Coastal Protection and Restoration Authority of Louisiana (CPRA)

2025/2026 Annual Inspection Report

For

BLACK BAYOU CULVERTS HYDROLOGIC RESTORATION PROJECT (CS-29)

State Project Number CS-29
Priority Project List 9

January 27th, 2026
Calcasieu and Cameron Parishes

Prepared by:

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I. Introduction

The Black Bayou Culverts Hydrologic Restoration Project (CS-29) encompasses a large project area and consists of one primary control structure located approximately ¼ mile south of the Gulf Intracoastal Waterway (GIWW) on LA State Highway 384 where it intersects Black Bayou in Calcasieu Parish. The project area is bordered to the north by the Gulf Intracoastal Waterway (GIWW), to the south by the Chenier sub-basin, to the east by Grand Lake, and to the west by the Calcasieu River. Total project area is approximately 72,378 acres and is comprised primarily of freshwater to intermediate marsh (See Appendix A).

The primary project feature is a 10 foot by 10 foot concrete box culvert equipped with flap gates and trash screens. LA Highway 384 was reconstructed over the structure complete with guard rails and signage. The CS-29 Black Bayou Culverts structure provides additional westward drainage opportunity for the Mermentau Lakes sub-basin. The CS-29 Operations Plan works in conjunction with the USACE's operation of the collective structures maintaining water level and salinity in the Lakes sub-basin including Calcasieu Lock, Catfish point and Schooner Bayou water control structures, and the Freshwater Bayou and Leland Bowman Locks. It is intended to provide relief to the marsh impacted by high water levels.

The Black Bayou Hydrologic Restoration Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990, as amended and approved on the ninth Priority Project List. The Black Bayou Culverts Hydrologic Restoration Project has a twenty-year (20 year) project life, which began in January 2010.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Black Bayou Culverts Hydrologic Restoration Project (CS-29) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, CPRA shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects, if any, which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C.

An inspection of the Black Bayou Culverts Hydrologic Restoration Project (CS-29) was conducted on January 27, 2026. In attendance were Dion Broussard, Ivy Thibodeaux, Bernard Wood, of CPRA and, Angela Trahan, Joshua Anderson, Nick McCoy and Dustin Farmer of NRCS and the Contract Operator, Chris Simon of Simon and Delany, with two individuals for support and boat operation. Crane services were provided by United Crane services, a sub-contractor to the operations Contractor. The Contractor deployed traffic control measures for the closure of the southbound lane per the approved permit issued for this purpose by the

LaDOTD. This lane closure is necessary to allow the crane to stage for the purposes of lifting the gates for inspection.

The field inspection began at 10:30 AM at the culvert structure on Hwy 384. This entailed a complete visual inspection of the following features:

1. Earth embankments
2. Rock armor installments
3. Trash screens
4. Warning signs in channel
5. Lifted flap gates, bays 1 through 10

Photographs were taken at each project feature (see Appendix B) and Field Inspection notes to record measurements, observations and deficiencies have been included (see Appendix D).

III. Project Description and History

Prior to the construction of the GIWW, Black Bayou served as the natural drainage route for the western edge of the Mermentau Basin. The three-million-acre Mermentau River Basin is bounded by Bayou Cocodrie to the north, Bayou Teche and the Vermilion River to the east, the Calcasieu River to the west, and the Gulf of Mexico to the south. Chenier ridges divide the basin into two sub-basins: the Chenier sub-basin south of LA State Highway 82, and the Lakes (Grand Lake and White Lake) sub-basin north of Highway 82. Historically, the water in these sub-basins has been fresher in spring, becoming more brackish in summer and fall depending on rainfall. Marsh within the project area is presently described as being predominately Fresh Maidencane with areas of Fresh Bulltongue and Oligohaline Wiregrass (Visser et al. 2000). In their natural state, these inland marshes served as estuarine nurseries for *Penaeus aztecus* (white shrimp), *Callinectes sapidus* (blue crab), *Cynoscion nebulosus* (speckled trout), *Sciaenops ocellatus* (redfish), and *Brevoortia patronus* (menhaden) (Faulkner 2000).

Construction of the GIWW was completed in 1944, and in 1950 the Calcasieu Lock was placed in operation to prevent saltwater from entering the Mermentau Basin from Calcasieu Lake while allowing passage of vessels. While the lock structure has had a positive effect on the Lakes sub-basin wetlands by maintaining a barrier to saltwater intrusion via the GIWW, it has also contributed to the problem of excessively high water levels by restricting the outflow of floodwater (Faulkner 2000). The Mermentau Lakes sub-basin now functions more as a freshwater reservoir and less as the low-salinity estuary it once was (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2002). LA State Highway 384 bisects and effectively dammed Black Bayou upstream of its confluence with the Calcasieu River; this further restricted floodwater relief of the Lakes sub-basin (Balkum 2002).

The installation of the box culvert structure under Highway 384 is intended to restore the natural drainage outlet of Black Bayou. It is expected to decrease the depth and duration of flooding events which is assumed to be contributing to marsh degradation within the sub-basin (Balkum 2002).

Construction of the Black Bayou Culverts Hydrologic Restoration Project was completed in January 2010 with a 20-year project life. Major structure repairs were constructed in 2015-2016 to restore full operation of the structure.

The main structure components are as follows:

1. Ten (10) - 10 ft. x 10 ft. concrete box culverts equipped with aluminum flap gates on the West side and trash racks with a receiving slot for a sluice gate on the East side of the structure. The box culverts are supported by one hundred ten (110) – 12 in. butt diameter timber piles 50ft. in length (to elevation -60 ft.) and one hundred twenty eight (128) – 4.5 in. (transitioned to 3.5 in. below the top 15ft.) diameter push piers to an elevation -70 ft.

2. At approximately 6 ft. from the headwall, a steel sheet pile cutoff wall on the West side of the structure to an elevation -35ft and steel sheet pile toe wall on the East side of the structure to an elevation -25ft was constructed with a tie-in concrete slab to the culvert structure.

3. Rock rip rap (R-700) channel lining was placed twenty-five (25) feet East and fifty (50) feet West of the structure. Rock rip rap (R-300) wingwall revetment was placed on either side of the structure.

4. A steel sheet pile bulkhead (approx. 550 ln.ft.) with a galvanized steel pile cap was constructed on the southwest channel bank.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since January 2010, the construction completion date of the Black Bayou Culverts Hydrologic Restoration Project (CS-29).

May-2010 Simon and Delany: This maintenance project included providing a boom truck to lift Gate No. 2 for inspection on May 5, 2010. During a prior operation on April 15, 2010, this gate was not able to be pinned closed with the other nine gates. The gate was found to be in good condition. Bent eyelets had prevented from closing and once corrected they were pinned closed. With all gates closed, it was noted that water was still flowing at the structure. The costs associated with this event are as follows:

Provide Boom Truck and Crew: (Coordination handled by OCPR)	$2,200.00
TOTAL COST:	**$2,000.00**

June-2010 Simon and Delany: This maintenance project included providing a two man dive team to perform an underwater inspection of all ten gates on June 1, 2010. Undermining of the structure was confirmed between Gates No. 1 & 2, and at Gates No. 5 and No. 8. The costs associated with this event are as follows:

Provide two man dive team and perform inspection:	$1,850.00
(Coordination handled by OCPR)	
TOTAL COST:	**$1,850.00**

June-2010 American Contractor and Technology, Inc. (ACT): This maintenance event included furnishing and placement of 240 supersize sandbags (approx. 1 CY per bag) in front of the flap gates on the lake side of the structure to reduce flow into the basin at high tide conditions as a result of undermining that has occurred. This work began on June 15, 2010 and was completed on June 23, 2010. Saltwater infiltration into the basin was reduced by this action. The costs associated with this event are as follows:

Construction Costs:	Approximately $99,081.91
(Coordination handled by NRCS)	
TOTAL COST:	**$99,081.91**

June- 2010 NRCS Investigation Committee: A committee was authorized by the NRCS State Conservationist to review and investigate the failures experienced at the structure. The committee began a design and construction review of the compiled records. A preliminary engineering report was prepared, and a physical inspection was recommended.

April- 2011 Healtheon: This contract included construction of two earthen cofferdams on each side of the structure with clay fill. The intent was to dewater the interior to allow for a physical inspection and re-flood the site once complete. Work began on April 26, 2011 and was completed September 2, 2011. The physical inspection by the NRCS National Design Center Committee out of Fort Worth, TX occurred August 24-25, 2011.

TOTAL COST:	**$1,096,322.93**
(Coordination handled by NRCS)	

June- 2015 Tarpan:
Once funds were approved by the CWPPRA task force, a repair project was led by NRCS. Lonnie Harper and Associates were tasked with the design. The structure was repaired by constructing a steel sheet pile cutoff wall with wing walls on the west side of the structure and a steel sheet pile toe wall with wing walls on the east side of the

structure. Existing timber piles were inspected for damage and flowable fill grout was pumped into the voids beneath the structure. The sheet pile was capped with a concrete tie-in slab to the structure sill (approximately 17ft from the structure headwall). For additional structural support, push piers were driven through the box culverts and fastened with stainless steel mounting plate assemblies. A concrete chamfer was installed over the mounting plates to form a smooth bottom surface. The trash racks were refurbished, and slots were added to accept a sluice gate. The flap gates and frames were refurbished and coated with coal tar epoxy. The box culverts were cleaned and refurbished. Two 6 in. vents were installed near the west side in each box culvert. R-700 stone lined the channel bottom 50 feet on the west side and 25 feet from the sheet pile wall on the east side. R-300 stone was used as revetment on the wingwall embankments. The inlet and outlet channels were dredged. The work was completed July 7, 2016.

E&D	$616,747
Construction	$6,900,963.61
TOTAL COST:	**$7,517,710.61**

April 2017 Simon and Delany: This maintenance event included parts and labor to replace the stainless steel nuts on the flap gate anchor rods with Teflon stop nuts to prevent the nuts from loosening and backing off the anchor rod.

TOTAL COST: $1,625.00

August 2018 Sealevel Construction: The Contract included fabrication of three aluminum sluice gates measuring 10’4” x 12’ 5 ¼”, for use on the East side of the structure. The gates were test fit and stored at the NRCS Lake Charles Field Office at 5417 Gerstner Memorial Drive.

TOTAL COST: $63,250.00

August 2020 Simon and Delany: Gate No. 4; this maintenance event included all materials, labor, equipment, and transportation necessary to remove, fabricate parts (new locking rings), repair including welding and coating, reinstall, and field adjust the flap gate for proper fit. This work was necessitated due to the damage of the locking rings documented in the 2019/2021 Annual Inspection Report (Section V. Inspection Results).

TOTAL COST: $4,350.00

June-July 2025 Simon and Delany: Gate No. 5 & 9; this maintenance even included all materials, labor, equipment, and transportation necessary to remove, fabricate parts, (new locking rings), repair work including wielding and coating, reinstall, and field adjust flap gate for proper fit. At this same time, the contractor fabricated 2 new locking pins and 10 new lifting cables. These 2 locking rings were to replace the ones that were

lost in the most recent gate unlocking event. 4 out of 10 of the new lifting cables were installed on gates 5 & 9, and 6 cables will be ready and available if any of the existing lifting cables need replacement.

TOTAL COST: **$20,650.00**

Structure Operations:

April 15, 2010	9 of 10 gates pinned closed, Gate No. 2 could not be pinned (Joint effort between OCPR, NRCS and USACE)
May 5, 2010	Lifted Gate No. 2, found bent eyelets, pinned closed (performed by Simon and Delany)
May 12, 2016	Removed cofferdams, removed pins, all gates free flapping (performed by Tarpan under NRCS contract)
March 7, 2017	Lifted gates No. 4 & 5 with crane truck, removed board from support bracing on gate no. 5. Board was jammed under gate no. 4 preventing it from closing and gate no. 5 from opening. Board broke locking ring on gate no. 4. (Performed by Simon and Delany with Crane Ceaux)
May 11, 2018	Closed all Flap Gates
September 11, 2018	Opened all Flap Gates
January 16, 2020	Lifted all 10 gates for inspection and found Gate No. 1, 3, 4, 6, 8, & 9 with broken locking rings. Gates No. 6, 7, & 8 have broken welds on stop plates.
July 22, 2021	Lifted all 10 gates for inspection and found Gate No. 1, 3, 6, 8, & 9 with broken locking rings. Gates No. 6, 7, & 8 have broken welds on stop plates.
March 10, 2022	Closed all Flap Gates
May 6, 2022	Opened all Flap Gates
November 29, 2022	Lifted all 10 gates for inspection and found Gates No. 1, 3, 5, 6, 8, & 9 with broken locking rings. In addition, gates 5 and 9 have missing locking rings.

August 21, 2023	Closed all Flap Gates
April 15th, 2024	Opened all Flap Gates
November 12, 2024	Lifted all 10 gates for inspection and found Gates No. 1, 3, 5, 6, 8, & 9 with broken locking rings, but are still able to be locked properly. In addition, gates 5 and 9 have missing locking rings, which will not allow these gates to be locked. Gates No. 6, 7, & 8 have broken welds on stop plates. The lifting cables for Gates 6 & 7 broke while lifting the gates during inspection. Gate No. 10's aluminum block for holding Styrofoam needs to be secured.
January 27th, 2026	Lifted all 10 gates for inspection and found Gates No. 1, 3, 6, 7, & 8 with broken locking rings. But all gates on the structure are still able to be locked properly. Gates No. 6, 7, & 8 have broken welds on stop plates.

V. Inspection Results

Concrete Box Culverts w/ Flap Gates

The flap gates were operating as intended and freely flapping, however, five gates were found to have broken locking rings and/or stop plates that will require repair in the future. Despite the damaged locking rings, all gates on the structure are still capable of being locked in the closed position if necessary. The broken stop plate welds may have resulted from boards, pipes, or other objects being inserted behind the gate arms at the hinge connections in an attempt to hold the gates open. Refer to Appendix B (Gates 1, 3, 6, 7, and 8) and Appendix D (Inspection Report and Notes) for photographs and additional details.

During the inspection, the south lifting cable on Gate No. 6 and the north lifting cable on Gate No. 7 were replaced. In addition, the south lifting cable pin on Gate No. 10 was replaced.

Water levels downstream of the structure were relatively low during this year's inspection, allowing full visibility of the hinge assemblies on all gates. Slight bending was observed in the hinge assemblies of Gates No. 7 and 9, however, this does not appear to affect their operation. The low water level also revealed a pipe lodged in the locking rings mounted to the structure of Gate No. 5, which was removed during the inspection (see Appendix B, Gate 5, Image 5f). The pipe was likely placed by a fisherman as a wedge to keep the gate open and is believed to be the cause of the locking ring damage on this gate, which was repaired in June 2025.

Trash Screen

The trash screens on the east side of the structure were working as intended. The area on the east side was relatively free of debris at the time of inspection. During previous additional visits,

it was found the debris does migrate back into the GIWW as the hydraulics fluctuate. (Photos: Appendix B).

Steel Sheet Pile Bulkhead
The steel sheet pile bulkhead was in good condition. (Photos: Appendix B)

Rock Rip Rap Along Channel
The visible rock rip rap was in good condition. (Photos: Appendix B)

Locking Pins for Flap Gates
The locking pins were used to lock the gates closed in August of 2023 and pulled by the Contractor to re-open the gates on April 15, 2024. The operations Contractor reported no issues with the pins. The locking pins were not visually inspected at the storage location at the Calcasieu Lock.

