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VERIFICATION OF EMPIRICAL METHOD FOR DETERMINING RIVERBANK STAB--ETC(U)
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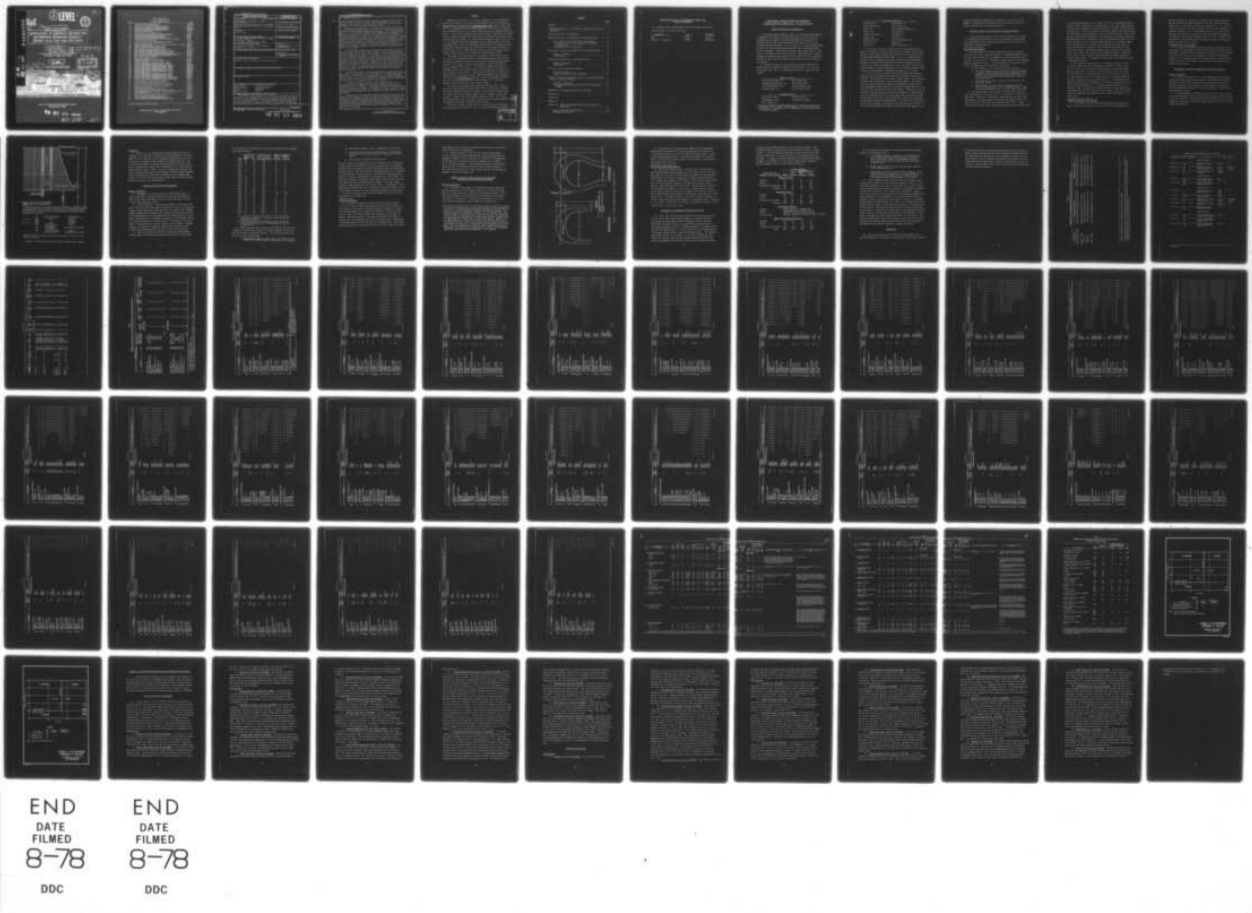

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VERIFICATION OF EMPIRICAL METHOD FOR DETERMINING RIVERBANK STABILITY REPORT 12-23-1972 AND 1973 DATA.

by

(10) Albert R. Gann
Geotechnical Laboratory
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

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POTAMOLOGY INVESTIGATIONS REPORTS

