



ALEXANDER & BALDWIN  
PARTNERS FOR HAWAII

REVISED  
2/1/2019

October 2, 2018

Mr. Jeff Pearson  
Deputy Director, Commission on Water Resource Management  
Hawaii Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

RECEIVED  
COMMISSION ON WATER  
RESOURCE MANAGEMENT  
2018 FEB -7 AM 7:25

**Subject: Stream Diversion Works Permit Applications (“Category 4” Diversions)  
East Maui Irrigation Company “Taro Stream” Diversion Abandonments**

Dear Mr. Pearson:

East Maui Irrigation Company (EMI) has previously submitted to the Commission on Water Resource Management (CWRM) a Stream Diversion Works Permit Application (SDWPA) for the abandonment of seventy of its existing irrigation system stream diversions in furtherance of its commitment to make existing stream flow restorations in several East Maui “taro streams” complete and permanent. Concurrently, EMI has made submittals to other governmental agencies (specifically, the Office of Conservation and Coastal Lands (OCCL), the United States Army Corps of Engineers (USACE), and the County of Maui Department of Planning) to secure approvals for the work to proceed.

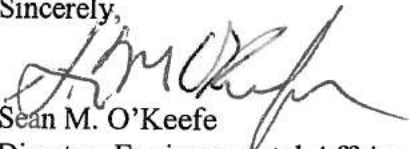
Pursuant to guidance provided by your office, EMI is amending its original SDWPA by splitting it into separate, smaller applications in order to facilitate review and approval of the proposed abandonment work. A copy of the third such application, covering abandonment of twenty-nine diversions, is enclosed, along with the required filing fee. In accordance with direction from your staff, the original of this application has been submitted to the Chairperson for her signature as landowner, with a request that she route the application to your office once she has signed it.

Note that no further work on these diversions is proposed prior to abandonment, since they were inactivated more than a decade ago in order to comply with the March 2007 interim order by the Board of Land and Natural Resources requiring restoration of flow in Waiokamilo Stream or, in the case of the Filipino Ditch diversion, can no longer be located and is believed to be no longer functioning as a diversion.

A fourth and final SDWPA covering fifteen “Category 1” diversions will be submitted upon completion of proposed maintenance work on these diversions. This maintenance work is necessary in order to preserve the operability of the associated irrigation ditches without diverting water. Our July 19, 2018 Request for Determination regarding this maintenance work is currently pending with your office.

Thank you for your consideration of these applications, and please feel free to contact me at (808) 877-2959 with any questions.

Sincerely,



Sean M. O'Keefe  
Director, Environmental Affairs  
Alexander & Baldwin, Inc.

Enclosure

cc: M. Vaught, M. Ching, N. Chun, Y. Izu



ALEXANDER & BALDWIN  
PARTNERS FOR HAWAII

October 2, 2018

Ms. Suzanne Case, Chairperson  
Hawaii Department of Land and Natural Resources  
Kalanimoku Building  
1151 Punchbowl Street  
Honolulu, HI 96813

**Subject: Stream Diversion Works Permit Applications (“Category 4” Diversions)  
East Maui Irrigation Company “Taro Stream” Diversion Abandonments  
Request for Landowner Signature**

Dear Ms. Case:

East Maui Irrigation Company (EMI) has previously submitted to the Commission on Water Resource Management (CWRM) a Stream Diversion Works Permit Application (SDWPA) for the abandonment of seventy of its existing irrigation system stream diversions in furtherance of its commitment to make existing stream flow restorations in several East Maui “taro streams” complete and permanent. Concurrently, EMI has made submittals to other governmental agencies (specifically, the Office of Conservation and Coastal Lands (OCCL), the United States Army Corps of Engineers (USACE), and the County of Maui Department of Planning) to secure approvals for the work to proceed.

Pursuant to guidance provided by CWRM, EMI is amending its original SDWPA by splitting it into separate, smaller applications in order to facilitate review and approval of the proposed abandonment work. The third such application, covering abandonment of twenty-nine diversions, is enclosed, along with the required filing fee. A fourth and final application will be submitted once CWRM provides a requested determination regarding maintenance work on fifteen diversions that are integral to the associated irrigation ditches.

Twenty-eight of the diversions covered by this application have been inactive since they were removed from service in 2007, while one diversion (known as the Filipino Ditch diversion) cannot be located, has not been visited or maintained for many years, and is believed to be no longer functional. As all work necessary to abandon these diversions was completed more than a decade ago, no further work is planned.

All of the diversions covered by this application are located on land owned by the State of Hawaii (Tax Map Key Number (2) 1-1-002:002). Your signature as landowner is therefore necessary in order for CWRM to accept the application for processing. In accordance with instructions we received from CWRM staff, we respectfully request that you sign the application as Landowner in Box 57 and then forward the signed application directly to CWRM for

processing. As you know, your signature on the application does not constitute endorsement or approval of the application.

Thank you for your consideration of these applications, and please feel free to contact me at (808) 877-2959 with any questions.

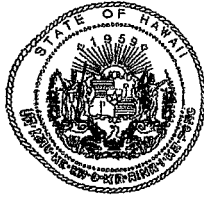
Sincerely,

A handwritten signature in black ink, appearing to read "Sean M. O'Keefe". The signature is fluid and cursive, with a large initial "S" and "O".

Sean M. O'Keefe  
Director, Environmental Affairs  
Alexander & Baldwin, Inc.

Enclosures

cc: M. Vaught, M. Ching, N. Chun, Y. Izu, J. Pearson



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
**STREAM DIVERSION WORKS**  
**PERMIT APPLICATION**

For Official Use Only:  
**RECEIVED**  
**COMMISSION ON WATER**  
**RESOURCE MANAGEMENT**  
**2019 FEB -7 AM 7:25**

**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.

<b>PERMIT TYPE</b>		
1. Permit Status:	<input checked="" type="checkbox"/> New	<input type="checkbox"/> After-The-Fact
2. Type of Construction:	<input type="checkbox"/> Installation	<input type="checkbox"/> Modification <input checked="" type="checkbox"/> Removal / Abandonment
<b>APPLICANT INFORMATION</b>		
3. APPLICANT'S NAME / COMPANY	Applicant's Contact Person	Applicant's Phone
East Maui Irrigation Company	Mark Vaught	(808) 579-9516
Applicant's Mailing Address	Applicant's E-mail Address	
PO Box 791628 Paia, Hawaii 96779	mvaught@abhi.com	
<input type="checkbox"/> 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
State of Hawaii (DLNR)	Suzanne D. Case, Chairperson	(808) 587-0404
Landowner's Mailing Address	Landowner's E-mail Address	
Kalanimoku Building 1151 Punchbowl Street Honolulu, Hawaii 96813	dlnr@hawaii.gov	
5. CONSULTANT'S NAME / COMPANY	Consultant's Contact Person	Consultant's Phone
N/A		
Consultant's Mailing Address	Consultant's E-mail Address	
6. CONTRACTOR'S NAME / COMPANY	Contractor's Contact Person	Contractor's Phone
N/A		
Contractor's Mailing Address	Contractor's E-mail Address	
<b>STREAM INFORMATION</b>		
7. Island: (Check only one)	<input type="checkbox"/> Kauai	<input type="checkbox"/> Oahu
	<input type="checkbox"/> Molokai	<input type="checkbox"/> Lanai
	<input checked="" type="checkbox"/> Maui	<input type="checkbox"/> Hawaii
8. Tax Map Key(s) List all affected tax map key parcels.		
(2) 1-1-002:002		
9. Stream / Gulch Name(s) List all affected streams and/or gulches.		
Waiokamilo, Wailuanui		
<b>FOR OFFICIAL USE ONLY:</b>		
LAT: _____	SWHU ID: _____	FILE ID: _____
LON: _____	GWHU ID: _____	DOC ID: _____
	REACH ID: _____	

**GENERAL PROJECT INFORMATION**

10. Diversion No: (if already assigned) see attached 11. Diversion Name: see attached

12. Project Site Location(s): Provide site coordinates of downstream-most point of project in degrees, minutes, seconds (NAD83).

Latitude: see attached ° ' " Longitude: see attached ° ' " Elevation: see attached ft. above mean sea level

13. Diversion Structure Type: (Check all that apply)

- Unlined channel  Hand-built rock  Concrete masonry  Dam/weir  Pipe
 Metal  Plastic  Wood  Pump  Direct use
 Other - Describe: multiple; see attached

**STREAM DIVERSION WORKS SPECIFICATIONS (For abandonments, skip to Legal Requirements section, Item #32)**

14. Structure Dimensions: (feet) Width: Height: Length: Diameter:
Provide generalized dimensions for the entire project / structure area. If the project includes a pipe (e.g., culvert, drain, etc.), provide the pipe diameter.

15. Diversion Location: Left bank (downstream view) Right bank (downstream view) Across entire stream channel
Provide the general location of the diversion intake structure in relation to the streambank.

16. Intake Dimensions: (feet) Width: Height: Length: Diameter:

17. Average diversion amount: (cubic feet per second)

18. Diversion is part of a system of diversions: Yes No

19. Diverted flow can be controlled: Yes No

Control Dimensions: (feet) Width: Height: Length: Diameter:

20. Water will be pumped from the stream: Yes No

If yes, identify pump capacity: (gallons per minute) Daily average pumping time: (hours)

21. Water will be impounded in the stream channel: Yes No

22. Water diversion capacity will be measured daily: Yes No

23. Water will be returned to the stream: Yes No

If yes, average amount of return flow: (cubic feet per second)

24. Water will be stored off-stream: Yes No Storage capacity: (gallons)

Describe storage facility:

25. State Land Use Classification: (Check all that apply) Agriculture Conservation Rural Urban

**WATER USE INFORMATION**

Check all water use categories below that are intended for the proposed diversion, then describe the proposed use in more detail.

26. Agriculture

27. Domestic

28. Industrial

29. Irrigation

30. Military

31. Municipal

**LEGAL REQUIREMENTS**

If required, the permits or approvals below must be obtained before the Commission on Water Resource Management can legally issue a permit. Visit the Commission's Applications & Forms webpage (http://dlnr.hawaii.gov/cwrm/info/forms/) for links to agency websites/contact information.

32. Conservation District Use Permit (CDUP): To find out if your stream diversion works is located in a Conservation District (CD), you may visit to the Land Use Commission (LUC) website at http://luc.hawaii.gov/maps to view Land Use District Boundary maps. If the stream diversion works will be located in a CD, contact the Department of Land and Natural Resources' Office of Conservation and Coastal Lands (OCCL) at (808) 587-0377 to determine if a CDUP is required.

- Stream diversion works is in a Conservation District.
 Required. CDUP #: Date CDUP approved:
 Not Required. Attach documentation from Office of Conservation and Coastal Lands (OCCL), Department of Land and Natural Resources.
 I have not checked with the OCCL about whether or not a CDUP is required.
 Stream diversion works is not in a Conservation District.

**33. Special Management Area Permit (SMAP):** To determine if an SMAP is necessary, contact your County Planning Department.

- Required. SMAP #: \_\_\_\_\_ Date SMAP approved: \_\_\_\_\_  
 Not Required. Attach documentation from applicable County agency.  
 I have not checked with the County about whether or not an SMA Permit is required.

**34. State Historic Preservation Division (SHPD), Department of Land and Natural Resources:** If the parcel(s) affected by the stream alteration has been reviewed by the State Department of Land and Natural Resources Historic Preservation Division (SHPD or through an OEQC Environmental Review, Special Management Area Permit, etc.), check "yes" and attach any relevant documentation from SHDP. If the affected parcel(s) has not undergone SHDP review, attach a photograph of the affected area, a schematic diagram (showing the location, access road and infrastructure for the alteration), and a short description of the prior use(s) of the land on which the alteration resides.

*\*Please note: You are strongly advised to contact the SHPD to obtain a pre-review of your project. In the event that you do not get an HP pre-review and if during the course of either review or the permit itself it is determined that you need SHPD's concurrence, your application or permit may be held in abeyance or denied until issues with HP are resolved. To contact SHPD, please call (808) 692-8015.*

- I have consulted the SHPD regarding potential impacts of stream channel alteration activities on historic sites. I have attached applicable documentation from the SHPD.  
 I have not consulted with the SHPD regarding potential impacts of stream channel alteration activities on historic sites.

