PROJECT COMPLETION REPORT

PROJECT NAME: Black Bayou Hydrologic Restoration Project (CS-27)

CWPPRA/STATE PROJECT NO. 2511-99-19

REPORT DATE: January 28, 2002 **BY:** C.H. Fenstermaker & Associates

I. Project Managers/Contracting Officer:

DNR Project Manager	Herb Juneau, PE, PLS	**Telephone:**	337-893-1812
DNR Construction Project Manager	Herb Juneau, PE, PLS	**Telephone:**	337-893-1812
DNR Monitoring Manager	Ralph Libersat	**Telephone:**	337-893-1812
Federal Agency Project Manager	John Foret, Ph.D.	**Telephone:**	337-482-5915
Consultant Project Manager	Dax Douet, E.I.	**Telephone:**	337-237-2200

II. Location and description of projects as approved for construction by Task Force

The project area is located in southwestern Louisiana in both Cameron and Calcasieu Parishes. The project is located south of the GIWW, west of the Gum Cove Ridge, East of the Sabine River, and North of an existing shell road. The project consist of constructing approximately 22,600 linear feet of foreshore rock dike, commencing west of the Gum Cove Ridge and ending approximately 1,000 feet west of Black Bayou Cutoff Canal, construction of a barge bay made of graded stone in the Black Bayou Cutoff Canal, construction of a boat bay made of graded rock at both the Burton Canal and Block's Creek, and finally a weir structure made of steel sheet pilings and a self-regulating tidegate to replace an existing failed weir structure within an adjacent canal off of the Black Bayou Cutoff Canal.

The engineering design of the project included the creation of a hydrodynamic and advection dispersion model to simulate the effects of the project as outlined above. The model dictated the geometric dimensions needed for each of the proposed structures to efficiently satisfy the scope of the project.

III. Final, as-built features, boundaries and resulting acreage (use attachments if necessary)

The final project as constructed, consisted of all the features outlined in section two above. During the construction phase, three change orders were added to the project.

Benefited Acres **+-27,328 acres**

Description of Change Order No. 1:

Item No. CO1-1, entitled "NAVIGATIONAL WARNING SIGN (COMPLETE W/ SINGLE 40' ROUND TREATED TIMBER PILING W/ 2-TYPE "B" WARNING SIGNS) (2 TOTAL)" was added to the original contract. During the construction phase of the project, representatives from both C.H. Fenstermaker & Associates and the Louisiana Department of Natural Resources expressed a safety concern that there needed to be two (2) additional navigational aides installed at both Station 144+95.25 and Station 157+35.50 of the project's proposed rock dike along the south bank of the GIWW. It was believed the possibility existed that local boaters who may not be aware that there is a newly constructed rock dike along the south bank of the GIWW in these two regions, may come into conflict with the structure. Because of this safety concern, a 40-foot timber pile with two (2) type "B" warning signs (90^0 apart) is proposed to be added to both these two sites mentioned above. After negotiations with the contractor, a final lump sum cost of $8,125.00 to include materials, labor, and installation was agreed upon.

Item No. C01-2, entitled "ADDITIONAL MANDATORY FILL AREAS" was added to the original contract. During routine field trips to the project site, it was noticed by representatives from C.H. Fenstermaker & Associates and the Louisiana Department of Natural Resources that along the southern bank line of the GIWW, there existed two (2) natural "cuts" into the east marsh area of the project. These two "cuts" were located at both Station 33+00 and Station 73+50 along the proposed baseline of the site "A" structure. It was determined that these two "cuts" were quite larger than what was originally surveyed by C.H. Fenstermaker & Associates. These

"cuts" could have the potential of allowing high concentrations of salinity into the east marsh area of the project from filtering through the permeable rock dike. It is believed that by providing two mandatory fill areas in these two locations, an impermeable barrier would be created, therefore, not allowing high concentrations of salinity come into the east marsh area from the GIWW. After negotiations with the contractor, a final lump sum cost of $26,965.59 to include materials, labor, and installation was agreed upon.

