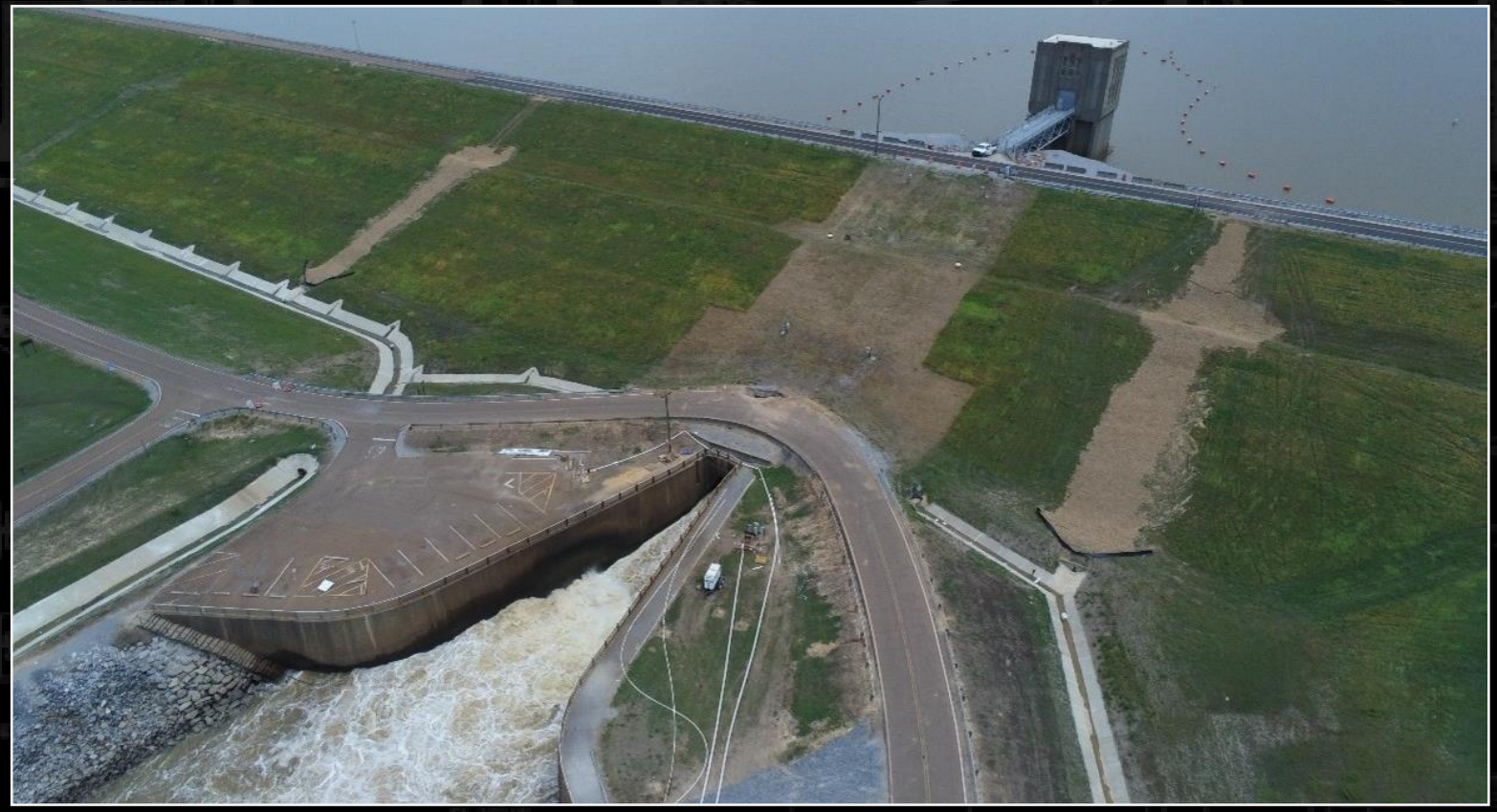
Arkabutla Dam Repair Project Update

Mississippi House Ways and Means Committee

U.S. Army Corps of Engineers
Vicksburg District

23 September 2025



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Presentation Topics:

1. Project History and Overview
2. 2023 Arkabutla Dam Safety Emergency
3. Interim Risk Reduction Measures
4. Long Term Repairs

Project History and Overview

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The 1927 Mississippi River Flood

- The headwaters of the Yazoo River played a substantial role in the Great Mississippi Flood of 1927
- The most destructive river flood in the history of the U.S.
  - Over 500 dead
  - $1 billion in economic losses
- Resulted in construction of four reservoirs as the Yazoo Headwater Project:
  1. Arkabutla
  2. Sardis
  3. Enid
  4. Grenada

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Yazoo Basin Drainage Map

Following the Great Flood of 1927, over the next three decades, the U.S. Army Corps of Engineers constructed a system of dams and levees to reduce flood risk along the Mississippi River and Tributaries.

Dam	Construction Dates
Sardis Lake	1936 - 1940
Arkabutla Dam	1940 - 1943
Enid Lake	1947 - 1952
Grenada Lake	1947 - 1954

