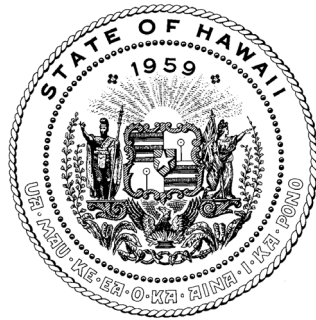


Report to the Thirty-Second Legislature
2023 Regular Session

**THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM
STATE FISCAL YEAR 2022**



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

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

October 2022

THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM STATE FISCAL YEAR 2022

This report is prepared pursuant to Hawaii Revised Statutes (HRS) Section 179D-29 and covers the period from July 1, 2021 through June 30, 2022.

INTRODUCTION

The Department of Land and Natural Resources' (Department) Engineering Division administers the Hawaii Dam and Reservoir Safety Act of 2007 (Act), codified as 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 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.

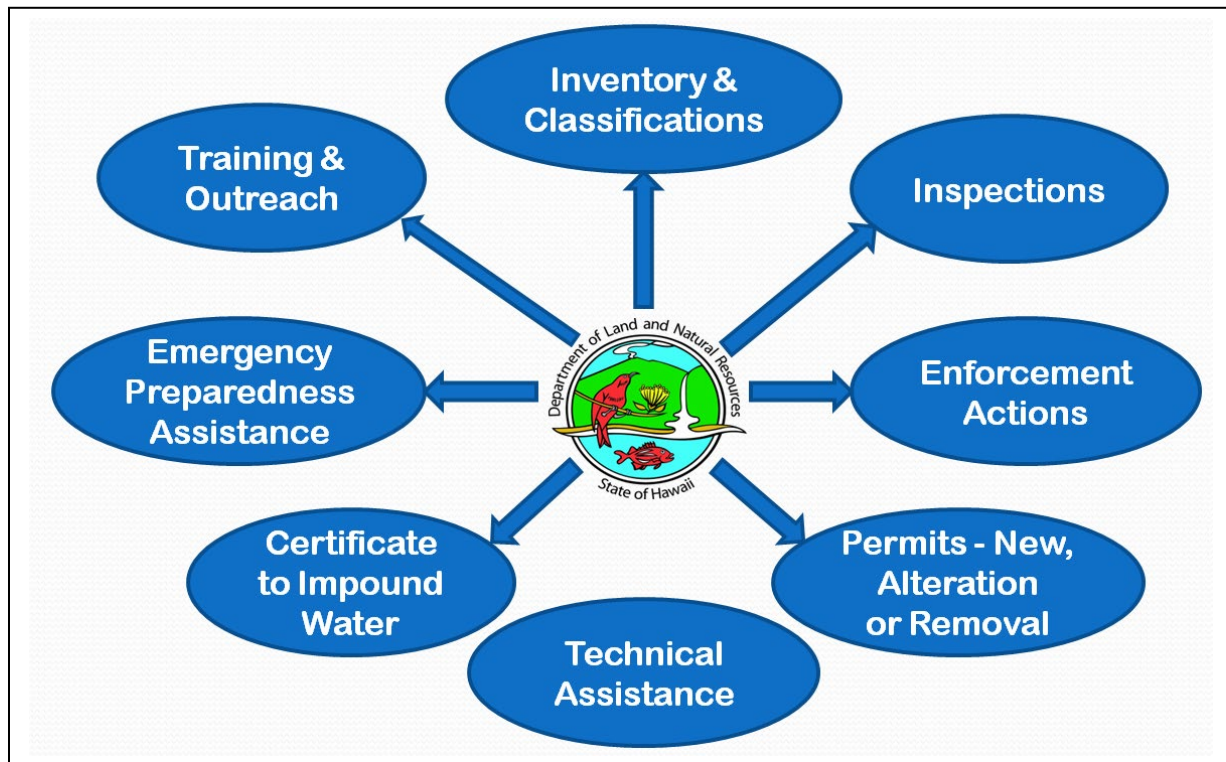
BACKGROUND

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, flood control, hydro-electric, 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.

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 or those with new data affecting this classification. The overall condition assessment classification is a relatively new field which the Dam and Reservoir Safety Program is working to consistently apply across the state based on the condition assessments conducted on all regulated dams. All regulated dams were assessed and assigned an overall condition assessment classification during phase I inspections conducted statewide in 2007-2009. These condition assessment classifications are being updated based on recently completed Phase I investigations.