Description of Change Order No. 2:

Item No. CO2-1, entitled "IMPACT OF CHANGE IN SELF REGULATING TIDEGATE DESIGN" was added to the original contract. The reason for the change order and the resulting impacts to the work is described by the discussion that follows. The manufacturer of the Self-Regulating Tidegate, Waterman Industries, has informed us that the delivery of the gate to the project site will be no earlier then October 1, 2001. The reason for this delay was due to the lengthy review of the shop drawings for this gate. The shop drawings needed some revisions and additional details to account for the irregular sections and surfaces of the proposed steel sheet piling and to provide for a more adequate and secure mounting of the gate to the sheet pile structure. As a result of much discussions and their revisions, more time was needed during the shop drawing phase than was anticipated, this in turn, delayed the manufacturing of the gate. Further, because of the redesign of the attachment procedure of mounting the gate to the steel sheet pile wall, and because various shims must now be installed and welded in place under dry conditions, the cofferdam presently surrounding the site of the gate and the peripheral area, must stay in place until the installation of the gate is completed. This in turn, will delay the placement of the filter cloth and rock riprap scour protection that are pertinent components of the Site "E" weir structure. Also, since the delivery of the gate has been delayed, the rock riprap closure of the "failed" weir canal, adjacent to the Site "E" structure, cannot be completed until the gate is installed and operative as drainage to the vast eastern marsh area would be in effect eliminated. Because of the incomplete plug at the "failed" weir canal, stone will need to be stockpiled near the site of the work. This stone now has to be rehandled into final location after the gate installation is completed and made operative. This was an unanticipated extension in the manufacturing timeframe, thereby, causing Berry Bros., subcontractor to Luhr Bros., Inc., to have to remobilize their barge equipment and perform the additional activities listed above. After negotiations with the contractor, a final lump sum cost of $19,000.00 was agreed upon

Description of Change Order No. 3:

Item No. CO3-1, entitled "INSTALLATION OF BOAT BARRIER AT SITE "E" STRUCTURE" was added to the original contract. The reason for the change order and the resulting impacts to the work is described by the discussion that follows. Due to increased concerns of the possibility of vandalism to the structure and public safety, it was decided by both NMFS and LADNR, that it would be in the best interest to the project to have a boat barrier installed at the site "E" structure. In an effort to keep the public and local boat traffic at a safe distance away from the structure, a boat barrier constructed of 12" wood pilings, 4" galvanized pipe, and 3" x 8" timber will be required to accomplish this task. This was an unanticipated extension to the contract, thereby, causing Berry Bros., subcontractor to Luhr Bros., Inc., to have deliver more material to the site necessary to construct the barrier as per the agreed upon detail, which is attached. After negotiations with the contractor, a final lump sum cost of $29,500.00 was agreed upon.

All as-built information are identified in the previously submitted "as-built" drawings. Final drawings for the Self Regulating Tide Gate will be submitted in the form of shop drawings that were previously approved. No deviations occurred during the fabrication and installation of this device.

SCHEDULE OF ITEMS (P.O. NUMBER 3109413)