**35. Chapter 343, Hawaii Revised Statutes, Hawaii Environmental Policy Act:**

- An Environmental Assessment was completed, and  
 An Environmental Impact Statement was required and has been accepted (attach letter of acceptance).  
 Publication date in The Environmental Notice: \_\_\_\_\_  
 A Finding of No Significant Impact has been determined (attach letter).  
 Publication date in The Environmental Notice: \_\_\_\_\_

This project proposes:

- |   |  |
|---|--|
| <input type="checkbox"/> Use of state or county lands, or use of state or county funds      | <input type="checkbox"/> A wastewater treatment unit           |
| <input type="checkbox"/> Use within a state conservation district                           | <input type="checkbox"/> Waste-to-energy facility              |
| <input type="checkbox"/> Use within a shoreline setback area                                | <input type="checkbox"/> Landfill                              |
| <input type="checkbox"/> Use within a national or Hawaii registered historic site           | <input type="checkbox"/> Oil refinery                          |
| <input type="checkbox"/> Use within the Waikiki Special District                            | <input type="checkbox"/> Power-generating facility             |
| <input type="checkbox"/> The construction, expansion or modification of helicopter facility | <input checked="" type="checkbox"/> None of the above 11 items |

**OTHER REGULATORY REQUIREMENTS**

If the proposed stream channel alteration is subject to the following permits or approvals, indicate by checking the appropriate box below and submit either the approval letter from the appropriate agency or attach a copy of the application form. If the proposed stream channel alteration is not subject to the following permits or approvals, indicate by checking the "N/A" (Not Applicable) field.

	Attached	N/A
<b>36. U.S. Army Corps of Engineers</b> (Harbors and Rivers Act, Section 404, Clean Water Act)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>37. State Department of Health, Clean Water Branch</b> (Section 401, Clean Water Act, Water Quality Certification, Best Management Practices Plan)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>38. Right-of-Entry or Right-of-Way Permit</b> if the proposed stream channel alteration includes State lands. (Chapter 171, Hawaii Revised Statutes)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>39. Hawaii Environmental Policy Act</b> (Chapter 343, Hawaii Revised Statutes; Title 11, Chapter 200, Hawaii Administrative Rules)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>40. Soil and Water Conservation District</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>41. County Certification of "No-Rise"</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>42. County Grading Permit</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>43. County Discretionary Permit(s)</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CULTURAL IMPACTS**

Articles IX and XII of the State Constitution, other state laws, and the courts of the State, require government agencies to promote and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups. If there is not enough space available, please make a note in the field (e.g., "See attached") and attach all information with this application as requested.

**44. Please provide the identity and scope of cultural, historical, and natural resources in which traditional and customary native Hawaiian rights are exercised in the area.**

Refer to the following:

County of Maui Planning Department, Kalo Kanu O Ka'aina: A Cultural Landscape Study of Ke'anae and Wailuanui, Island of Maui, July 1995

Kepa Maly and Onaona Maly, Wai O Ke Ola: He Wahi Mo'olelo No Maui Hikina, 2001

**45. Identify the extent to which those resources, including traditional and customary Native Hawaiian rights, will be affected or impaired by the proposed action.**

Except as noted in Box 47 below, work on these diversions completed in 2007 has already had a positive impact on stream resources due to the total and permanent restoration of flows in affected streams. This in turn has had a positive effect on traditional and customary Native Hawaiian rights, including but not limited to kalo cultivation in areas downstream of the diversions.

**46. What feasible action, if any, could be taken by the Commission on Water Resource Management in regards to your application to reasonably protection Native Hawaiian rights?**

None known, as the diversions have already been completely inactivated and flow has already been completely restored in these streams.



**PROJECT DESCRIPTION**

*Please complete the following sections by providing detailed information on the project components identified below. If there is not enough space available, please make a note in the field (e.g., "See attached") and attach all information with this application as requested.*

**47. Describe the overall project scope and objectives.**

See attached. The project scope is to formally abandon 29 diversions, 28 of which are located on Waiokamilo Stream and one of which is believed located on (West) Wailuanui Stream. All diversions on Waiokamilo Stream were inactivated in 2007 and have been out of service ever since. One diversion on (West) Wailuanui Stream (known as the Filipino Ditch diversion) has not been maintained for many years, cannot be readily located, and is believed to no longer be diverting water.

**48. Describe existing stream channel dimensions and median streamflow conditions at the site of the proposed stream diversion works.**  
Not applicable as no stream diversion works are proposed.

**49. Identify and describe the project components outlined below**

**A. Materials**

None. No work is proposed.

**B. Quantities**

None. No work is proposed.

**C. Excavation**

None. No work is proposed.

**D. Fill**

None. No work is proposed.

**E. Disposal**

None. No work is proposed.

**F. Construction methods**

None. No work is proposed.

**G. Temporary facilities**

None. No work is proposed.

**H. Expected period of time required for construction**

Not applicable. No work is proposed.

**I. Liability during construction**

None. No work is proposed.

50. Describe the project's consistency with county zoning and development plans.

Not applicable. No new uses are proposed.

51. Identify potential alternatives (sources of water) to the project and describe the relative costs and benefits of each alternative.

Not applicable. No water is proposed to be diverted.

### SUBMITTALS

Please submit the following plans, maps, or drawings in legible form, preferably on 8.5" by 11" sheets.

52. **Location Map:** Provide a location map of the proposed project relative to major roadways.

53. **Plans / Elevations / Sections:** Provide a plan view of the proposed stream diversion works structure in relation to the stream channel and property boundaries. Elevation and section views of the diversion structure in relation to the stream channel should also be provided if available.

### SIGNATURES

Signing below indicates that the signatories understand and swear that the information provided is accurate and true to the best of their knowledge. Further, the signatories understand that if the permit requested is granted by the Commission on Water Resource Management (Commission), the permit shall be subject to the following conditions:

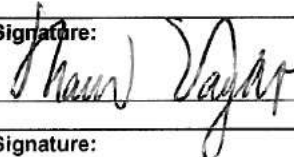
- 1) The proposed work is to be completed within two (2) years from the date of permit approval.
- 2) The permittee shall notify the Commission, by letter, of the actual dates of project initiation and completion.
- 3) The permittee shall submit a set of as-built plans and photographs to the Commission upon completion of the project.
- 4) The permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months.
- 5) If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

#### 54. APPLICANT

Print Name:

Mark Vaught

Signature:



Date:

08/20/2018

#### 55. CONSULTANT

Print Name:

NA

Signature:

Date:

#### 56. CONTRACTOR

Print Name:

NA

Signature:

Date:

57. **LANDOWNER** (If multiple landowners, skip Section 53, then complete and attach Form SCAP-LND with appropriate landowner signatures.)

Print Name:

Suzanne D. Case, Chairperson BLNR

Signature:

Date:

**Attachment to Stream Diversion Works Permit Application**  
**East Maui Irrigation Company, LLC**

- Boxes 10 through 13: This application is for abandonment of multiple (29) existing or formerly existing diversions on multiple streams. See attached spreadsheet for details relating to individual diversions.
- Boxes 14 through 31: Not applicable to abandonments.
- Box 32: All diversions covered by this application are or were located within the Conservation District. Except as noted in Box 47, all work on these diversions was completed in 2007 to comply with the March 2007 interim order by the Board of Land and Natural Resources requiring restoration of flow in Waiokamilo Stream. No further work within the Conservation District is proposed under this application; therefore, no CDUP is required.
- Box 33: None of the diversions covered by this application are or were located within the SMA, therefore no SMA Permit is required.
- Box 34: Some diversions covered by this application may be considered historic structures because they are more than 50 years old, but none are listed on either the State or National Register of Historic Places. Since no further work on these diversions is proposed under this application, no historic preservation requirements are anticipated.
- Boxes 35 and 39: While all existing or formerly existing diversions covered by this application are located on state land and within the Conservation District, no continuing use of state land or land within the Conservation District is proposed.
- Boxes 36 through 43: No permits are required because no work is proposed to be conducted to abandon these diversions.
- Box 52: Not applicable, as no new stream diversion works are proposed.

**Stream Flow Restoration in Waiokamilo Stream**  
**Summary of Relevant Information**

1. Parties involved in the work:

Organization: East Maui Irrigation Company, LLC  
Contact: Sean O'Keefe  
Address: P.O. Box 266, Puunene, HI 96784  
Telephone: (808) 877-2959

2. Project name or title: Stream Flow Restoration at Koolau Ditch on Waiokamilo Stream and West Wailuanui Stream (Filipino Ditch diversion)

3. Name of water body: Waiokamilo Stream and tributaries, West Wailuanui Stream

4. Project street address: Not applicable

5. Location of project: Keanae/Nahiku (Koolau moku), Maui County, Hawaii

6. Other location descriptions: See attached spreadsheet for latitude and longitude, elevation, and Tax Map Key Number of each individual diversion.

7. Directions to the site: Please contact East Maui Irrigation Company for directions.

8. Nature of activity: No work on these diversions is planned. These diversions were inactivated in 2007 (28 diversions) or can no longer be located and are believed to be non-functional (one diversion).

9. Project purpose: The purpose of the project is to permanently abandon 29 diversions. Flows in Waiokamilo and West Wailuanui Streams at these diversions have been completely restored since 2007.

10. Reason for discharge of dredged and/or fill material: No discharges.

11. Types of material being discharged and the amount in cubic yards: No discharges.

12. Surface areas of wetlands or other areas filled: No fills.

13. Attachments:

Spreadsheet – EMI Taro Stream Diversions (Waiokamilo/West Wailuanui Streams)  
Waiokamilo Hydrologic/Watershed Unit Maps  
USGS Nahiku Quadrangle Map, Detail – Waiokamilo Stream Diversions  
EMI Registered and Minor Diversions, Waiokamilo Hydrologic Unit  
Site Photographs, Waiokamilo Stream Diversions

**Additional Attachments – Description of Work**

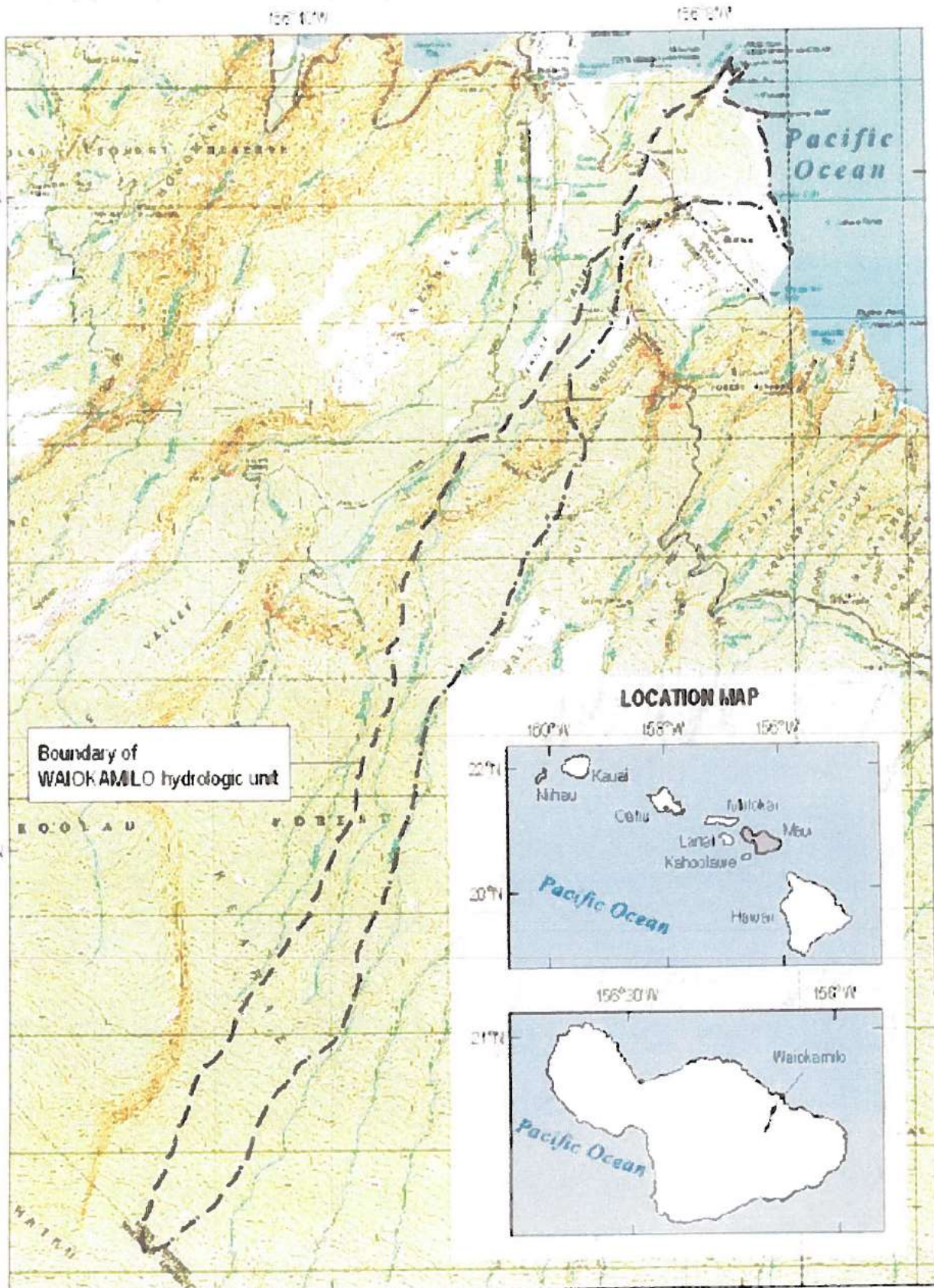
# Waiokamilo Watershed Unit

TRUE NORTH

- West Kikokiko Small Intakes (4) ● Koolau Ditch
- Small Intakes (6) West of #12 Crosscut ● Koolau Ditch
- Waiokamilo #12 Intake ● Koolau Ditch
- #12 Crosscut Intakes (5) ● Koolau Ditch
- Waiokamilo #11 Intake ● Koolau Ditch
- 4" Pipe East of #11 ● Koolau Ditch
- #10 Crosscut Intakes (6) ● Koolau Ditch
- 6" Kualani (East Waiokamilo) Aluminum Pipe ● Koolau Ditch
- East Waiokamilo (Kualani) ● Koolau Ditch
- Kikokiko Small Intake ● Koolau Ditch
- Waiokamilo Kikokiko Intake ● Koolau Ditch

