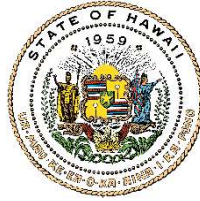


JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII'
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

P.O. BOX 621
HONOLULU, HAWAII 96809

November 22, 2023

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

LAURA H.E. KAAKUA
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

The Honorable Ronald D. Kouchi,
President
and Members of the Senate
Thirty-Second State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki, Speaker
and Members of the House of
Representatives
Thirty-Second State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the Hawaii Dam and Reservoir Safety Program Fiscal Year 2023 report, as required by Section 179D-29, Hawaii Revised Statutes. In accordance with Section 93-16, Hawaii Revised Statutes, a copy of this report has been transmitted to the Legislative Reference Bureau and the report may be viewed electronically at <https://files.hawaii.gov/dlnr/reports-to-the-legislature/2024/EN24-Dam-Safety-Report-FY23.pdf>

Sincerely,

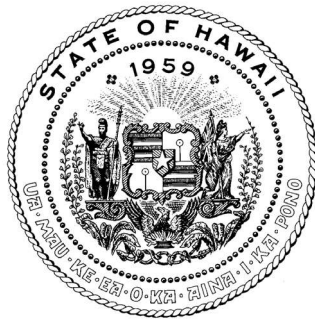
A handwritten signature in black ink, appearing to be "Dawn N.S. Chang".

DAWN N.S. CHANG
Chairperson

Enclosure

Report to the Thirty-Second Legislature
2024 Regular Session

**THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM
STATE FISCAL YEAR 2023**



Prepared by the
Department of Land and Natural Resources
State of Hawaii

In response to
Section 179D-29, Hawaii Revised Statutes

November 2023

THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM STATE FISCAL YEAR 2023

This report is prepared pursuant to Hawaii Revised Statutes (HRS) Section 179D-29 and covers the period from July 1, 2022 through June 30, 2023.

INTRODUCTION

The Department of Land and Natural Resources' (Department) Engineering Division administers the Hawaii Dam and Reservoir Safety Act of 2007 (Act), codified as Hawaii Revised Statutes (HRS) Chapter 179D (Dam and Reservoir Safety Program). This Act, in conjunction with Hawaii Administrative Rules (HAR) Chapter 13-190.1, "Dams and Reservoirs", governs the design, construction, operation, maintenance, enlargement, alteration, repair, and removal of dams, reservoirs, and their appurtenant works in the State of Hawaii, to protect the health, safety, and welfare of the citizens of the State by reducing the risk of failure of the dams or reservoirs. Pursuant to HRS Section 179D-29, the Department of Land and Natural Resources (Department) shall submit an annual report to the governor and the legislature by January 5 of each year concerning the activities of the Department relating to this chapter for the preceding fiscal year. The report shall include but not be limited to information on the following:

- (1) Approvals of plans and specifications for the construction of dams and reservoirs and for alterations, modifications, repairs, removal, and enlargements of any dams and reservoirs;
- (2) A listing of dam and reservoir safety inspections made;
- (3) Use of appropriated funds;
- (4) Rules adopted or amended;
- (5) Enforcement orders and proceedings;
- (6) Dam and reservoir failures and department evaluations of the reasons for the failure, if known; and
- (7) Any other available data regarding the effectiveness of the State's dam and reservoir safety program.

BACKGROUND

Historically, dams and reservoirs in Hawaii were predominately developed by the agriculture industry in the early 1900s. Today, dams and reservoirs continue to be used by the agriculture industry, in addition to providing storage for drinking water, fire protection, flood control, ground water recharge, hydro-electric generation, recreation and other purposes.

Only dams that meet a certain jurisdictional size criteria (height and volume) are regulated by the Department. Regulated dams are identified as having artificial barriers which are 25-feet or more in height or have an impounding capacity of 50-acre-feet (~17 million gallons) or more. Dams less than 6-feet in height, regardless of storage capacity, or that have a storage capacity less than 15-acre-feet (5 million gallons) regardless of height, do not fall under State of Hawaii jurisdiction, unless otherwise specified by the Dam and Reservoir Safety Program. At the end of Fiscal Year (FY) 2023 there were 127 regulated dams on the Department's inventory.

THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM

The Dam and Reservoir Safety Program is comprised of several core functions:



Regulated Dam Inventory and Dam Classifications: The Department maintains a database of regulated structures, including classifications of each in regard to size, hazard potential and overall condition. The Department verified and updated their inventory of regulated dams in 2006. Hazard potential classifications were updated and assigned by the Department as a product of their statewide dam break modeling analysis conducted between 2007 and 2011. Subsequent updates to the hazard classifications have been made for newly added facilities. Regulated dams (with two exceptions) were assessed and assigned an overall condition assessment classification during Phase I inspections conducted statewide in 2006-2009 and these condition assessment classifications have been updated based on recently completed Phase I investigations between 2018-2023.

Dam Safety Inspections: The Department staff routinely inspects regulated structures statewide and retains consultants as necessary to assist with the assessments. Staff conducted 46 dam safety inspections, construction site visits and informal inspections in FY 2023. The list of the dams inspected in this fiscal year is described in Dam Safety Activities Section B of this report.

Enforcement Actions: The Hawaii Dam and Reservoir Safety Act of 2007 authorized the Department to take enforcement action for both emergencies and any other violations of the Act. The Department has established administrative enforcement action procedures that are initiated by various actions such as the following:

- Failure to timely address unsafe or emergency conditions

- Conducting construction work on a dam without a permit
- Non-compliance with dam safety permit general terms and special conditions
- Failure to furnish requested information or submit required documents or reports
- Failure to submit a required emergency action plan (EAP) or EAP update
- Failure to pay the annual dam owner fee
- Failure to complete corrective actions as ordered by the Board or its agent

The Department has worked with dam owners to set reasonable rehabilitation or compliance schedules for their dam facilities. In February 2020, the Department began to take a harder stance on enforcing compliance of set improvement schedules for some structures which culminated in penalties being issued in FY 2021. Enforcement actions pursued by the Department in Fiscal Year 2023 are described in the Dam Safety Program Activities, Section D.

Dam Safety Construction Permits: A permit from the Board of Land and Natural Resources (Board) is required for all dam construction, alteration, enlargement, modification or removal work. Dams are uniquely engineered structures that require knowledge and experience in dam safety, particularly how to safely handle water flows in and out of the structure through appurtenant features, as well as mitigating the hazards of water passing through the dam embankment itself (seepage). Dams sustain high hydrostatic water loads, which can result in failure of the embankment if they are not properly designed and constructed. Dam safety permits allow the Department to review and check proposed improvements for concurrence with current dam safety practices and guidelines. Work that is not considered routine maintenance requires prior approval from the Board. Detailed procedures and requirements for this permitting process are provided in HAR Chapter 190.1. A listing of current and closed permit for FY 2023 is listed in Section A of the Dam Safety Program Activities.

Certificate of Approval to Impound: The Certificate of Approval to Impound (CAI) water requirement was included in the Hawaii Dam and Reservoir Safety Act of 2007. Issuance of this certificate will be dependent on dam and reservoir owners ensuring their structures are remedied of critical deficiencies and meet minimum operational criteria. The Department developed guideline procedures for this certificate in coordination with dam owners on the implementation of this requirement. The Department sent out notices to complete and submit CAI applications to all owners of regulated dams and reservoirs in the state and is in the process of reviewing and evaluating how to reasonably manage this certification program. Understanding that the average age of the dams in our inventory is 90 years, and almost all were constructed before the development of any modern dam safety standards, the Department is working with owners to establish a reasonable improvement schedule for these facilities to meet current regulations. In the interim period, the Department is working with owners to mitigate these deficiencies through operational restrictions or other types of mitigative actions.

Emergency Preparedness: HRS Chapter 179D requires that all dam owners of High and Significant Hazard Potential dams complete and submit an Emergency Action Plan (EAP) to the Department. The Department developed guidelines and an EAP template for dam owners to utilize in formulating and executing a plan of action should a possible threat or deficiency occur on their dam facilities. The Department provides training and technical assistance to dam

owners and emergency management officials to assist them in their roles and implementation of the EAPs.

In FY 2023, all high and significant regulated dams in Hawaii have EAPs on file with the Department that was updated in the last year. All of these EAPs have migrated over to the Department's online EAP tool, which simplifies the creation and routine updates of the EAP process. The tool allows the Department to easily update the statewide template quickly and users can process revisions to EAPs almost instantly.

