

Recommendation and concept for water  
quality and flood water management for  
the  
Atchafalaya Basin Project Phase 1  
Henderson Lake Project

A Cooperative Effort of  
LCPA-West  
St. Martin Parish St. Landry Parish Avoyelles Parish  
Acadian Group Sierra Club  
Dredge the Vermilion, Inc.  
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**Atchafalaya Basin Phase Project 1 – the Henderson Lake Project**  
**A Cooperative Effort of**  
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## Overview of the Atchafalaya Basin Project

Act 570 of the 2018 Regular Session, enacting La. R.S. 49:214.8.1, et seq., transferred the responsibilities of the Atchafalaya Basin Research and Promotion Board and the Atchafalaya Basin Program from the Department of Natural Resources to the Coastal Protection and Restoration Authority (CPRA).

The Atchafalaya Basin in south central LA is the largest river swamp in the United States and is comprised of approximately 1 million acres of bottomland hardwoods, swamps, bayous, and backwater lakes.

Historically water flows in the basin kept the basin supplied with adequate fresh water ensuring water quality. Due to flood control projects executed by the US Federal Government along with pipeline and highway construction inside the basin has resulted in blocked or restricted water flows degrading water quality that impact both commercial and sport fisheries.

Additionally, some of these projects that have contributed to water quality issues also has blocked or inhibited flood flows in the basin. These blocked flows have caused flood water to backup impacting agricultural operations and contributing to some residential flooding.

Over time many of the canals and bayous in the basin have also become silted and grown up requiring some clearing and snagging to restore flows.

## The Overall Key Objectives of the Atchafalaya Basin Project

The key objectives of the overall Atchafalaya Basin Project are the following:

1. Improving water quality to improve fisheries, waterfowl, migrating birds, and native species
2. Remove man made and natural obstructions to water flows improving both freshwater and flood flows
3. Removal of sediment and other obstructions that inhibit water flows
4. Developing a management plan to optimize utilization of existing and future water control structures and systems
5. Restoring navigability in the basin waterways
6. Improve management of water levels to allow control of noxious aquatic plants
7. Restore the basin to as much as possible to its natural state

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## Objectives of the Atchafalaya Basin Project Phase 1 – the Henderson Lake Project and Priorities

The Henderson Lake Project will address restricted water flows north of Henderson Lake. The restricted flows contribute to water quality issues in the swamps, the lake, and also inhibit flood flows south to the lower basin.

Priority 1 - The Dixie Pipeline spoil banks have been identified as a significant flow obstruction. This project will address either leveling of the spoil to near natural ground elevations (preferred) or creating openings adequate to address the flow restrictions.

Priority 2 - The existing Grimmert canal handles water discharged into the basin through the Bayou Courtableau floodgates just south of US190 on the West Atchafalaya floodway west guide levee. The water dispersion at the south end of the canal is inadequate causing water quality issues in the swamp north of Henderson lake. This project will address dispersion of the flows from the Grimmert.

Priority 3 - The gates on the inside borrow pit south of the Butte Larose road pontoon bridge that control levels in Henderson Lake are obsolete, undersized, and are not designed to allow controllable freshwater flows. The existing gate was constructed by LA DOTD to facilitate construction of the I10 highway across the basin and was never intended to be a permanent control gate. This project will address replacement of this gate with an adequately sized and controllable gate.

Priority 4 - Bayou Courtableau inside the basin currently dead-ends at the inside levee on the river. This causes a water quality issue in the eastern part of the bayou as well as its nearby swamp areas. Re-connecting the bayou to the river through a flood control gate will also provide an important flood control resource for the watershed by discharging flood waters into the river when river levels will allow flow. Additionally, when adequate levels in the river exist the gates could potentially provide fresh water to the basin during periods of low water.

## Overall Current Water Quality Issues in the Basin

During periods of low water conditions in the basin water quality will get so bad that it will lead to fish kills damaging both commercial and sport fisheries.

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## Proposed Enhancements for Improvements in Water Quality North of Henderson Lake in the Basin

We are proposing three improvements to the basin to enhance water quality north of Henderson Lake by removing spoil bank restrictions along some pipeline right of ways, extending the Grimmett east and west that would provide better dispersion of freshwater flows from the Grimmet Canal, and restoring Bayou Courtableau from levee to levee with a gate on the river on the eastern end and it's flows to southern tributaries .

### Dixie Pipeline Spoil Banks

Dixie Pipeline spoil banks are a significant flow obstruction. This project will address either leveling of the spoil to near natural ground elevations(preferred) or creating openings adequate to address the flow restrictions.

### East and West Grimett Canal Extensions

The Grimett canal currently dead -ends south of the Bayou Courtableau flood gates. The objective of the extensions is to route fresh water both east and west to establish an improved sheet flows across the floodplain by connecting existing sloughs, bayous, and bottoms to the extensions. See the below illustration for these extensions.

