US Army Corps of Engineers
New Mexico Silver Jackets

Impacts of Wildfires on Dams

Please add your name and email address to the chat to receive a CEC Certificate for this webinar.

USACE Silver Jackets

- USACE Silver Jackets is a component of the National Flood Risk Management Program (NFRMP)
- State (DHSEM) Led Teams with regular meetings
- Interagency Program to Reduce Flood Risk throughout New Mexico
- Interagency Projects
  - Competitive Project Proposals
  - 12 to 18-month Projects

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New Mexico Post-Fire Flood Risk Education

Fill gaps for post-fire technical support to understand flood risk post-fire, possible mitigation strategies, and resources and programs to provide long-term fire recovery support. Topics will inform and address risks associated with:

- **dam safety**
- **floodplains**
- **flood after fire**
- **alluvial fans.**

The New Mexico Post-Fire Flood Risk Education project will empower communities in New Mexico to be better prepared for flood events after wildfire season.

New Mexico Flood Risk Webinar Series

Please join us for a webinar series about different types of **Flood Risks** across the State of New Mexico.

DAM SAFETY

21 OCT 2025

9:00-10:00AM

FLOODPLAINS

18 DEC 2025

FLOOD AFTER FIRE

19 FEB 2026

ALLUVIAL FANS

23 APR 2026

Continuing Education Credits (CECs) will be offered through the US Army Corps of Engineers upon completion of individual sessions.

Sessions are **60** minutes, held virtually, with **30** minutes of recorded presentation and **30** minutes of question and discussion. Meeting instructions will be provided with induvial series invites.

Interagency partners will present on **dam safety, floodplains, flood after fire,** and **alluvial fan** risks.

OCTOBER PRESENTER: SUSHIL CHAUDHARY
BUREAU CHEIF

NM OFFICE OF THE STATE ENGINEER

DAM SAFETY BUREAU

Office of the State Engineer
Interstate Stream Commission

US Army Corps of Engineers.
Albuquerque District

New Mexico Flood Risk Webinar Series

Impacts of Wildfires on Dams

Office of the State Engineer
nm
Interstate Stream Commission

Outline

- Wildfires
- Impacts on Dam Safety
- Preparedness
- Mitigation

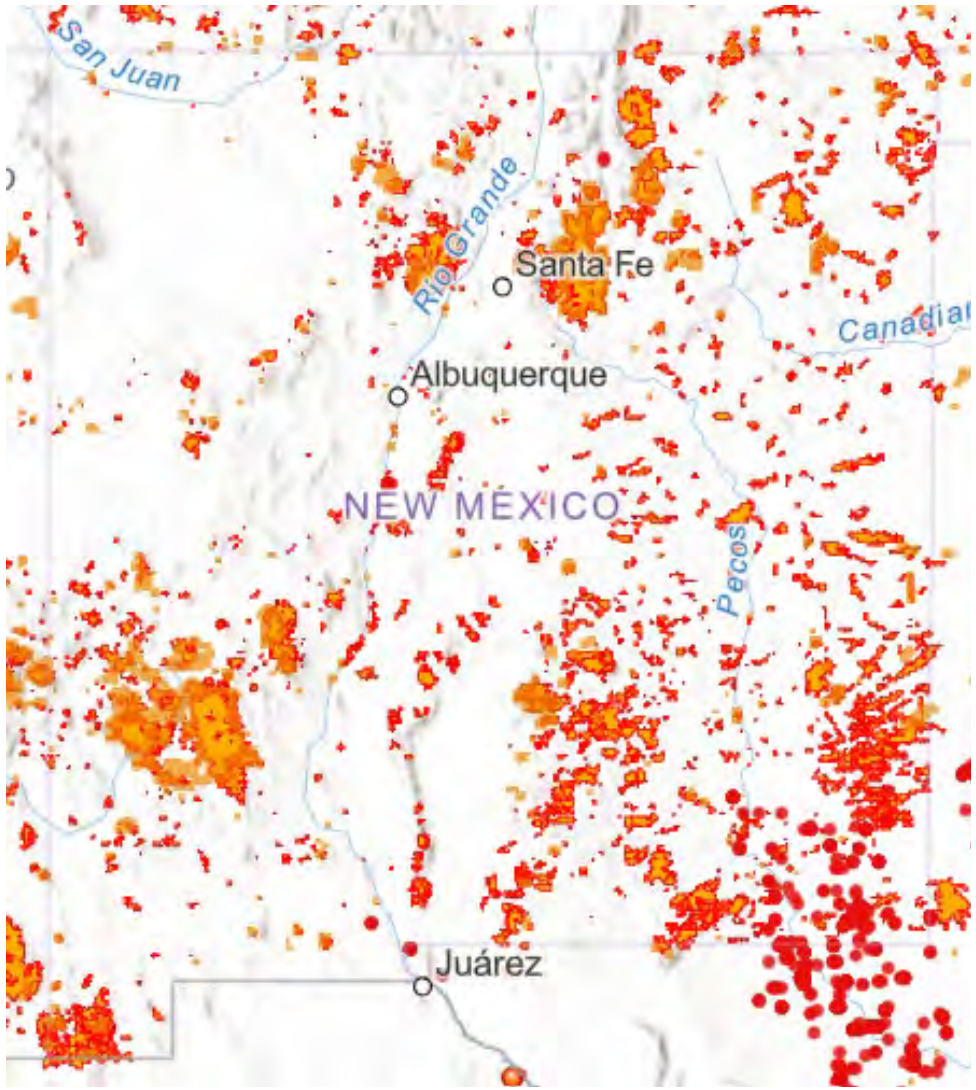
Wildfires in New Mexico

Footprint of wildfires from 1950 to Present

(NM Fire Viewer - https://nmfireviewer.org/)

5 Largest Wildfires in NM:

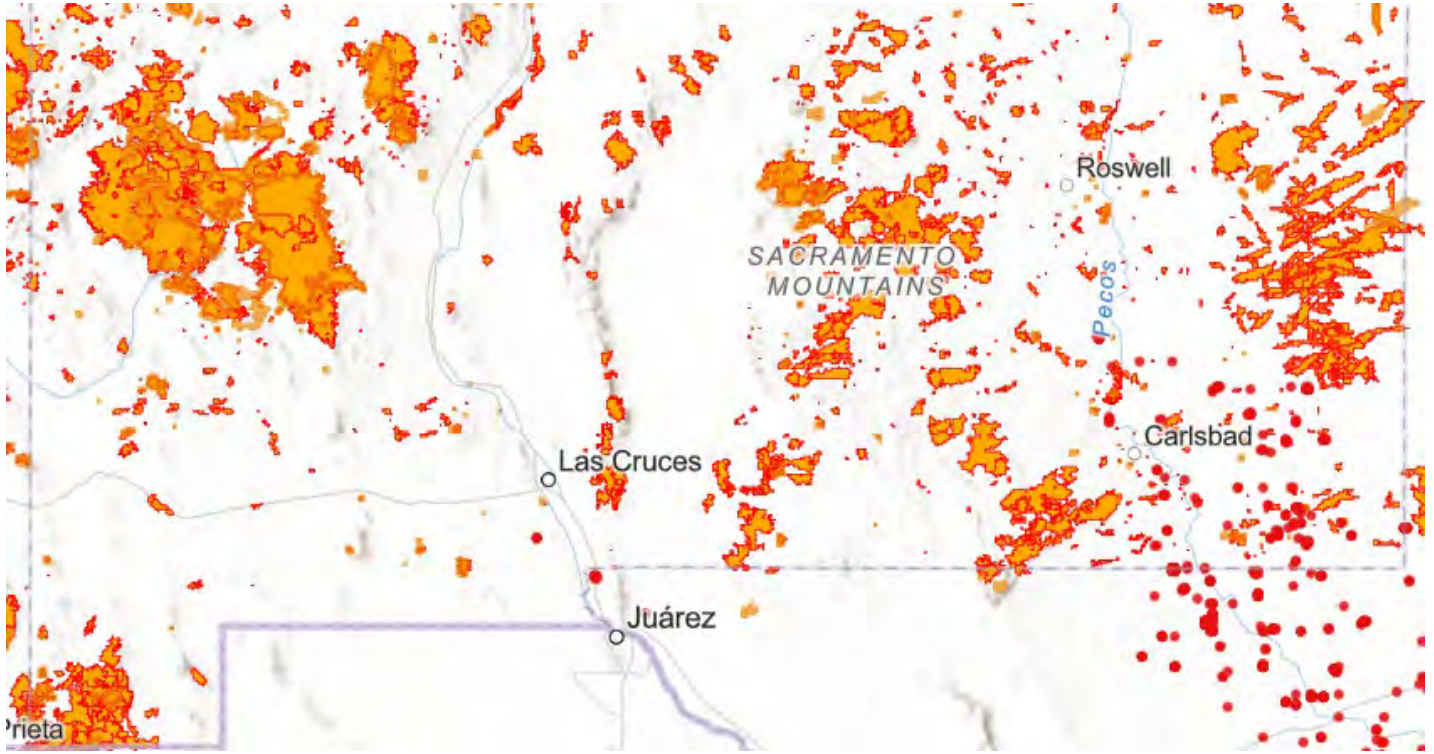
- Hermits Peak-Calf Canyon – 2022 (Santa Fe NF)
- Black Fire – 2022 (Gila NF)
- Whitewater-Baldy - 2012(Gila NF)
- Las Conchas – 2011 (Santa Fe NF)
- Silver – 2013 (Gila NF)