Training and Outreach: The Department provides technical assistance to the dam owners, operators, and consultants, as well as to the broader community of hazard mitigation partners and agencies. The Department is a member of the Association of State Dam Safety Officials, (ASDSO) and collaborates on public outreach and national awareness of the importance of dam and reservoir safety programs. In 2023, the Department conducted 2-day trainings for dam owners and consultants on Oahu, Maui, Kauai and Hawaii which covered Failure Mechanisms, Inspections, Operation, Maintenance, and Emergency Response. Approximately 200 dam owners, operators, emergency management personnel, consultants, and state and county personnel attended these workshops.

In addition, the department conducted Dam Screening Level Risk Assessment (SLRA) and Failure Modes Analysis Workshops with owners of select dams on each island. The list of the dams for which SLRAs were completed this Fiscal year is described in Dam Safety Activities Section F of this report.

Past Dam Safety training events include:

- 2008 Dam Safety Failure Mechanisms and Inspections - Statewide
- 2012 Dam Safety Operation and Maintenance Training – Statewide
- 2014 Dam Safety Inspections – Statewide
- 2015 Dam Safety Emergency Actions Workshops – Statewide
- 2017 Dam Evaluation and Rehabilitation Workshops – Statewide
- 2017 Dam Safety Rehabilitation Technical Seminar – Oahu
- 2019 Dam Safety Emergency Intervention Workshops – Kauai, Maui, & Oahu
- 2020 Dam Screening Level Risk Assessment / Failure Modes Analysis Workshop – Oahu
- 2023 Dam Failure Mechanisms, Inspections, Operation, Maintenance, and Emergency Response Training – Statewide
- 2023 Dam Screening Level Risk Assessment / Failure Modes Analysis Workshop – Statewide

The Department maintains an online inventory of regulated dams in the state and makes this inventory available to the public at dams.hawaii.gov. This website was updated to include more publicly available information on the inventory, as well as to update the information pages to make them easier to understand. The Department coordinated with the Counties to provide their current Dam Evacuation Maps on the Department's Dam Safety Inventory website for the public to download.

FUNDING

The Dam and Reservoir Safety Program is funded under the Department’s LNR 810 Program, Prevention of Natural Disasters, which utilizes operational funding from two state funding sources and two federal grants from the United States Department of Homeland Security, Federal Emergency Management Agency (FEMA). The dam and reservoir safety special fund has an annual appropriation ceiling spending limit of \$1,300,000 but is typically limited based on available funding. In FY 2020 the State was able to secure the Federal High Hazard Potential Dam Rehabilitation Grant which was approved by FEMA for Screening Level Risk Assessments of High Hazard Potential Dams. The following is a breakdown of available funds to the Department for its dam safety activities in FY 2023:

Dam Safety Program – Appropriated funding for FY 2023

State of Hawaii – Special Land and Development Fund (Payroll & Operating)	\$ 622,600
State of Hawaii – Dam & Reservoir Safety Special Fund (SF23 Appropriated)	\$ 0
Rollover from previous year	\$ 2,020,700
Dam Owner Annual Fees	\$ 580,000
Permit Fees	\$ 93,400
Enforcement	\$ 20,000
FEMA High Hazard Potential Dam Rehabilitation Grant (Fed FY 2020)	\$ 419,500
<u>FEMA National Dam Safety Program Grant (Fed FY 2022)</u>	<u>\$ 87,900</u>
Total Available Funding from All Sources	\$ 3,844,100

Previously Obligated Contracts \$ 1,726,000

Encumbrances:

FY 2023 Contracts	\$ 770,700
<u>Emergency Contingency Reserve</u>	<u>\$ 700,000</u>
Total FY 2023 Encumbrance (including emergency reserve)	\$ 1,470,700

FY 2023 expenditures from the various funding sources were made as follows:

	Other Funding	Section S323/ Dam and Reservoir Safety Special Fund S328	Federal Funds	Total
Personnel Services	\$ 0	\$ 622,600	\$ 0	\$ 622,600
Consultant Services	\$ 785,300	\$ 813,400	\$ 419,500	\$ 2,018,200
Inspections Costs	\$ 0	\$ 21,800	\$ 0	\$ 21,800
Training Expense	\$ 0	\$ 26,800	\$ 19,600	\$ 46,400
Other Expenses (Supplies, Operating & Equipment)	\$ 0	\$ 32,100	\$ 26,700	\$ 58,800
B&F Management Fee	\$ 0	\$ 87,300	\$ 0	\$ 87,300
	\$ 785,300	\$ 1,604,000	\$ 465,800	\$ 2,855,100

