

Auxiliary Spillway for Lake Claiborne Dam?

HOMER, LA-- The Claiborne Parish Police Jury and Claiborne Parish Watershed District Commission have sought federal assistance to construct an auxiliary spillway and gated outlets at Lake Claiborne Dam.

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At A Glance

The Claiborne Parish Police Jury and Watershed District Commission have, over the years, sought federal assistance to construct an auxiliary spillway and gated outlets at Lake Claiborne Dam.

In 1991, a flood caused extensive damage to the 40 mile shoreline of Lake Claiborne and to public and private properties in the drainage area of the lake. Residents became interested in increasing the capacity of Lake Claiborne Dam's outflow controls to prevent a recurrence of serious flooding. At the request of the Claiborne Parish Police Jury, the Louisiana Department of Transportation and Development completed a feasibility study for structural modifications that will limit surcharge water level rise from the current 6.3 feet to approximately two feet for the '100 year storm' (a storm that could be expected once every 100 years). The study used design technology and safety requirements that have been updated since the construction of Lake Claiborne Dam 32 years ago.

The results of the 1998 Lake Claiborne Surcharge Reduction Feasibility Study suggested that building an additional spillway with gated outlets on Lake Claiborne Dam would be the most cost-effective way to prevent flooding and keep the dam safe during a potentially catastrophic rainfall. However, even that solution would be costly (an estimated \$15 million in 1998), and some information was provided that the potential for flooding of a number of lakes elsewhere exceeds that of Lake Claiborne.

Between 2000 and 2008, the Claiborne Parish Watershed District made repeated attempts, through Louisiana's U.S. Congressional delegation to secure funding for a U.S. Army Corps of Engineers Reconnaissance Study, with some response but, in the end, no success in securing funding. This document summarizes the effort.

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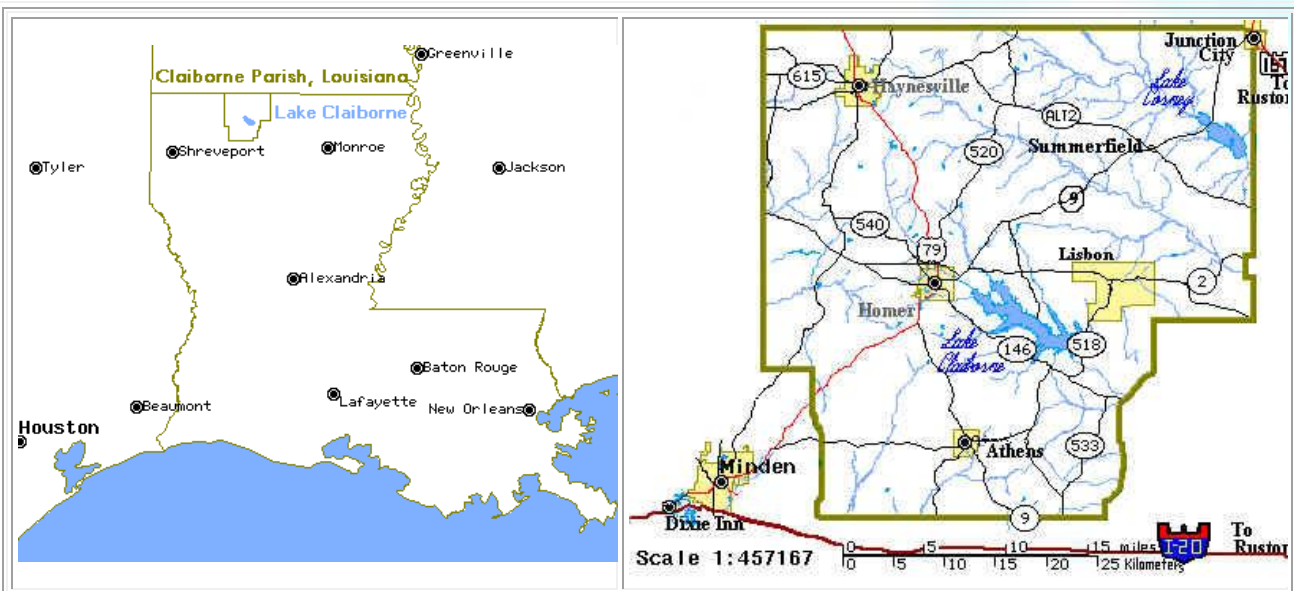