1/30/17

000015



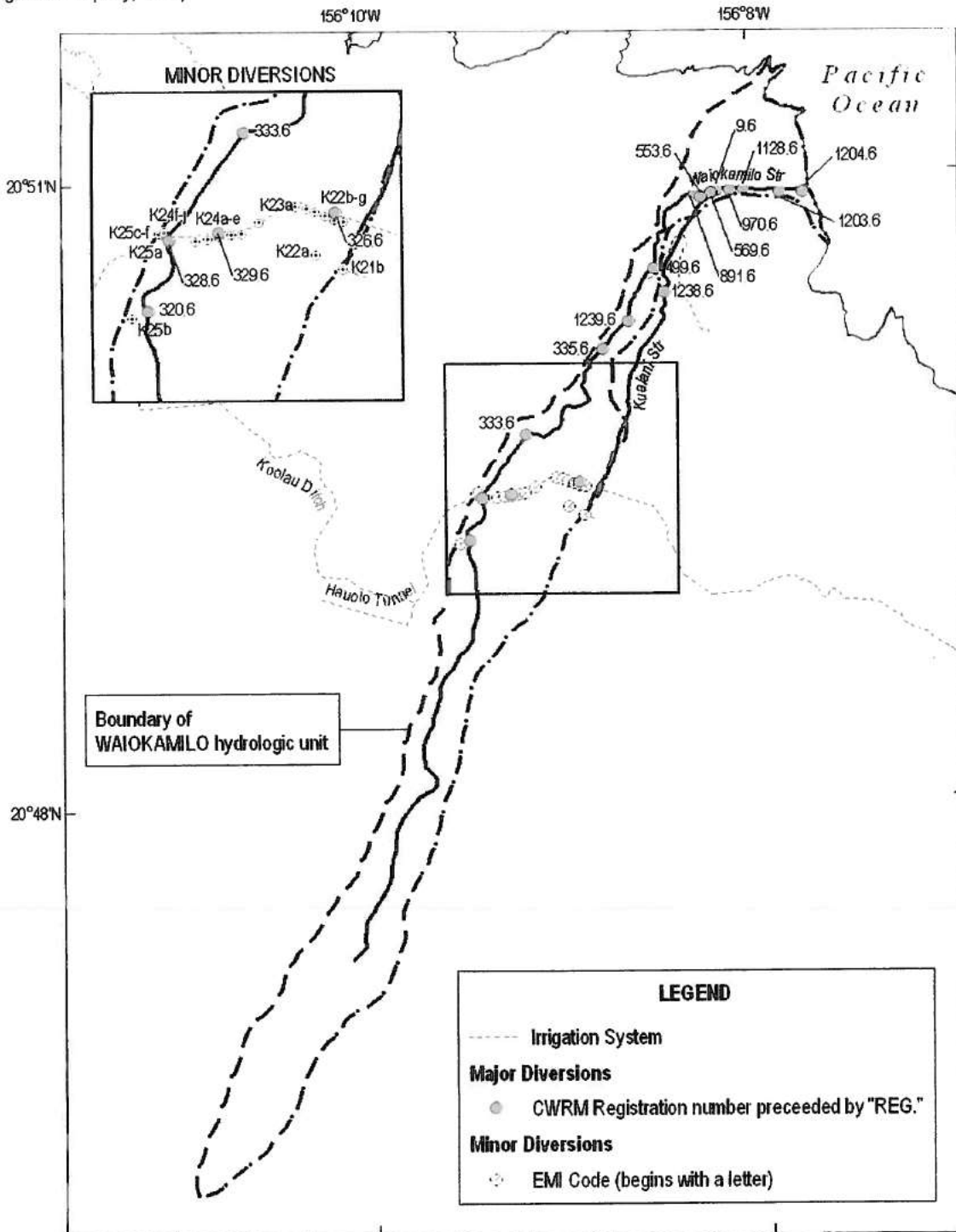
Prepared by the Department of Land and Natural Resources  
 Commission on Water Resource Management  
 Hawaiian Islands Population, 2004, Final Report (LNR-04-01)







Figure 13-9. All registered diversions and EMI minor diversions identified in the Waiokamilo hydrologic unit (Source: East Maui Irrigation Company, 1970).



Prepared by the Department of Land and Natural Resources,  
Commission on Water Resource Management  
Transverse Mercator projection, zone 4, North American Datum 1983

**Photographs – Completed Alterations to Waiokamilo Stream Diversions**

**(Photos 1 through 30)**

Kualani (East Waiokamilo) -Koolau ditch  
**Latitude (N)** 20° 49' 28.49" **Longitude (W)** 156° 09' 00.00" **Elevation (feet)** 1,472  
 Concrete masonry  
 Concrete diversion intake



**Photo 1:** East Waiokamilo (Kualani) at Koolau Ditch (K-22/326.6) Diversion intake grate shown was sealed with concrete in 2007. (Note: Orientation of photo from 2008 IFSAR for Waiokamilo Hydrologic Unit appears incorrect; rotate counter-clockwise 90 degrees.)

6" Kualani (East Waiokamilo) aluminum pipe-Koolau ditch  
**Latitude (N)** 20° 49' 28.18" **Longitude (W)** 156° 09' 00.65" **Elevation (feet)** 1,475  
 Pipe  
 Remove pipe



**Photo 2:** 6-inch Kualani (East Waiokamilo) aluminum pipe at Koolau Ditch (K-22a) Pipe shown was removed in 2007.



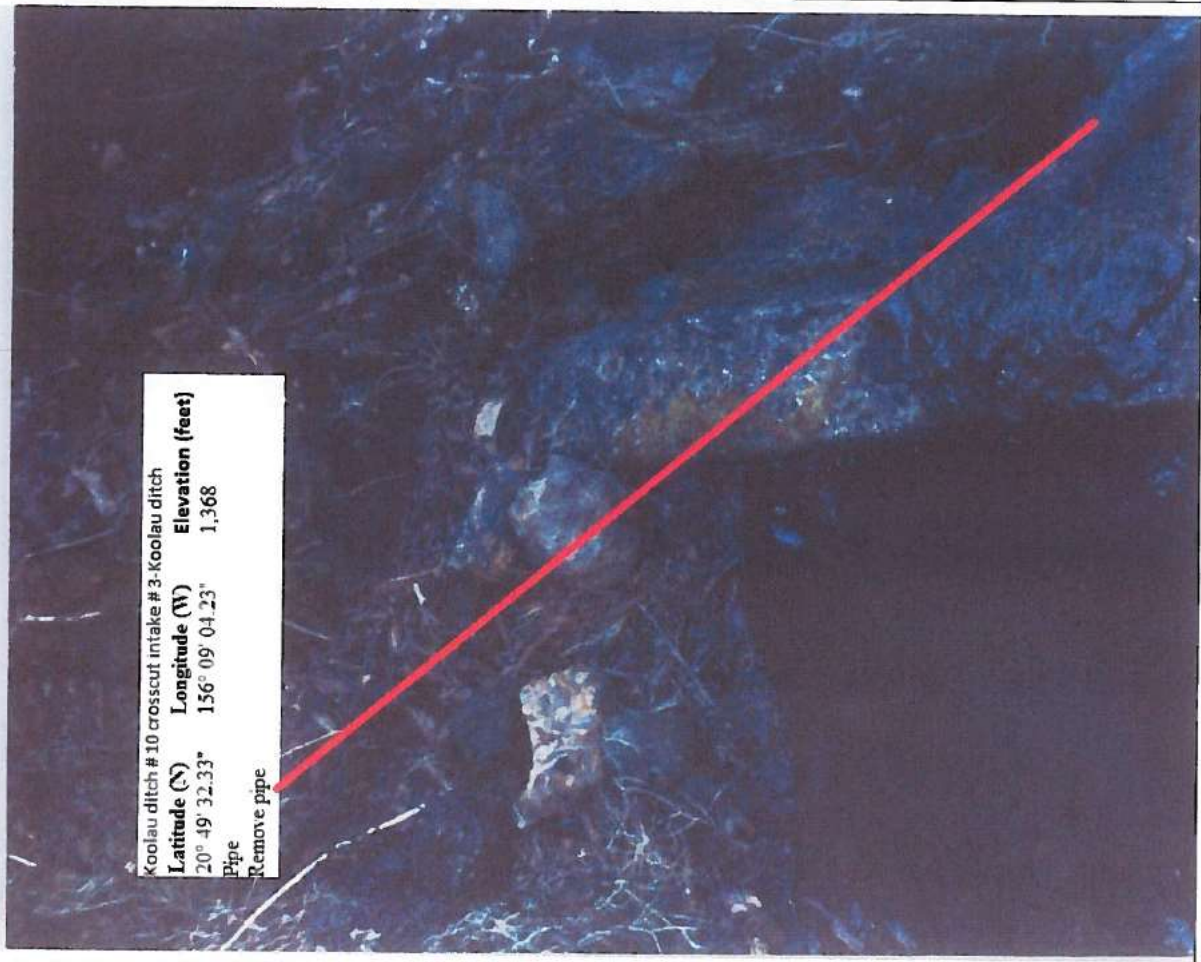
Koolau ditch # 10 crosscut intake # 1-Koolau ditch  
 Latitude (N) 20° 49' 32.33" Longitude (W) 156° 09' 04.23" Elevation (feet) 1,368  
 Pipe  
 Remove pipe

**Photo 3:** Number 10 crosscut intake at Koolau Ditch, #1 of 6 (K-22b)  
 Pipe shown was capped/removed in 2007.



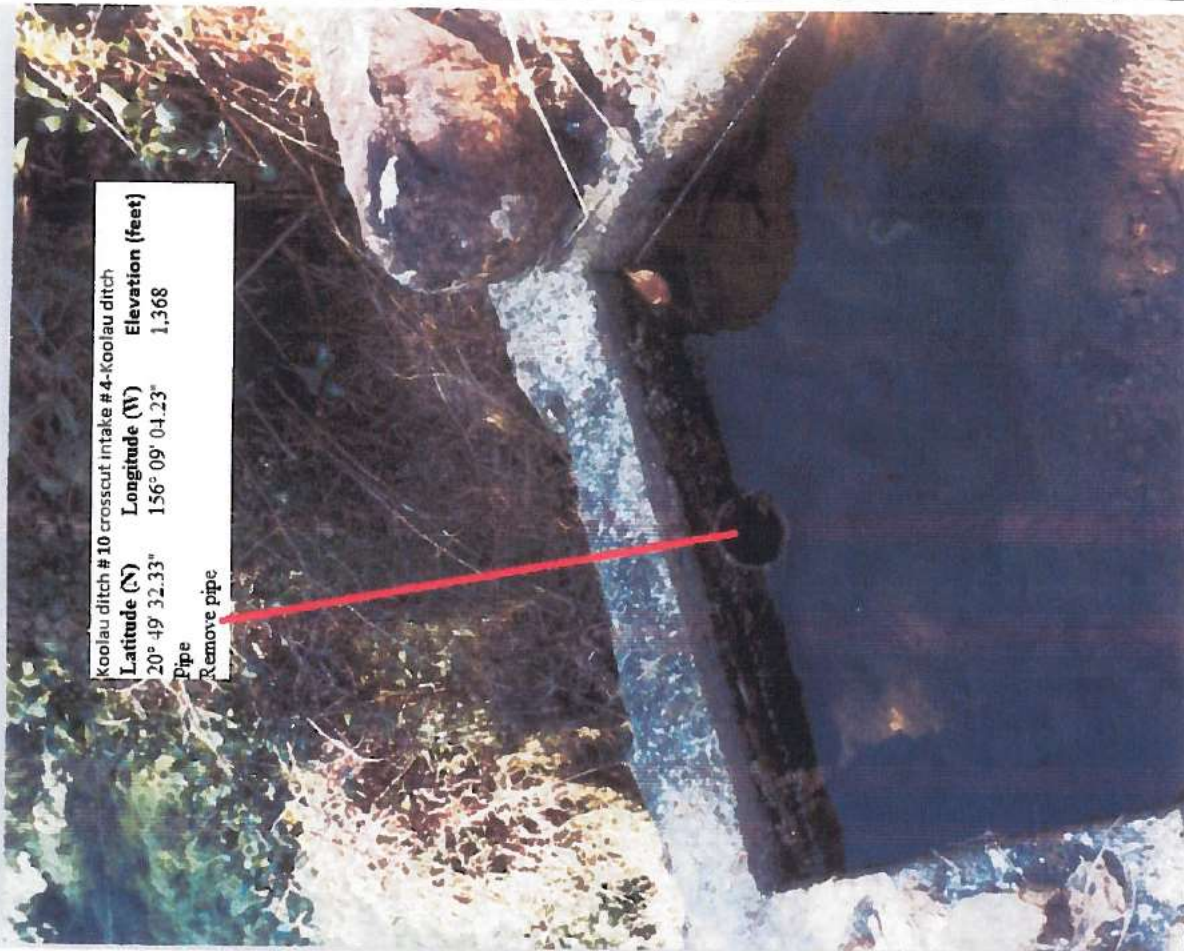
Koolau ditch # 10 crosscut intake # 2-Koolau ditch  
 Latitude (N) 20° 49' 32.33" Longitude (W) 156° 09' 04.23" Elevation (feet) 1,368  
 Pipe  
 Remove pipe