### Bayou Courtableau inside the Basin

By connecting Bayou Courtableau inside the basin to the river by clearing and snagging sections of the bayou as needed and utilizing a flood control gate at the river will address water quality issues in both the eastern part of the bayou as well as it nearby basin swamp areas. The proposed gate will provide a flood water outlet in certain flood situations as well as provide a freshwater source during low water conditions.

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## New and Replacement Gates

The project recommendations include two gates, one replacement gate for Lake Henderson and a new gate at the east end of Bayou Courtableau at the Atchafalaya river. Below are some details and operational objectives and responsibilities for each gate.

### Priority 3 -The Henderson Lake Gate

We are recommending adding a dual- purpose gate in the levee borrow pit to replace the existing gate. The gate could provide both a flood mitigation resource as well as a water quality resource.

The gate, if constructed would improve water quality in the entire western portion of the basin.

The gate would also provide a critically needed flood management resource for 10 parishes in the Courtableau-Teche-Vermilion Watershed.

## Proposed Theory of Operation of Henderson Lake Gate Facilities during a Flood Risk Event

As necessary as soon as a Major Regional Rain Forecast (10” of greater) is made for the Teche-Vermilion Watershed

At least 72 hours but no less than 48 hours prior to the forecast beginning of the forecasted rain event begin draining the Atchafalaya Basin and fully opening both the existing gates in the West Atchafalaya West Guide Levee(if basin levels allow) and the new Henderson Lake gate installed by the project.

The objective with this operational mode is to lower levels in Henderson Lake establishing an adequate flow path for flood flows and establishing as much retention and as possible in the Atchafalaya Basin watershed to hold excess flood waters.

The current obsolete gate is operated by St. Martin Parish. The new gate flood control mitigation control responsibilities are to be determined as the USACE currently controls most flood management gate systems.

## Proposed Theory of Operation of Henderson Lake Gate Facilities to Manage Fish Migration during Low Water Conditions

The smaller adjustable gate constructed in the main gate will allow for fish migration during low water conditions and will be operated by the LA Department of Wildlife and Fisheries.

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## Priority 4 -The Eastern Bayou Courtableau Gate

We are recommending adding a new dual- purpose gate in the Atchafalaya river levee that re-connects Bayou Courtableau inside the basin to the Atchafalaya river. The gate could provide both a flood mitigation resource as well as a water quality management resource.

The gate would improve water quality in the entire east portion of the basin west of the river.

The gate would also provide a critically needed flood management resource for 10 parishes in the Courtableau-Teche-Vermilion Watershed.

## Proposed Theory of Operation of Eastern Bayou Courtableau Gate Facilities during a Flood Risk Event

As necessary as soon as a Major Regional Rain Forecast (10” of greater) is made for the Teche-Vermilion Watershed

At least 72 hours but no less than 48 hours prior to the forecast beginning of the forecasted rain event begin draining the Atchafalaya basin by fully opening the new Eastern Courtableau gate installed by the project if river levels allow.

The objective with this operational mode is to lower levels in basin, establishing an adequate flow path for flood flows, and establishing as much retention and as possible in the Atchafalaya Basin watershed.

The new gate flood control mitigation responsibilities are to be handled by the USACE as they currently control all nearby flood management gate systems.

## Proposed Theory of Operation of Eastern Courtableau Gate Facilities to provide Freshwater during Low Water Conditions in the Basin

During low water conditions in the basin and when river and basin levels allow the gate could be utilized to provide freshwater from the river to eastern Bayou Courtableau and its adjacent swamps. As Teche-Vermilion Freshwater District currently is responsible for managing water quality in Bayou Courtableau, the Bayou Teche, and the Vermilion River this we recommend they continue to do so utilizing the new gate.



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Acadian Group Sierra Club <https://lafayettesierraclub.org/>

For More Information Contact the Authors

Harold Schoeffler President Sierra Club 337.417.1550 [cadistyle@aol.com](mailto:cadistyle@aol.com)

Dave Dixon President Dredge the Vermilion, Inc. 337.739.9331 [daveralphdixon@gmail.com](mailto:daveralphdixon@gmail.com)

Chris Tauzin Councilman St Martin Parish District 5 337.277.3563 [christauzin@yahoo.com](mailto:christauzin@yahoo.com)

Sherbin Collette Mayor of Henderson LA 337.319.5267 [hendersonls@cox-internet.com](mailto:hendersonls@cox-internet.com)

Jody Meche Mayor ProTemp of Henderson LA 337.257.3331 [jodymeche44@hotmail.com](mailto:jodymeche44@hotmail.com)