Wildfires in New Mexico

Recent wildfires Impacting Dams

- Little Bear – 2012 (Lincoln NF)
- Hermits Peak-Calf Canyon – 2022 (Santa Fe NF)
- South Fork – 2024 (Lincoln NF)
- Trout -2025 (Gila NF)

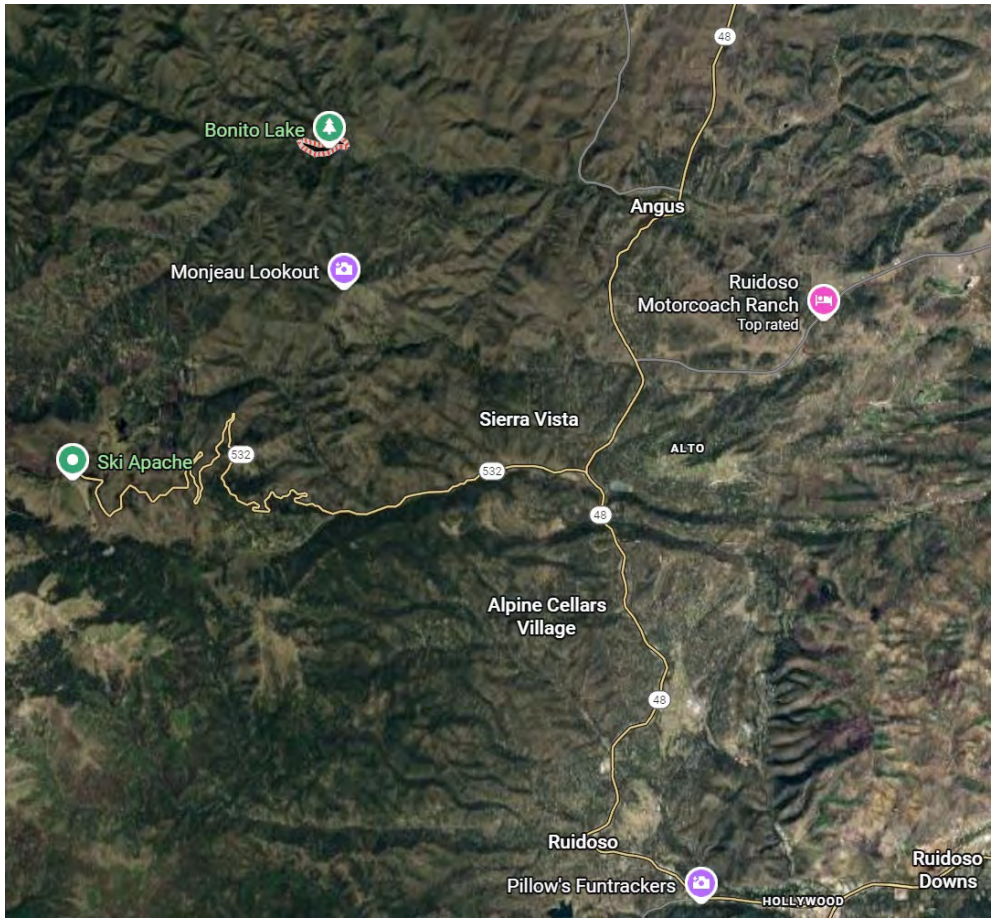


Source: NM Fire Viewer - https://nmfireviewer.org/

2012 - Little Bear Fire - Bonito Dam

Bonito Dam –

- Owned and operated by the City of Alamogordo
- 113 ft high, 1230 ac-ft storage to spillway
- Watershed – 34 sq.mi.
- Constructed in 1930
- Main source of water for the City of Alamogordo



2012 - Little Bear Fire - Bonito Dam

2012 - Little Bear Fire - Bonito Dam

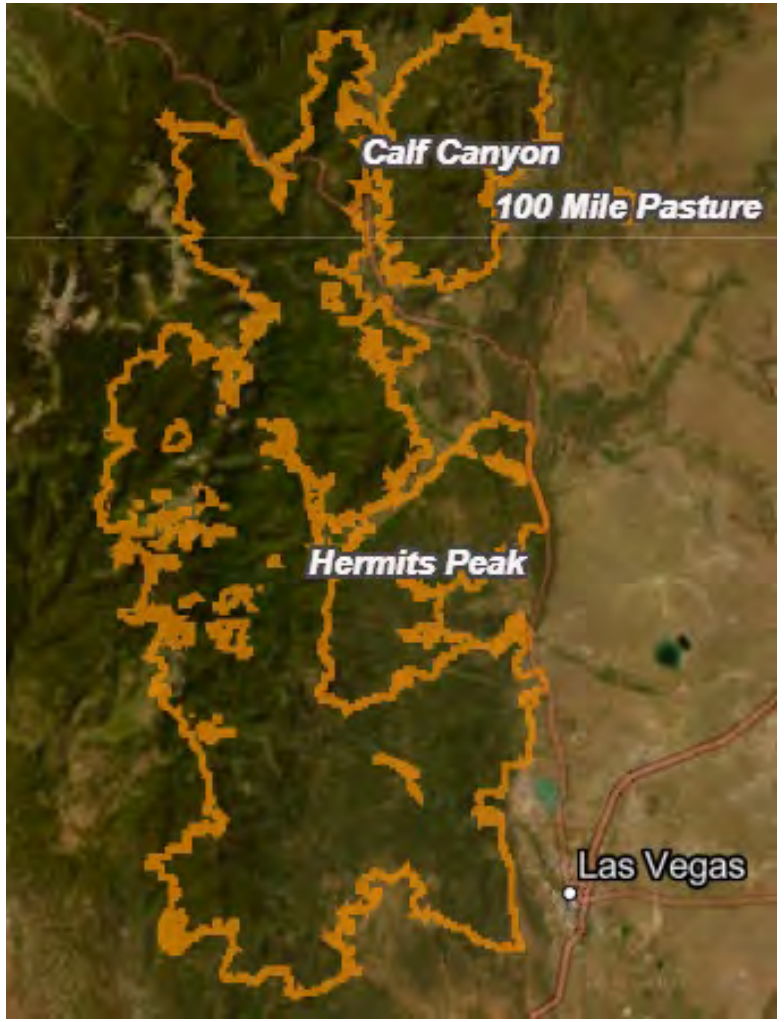
Summary of Impacts:

- Rain events, shortly after fire, between June 22 and July 12, 2012 brought flood, debris, and ash laden sediment into the reservoir, putting the reservoir out of service immediately
- About 372 (+/-38) acre-feet of sediment (539,000 – 661,000 cubic yards) attributed to the fire
- Loss of Water Supply Source; Loss of Recreational opportunity
- It took millions of dollar from many sources to remove the sediment and address other issues at the dam
- Dam refilled and came online in 2023 (Loss of 11 years)

2022 - Hermits Peak-Calf Canyon Fire

Impacted Several Dams in the Mora and San Miguel Counties

- Morphy Lake Dam
- Storrie Lake Dam
- Peterson Dam
- Bradner Dam



2022 - Hermits Peak-Calf Canyon Fire

Morphy Lake Dam:

- Ash-laden water diverted by breaching the diversion channel close to the dam causing erosion damage to the downstream area and near the outlet discharge