Newly Installed Staff Gauge
On February 18th, 2026, staff gauges were installed at both the upstream and downstream ends of the structure. These gauges allow for real-time observation of the head differential across the structure, which is useful when performing a sonar flow scan. The discharge calculated from the sonar scan can then be associated with a specific head differential, allowing for improved estimation of flow through the structure. (See Appendix F)

VI. Conclusions and Recommendations

Construction of the Black Bayou Culverts Hydrologic Restoration Project was completed in January 2010; however, due to the issues described in the maintenance history, it was taken out of service roughly six months later and not returned to operation until May 2016. Since 2016, the gates have been locked in the closed position three times due to drought conditions. These closures occurred from May 2018 through September 2018, again in March 2022 through May 2022, and most recently from August 2023 through April 2024. On all occasions, once water levels rose above the target elevation, the flap gates were restored to their free-flapping state without issue.

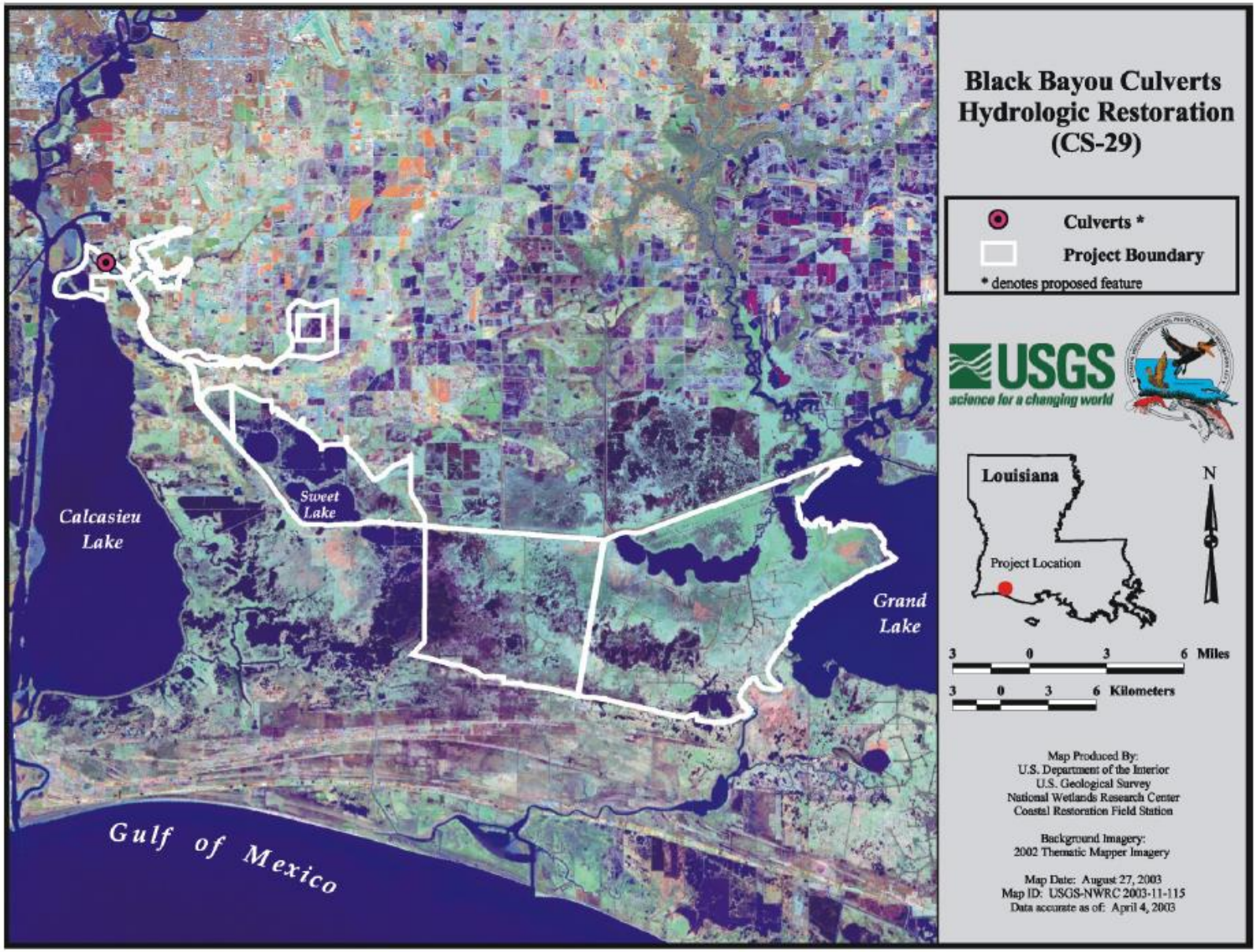
Currently Gates: 1, 3, 4, 6, 8, & 9 have damages to varying degrees. Tampering was a factor in prior damages to Gate No. 4, 5, & 9, the locking rings on all gates remain susceptible to possible vandalism. All 10 gates are still functional and will continue to be monitored for further damage to ensure operation readiness for the next event in which the gates will locked in the closed position.

CPRA does not believe any immediate repair is required for the structure at this time.

Lessons Learned: The use of locking nuts on gates appears to have kept the connections from the gate at anchor rods secure throughout the normal, continuous opening and closing of the gates due to tidal fluctuations.

Appendix A

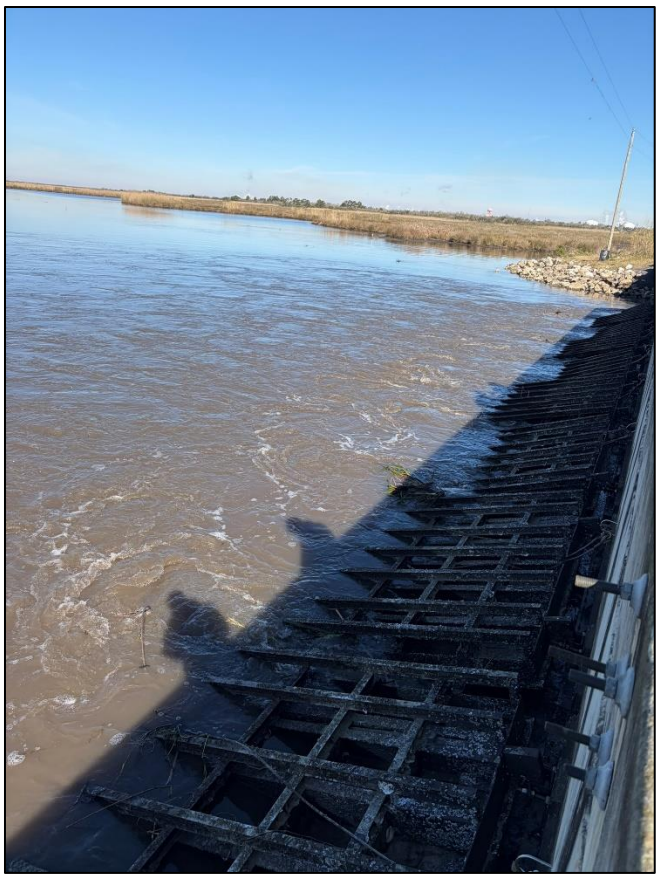
Project Features Map


Black Bayou Culverts
Hydrologic Restoration
(CS-29)
Culverts *
Project Boundary
* denotes proposed feature
USGS
science for a changing world
Louisiana
Project Location
N
3 0 3 6 Miles
3 0 3 6 Kilometers
Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Background Imagery:
2002 Thematic Mapper Imagery
Map Date: August 27, 2003
Map ID: USGS-NWRC 2003-11-115
Data accurate as of: April 4, 2003
Calcasieu Lake
Sweet Lake
Grand Lake
Gulf of Mexico

Appendix B

Photographs

GATE (WEST) AND TRASH RACK (EAST) SIDES OF STRUCTURE



B1. West Side of Structure – Looking North

B2. West Side of Structure – Looking South

B3. West Side of Structure – North Riprap

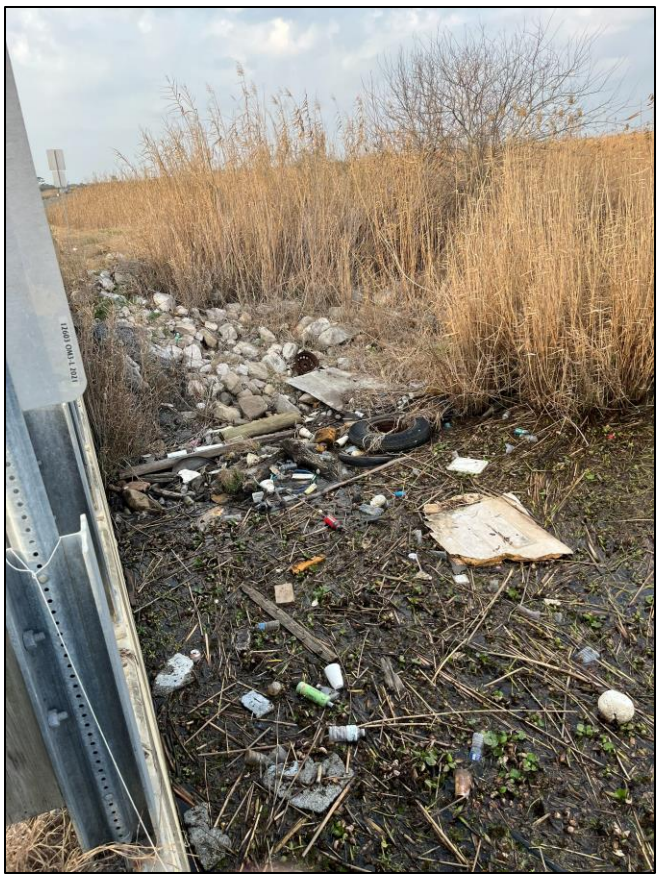
B4. West Side of Structure – South Riprap

B5. West Side of Structure – Navigation Warning Sign

B6. East Side of Structure – Looking North

B7. East Side of Structure – Looking South

B8. East Side of Structure – South Riprap



B9. East Side of Structure – North Riprap

B10. East Side of Structure – Navigation Warning Sign

Appendix C

Three Year Budget Projection

BLACK BAYOU CULVERTS H R/ CS-29 / C.140029.8/ PPL 9

Three-Year Operations & Maintenance Budgets 07/01/2026 - 06/30/2029

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Ivy Thibodeaux	*Ivy Thibodeaux*	*NRCS*	*Ivy Thibodeaux*

	2026/2027 (-17)	2027/2028 (-18)	2028/2029 (-19)	
O&M Inspection & Admin	$ 17,800.00	$ 17,800.00	$ 17,800.00	
State Administration (IDC)	$ 41,780.16	$ 41,780.16	$ 41,780.16	
Admin Notes:	Administer Survey Task & Ops Contract	Administer Channel Maintenance & Ops Contract		
Structure Operation	$ 22,500.00	$ 23,800.00	$ 23,800.00	*based on anticipated opertions*
Federal Administration	$ -	$ -	$ -	

2025/2026 Description: Flapgate repairs, locking ring repairs, traffic control, and debris removal. Survey Channel

E&D and Construction Oversight	$ 12,000.00	*Survey Channel Cost*
Construction	$ 8,000.00	*Note: O&M Contract is used for a portion of this work.*
Sub Total - Maint. And Rehab.	$ 20,000.00	

2026/2027 Description: Channel Maintenance Dredging (20% of original)

E&D and Construction Oversight	$ 45,000.00	
Construction	$ 263,340.00	
Sub Total - Maint. And Rehab.	$ 308,340.00	

2027/2028 Description:

E&D		
Construction		
Sub Total - Maint. And Rehab.	$ -	

	2026/2027 (-17)	2027/2028 (-18)	2028/2029 (-19)
Total O&M Budgets	**$ 102,080.16**	**$ 391,720.16**	**$ 83,380.16**

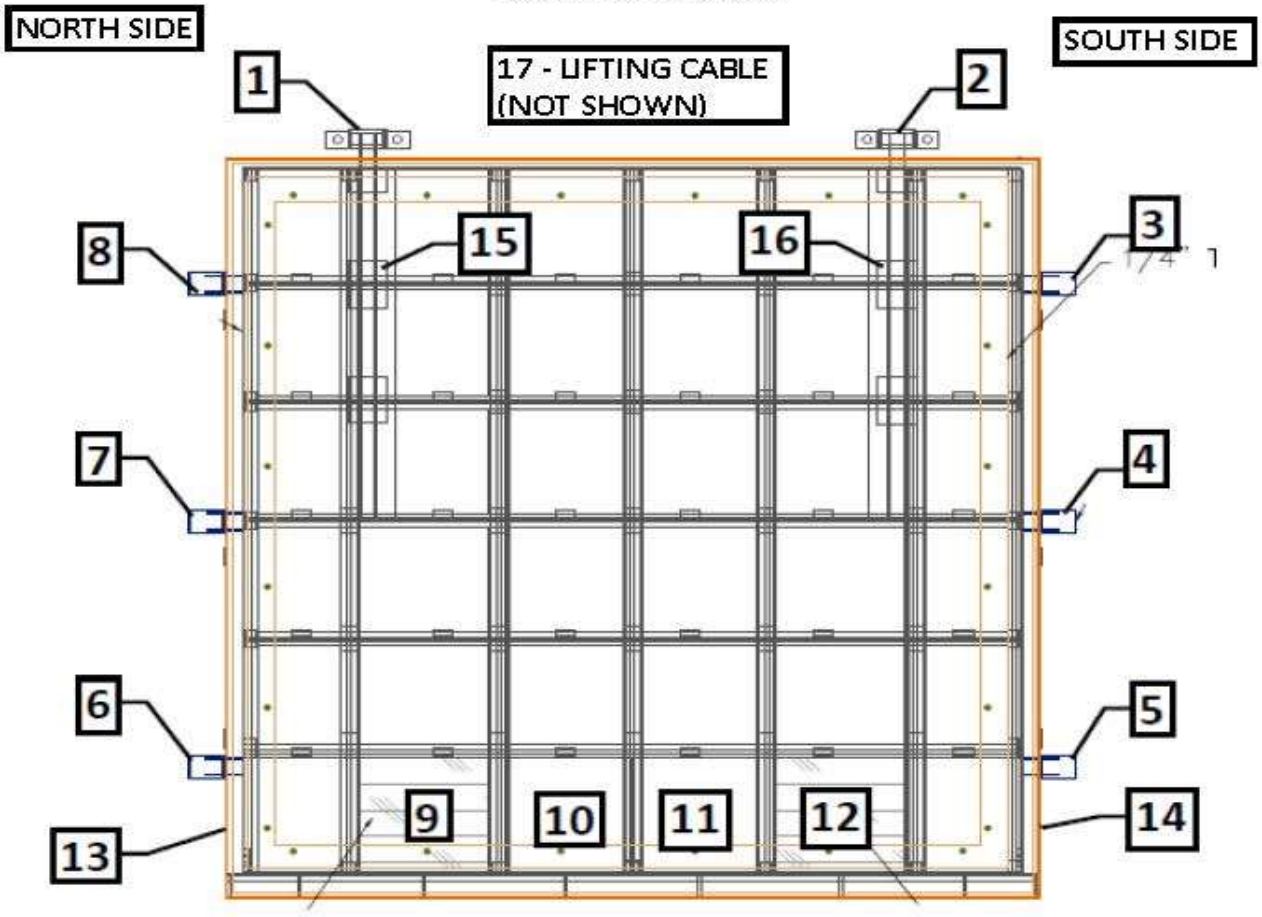
O &M Budget (3 yr Total)	**$**	**577,180.48**
Existing O & M Budget	**$**	**879,984.70**
Remaining O & M Budget (Projected)	**$**	**302,804.22**

per USACE (LANA) report & LAGov (PBEC) Expditures

Appendix D

Field Inspection Form and Inspection Notes

CS-0029 BLACK BAYOU CULVERTS HYDROLOGIC RESTORATION
TYPICAL FLAPGATE AND FRAME INSTALLATION DIAGRAM
CHECKLIST FEATURES TO NOTE FOR O&M FIELD INSPECTION
November 29, 2022