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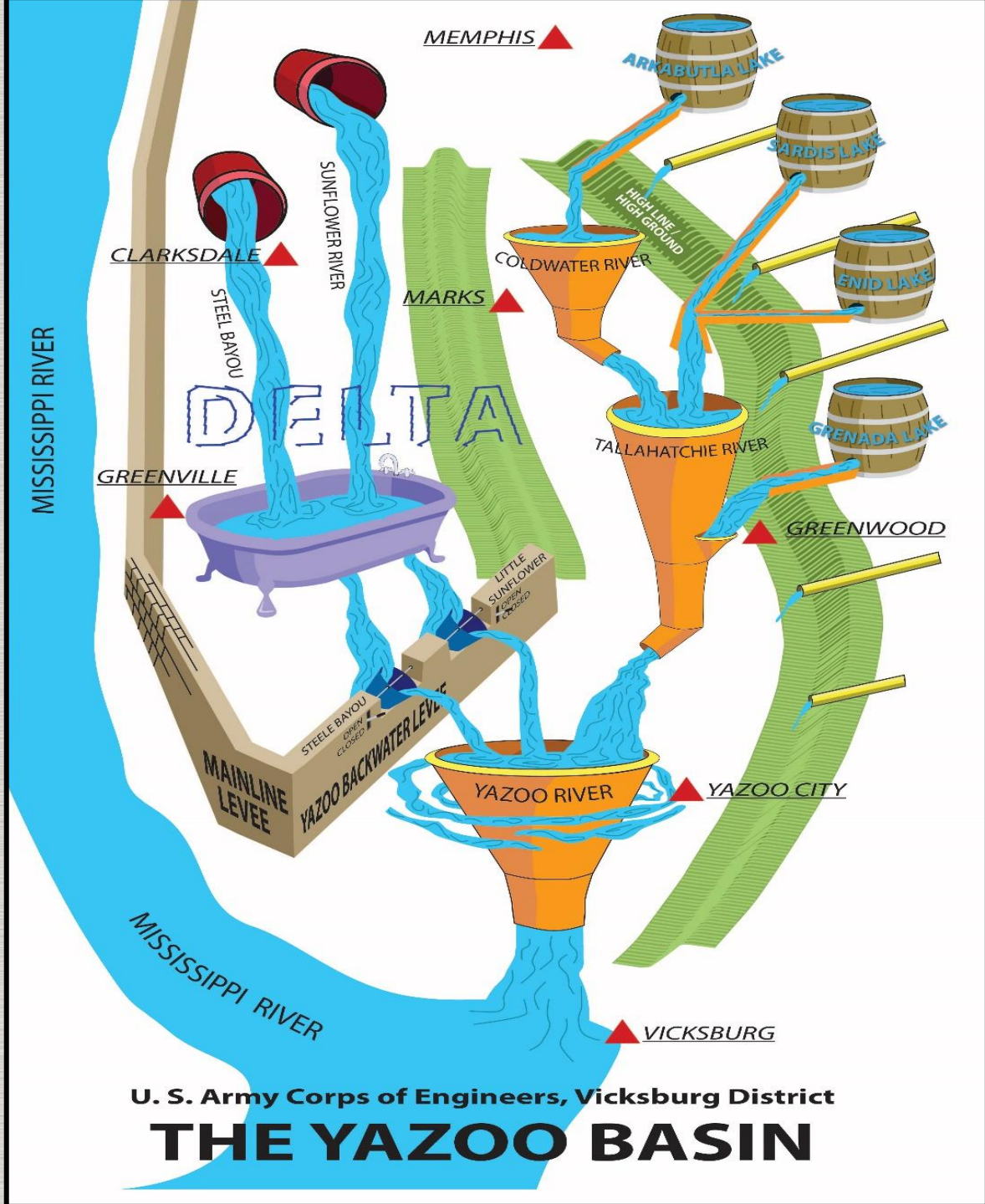
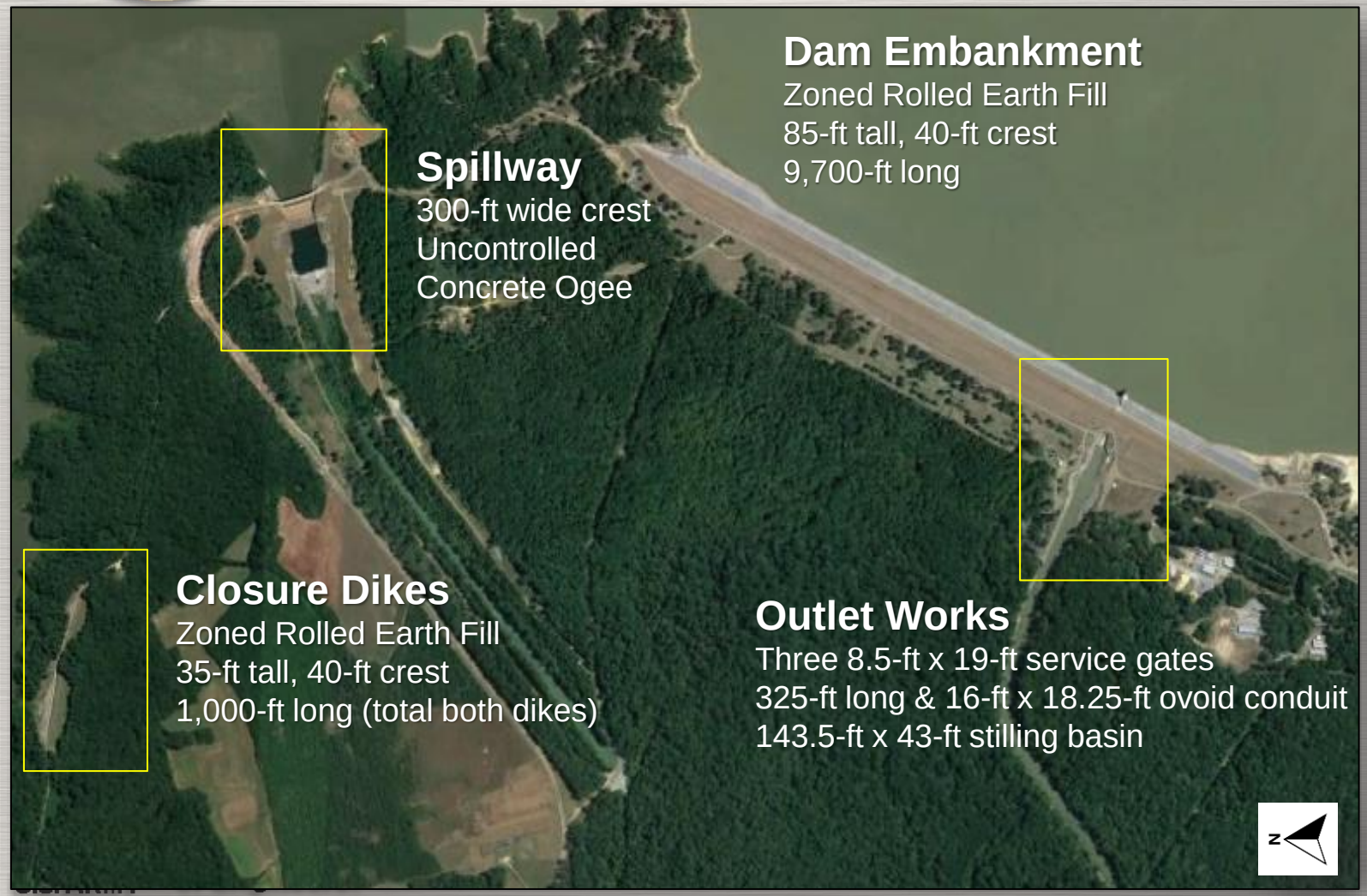