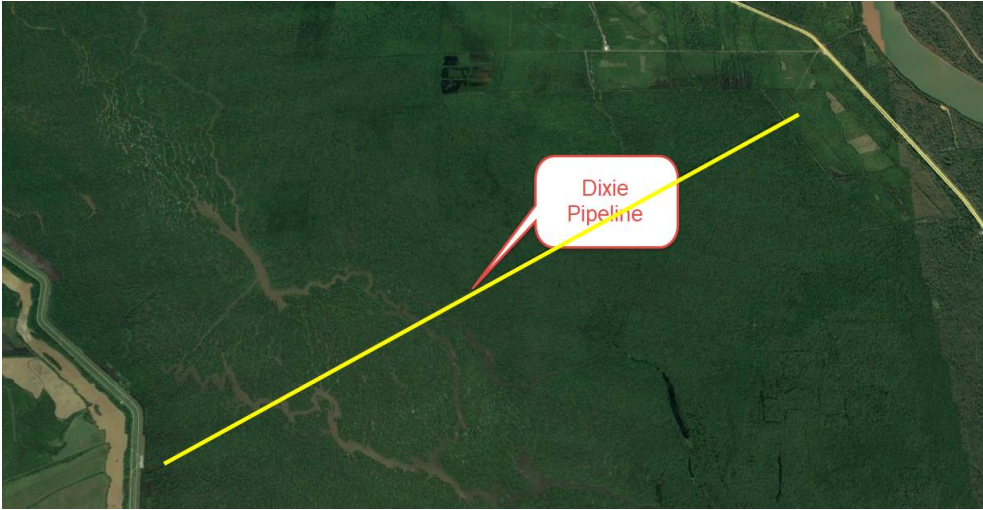
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Illustrations

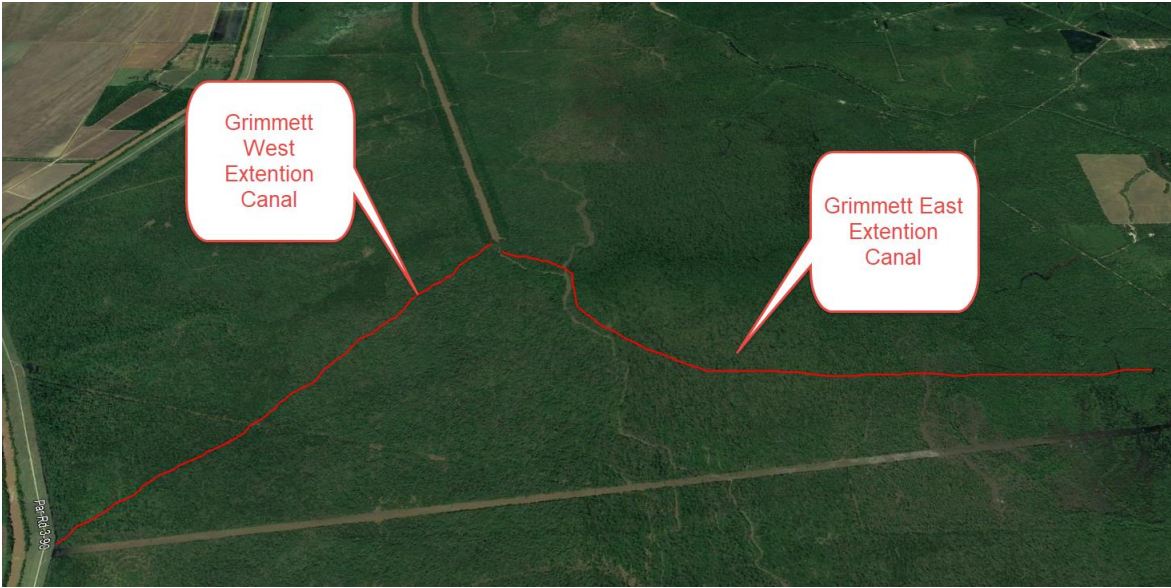


Area Overview for Proposed Project

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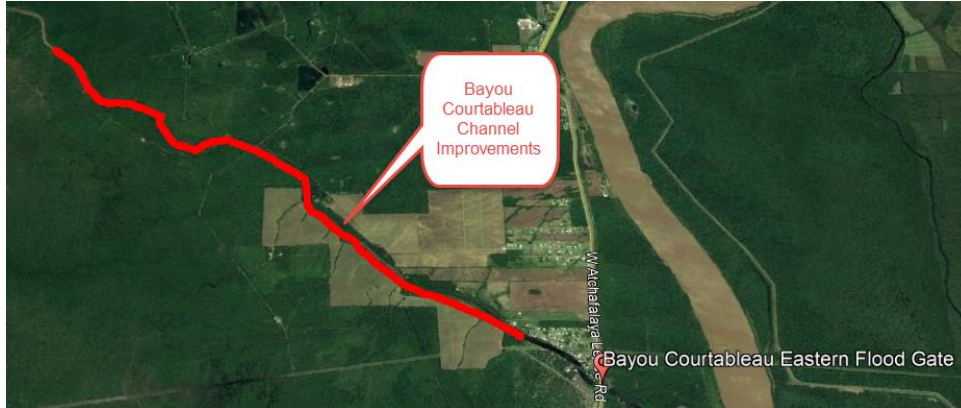


Dixie Pipeline



Grimmett Canal East and West Extension

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Bayou Courtableau Channel Improvements and East Floodgate



Henderson Lake Gate(existing and proposed new gate location)