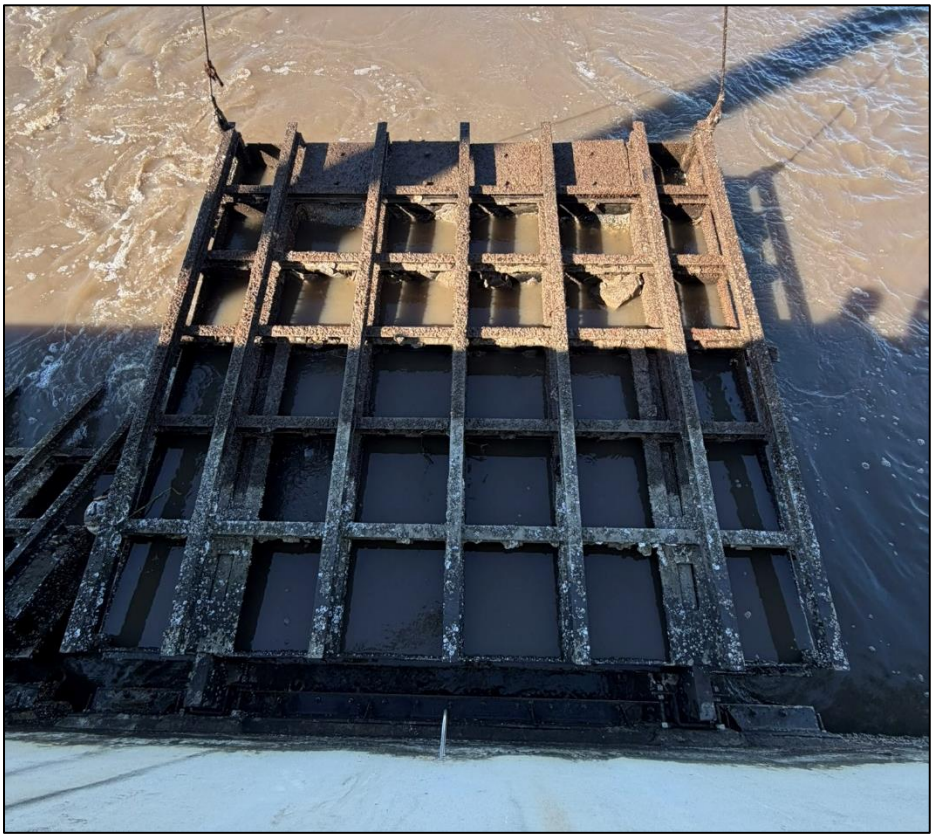
ELEVATION VIEW

EXISTING FLAP GATE (TYPICAL)

GATE NO. 1

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 1

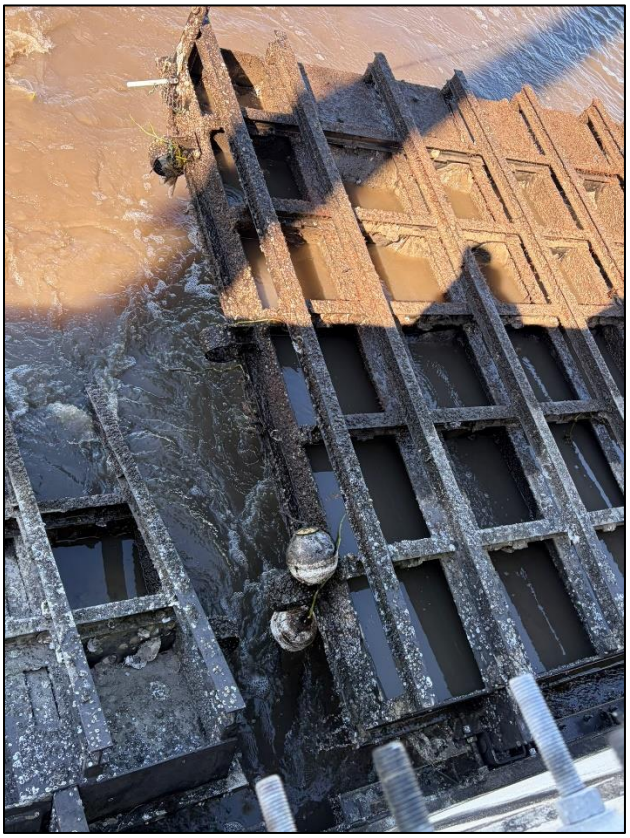
Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)		X	3/4 of this ring is missing
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)	X		
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	With all but one locking ring on the gate intact, barring issues with the rings on the receiver gate frame, there should be no problems locking the gate in the closed position.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E				
F				



1a. Gate No. 1 – Top View of Gate

1b. Gate No. 1 – North side of Gate

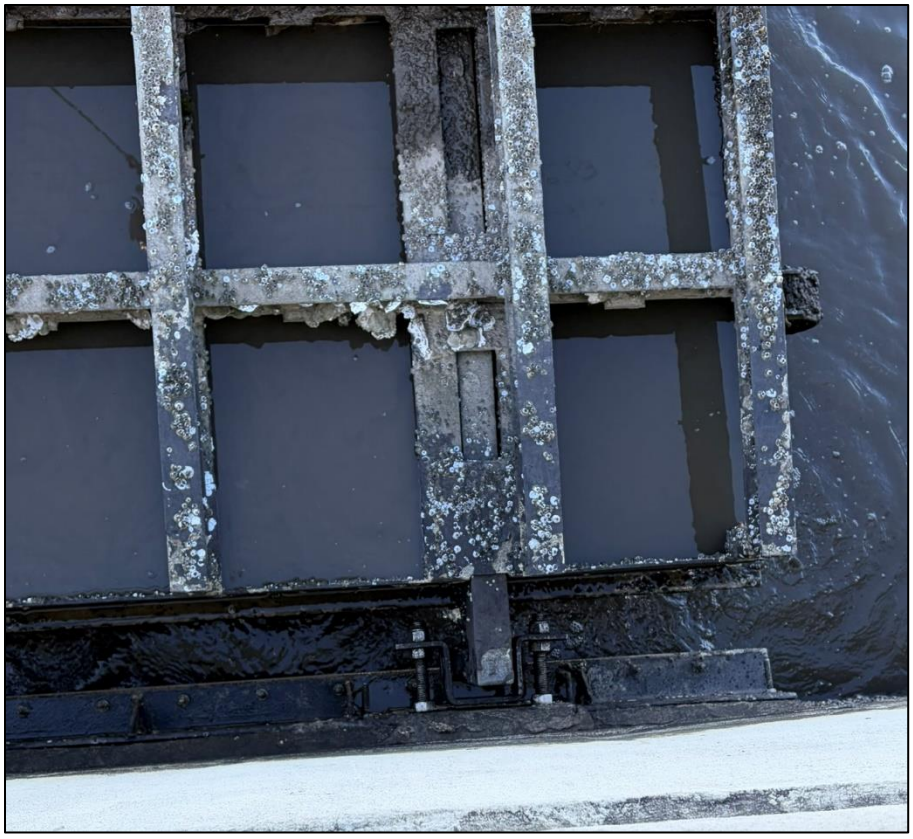
1c. Gate No. 1 – Lifting eye, shackle and cable - North side of Gate



1d. Gate No. 1 – South side of Gate

1e. Gate No. 1 – Lifting eye, shackle and cable - South side of Gate

1f. Gate No. 1 – Hinge Assembly and Stop Plate – South Side



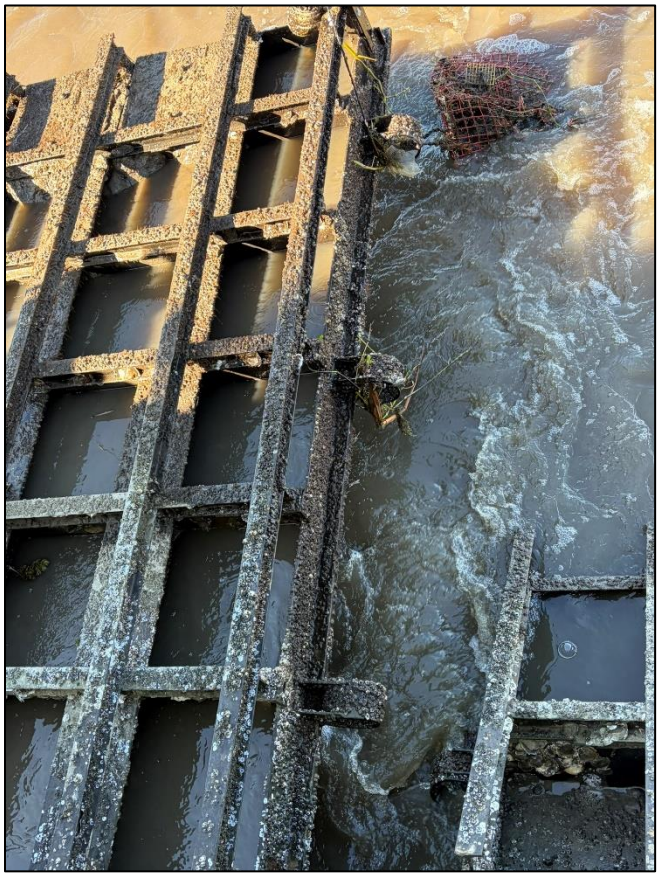
1g. Gate No. 1 – Hinge Assembly and Stop Plate – North Side

GATE NO. 2

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 2

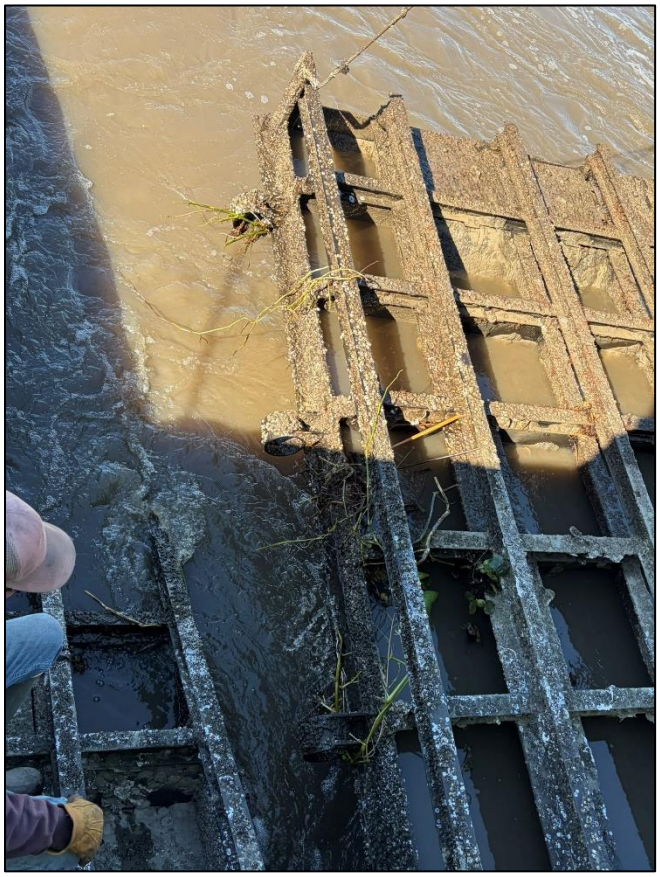
Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)	X		
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	With all the locking rings on the gate intact, barring issues with the rings on the receiving gate frame, there should be no issues locking this gate in the closed position.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E	The pins which connect the cables to the bottom of the gate, do now allow for the cables to swivel when lifting the gate.			
F				