Arkabutla Dam Overview



Authorized by:

- Flood Control Act of 1928 amended in 1936 and 1938

Designated for flood control under:

- Flood Control Mississippi River and Tributaries Act of 1939

Other Project Purposes:

- Recreation

Outlet Works - Max Water Capacity:

- 10,000 cubic ft. per second

Spillway - Max Water Overflow Capacity:

- 90,000 cubic ft. per second

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2023 Arkabutla Dam Safety Emergency

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May 2023: Sinkhole Discovery

After discovery of a sinkhole, we began testing to find where the soil was going:

- Inspected nearby utilities and joints in dam's outlet. Everything was intact and in good condition.
- Poured 500 gallons of water into the sinkhole. It drained quickly, but we couldn’t find the exit.
- The next day, poured 1,000 gallons of water with red dye to help track the flow, but still didn’t see the dye show up downstream.

This told us water was leaking into spaces beneath the dam, likely eroding the soil inside it—an early warning sign of internal instability.

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May 2023: Outlet Works Inspection

- We drained the stilling basin to look for possible clues.
- As it emptied, we saw sand, silt, and decayed plant material flowing out.
- Clear evidence water was carrying soil from within the dam (possibly all the way back to the lake) into the outlet.

The dam's foundation was being washed out from the inside—a serious issue that needed immediate action.

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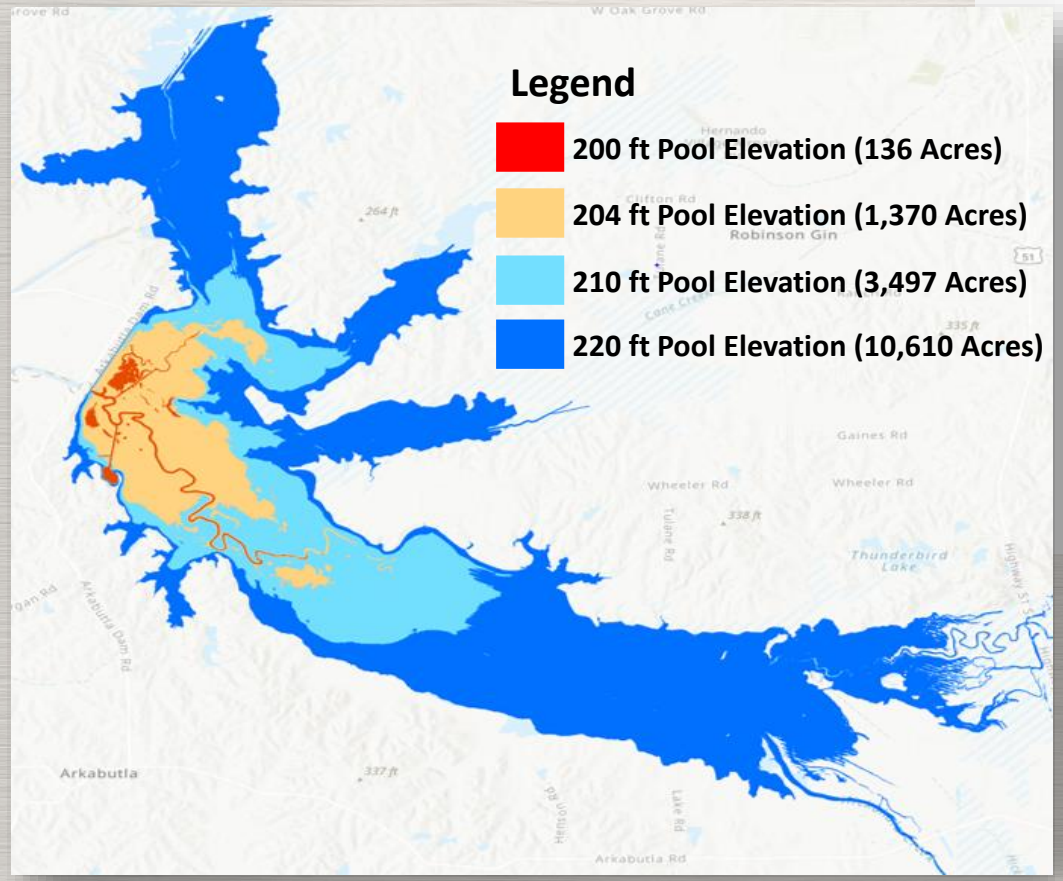
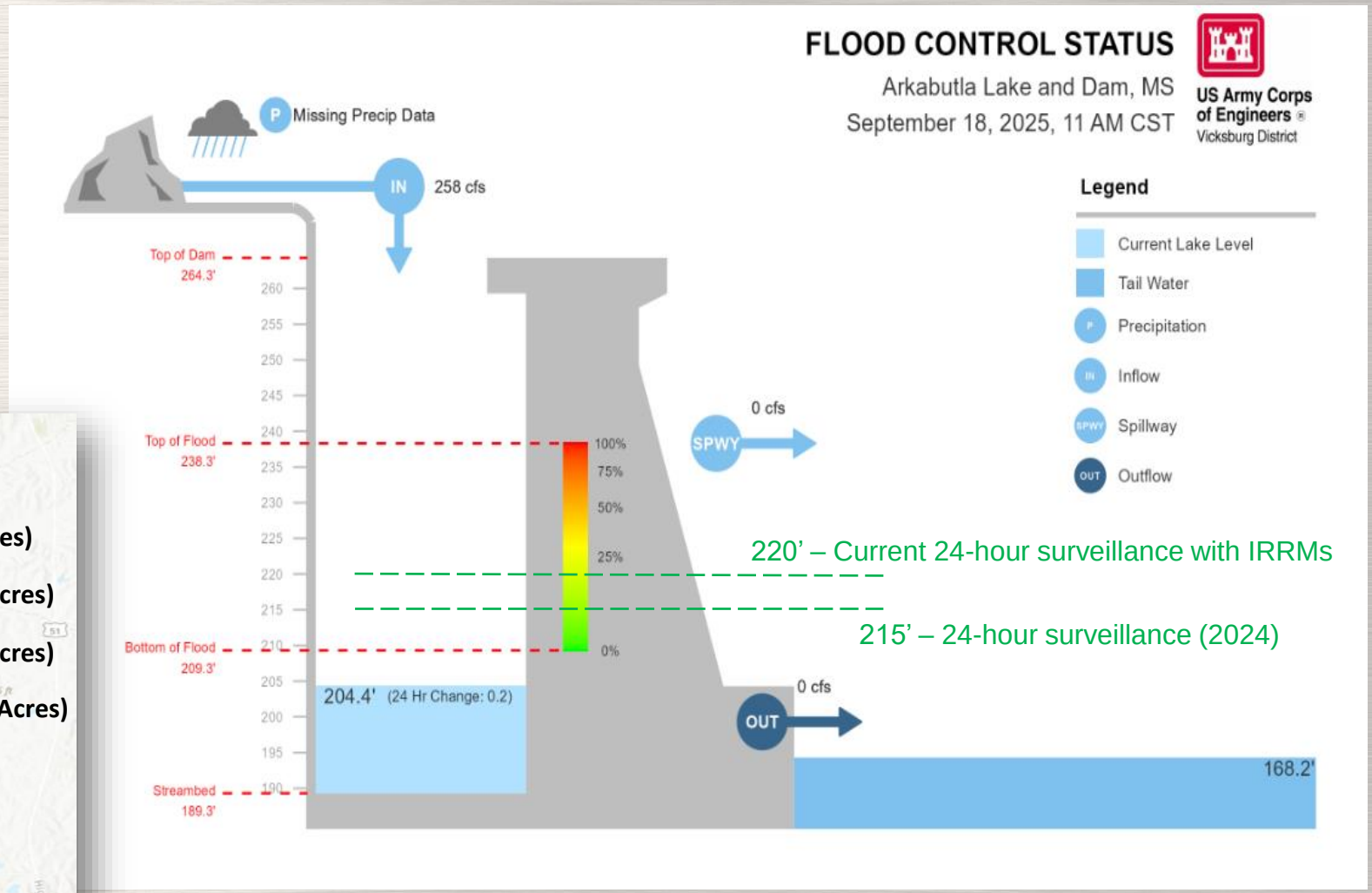
Managing Lake Levels