Operating funds for the LNR 810 Program support multiple sub-programs which include the State oversight of the National Flood Insurance Program, the State General Flood Control Plan and the Dam and Reservoir Safety Program. Some assumptions were taken to separate costs between these programs for this report. The Dam and Reservoir Safety Special Fund was intended to maintain a funding source for ongoing operations as well as a dam safety emergency reserve. HAR Chapter 190.1 enables the Department to collect Dam Safety Annual Fees from regulated dam owners. The collection of these fees has enabled the Department to meet the targeted \$ 700,000 minimum emergency reserve. No State general funds are appropriated for the Dam Safety Program in FY 2023.

DAM SAFETY PROGRAM ACTIVITIES:

- A. Approvals of plans and specifications for the construction of dam and reservoirs and for alterations, modifications, repairs, removals, and enlargements of any dams and reservoirs. The following is a listing of active permits and permit reviews in FY 2023 and their status:

Permit No.	State ID	Dam Name	Description of Improvements	Status / Comments
19	MA-0141	Kehalani Retention Basin	New Construction	Variance request pending Permit revisions pending
39	KA-0113	Omao Reservoir	Dam removal	Permits approved. Start of construction pending County grading permit.
51	KA-0063	Aahoaka Reservoir	Improvement	Approved, Owner resubmitting with new project scope
53	HA-0042	Waimea 60 MG Reservoir (Puukapu)	Dam improvement - lining, outlet slip-line, upstream control, subdrain	In construction. Reservoir refill planned to commence within the next 30 days
54	HA-0131	Paauilo Reservoir	Dam improvement - upstream control, vegetation	Construction completed, permit pending close-out.
55	HA-0123	Puu Pulehu Reservoir	Dam Spillway/Embankment Rehabilitation	Owner redesigning rehabilitation of spillway and embankment.
59	HA-0040	Waikoloa Reservoir No. 1	Major repair.	In construction; On hold pending design revision
66	OA-0001	Nuuanu No. 4 Res.	Repair and improvement	In Construction
68	OA-137	Oahu Reservoir 155	Improvement	Permit Application under Review.
71	KA-0061	Lower Kapahi Reservoir	Removal	Owner resubmitting with new project scope
77	MA-0140	Ukumehame Reservoirs	Removal	Approved; owner obtaining permits for construction.
83	OA-0129	Waimanalo 60 MG - Crest Modifications	Repair and improvement	In Construction.
84	KA-0065	Upper Anahola Reservoir	Removal	Review pending owner revisions to plans based on comments.
85	KA-0118	Manuhonuhonu	Removal/Reduction	Review pending owner revisions to plans based on comments.

Permit No.	State ID	Dam Name	Description of Improvements	Status / Comments
86	KA-0024	Kalihiwai Reservoir	Removal	Final acceptance pending architectural documentation.
87	HA-0049	Keaiwa Reservoir	Removal / Reduction	Permit Application under Review.
88	MA-0094	Kapalaalaea	Removal	Permit Application under Review.
89	MA-0058	Honokowai Dam	Reduction	Permit Application under Review.
90	HA-0051	Hawi No. 5 Reservoir	Removal	Permit Application under Review.
91	MA-0126	Kahana Nui Dam	Repair	Preliminary permit review.
92	MA-0070	Maui Reservoir 20	Removal	Permit Application under Review.
93	KA-0067	Field 1 Kealia Reservoir	Removal	Pending full package submittal by owner.
94	KA-0010	Waiakalua Reservoir	Improvements	Preliminary Review completed. Pending owner revisions to comments.
95	OA-0021	Kemoo 5 Reservoir	Removal	Permit Application under Review.