Item No.	Work	Est. Quantity	Unit	Est. Unit Price	Estimated Amount	Final Quantity	Bid Unit Price	Final Amount	% Over or Under
01590.001	Mobilization & Demobilization	1	Lump Sum	$70,000.00	$70,000.00	1.00	$185,900.00	$185,900.00	165% Over
02315.001	General Excavation (Common)	6,600	Cubic Yard	$6.00	$39,600.00	5,400	$3.90	$21,060.00	47% Under
02050.001	Geotextile Fabric	1,200	Square Yard	$3.00	$3,600.00	1,200	$3.50	$4,200.00	17% Over
02374.100	Graded Stone (650 lb.) (Bankline Paving)	6,700	Ton	$26.00	$174,200.00	6,700	$23.50	$157,450.00	10% Under
02374.101	Graded Stone (650 lb.) **	92,000	Ton	$22.00	$2,024,000.00	83,900	$22.10	$1,854,190.00	8% Under
02374.102	Graded Stone (1200 lb.) *	7,500	Ton	$24.00	$180,000.00	8,114	$21.50	$174,451.00	3% Under
02453.100	Treated Timber Piles (Coastal Treatment) (Round) (40' Length)	18	Ton	$700.00	$12,600.00	18	$860.00	$15,480.00	23% Over
02453.200	4-Pile Navigation and Dolphin (12" x 40') (Coastal Treatment)	4	Each	$3,000.00	$12,000.00	4	$3,250.00	$13,000.00	8% Over
02454.100	Steel Sheet Piling (Type Z)	9,440	Square Foot	$25.00	$236,000.00	9,440	$25.00	$236,000.00	Even
02454.110	Steel Sheet Piling (4-Way Intersection) (40' Length)	2	Each	$1,200.00	$2,400.00	2	$1,900.00	$3,800.00	58% Over
02454.120	Steel Sheet Piling (45° Bend) (40' Length)	4	Each	$1,000.00	$4,000.00	4	$713.00	$2,852.00	29% Under
05505.001	Tidegate, Self Regulating	1	Each	$60,000.00	$60,000.00	1	$75,300	$75,300.00	25% Over
02454.300	Settlement Plates	11	Each	$1,000.00	$11,000.00	11	$750.00	$8,250.00	25% Under
16520.100	Day Mark Navigation Aid (Type A)	4	Each	$800.00	$3,200.00	4	$1,265.00	$5,060.00	58% Over
16520.101	Day Mark Navigation Aid (Type B)	6	Each	$800.00	$4,800.00	6	$1,250.00	$7,500.00	56% Over
16520.102	Day Mark Navigation Aid (Type C)	4	Each	$800.00	$3,200.00	4	$800.00	$3,200.00	Even
16520.103	Day Mark Navigation Aid (Type D)	12	Each	$800.00	$9,600.00	12	$690.00	$8,280.00	14% Under
16520.200	Navigation Obstruction Light (Complete Assembly) (Red Lateral Light) (4.0 Second Rhythm)	1	Each	$3,500.00	$3,500.00	1	$5,400.00	$5,400.00	54% Over
16520.201	Navigation Obstruction Light (Complete Assembly) (White Lateral Light) (2.5 Second Rhythm)	2	Each	$3,500.00	$7,000.00	2	$5,975.00	$11,950.00	54% Over
16520.202	Navigation Obstruction Light (Complete Assembly) (Green Lateral Light) (4.0 Second Rhythm)	1	Each	$3,500.00	$3,500.00	1	$5,975.00	$5,975.00	71% Over
C01-1	Navigational Warning Sign (Complete w/Single 40' Round Treated Timber Piling w/2 Type "B" Warning Signs) (2 Total)	1	Lump Sums	$8,125.00	$8,125.00	1	$8,125.00	$8,125.00	Even
C01-2	Additional Mandatory Fill Areas	1	Lump Sums	$26,965.59	$26,965.59	1	$26,965.59	$26,965.59	Even
C02-1	Impact of Change in Self-Regulating Tidegate Design	1	Lump Sums	$19,000.00	$19,000.00	1	$19,000.00	$19,000.00	Even
C03-1	Installation of Bast Barrier at Site "E"" Structure	1	Lump Sums	$29,500.00	$29,500.00	1	$29,500.00	$29,500.00	Even

Construction and Construction Oversight

	Construction Contract
Prime Construction Contractor	**Luhr Bros., Inc.**
Subcontractor	**Berry Brothers Inc.**
Original Construction Contract	**$2,864,200.00**
Change Orders	**$83,590.59**
Over/Under Runs	**-$64,902.00**
Final Construction Contract	**$2,882,888.59**

Major equipment used:

L10525 Dragline, L1103 Spud Barge, L14915 Backhoe, BB107 Pile Driver Barge, BB278 Deck barge, IBR232 Deck barge, Crew boat, 5299 American Crane (50 ton), Tug (Brave), Vulcan Air Hammer, and other small equipment to complete project.

