AD-A158 236 COOPER RIVER REDIVERSION PROJECT LAKE MOULTRIE AND SANTEE RIVER SOUTH CAR..(U) CORPS OF ENGINEERS CHARLESTON SC CHARLESTON DISTRICT 04 AUG 76 1/1

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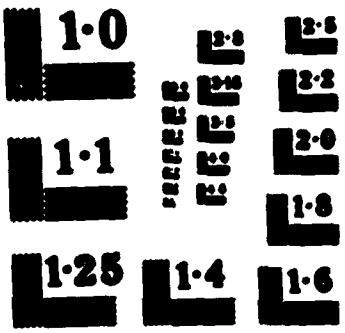


(2)

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
P O BOX 919
CHARLESTON, S.C. 29402

SACEN-GF

4 August 1976

SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Appendix A to Supplement No. 2 to General Design Memorandum - Bushy Park Water Supply Tests

AD-A150 160

Division Engineer, South Atlantic
ATTN: SADPD-P

1. Transmitted are 23 copies of the subject Appendix A. The information contained in the body of the appendix was developed for the Charleston District by the Waterways Experiment Station in Vicksburg, Mississippi.

2. Also transmitted are 23 copies of the following items for revision of the basic Supplement No. 2 report.

(a) Cover and back sheets for binding Supplement No. 2 with inclosed Appendix A.

(b) Revised Table of Contents page.

3 Incl.
as

HARRY S. WILSON, JR.
Colonel, Corps of Engineers
District Engineer

SADEN-GK (6 Feb 76) 1st Ind
SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Supplement No. 2 to General Design Memorandum - Requirements for Protection of Bushy Park Reservoir

DA, South Atlantic Division, Corps of Engineers, 510 Title Building, 30 Pryor Street, S. W., Atlanta, Georgia 30303 13 April 1976

TO: HQDA (DAEN-CWE-B)

Supplement No. 2 to GDM is recommended for approval subject to the following comments:

a. Pages 2 and 3, paragraphs 6 and 7. Since it is probable that hurricane surges would enter the Bushy Park Reservoir with or without reduced flows, we should not guarantee protection of the reservoir under hurricane conditions.

b. Page 3, second line from bottom. The mileage figures 32.6 and 38.5 should be verified since it is our understanding that mileage distances vary on some project maps, i.e., one statement in hand indicates that "During this 10 day period, the EPA found the maximum penetration of the salt water wedge occurred at mile 28.4." Another refers to mile 33.2 and states "According to EPA studies, this is the maximum intrusion to be expected."

c. Page 6, paragraph 12. The District has been given authority to conduct further study of monitor system requirements and provisions needed to assure protection of the Bushy Park Reservoir against salinity intrusion. This report gives the results of the study for Bushy Park and recommends that corrective action be approved.

d. Page 1, last line. Spelling of "complex" should be corrected.

e. Page 3, second line from bottom. Spelling of "Bushy" should be corrected.

f. Page 4, line 7. Spelling of "Bushy" should be corrected.

FOR THE DIVISION ENGINEER:

WILLIAM N. McCORMICK, JR.
Chief, Engineering Division

2 Incl
wd 10 cys ea

Copy Furnished:
District Engineer, Charleston
ATTN: SANGE

DAEN-CWE-B (SANGE, 6 Feb 76) 2d Ind
SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Supplement No. 2 to General Design Memorandum - Requirements for Protection of Bushy Park Reservoir

DA, Office of the Chief of Engineers, Washington, D.C. 20314 21 June 1976

TO: Division Engineer, South Atlantic, ATTN: SADEN-GK

1. The subject Supplement is approved, subject to the comments of the Division Engineer in the 1st Indorsement, and to the comments in the following paragraphs.

2. Paragraph 8. The application of a mathematical model appears feasible for computing the salinity migration under various combinations of flow and tidal conditions for the study project. In view of the potential cost savings in terms of selecting the number and location of monitoring stations, and the provision of better information for formulating the "Operations Manual" of project operation, the possibility of application of a mathematical model should be explored.

3. Paragraph 9. An investigation should be made of the possibility of using slotted bulkheads for diversion through the skeleton bay at the Pinopolis plant to obtain emergency flows.

a. Model and prototype tests at the Snake River projects in Washington have shown that flow control through skeleton bays by operation of the intake gates is not practicable at these projects. Instead, slotted bulkheads (intake diffusers) were used in both the skeleton bays and operating units to divert water to reduce spillage. Only minor modification to the skeleton bays was required. The bulkheads when used with the operating units maintained near maximum discharge with more than a 90 percent reduction in unit output. Most of the head is dissipated across the slotted bulkheads.

b. For the above described system to be applied, emergency closure provisions are necessary in case of bulkhead failure. This was provided at the Snake River projects with the intake gates. The intake diffusers were placed in the bulkhead slots just upstream of the intake gates. When used with the operating units, slow wicket gate closing times had to be used to avoid damaging surges in the intake water passages during a load rejection.

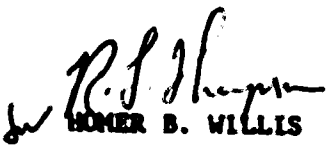
c. A copy of prototype tests made at Little Goose is inclosed. Much additional information is available from the North Pacific Division.