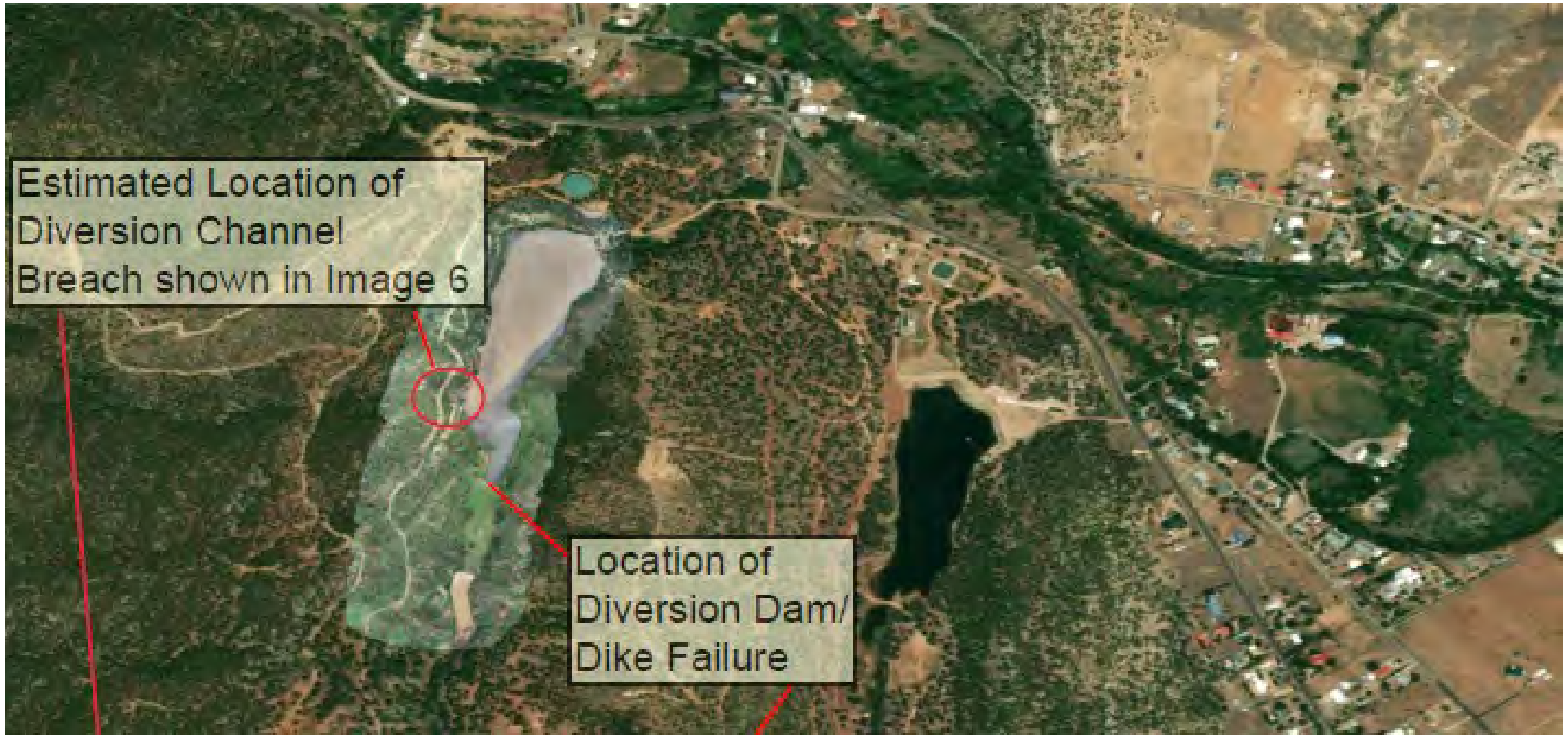
- Dam and appurtenances not damaged directly

2022 - Hermits Peak-Calf Canyon Fire

Storrie Dam:

- Lake contaminated with ash-laden water
- Many attempts made to stop diversion to the lake
- Dam and appurtenances not damaged directly

2022 - Hermits Peak-Calf Canyon Fire



2022 - Hermits Peak-Calf Canyon Fire

Peterson Dam:

- Dam overtopped on June 21, 2024 by 2 feet
- Diversion embankment upstream of the reservoir and diversion ditch overtopped and breached
- Reservoir water contaminated with debris and sediment increasing turbidity
- Dam sustained minor damages

2022 - Hermits Peak-Calf Canyon Fire

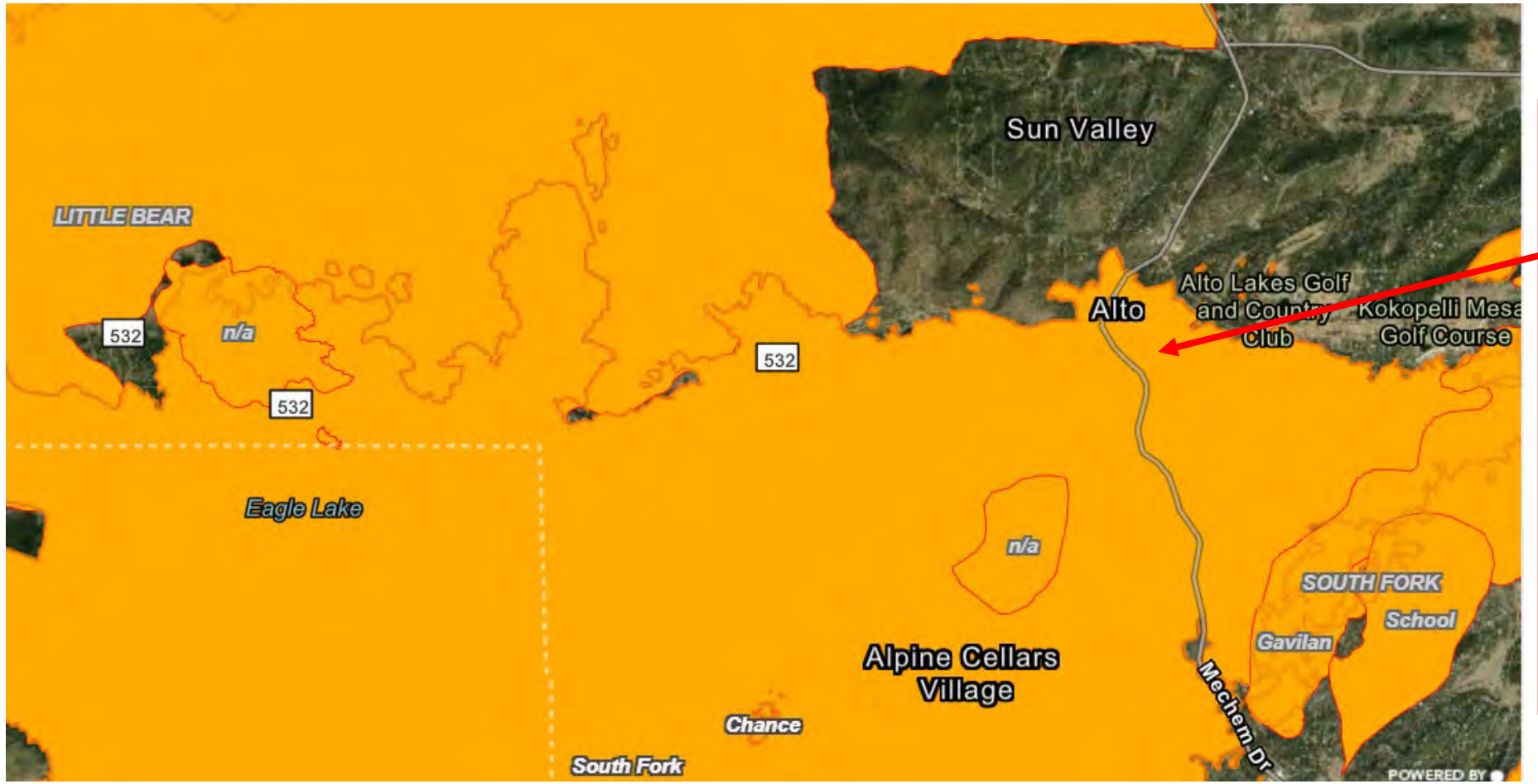
Bradner Dam:

- Diversion ditch around the reservoir overtopped and breached
- Reservoir water contaminated with debris and sediment increasing turbidity
- Dam did not sustain damage
- Treatment plant flooded causing heavy damages

Westerly view of the diversion channel located along the west side of the Bradner Reservoir with eroded embankment slope as indicated.

View of the inundated Water Treatment Plant Sludge Pond located to the north (downstream) of the Bradner Dam main embankment.

2024 - South Fork Fire



Alto Lake Dam

- Watershed – 12 sq.mi.
- Height – 51 ft
- Storage – 300 ac-ft (up to spillway)
- 70% of water supply to Village of Ruidoso
- Bypass channel capacity – 565 cfs
- 100-yr flood peak – 3,300 cfs

