WATER RESOURCES COMMISSION

JULY 30, 2014

Public Works & Water Resources

Christopher P. Knotts, P.E.
Chief, Public Works & Water Resources

Public Works & Water Resources

- Statewide Flood Control Program
- Federal Projects (Non-coastal)
- Reservoir Priority & Development Program
- Dam Safety Program
- Levee Safety Program (Non-coastal)
- National Flood Insurance Program
- Hydraulics (Roads and Bridges)

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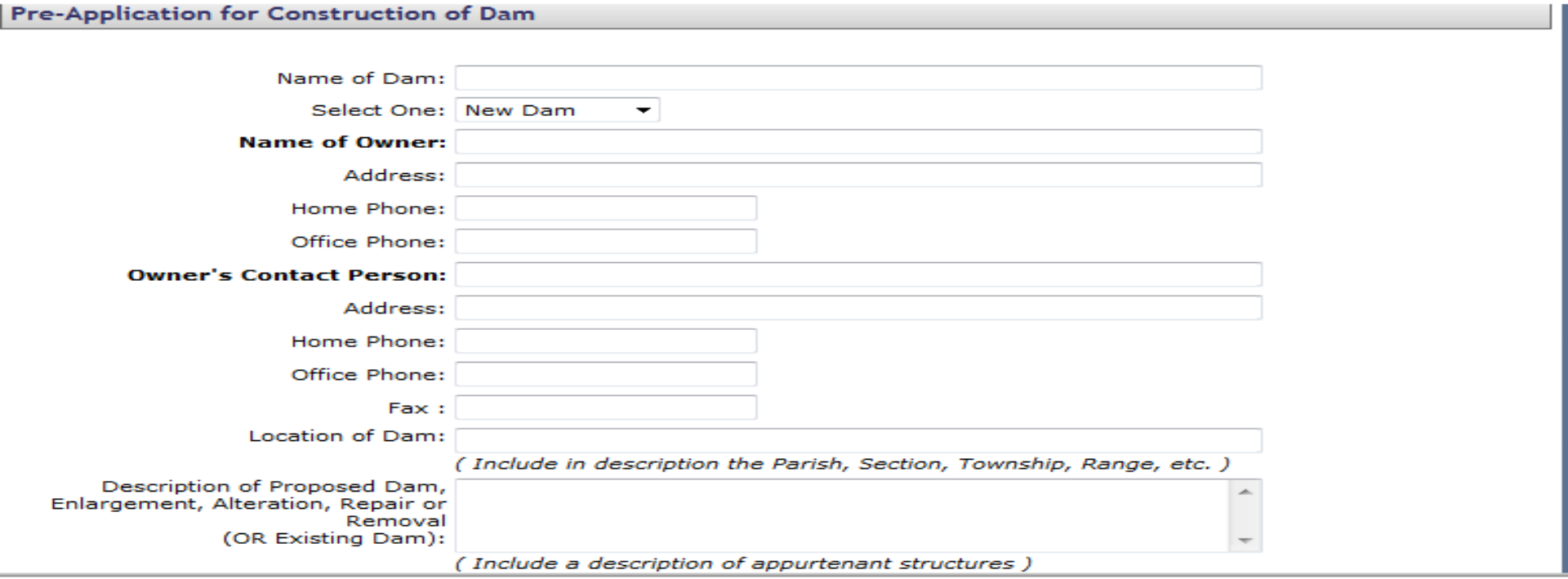
Dam Safety Program

Public Works and Water Resources

New Dam Construction

www.dotd.la.gov/intermodal/dams/preapplication.aspx



Pre-Application for Construction of Dam

Name of Dam:

Select One: New Dam

Name of Owner:

Address:

Home Phone:

Office Phone:

Owner's Contact Person:

Address:

Home Phone:

Office Phone:

Fax :