Table 1 Lake Claiborne In Louisiana

Lake Claiborne 1,2,3

Act 299 of the Louisiana State legislature, passed in 1964, created the Claiborne Parish Watershed District as a political and budgetary unit of the state and also provided for "[t]he creation and maintenance of Lake Claiborne within the district for the purpose of conserving the soil and water and developing the natural resources and wealth of the district for sanitary, agricultural, industrial and recreational purposes..." A Board of Commissioners, appointed by the parish Police Jury, was granted the right to regulate improvements "within one (1) mile from the 185.0 foot contour shoreline of Lake Claiborne."

Construction of Lake Claiborne and the Lake Claiborne Dam was completed in 1967. The lake is located at the southeast corner of the town of Homer on Bayou D'Arbonne, a tributary of the D'Arbonne River. The lake inundates land in Claiborne Parish only. It has a drainage area of 133 square miles. At full reservoir level, Lake Claiborne has a surface area of 6400 acres. Normal pool elevation is 185 feet above mean sea level.

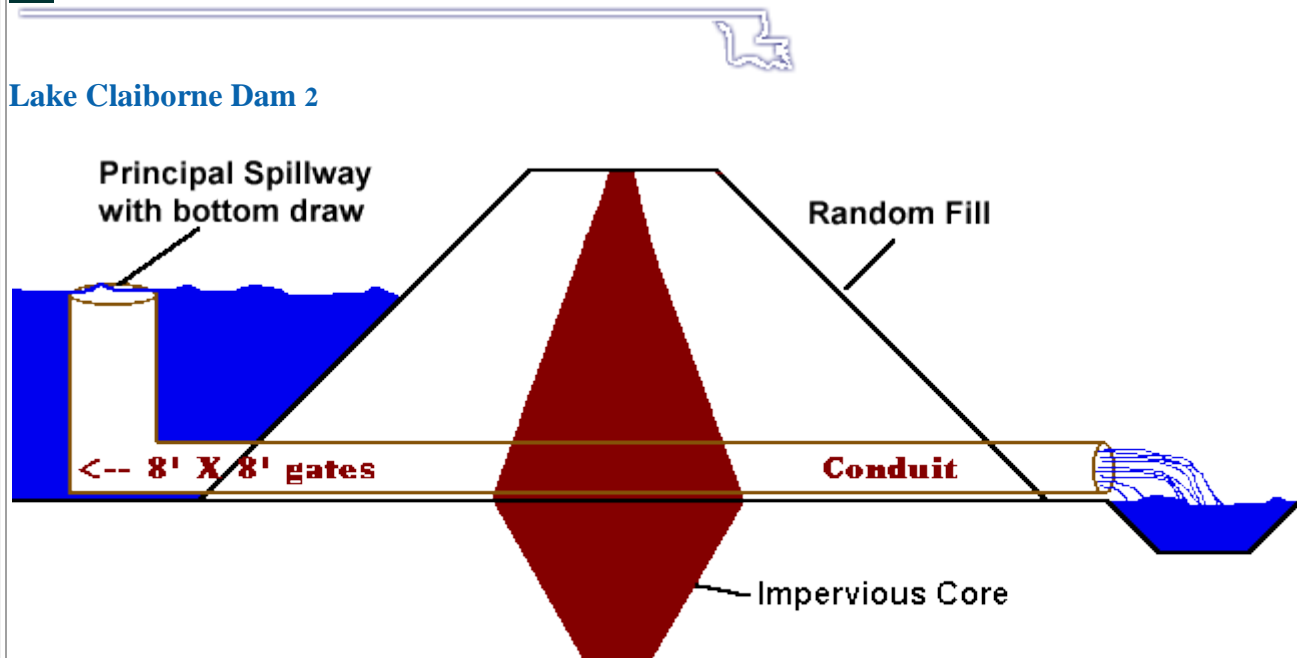
Lake Claiborne is located in the gently rolling upland hills of northwestern Louisiana. One of the area's most scenic sites, it is estimated to attract more than 100,000 visitors a year. The lake was designed for sportsmen. At its beginning, the land to be covered by water was cleared of some trees and other obstructions to assure maximum skiing and boating pleasure. Later, the lake was stocked with largemouth bass, bluegill sunfish, channel catfish, black crappie, striped bass, and walleye fingerlings. Facilities for camping, fishing, boating, and picnicking were added when the 600 acre Lake Claiborne State Park was created. Along the park's 100 acre wooded shoreline are more than 100 picnic sites with tables and grills, a large covered shelter, restrooms, a boathouse, a concession stand, and a beach. The park's 87 unit camping area includes comfort stations, dump stations, a laundry, electric and water hookups, picnic tables and barbeque grills. A primitive camping area is available for groups, such as Scouts. There are ten modern cabins as well. More than 65,000 people visit the park each year. Because of the demand, plans are underway to expand programs at the state park.