Issued Prior to and Including This Report

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1-1	Instructions and Outline for Potamology Investigations	November 1947
1-2	Outline of Plans for the Potamology Investigations	December 1947
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21-4	Use of Plastic Filter Cloth in Revetment Construction; Potamology Research Project 11	June 1970

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Empirical method	Rivers

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report is the eighteenth of a series in which new data obtained from borings made for revetment construction are analyzed to determine the applicability of an empirical method for predicting riverbank stability with regard to flow (liquefaction) failure. Boring data obtained in 1972 and 1973 are analyzed, and stability predictions are made for 31 new areas. Failures that occurred during 1972 and 1973 at sites previously analyzed also are discussed.

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20. ABSTRACT (Continued).

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Based on analyses made in 1958 of previous performance data, the classification criteria for zone A and zone B sands were modified in 1959. The failures at sites previously studied, new site predictions, and current year performance are analyzed using the modified criteria.

ABSTRACT

During 1972, 24 bank failures (11 flow type and 13 shear type) occurred along the Lower Mississippi River at 8 revetment sites within 500 ft of boring locations for which stability predictions with regard to flow failure had been made. All 11 flow failures occurred near 10 boring locations predicted to be unstable with regard to flow failure. Three shear failures occurred near 3 boring locations predicted to be stable, 6 shear failures occurred near 5 boring locations predicted to be unstable, and 4 shear failures occurred near 3 boring locations for which no prediction was possible because the thickness of zone A sand had not been determined. In addition, 4 failures occurred that could not be classified as to type failure; 3 of these were judged to be the direct result of severe scour. Four flow failures (at 3 revetment sites) and 4 shear failures (at 3 revetment sites) were reported in areas where no borings were located within 500 ft.

In 1973, 27 bank failures (16 flow type and 11 shear type) occurred at 15 revetment sites within 500 ft of boring locations for which stability predictions with regard to flow failure had been made. There were 13 flow failures near 11 boring locations predicted to be unstable, 3 flow failures near 3 boring locations predicted to be stable, 7 shear failures near 6 boring locations predicted to be stable, 3 shear failures near 3 boring locations predicted to be unstable, and 1 shear failure near a boring location for which no prediction was possible because boring depth was not sufficient and zone A sand had not been penetrated. In addition, 23 failures occurred that could not be classified as to type of failure; 16 of these were judged to be the direct result of severe local scour. Also, 9 flow failures near 7 boring locations and 13 shear failures near 11 boring locations were reported in areas where no borings were located within 500 ft.

From 1954 (when riverbank stability predictions were initiated) through 1973, 2047 boring locations at 212 revetment sites on the Mississippi River have been studied. The majority of the borings were in the Vicksburg and Memphis District areas. Data on sites in the New Orleans District were included only in the first report of this series (Report 12-3). However, boring data beginning in 1968 from the New Orleans District are included herein.

Flow failures reported through 1973 have occurred within 500 ft of 21 boring locations in the Memphis District and 154 boring locations in the Vicksburg District; of these, 141 occurred near locations that had been predicted to be unstable according to the modified criteria, 24 occurred at boring locations predicted to be stable, and 10 occurred at boring locations for which no prediction had been made because the thickness of zone A sand had not been determined.

The modified criteria have proven reliable in predicting stability with regard to flow failure. Of the total of 175 flow failures recorded since 1954 within 500 ft of analyzed borings, 24 failures (18 violations of criteria or 10 percent) were near boring locations predicted to be stable. However, many locations predicted to be unstable have not experienced flow failure, and it is possible that either the density of the zone A sand may be such that flow failure will not occur or the severity of river attack has not been sufficient to initiate flow failure.

Preface

Estimates of bank stability from the standpoint of flow (liquefaction) failure at a number of sites along the Mississippi River were included in Summary Report of Soils Studies, Potamology Report 12-2, dated October 1952, and it was suggested that boring data acquired in future routine investigations be examined and used to estimate bank stability by a proposed empirical method. It was further suggested that these studies be conducted by a central office to permit refinement of criteria and to establish the validity of the proposed empirical method. In a letter dated 18 February 1953 to the Director, U. S. Army Engineer Waterways Experiment Station (WES), subject "Proposed Potamology Study - Soils," the President, Mississippi River Commission (MRC), indorsed the proposed program for verification of the empirical method and indicated that the U. S. Army Engineer Division, Lower Mississippi Valley (LMVD), would be instructed to forward the necessary data to WES.

