoir basin will mean that all aspects of integrity for this resource except location and setting

[23] C. J. Cayanan, Regulatory Specialist, U.S. Army Corps of Engineers, Honolulu District, Letter to Alan Downer, SHPD Administrator, regarding the Kapala'alaea Dam decommissioning, SHPD Project 2022PR01311, dated June 9, 2023.

will no longer be retained. In addition, the depositing of excavated material in the five upland areas adjacent to the reservoir will reduce integrity of setting.

The proposed work will breach the Kapala'alaea Reservoir dam with a 193' x 40' opening that will be lined with riprap. Excavated material will be deposited in the reservoir basin and in adjacent areas. The effect of this work is this resource will no longer retain integrity.

- Location – Integrity of location will be retained.
- Setting – Integrity of setting will be diminished by the depositing of excavated material in the adjacent surroundings.
- Design – The original design of the dam and reservoir held water. The purpose of the project is to not hold water. The resource's original configuration will no longer be retained.
- Materials – Historic material will be removed from the dam.
- Workmanship – When breached, a noteworthy portion of the dam will no longer evidence the extent of the labor and skill of construction.
- Feeling – Demolition of a large portion of the dam will remove the resource's ability to express the aesthetic of its historic period.
- Association – The resource will have a diminished capability to convey its relationship to historic irrigation activities to an observer.

Since the proposed changes above will impair the integrity of the reservoir, MASON recommends an "Effect with proposed mitigation commitments" finding.

Lowrie Ditch

For the Lowrie Ditch, also evaluated as historically significant, the depositing of excavated material from the dam in the three upland areas to the east of the reservoir will change the topography of areas adjacent to the ditch but have no physical effects on the ditch itself.

The proposed work will deposit excavated material from the Kapala'alaea Reservoir dam breaching in proximity to the Lowrie Ditch. The ditch will retain its historic integrity.

- Location – Integrity of location will be retained.
- Setting – Integrity of setting will be retained despite excavated material being added to adjacent areas. The surrounding environment will remain a naturally vegetated area similar to the period when the ditch was in use for irrigation.
- Design – Integrity of design will be retained, there is no work proposed for the ditch.
- Materials – Integrity of materials will be retained.
- Workmanship – Integrity of workmanship will be retained.
- Feeling – Integrity of feeling will be retained; the ditch will retain the ability to express the aesthetic of its historic period.
- Association – Integrity of association will be retained; the ditch will continue to convey its relationship to historic irrigation activities to an observer.

These proposed changes will not impair the integrity of the Lowrie Ditch. MASON recommends a "No historic properties affected" finding.

Mitigation Recommendations

Hawai'i Administrative Rules (HAR) HAR Section 13-284-8 – Mitigation (a) provides four types of mitigation accepted by the SHPD for an architectural resource. These are Preservation, Architectural Recordation, Historical Data Recovery, and Ethnographic Documentation. See Appendix D.

For this project, mitigation for the historic property affected, the Kapala'alaea Reservoir, is recommended in the form of Architectural Recordation. Because this ILS contains excellent views of the reservoir basin, upstream and downstream slopes, and crest of the dam, it is recommended that this ILS report is accepted by the SHPD as mitigation. MASON believes this ILS provides sufficient recordation, by documenting the resources' historical development and context, design and physical alterations, and architectural characteristics, including character-defining features, to serve as mitigation.

No mitigation is recommended for Lowrie Ditch due to the recommended finding of "No historic properties affected."

Bibliography

Adler, Jacob. *Claus Spreckels, The Sugar King in Hawai'i.* Honolulu: University of Hawai'i Press. 1966.

Cayanan, C. J., Regulatory Specialist, U.S. Army Corps of Engineers, Honolulu District, Letter to Alan Downer, SHPD Administrator, regarding the Kapala'alaea Dam decommissioning, SHPD Project 2022PR01311, dated June 9, 2023.

Cheng, Chui Ling. *Measurements of Seepage Losses and Gains, East Maui Irrigation Diversion System, Maui, Hawai'i. Open-File Report 2012-115.* Prepared in cooperation with the State of Hawai'i Commission on Water Resource Management. U.S. Department of the Interior; U.S. Geological Survey, Reston, Virginia: 2012.

Dean, Arthur L. *Alexander & Baldwin, LTD. and the Predecessor Partnerships.* Honolulu: A&B, Ltd. 1950.

Environment Hawaii, "Complex Legal Issues Surrounding A&B's Taking of East Maui Water." Website www.environment-hawaii.org. Accessed June 25, 2018.

Group 70 International, Inc., Davianna McGregor, and Cultural Surveys Hawai'i. *Kalo Kanu O KA Aina, A Cultural Landscape Study of Keanae and Wailuanui, Island of Maui.* Wailuku: County of Maui Planning Department. July 1995.

"The Hawaiian Commercial and Sugar Company," *Honolulu Advertiser.* December 1, 1885. 4.

MASON, "Hāli'imaile Subdivision – Hāli'imaile Residential Large Lot Subdivision Lot 2, Architectural Historic Context Study." Honolulu: Prepared for 'Āina Lani LLC. November 2022.