2024 - South Fork Fire

Alto Lake Dam

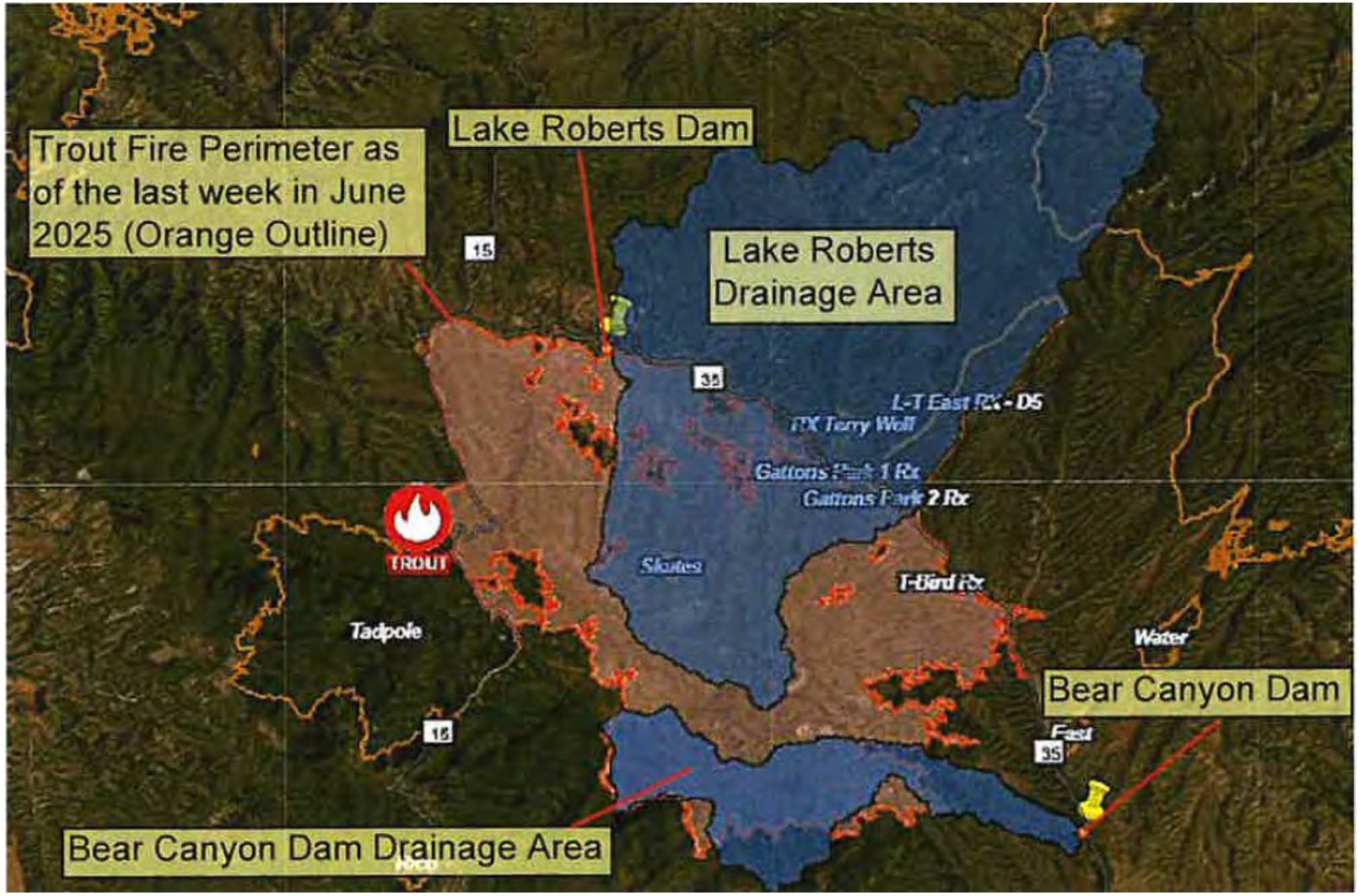
2025 - Trout Fire (near Silver City)

Bear Canyon Dam –

- Most of the watershed

Lake Roberts Dam –

- About 40% of the watershed

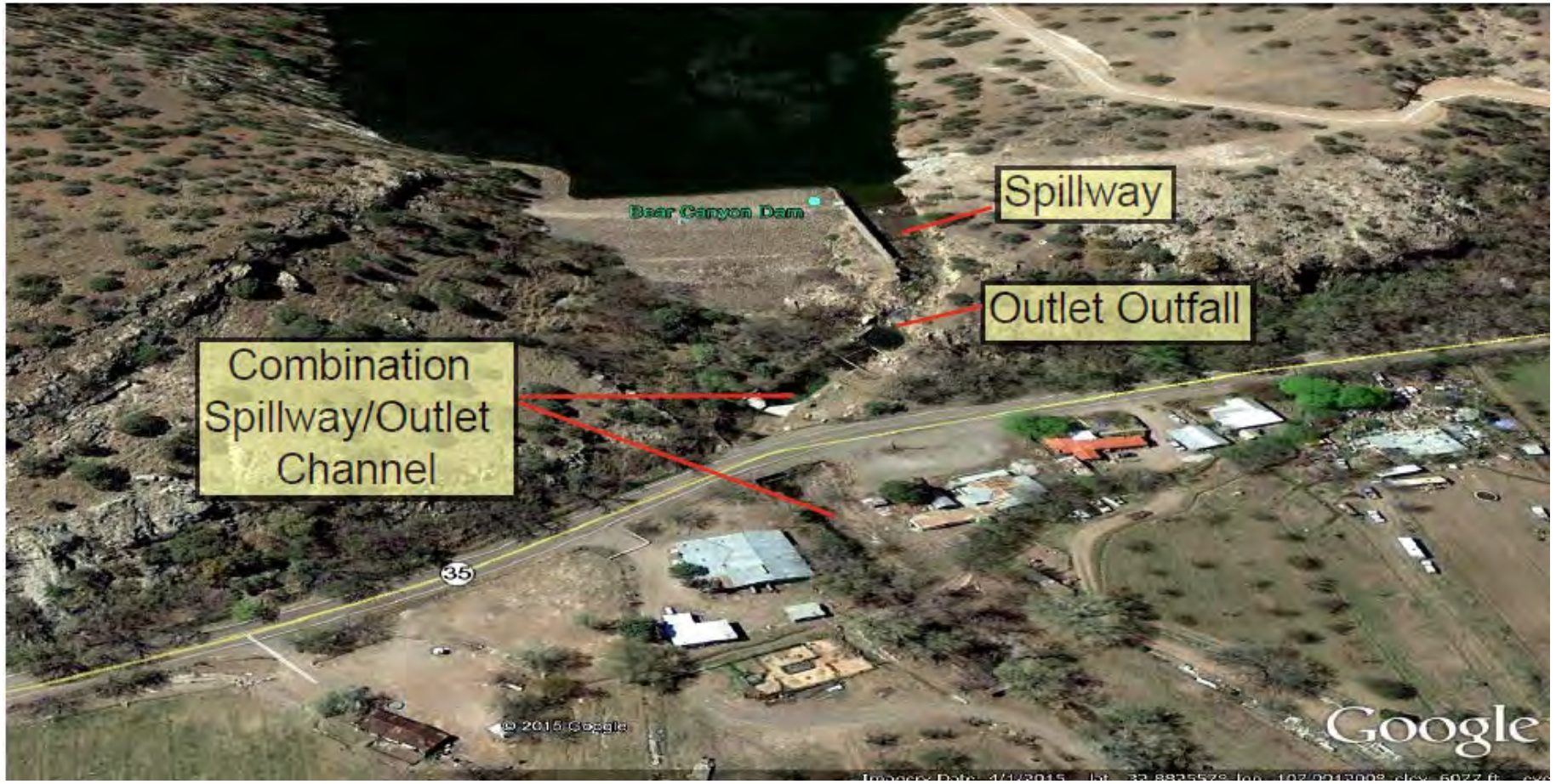


2025 - Trout Fire (near Silver City)

Bear Canyon Dam

Overtopping probability before Trout Fire – 0.03
(1 in 33 chances)

Height – 79 ft
Storage – 685 ac-ft
Watershed – 16 sq.mi.
100-yr flow – 8,100 cfs



2025 - Trout Fire (near Silver City)