Discuss construction sequences and activities, problems encountered, solutions to problems, etc.

Contractor mobilized to site. Upon arrival of stone, construction began at the site "A" location. During the construction of site "A", the contractor experienced problems retrieving suitable borrow material to construct the mandatory fill areas shown on the engineering plans. The contractor spent extra time finding areas within the GIWW that had suitable borrow material. During the construction of site "A", the subcontractor Berry Brothers Inc., mobilized to the site "E" site. Once mobilized, the subcontractor began excavation of the existing levee shown in the plans. Upon completion of site "A" (August 7, 2001), the prime contractor thence moved to site "B" and started on the west bank of the Black Bayou Cutoff Canal placing 650lb. stone along the bank line. Upon completion of the excavation of the levee by the subcontractor at site "E", installation of the steel sheet pilings (Type Z) commenced (August 8, 2001). A decision was made in the field by the project engineer to limit the amount of blows per foot to the steel sheet pilings by the diesel hammers to 80. Problems were being experienced with the subsurface soil conditions causing bending of the piles. On August 14, 2001, the prime contractor proceeded with the construction of site "D" located in Block's Creek. On August 15, 2001, the prime contractor proceeded with the construction of site "C" located in the Burton Canal. Beginning on August 18, 2001, the prime contractor began work on a punch list for site "A" that was prepared by the project engineer. On August 24, 2001, the prime contractor began construction of the barge bay at site "B" located in the Black Bayou Cutoff Canal, and commenced driving of the pilings used to support the navigational aides at both sites E, D, and C. On August 28, 2001, the subcontractor began the installation of a temporary coffer dam at the site "E" structure to be able to construct the proposed fish openings and the self regulating tide gate. Problems with leaks in the temporary cofferdam were experienced by the subcontractor. Additional pumps were brought to the site and ran for continuous 24- hour periods. Stone was placed within the limits shown on the engineering drawings adjacent to the self regulating tide gate. On November 2, 2001, the subcontractor began installing the Self Regulating tide gate to the steel sheet pile structure and attached the pipe railing on top of the steel sheet pile wall as depicted in the engineering drawings. On November 21, 2001, the subcontractor installed the boat barrier around the site "E" structure that was added previously as change order no. 3. The project was completed on November 23, 2001.

Pipeline and other utility crossings.

Structure	Owner	Rep. To Contact
Pipeline	Colonial	Randy Sullivan @ 409-842-6405
Pipeline	Williams/Transcontinental	Paul Young @ 337-569-7500
Pipeline	Sabine/ Bridgeline	Morris Oliver @ 504-712-5653
Pipeline	Texaco	Morris Oliver @ 504-712-5653
Pipeline	Kinder/ Morgan	Mr. Munoz/ Mr. Rival @ 281-383-3793

Safety and Accidents

No accidents occurred during the construction of this contract

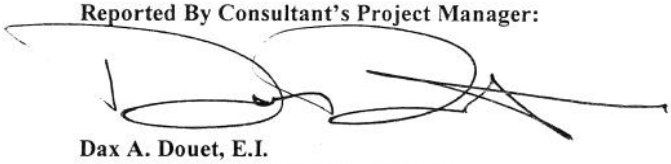
Additional comments pertaining to consrtruction, completed project, etc.

None

Significant Construction Dates:

Bid Opening	**April 30, 2001**
Contract Award	**May 31, 2001**
Preconstruction Conference	**May 31, 2001**
Notice to Proceed	**June 23, 2001**
Mobilization Began	**June 20, 2001**
Construction Start	**June 24, 2001**
Construction Completion	**November 23, 2001**
Final Acceptance	**December 10, 2001**

Reported By Consultant's Project Manager:



Dax A. Douet, E.I.
C.H. Fenstermaker & Associates Inc.