Dam Safety Inspections: The Department staff routinely inspects regulated structures statewide and retains consultants as necessary to assist with the assessments. Staff conducted dam safety inspections and construction site visits in FY 2022. The Department was fortunate to be provided with \$2.04 million in emergency state funding to update and complete Phase I investigations of dams statewide. The last complete set of Phase I investigations were completed in 2009 and are over 10 years old. These Phase I investigations supplement the inhouse Visual Dam Safety Inspections conducted by dam safety staff and provide an objective and more thorough

investigation of the dam's current overall conditions and deficiencies. The list of the dams inspected in the fiscal year is described in Section C 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; however, this has yielded mixed results with some structures not being able to resolve outstanding deficiencies. In February 2020, the program began to take a harder stance on some of these structures which culminated in enforcement fines in the end of FY 2021. Enforcement actions pursued by the Department in Fiscal Year 2022 are described in Section D of this report.

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.

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 has developed guidelines and procedures for this certificate in coordination with dam owners on the implementation of this new requirement. The Department sent out notices to complete and submit CAI applications, to all owners of regulated dams and reservoirs in the state and received CAI applications for most of the regulated structures. The Department is in the process of reviewing these submissions and reevaluating how to apply current regulations to this requirement.

Understanding that many of these dams are over 80 years old, 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 the completion and execution of the EAPs. Additionally, the Department is identified as a technical advisor during dam safety emergencies when an EAP is activated.

The Department worked with dam owners to have an EAP for every regulated dam in the state in FY 2019. In FY 2022, all high and significant regulated dams in Hawaii have EAPs on file with the Department. 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 works closely with the Association of State Dam Safety Officials, (ASDSO) to collaborate on public outreach and national awareness of the importance of dam and reservoir safety programs. 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

The Department maintains an online inventory of regulated dams in the state and makes this inventory available to the public at dams.hawaii.gov. 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. Residents are also able to quickly identify if their parcels are in a dam evacuation area by entering their address into the Department's Flood Hazard Assessment Tool (<http://gis.hawaiiinfip.org/fhat/>) and click on the parcel details for a flood report to learn if the parcel is affected by a dam evacuation area and identifies the dams' State ID number(s).

FUNDING

The Dam and Reservoir Safety Program is funded under the Department’s LNR 810 Program, Prevention of Natural Disasters, and utilizes operational funding from two state special funding sources and typically one federal grant from the United States Department of Homeland Security, Federal Emergency Management Agency (FEMA). The dam and reservoir safety special fund has an annual ceiling spending limit of \$ 1,300,000 but is typically limited based on available funding. In FY 2020 the State was able to secure an additional Federal Grant, the High Hazard Potential Dam Rehabilitation Grant which has recently been approved by FEMA to utilize these funds for 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 2022:

Dam Safety Program Budget

State of Hawaii – Special Land and Development Fund (operating)	\$ 542,700
State of Hawaii – Dam & Reservoir Safety Special Fund (DRSSF balance)	\$1,952,580
Revenues (Annual Fees, Permit Fees, Enforcements)	\$ 699,870
FEMA – High Hazard Potential Dam Rehabilitation Grant (Fed FY 2020)	\$ 419,550
FEMA – National Dam Safety Program Grant (Fed FY 2022)	\$ 87,938
Total	\$ 3,702,638

Previously Obligated Contracts	\$ <1,766,490>
Emergency Contingency Reserve	\$ <700,000>
Total Available Funding	\$ 1,236,148

FY 2022 expenditures from the various funding sources were made as follows:

	Operating Special Fund	Dam and Reservoir Safety Special Fund	Federal Funds	Total
Personnel Services	\$ 542,700	\$ 0	\$ 0	\$ 542,700
Consultant Services	\$ 0	\$ 505,510	\$ 0	\$ 505,510
Inspections Costs (including travel)	\$ 650	\$ 16,160	\$ 0	\$ 16,810
Training Expense (including travel)	\$ 0	\$ 9,020	\$8,460	\$ 17,480
Other Expenses (Supplies, Operating & Equipment)	\$ 12,640	\$ 18,910	\$ 70,300	\$ 101,850
B&F Management Fee	\$ 48,200	\$ 47,100	\$ 0	\$ 95,300
	\$ 604,190	\$ 596,700	\$ 78,760	\$ 1,279,650

Operating funds for the State 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.