2a. Gate No. 2 – Top View



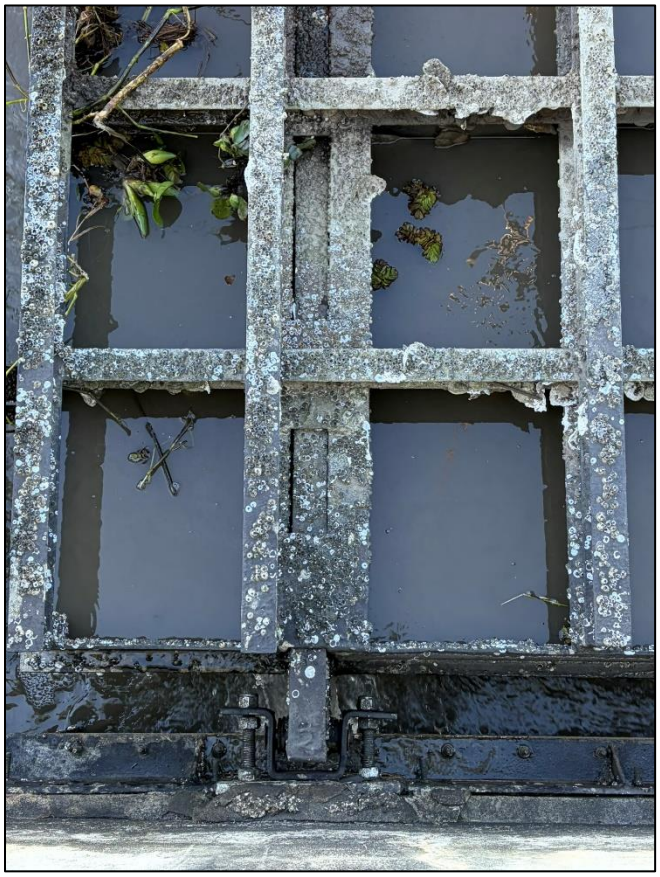
2b. Gate No. 2 – North side of Gate

2c. Gate No. 2 – Lifting eye, shackle and cable - North side of Gate

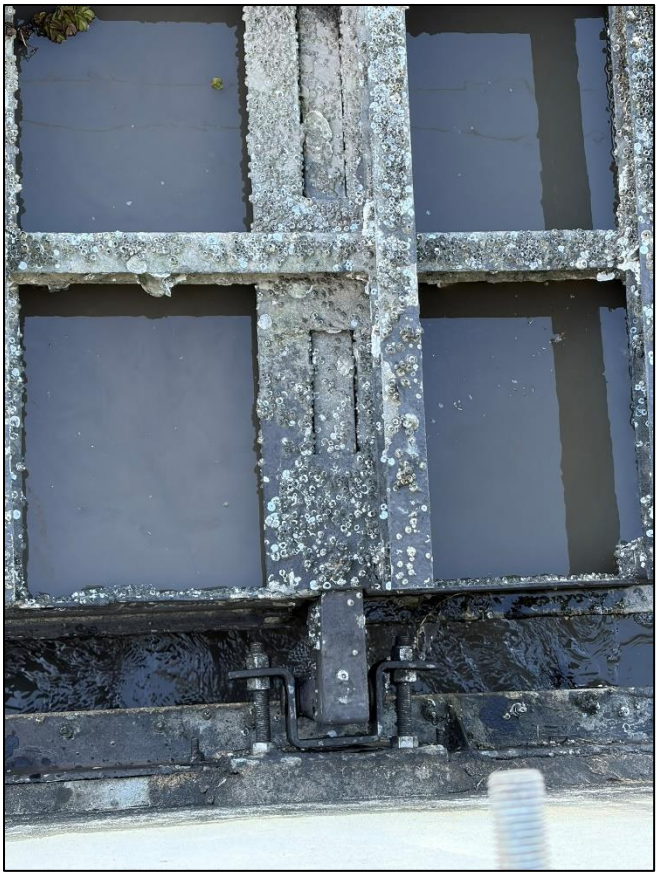


2d. Gate No. 2 – South side of Gate

2e. Gate No. 2 – Lifting eye, shackle and cable - South side of Gate



2f. Gate No. 2 – Hinge Assembly and Stop Plate – South Side



2g. Gate No. 2 – Hinge Assembly and Stop Plate – North Side

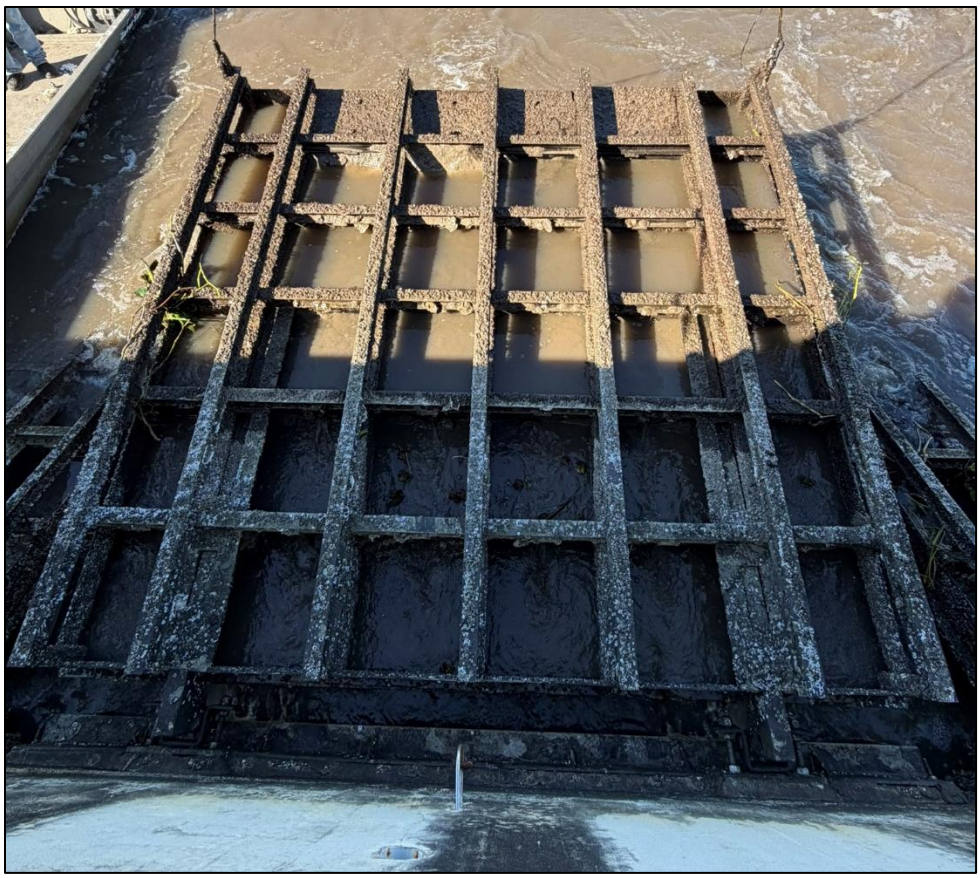
GATE NO. 3

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**

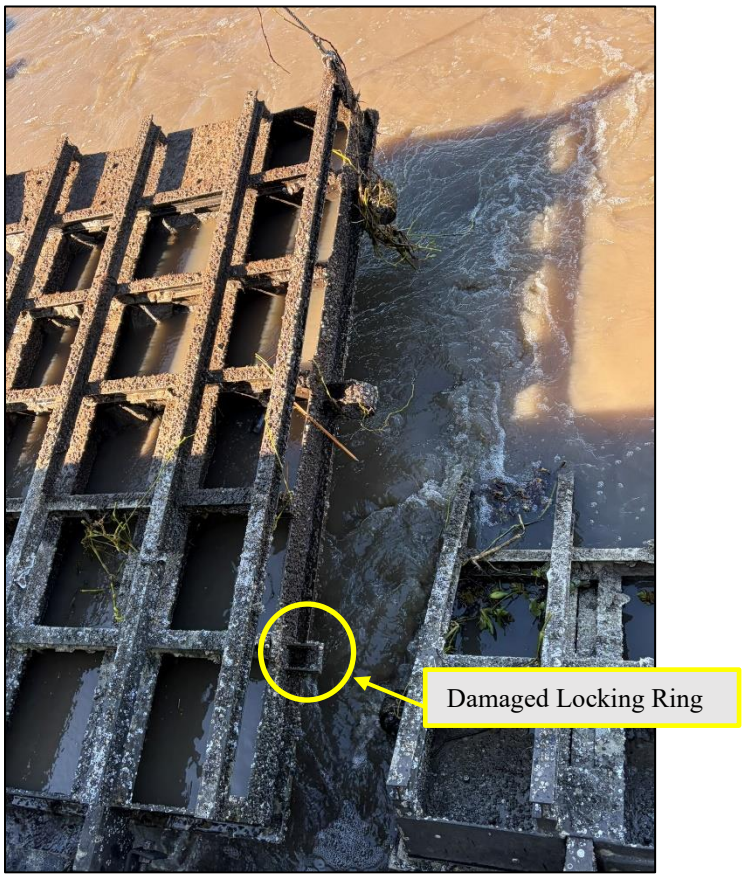
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**

Gate No. 3

Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)		X	Approximately 1/3 of the outer portion of this ring is missing. However the portion remaining should serve to help hold the locking pin in place if deployed.
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)		X	This ring except for the portion welded to the gate frame is missing. As such, it will not provide any support should the locking pins need to be installed.
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)		X	Some flaking of the metal coating apparent. The function of the plate is unaffected.
16	Stop Plate (Right)		X	Some flaking of the metal coating apparent. The function of the plate is unaffected.
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	While one of the lock rings on the gate is totally missing and another partially missing, barring issues with the rings on the gate frame, there should be no problems locking this gate in the closed position. Repair/replacement is not recommended at this time.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E	A shackle was added to the lifting cable in order for lifting cable to reach U-Bolt.			
F				

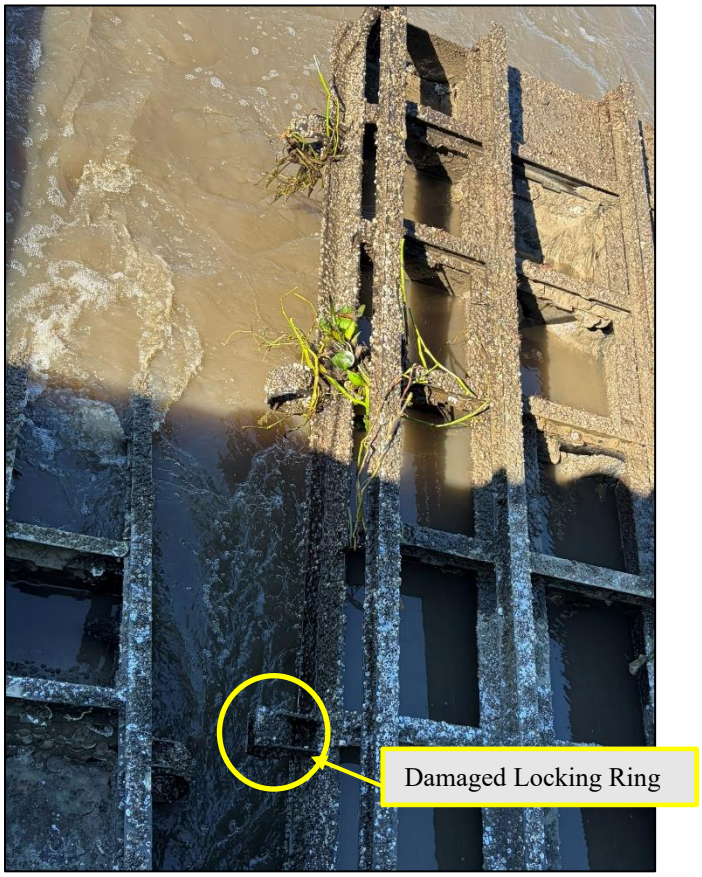


3a. Gate No. 3 – Top View

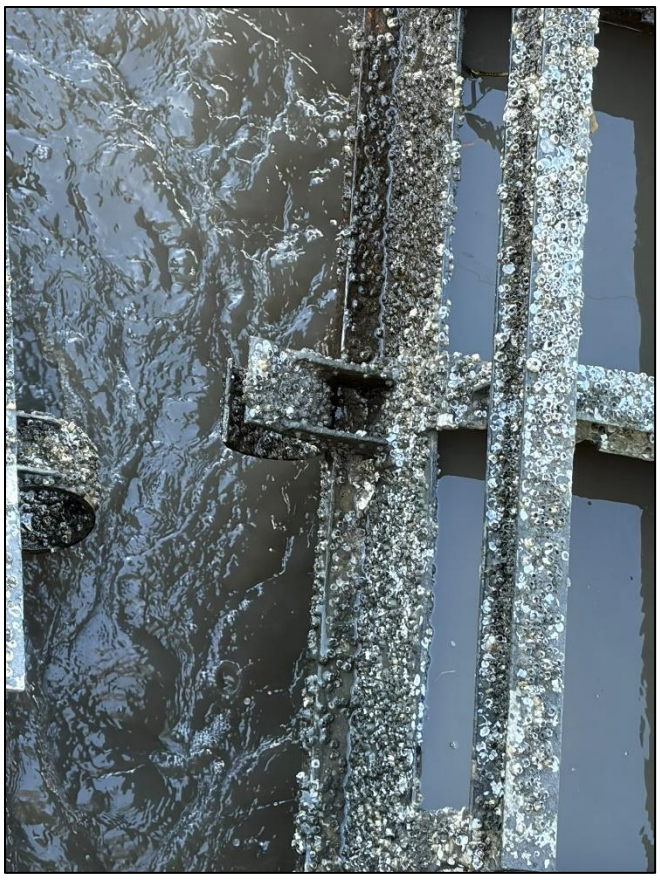


3b. Gate No. 3 – North side of Gate

3c. Gate No. 3 – Lifting eye, shackle and cable - North side of Gate

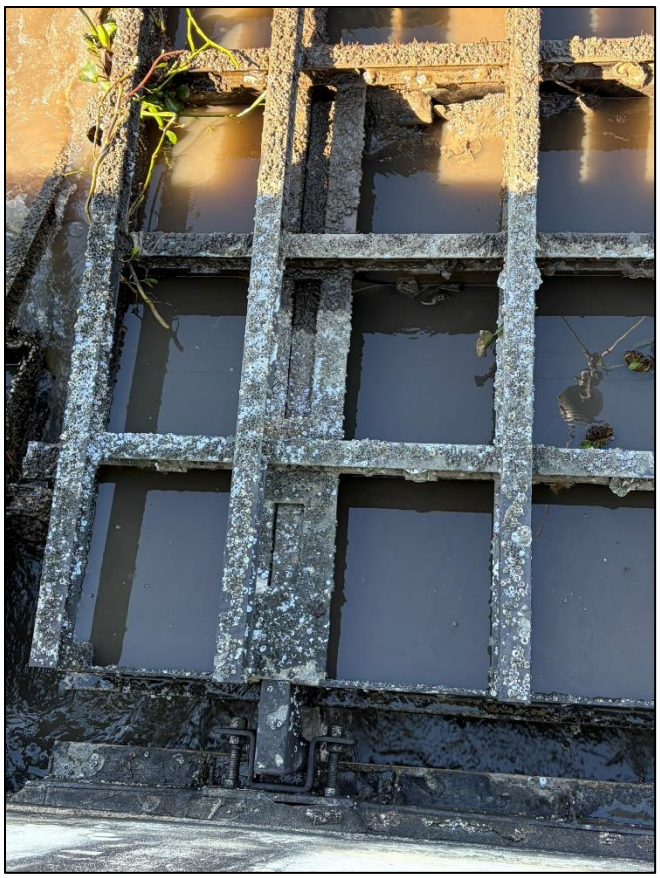


3d. Gate No. 3 – South side of Gate

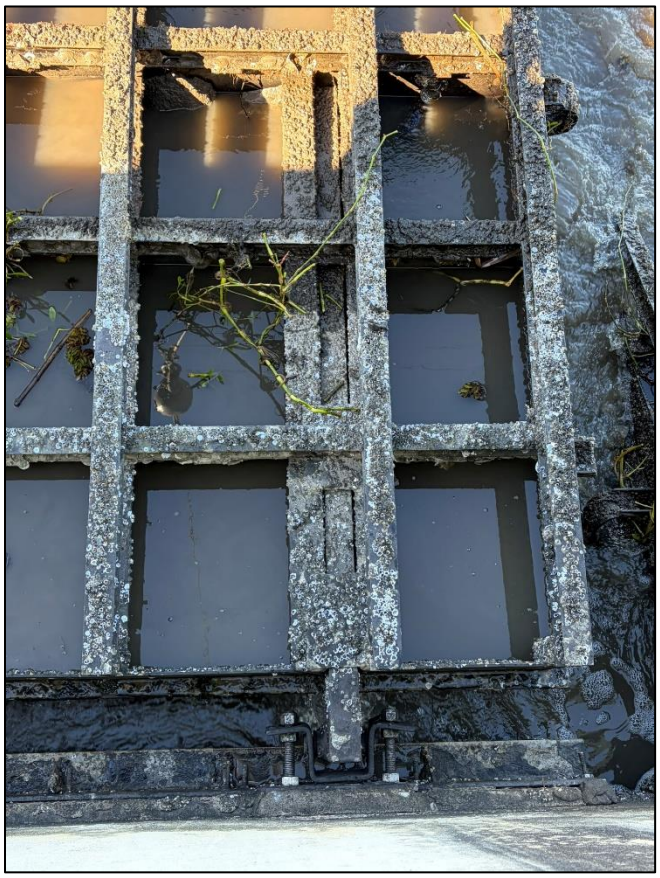


3e. Gate No. 3 – South side of Gate - Damaged Upper Locking Ring

3f. Gate No. 3 – Lifting eye, shackle and cable - South side of Gate



3g. Gate No. 3 – Hinge Assembly and Stop Plate – South Side



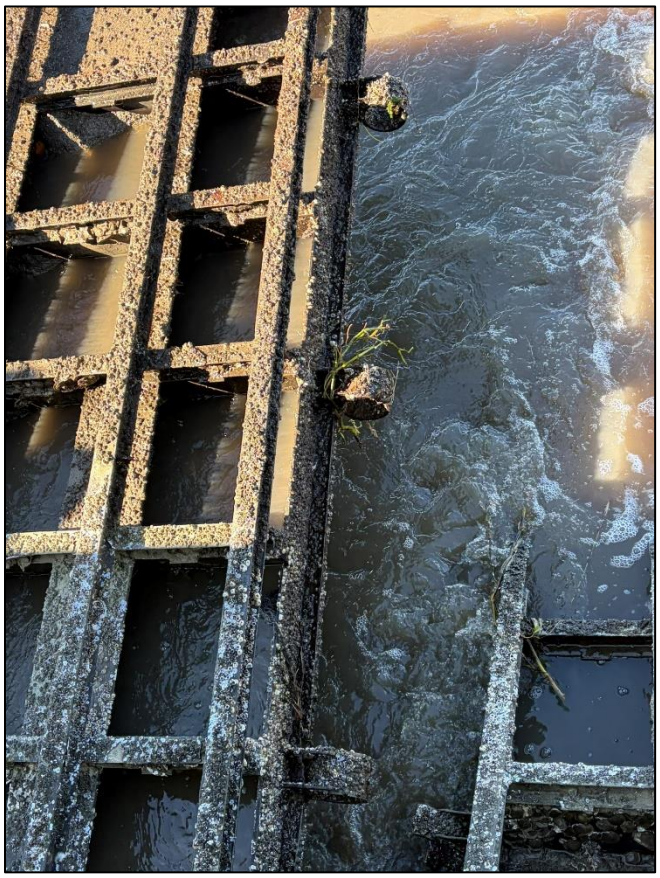
3h. Gate No. 3 – Hinge Assembly and Stop Plate – North Side