Additional permit applications under review:

State ID	Dam Name	Description of Improvements	Status / Comments
OA-0025	Ku Tree Removal	Removal	Preliminary Review
OA-0017	Wahiawa Reservoir	Spillway Improvement	Preliminary Review
MA-0073	HC&S Reservoir 24 - Removal	Removal / Reduction	Preliminary Review
MA-0095	Haiku Reservoir Remediation	Remediation	Preliminary Review
OA-0022	Upper Helemano		Geotechnical Review
KA-0002	Puu Opae	Rebuild	First Review of 100% plans complete. Pending environmental clearance
KA-0003	Puu Lua	Improvements	First Review of 100% plans complete. Pending environmental clearance.
KA-0005	Mana	Rebuild	Preliminary Review

Permits closed in FY 2023:

Permit No.	State ID	Dam Name	Description of Improvements	Status / Comments
82	MA-0093	Kaupakalua Reservoir	Removal	Permit Closed

B. Listing of dam and reservoir safety inspections.

In FY 2023, Dam and Reservoir Safety Program staff conducted 43 visual dam safety inspections and two construction inspections and one informal inspection on regulated dams. A listing of the inspections is provided below:

State ID	Dam Name	Inspection Type	Inspection Date
HA-0043	PUUKAPU WATERSHED RETARDING DAM R-1	Visual Dam Safety	07/22/2022
HA-0131	PAAUILO RESERVOIR	Visual Dam Safety	07/22/2022
MA-0151	WAILUKU WATER RESERVOIR 10	Visual Dam Safety	08/10/2022
MA-0083	MAUI RESERVOIR 73	Visual Dam Safety	08/10/2022
MA-0057	KAHOMA RESERVOIR	Visual Dam Safety	08/11/2022
MA-0058	HONOKOWAI RESERVOIR	Visual Dam Safety	08/11/2022
KA-0103	AEPO RESERVOIR	Visual Dam Safety	09/07/2022
KA-0119	MAUKA RESERVOIR	Visual Dam Safety	09/07/2022
KA-0107	PUU O HEWA RESERVOIR	Informal	9/7/2022
OA-0023	HELEMANO 6 RESERVOIR	Visual Dam Safety	09/09/2022
OA-0021	KEMOO 5 RESERVOIR	Visual Dam Safety	09/09/2022
MA-0096	PAUWELA RESERVOIR	Visual Dam Safety	10/12/2022
MA-0095	HAIKU RESERVOIR	Visual Dam Safety	10/12/2022
MA-0048	OLINDA RESERVOIR	Visual Dam Safety	10/14/2022
MA-0084	MAUI RESERVOIR 74	Visual Dam Safety	10/14/2022
OA-0017	WAHIAWA DAM	Visual Dam Safety	10/18/2022
OA-0022	UPPER HELEMANO RESERVOIR	Visual Dam Safety	10/18/2022
MA-0152	WAIKAMOI RESERVOIRS	Visual Dam Safety	10/24/2022
MA-0046	WAIKAMOI DAM NO. 2	Visual Dam Safety	10/24/2022
MA-0138	KAHAKAPAO RESERVOIRS	Visual Dam Safety	12/01/2022
MA-0047	PIIHOLO 50 MG RESERVOIR	Visual Dam Safety	12/01/2022
MA-0091	PEAHI RESERVOIR	Visual Dam Safety	12/07/2022
MA-0069	MAUI RESERVOIR 15	Visual Dam Safety	12/07/2022
MA-0059	RESERVOIR 140	Visual Dam Safety	12/08/2022
MA-0144	MAHINAHINA RESERVOIR	Visual Dam Safety	12/08/2022
OA-0129	WAIMANALO 60 MG RESERVOIR	Construction	12/09/2022
KA-0010	WAIKALUA RESERVOIR	Visual Dam Safety	12/12/2022
KA-0024	KALIHUWAI RESERVOIR	Visual Dam Safety	12/12/2022
MA-0141	KEHALANI OFFSITE RETENTION BASIN	Visual Dam Safety	12/14/2022