"Maui Notes," *Pacific Commercial Advertiser.* April 15, 1882. 3.

"Mr. Spreckels Projected Enterprise on Maui." *Pacific Commercial Advertiser.* October 12, 1878. 3.

"Taro growers, practitioners elated with E. Maui water rights decision." *The Maui News.* June 26, 2018. 1.

University of Hawai'i at Mānoa, MAGIS Collection. Historic maps and aerial photos. Various dates.

USGS. Topographic maps. Various dates.

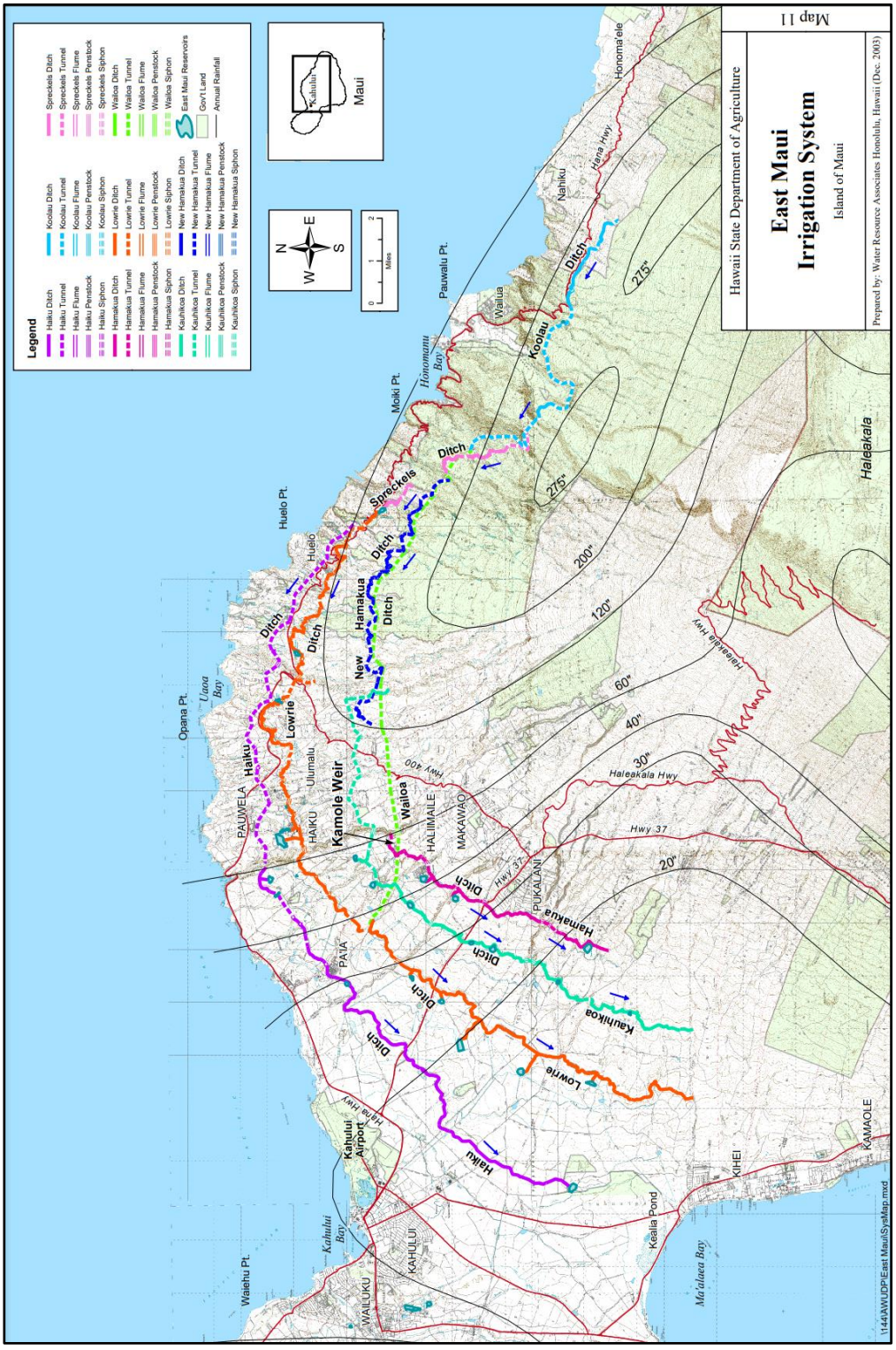
Wilcox, Carol. *Sugar Water: Hawai'i's Plantation Ditches.* Honolulu: University of Hawai'i Press. 1996.

Wilson Okamoto Corp. *Proposed Lease (Water Lease) for the Nahiku, Ke'anae, Honomanu, and Huelo License Areas Environmental Impact Statement Preparation Notice.* Honolulu: Wilson Okamoto Co. February 2017.

