## REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Sulte 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 2050-8.

1. AGENCY USE ONLY (Leave blank)

2. REPORT DATE October 2002 3. REPORT TYPE AND DATES COVERED **Final Report** 

4. TITLE AND SUBTITLE

SEDIMENTATION STUDY OF THE MIDDLE MISSISSIPPI RIVER AT RED ROCK, RIVER MILES 93 TO 86, HYDRAULIC MICRO MODEL INVESTIGATION

5. FUNDING NUMBERS

6. AUTHOR(S)

Dawn M. Lamm, David C. Gordon, Robert D. Davinrov, Edward H. Riiff,

James K. Hunn

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

U.S. Army Corps of Engineers St. Louis District Applied River Engineering Center Foot of Arsenal Street St. Louis, Missouri 63118

8. PERFORMING ORGANIZATION REPORT NUMBER

**Technical Report M26** 

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Army Engineer District, St. Louis 1222 Spruce Street St. Louis, Missouri 63103

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; Distribution is Unlimited. Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

A sedimentation study of the Middle Mississippi River at Red Rock, between River Miles 93 and 86 was conducted to evaluate environmental designs for the development of side channels, island habitat, deep scour holes, and shoaling utilizing an existing dike field on the Mississippi River. The study was funded by the St. Louis District's Biological Opinion Program.

A physical hydraulic micro model was used by the St. Louis District's Applied River Engineering Center to assess 13 structural design alternatives in an effort to create a secondary channel and island complex as well as deep scour holes and shoaling. The study recommended three alternatives for the creation of the above mentioned habitats. Alternatives included the placement of chevrons and new dikes and the notching of existing dikes.

14. SUBJECT TERMS

Mississippi River Notches Micro Model

Sedimentation Navigation Flow Splits

Side Channels Islands Chevrons

15. NUMBER OF PAGES 69

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT

**UNCLASSIFIED** 

18. SECURITY CLASSIFICATION 19. SECURITY CLASSIFICATION 20. LIMITATION OF ABSTRACT OF ABSTRACT

## **GENERAL INSTRUCTIONS FOR COMPLETING SF 298**

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to **stay within the lines** to meet **optical scanning requirements.** 

- Block 1. Agency Use Only (Leave blank).
- Block 2. Report Date. Full publication date including day, month, and year, if available (e.g. 1 Jan 88). Must cite at least the year.
- Block 3. Type of Report and Dates Covered. State whether report is interim, final, etc. If applicable, enter inclusive report dates (e.g. 10 Jun 87 30 Jun 88).
- Block 4. <u>Title and Subtitle</u>. A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, repeat the primary title, add volume number, and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.
- **Block 5.** Funding Numbers. To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:

C - Contract
 G - Grant
 PE - Program
 Element
 PR - Project
 TA - Task
 WU - Work Unit
 Accession No.

- **Block 6.** Author(s). Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).
- Block 7. Performing Organization Name(s) and Address(es). Self-explanatory.
- **Block 8.** Performing Organization Report Number. Enter the unique alphanumeric report number(s) assigned by the organization performing the report.
- Block 9. Sponsoring/Monitoring Agency Name(s) and Address(es). Self-explanatory.
- Block 10. Sponsoring/Monitoring Agency Report Number. (If known)
- Block 11. Supplementary Notes. Enter information not included elsewhere such as: Prepared in cooperation with...; Trans. of ...; To be published in.... When a report is revised, include a statement whether the new report supersedes or supplements the older report.

Block 12a. <u>Distribution/Availability Statement.</u>
Denotes public availability or limitations. Cite any availability to the public. Enter additional limitations or special markings in all capitals (e.g. NOFORN, REL, ITAR).

DOD - See DoDD 5230.24, "Distribution Statements on Technical Documents."

DOE - See authorities.

NASA - See Handbook NHB 2200.2.

NTIS - Leave blank.

Block 12b. Distribution Code.

DOD - Leave blank.

DOE - Enter DOE distribution categories from the Standard Distribution for Unclassified Scientific and Technical Reports.

NASA - Leave Blank. NTIS - Leave Blank.

- **Block 13.** Abstract. Include a brief (*Maximum 200 words*) factual summary of the most significant information contained in the report.
- **Block 14.** <u>Subject Terms.</u> Keywords or phrases identifying major subjects in the report.
- **Block 15.** Number of Pages. Enter the total number of pages.
- **Block 16.** Price Code. Enter appropriate price code (NTIS only).
- Blocks 17.-19. Security Classifications. Selfexplanatory. Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., UNCLASSIFIED). If form contains classified information, stamp classification on the top and bottom of the page.
- Block 20. <u>Limitation of Abstract</u>. This block must be completed to assign a limitation to the abstract. Enter either UL (unlimited) or SAR (same as report). An entry in this block is necessary if the abstract is to be limited. If blank, the abstract is assumed to be unlimited.