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Arkabutla Dam Flyover

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Video taken on 07 August 2025. Water Elevation ~ 205.4’

Interim Risk Reduction Measures

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Dam Safety Incident and Response

Interim Risk Reduction Measures (2023-2024):

- Installed 6 relief wells and gravity laterals
- Plugged underslab drainage system
- Installed new piezometers
- Automated existing piezometers
- Implemented a pool restriction (Elevation level 204’ summer and Elevation level 200’ winter)

Interim Risk Reduction Measures (2025-2026):

- Conduit and stilling basin grouting
- Permanent underslab drainage system abandonment

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Emergency Preparedness

- Routine update of the dam's Emergency Action Plan.
- Annual Tabletop Exercise with State and Local Emergency Managers.
- Most recent Tabletop Exercise held on July 23, 2025, in Batesville, MS.

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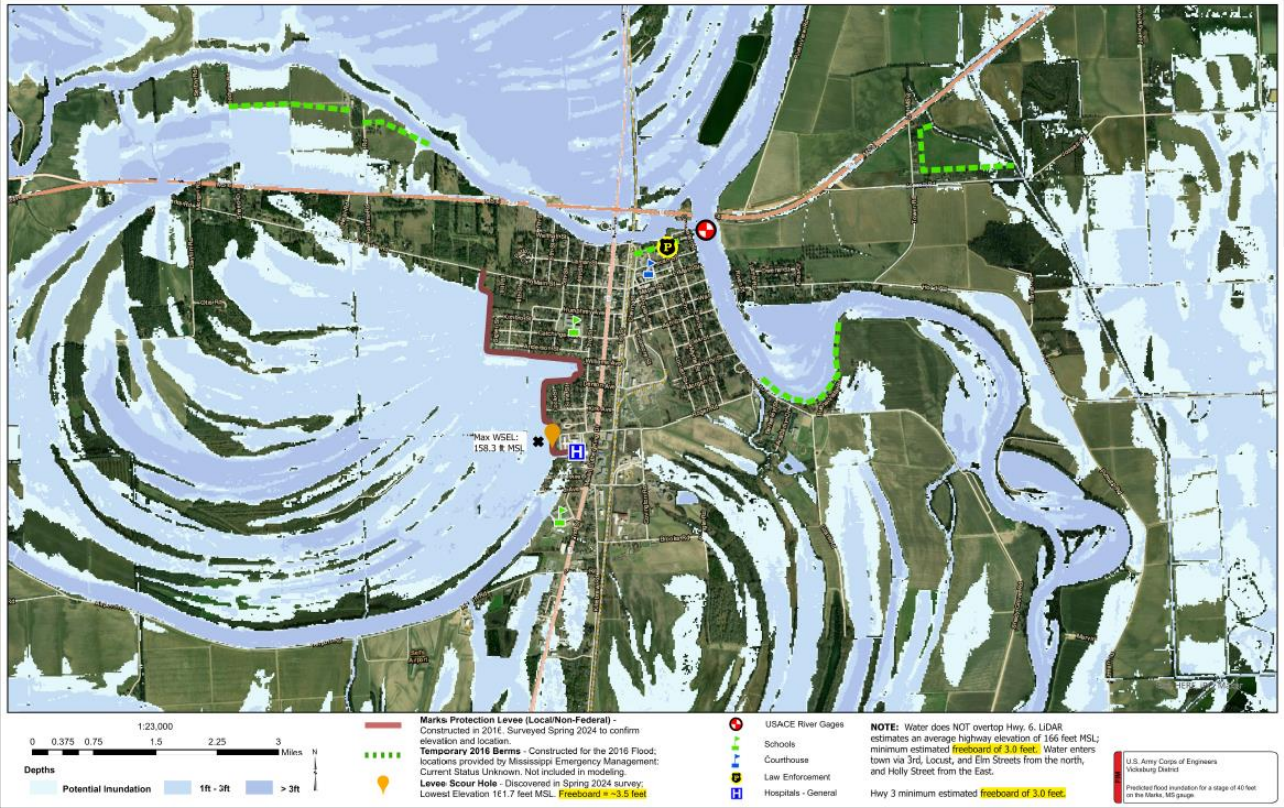
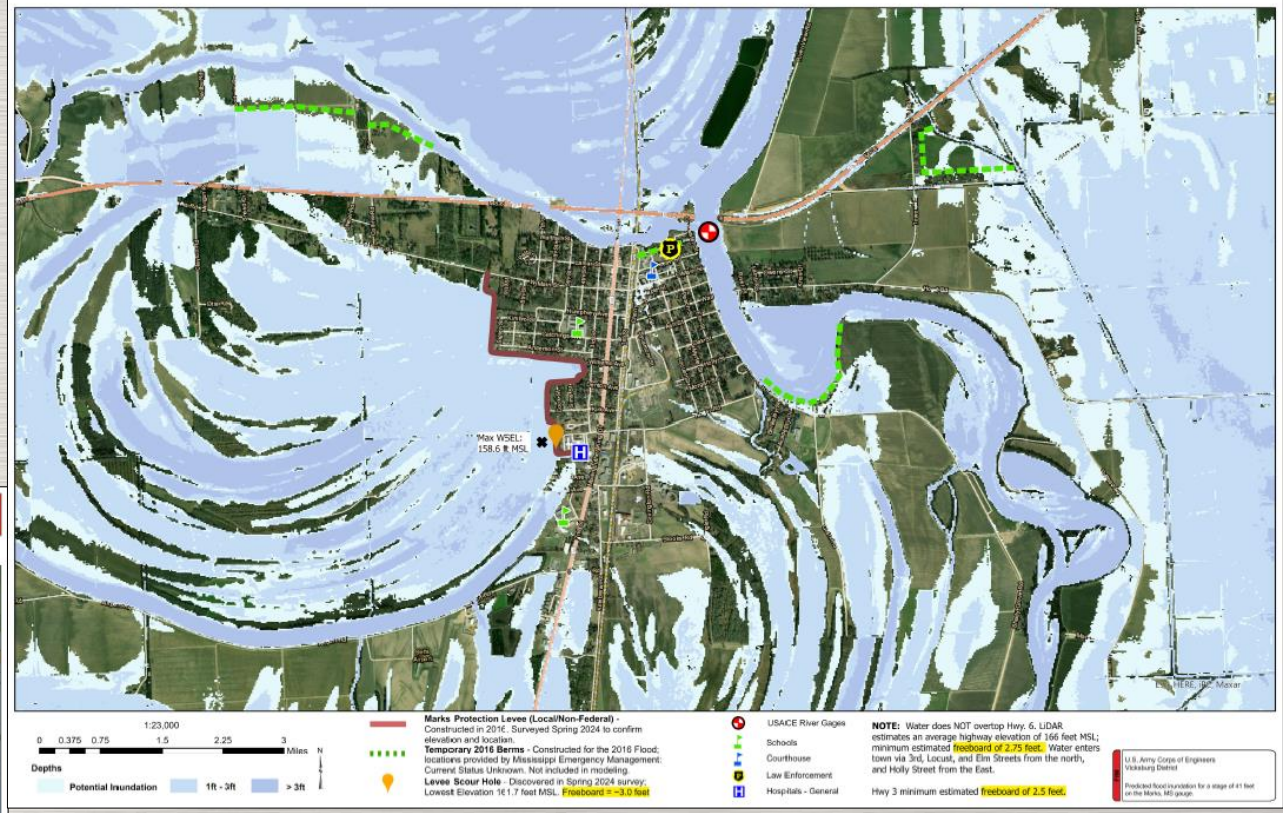
Flood Maps
Marks, MS
MS River at 40’ and 41’

Flood Event Projection: 40 feet Stage Marks, MS



Flood Event Projection: 41 feet Stage Marks, MS



Coldwater River
Marks, MS gage
40.7’ on April 12, 2025

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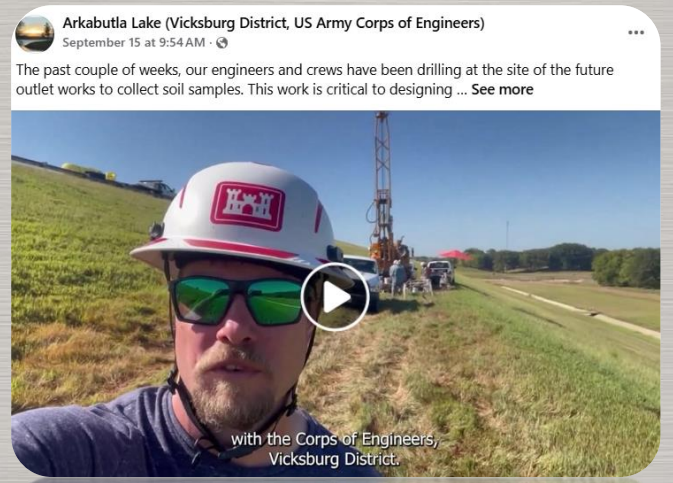
Increased Stakeholder and Public Engagement



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Long Term Repairs

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USACE Dam Modifications

USACE Dam Safety

- USACE owns and operates 790 Dams

Priorities

- Whittier Narrows (CA)
- Painted Rock (AZ)
- Arkabutla (MS)