Appendices

Appendix A – Map of EMI

(Water Source Associates, Honolulu. 2003)



Appendix B – HAR §13-284-6 Evaluation of Significance

The following is an excerpt from HAR §13-284-6:

(a) Once a historic property is identified, then an assessment of significance shall occur. The agency shall make this assessment or delegate this assessment, in writing, to the SHPD. This information shall be submitted in the survey report, if historic properties were found through the survey.

(b) To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criterion:

(1) Criterion "a". Be associated with events that have made an important contribution to the broad patterns of our history;

(2) Criterion "b". Be associated with the lives of persons important in our past;

(3) Criterion "c". Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value;

(4) Criterion "d". Have yielded, or is likely to yield, information important for research on prehistory or history; or

(5) Criterion "e". Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts--these associations being important to the group's history and cultural identity.

A group of sites can be collectively argued to be significant under any of the criteria.

Appendix C – HAR §13-284-7 Determining effects to significant historic properties

The following is an excerpt from HAR §13-284-7:

(a) The effects or impacts of a project on significant properties shall be determined by the agency. Effects include direct as well as indirect impacts. One of the following effect determinations must be established:

(1) "No historic properties affected". The project will have no effect on significant historic properties; or

(2) "Effect, with proposed mitigation commitments". The project will affect one or more significant historic properties, and the effects will be potentially harmful. However, the agency has proposed mitigation commitments involving one or more forms of mitigation to reasonably and acceptably mitigate the harmful effects.

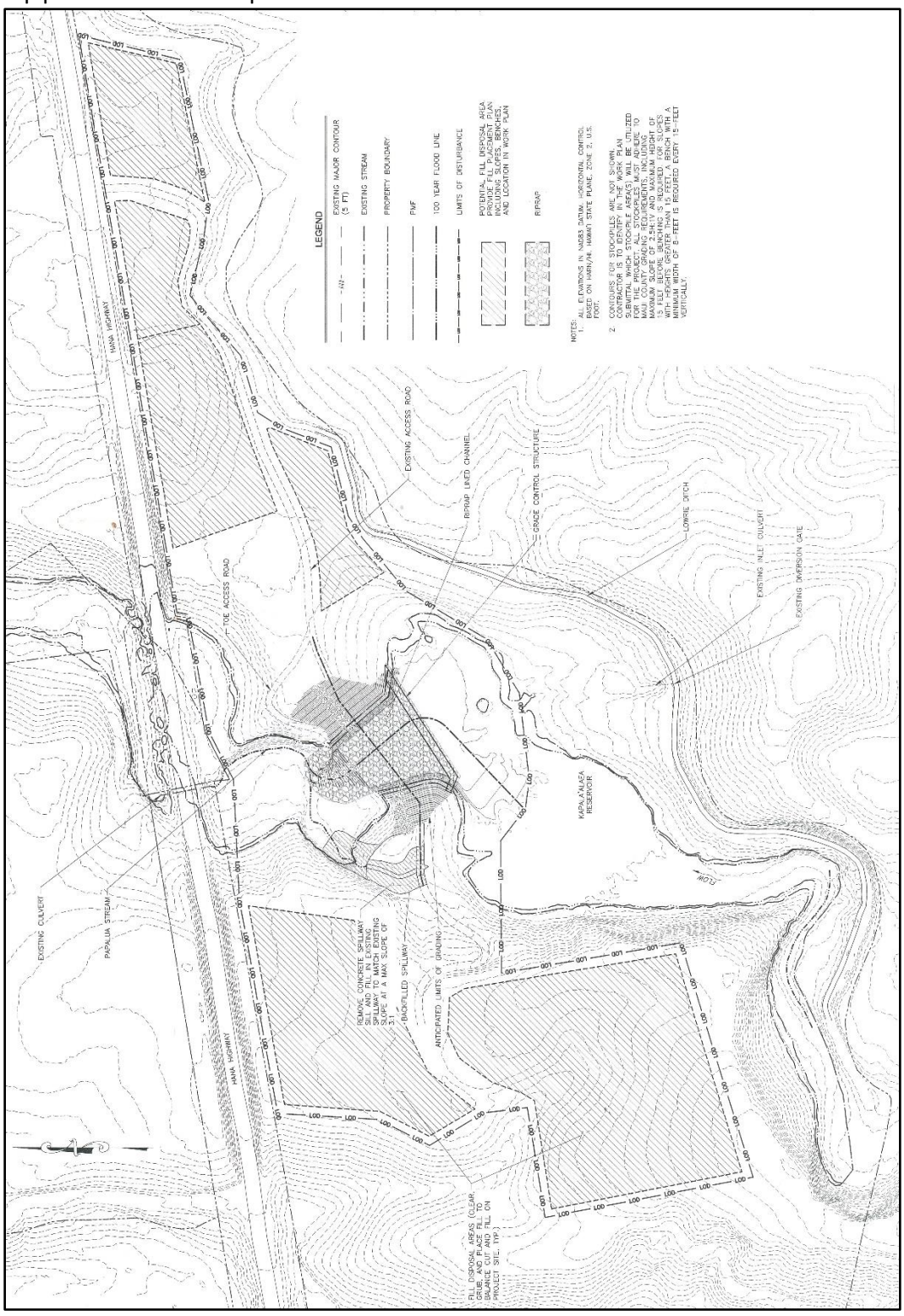
(b) Effects include, but are not limited to, partial or total destruction or alteration of the historic property, detrimental alteration of the properties' surrounding environment, detrimental visual, spatial, noise or atmospheric impingement, increasing access with the chances of resulting damage, and neglect resulting in deterioration or destruction.