GATE NO. 4

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 4

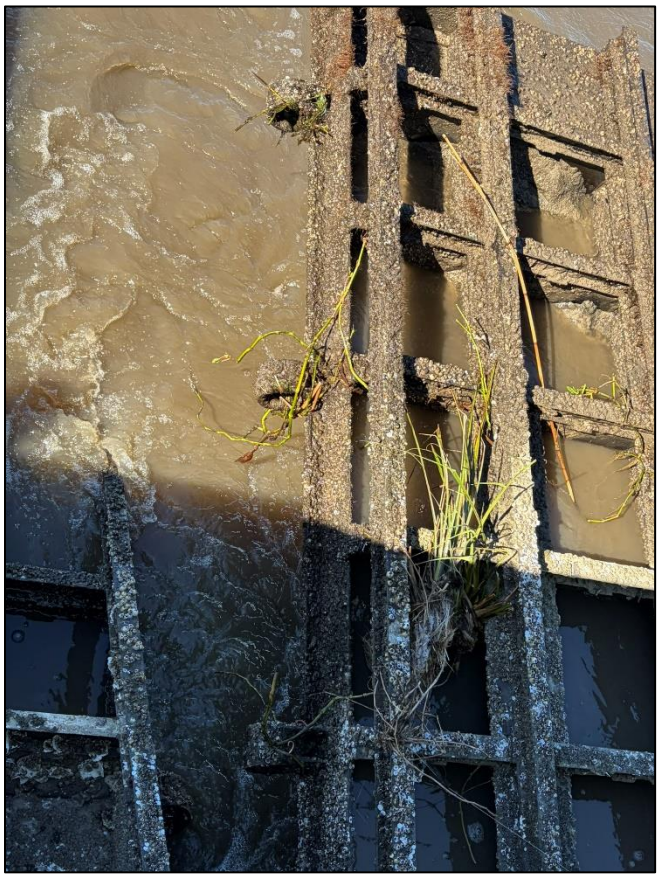
Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)	X		
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	With all the locking rings on the gate intact, barring issues with the rings on the receiving gate frame, there should be no issues locking this gate in the closed position.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E				
F				

4a. Gate No. 4 – Top View



4b. Gate No. 4 – North side of Gate

4c. Gate No. 4 – Lifting eye, shackle and cable - North side of Gate



4d. Gate No. 4 – South side of Gate

4e. Gate No. 4 – Lifting eye, shackle and cable - South side of Gate

4f. Gate No. 4 – Hinge Assembly and Stop Plate – South Side

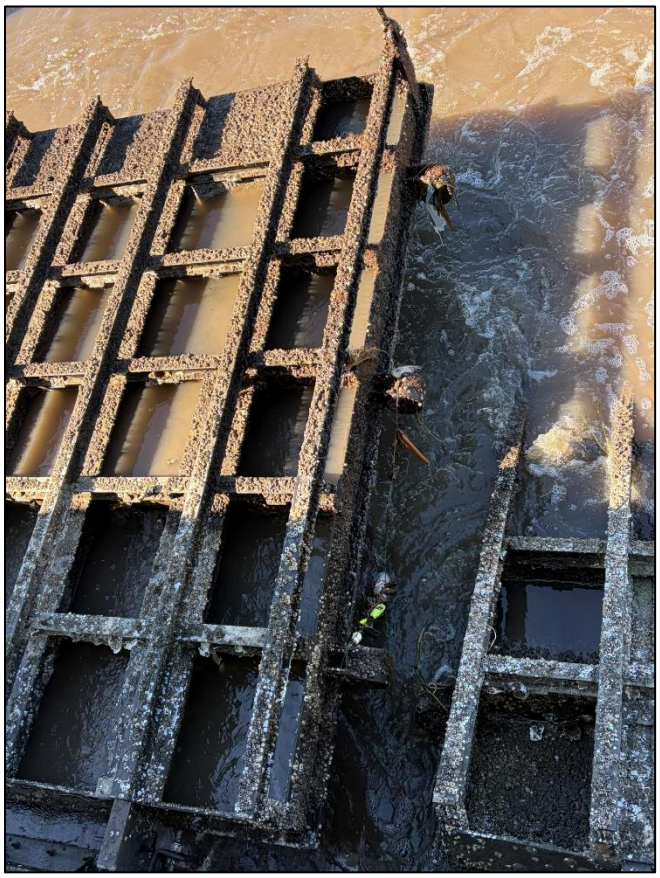
4g. Gate No. 4 – Hinge Assembly and Stop Plate – North Side

GATE NO. 5

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 5

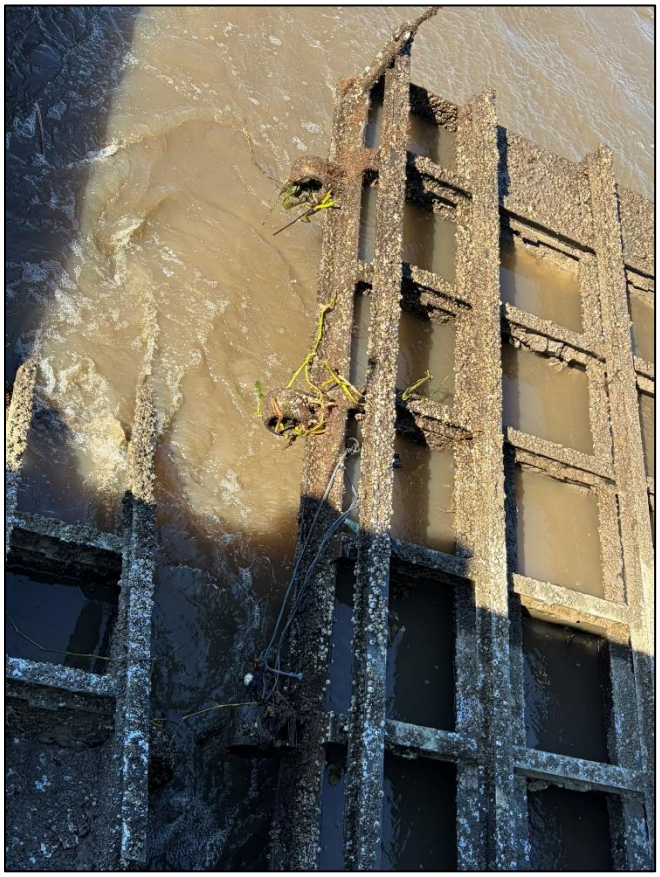
Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)	X		
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	With all the locking rings on the gate intact, barring issues with the rings on the receiving gate frame, there should be no issues locking this gate in the closed position.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E	At the time of inspection, a 10' pole was found inserted through the locking rings on the structure. This suggest the gate was tampered with in attempt to keep the gate in the open position and is the likely cause of the damaged rings on the flapgate. These rings were repaired in June 2025.			
F				

5a. Gate No. 5 – Top View



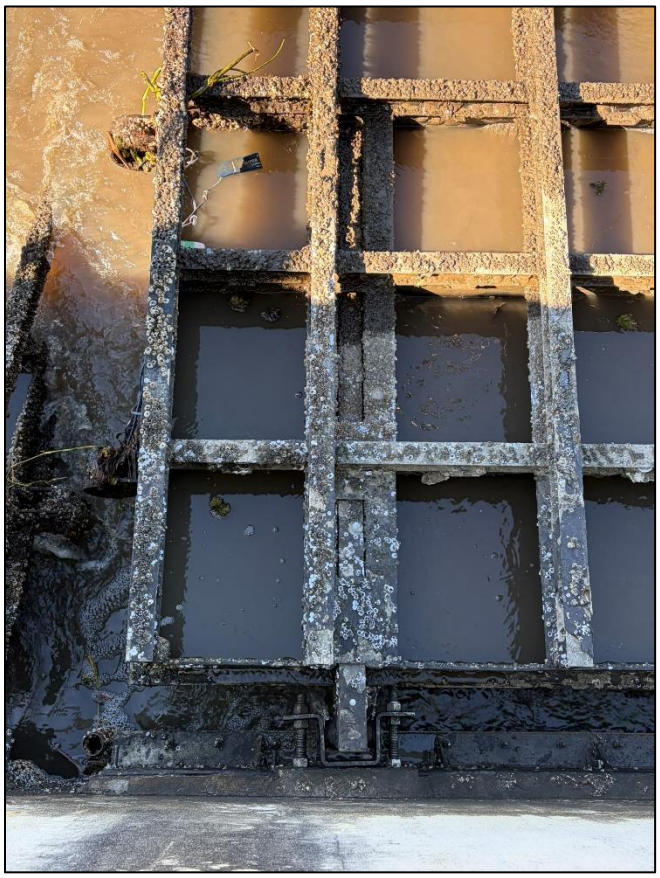
5b. Gate No. 5 – North side of Gate

5c. Gate No. 5 – Lifting eye, shackle and cable - North side of Gate



5d. Gate No. 5 – South side of Gate

5e. Gate No. 5 – Lifting eye, shackle and cable - South side of Gate



5f. Gate No. 5 – Hinge Assembly and Stop Plate – South Side

5g. Gate No. 5 – Hinge Assembly and Stop Plate – North Side

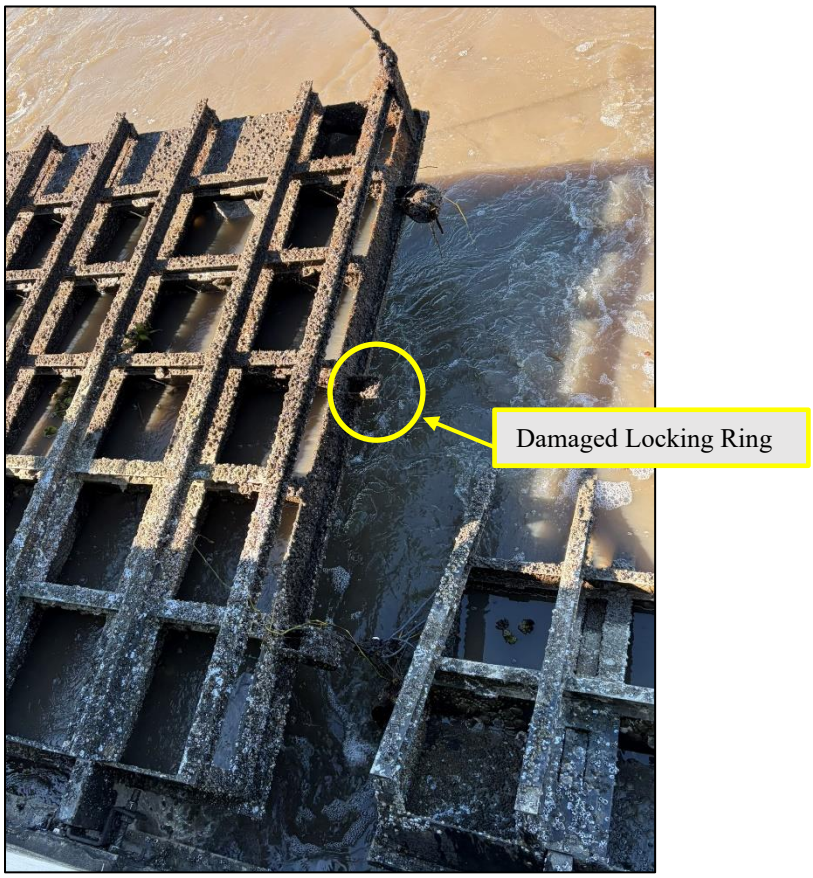
GATE NO. 6

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 6

Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)		X	All but the welded connection to the gate portion of this lock ring is missing.
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)		X	Cracked weld
16	Stop Plate (Right)		X	Cracked weld
17	Lifting Cables	X		Installed New South Lifting Cable

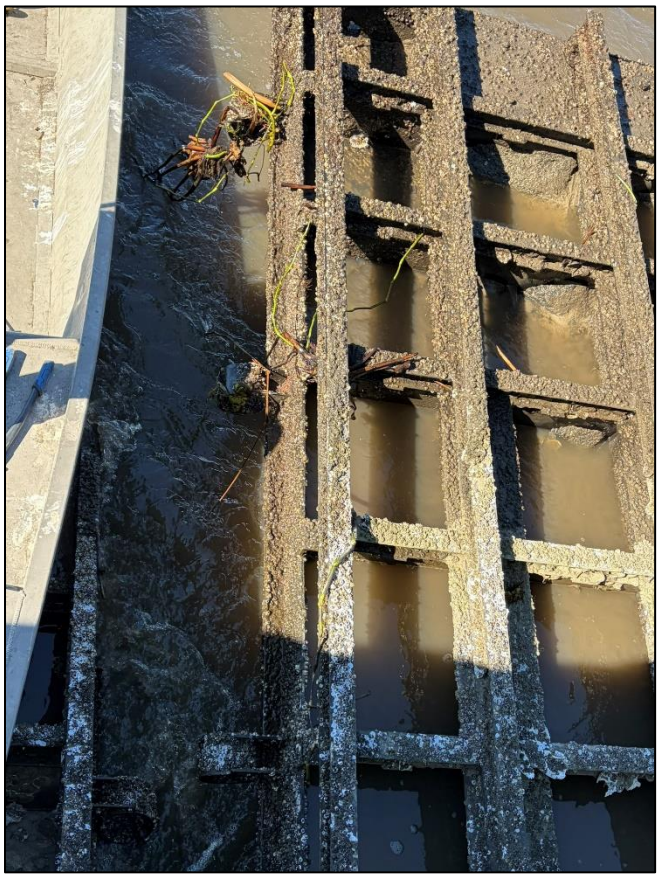
Additional Comments	
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.
B	With all but one locking ring on the gate intact, barring issues with the rings on the receiver gate frame, there should be no problems locking the gate in the closed position. Note that the operations Contractor had trouble locking the gate in the closed position in March of 2022. The locking pin could not be inserted to its full length through the locking rings on the north side of the gate. It's believed that an underwater obstruction may have prevented the proper installation of the locking pin. Repair/replacement is not recommended at this time.
C	Due to the south lifting cable being damaged, a new lifting cable was installed during the inspection.
D	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.
E	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.
F	