This report is the eighteenth in the series of verification studies but is the first published as part of the WES Miscellaneous Paper series. The previous seventeen reports were published as "Potamology Investigation Reports." This change in reports was directed by LMVD letter LMVED-P, dated 10 November 1976, subject: "Verification of Empirical Method of Determining Riverbank Stability Reports and Investigation of Liquefaction and Prevention of Flow Slides." This study was authorized by LMVD letter LMVED-G, dated 19 June 1973, subject "WES Investigational Work Program, FY 74 and FY 75 (RCS ENGCW-E-10) Status of Soils and Pavements Laboratory Projects for MRC and LMVD for FY 73 and Proposed FY 74," and letter LMVED-F, dated 31 July 1973, subject same as above.

The studies and analyses reported herein were made by Mr. Albert R. Gann of the Soil Mechanics Division (SMD) under the direction of Messrs. Clifford L. McAnear and Gerald B. Mitchell. The studies were made under the general direction of Messrs. James P. Sale, Richard G. Ahlvin, and Stanley J. Johnson, Soils and Pavements Laboratory, WES. This report was prepared by Mr. Gann. The SMD is now part of the recently organized Geotechnical Laboratory of which Mr. Sale is Chief.

COL John L. Cannon, CE, was Director of WES during the preparation and publication of this report. Mr. F. R. Brown was Technical Director.

Contents

Conversion Factors, U. S. Customary to Metric (SI) Units of Measurement

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To obtain
feet	0.3048	metres
miles (U. S. statute)	1.609344	kilometres

VERIFICATION OF EMPIRICAL METHOD FOR DETERMINING RIVERBANK STABILITY, REPORT 12-23 - 1972 AND 1973 DATA

Purpose and Scope of Investigation

1. The study reported herein is part of a continuing investigation to determine the validity of an empirical method for predicting the susceptibility of banks of the Lower Mississippi River and banks of alluvial rivers in the Lower Mississippi River basin to flow slides (liquefaction-type failures). In this report, soils data obtained during 1972 and 1973 from routine borings along the banks of the Mississippi River are evaluated. Predictions are made of the susceptibility to flow slides of the banks at the boring locations. This report also includes a summary of failures that occurred in 1972 and 1973 at sites previously studied for which stability predictions were made in earlier reports of this series.

2. Boring data from 31 sites along the Lower Mississippi River between 901 and 33 MAHP* are evaluated in this report. The sites are listed below under the U. S. Army Engineer District in which they are located:

Memphis District	
Winchester Towhead, Mo.	Obion-Tamm, Tenn.
Merriweather-Cherokee, Tenn.	Kate Aubrey, Tenn.
Above Lee Towhead, Tenn.	Sunrise Towhead, Tenn.
Robinson Bayou, Mo.	Island 63 Bar, Miss.

Vicksburg District	
Smith Point, Miss.	Grand Gulf, Miss.
Eutaw-Mounds, Miss.	Carthage Point, Miss.
Bell Island, La.	

* Miles above Head of Passes (1962 mileage). A table of factors for converting U. S. customary units of measurement to metric (SI) units is presented on page 3.

New Orleans District	
Waterford, La.	Black Hawk, La.
New Orleans Harbor	Point Breeze, La.
Meraux, La.	Little Gypsey Setback, La.
Story, La.	Good Hope, La.
Twelve Mile Point, La.	Destrehan, La.
Poydras, La.	Luling, La.
English Turn, La.	New Orleans Harbor, La.
Oak Point, La.	Algiers, La.
Belair, La.	Sixty Mile Point, La.

3. This study is a test of empirical criteria for stability of banks with regard to flow failure rather than a complete bank stability analysis; consequently, factors other than those on which the criteria are based have purposely been excluded. Also, it is emphasized that the data used in compiling this report were obtained by the Memphis, Vicksburg, and New Orleans Districts in routine investigations of soil conditions at proposed revetment sites or at sites where revetments are being extended; no special explorations, such as deep undisturbed sample borings or cone penetration soundings, were made for this study.