State ID	Dam Name	Inspection Type	Inspection Date
MA-0068	MAUI RESERVOIR 14	Visual Dam Safety	12/14/2022
MA-0073	MAUI RESERVOIR 24	Visual Dam Safety	12/15/2022
HA-0042	WAIMEA 60 MG RESERVOIR	Construction	12/15/2022
MA-0133	PUU KOA RESERVOIR	Visual Dam Safety	12/15/2022
KA-0030	KALOKO RESERVOIR	Visual Dam Safety	12/21/2022
MO-0041	KUALAPUU RESERVOIR	Visual Dam Safety	01/25/2023
KA-0098	ALEXANDER	Visual Dam Safety	02/15/2023
KA-0102	IOLEAU RESERVOIR	Visual Dam Safety	02/22/2023
KA-0109	IPUOLONO RESERVOIR	Visual Dam Safety	02/22/2023
KA-0014	OKINAWA RESERVOIR	Visual Dam Safety	05/31/2023
HA-0157	PA AALII RESERVOIR	Visual Dam Safety	05/31/2023
KA-0011	AII RESERVOIR	Visual Dam Safety	05/31/2023
KA-0099	WAITA RESERVOIR	Visual Dam Safety	06/15/2023
KA-0113	OMAO RESERVOIR	Visual Dam Safety	06/21/2023
KA-0114	PIWAI RESERVOIR	Visual Dam Safety	06/21/2023
KA-0105	ELIMA RESERVOIR	Visual Dam Safety	06/28/2023
KA-0116	MAU RESERVOIR	Visual Dam Safety	06/28/2023

C. Rules adopted or amended.

No Dam Safety rules were adopted or amended in FY 2023.

D. Enforcement orders and proceedings.

In FY 2023, the Department issued three penalty fines via enforcement action to two owners for delinquent action (see table below). Two additional fines were recommended, but not issued because the fines were contested. The contested case had not yet been resolved at the end of FY 2023.

State ID	Dam Name	Fine Amount	Description
OA-0017	Wahiawa Dam	\$5,000	Failure to submit a complete Geotechnical Date Report by the BLNR remediation schedule.
MA-0140	Ukumehame Reservoir	\$5,000 and \$10,000	Failure to begin Construction by specified deadline.
KA-0119	Mauka Reservoir	\$15,000 (Contested)	Failure to submit technical studies by NOD deadline.
KA-0107	Puu O Hewa Reservoir	\$5,000 (Contested)	Failure to comply with NOD Scheduled Requirements.

The Department issued 7 Notice of Deficiency (NOD) Letters during FY 2023, putting dam owners on a specific schedule for improvements. In addition, one case resulting in an NOD from a previous fiscal year was brought before the board for an extension. Five other cases were brought before the Board with fine recommendations (see table above). Because of the specific schedule the owners are mandated to follow, and because of the frequent milestones, these NODs have proven very effective in motivating owners to begin remediation that was long overdue. Many of the permits being reviewed this FY are a result of the timelines issued in NODs in previous fiscal years. One owner this year contested recommended fines, which led to two contested cases which are still in progress, as described above.

The dam structures receiving NODs in FY 2023 are listed below:

State ID	Dam Name
KA-0006	Waikaia Reservoir
KA-0007	Kepani Reservoir
KA-0008	Waikaloi Reservoir
KA-0009	Kaawanui Reservoir
HA-0051	Hawi No. 5 Reservoir
KA-0107	Puu O Hewa Reservoir
OA-0154	Nuuanu Reservoir No. 1

The Department also maintained the following dam restrictions issued in previous years.

State ID	Dam Name	Deficiency	DLNR Restriction
HA-0049	Keaiwa Reservoir	Earthquake Damage	Keep Empty
HA-0051	Hawi No. 5 Reservoir	Outlet Not Functioning Properly	Keep Empty
KA-0002	Puu Lua Reservoir	No Spillway	Keep Below 59 ft. (Top of Dam = 111 ft.)
KA-0003	Puu Opaе Reservoir	Abandoned Condition	Keep Empty
KA-0005	Mana Reservoir	No Spillway	Keep Empty
KA-0010	Waiakalua Reservoir	Requires Hydraulic and Stability Studies	Keep below 9 ft (Top = 19 ft)
KA-0014	Okinawa Reservoir	Requires Hydraulic and Stability Studies	Keep 10-ft Below Top of Dam
KA-0015	Kaneha Reservoir	Spillway Undersized	Keep Below 22' (Spillway = 42')