DAM SAFETY 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 2022 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	Permit Approved. Other agency permits pending
51	KA-63	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	Waikaloa 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.
82	MA-0093	Kaupakalua Reservoir Removal	Removal	Construction complete. Permit pending close-out
83	OA-0129	Waimanalo 60 MG - Crest Modifications	Repair and improvement	In Construction
84	KA-0065	Upper Anahola Reservoir	Removal	Permit Application under Review
85	KA-0118	Manuhonuhonu	Removal/Reduction	Permit Application under Review
86	KA-0024	Kalihiwai Reservoir	Removal	Permit Application under Review
87	HA-0049	Keaiwa Reservoir	Removal / Reduction	Preliminary Review

Permit No.	State ID	Dam Name	Description of Improvements	Status / Comments
88	MA-0094	Kapalaalaea	Removal	Permit Application under Review

Additional applications under review:

Permit No.	State ID	Dam Name	Description of Improvements	Status / Comments
	MA-0058	Honokowai Dam	Proposed Reduction	Preliminary Review
	KA-0030	Kaloko - Remediation	Rehabilitation / Reduction	Geotechnical Review
	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 Opa	Rebuild	Preliminary Review
	KA-0003	Puu Lua	Improvements	Preliminary Review
	KA-0005	Mana	Rebuild	Preliminary Review
	KA-0010	Waiakalua	Improvements	Preliminary Review

Permits closed in FY 2022:

Permit No.	State ID	Dam Name	Description of Improvements	Status / Comments
80	KA-0105	Elima Reservoir	Outlet Work Repair	Construction completed / Permit Closed

B. Listing of dam and reservoir safety inspections.

In FY 2022, Dam and Reservoir Safety Program staff conducted 93 visual and Phase I dam safety inspections on regulated dams. These inspections were a mix of informal dam safety visits, construction inspections as well as several Phase I inspections. Phase I investigations, which accounted for 73 of the inspections done during FY 2022, supplement the inhouse Visual Dam Safety Inspections and provide an objective review and more thorough investigation of the dam's current overall conditions and deficiencies. As our in-house dam safety staff were also involved in the Phase I inspections this year, these inspections provided

a tremendous training opportunity for them to learn what the dam safety specialists look for during an inspection and become much more familiar with the structures and previous reports of the dams inspected. The Department was fortunate to be provided with \$ 2.04 million in emergency state funding to complete these Phase I inspections. A listing of the inspections is provided below:

State ID	Dam Name	Inspection Type	Inspection Date
KA-0113	OMAO RESERVOIR	Phase I	07/01/2021
KA-0107	PUU O HEWA RESERVOIR	Phase I	07/01/2021
KA-0115	PIA MILL RESERVOIR	Phase I	07/01/2021
MA-0128	NAPILI 2-3 DESILTING BASIN	Phase I	07/19/2021
MA-0127	NAPILI 4-5 DESILTING BASIN	Phase I	07/19/2021
MA-0130	HONOKOWAI - STRUCTURE #8	Phase I	07/20/2021
MA-0134	KAOPALA BASIN	Phase I	07/20/2021
MA-0153	PLANTATION RESERVOIR	Phase I	07/21/2021
MA-0132	UPPER FIELD 14 RESERVOIR	Phase I	07/21/2021
MA-0142	MIDDLE FIELD 14 RESERVOIR	Phase I	07/21/2021
MA-0056	HANAKAOO RESERVOIR	Phase I	07/22/2021
KA-0098	ALEXANDER	Phase I	08/02/2021
KA-0105	ELIMA RESERVOIR	Phase I	08/03/2021
KA-0117	ELUA RESERVOIR	Phase I	08/03/2021
KA-0116	MAU RESERVOIR	Phase I	08/03/2021
KA-0010	WAIKALUA RESERVOIR	Phase I	08/04/2021
KA-0024	KALIHUWAI RESERVOIR	Phase I	08/04/2021
KA-0011	AII RESERVOIR	Phase I	08/05/2021
KA-0030	KALOKO RESERVOIR	Phase I	08/05/2021
MA-0093	KAUPAKALUA RESERVOIR (Removed 2022)	Construction	09/09/2021
KA-0110	AEPOALUA RESERVOIR	Phase I	10/11/2021
KA-0111	AEPOEKOLU RESERVOIR	Phase I	10/11/2021
KA-0114	PIWAI RESERVOIR	Phase I	10/11/2021
KA-0104	HUINAWAI RESERVOIR	Phase I	10/11/2021
KA-0145	KAUAI LAGOONS	Phase I	10/12/2021
KA-0108	KAUPALE RESERVOIR	Phase I	10/12/2021
KA-0112	AEPOEHA RESERVOIR	Phase I	10/12/2021
KA-0106	KUMANO RESERVOIR	Phase I	10/12/2021