**Photo 4:** Number 10 crosscut intake at Koolau Ditch, #2 of 6 (K-22c)  
 Pipe shown was removed in 2007.



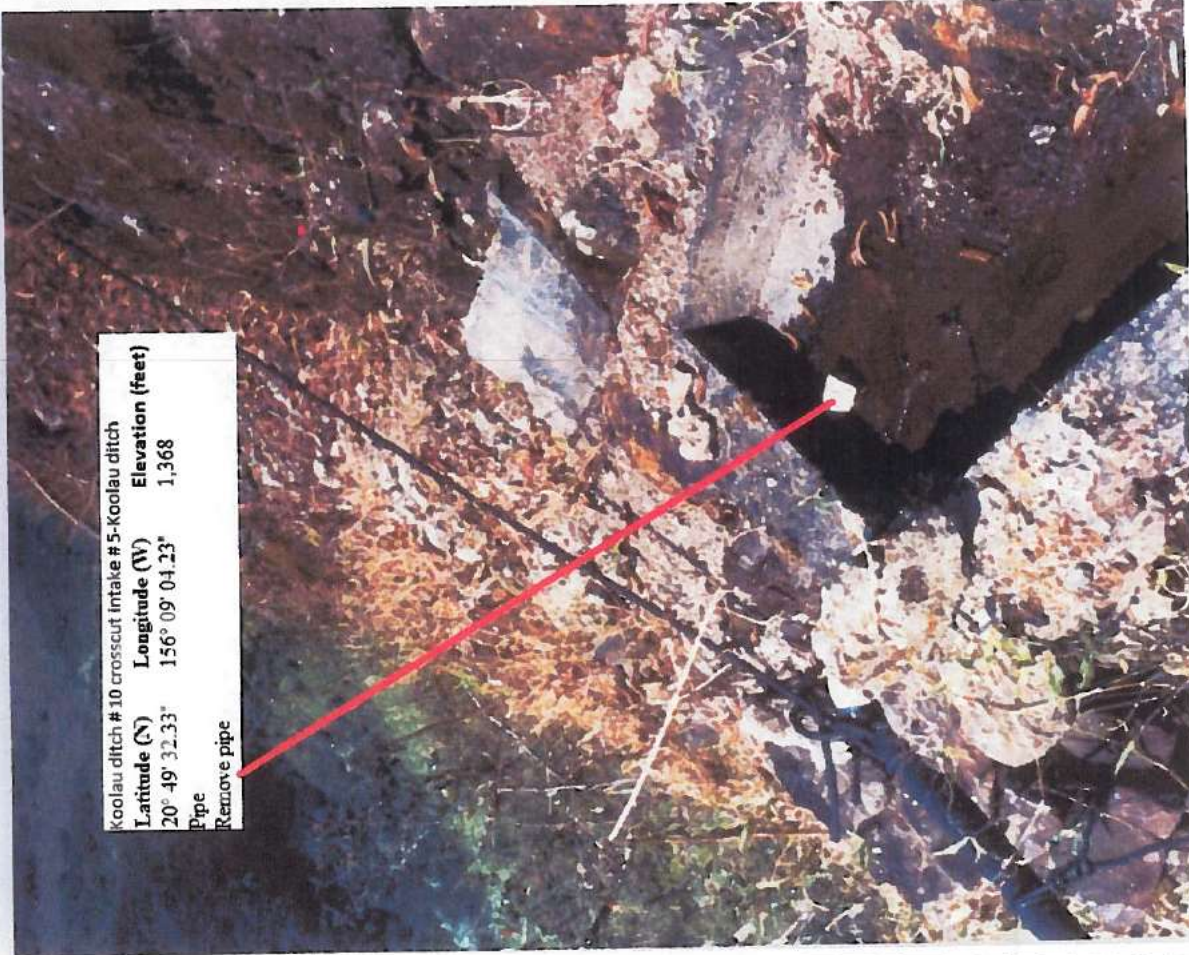
Koolau ditch # 10 crosscut intake # 3-Koolau ditch  
**Latitude (N)** 20° 49' 32.33" **Longitude (W)** 156° 09' 04.23" **Elevation (feet)** 1,368  
 Pipe  
 Remove pipe

**Photo 5:** Number 10 crosscut intake at Koolau Ditch, #3 of 6 (K-22d)  
 Pipe shown was capped/removed in 2007.

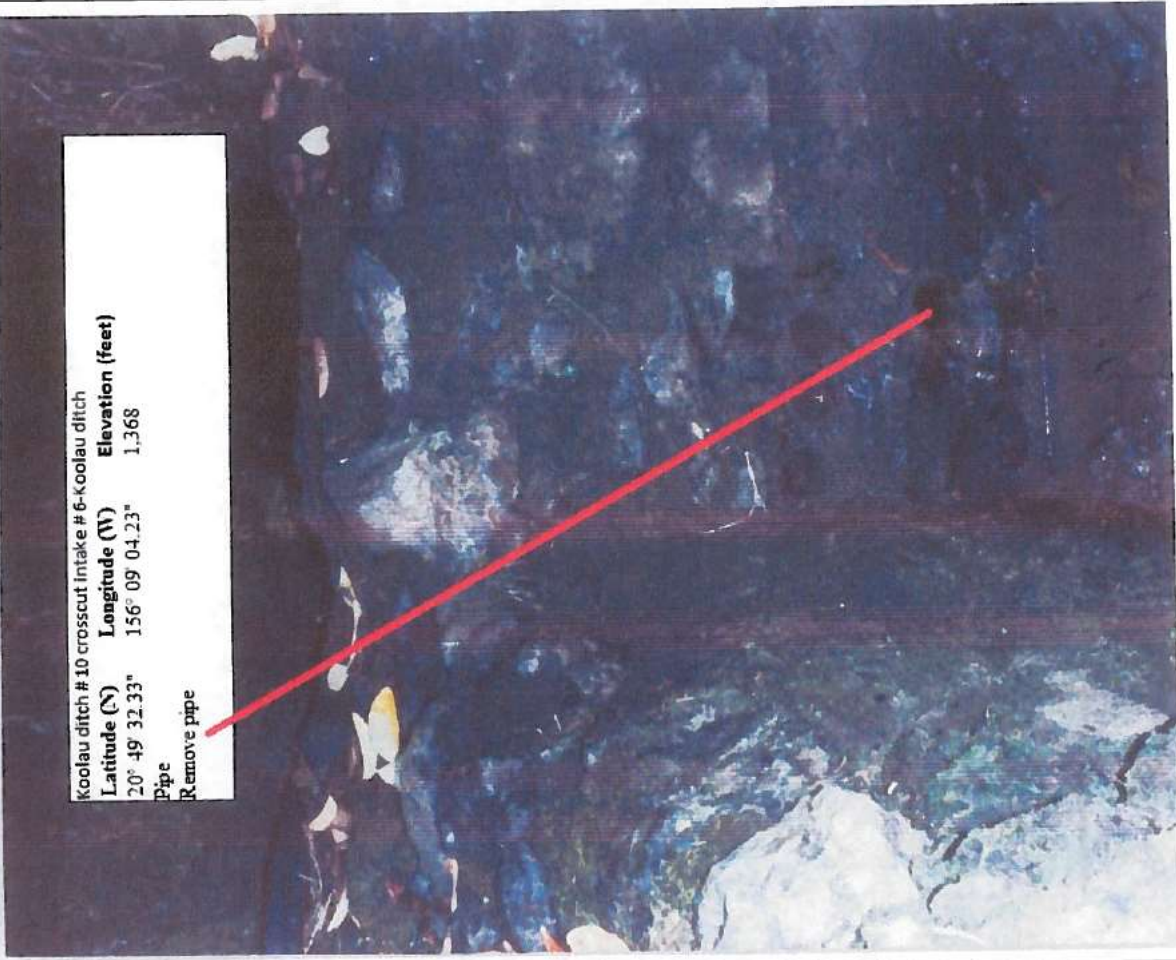


Koolau ditch # 10 crosscut intake # 4-Koolau ditch  
**Latitude (N)** 20° 49' 32.33" **Longitude (W)** 156° 09' 04.23" **Elevation (feet)** 1,368  
 Pipe  
 Remove pipe

**Photo 6:** Number 10 crosscut intake at Koolau Ditch, #4 of 6 (K-22e)  
 Pipe shown was capped/removed in 2007.

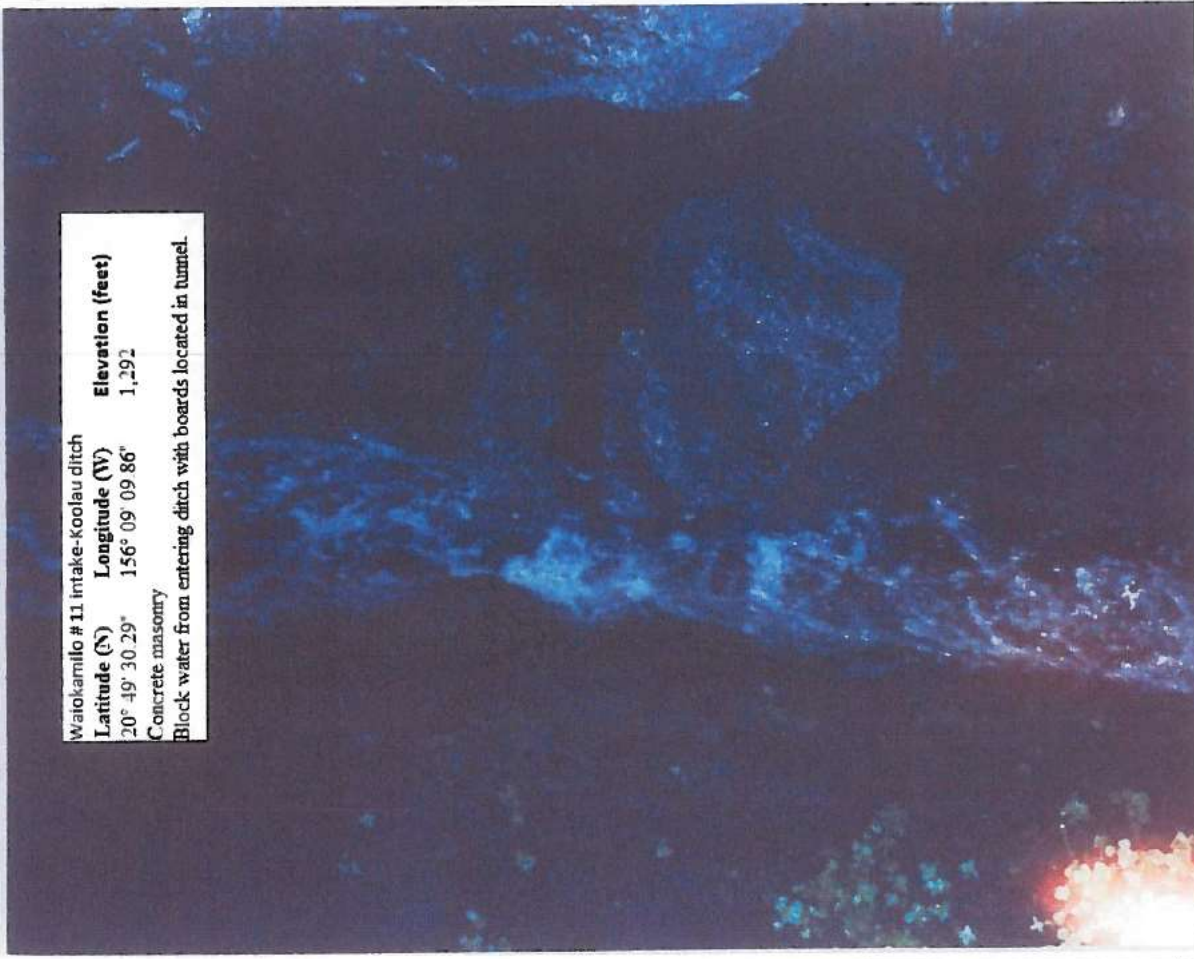


**Photo 7:** Number 10 crosscut intake at Koolau Ditch, #5 of 6 (K-22f)  
Pipe shown was capped/removed in 2007.



**Photo 8:** Number 10 crosscut intake at Koolau Ditch, #6 of 6 (K-22g)  
Pipe shown was capped/removed in 2007.

Waiokamilo #11 intake-Koolau ditch  
**Latitude (N)**    **Longitude (W)**    **Elevation (feet)**  
 20° 49' 30.29"    156° 09' 09.86"    1,292  
 Concrete masonry  
 Block water from entering ditch with boards located in tunnel.