Anglers, too, are frequent visitors to the lake. Louisiana's fifth and sixth largest striped bass on record were caught from Lake Claiborne. Recent studies show that Lake visitors have an important economic impact for the locality and the state.

Since Lake Claiborne's construction, 1000 homes have been built in the area. Many of the new residents are retirees, who bring in an average annual income of more than \$50,000 as well as diverse knowledge and expertise. Lake residents provide about 15% of Claiborne Parish's total tax base. Their local spending strengthens the local economy and adds to state taxes.

Lake Claiborne attracts some industry and has the potential for attracting more. Presently there are restaurants, gas stations, convenience stores, and an RV park, all supporting tourism. Recreational programs, assisted living arrangements, and retirement communities are possibilities.

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When Lake Claiborne Dam and Lake Claiborne were designed in the 1960s, engineers used available rainfall and weather data to predict the worst-case flood Mother Nature might reasonably create, that is, the "probable maximum flood." During such a predicted rainfall, the lake would completely fill and water would continue pouring through the spillway without flooding surrounding lands or jeopardizing the structure of dam. Design technology and safety requirements of that time were used to ensure the dam was structurally sound and had adequate storage and spillway capacity to withstand the "probable maximum flood."

The earthen Lake Claiborne Dam is 5500 feet in length with a top elevation of 202 feet MSL. The outlet works consist of a 62 foot-diameter circular drop-inlet spillway with a crest elevation of 185 feet, MSL, three 9.5'x14' concrete outlet conduits, and two 8'x8' drawdown gates with an invert elevation of 151.2 feet MSL. As part of the circular spillway, the gates offer no additional water outlet. At the northern end of the dam, there is an all earthen

structure (without impervious core) lower than the dam's surface, designed as an emergency spillway in the event of the "probable maximum flood." This spillway would provide water outlet only when the lake level rises to approximately 11 feet above normal pool level.

Today, employing updated design technology, it is calculated that the "design storm" discharge (based on 15" rainfall in 24 hours, considered the worst storm possible) would produce an estimated maximum surcharge elevation of 198 feet, that is, 13 feet above normal pool level. The more likely "100 year storm" (10" rainfall in 24 hours) would produce a surcharge 6.3 feet above normal pool level.

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Flood of 1991 2,4

In 1991, a 12" rainfall over 24 hours caused Lake Claiborne to rise more than seven feet above its normal pool elevation. This was a half foot above the "100 year storm" flood elevation. Two hundred homes in the lake area were flooded, with extensive property damage and loss. Schools were closed because bridges and roads were washed out or hazardous. Forty-two roads were closed, including three state highways. Crops were destroyed, and cattle were stranded in flooded fields. Boat traffic was closed. Wildlife and Fisheries agents helped bring to dry land floating butane tanks, satellite dishes, boats, and gas tanks. Crews had to travel by boat to cut off electricity to some homes. Some residents on Lake Claiborne were without electricity for days.