State ID	Dam Name	Inspection Type	Inspection Date
KA-0065	UPPER ANAHOLA RESERVOIR	Phase I	10/13/2021
KA-0146	HALAULA RESERVOIR	Phase I	10/13/2021
KA-0067	FIELD 1 KEALIA RESERVOIR	Phase I	10/13/2021
KA-0060	WAILUA RESERVOIR	Phase I	10/14/2021
KA-0061	LOWER KAPAHI RESERVOIR	Phase I	10/14/2021
KA-0062	TWIN RESERVOIRS	Phase I	10/14/2021
MA-0092	PAPAAEA RESERVOIR	Phase I	10/15/2021
MA-0094	KAPALAALAEA RESERVOIR	Phase I	10/15/2021
MA-0139	MAUI FIELD 290 RESERVOIR	Phase I	10/15/2021
MA-0070	MAUI RESERVOIR 20	Phase I	10/18/2021
MA-0071	MAUI RESERVOIR 21	Phase I	10/18/2021
MA-0072	MAUI RESERVOIR 22	Phase I	10/18/2021
MA-0080	MAUI RESERVOIR 60	Phase I	10/19/2021
MA-0074	MAUI RESERVOIR 25	Phase I	10/19/2021
MA-0075	MAUI RESERVOIR 30	Phase I	10/19/2021
MA-0082	MAUI RESERVOIR 70	Phase I	10/20/2021
MA-0079	MAUI RESERVOIR 52	Phase I	10/20/2021
MA-0081	MAUI RESERVOIR 61	Phase I	10/20/2021
MA-0076	MAUI RESERVOIR 33	Phase I	10/20/2021
MA-0085	MAUI RESERVOIR 80	Phase I	10/21/2021
MA-0078	MAUI RESERVOIR 42	Phase I	10/21/2021
MA-0088	MAUI RESERVOIR 84	Phase I	10/21/2021
MA-0077	MAUI RESERVOIR 40	Phase I	10/21/2021
MA-0089	MAUI RESERVOIR 90	Phase I	10/25/2021
MA-0087	MAUI RESERVOIR 82	Phase I	10/25/2021
MA-0090	MAUI RESERVOIR 92	Phase I	10/25/2021
MA-0086	MAUI RESERVOIR 81	Phase I	10/25/2021
MA-0140	UKUMEHAME RESERVOIRS	Phase I	10/26/2021
MA-0150	WAILUKU WATER RESERVOIR 6	Phase I	10/26/2021
MA-0143	KAILI ILI RESERVOIR	Phase I	10/27/2021
MA-0093	KAUPAKALUA RESERVOIR (Removed 2022)	Construction	10/27/2021
KA-0102	IOLEAU RESERVOIR	Phase I	11/01/2021