6a. Gate No. 6 – Top View



6b. Gate No. 6 – North side of Gate

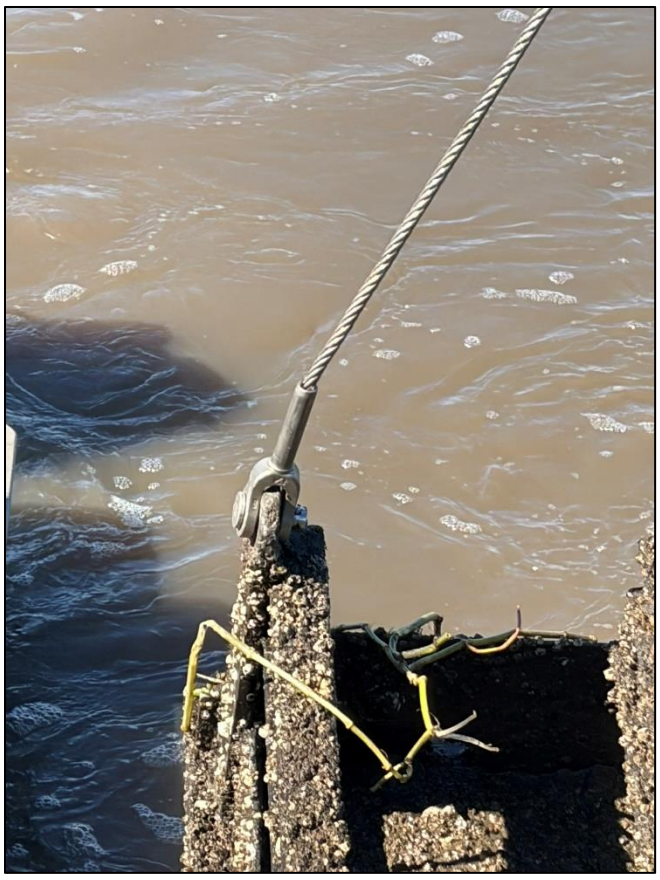
6c. Gate No. 6 – Lifting eye, shackle and cable - North side of Gate



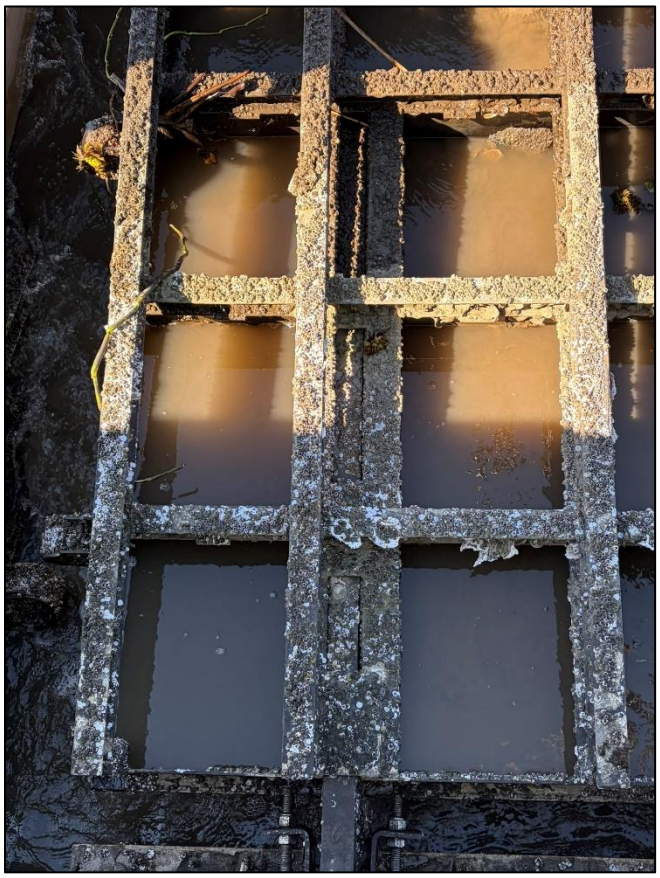
6d. Gate No. 6 – South side of Gate

6e. Gate No. 6 – Old, Damaged Lifting cable. (South Cable)

6f. Gate No. 6 – New Lifting cable. (South Cable)



6g. Gate No. 6 – New Lifting eye, shackle and cable - South side of Gate



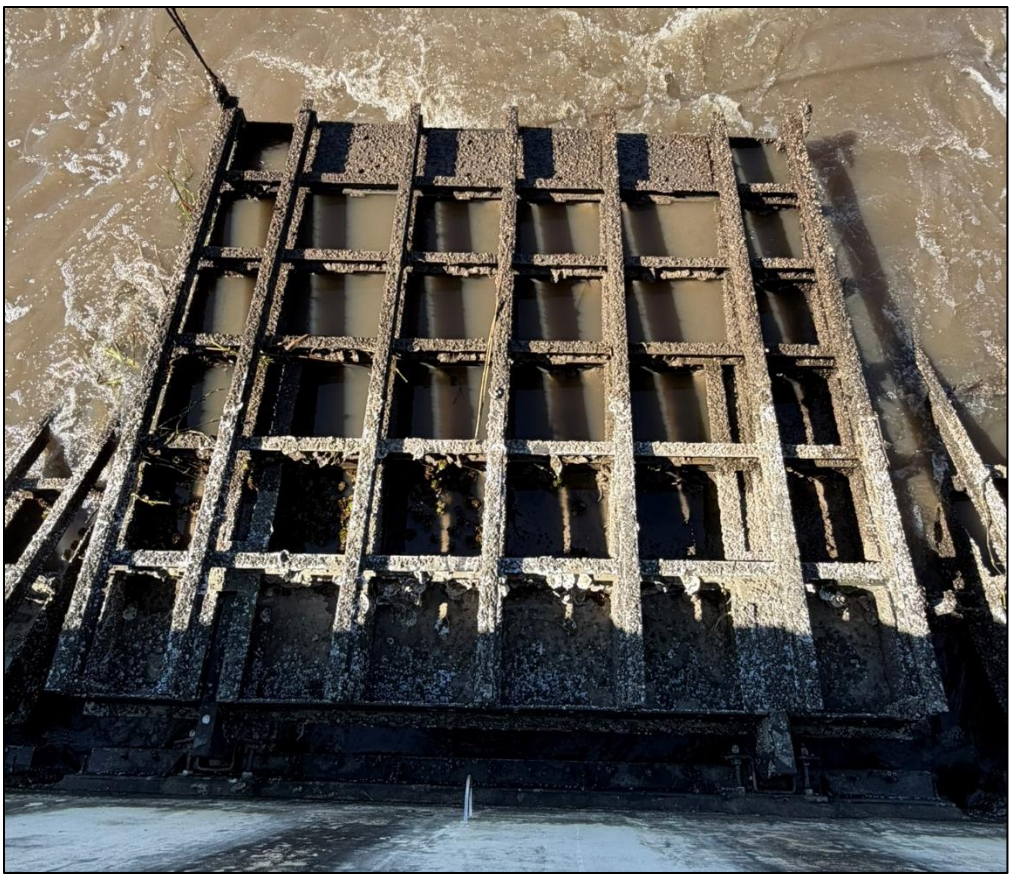
6h. Gate No. 6 – Hinge Assembly and Stop Plate – South Side

6i. Gate No. 6 – Hinge Assembly and Stop Plate – North Side

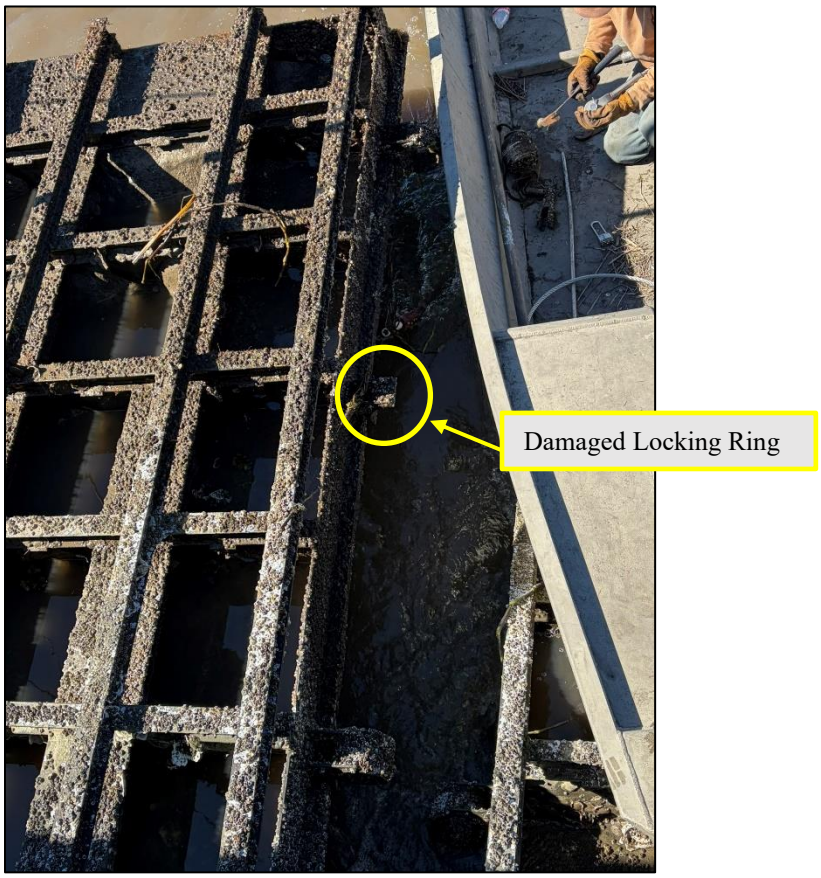
GATE NO. 7

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 7

Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)		X	Bent
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)		X	This ring except for the portion welded to the gate frame is missing. As such, it will not provide any support should the locking pins need to be installed.
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)		X	Missing
17	Lifting Cables	X		Installed New North Lifting Cable
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	While one of the lock rings on the gate is totally missing and another partially missing, barring issues with the rings on the gate frame, there should be no problems locking this gate in the closed position. Repair/replacement is not recommended at this time.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E	Due to the north lifting cable being damaged, a new lifting cable was installed during the inspection.			
F				



7a. Gate No. 7 – Top View



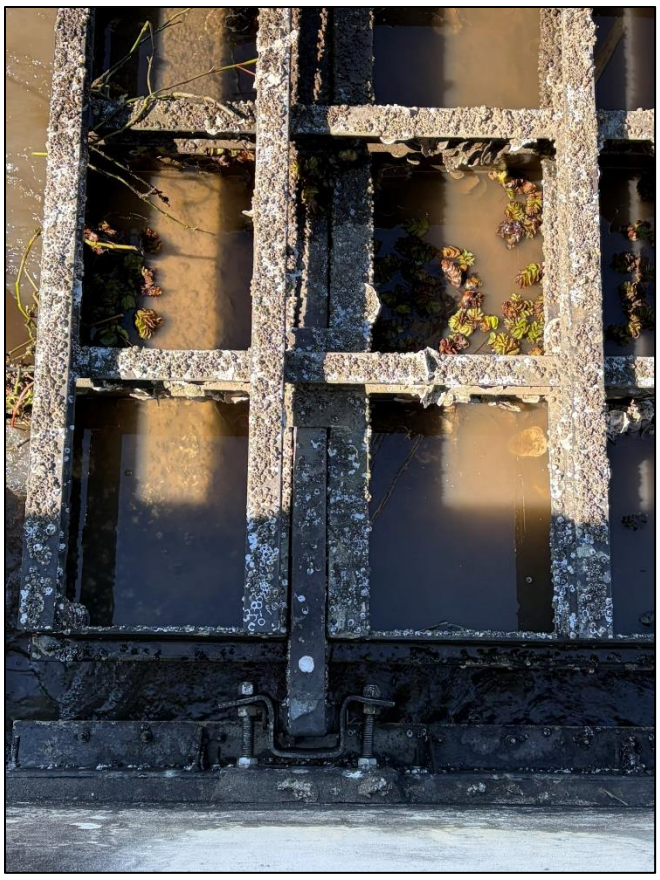
7b. Gate No. 7 – North side of Gate

7c. Gate No. 7 – Lifting eye, shackle and cable - North side of Gate. Broken Cable

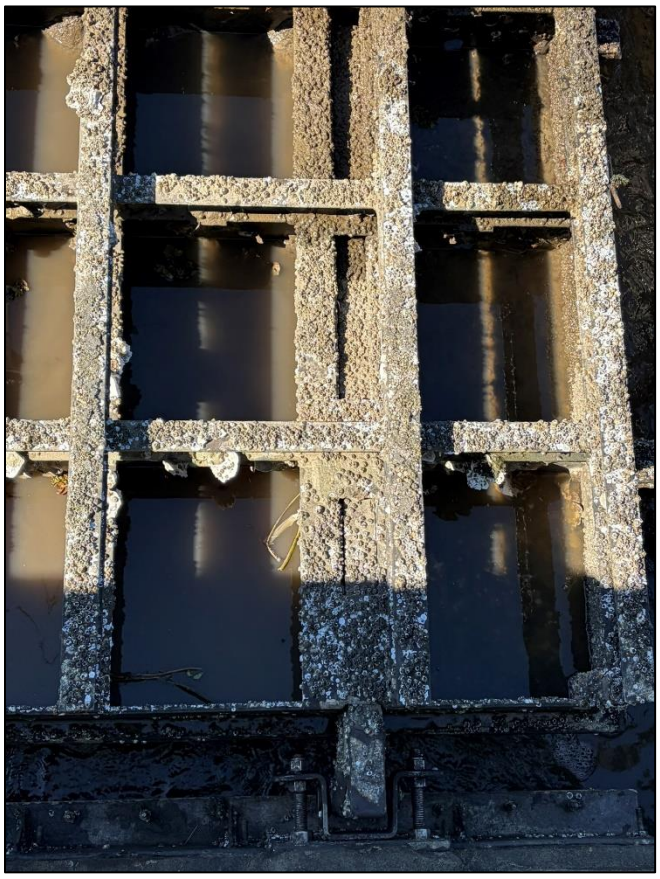
7d. Gate No. 7 – New Cable Installed

7e. Gate No. 7 – South side of Gate

7f. Gate No. 7 – Lifting eye, shackle and cable - South side of Gate



7g. Gate No. 7 – Hinge Assembly and Stop Plate – South Side



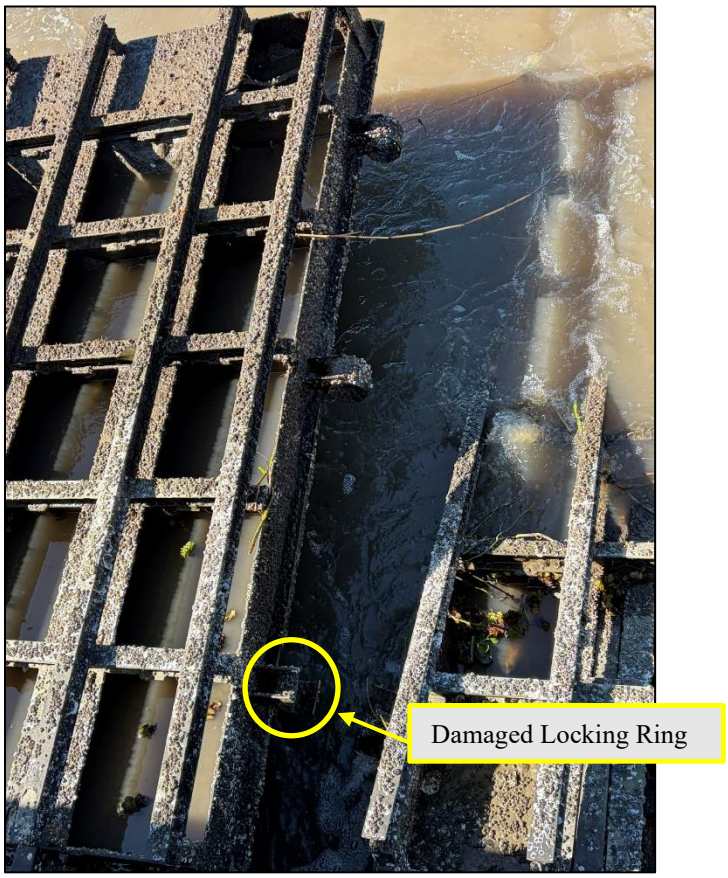
7h. Gate No. 7 – Hinge Assembly and Stop Plate – North Side