Appendix D - HAR §13-284-8 Mitigation

According to Hawai'i Administrative Rules Chapter §13-284-8, mitigation for an architectural resource may take the form of one or more of the following:

A. Preservation. Preservation may include avoidance of the effect and protection, rehabilitation, restoration, or reconstruction.
B. Architectural Recordation. Recordation involves the photographic documentation and possibly the measured drawing of a building, structure or object prior to its alteration. Architectural recordation plans and photos shall meet the minimal standards as provided by Historic American Building Survey (HABS).
C. Historical Data Recovery. Data recovery involves researching historical source materials to document an adequate and reasonable amount of information about the property when a property will be altered or destroyed.
D. Ethnographic Documentation. Ethnographic documentation consists of interviewing knowledgeable individuals and researching historical materials to document an adequate and reasonable amount of information about the property.

Appendix E – Proposed Work



Drawing: Kleinschmidt Group, "Kapala'alaea Dam Decommissioning Design, Proposed Conditions. September 26. 2022.


MASON
ARCHITECTURE
HISTORIC CONSULTING

EXHIBIT 6

Permit No. 88 - KAPALAALAEA RESERVOIR (MA-0094) - DAM REMOVAL

Agency	Date Sent by Dam Safety	Date Returned	No Comments	Comments	No Reply
DLNR Division of Aquatic Resources	10/20/2022	11/2/2022	X		
DLNR Commission on Water Resources Mgt	10/20/2022	2/1/2023		X, See attached	
DLNR Division of Forestry & Wildlife (DOFAW)	10/20/2022	11/30/2022		X, See attached	
DLNR Historic Preservactin Division	10/20/2022			See Exhibit 5	
DLNR Land Division	10/20/2022				X
DLNR Office of Conservation & Costal Lands	10/20/2022	10/28/2022	X		
Department of Agriculture	10/20/2022				X
DOA Agribusiness Development Corporation	10/20/2022				X
County of Maui, Natioinal Flood Insurance Program	10/20/2022	10/25/2022	X		
County of Maui, Emergency Management	10/20/2022				X

Notes:

1. Commision on Water Resource Management required Mahi Pono LLC to aquire a Stream Divirions Work Permit. See attached.

2. DOFAW has comments regarding the Hawaiian Hoary Bat and seabirds. See attached

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STREAM DIVERSION WORKS PERMIT APPLICATION

For Official Use Only:

Instructions: Please print in ink or type and send one (1) completed hardcopy and one (1) digital copy of the application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Applications must be accompanied by a non-refundable filing fee of **$25.00** payable to the Department of Land and Natural Resources. The Commission may not accept incomplete applications without the required signatures. For assistance, call the Stream Protection and Management Branch at **587-0234**. For further information and updates to this application form, visit http://dlnr.hawaii.gov/cwrm.

☐ Check here to allow Commission staff to communicate primarily via e-mail.
Legally required and other key correspondence will still be transmitted via postal mail.

PERMIT TYPE

1. Permit Status: ☒ New ☐ After-The-Fact

2. Type of Construction: ☐ Installation ☐ Modification ☒ Removal / Abandonment

APPLICANT INFORMATION

3. APPLICANT'S NAME / COMPANY	Applicant's Contact Person	Applicant's Phone
East Maui Irrigation	Mark Vaught	(808) 579-9576
Applicant's Mailing Address PO Box 1104, Puunene, HI 96784	Applicant's E-mail Address Mark.Vaught@mahipono.com	

☐ **Check here if project will impact multiple landowners.** *If project impacts multiple landowners, skip **Item 4** below, then complete and attach **Form LND-APP** to identify and verify landowner's approval of proposed stream diversion work.*

4. LANDOWNER'S NAME / COMPANY	Landowner's Contact Person	Landowner's Phone
East Maui Irrigation	Mark Vaught	(808) 579-9576
Landowner's Mailing Address PO Box 1104, Puunene, HI 96784	Landowner's E-mail Address Mark.Vaught@mahipono.com	

5. CONSULTANT'S NAME / COMPANY	Consultant's Contact Person	Consultant's Phone
Kleinschmidt Associates	Jason Kent	(971) 254-3134
Consultant's Mailing Address 1500 NE Irving St., Suite 550 Portland, OR 97232	Consultant's E-mail Address Jason.Kent@kleinschmidtgroup.com	

6. CONTRACTOR'S NAME / COMPANY	Contractor's Contact Person	Contractor's Phone
N/A - contractor has not been selected		
Contractor's Mailing Address	Contractor's E-mail Address	