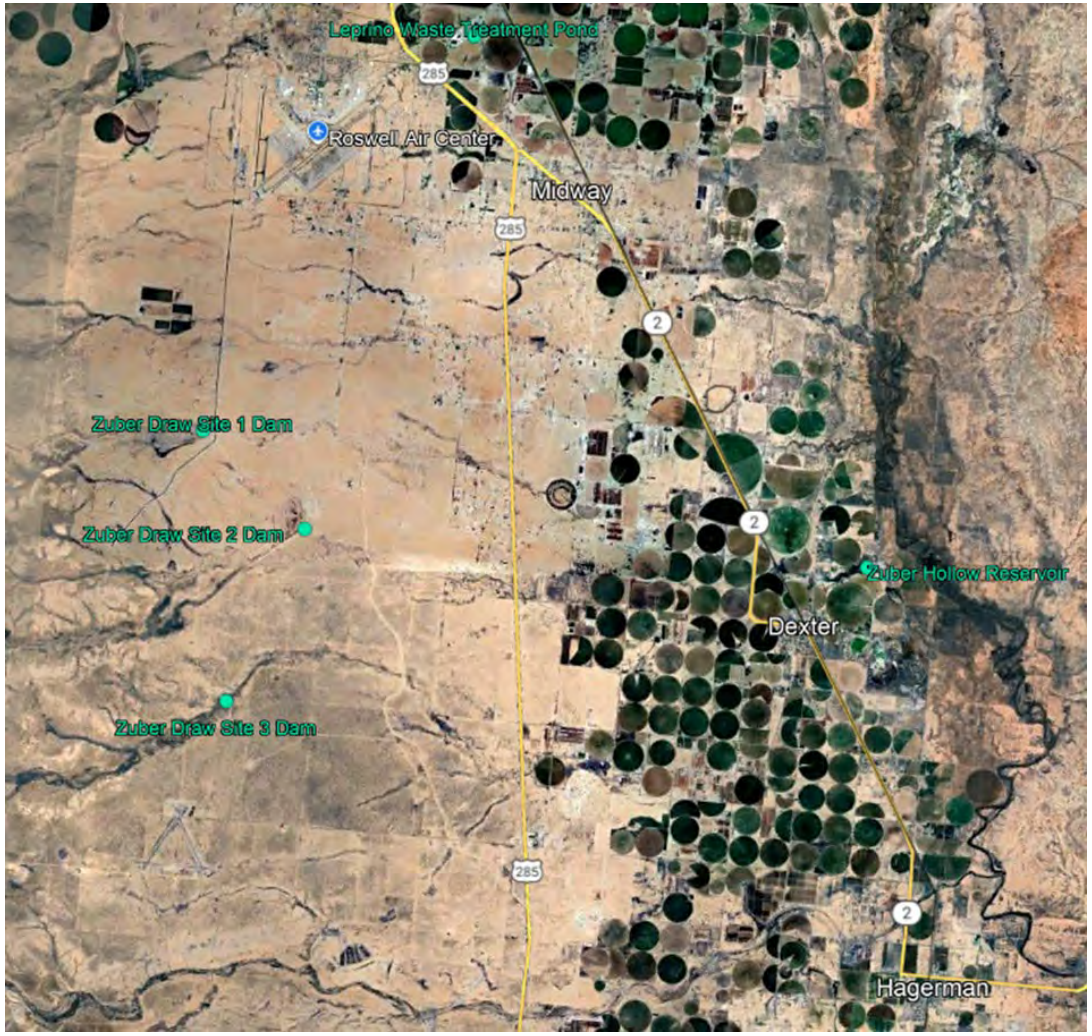
Lake Roberts Dam

Overtopping Probability before Trout Fire – 3.0E-7
(1 in 3 million chances)

Spillway Discharge –
12,000 cfs – 10-yr
21,000 cfs – 100-yr

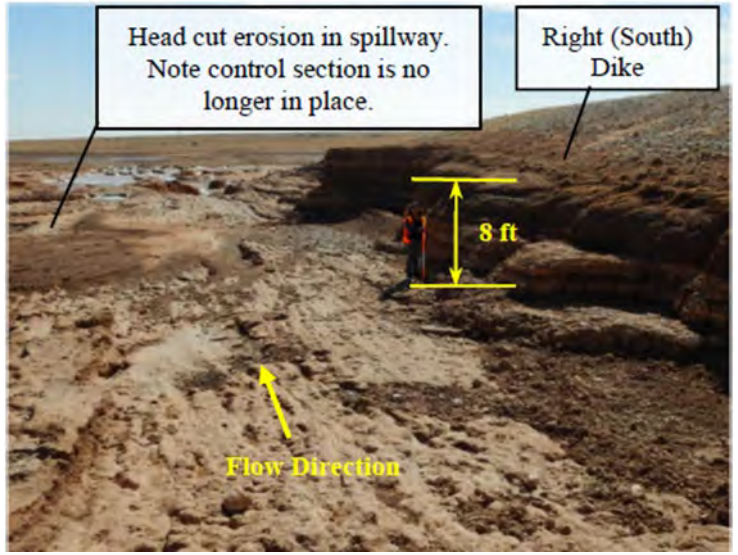
Height – 64 ft
Storage – 748 ac-ft
Watershed – 89 sq.mi.

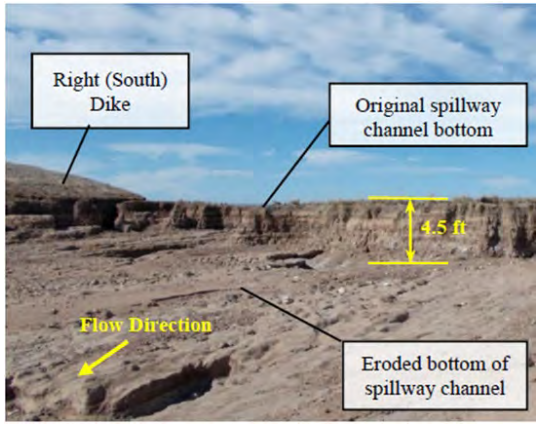
2024 – Roswell Flood Event in October



2024 – Roswell Flood Event in October

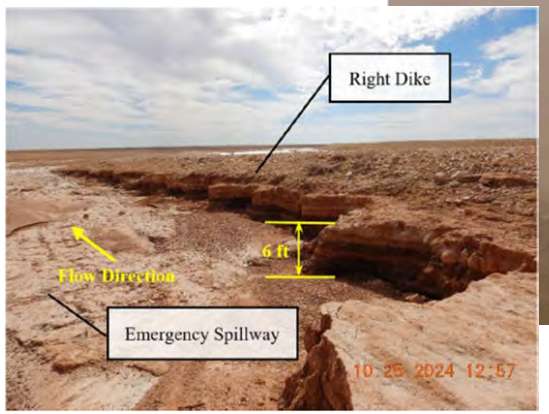
Zuber Draw Site 1
(13 Mile Draw) Dam



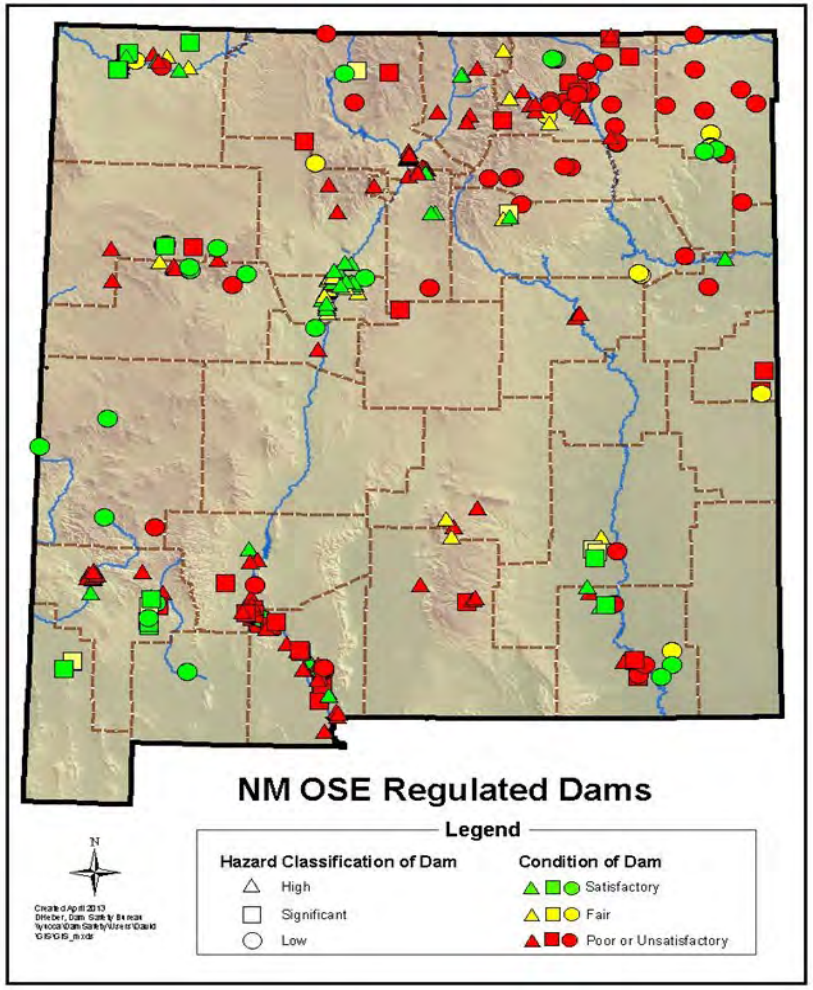


2024 – Roswell Flood Event in October

Zuber Draw Site 2
(Peters Lake) Dam



Dams in New Mexico



404 Jurisdictional Dams

291 in State Jurisdiction

	Table 3 – FY25 Condition Rating Summary for NM Jurisdictional Dams				
	Hazard Potential Classification	Condition Rating and Percentage w/Rating			
		Satisfactory	Fair	Poor*	Unsatisfactory
66%	High	40	28	116	3
	187dams	21%	15%	62%	2%
13%	Significant	8	4	24	1
	37 dams	22%	11%	65%	3%
21%	Low	13	8	38	2
	61 dams	21%	13%	62%	3%

Dams and Wildfire – Things to Consider

- Dams are designed for extreme flood but no specific consideration of wildfire
- Wildfire impacts are not uniform – many factors come into play (Other presentation will talk about this)
  - Run off increase by over 10 times over normal run off – 10 yr → 100 yr storm
  - Watershed characteristics, burn severity, watershed recovery
- Watershed recovery can take a long time (difficult to predict how long)