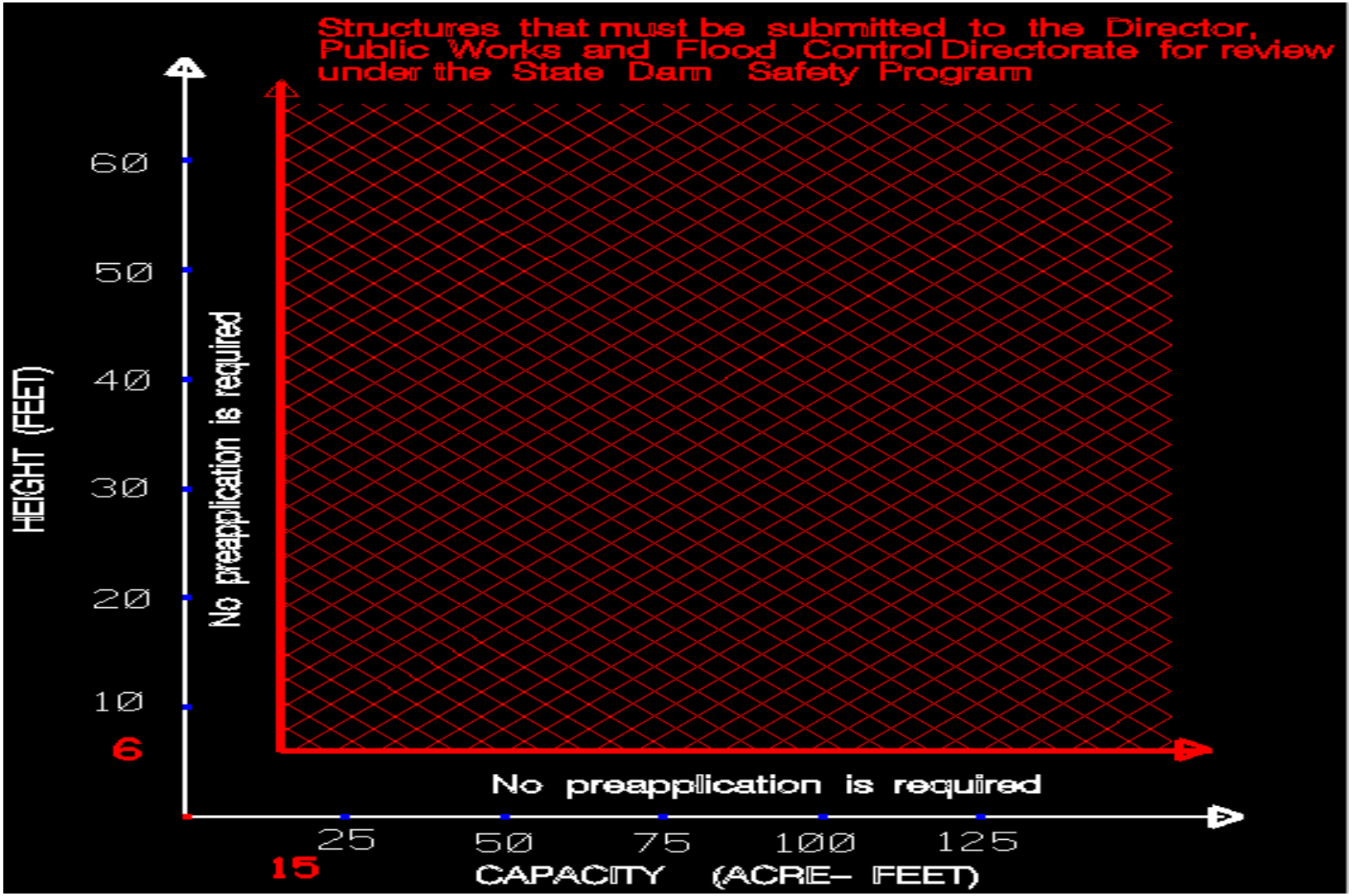
Location of Dam:

(Include in description the Parish, Section, Township, Range, etc.)

Description of Proposed Dam, Enlargement, Alteration, Repair or Removal (OR Existing Dam):

(Include a description of appurtenant structures)