4. Prior to 1960, the methods used by the Memphis and Vicksburg Districts to obtain samples from below the groundwater table were not the same. The Vicksburg District used a bailer sampler, and the Memphis District used a thin-walled, fixed-piston-type sampler. The samples obtained with the piston-type sampler are generally considered to be more representative and to provide a more accurate grain-size distribution than those obtained with the bailer sampler. Nevertheless, it was assumed in previous analyses that the bailer samplers obtained samples that were representative of the natural grain-size distribution, even though some loss of fines could be expected in this type of sampling. This may have affected the determination of the limits of various zones as described in reports concerned with data obtained prior to 1960. In 1960, the Vicksburg District began using the piston-type sampler, and

stability predictions presented in this report for new sites in the Memphis, Vicksburg, and New Orleans Districts are based on data for samples obtained with the piston-type sampler.

Empirical Criteria for Determining Riverbank Stability

5. The following discussion, based on data accumulated as a part of the potamology investigations and related studies of caving banks, is concerned with the soil conditions involved in the criteria for determining riverbank stability.

Soil conditions associated with flow failures

6. Several basic soil conditions have been found to be associated with flow slides; they are described in Potamology Reports 9-1 and 12-2 and other reports, and are summarized in Potamology Report 12-3, the first of this series of verification reports (see list of Potamology Reports inside front cover). A brief description of these soil conditions is repeated here for the sake of convenience.

a. Flow failures occur in ancient point bar deposits.

b. Point bar deposits usually contain three basic soil types: a somewhat cohesive topstratum called "overburden soils"; underlying fine sands called the "upper sand series"; and in turn, underlying coarse sands and gravels called the "lower sand series."

c. Flow failures have never been known to extend into the lower sand series.

d. The stability of a given slope is dependent upon the relative thicknesses of (1) the overburden, and (2) a zone of fine sand (designated zone A) in the upper sand series.

7. For data analyzed in this report, the upper sand series has been subdivided into two zones, A and B, on the basis of variations in grain size. Penetration resistance, as determined by the rotary cone penetrometer, or natural density from undisturbed samples may also be used to delineate zone A sand (see Potamology Report 18-1). Where failures have occurred, the boundary between zones A and B has been found

to correspond approximately to the depth of failure (see Potamology Reports 12-2 and 12-5). Predictions of susceptibility to flow failure made through 1958 were based on gradation criteria developed in October 1952 as described in Report 12-2. However, a performance evaluation made during 1958 indicated that the gradation classification criteria for overburden soils, zone A sand, and zone B sand should be modified. This evaluation, described in detail in Potamology Report 12-8, showed that, based on the modified criteria, all flow failure locations studied would have been predicted to be unstable except three locations where the borings did not penetrate the full depth of zone A sand and which, therefore, did not meet the requiremnts for the verification study. The modified classification criteria for overburden soils, zone A sand, zone B sand, and lower sands are based on variations in grain size. These criteria have been adopted for making predictions at new revetment sites. A comparison of the original and modified criteria is presented in Table 1.

8. In zoning soil conditions in the riverbank, it should be noted that zone B sands may contain occasional thin strata of sands as fine as zone A sands, but zone B contains predominantly coarser and denser material than zone A. Conversely, the occurrence of strata of medium or coarse material not exceeding about 5 ft in thickness in a zone of fine sand greater than 20 ft in thickness is not considered sufficient reason to classify the zone as other than zone A. In determining the overburden thickness, the thicknesses of all strata overlying the zone A sand of governing thickness (i.e. thickness greater than 20 ft) are included. Thus, the overburden zone may include not only cohesive top-stratum material, but also relatively thin strata of sands (even zone A sands when separated from underlying zone A sands by more than 5 ft of other soils).

Thickness of zone A sand compared with thickness of overburden

9. It has been found that where flow failures have occurred, the zone A sands were at least 20 ft thick, and this is established as a

minimum thickness for any location considered as potentially unstable. The ratio of the overburden thickness to the zone A sand thickness, called the R value, has also been found significant. An R value of 0.85 or less and a zone A sand thickness of 20 ft or more indicate an unstable condition. An R value greater than 0.85 or a zone A sand thickness less than 20 ft indicates a stable condition with regard to flow failure. The critical thickness ratio (R = 0.85) is based on application of the modified criteria developed from data for locations where flow failure have occurred.