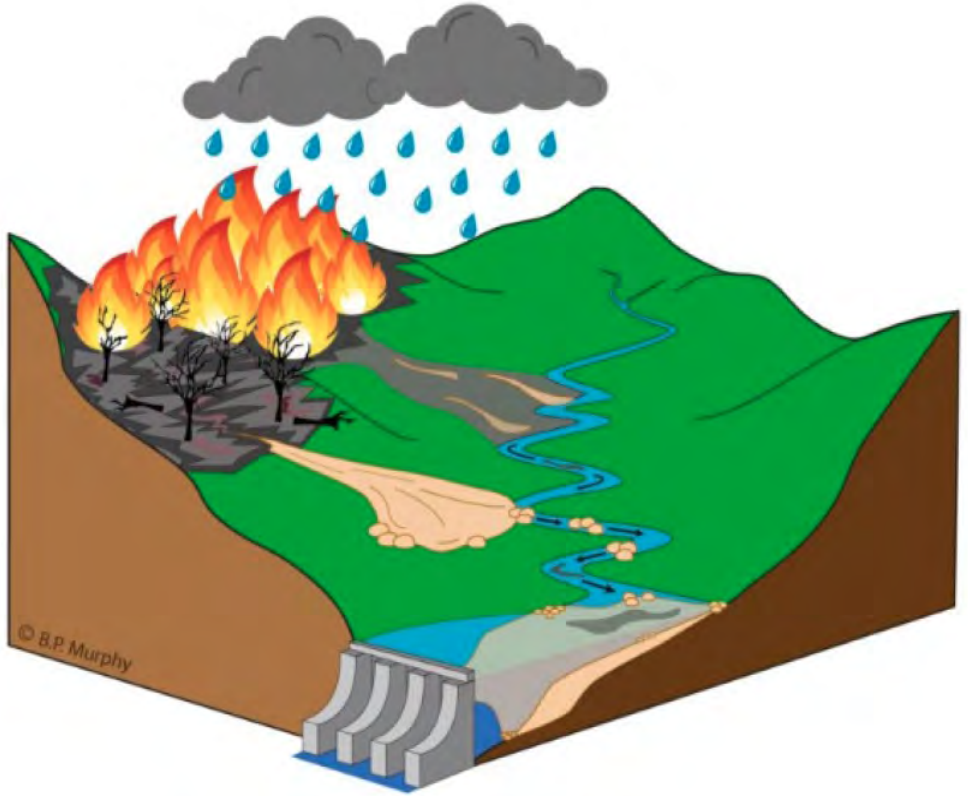


Image Source: Rae Ellen Bichelle / KUNC News.

Dams and Wildfire – Things to Consider

- Even small more frequent storms can have extensive impacts on dam performance and operation
  - Sediment, debris impacting reservoir capacity, gate operation, spillway activation, and even dam overtopping
  - Watershed characteristics change
- Average age of dams in NM is 65 years and 65% of the dams are in Poor or Unsatisfactory condition

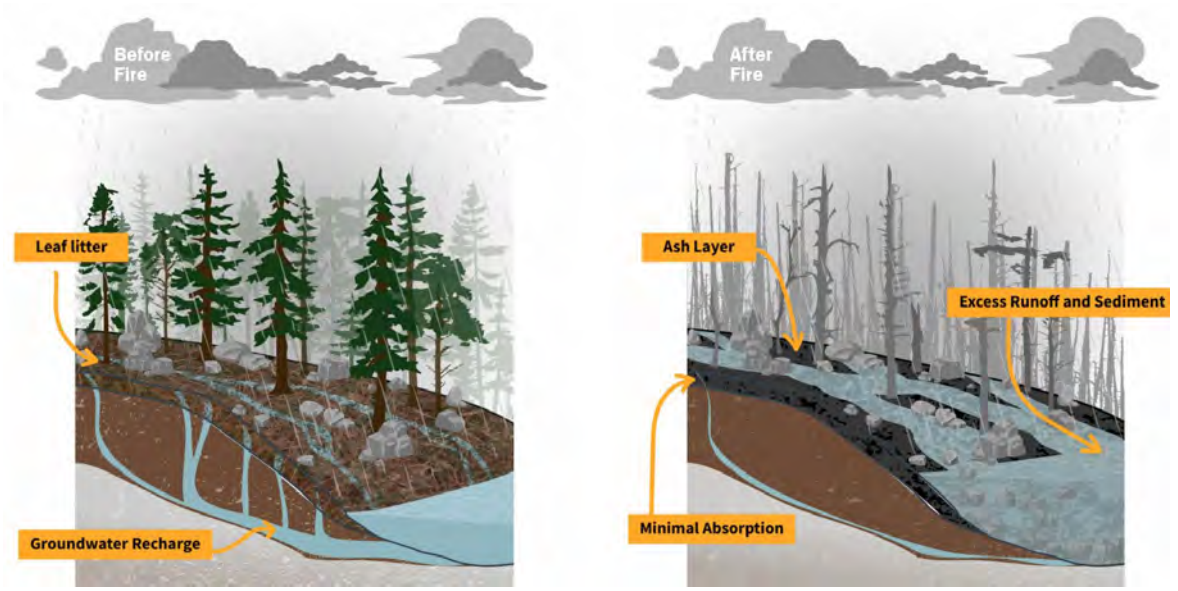


Image source: U.S. Geological Survey (USGS).

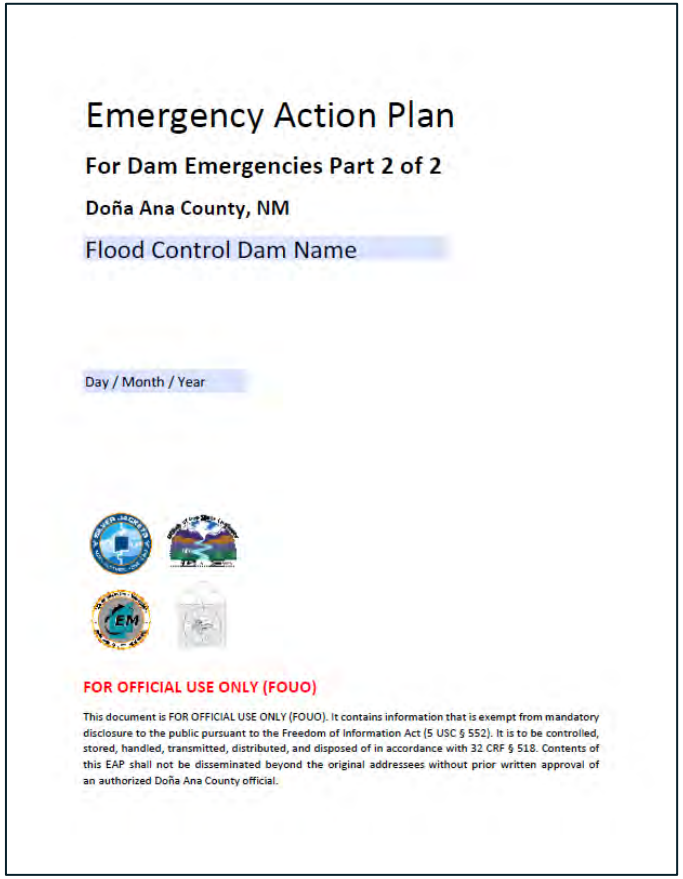
Disaster Mitigation Response

Depending on the Wildfire Impacts to Communities

- Disaster is declared by the State and Federal governments to release state and federal resources
- NMDHSEM leads the State Response and coordinates with other State and Federal Agencies
  - State agencies can include NMDOT, NMED, NMDOH, EMNRD, DFA, Dam Safety Bureau, and others
  - Federal agencies can include **USACE**, **NRCS**, National Weather Service, USDA, Forest Service, Fish &Wildlife, and so on
- USACE and NRCS play major role in flood mitigation – bring federal dollars with their assistance
  - A better coordination with state agencies such as the OSE is desired (work left behind lasts much longer that tends to create headache for state agencies later)

Preparedness for Flooding

- Difficult to predict wildfires, not in our control
- Preparedness for disasters is key, and it is in our control
  - Local/State Emergency Managers (EMs) and NMDHSEM lead the effort, prepare emergency response plans for all possible emergencies and disasters and exercise those plans routinely
  - Enables the local/state EMs to respond quickly and appropriately
  - For Potential Flood Disaster involving Dams, there is an Emergency Action Plans (EAP) for High and Significant Hazard Potential Dams. The local and state EMS, dam owners should have copies of the EAP.