GATE NO. 8

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 8

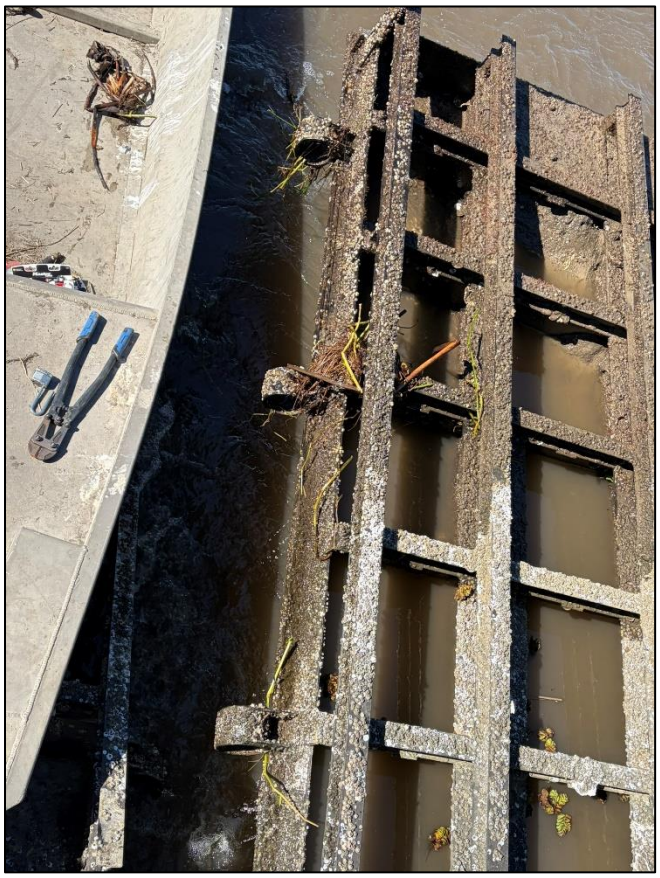
Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)		X	Approximately 1/3 of the outer portion of this ring is missing. However the portion remaining should serve to help hold the locking pin in place if deployed.
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)		X	Cracked weld
16	Stop Plate (Right)		X	Cracked weld
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	With all but one locking ring on the gate intact, barring issues with the rings on the receiver gate frame, there should be no problems locking the gate in the closed position. Repair/replacement is not recommended at this time.			
C	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
D	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
E				
F				

8a. Gate No. 8 – Top View



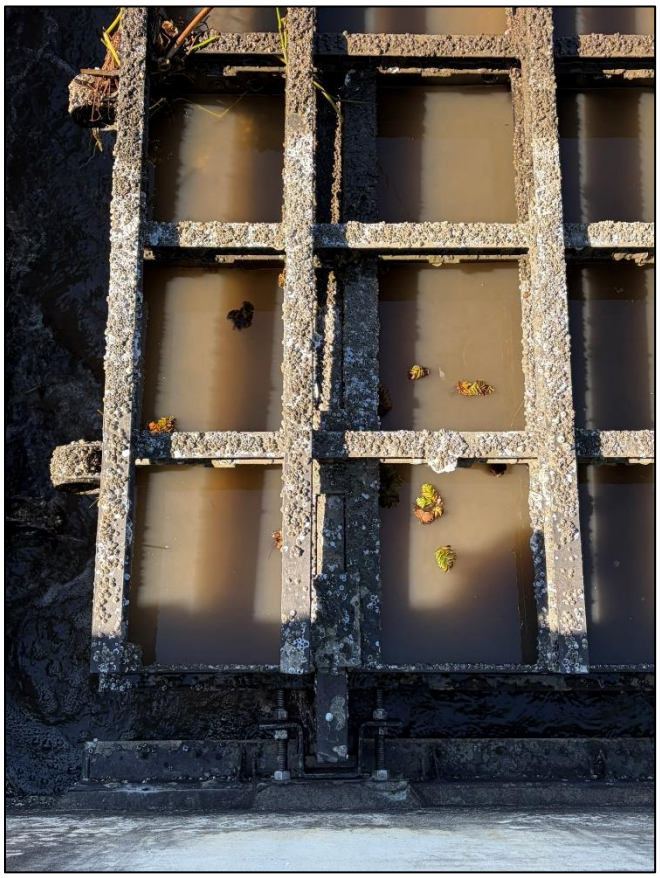
8b. Gate No. 8 – North side of Gate

8c. Gate No. 8 – Lifting eye, shackle and cable - North side of Gate.



8d. Gate No. 8 – South side of Gate

8e. Gate No. 8 – Lifting eye, shackle and cable - South side of Gate



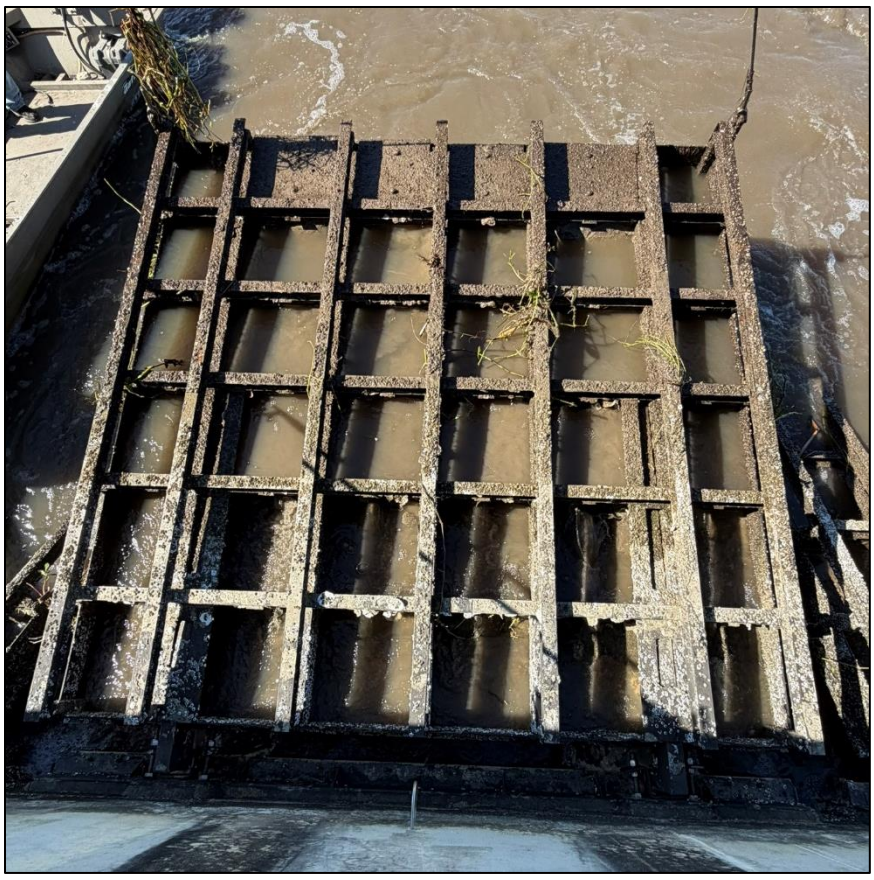
8f. Gate No. 8 – Hinge Assembly and Stop Plate – South Side

8g. Gate No. 8 – Hinge Assembly and Stop Plate – North Side

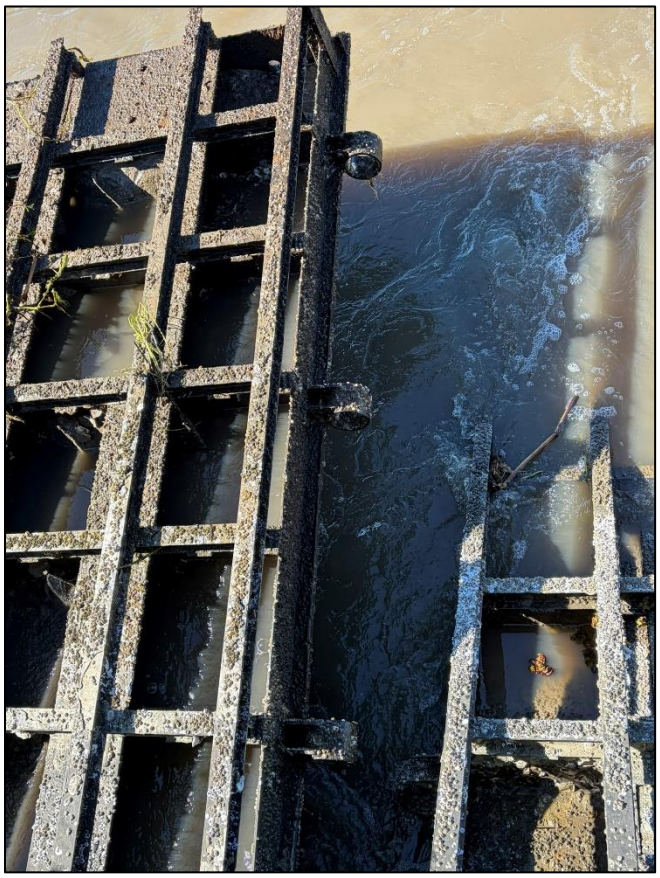
GATE NO. 9

Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 9

Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)		X	Bent
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)	X		
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
C				
D				
E				
F				

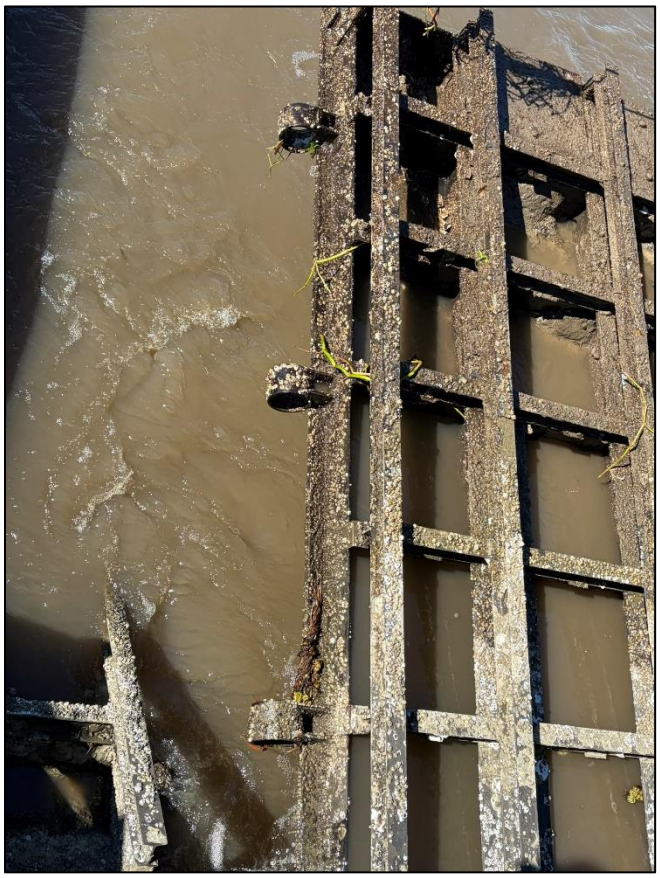


9a. Gate No. 9 – Top View

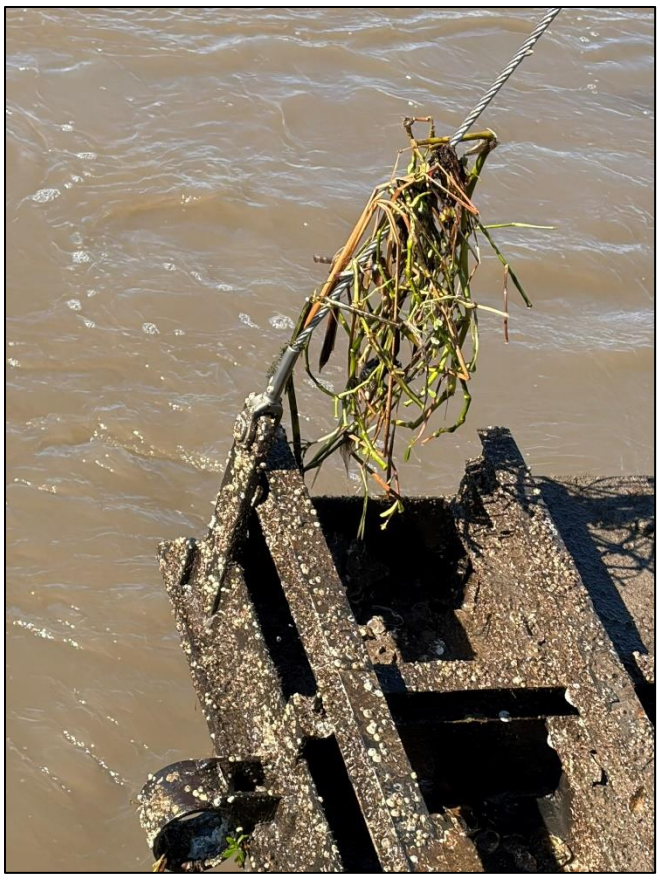


9b. Gate No. 9 – North side of Gate

9c. Gate No. 9 – Lifting eye, shackle and cable - North side of Gate.