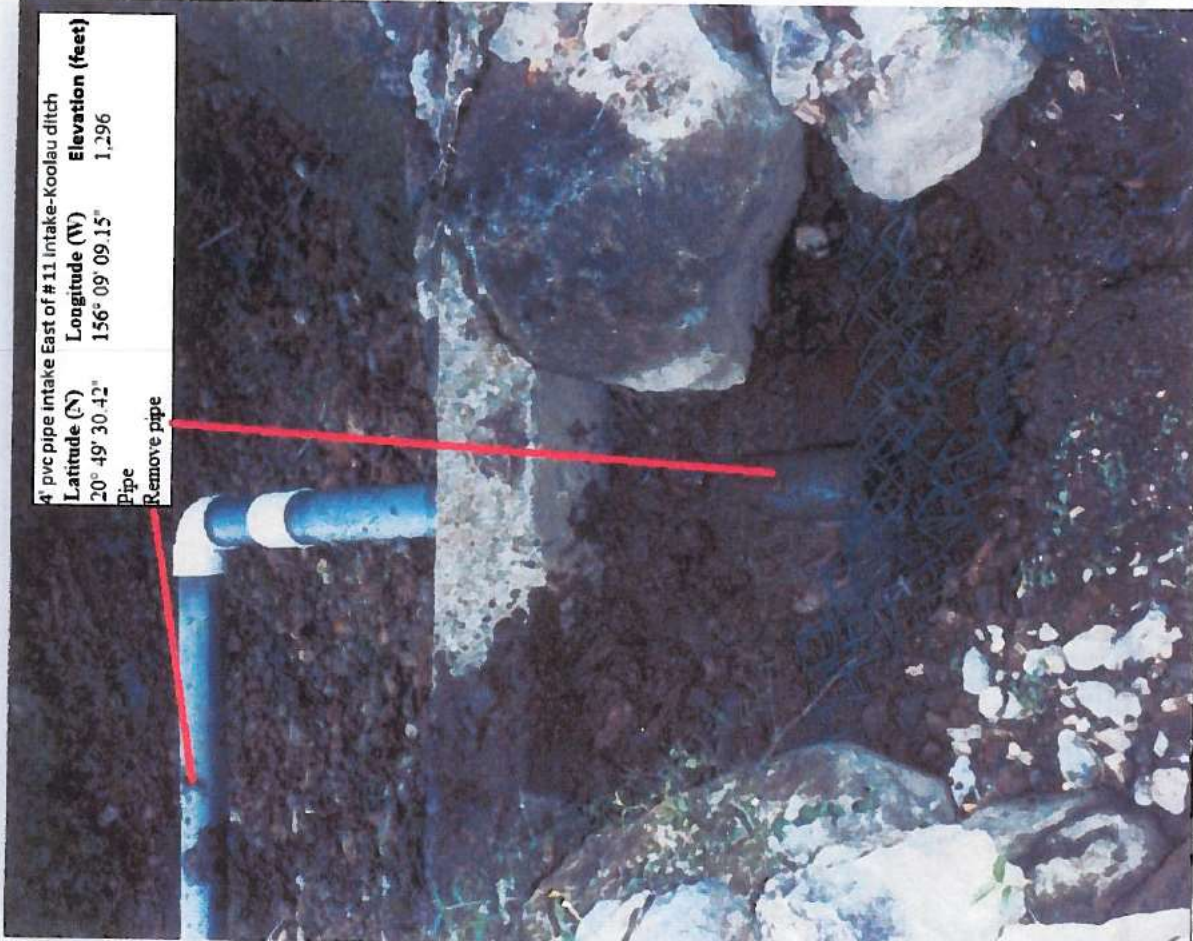


**Photo 9:** Waiokamilo #11 Intake at Koolau Ditch (K-23/329.6)  
 Placed boards in tunnel in 2007 to block water from entering ditch (see Photo 10).



**Photo 10:** Boards and fill material placed in tunnel at diversion K-23 to block water from entering Koolau Ditch.





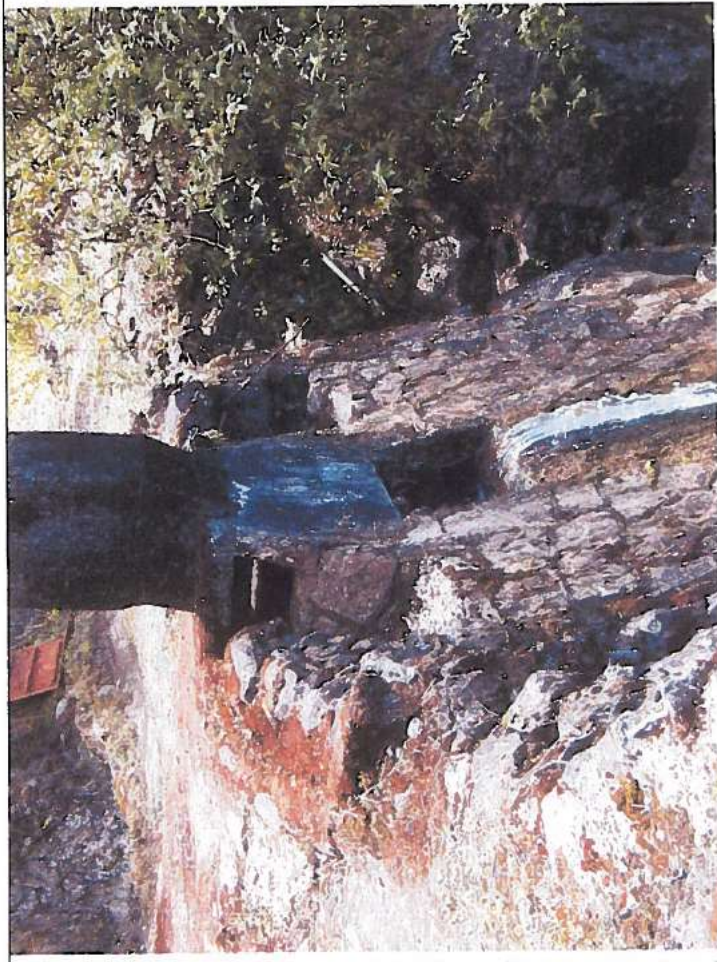
4" pvc pipe intake East of # 11 intake- Koolau ditch  
 Latitude (N) 20° 49' 30.42" Longitude (W) 156° 09' 09.15" Elevation (feet) 1,296  
 Pipe  
 Remove pipe

**Photo 11:** 4-inch pipe east of #11 intake at Koolau Ditch (K-23a)  
 Pipe shown was removed in 2007.

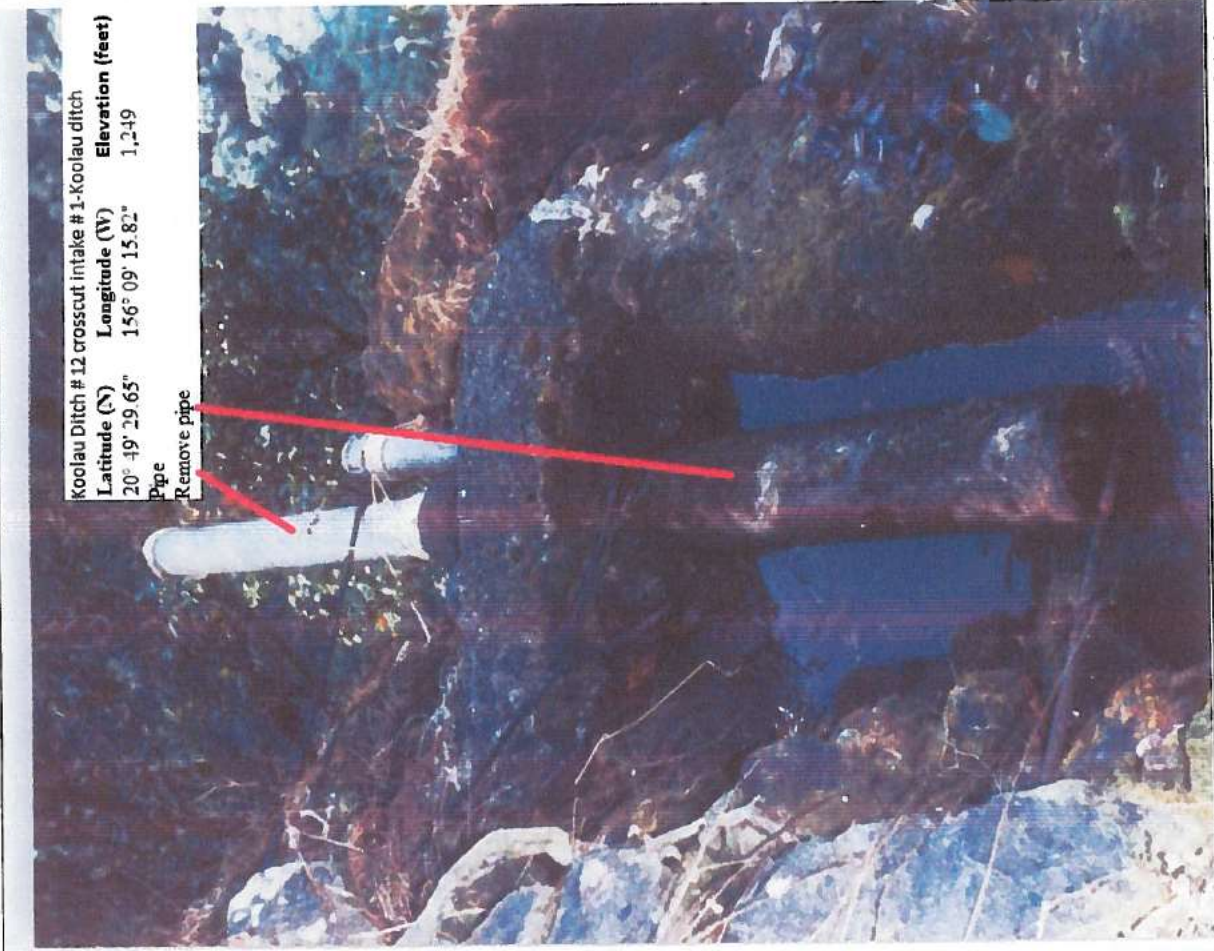


Waiokamilo # 12 intake- Koolau ditch  
 Latitude (N) 20° 49' 29.69" Longitude (W) 156° 09' 20.52" Elevation (feet) 1,269  
 Concrete masonry  
 Concrete over diversion intake.

**Photo 12:** Waiokamilo #12 intake at Koolau Ditch (K-24/328.6)  
 Diversion was sealed with concrete in 2007.



**Photo 13:** Flow continuing downstream past Waiokamilo #12 intake (K-24/328.6) after sealing with concrete.



Koolau Ditch # 12 crosscut intake # 1-Koolau ditch  
 Latitude (N) 20° 49' 29.65" Longitude (W) 156° 09' 15.82" Elevation (feet) 1,249

Pipe  
 Remove pipe

**Photo 14:** Number 12 crosscut intake at Koolau Ditch #1 of 5 (K-24a) Pipe shown was removed in 2007.



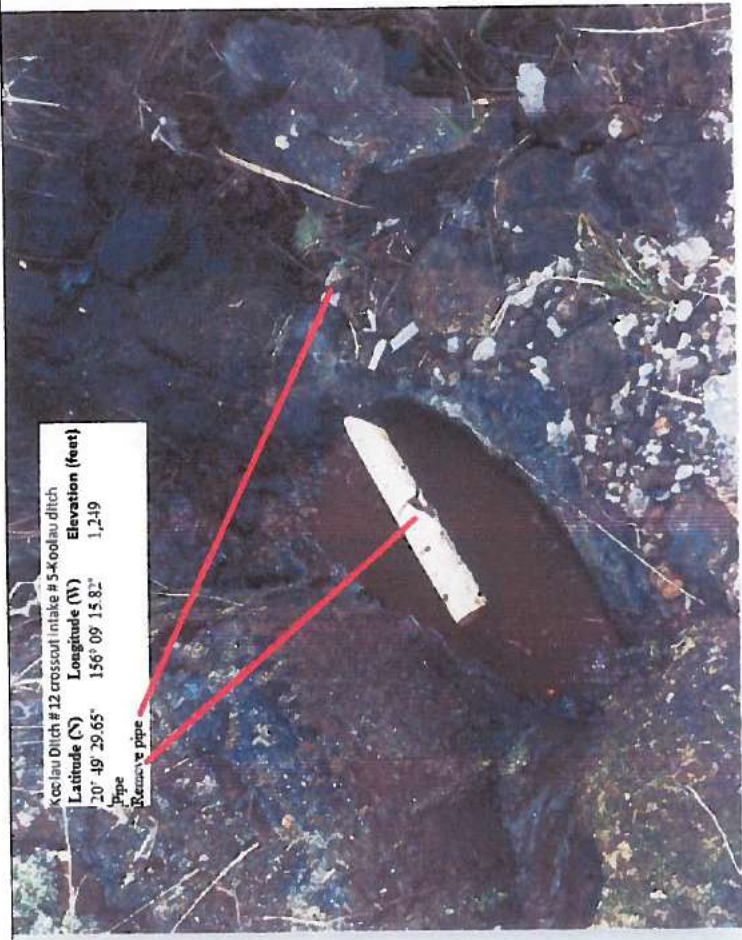
**Photo 15:** Number 12 crosscut intake at Koolau Ditch #2 of 5 (K-24b)  
Pipe shown was removed in 2007.