New Dam Construction



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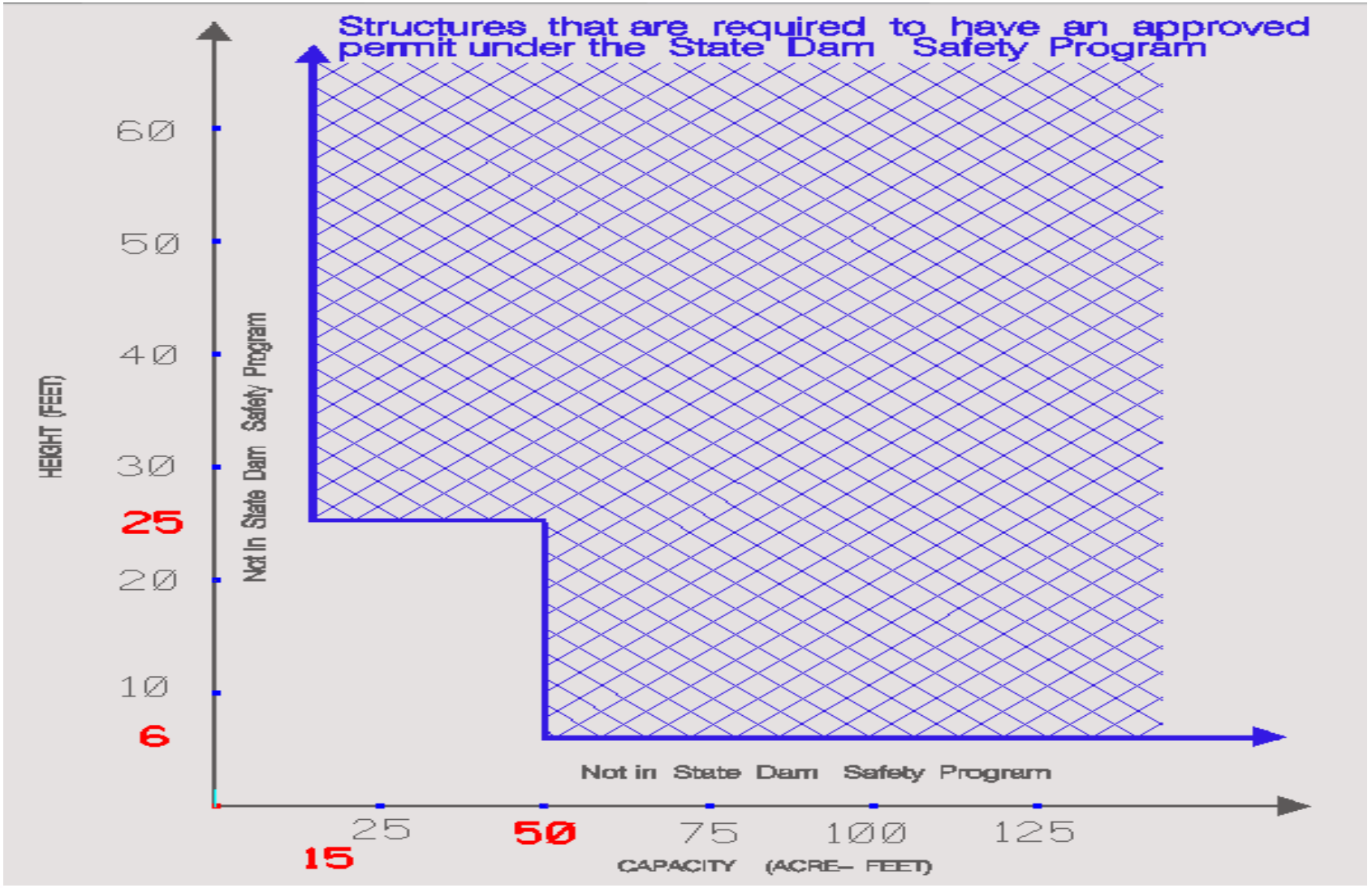
New Dam Construction



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New Dam Construction

- Applicant sends a copy of the pre-application to the USACE who distributes copies to appropriate federal, state, and local agencies for review and comment.

- Applicant then receives approval / denial from USACE.

- Applicant submits copies of LONO from the various agencies and Corps' permit to DOTD Dam Safety Unit.