Emergency Action Plan

For Dam Emergencies Part 2 of 2

Doña Ana County, NM

Flood Control Dam Name

Day / Month / Year

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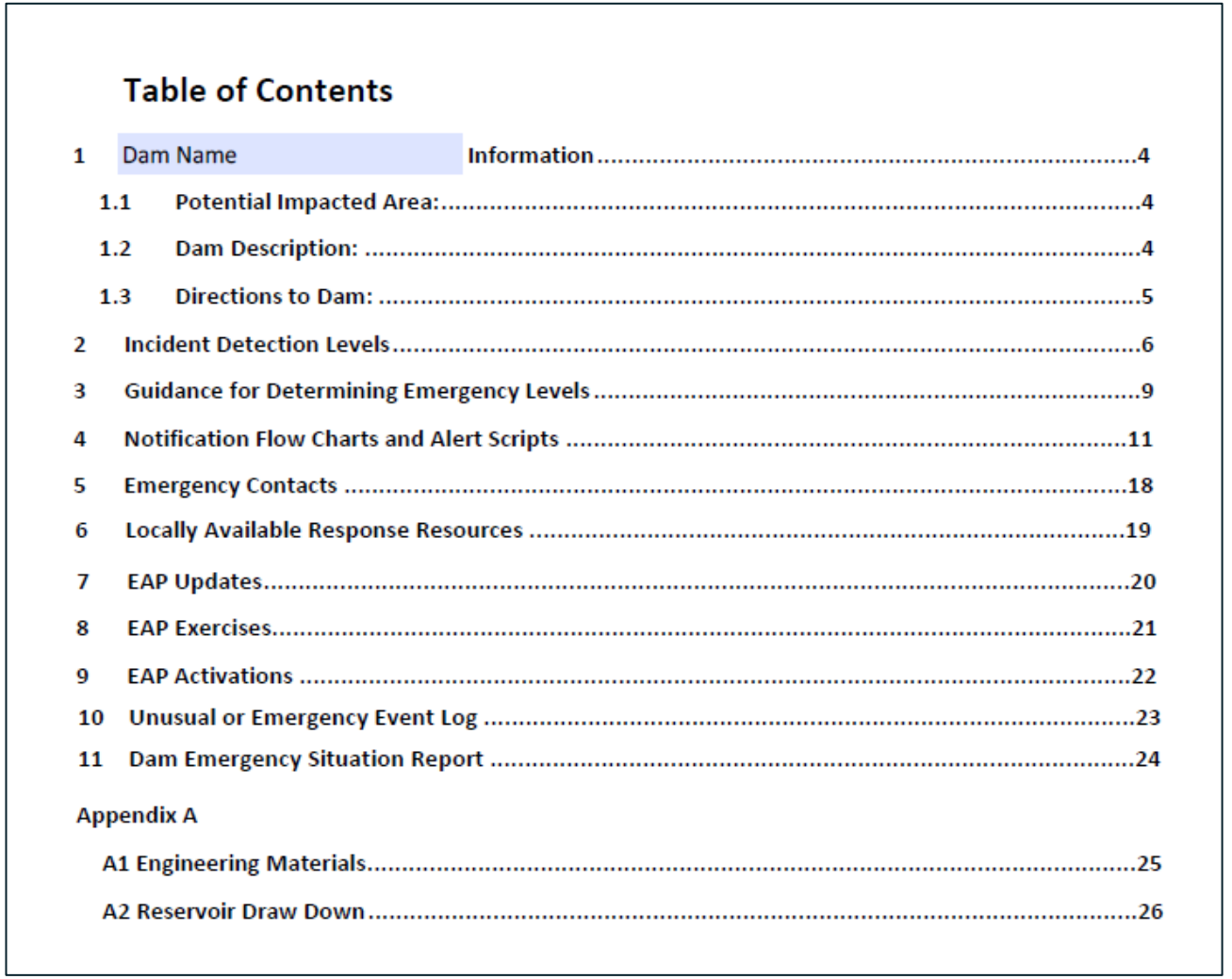
This document is FOR OFFICIAL USE ONLY (FOUO). It contains information that is exempt from mandatory disclosure to the public pursuant to the Freedom of Information Act (5 USC § 552). It is to be controlled, stored, handled, transmitted, distributed, and disposed of in accordance with 32 CRF § 518. Contents of this EAP shall not be disseminated beyond the original addressees without prior written approval of an authorized Doña Ana County official.

EAP Required by State Regulations: 19.25.12 NMAC.

Elements of an Emergency Action Plan (EAP)

- Owners are required to develop and maintain EAP for High & Significant Hazard Dams.
- EAP is the document for responding to emergencies involving dams
  - Determine level of emergency
  - Monitoring/Mitigation measures
  - Notification to stakeholders/EMs
  - Inundation/Evacuation Maps



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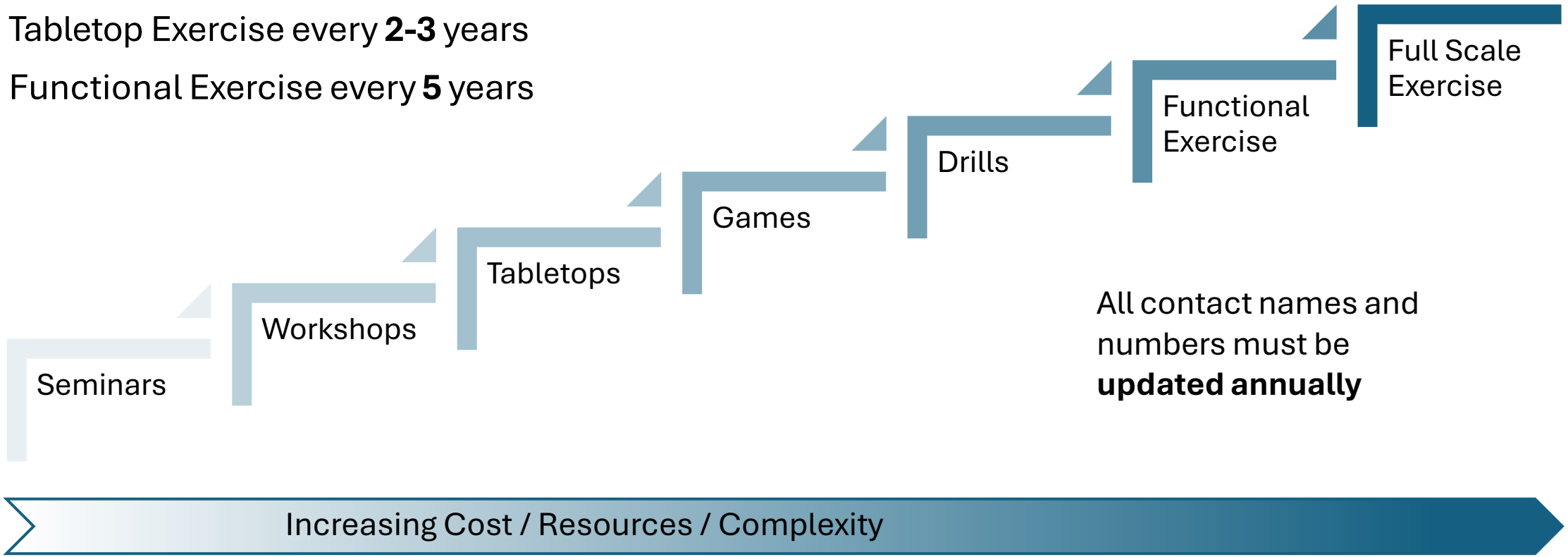
Exercising / Updating EAP

OSE Dam Safety Rules and Regulations recommend:

- Tabletop Exercise every **2-3** years
- Functional Exercise every **5** years



All contact names and numbers must be **updated annually**

Source: Gannett Fleming (Alicia Baehr)

Steps to take Post-Fire?

Impacts to Populations Below Dams

Water Quality Degradation

- Ash, fire suppressant chemicals, and heavy metals from burn scars can contaminate reservoirs and drinking water supplies.

Debris & Mudslides

- Form when rain falls on a burn scar; transporting large amounts of ash, rock, boulders, and burned trees.

Increased Flood Risk & Severity

- Loss of vegetation and hydrophobic soils increase flash flood severity.

Damage to Infrastructure

- Floodwaters and debris flows can damage roads, homes, culverts, bridges, and dams while sediment buildup in reservoirs reduces capacity and flood control effectiveness.

Risk Reduction Steps

Inundation Mapping

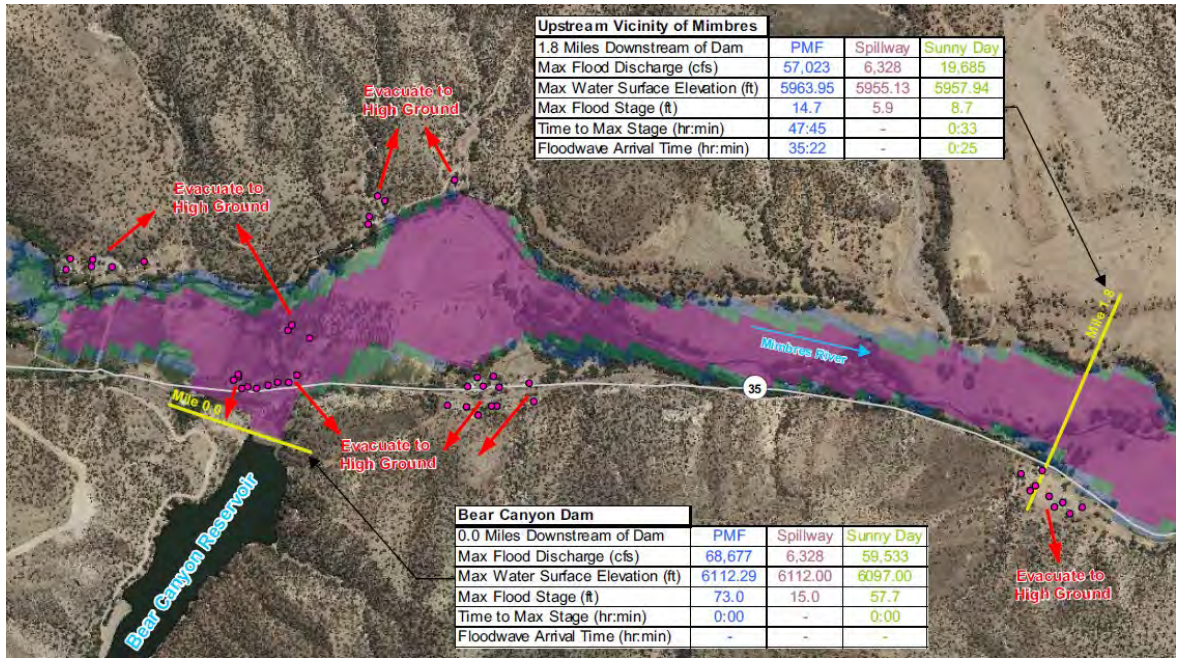
- Review and update EAPs if necessary to account for new conditions.