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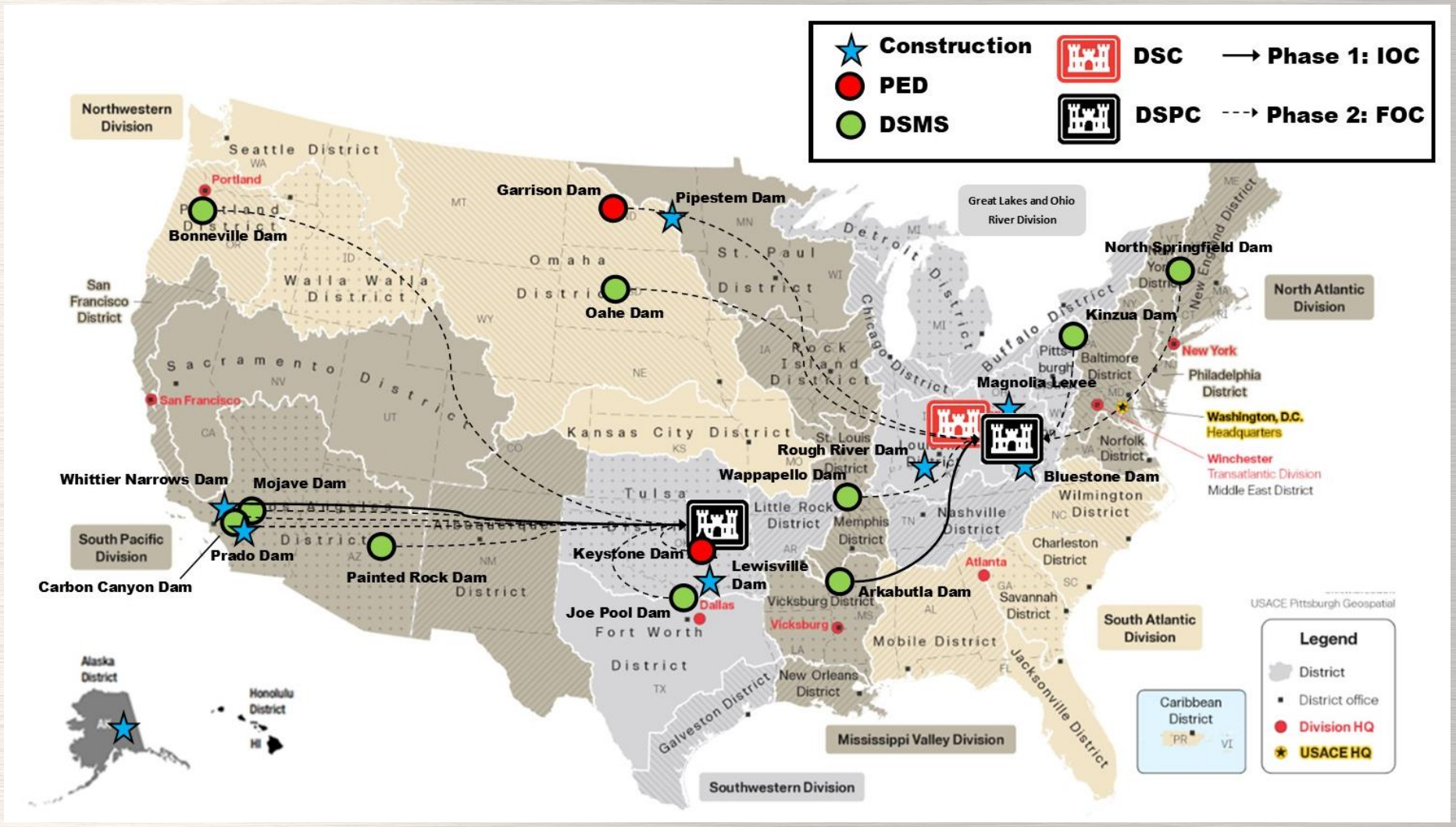
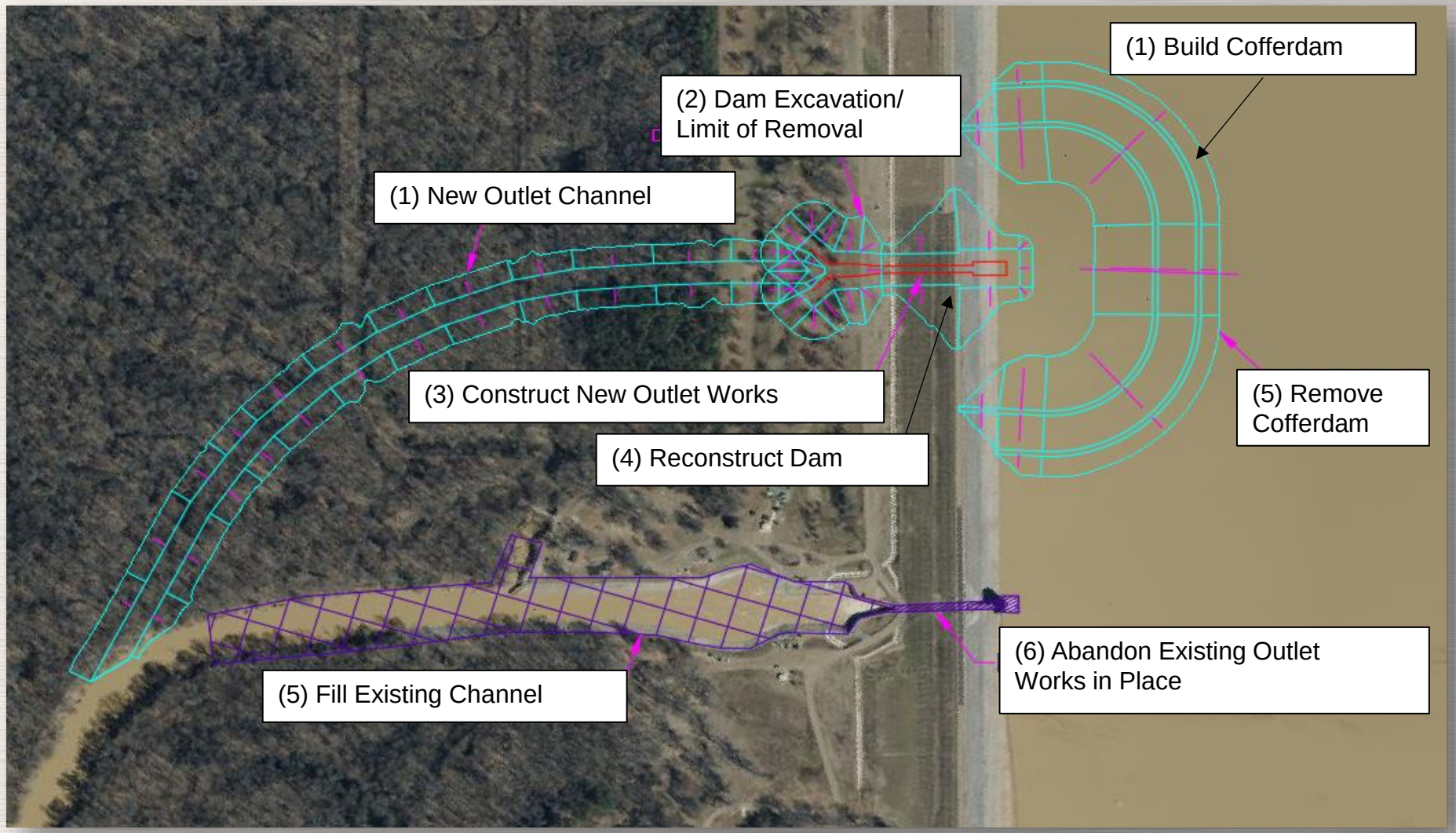