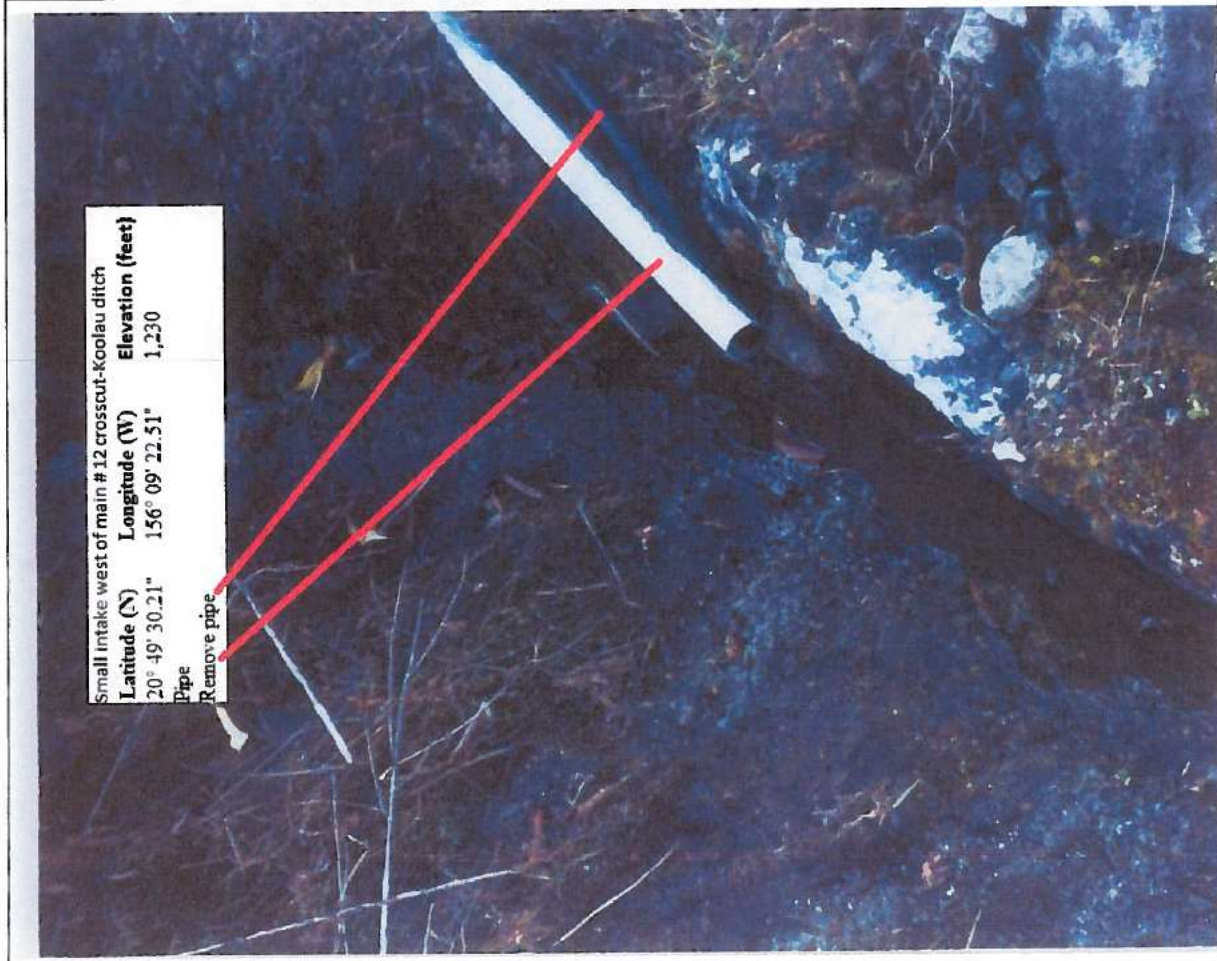
**Photo 16:** Number 12 crosscut intake at Koolau Ditch #3 of 5 (K-24c)  
Pipes shown were removed in 2007.



**Photo 17:** Number 12 crosscut intake at Koolau Ditch #4 of 5 (K-24d)  
Pipe shown was removed in 2007.



**Photo 18:** Number 12 crosscut intake at Koolau Ditch #5 of 5 (K-24e)  
Pipe shown was removed in 2007.



Small intake west of main # 12 crosscut-Koolau ditch  
**Latitude (N)** 20° 49' 30.21" **Longitude (W)** 156° 09' 22.51" **Elevation (feet)** 1,230  
 Pipe  
 Remove pipe

**Photo 19:** Small intake west of number 12 crosscut intake at Koolau Ditch #1 of 6 (K-24f)  
 Pipes shown were removed in 2007.

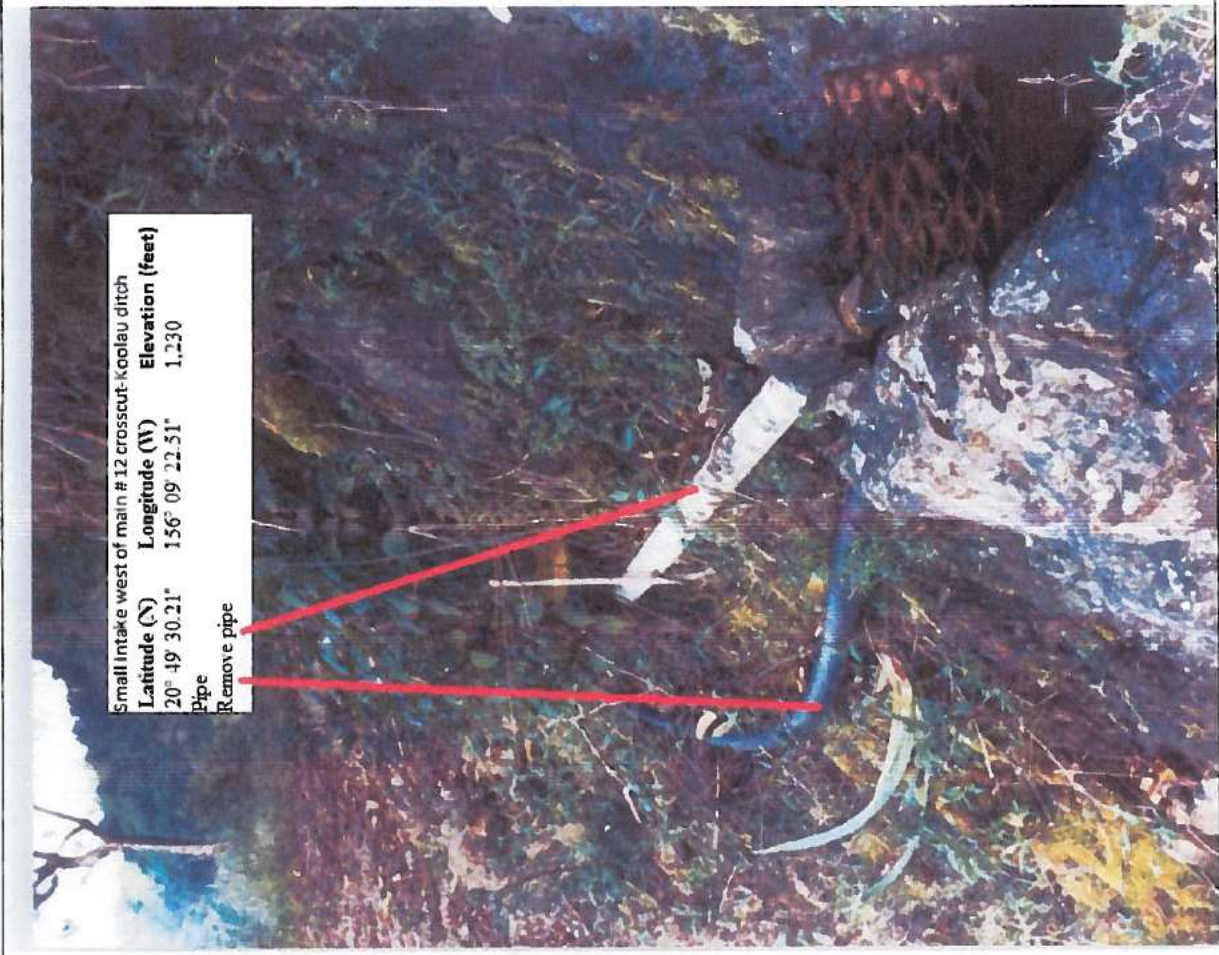


Small intake west of main # 12 crosscut-Koolau ditch  
**Latitude (N)** 20° 49' 30.21" **Longitude (W)** 156° 09' 22.51" **Elevation (feet)** 1,230  
 Pipe  
 Remove pipe

**Photo 20:** Small intake west of number 12 crosscut intake at Koolau Ditch #2 of 6 (K-24g)  
 Pipe shown was removed in 2007.



**Photo 21:** Small intake west of number 12 crosscut intake at Koolau Ditch #3 of 6 (K-24h)  
Pipe shown was removed in 2007.

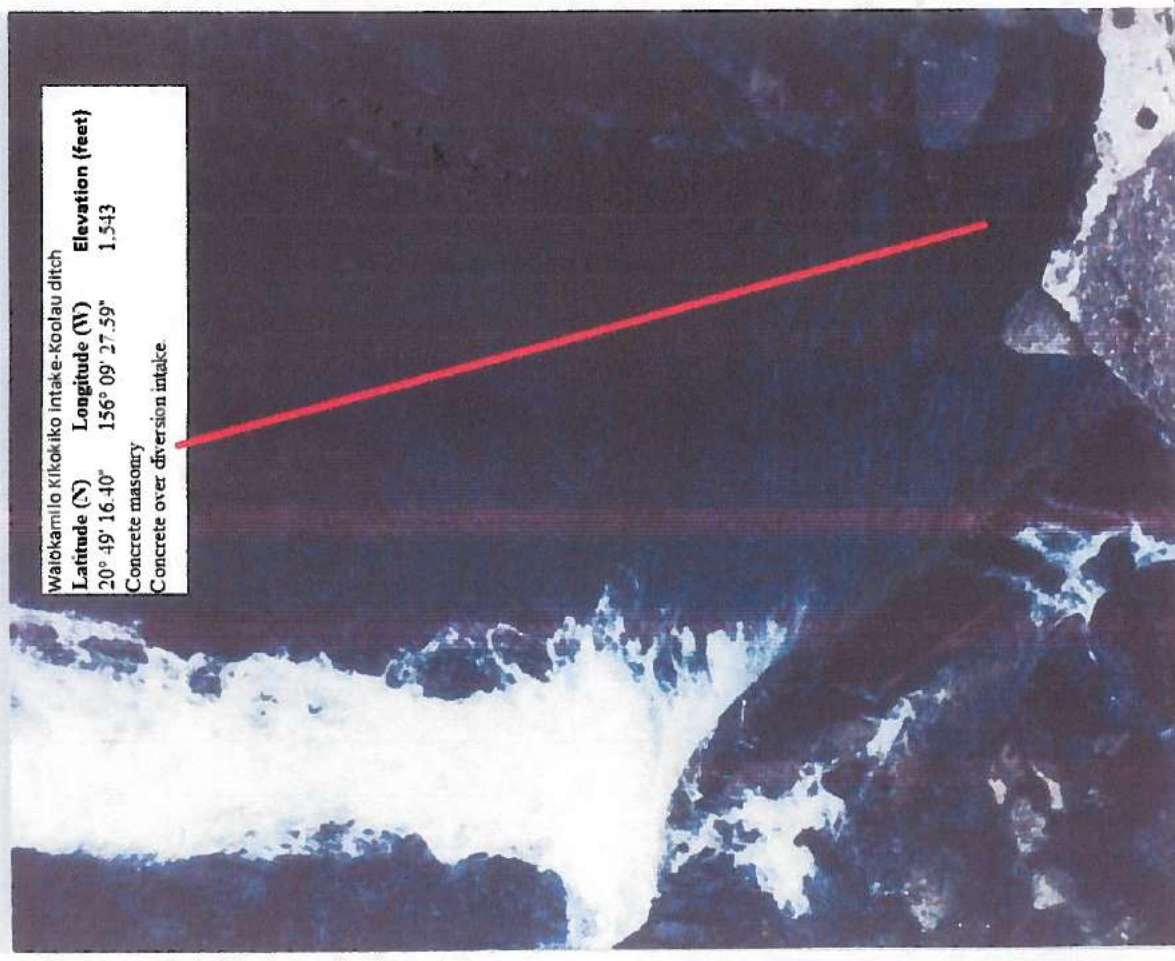


**Photo 22:** Small intake west of number 12 crosscut intake at Koolau Ditch #4 of 6 (K-24i)  
Pipes shown were removed in 2007.