Emergency Materials

- Stockpiling of materials to reduce immediate impacts.
- Verifying/Readying Suppliers/Service providers

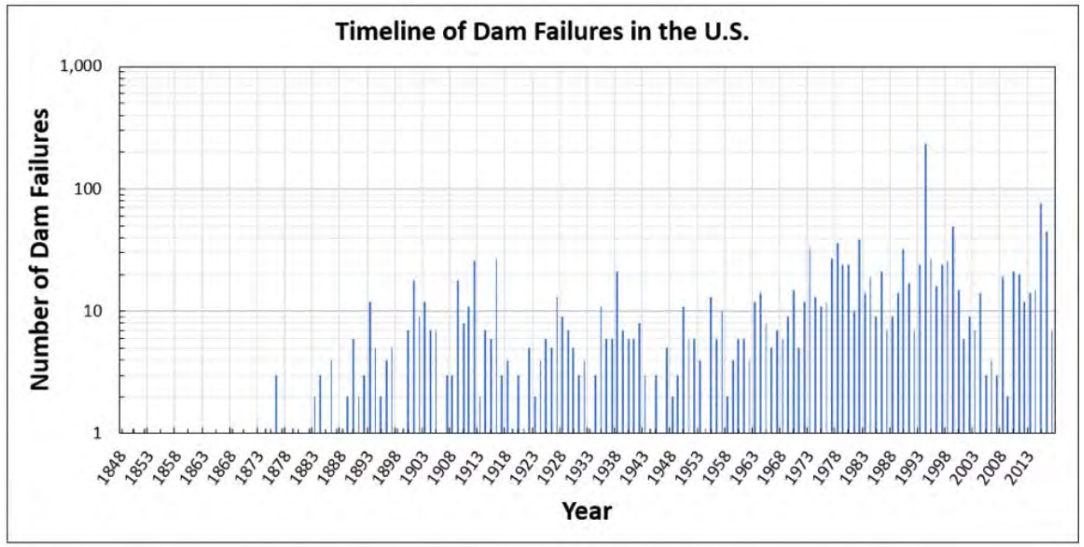
Collaboration

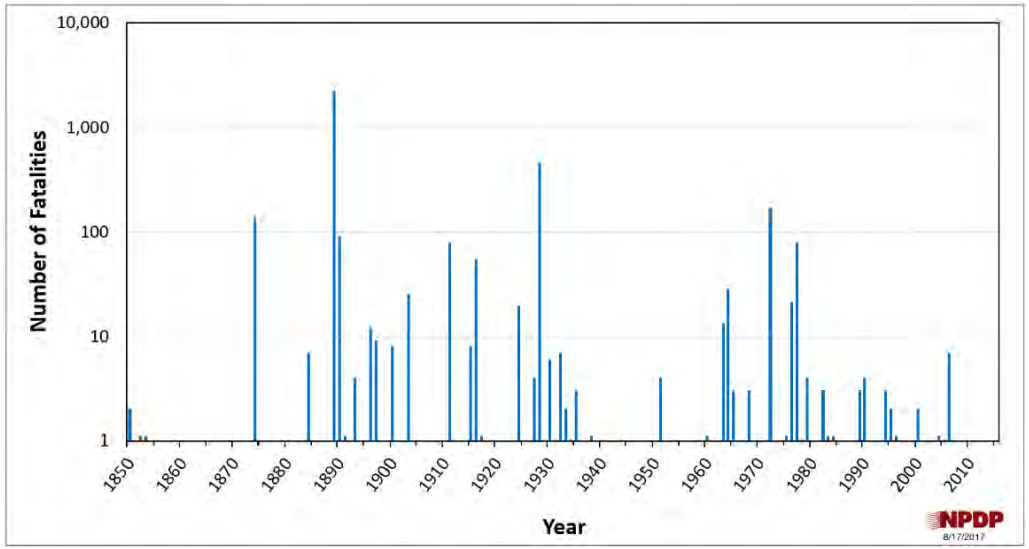
- Notifying/collaborating responses with local EMs, State agencies -DHSEM, Dam Safety Bureau, and others
- Exercise EAP
- Review/update EAP/contacts
- Activate EAP if warranted



Life Safety is Paramount!

Dam Failures and Life Loss





Objective is to Prevent any Life Loss even if dam failure cannot be prevented

Credit: National Performance of Dams Program @ Stanford University

Contact Information:

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Chief, Dam Safety Bureau

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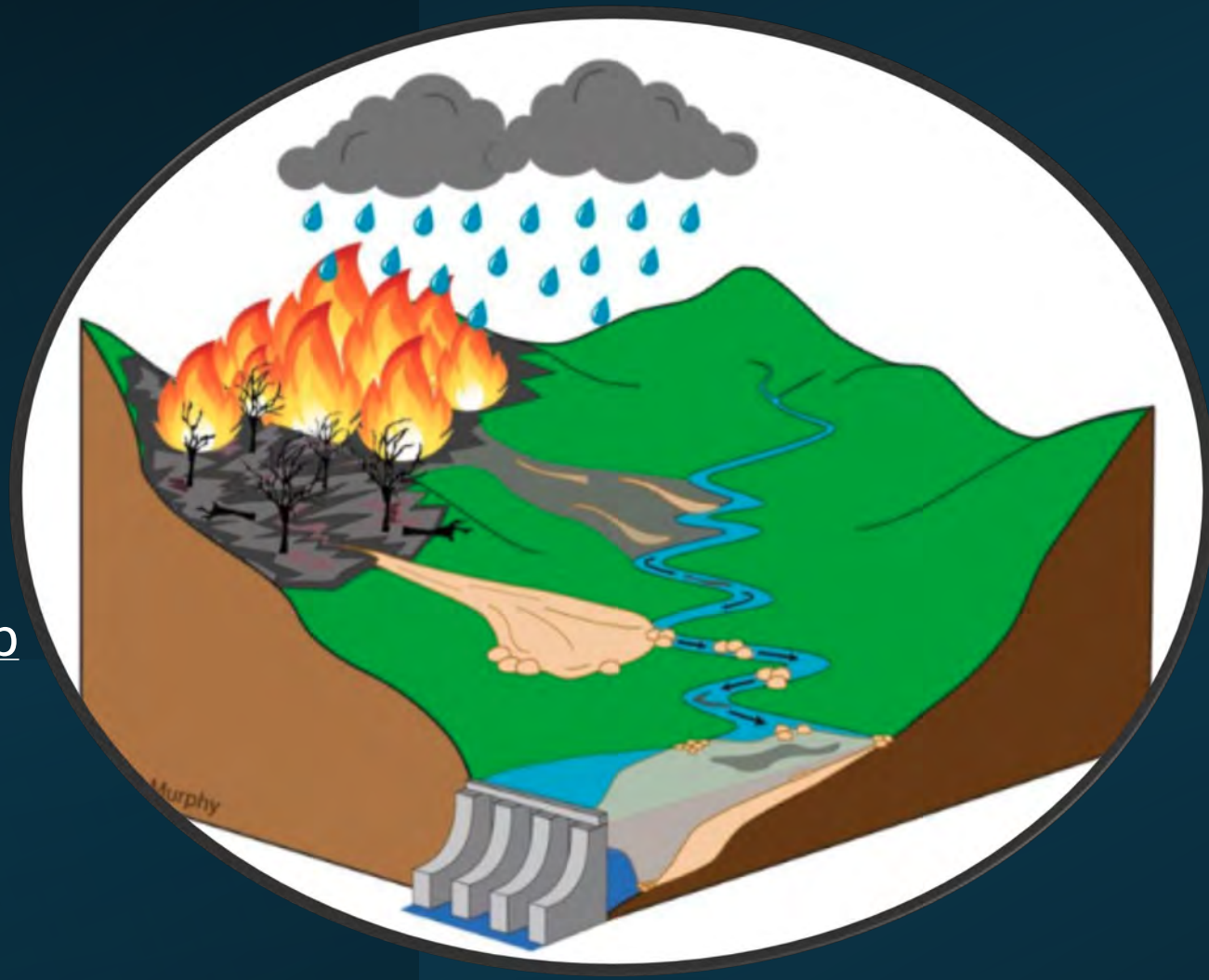
Email: Sushil.Chaudhary@ose.nm.gov

Additional Information Available from the OSE Website:

https://www.ose.nm.gov/dams/index.php



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