State ID	Dam Name	Deficiency	DLNR Restriction
KA-0016	Mimino Reservoir	Spillway Undersized	Keep Below 26' (Spillway = 36')
KA-0024	Kalihiwai Reservoir	Spillway undersized and outlet needs repair	Keep Below 10.2' (Top = 18.6')
KA-0030	Kaloko Reservoir	Partially Breached - No Permanent Repair	Keep Below 21.0' (Spillway = 22.7') (Top >40')
KA-0061	Lower Kapahi Reservoir	No Spillway	Keep Empty
KA-0062	Twin Reservoirs	Spillway Undersized / Abandoned Condition	Keep Empty
KA-0063	Aahoaka Reservoir	No Functioning Outlet / Spillway Undersized	Keep at Outlet Elevation (426.8)
KA-0065	Upper Anahola Reservoir	Abandoned Condition	Keep Empty
KA-0067	Field 1 Kealia Reservoir	Abandoned Condition	Keep Empty
KA-0100	Kapa Reservoir	Requires Hydraulic and Stability Studies	Keep Below 6' (Spillway = 11')
KA-0101	Hukiwai Reservoir	No Spillway	Keep Below 12' (Top =17')
KA-0102	Ioleau Reservoir	Spillway Undersized	Keep Below 25'
KA-0105	Elima Reservoir	Spillway Undersized	Keep Below 7' (Spillway = 22')
KA-0106	Kumano Reservoir	No Spillway	Keep Empty
KA-0107	Puu O Hewa Reservoir	Requires Hydraulic and Stability Studies	Keep Below Lower Spillway Elevation
KA-0108	Kaupale Reservoir	Spillway Undersized	Keep Empty
KA-0109	Ipuolono Reservoir	Spillway Undersized	Keep Below 25' (Spillway = 45')
KA-0111	Aepoekolu Reservoir	Spillway Undersized	Keep Empty
KA-0112	Aepoeha Reservoir	Spillway Undersized	Keep Below 27' (Spillway = 37')
KA-0113	Omao Reservoir	Spillway Undersized	Keep Empty
KA-0114	Piwai Reservoir	Spillway Undersized	Keep Empty
KA-0115	Pia Mill Reservoir	Requires Hydraulic and Stability Studies	Keep 5 ft. Below Spillway
KA-0116	Mau Reservoir	Spillway Undersized	Keep Empty

State ID	Dam Name	Deficiency	DLNR Restriction
KA-0117	Elua Reservoir	Spillway Undersized	Keep Below 16' (Spillway = 26.6')
KA-0118	Manuhonuhonu Reservoir	No Spillway	Keep Empty
KA-0119	Mauka Reservoir	Requires Hydraulic and Stability Studies	Keep 5 ft. Below Spillway
KA-0121	Halenanahu Reservoir	Requires Hydraulic and Stability Studies	Keep 20 ft. Below Spillway
KA-0146	Halaula Reservoir	Requires Hydraulic and Stability Studies	Keep Below Spillway
MA-0054	Horner Reservoir	Requires Hydraulic and Stability Studies	Keep Below 300" Gage (Spillway = 360" Gage)
MA-0068	Maui Reservoir 14	Reservoir Overtops from Design	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0070	Maui Reservoir 20	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0073	HC&S Reservoir 24	Reservoir Overtops from Design Rainstorm event	Keep and maintain empty under normal conditions, alert / coordinate downstream population notification with Maui EMA.
MA-0074	Maui Reservoir 25	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0076	Maui Reservoir 33	Requires H&H and stability study	Maintain water level at least 5' below spillway elevation
MA-0078	Maui Reservoir 42	Poor condition, requires H&H and stability study	Maintain water level at least 5' below spillway elevation
MA-0079	Maui Reservoir 52	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0080	Maui Reservoir 60	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0081	Maui Reservoir 61	Reservoir does not have required safety freeboard	Maintain water level at least 5' below spillway elevation
MA-0082	Maui Reservoir 70	Repairs needed, requires H&H, topo & stability study	Maintain water level at least 5' below spillway elevation
MA-0083	Maui Reservoir 73	Repairs needed, requires H&H and stability study	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0084	Maui Reservoir 74	Reservoir Overtops from Design Rainstorm event	Maintain Empty
MA-0085	Maui Reservoir 80	Requires H&H and stability study	Maintain water level at least 5' below spillway elevation
MA-0086	Maui Reservoir 81	Requires H&H and stability study	Maintain water level at least 5' below spillway elevation