STREAM INFORMATION

7. Island: *(Check only one)* ☐ Kauai ☐ Oahu ☐ Molokai ☐ Lanai ☒ Maui ☐ Hawaii

8. Tax Map Key(s) *List all affected tax map key parcels.*
(2) 2-8-007:001

9. Stream / Gulch Name(s) *List all affected streams and/or gulches.*
Papalua Stream

FOR OFFICIAL USE ONLY:	SWHU ID:	FILE ID:
LAT:	GWHU ID:	DOC ID:
LON:	REACH ID:	

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

November 30, 2022

MEMORANDUM *Log no. 3866*

TO: CARTY S. CHANG, Chief Engineer
Engineering Division

FROM: LAINIE BERRY, Wildlife Program Manager
Division of Forestry and Wildlife

SUBJECT: **Division of Forestry and Wildlife Comments for Dam Safety Permit No. 88 for a Dam Removal in Kapala‘alaea Reservoir on Maui**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for comments for Dam Safety Permit No. 88 regarding the dam removal in Kapala‘alaea Reservoir (MA-0094) located in Haiku, on the island of Maui; TMK: (2) 2-8-007:001. The proposed project consists of breaching the dam according to DLNR’s Dam Safety Guidelines due to risks of dam failure to the downstream area. The breached channel will be protected from erosion and scour by riprap, and the disturbed areas will be seeded to allow for vegetation growth after construction is completed. The site will be returned to a condition similar to what existed before the dam was constructed.

The State listed Hawaiian Hoary Bat or ‘Ōpe‘ape‘a (*Lasiurus cinereus semotus*) could potentially occur at or in the vicinity of the project and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should also be avoided for any construction because bats can become ensnared and killed by such fencing material during flight.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in their collision with manmade structures or the grounding of birds. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize the attraction of seabirds. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season, from September 15 through December 15, when young seabirds make their maiden voyage to sea. Permanent lighting also poses a risk of seabird attraction, and as such should be minimized or eliminated to protect seabird flyways and preserve the night sky. For illustrations and guidance related to seabird-friendly light styles that also protect seabirds and the dark starry skies of Hawai‘i please visit https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

State-listed waterbirds such as the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), Hawaiian Duck (*Anas wyvilliana*), and Hawaiian Goose (*Branta sandvicensis*) could potentially occur at or in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction, all activities within 100 feet (30 meters) should cease and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, please contact the Maui Branch DOFAW Office at (808) 984-8100.

DOFAW recommends that a botanical survey be conducted by a qualified botanist in all proposed affected areas prior to commencing work to determine if any rare or endangered plants are present in the project area. We recommend that the survey consists of a complete species list and is conducted during the wettest time of year when plants are more likely to be visible, especially in drier areas. If any listed species are found, please notify DOFAW at (808) 587-0166.

DOFAW recommends using native plant species for landscaping that are appropriate for the area; i.e., plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc. Please do not plant invasive species. DOFAW also recommends referring to www.plantpono.org for guidance on the selection and evaluation of landscaping plants and for consulting the Hawai‘i-Pacific Weed Risk Assessment to determine the potential invasiveness of plants proposed for use in the project.

DOFAW recommends minimizing the movement of plant or soil material between worksites. Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid ‘Ōhi‘a Death), vertebrate and invertebrate pests (e.g., Coqui Frogs, Little Fire Ants, etc.), or invasive plant parts (e.g., Miconia, Mullein, etc.) that could harm our native species and ecosystems. We recommend consulting the Maui Invasive Species Committee (MISC) at (808) 573-6472 to help plan, design, and construct the project, learn of any high-risk invasive species in the area, and ways to mitigate their spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

To prevent the spread of Rapid ‘Ōhi‘a Death (ROD), DOFAW requests that the information and guidance at the following website be reviewed and followed if ‘ōhi‘a trees are present at the project site that will be removed, trimmed, or potentially injured: https://cms.ctahr.hawaii.edu/rod.

We appreciate your efforts to work with our office for the conservation of our native species. These comments are general guidelines and should not be considered comprehensive for this site or project. It is the responsibility of the applicant to do their own due diligence to avoid any negative environmental impacts. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Paul Radley, Protected Species Habitat Conservation Planning Coordinator at (808) 295-1123 or paul.m.radley@hawaii.gov.

Sincerely,

Lainie Berry

LAINIE BERRY
Wildlife Program Manager

EXHIBIT 7

DLNR Dam Safety
Ka Pa'akai Pre-Assessment Form (Revised 11/8/23)

PROJECT INFORMATION (To be completed by the dam owner)

Dam Name: Kapala'alaea Dam

Dam ID No.: MA-0094

Dam Owner (name, title, company): East Maui Irrigation Co., LLC.

Type of Project (e.g., removal, reduction, improvement): Removal

Brief Description of Project (as needed, attach diagrams, maps, etc.): This project seeks to remove the Kapala'alaea Dam to prevent any future impoundments at this facility.