State ID	Dam Name	Inspection Type	Inspection Date
KA-0101	HUKIWAI RESERVOIR	Phase I	11/01/2021
KA-0109	IPUOLONO RESERVOIR	Phase I	11/01/2021
KA-0009	KAAWANUI RESERVOIR	Phase I	11/02/2021
KA-0008	WAIKOLOI RESERVOIR	Phase I	11/02/2021
KA-0100	KAPA RESERVOIR	Phase I	11/02/2021
KA-0006	WAIKAIA RESERVOIR	Phase I	11/03/2021
KA-0007	KEPANI RESERVOIR	Phase I	11/03/2021
KA-0002	PUU LUA RESERVOIR	Phase I	11/04/2021
KA-0005	MANA RESERVOIR	Phase I	11/16/2021
KA-0003	PUU OPAE RESERVOIR	Phase I	11/16/2021
KA-0016	MIMINO RESERVOIR	Phase I	11/17/2021
KA-0010	WAIKALUA RESERVOIR	Informal	11/17/2021
KA-0155	POND NO. 1 AT KAUI RANCH	Phase I	11/17/2021
OA-0025	KU TREE RESERVOIR	Phase I	11/18/2021
OA-0137	OAHU RESERVOIR 155	Visual Dam Safety	02/24/2022
OA-0129	WAIMANALO 60 MG RESERVOIR	Visual Dam Safety	02/25/2022
OA-0149	MAUNAOLU RESERVOIR	Visual Dam Safety	03/11/2022
OA-0018	OPAEULA 01 RESERVOIR	Visual Dam Safety	03/15/2022
OA-0154	NUUANU NO.1 RESERVOIR	Phase I	11/18/2021
OA-0156	KOOLAU RESERVOIR	Phase I	11/18/2021
MA-0093	KAUPAKALUA RESERVOIR (Removed 2022)	Construction	03/16/2022
MA-0054	HORNER RESERVOIR	Visual Dam Safety	04/01/2022
MA-0126	KAHANA NUI DAM	Visual Dam Safety	04/01/2022
KA-0015	KANEHA RESERVOIR	Visual Dam Safety	04/07/2022
KA-0012	KAPAIA RESERVOIR	Visual Dam Safety	04/07/2022
HA-0136	WAIKOLOA RESERVOIR NO. 3	Visual Dam Safety	04/28/2022
HA-0122	WAIKOLOA RESERVOIR NO. 2	Visual Dam Safety	04/28/2022
HA-0040	WAIKOLOA RESERVOIR NO. 1	Visual Dam Safety	04/28/2022
OA-0124	KANEOHE DAM	Visual Dam Safety	05/10/2022
HA-0123	PUU PULEHU RESERVOIR	Visual Dam Safety	06/21/2022
HA-0042	WAIMEA 60 MG RESERVOIR	Visual Dam Safety	06/21/2022

State ID	Dam Name	Inspection Type	Inspection Date
HA-0147	PUNAWAI RESERVOIR	Visual Dam Safety	06/23/2022
HA-0051	HAWI NO. 5 RESERVOIR	Visual Dam Safety	06/23/2022

C. Rules adopted or amended;

No Dam Safety rules were adopted or amended in FY 2022.

D. Enforcement orders and proceedings;

The Department issued penalty fines via enforcement action for delinquent submissions to the dam owners of the following dam in FY 2022:

State ID	Dam Name	Fine Amount	Description
KA-0010	Waiakalua Reservoir	\$1000	Failure to comply with NOD Scheduled Requirements

The Department issued 12 Notice of Deficiency (NOD) Letters to 11 owners during FY 2022, putting dam owners on a specific schedule for improvements. 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. As a direct result of these notices, three owners have submitted permit packages for remediation work this year, and an additional three have submitted preliminary studies as a first step to future permits for remediation. In addition, it is very likely that the NODs issued this year will continue to encourage owners to stay on schedule for remediation producing more results in future years. The Structures receiving NODs are listed below:

DAM ID	DAM NAME
KA-0010	WAIAKALUA RESERVOIR
OA-0021	KEMOO 5 RESERVOIR
OA-0022	UPPER HELEMANO RESERVOIR
OA-0023	HELEMANO 6 RESERVOIR
KA-0024	KALIHAIWAI RESERVOIR
MA-0047	PIIHOLO 50 MG RESERVOIR
MA-0068	MAUI RESERVOIR 14
MA-0069	MAUI RESERVOIR 15

DAM ID	DAM NAME
MA-0096	PAUWELA RESERVOIR
KA-0118	MANUHONUHONU RESERVOIR
KA-0119	MAUKA RESERVOIR
MA-0151	WAILUKU WATER 10

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')
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')

State ID	Dam Name	Deficiency	DLNR Restriction
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
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

State ID	Dam Name	Deficiency	DLNR Restriction
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
MA-0087	Maui Reservoir 82	Poor Condition, require Freeboard Buffer	Maintain water level at least 5' below spillway elevation

State ID	Dam Name	Deficiency	DLNR Restriction
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 2022.

There were no known incidents in FY 2022.

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

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 126 regulated dams in FY 2022, 118 are classified as high or significant hazard potential structures. All regulated dams except one low hazard dam have EAPs on file with the Department, and all EAPs have been migrated and updated on the Department’s new online “Easy EAP” Tool. The following is a summary of EAPs on file with the Department for all classifications.

FY 2004	FY 2007	FY 2010	FY 2015	FY 2020	FY 2022
12	55	121	130	131 of 131	125 of 126