Tentative Plan For Permanent Repairs

- Construct Outlet Works and Channel in new location.
- Abandon existing Outlet Works and fill existing Channel.



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Project Schedule and Cost (Preliminary)

Timeline: 10 Years Cost: ~$829 million

Complete Design

Certify Cost Estimate

Award Construction Contract

Complete Construction

Why Is It Going to Take So Long?

The dam has to protect our communities while construction is underway.

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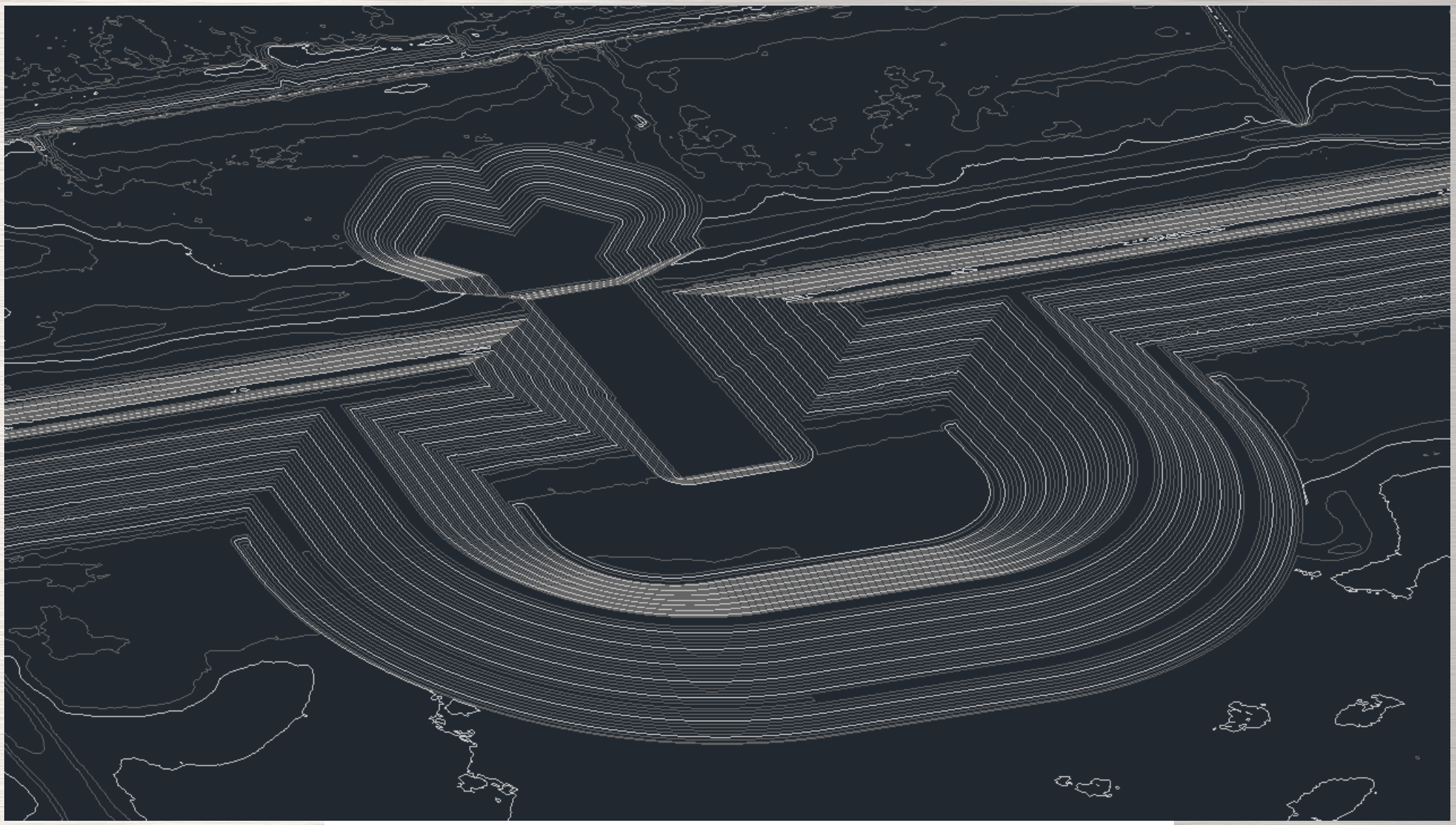
Cofferdam and Excavation