TMK(s): (2) 2-8-007-001

Ahupua'a: Hamakualoa

PRE-SCREENED COMPLIANT ACTIVITIES (To be completed by the dam owner)

Yes	No	Compliant Activity
	✓	Repair and maintenance
	✓	Removing trees or vegetation
	✓	Valve replacement
	✓	Outlet modification
	✓	Perimeter fence installation
	✓	Service roadway installation
	✓	Embankment repair or improvement

Does the permit activity meet any of the pre-screened compliant activities? Yes _____ No ✓

If Yes, DLNR Dam Safety will evaluate the compliant activities.

Please continue with the SCREENING ANALYSIS section below.

SCREENING ANALYSIS (To be completed by the dam owner)

Provide responses to the following four screening questions:

1. Upon completion, will the proposed project result in a physical change of the geographical landscape in the area?

   No. Relative to the size of the dam structure and the breach of the channel on the dam embankment, the new channel will not change the overall landscape of the area.

2. Upon completion, will the proposed project result in changes to the water flow frequency, volume, or path upstream of the dam facility, through the project site, or downstream of the project site? Include impacts during conditions such as severe storm events.

   This dam has been operated as a flow-through, with no intentional impoundment for the past 17 years.

3. Upon completion, is there a possibility the project may impact "valued cultural, historical, or natural resources in the petition area?"

   No, an Intensive Level Survey was completed as requested by SHPD.

4. Upon completion, is there a possibility the project may change public accessibility to the dam facility or surrounding area?

   No

_____ If AT LEAST ONE of the four questions above were answered Yes, Dam Safety will consult Aha Moku and/or the Po'o of the respective island to determine the likelihood of the proposed permit activity to affect the Ka Paakai Framework. If it is deemed that further investigation is required, the dam owner will conduct a Ka Pa'akai Consultation Assessment (KPCA). Otherwise, no further analysis will be required.

_✓_ If ALL of the four questions above were answered "No," no further analysis will be required and the dam owner will NOT need to perform a KPCA, subject to review and concurrence by DLNR and the Aha Moku Council.

SCREENING ANALYSIS RECOMMENDATIONS (To be completed by DLNR Dam Safety)

Is a Ka Pa'akai Consultation Assessment recommended?

Yes _____ Recommend the dam owner to perform a Ka Pa'akai Consultation Assessment

No ✓ Subject to approval by the Aha Moku Council.

Comments:

_____

_____

_____

_____

Dam Safety Reviewer Name (Printed): Jesse Colandrea / Edwin Matsuda

Dam Safety Reviewer Signature: _____ _____

Aug 7, 2024 Aug 7, 2024

CONCURRENCE & ACCEPTANCE OF SCREENING ANALYSIS RECOMMENDATIONS (To be processes by DLNR Dam Safety)

☒ Concur with the Ka Pa'akai Screening Analysis Recommendation

☐ Do not concur with the Ka Pa'akai Screening Analysis Recommendation

DLNR Chief Engineer Name (Printed): Carty S. Chang

DLNR Chief Engineer Signature: _____ Aug 7, 2024

☑ Concur with the Ka Pa'akai Screening Analysis Recommendation

☐ Do not concur with the Ka Pa'akai Screening Analysis Recommendation

Aha Moku Executive Director (Printed): Leimana DaMate

Aha Moku Executive Director Signature: Leimana DaMate 8/7/2024

✓ Attachments (Ka Pa'akai Pre-Assessment supporting documents)

DAM SAFETY PERMIT GENERAL CONDITIONS

APPROVAL OF PLANS AND SPECIFICATIONS FOR DAM AND RESERVOIR CONSTRUCTION, ENLARGEMENT, REPAIR, ALTERATION OR REMOVAL

The following General Conditions shall be adhered to for all Dam Safety permits unless otherwise authorized in writing.

1. Actual construction, enlargement, repair, alteration or removal shall be completed within 5 years of issuance of the permit application approval unless an extension authorized in writing by the Board is issued.
2. Prior to the start of work the owner or applicant shall provide a construction engineer to ensure compliance with the approved plans and specifications and who shall have ultimate responsibility for the supervision of all inspection tasks. The construction engineer may assign some inspection tasks to a duly authorized agent under the construction engineer's supervision. The engineer shall be licensed in the State of Hawaii.
3. The construction engineer shall maintain a record of construction that at a minimum, shall include, daily activity, and progress reports, all test results pertaining to construction; photographs sufficient to provide a record of foundation conditions and various stages of the construction through completion, all geologic information obtained; and construction problems and remedies.
4. A construction quality assurance plan shall be prepared and submitted to the Department for approval prior to the start of construction, which details the minimum requirements of the construction engineer's observation of construction.
5. A construction schedule, which includes the notice to proceed date and estimated project duration and a construction emergency action plan shall be submitted prior to the preconstruction meeting.
6. A preconstruction meeting shall be held subsequent to submitting the quality assurance plan, construction schedule and construction emergency action plan, but not later than 14 days prior to the start of construction. All parties actively involved in the construction should be requested to attend, such as the dam owner, the design engineer, the construction engineer, the contractor and the Department.
7. The Department shall be notified 5 calendar days prior to the commencement of construction.
8. Any changes from the approved plans and specifications shall be approved by the design engineer and a change order, including details and supporting calculations, must be provided to the Department. Major changes must be submitted in writing with supporting documentation and approved in writing by the Department. No work shall be initiated until the approval by the Department or Board is received. Minor changes may be transmitted verbally and approved by the Department verbally provided that documentation of the change is provided to the Department within 10 days of the approval.