Current danger

More homes have been built around the lake since the storm of 1991, with a better awareness now of flooding potential. Nevertheless, if another "100 year storm" occurred, it is estimated that, because the number of personal properties has increased, there would be greater damage to personal property as a whole, compared to such damage in 1991. And, again, major damage to roads and bridges would cost a great deal to repair. Moreover, if the Lake Claiborne Dam remains in its current state and a "design storm" occurred, there would be far more damage than that of the flood of April 1991; it is estimated, in the event of a "design storm", as many as two-thirds of the 1000 homes that have been built in the lake area since the lake was constructed would be flooded.

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Lake Claiborne Surcharge Reduction Preliminary Feasibility Study2

To investigate ways to reduce the risk of such flooding, at the request of the Claiborne Parish Police Jury, in March 1998 the Louisiana Department of Transportation and Development approved a study to identify the best possible economical alternative to prevent flooding and damage to the dam.

The study, completed in August, 1998, showed five combinations of spillway and gated outlets that would triple peak discharge out of the lake, thereby limiting the surcharge water level rise to approximately two feet for a "100 year storm." Comparison data for the alternatives are as follows:

Scenario	Lake Claiborne Surcharge Height; "100 Year Storm" (10"/24 hours)	Lake Claiborne Surcharge Height; Actual 1991 Storm (12"/24 hours)	Lake Claiborne Surcharge Height; "Design Storm" (15"/24 hours)	Estimated Cost
Existing Condition	6.3'	7.2'	12.4'	
Add 1000' spillway + 12-8'x8' gates	2.1'		4.2'	\$15 million
Add 2000' spillway + 10-8'x8' gates	2.0'		3.4'	\$27 million
Add 3000' spillway + 6 8'x8' gates	2.0'		3.0'	\$40 million
Add 4000' spillway + 2-8'x8' gates	2.0'		2.7'	\$53 million
Add 110' tainer gate	2.1'		6.1'	\$60 million

To put flooding potential into perspective, the authors of the study listed a number of lakes in Louisiana and elsewhere that have substantially more flooding potential than Lake Claiborne has at this time.

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Benefits and Limitations of 1000' Spillway plus 12 8'x8' gates²

Of the alternatives, the shorter spillway (1000 feet') with more gates (12) is the least costly. In contrast to longer spillways, it would disturb only a portion of existing embankment and would require little additional downstream land purchase. However, the greater number of gates would require higher maintenance, because trash and debris tend to wedge in gate openings. After considering the several options and gathering considerable public input, the Claiborne Parish Police Jury determined that this least costly approach is the best solution.

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Environmental Impact

There would be no change in the way Lake Claiborne is operated from day to day. The new spillway would only be used during extreme emergencies when lake levels exceed an elevation of 187 feet. In such emergencies, it is considered that the improved mechanism for water discharge management would have positive environmental impact on the lake area and downstream. More study would be needed.

Public Benefits of Auxiliary Increased Outlet Capacity at Lake Claiborne Dam

Improved flood control would be the major public benefit from increasing the outlet capacity of the Lake Claiborne Dam. The more stable water level and shoreline that would result would provide other benefits as well, including:

- enhanced recreational opportunities for fishing and boating,
- improved aesthetics,
- assurance of a more stable aquatic habitat, and
- prevention of the sudden drowning of water fowl nests.

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References

1. Louisiana State Legislature and Office of the Governor of the State of Louisiana. Louisiana State Legislature Act 299.

2. Louisiana Department of Transportation and Development. Lake Claiborne Surcharge Reduction Preliminary Feasibility Study. August, 1998.

3. Louisiana Office of State Parks, Lake Claiborne. .the Outdoor Pleasure Never Ends
<http://www.crt.state.la.us/crt/parks/claiborn.htm> References: Lake Claiborne State Park, P.O. Box 246, Homer, LA 71040; Phone: (318) 927-2976; 1-888-677-2524 toll free.

4. Newspapers dated April 18, 1991 through May 2, 1991, including The Guardian Journal (Homer), The Advertiser (Homer), and The Shreveport Times.

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