9d. Gate No. 9 – South side of Gate



9e. Gate No. 9 – Lifting eye, shackle and cable - South side of Gate

9f. Gate No. 9 – Hinge Assembly and Stop Plate – South Side

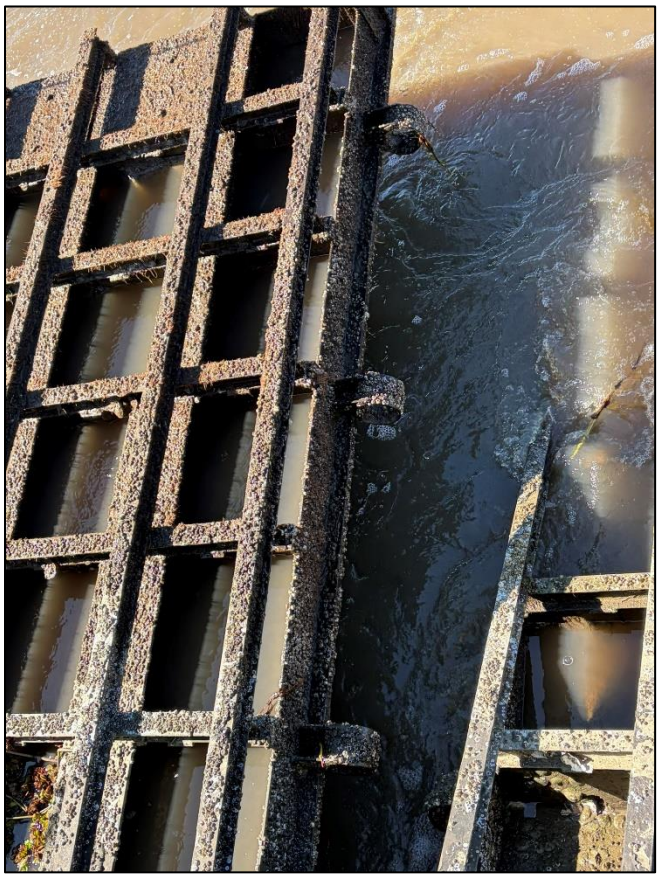
9g. Gate No. 9 – Hinge Assembly and Stop Plate – North Side

GATE NO. 10

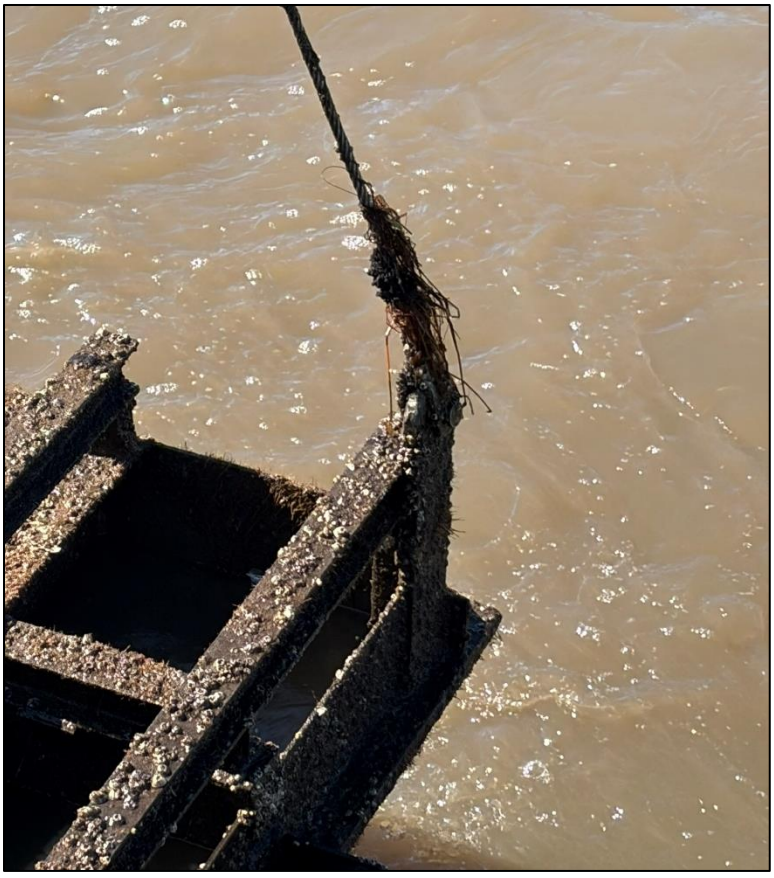
Date: 01/27/26 **CS-0029 Black Bayou Culverts Hydrologic Restoration Project**
By: I. Thibodeaux, P.E. **Flap Gate Inspection Summary**
Gate No. 10

Feature No.	Description	Intact	Damaged	Comments
Flap Gate Features				
1	Hinge Assembly (Left)	X		
2	Hinge Assembly (Right)	X		
3	Flap Gate Lock Ring, Upper (Rt.)	X		
4	Flap Gate Lock Ring, Middle(Rt.)	X		
5	Flap Gate Lock Ring, Lower (Rt.)	X		
6	Flap Gate Lock Ring, Lower (Lt.)	X		
7	Flap Gate Lock Ring, Middle (Lt.)	X		
8	Flap Gate Lock Ring, Upper (Lt.)	X		
9a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
9b	Styrofoam Floatation Block	X		
10a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
10b	Styrofoam Floatation Block	X		
11a	Aluminum Plate for Retaining Styrofoam Floatation Block		X	Aluminum Plate is damaged. Not sitting flush with gate.
11b	Styrofoam Floatation Block	X		
12a	Aluminum Plate for Retaining Styrofoam Floatation Block	X		
12b	Styrofoam Floatation Block	X		
13	Aluminum Angle (Lt.)	X		
14	Aluminum Angle (Rt.)	X		
15	Stop Plate (Left)	X		
16	Stop Plate (Right)	X		
17	Lifting Cables	X		
Additional Comments				
A	Water levels in the channel did not allow for visual inspection of the locking rings attached to the gate frames.			
B	With all the lock rings on the gate intact, barring issues with the rings on the receiving gate frame, there should be no issues locking this gate in the closed position.			
C	A new shackle pin was installed on the south lifting cable.			
D	A new padlock was installed through the shackle of the lifting cables once the gate was lowered.			
E	Observed an increase in the growth of marine vegetation on the gate surface from that observed during last year's inspection.			
F				

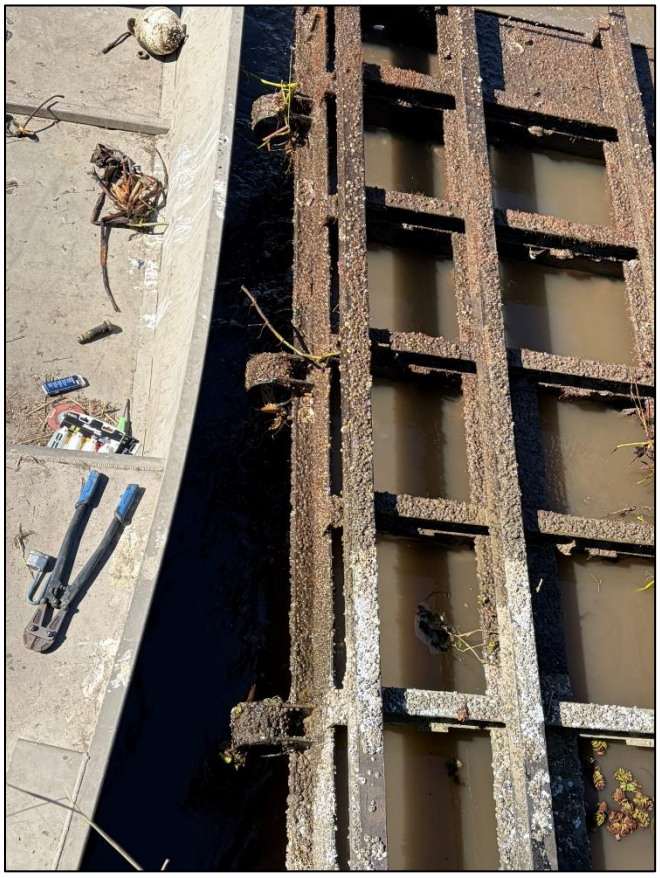
10a. Gate No. 10 – Top View



10b. Gate No. 10 – North side of Gate



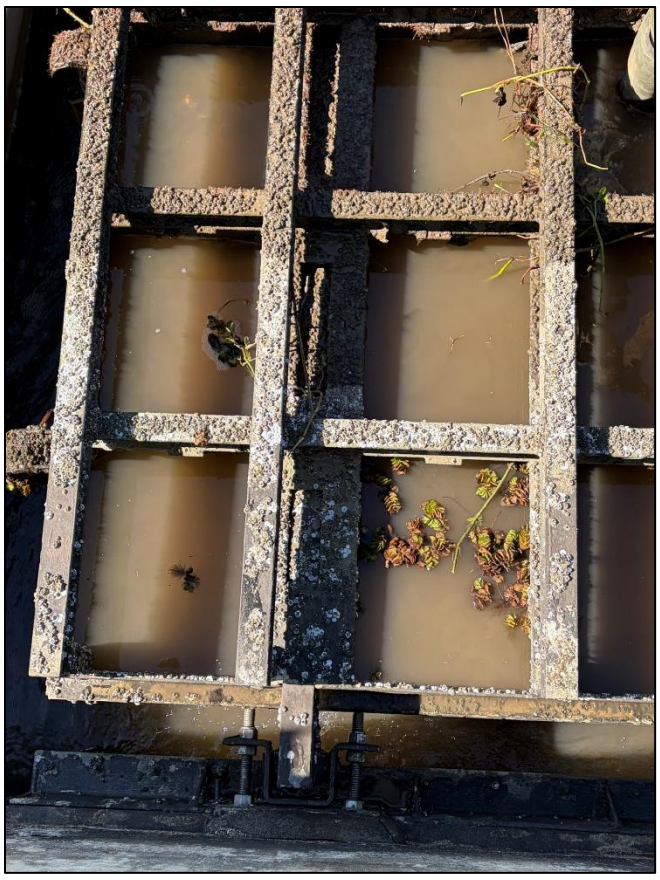
10c. Gate No. 10 – Lifting eye, shackle and cable - North side of Gate.



10d. Gate No. 10 – South side of Gate

10e. Gate No. 10 – Lifting eye, shackle and cable - South side. Old Pin

10f. Gate No. 10 –South Side of Gate - New Pin



10g. Gate No. 10 – Hinge Assembly and Stop Plate – South Side

10h. Gate No. 10 – Hinge Assembly and Stop Plate – North Side

Appendix E

Water Management Plan/Operations

CS-29 BLACK BAYOU CULVERTS HYDROLOGIC RESTORATION

WATER MANAGEMENT PLAN/OPERATIONAL SCHEDULE
PROPOSED WATER CONTROL STRUCTURE IN THE
BLACK BAYOU AREA
CALCASIEU PARISH, LOUISIANA

With the construction of Louisiana Highway 384, the Black Bayou drainage path to the Calcasieu River was effectively blocked. In conjunction with the poor water relief offered by the Calcasieu Lock, the barrier created in Black Bayou has hindered the release of flood waters from the Mermentau Basin. Coupled with upstream drainage improvements, clearing of adjacent lands, subsidence, and relative sea level rise, the area is experiencing even longer periods of inundation from flood waters.

This project would re-open Black Bayou and alleviate some of the high water levels in the Mermentau Basin, as well as reduce water velocities through the Calcasieu Lock resulting in safer navigation. The removal of excess water in this area would allow an increase in emergent vegetation, while decreasing stresses on existing vegetation. The proposed flap gated structure would also maintain the deterrence of saltwater intrusion from the Calcasieu River.

Elevation observations in the marshes located near the project site revealed that the average mud line elevations were approximately +0.8 feet NAVD88. The top of the marsh plant root crown mass ranged in elevation from +0.9 feet NAVD88 to +1.2 feet NAVD88 (survey data as per On Target Surveying, Inc. and referenced in the 'Hydrologic Investigation of the Louisiana Chenier Plain' report dated October 2002). The applicant proposes to allow the structure to operate without human intervention, i.e. flap gates operating without restriction, unless the water level upstream of the structure reaches the previously stated average mud line elevation (+0.8 feet NAVD88). If this condition occurs, flow through the structure would be eliminated by manually locking closed the flap gates. A tide gauge referenced to the NAVD88 datum will be maintained upstream of the structure and the water surface elevation at this gauge will be used to determine the appropriate time for restriction of flow through the structure. The structure will remain closed until the water surface elevation at the gauge is +1.0 feet NAVD88; at which time the pins will be removed from the flap gates and the structure will be allowed to operate as designed.

STRUCTURE OPERATION SCHEDULE:

DATE	WATER LEVEL	STRUCTURE OPERATION
Jan. 1 – Dec. 31	above +0.8 ft*	Normal operation, i.e. unrestricted flap gates
Jan. 1 – Dec. 31	below +0.8 ft*	Structure closed, i.e. no flow through structure

*In the event that the water level upstream of the structure drops below +0.8 ft NAVD88 the flap gates will be closed in order to eliminate flow through the structure. After such an event, the structure will remain closed until the water level increases to +1.0 ft NAVD88, at which time the flap gate restriction will be removed and the structure will operate as designed.

5/7/2004

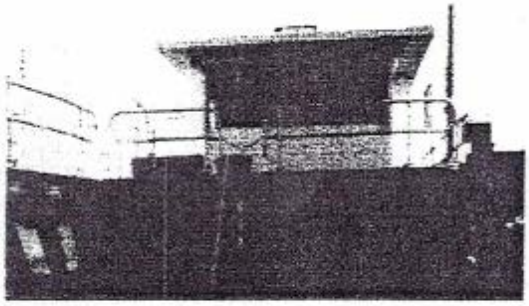
Note: The Calcasieu Lock East Gauge is used for water level monitoring within the project area. The Data Sheet to convert from the USACE gauge in MLG to the operation elevations in NAVD88 of the water management plan is included in this appendix.

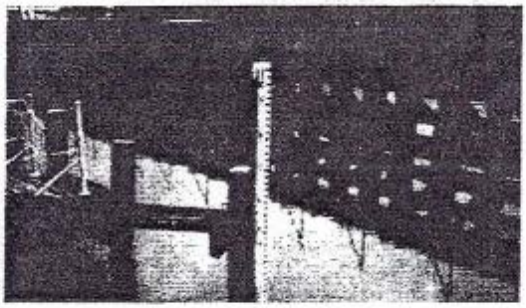

USACE
Calcasieu Lock
Calcasieu Ship Channel
Bazile Rd
Calcasieu Lock East Gauge
Calcasieu Locks Rd
GIWW
Hwy 384
384
CS-29 Black Bayou
Culverts Structure
Black Bayou
© 2016 Google
Tour Guide
1998
Imagery Date: 3/13/2017 30°04'55.60" N 93°17'16.69" W

Calcasieu Locks Gauge Data Sheet (2005) in NAVD88
Conversion from MLG to NAVD88 – Subtract 1.293ft

VICINITY MAP

Reproduced from USC&GS "MOSS LAKE" Quadrangle





WEST
STAFF GAUGE 3
(EXISTING)

Adjusted NAD 83 (1992) Geodetic Position (RTK)
Lat. 30°05'19.78129" N
Long. 93°17'41.39782" W

Adjusted NAD 1983 Datum(1992)
LSZ (1702) Feet (RTK)
N = 583,105.13
E = 2,660,539.46

Elevation of 7.0 foot mark on
Gauge No. 3(NAVD 88) (Feet) (RTK)
Elevation = + 5.707

EAST
STAFF GAUGE 4
(EXISTING)

Adjusted NAD 83 (1992) Geodetic Position (RTK)
Lat. 30°05'12.32111" N
Long. 93°17'28.38764" W

Adjusted NAD 1983 Datum(1992)
LSZ (1702) Feet (RTK)
N = 582,332.08
E = 2,661,669.33

Elevation of 6.0 foot mark on
Gauge No. 4 (NAVD 88) (Feet) (RTK)
Elevation = + 4.707

NGS Monument F226
(SEE ATTACHED NGS DATA SHEET)

Adjusted NAD 83 (1992) Geodetic Position (RTK)
Lat. 30°05'11.62589" N
Long. 93°17'11.66667" W

Adjusted NAD 1983 Datum(1992)
LSZ (1702) Feet (RTK)
N = 582,236.79
E = 2,663,136.84

Adjusted NAVD88 (Feet)(RTK)
Elevation = +3.377

Appendix F

CS-29 Staff Gauge Information

Feb. 18, 2026 - Staff Gauge installation

Water started flowing out at approx. 11am. Windy conditions, 18mph SSW.

Outside (Big Lake) 8 ft treated 4x4

Top of Post – 3.54703 ft NAVD88 Geoid 12b

Tape down – 10 1/2 inches

Distance from Bridge – approx. 82 ft

Reading at installation – 0.28 ft NAVD88 Geoid 12b @ 11:30 am

Nearest comparable (NOAA Bulk Terminal) – 0.36 ft NAVD88 Geoid 12b @ 11:30 am

Inside (Mermentau) 10 ft treated 4x4

Top of Post – 3.8747 ft NAVD88 Geoid 12b

Tape down – 6 5/8 inches

Distance from Bridge – approx. 75ft

Reading at installation – 0.55 ft NAVD88 Geoid 12b @ 1:37 pm

Nearest comparable (CRMS0568) – 0.07 ft Geoid 12b @ 2:00 pm (*update when 590 Feb Hydro available*)