New Dam Construction

- DOTD conducts public hearing in the parish where the dam will be located
- Applicant or their representative is required to attend hearing
- Hazard Classification is determined by evaluation of the probable maximum impacts of a dam breach
- Owner responsible establishment of Hazard Class, but all dams are considered High Hazard until proven otherwise
- DOTD has authority to reject the Hazard Class determination

Dam Safety Program

- Program was created by Act 733 of the 1981 Regular Legislative Session (R.S. 38:21-28)

- Responsibilities are to:
  - Define & Enforce Minimum Standards
  - Maintain the State Dam Safety Inventory

Dam Safety Program

- Applicable to dam or impoundment structures:
  - any artificial barrier which will impound or divert water or any liquid and which is
    - 25+ feet height
    - has a maximum storage of 15 acre-feet or greater

    OR

    - 6 feet in height
    - has a maximum storage of 50 acre-feet or greater

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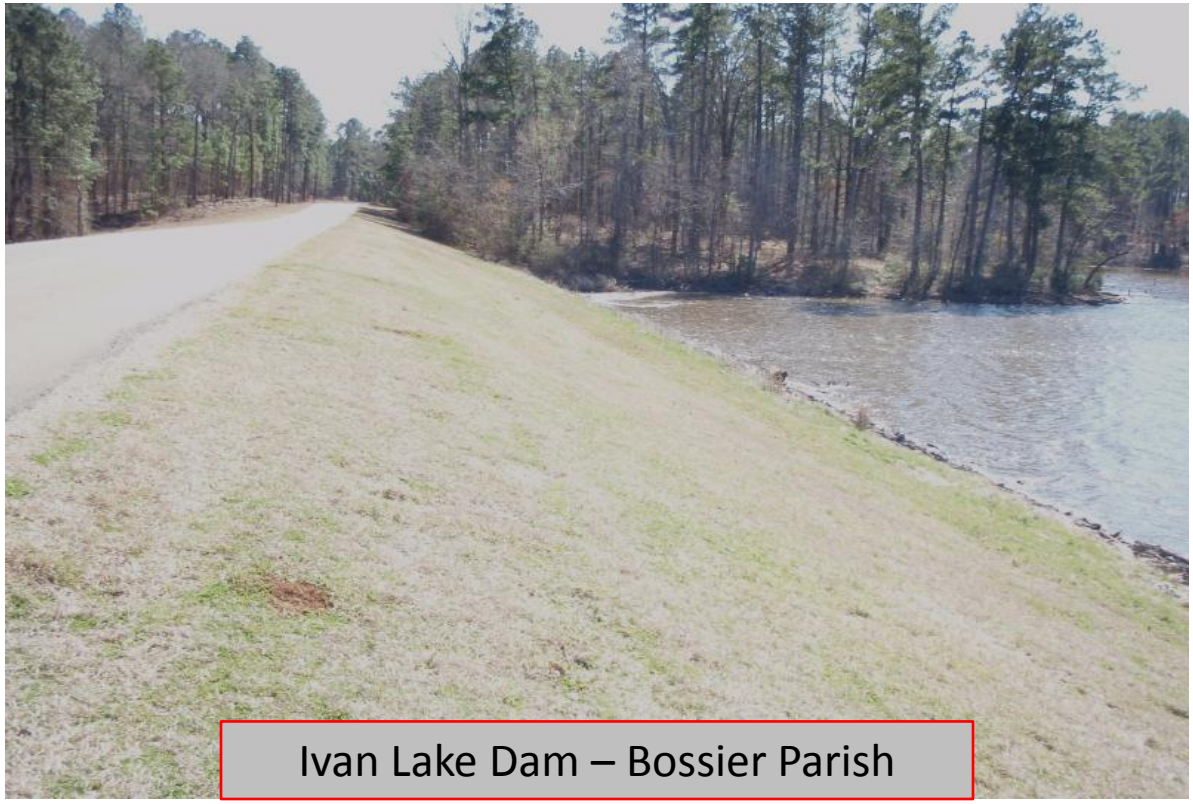
Dam Safety Program

Defines minimum standards for:

- Design
- Construction
- Modification
- Operation & Maintenance



Ivan Lake Dam – Bossier Parish

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Dam Safety Program

Operation & Maintenance

- Acoustic Surveys
- Underwater Inspections
- Operation of Gates
- Emergency Action Plans

Grand Bayou Reservoir – Red River Parish

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Dam Safety Inventory

547 Regulated Dams

(As of February 21, 2014)

- 45 High Impact
- 58 Significant Impact
- 444 Low Impact

Vernon Lake Dam – Vernon Parish

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Dam Inspection Process

- High and Significant Impact Dams are inspected annually
- Low Impact Dams are inspected every 5 years
- 150 - 175 Dams are inspected annually
- Inspections include:

1. Planning and Scheduling
2. Field Inspection
3. Post-Inspection Activities and Report Preparation

Dam Inspection Process

Planning and Scheduling

- Group inspections by geography and required frequency
- Contact dam owners and other stakeholders to coordinate the inspection visit
- Send out notification/confirmation letters

Dam Inspection Process

Field Inspection

- Verify location and dimensions of all components (embankment, weir, gates, spillway, etc.)
- Document any safety deficiencies
- Collect additional information from the dam owner and others
- Collect information downstream of the dam for development of inundation maps and Emergency Action Plans (EAP)

Dam Inspection Process

Post-Inspection Activities

- Prepare Inspection Report and document deficiencies
- Determine if immediate action is required
- Distribute the Report and deficiencies to the owner and other stakeholders
- Prepare breach analysis, inundation map, EAP, and verify the Hazard Class
- Distribute the EAPs to owner and other stakeholders.
- Follow-up with the owner on the required actions identified in the report and the deficiency letters
- Provide dam owner with informational/educational brochures and additional guidance as required. Enforcement action if necessary.

DOTD Maintained Dams

- As statutorily mandated, DOTD maintains 20 dams.
- Many are over 40 to 50 years old and have been poorly maintained due to lack of funds.
- A few are in critical need of repair:
  - ✧ Lake Bistineau (Bossier, Red River and Bienville Parishes)
  - ✧ Smithport Lake Dam (De Soto Parish)
  - ✧ Cheneire Brake Dam (Ouachita Parish)

Some Good News

Cheneire Brake recently began E&D Phase

Thanks to State Capital Outlay funds and the Bayou D'Arbonne Lake Commission, the existing spillway was recently repaired. Also, a new Auxiliary Spillway with 2- 40' Tainter Gates was completed in early 2014.

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Lake D'Arbonne Spillway

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Lake D’Arbonne Spillway Tainter Gates

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Lake D'Arbonne Spillway Tainter Gates

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Consequences Of Dam Failure

- U.S. dam failures in the past 30 years are fairly rare, but…
  - ✧over **135 fatalities**
  - ✧more than **$2.6 billion in property damage**

- Fairly recent failures include:
  - ✧Big Bay Lake, Mississippi (2004)
  - ✧Hadlock Dam, New York (2005)
  - ✧Taum Sauk, Missouri (2005)
  - ✧Lake Needwood, Maryland (2006)
  - ✧Lake Delhi, Iowa (2010)
  - ✧St. Mary's Lake, Maryland (2011)
  - ✧Percy Quinn Lake, Mississippi (2012)

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Percy Quinn Lake

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Big Bay Lake

Lumberton, MS

- Located 17 mi. SW of Hattiesburg, MS and 32 mi. NNW of Bogalusa, LA
- Dam approx. 1800 ft. long and 55 ft. high
- Lake approx. 1000 acres (42 ft. deep at the dam)
- By all accounts dam was well maintained
- Minor seepage along alignment and in spillway conduit
- Periodic inspections by an engineer
- Daily observations by maintenance staff

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Chronology of the Big Bay Lake Dam Failure

- Thursday, March 11, 2004

Afternoon: Maintenance staff notice new seepage near the spillway conduit and notified the owner's engineer. Engineer found a new small boil and advised it be observed overnight

- Friday, March 12, 2004

Morning: Engineer returns and notices that flow from new boil was clear. He left the site to call a contractor. He was called back by maintenance staff because the seepage was rapidly increasing.

12:00 PM Pencil diameter stream developed flowing from the boil

12:30 PM Diameter of stream flow had grown to 4 ft.

12:40 PM NWS issues a Flash Flood Warning to two downstream communities per the EAP

12:40 PM COMPLETE DAM BREACH!


Breach was 385’ wide
Approximately 230,000 CY of material lost
2004 3 16

Entire lake drained in 90 minutes


Flow path was 17 miles long, but EAP only covered 3 miles.
2004 3 16

Thank You!

Contact Info:

Christopher P. Knotts, P.E.
DOTD Public Works & Water Resources
P. O. Box 94245
Baton Rouge, LA 70804-9245

chris.knotts@la.gov
225-379-3015

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