State ID	Dam Name	Deficiency	DLNR Restriction
MA-0087	Maui Reservoir 82	Poor Condition, require Freeboard Buffer	Maintain water level at least 5' below spillway elevation
MA-0088	Maui Reservoir 84	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0089	Maui Reservoir 90	Requires H&H and stability study	Maintain water level at least 5' below spillway elevation
MA-0090	Maui Reservoir 92	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0091	Peahi Reservoir	Reservoir Overtops from Design Rainstorm event	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0092	Papaaea Reservoir	Repairs needed, requires H&H, topo & stability study	Maintain Empty, unless water required, coordinate safe level with DLNR
MA-0094	Kapalaalaea Reservoir	Reservoir Overtops from Design Rainstorm event and has piping along outlet	Maintain Empty
MA-0095	Haiku Reservoir	Reservoir Overtops from Design Rainstorm event and has piping along outlet	Drain and maintain empty, alert Maui EMA of potential hazard
MA-0096	Pauwela Reservoir	Reservoir Overtops from Design Rainstorm event	Drain and maintain water at outlet works elevation, alert / coordinate downstream population notification with Maui EMA.
MA-0140	Ukumehame Reservoirs	Spillway Undersized	Res 2: Keep Below 2' Res 3: Keep Below 10'
MA-0151	Wailuku Water Reservoir 10	Requires Hydraulic and Stability Studies	Keep Below 9' (Spillway = 11.6')
OA-0017	Wahiawa Dam	Spillway Undersized	Keep Below 65' (Spillway = 80')
OA-0023	Helemano 6 Reservoir	Spillway Erosion	Keep 15' Below Top of Dam
OA-0025	Ku Tree Reservoir	Abandoned Condition	Keep Empty
OA-0154	Nuuanu Reservoir No. 1	No Functioning Outlet / Spillway Undersized	Keep Below 381.5
OA-0156	Koolau Reservoir	Abandoned Condition	Keep Empty

E. Dam and reservoir failures and department evaluations of the reasons for the failure, if known;

There were no known dam failures in FY 2023.
There were no known incidents in FY 2023.

F. Other available data regarding the effectiveness of the State's Dam and Reservoir Safety Program.

Screening Level Risk Analysis (SLRA) were performed on 25 select dams across the state inventory. The objectives of the SLRA were to provide the Department with an overview of the risk profile for the selected high hazard dams and to assist in prioritizing future actions to manage and reduce risk for their dam inventory. The SLRAs are conducted as a daylong facilitated workshop that includes owners, operators, staff from Department dam safety and consultant experts in dam safety. SLRA completed in FY 2023:

STATE ID	DAM NAME
KA-0007	KEPANI RESERVOIR
KA-0010	WAIKALUA RESERVOIR
OA-0021	KEMOO 5 RESERVOIR
OA-0022	UPPER HELEMANO RESERVOIR
OA-0023	HELEMANO 6 RESERVOIR
KA-0024	KALIHIWAI RESERVOIR
KA-0030	KALOKO RESERVOIR
HA-0040	WAIKOLOA RESERVOIR NO. 1
HA-0042	WAIMEA 60 MG RESERVOIR
MA-0054	HORNER RESERVOIR
MA-0057	KAHOMA RESERVOIR
KA-0061	LOWER KAPAHI RESERVOIR
KA-0062	TWIN RESERVOIRS
MA-0068	MAUI RESERVOIR 14
MA-0069	MAUI RESERVOIR 15
MA-0073	MAUI RESERVOIR 24
MA-0088	MAUI RESERVOIR 84
MA-0090	MAUI RESERVOIR 92
MA-0091	PEAHI RESERVOIR
KA-0109	IPUOLONO RESERVOIR
KA-0121	HALENANAHU RESERVOIR
HA-0123	PUU PULEHU RESERVOIR
MA-0126	KAHANA NUI DAM
MA-0151	WAILUKU WATER RESERVOIR 10
OA-0154	NUUANU RESERVOIR NO. 1

The Dam and Reservoir Safety Program has been working with dam owners in the preparation of their Emergency Action Plans (EAP) for their facilities. EAPs are required by Statute for all high and significant hazard potential classifications of dams. Out of the 127 regulated dams in FY 2023, 119 are classified as high or significant hazard potential structures. All regulated dams except one low hazard dam and one newly added dam have EAPs on file with the Department, and all EAPs have been migrated and updated on the Department’s online “Easy EAP” Tool.

The following is a summary of EAPs on file with the Department for all hazard potential classifications.