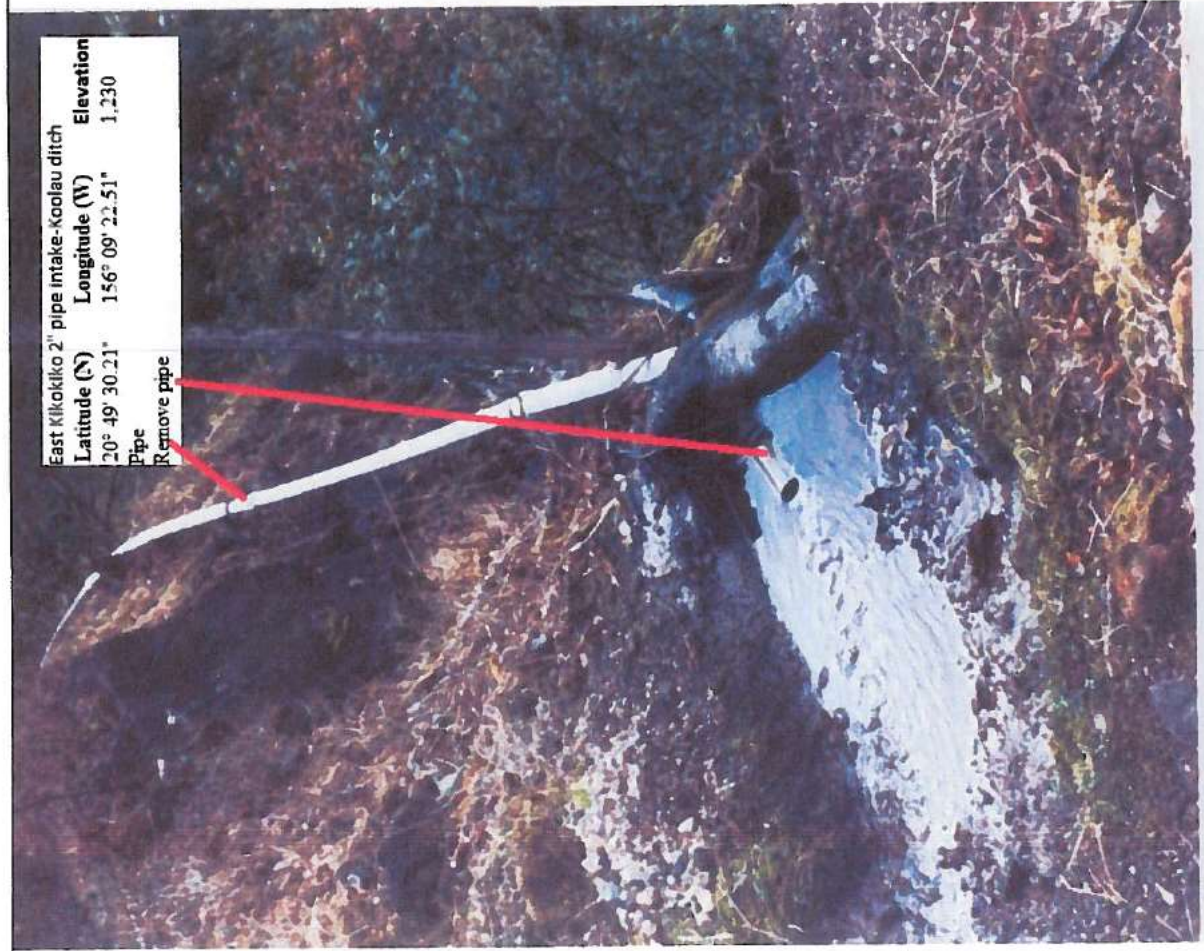
Small Intake west of main # 12 crosscut-Koolau ditch  
**Latitude (N)** 20° 49' 29.65"  
**Longitude (W)** 156° 09' 15.82"  
**Elevation (feet)** 1,249  
 Pipe  
 Remove pipe

**Photo 23:** Small intake west of number 12 crosscut intake at Koolau Ditch #5 of 6 (K-24j)  
 Pipe shown was removed in 2007.



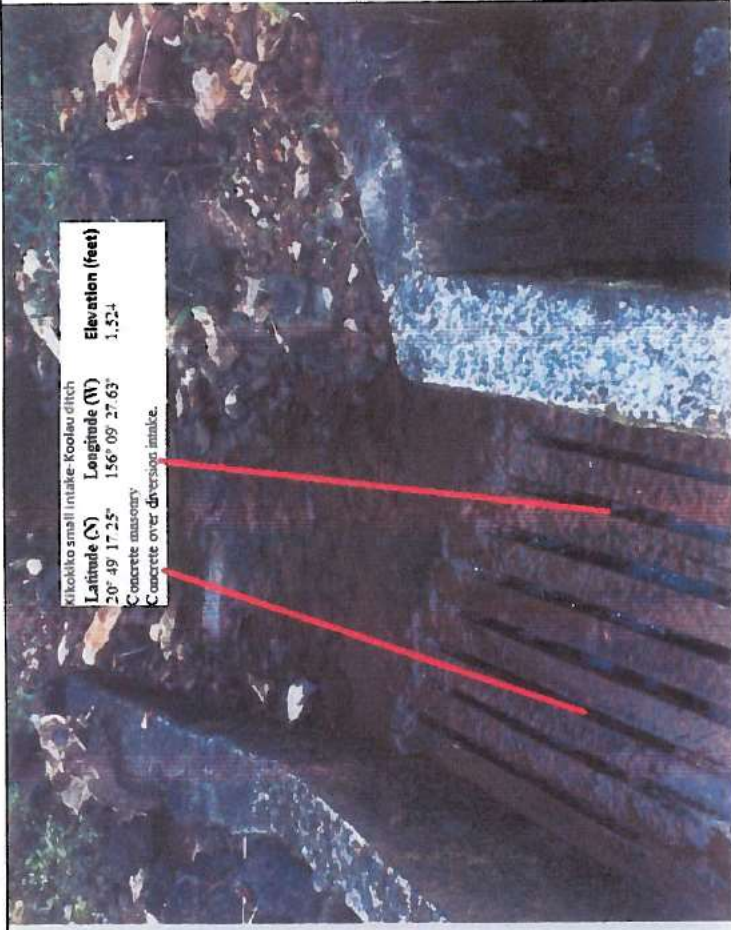
Waiokamilo Kikokiko intake-Koolau ditch  
**Latitude (N)** 20° 49' 16.40"  
**Longitude (W)** 156° 09' 27.59"  
**Elevation (feet)** 1,543  
 Concrete masonry  
 Concrete over diversion intake

**Photo 24:** Waiokamilo Kikokiko intake at Koolau Ditch (K-25/320.6)  
 Intake was sealed with concrete in 2007.



East Kikokiko 2" pipe intake-Koolau ditch  
 Latitude (N) 20° 49' 30.21" Longitude (W) 156° 09' 22.51" Elevation 1,230  
 Pipe Remove pipe

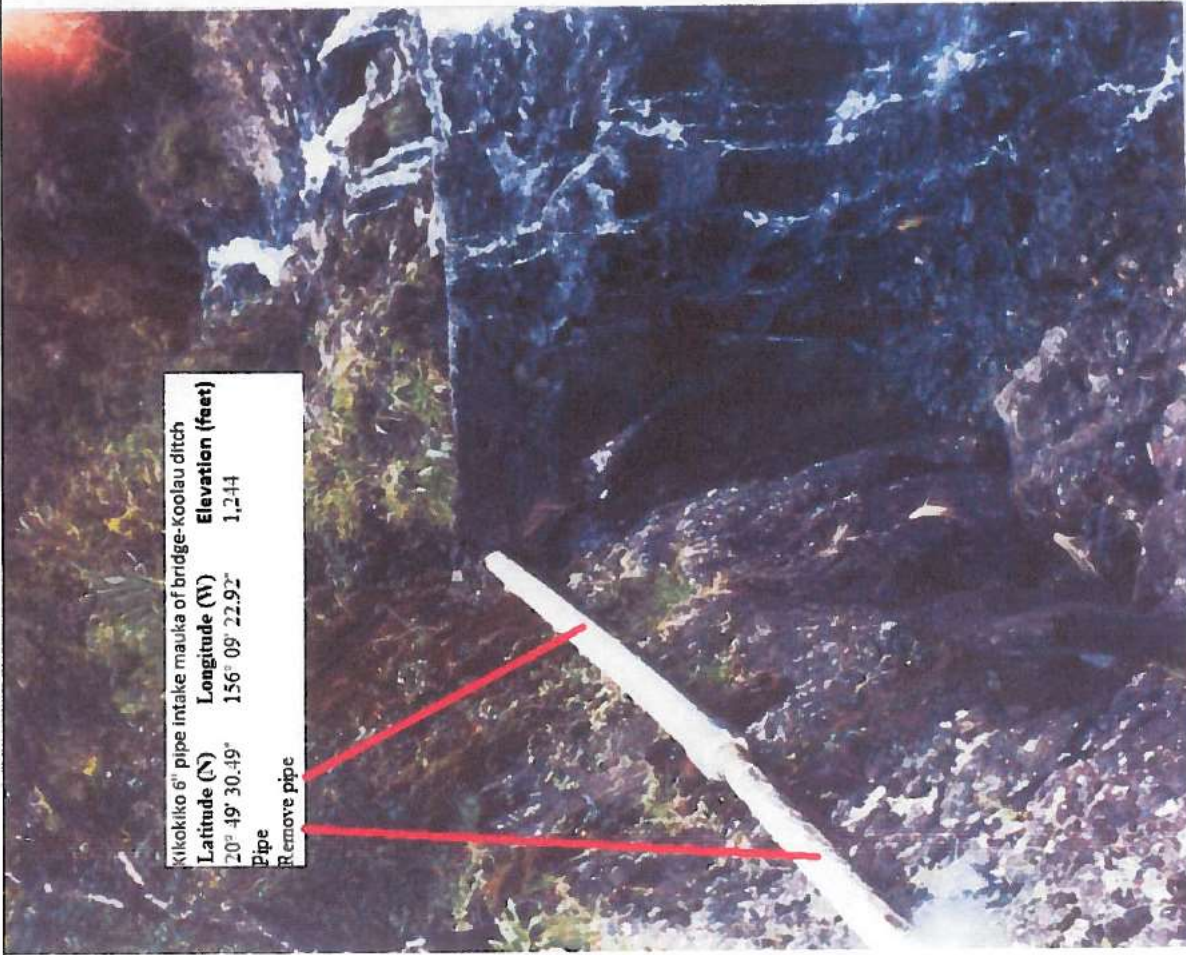
**Photo 25:** Small intake west of number 12 crosscut intake at Koolau Ditch #6 of 6 (K-25a) (East Kikokiko 2-inch pipe intake) Pipe shown was removed in 2007.



Kikokiko small intake-Koolau ditch  
 Latitude (N) 20° 49' 17.25" Longitude (W) 156° 09' 27.63" Elevation (feet) 1,524  
 Concrete masonry Concrete over diversion intake.