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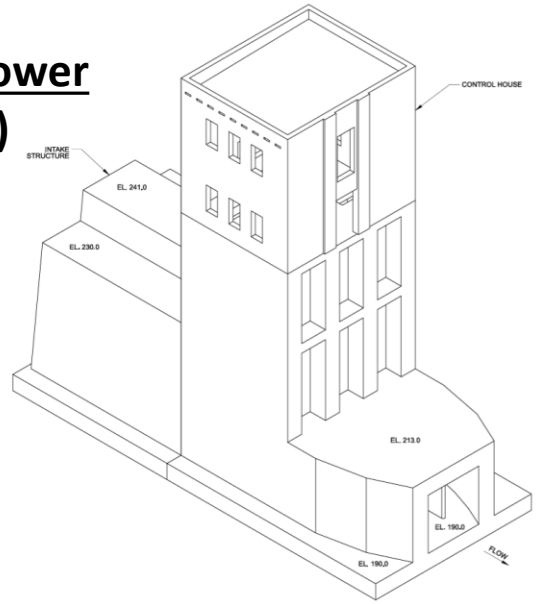
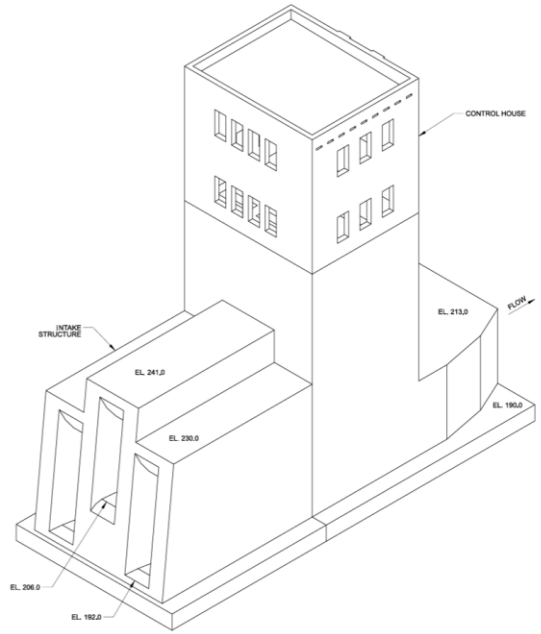
ISOMETRIC VIEW – COFFERDAM AND DAM EXCAVATION

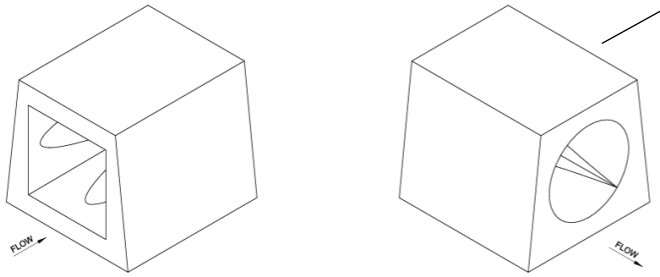
Preliminary Outlet Works Replacement

Intake Structure and Control Tower
130’ (L) x 56’ (W) x 122’ (H)
7,500 CY



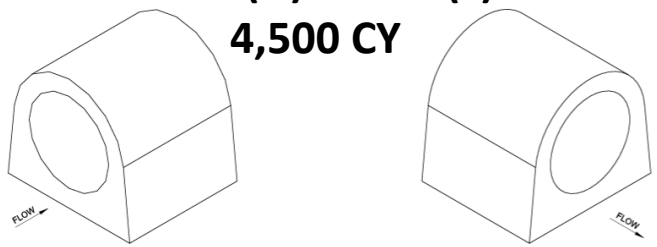


Transition Conduit
30’ (L)
500 CY



Service and Emergency Vertical Lift Gates
10’ (W) x 21’ (H) x 6 Gates

Conduit (13ea)
18.5’ (D) x 325’ (L)
4,500 CY



Stilling Basin
233’ (L) x 38’ (W) x 56’ (H)
4,000 CY

Note: Design configuration and size will be further refined

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What About the Other Three Dams?

Dam	USACE Dam Safety Action Classification	Dam Safety Status
Arkabutla Dam	1	Dam Safety Modification; Interim Repairs and Increased Monitoring.
Sardis Dam	2	Dam Safety Evaluation Ongoing
Grenada Dam	4	No ongoing concerns. Routine Dam Safety Monitoring
Enid Dam	4	No ongoing concerns. Routine Dam Safety Monitoring

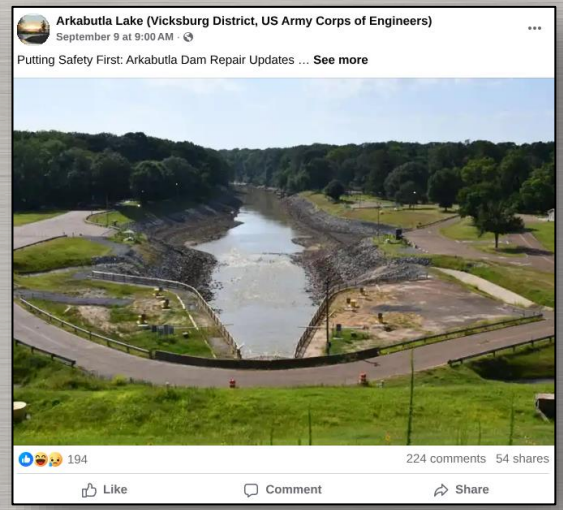
Community Commitment

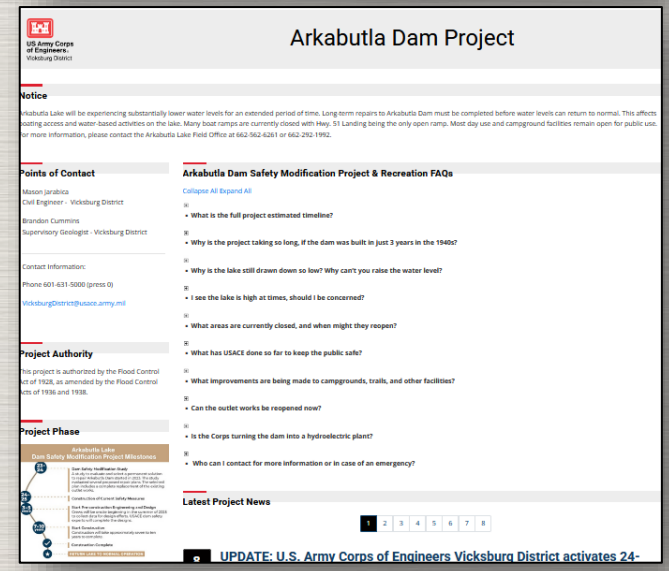
Our Focus Is Public Safety:

- Communicating flood risk to downstream communities; protecting lives is our priority.
- Provide visibility through community engagements, press releases, websites, and social media.

We are Listening:

- Communication on local concerns is helping the long-term solution.





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