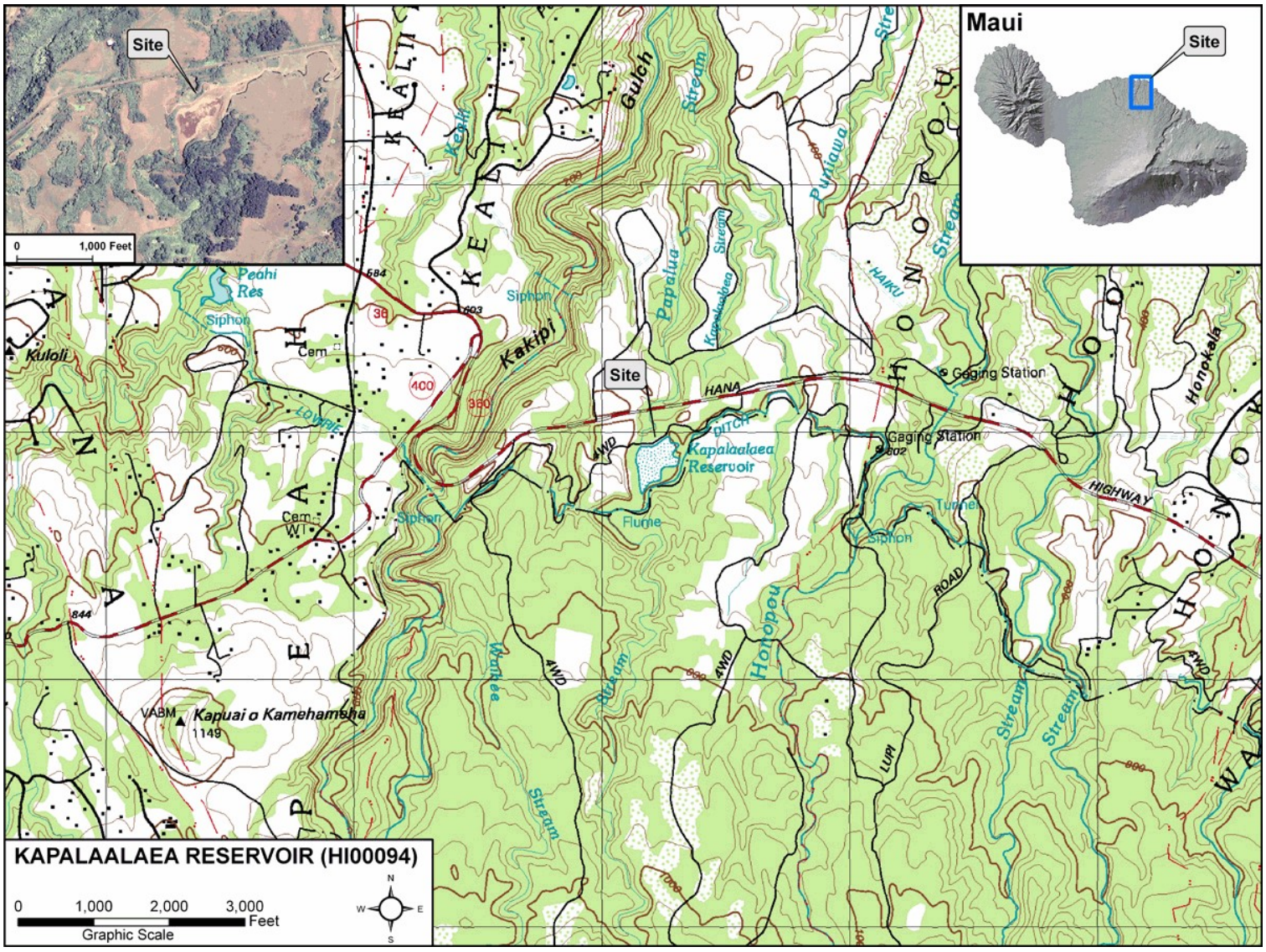
9. For new dam construction and for dams and reservoirs that have lowered the water level or have been drained to facilitate construction, the construction engineer shall file and obtain approval of a filling plan with the Department. The applicant/owner shall not proceed with the filling of the reservoir until it receives permission from the Department. The construction engineer shall provide documentation of monitoring during the filling operation.
10. Prior to the filling of the reservoir, the construction engineer shall submit one copy each of the approved Operations Manual and the approved Emergency Action Plan for the facility upon completion of the project as applicable.
11. The construction engineer shall give the Department at least ten days advanced notice of initial materials placement of the dam's foundation, in the cutoff trench, outlet backfill, outlet foundation, and any appurtenance requested by the Department in the approval of the plan for construction observation, to allow for observation by the Department.
12. Notice of substantial completion shall be issued by the construction engineer to the Department stating that the permitted improvements are functionally complete such that filling of the reservoir can be initiated with an approved filling plan.
13. The construction engineer shall give the Department fifteen (15) calendar days advance written notice prior to the project's final construction inspection. The construction engineer shall coordinate with the Department to conduct this inspection in the presence of the Department's dam safety personnel.
14. The construction engineer shall provide notice at least ten (10) days prior to initiating filling the reservoir, unless agreed at the final inspection.
15. If conditions are revealed which will not permit the construction, enlargement, repair, alteration, or removal of a safe dam or reservoir, the application for approval for construction, enlargement, repair, alteration, or removal shall be revoked.
16. A topographic survey of completed work including all monuments, inverts, crest alignment, spillways, and significant appurtenant features, when required by the Department shall be completed.
17. The applicant/owner shall utilize appropriate erosion control best management practice measures during construction to minimize turbidity (such as scheduling of work during period of low stream flow) and prevent debris and construction materials, including concrete, petroleum products, and other pollutants from enter the waters of the State. Construction related water and debris should be properly disposed of in a legal and environmentally safe manner and in accordance with the Department of Health and other Federal regulations.
18. The applicant/owner shall submit a copy of the dam safety application and the plans and specifications of the proposed improvements to the County Engineer of the County for which the dam resides for compliance with County codes.
19. Within fifteen (15) calendar days of completing the project, the applicant/owner or its representative shall provide the Department with a confirmation letter of compliance, signed and stamped by the construction engineer, indicating that the construction