**Photo 26:** Kikokiko small intake at Koolau Ditch (K-25b) Intake was sealed with concrete in 2007.





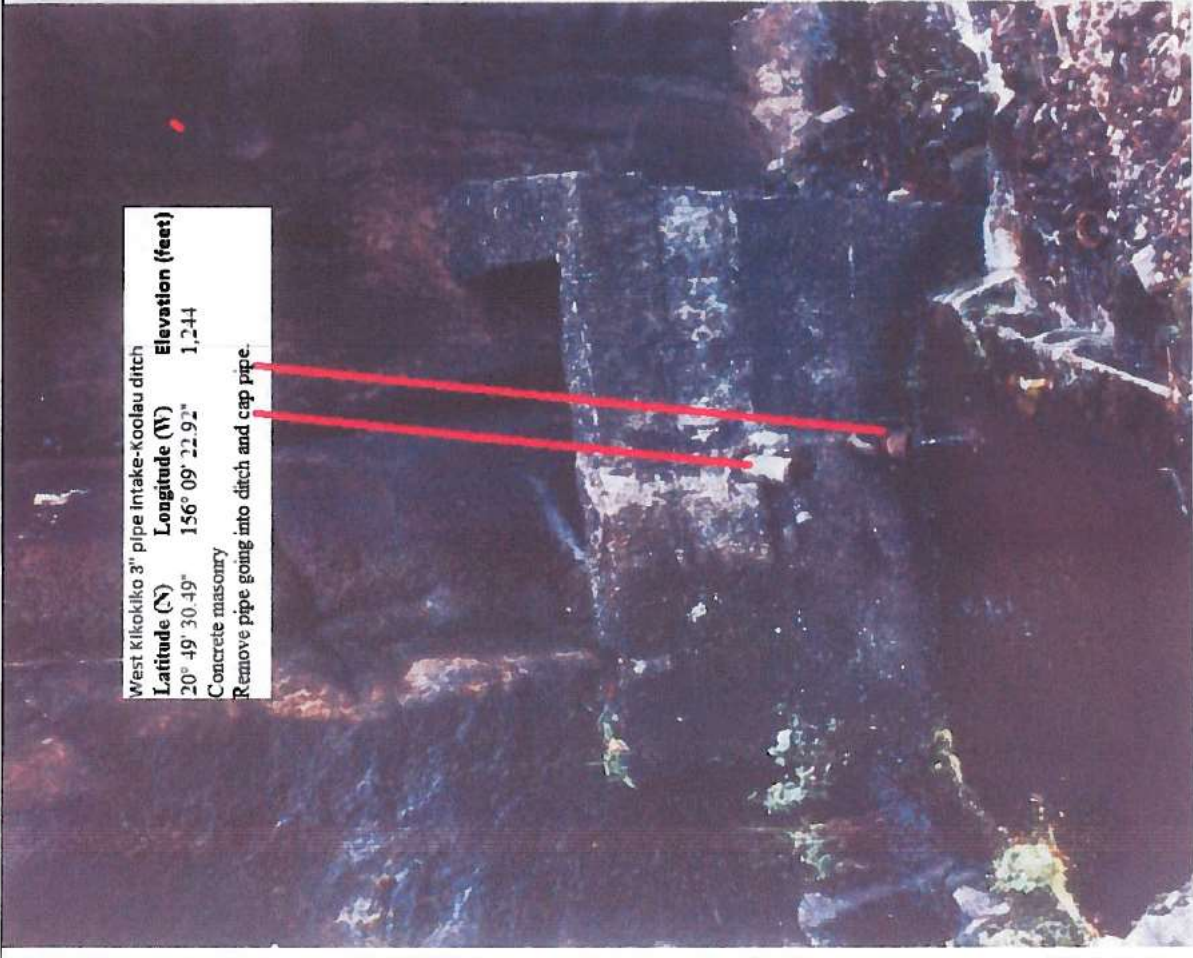
Kikokiko 6" pipe intake mauka of bridge-Koolau ditch  
**Latitude (N)**    **Longitude (W)**    **Elevation (feet)**  
 20° 49' 30.49"    156° 09' 22.92"    1,244  
 Pipe  
 Remove pipe

**Photo 27:** West Kikokiko small intake at Koolau Ditch #1 of 4 (K-25c)  
 (Kikokiko 6-inch pipe intake mauka of bridge)  
 Pipe shown was removed in 2007.



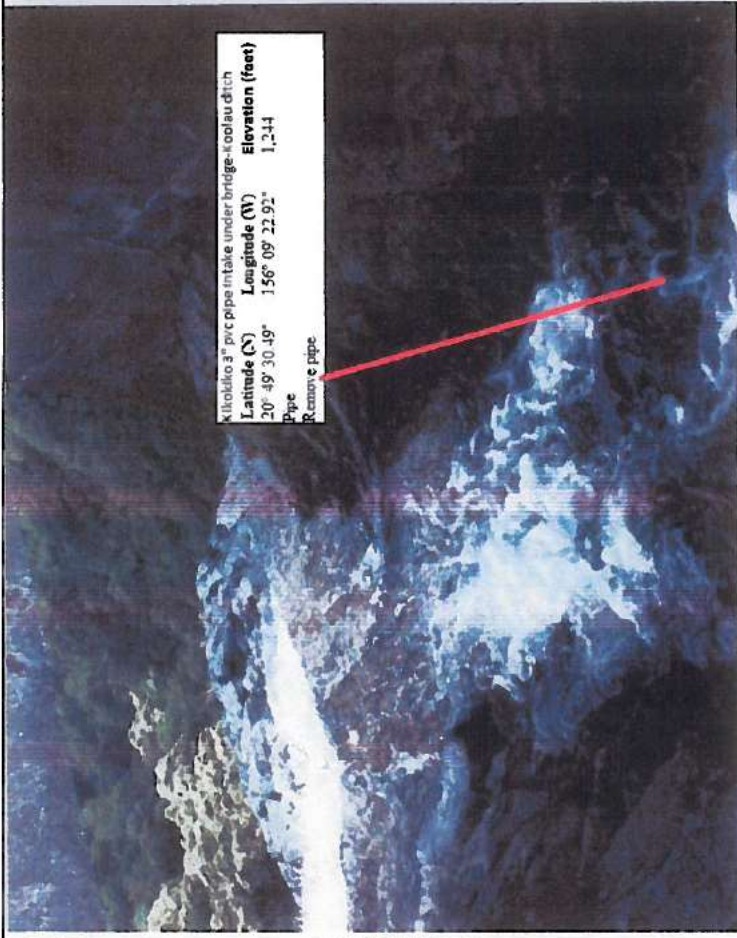
West Kikokiko 3" pipe intake-Koolau ditch  
**Latitude (N)**    **Longitude (W)**    **Elevation (feet)**  
 20° 49' 30.49"    156° 09' 22.92"    1,244  
 Concrete masonry  
 Remove pipe going into ditch

**Photo 28:** West Kikokiko small intake at Koolau Ditch #2 of 4 (K-25d)  
 (West Kikokiko 4-inch pipe intake)  
 Pipe was removed in 2007.  
 (Note: Orientation of photo from 2008 IFSAR for Waiokamilo  
 Hydrologic Unit appears incorrect; rotate clockwise 90 degrees.)



West Kikokiko 3" pipe intake-Koolau ditch  
**Latitude (N)**    **Longitude (W)**    **Elevation (feet)**  
 20° 49' 30.49"    156° 09' 22.92"    1,244  
 Concrete masonry  
 Remove pipe going into ditch and cap pipe.

**Photo 29:** West Kikokiko small intake at Koolau Ditch #3 of 4 (K-25e)  
 (West Kikokiko 3-inch pipe intake)  
 Pipe was removed in 2007.



Kikokiko 3" pvc pipe intake under bridge-Koolau ditch  
**Latitude (N)**    **Longitude (W)**    **Elevation (feet)**  
 20° 49' 30.49"    156° 09' 22.92"    1,244  
 Pipe  
 Remove pipe.

**Photo 30:** West Kikokiko small intake at Koolau Ditch #4 of 4 (K-25f)  
 (Kikokiko 3-inch PVC pipe intake under bridge)  
 Pipe was removed in 2007.

			<p><b>No Photo:</b> Filipino Ditch diversion (K-21b) The location of the Filipino Ditch diversion is unknown and it is believed no longer functional as a diversion (See September 2008 IFSAR for Wailuanui Hydrologic Unit: "...diversion and ditch have not been maintained, are difficult to locate, and are probably no longer transmitting water."). In any case, this diversion formerly discharged to the number 9 diversion (K-21) on West Wailuanui Stream at Koolau Ditch, which intake is itself being sealed as part of the Category 1 diversion work and will also be abandoned as a diversion.</p>
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Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#10 crosscut intake at Koolau Ditch (#1)	K-22a	1-1-002:002	State of HI	Approximate 20° 49' 32.33"	Approximate 156° 09' 4.23"	1.34
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#10 crosscut intake at Koolau Ditch (#2)	K-22c	1-1-002:002	State of HI	Approximate 20° 49' 32.33"	Approximate 156° 09' 4.23"	1.30
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#10 crosscut intake at Koolau Ditch (#3)	K-22d	1-1-002:002	State of HI	Approximate 20° 49' 32.33"	Approximate 156° 09' 4.23"	1.30
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#10 crosscut intake at Koolau Ditch (#4)	K-22e	1-1-002:002	State of HI	Approximate 20° 49' 32.33"	Approximate 156° 09' 4.23"	1.36
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#10 crosscut intake at Koolau Ditch (#5)	K-22f	1-1-002:002	State of HI	Approximate 20° 49' 32.33"	Approximate 156° 09' 4.23"	1.36
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#10 crosscut intake at Koolau Ditch (#6)	K-22g	1-1-002:002	State of HI	Approximate 20° 49' 32.33"	Approximate 156° 09' 4.23"	1.36
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	4 inch ridge east of #11 intake at Koolau Ditch	K-23a	1-1-002:002	State of HI	Approximate 20° 49' 30.42"	Approximate 156° 09' 9.15"	1.25
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#12 crosscut intake at Koolau Ditch (#1)	K-24a	1-1-002:002	State of HI	Approximate 20° 49' 29.65"	Approximate 156° 09' 15.82"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#12 crosscut intake at Koolau Ditch (#2)	K-24b	1-1-002:002	State of HI	Approximate 20° 49' 29.65"	Approximate 156° 09' 15.82"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#12 crosscut intake at Koolau Ditch (#3)	K-24c	1-1-002:002	State of HI	Approximate 20° 49' 29.65"	Approximate 156° 09' 15.82"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#12 crosscut intake at Koolau Ditch (#4)	K-24d	1-1-002:002	State of HI	Approximate 20° 49' 29.65"	Approximate 156° 09' 15.82"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	#12 crosscut intake at Koolau Ditch (#5)	K-24e	1-1-002:002	State of HI	Approximate 20° 49' 29.65"	Approximate 156° 09' 15.82"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Small intake west of (main) #12 crosscut at Koolau Ditch (#1)	K-24f	1-1-002:002	State of HI	Approximate 20° 49' 30.21"	Approximate 156° 09' 22.51"	1.23
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Small intake west of (main) #12 crosscut at Koolau Ditch (#2)	K-24g	1-1-002:002	State of HI	Approximate 20° 49' 30.21"	Approximate 156° 09' 22.51"	1.23
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Small intake west of (main) #12 crosscut at Koolau Ditch (#3)	K-24h	1-1-002:002	State of HI	Approximate 20° 49' 30.21"	Approximate 156° 09' 22.51"	1.23
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Small intake west of (main) #12 crosscut at Koolau Ditch (#4)	K-24i	1-1-002:002	State of HI	Approximate 20° 49' 30.21"	Approximate 156° 09' 22.51"	1.23
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Small intake west of (main) #12 crosscut at Koolau Ditch (#5)	K-24j	1-1-002:002	State of HI	Approximate 20° 49' 29.65"	Approximate 156° 09' 15.82"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Small intake west of (main) #12 crosscut at Koolau Ditch (#6)	K-25a	1-1-002:002	State of HI	Approximate 20° 49' 30.21"	Approximate 156° 09' 22.51"	1.23
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	Koolau small intake at Koolau Ditch	K-25b	1-1-002:002	State of HI	Approximate 20° 49' 17.25"	Approximate 156° 09' 27.63"	1.52
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	West Koolau small intake at Koolau Ditch (Koolau or pipe intake results of bridge)	K-25c	1-1-002:002	State of HI	Approximate 20° 49' 30.49"	Approximate 156° 09' 22.92"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	West Koolau small intake at Koolau Ditch (West Koolau 4 inch pipe intake)	K-25d	1-1-002:002	State of HI	Approximate 20° 49' 30.49"	Approximate 156° 09' 22.92"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	West Koolau small intake at Koolau Ditch (West Koolau 3 inch pipe intake)	K-25e	1-1-002:002	State of HI	Approximate 20° 49' 30.49"	Approximate 156° 09' 22.92"	1.24
Waioakamilo (6055)	Waioakamilo	COMPLETED 2007	None - P Subzone	Not in SMA	Waioakamilo Group Permit	West Koolau small intake at Koolau Ditch (Koolau 3 inch pipe intake under bridge)	K-25f	1-1-002:002	State of HI	Approximate 20° 49' 30.49"	Approximate 156° 09' 22.92"	1.24
Waikamui (6056)	Waikamui	NA	None - Presumed P Subzone	Not in SMA	Waikamui Group Permit	Pihono Ditch Depression (Waikamui)	K-21b	1-1-002:002	State of HI	Best Estimate 20° 49' 19.10"	Best Estimate 156° 08' 50.65"	1.47



U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY

LOCATION  
OF  
DIVERSIONS