4. Paragraph 11 and Table 3. The project economics in this paragraph and in the table are misleading. A negative annual power betterment of $1,822,368 cannot be substantiated by any of the recent efforts in negotiating a power betterment contract. This discussion and table should be qualified to indicate that based on the draft agreement of December 1975, the BCR is 1.4, and the final figure will depend upon the time of the negotiated contract.

DAEN-CWE-B(SANGE, 6 Feb 76) 2d Ind 21 June 1976
SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Supplement No. 2 to General Design Memorandum - Requirements for Protection of Bushy Park Reservoir

5. The subject report indicates that at those times when salt water intrusion threatens to affect the water quality at Bushy Park Reservoir, that the "Manual of Operation" for the Cooper River Rediversion Project prescribes procedures for permitting discharges from the Pinopolis Plant up to 5,000 c.f.s. In order to permit such an emergency operation to take place under the authority of this project, specific authorization must be obtained from the Secretary of the Army to allow such a discharge procedure to be incorporated into the "Manual of Operation."

FOR THE CHIEF OF ENGINEERS:



HOMER B. WILLIS
Chief, Engineering Division
Directorate of Civil Works

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Added 1 incl
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SADEN-GK (6 Feb 76) 3rd Ind
SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Supplement No. 2 to General Design Memorandum - Requirements for Protection of Bushy Park Reservoir

DA, South Atlantic Division, Corps of Engineers, 510 Title Building, 30 Pryor Street, S. W., Atlanta, Georgia 30303 4 November 1976

TO: District Engineer, Charleston, ATTN: SANGE

1. The second indorsement is referred for necessary action. The following additional guidance is offered:

a. Reference paragraph 2 of 2nd Indorsement: A mathematical model is warranted only if there is not sufficient information from physical model studies to provide the necessary operating guidelines. Information provided by the District (John Golden) indicates that a vigorous analysis of the physical model study results may provide the operating guidelines for the manual. A report on the physical model study by WES is being prepared by the District and will be distributed as a supplement to the GDM.

b. Reference paragraph 3.a. of 2nd Indorsement: Discussion on the use of slotted bulkheads should include the impact that velocities through the slots have on migratory fish. The experience of NPD (Mr. David Legg FTS 423-3764) may be helpful.

2. Your response should reach SADEN-GK by 15 November 1976.

FOR THE DIVISION ENGINEER:

John L. Lyon Jr
for WILLIAM N. McCORMICK, JR.
Chief, Engineering Division

1 Incl
nc

SACEN-G (6 Feb 76) 4th Ind
SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Supplement No. 2 to General Design Memorandum - Requirements for Protection of Bushy Park Reservoir

DA, Charleston District, Corps of Engineers, P. O. Box 919, Charleston, South Carolina 29402 1 September 1977

TO: Division Engineer, South Atlantic, ATTN: SADEN-GK

1. The information in the following paragraphs is in response to the comments in the preceding indorsements. The responses are referenced to paragraphs in first, second, and third indorsements.

2. First Indorsement, Paragraph a Concur. The District has informed local interests that there is a present potential for surges from hurricanes, earthquakes, etc. to enter the low areas along the lower reaches of Bushy Park and this condition will remain after project construction. However, should these or other uncontrollable forces occur it is planned to make such releases from Pinopolis that will reduce impacts on the Bushy Park Reservoir.

3. First Indorsement, Paragraph b Mileage figures shown in the report refer to the map shown on Plate 1 of this report and correspond to the same locations given in the EPA report although the mileages are different.

4. First Indorsement, Paragraph c Concur.

5. First Indorsement, Paragraph d Concur.

6. First Indorsement, Paragraph e Concur.

7. First Indorsement, Paragraph f Concur.

8. Second Indorsement, Paragraph 2, and Third Indorsement, Paragraph 1a The WES report on the model study has been distributed as an appendix to subject report.

9. Second Indorsement, Paragraph 3, and Third Indorsement, Paragraph 1b It appears that the mortality rate of anadromous fish (blueback Herring) would be very high through slotted bulkheads. SASEN will conduct detailed design studies of the emergency release facilities to determine the most feasible type of gate. The impact on migratory fish will be considered in the gate feasibility study. Completion date is about July 1978, results will be included in Cooling Water Facilities DM.

SACEN-G (6 Feb 76) 4th Ind 1 September 1977
SUBJECT: Cooper River Rediversion Project, Lake Moultrie and Santee River, South Carolina, Supplement No. 2 to General Design Memorandum - Requirements for Protection of Bushy Park Reservoir

10. Second Indorsement, Paragraph 4 New pages containing appropriate revisions to paragraph 11 and Table 3 are attached.

11. Second Indorsement, Paragraph 5 The operations manual will include provisions for 5000 cfs emergency release as permitted by the South Carolina Public Service Authority/Corps contract agreement for project operations.

12. Revised pages 3, 4, 5, 6, 7, and 8 are inclosed for substitution in the report.

FOR THE DISTRICT ENGINEER:

3 Incl
1 wd
Added 2 Incl
2. Revised Pages (17 cys)
3. 4th Ind (17 cys)

JACK J. LESEMANN
Chief, Engineering Division

END

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