was completed in accordance to approved plans and specifications including any field changes. The construction engineer shall submit the remaining construction completion documents which may include, but not be limited to, as-constructed drawing, final construction report, topographic survey, record of the location of permanent monuments, log of recorded water levels and other readings from the refilling operation, long-term instrumentation monitoring plan, and affidavit showing the actual cost of construction including engineering costs, within 60 calendar days of the submittal of the final construction inspection.

20. Construction completion documents and the construction engineer's certification shall be provided to the Department within 60 days of the final construction inspection. The Department will review the submitted items and furnish acceptance or denial within 60 days of receipt of satisfactorily completed construction completion documents and close out the dam safety permit.
21. This permit does not relieve the applicant/owner of their obligations to comply with all applicable Federal, State, and County regulations.
22. In the unlikely event that subsurface historic resources, including human skeletal remains, structural remains, cultural deposits, artifacts, sand deposits, or sink holes are identified during the demolition and/or construction work, cease work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the State Historic Preservation Division at (808) 692-8015.
23. Compliance with Hawaii Revised Statutes 179D, and Hawaii Administrative Rules 13-190.1.

EXHIBIT 9

KAPALAALAEA RESERVOIR | MA-0094 | Maui



1. General Information

a. State Dam ID	MA-0094
b. National ID	HI00094
c. Dam Name	KAPALAALAEA RESERVOIR
d. Other Name(s)	
e. Longitude / Latitude	-156.2580 / 20.9132
f. County / Island	Maui / Maui
g. Type of Dam	Earthen
h. Purpose	Irrigation
i. Completed / Last Modified	1885 /
j. Nearest City / Town	Huelo (2.2 miles)
k. Water Body Type	State Regulated Dam
l. Dam Height	48 ft
m. Dam Length	230 ft
n. Drainage Area	0.89 sq. miles / 570 acres
o. Size Classification	Intermediate

2. Owner Information

a. Name of Owner	East Maui Irrigation Company, Mahi Pono Holdings, LLC
b. TMK(s)	(2) 2-8-007:001

3. Hazard Potential Classification

a. Hazard Classification	High
b. Emergency Action Plan	Yes
c. Date of Last EAP	07/27/2022

KAPALAALAEA RESERVOIR | MA-0094 | Maui

Aerial Photo (05/10/2007)

4. Reservoir

a. Normal Storage	153 ac-ft / 50 MG
b. Maximum Storage	197 ac-ft / 64 MG
c. Surface Area	8.7 acres

5. Primary Spillway

a. Minimum Width	50 ft
b. Length	115 ft
c. Type	Channel
d. Protection	Mowed Grass
e. Maximum Discharge	

6. Primary Outlet Works

a. Works Type	Slide (sluice gate)
b. Maximum Discharge	31
c. Size	16" steel slip lined in 20" steel
d. Control Description	Downstream Control

7. Embankment

a. Type of Dam	Earthen
b. Minimum Crest Width	11 ft
c. Upstream Slope Grade	26° / 2.1:1
d. Upstream Slope Protection	Ungrouted Riprap
e. Downstream Slope Grade	32° / 1.6:1
f. Downstream Slope Protection	Mowed Grass
g. Dam Height	48 ft
h. Dam Length	230 ft

8. Inflow Works

Type	Name	Controlled	Size
Ditch	Feeder from Lowrie	Yes	
Stream	Piiloi Stream	No	