Variability of soil conditions

10. Previous investigations have shown that the thickness of zone A sand may vary considerably in borings spaced as close as 250 ft from each other. Because of the wide spacing of borings at the sites studied, usually 1000 ft or more, it is reasonable to assume that appreciable changes in soil conditions may occur between borings. Therefore, predictions are made for individual boring locations rather than for an entire revetment reach.

Predictions at New Sites, Memphis and Vicksburg Districts

Method of analysis

11. The data furnished the U. S. Army Engineer Waterways Experiment Station (WES) during 1972 and 1973 by the Memphis and Vicksburg Districts for use in this study consisted of boring logs, results of mechanical analysis of soil samples, and hydrographic survey maps of sites showing boring locations. Table 2 is a summary of the site and map identification data.

12. The percentages of material passing the Nos. 40, 60, and 200 sieves were obtained directly from sieve analysis data sheets furnished by the two Districts. Using the modified criteria (Table 1), each soil sample was classified as overburden, upper sand (zone A or B), or lower sand series material.

13. The various series and zones were then delineated as a soil profile for each site. Thicknesses of overburden and zone A sand were determined for individual borings, and the corresponding R values were computed. In some cases, borings did not penetrate the full thickness of zone A sand. In these cases, a prediction of susceptibility to flow failure could be made only when a sufficient thickness of zone A sand was penetrated to indicate instability (i.e. when the R value obtained in the computation $R = \frac{\text{overburden thickness}}{\text{zone A thickness}}$ was 0.85 or less). No prediction could be made when the incompletely penetrated thickness of zone A sand was less than that required to produce an R value of 0.85 or less.

Predictions*

14. Table 3 summarizes soil conditions at sites in the Memphis and Vicksburg Districts for which data were supplied in 1972 and 1973 and evaluates individual boring locations with respect to susceptibility to flow failure. Zone A sand thicknesses are plotted versus R values in Plates 1-4 for all sites in both the Vicksburg and Memphis Districts. As can be seen in Table 3 and Plates 1-4, the majority of the boring locations at revetment sites Nos. 316, 326, and 329 in the Memphis District and No. 330 in the Vicksburg District are classified as stable with respect to flow failure; the majority of the borings at sites Nos. 170, 319, and 328 in the Memphis District and Nos. 185, 193 and 321 in the Vicksburg District are classified as susceptible to flow failure.

Predictions at New Sites, New Orleans District

Method of analysis

15. The 1972 and 1973 data furnished WES by the New Orleans District consisted of boring logs, mechanical analyses of soil samples, and a set

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* These evaluations were previously furnished the Memphis and Vicksburg Districts.

of small-scale hydrographic survey maps* showing the boring locations at 18 new revetment sites. Sounding ranges are plotted on the 1:20,000-scale hydrographic maps furnished by the New Orleans District. Revetment borings were generally made on the top of the bank at one of these sounding ranges and are designated with the range number. The hydrographic range numbers correspond to the approximate mileage above Head of Passes. Table 4 presents the boring locations and the soil conditions at the 18 sites for which data were furnished in 1972 and 1973.

16. With the inclusion of the boring data from the New Orleans District, a problem associated with the modified empirical criteria for predicting stability with regard to flow failure has become apparent. It is often the case that the borings made by the New Orleans District for revetment work extend to or slightly below thalweg elevations but still do not completely penetrate or extend far enough into the underlying zone A sand to permit a prediction in accordance with the current criteria. A criterion limiting the depth considered in making predictions is used herein for borings in the New Orleans District.

17. It is considered logical to assume that the mass of soil which might be involved in a flow-type failure would be that lying between the ground surface and the elevation of the thalweg opposite the boring location. Thus, the concept of a limiting depth D_L arises. For the purpose of making predictions of susceptibility to flow failure in the New Orleans District, the limiting depth D_L is considered to be the difference between ground surface elevation of the boring and the 1962 thalweg elevation (1962 hydrographic survey) at the boring location, plus an additional 50 ft to allow for any deepening of the thalweg which may have occurred since 1962. The application of the limiting depth concept is described in Figure 1.

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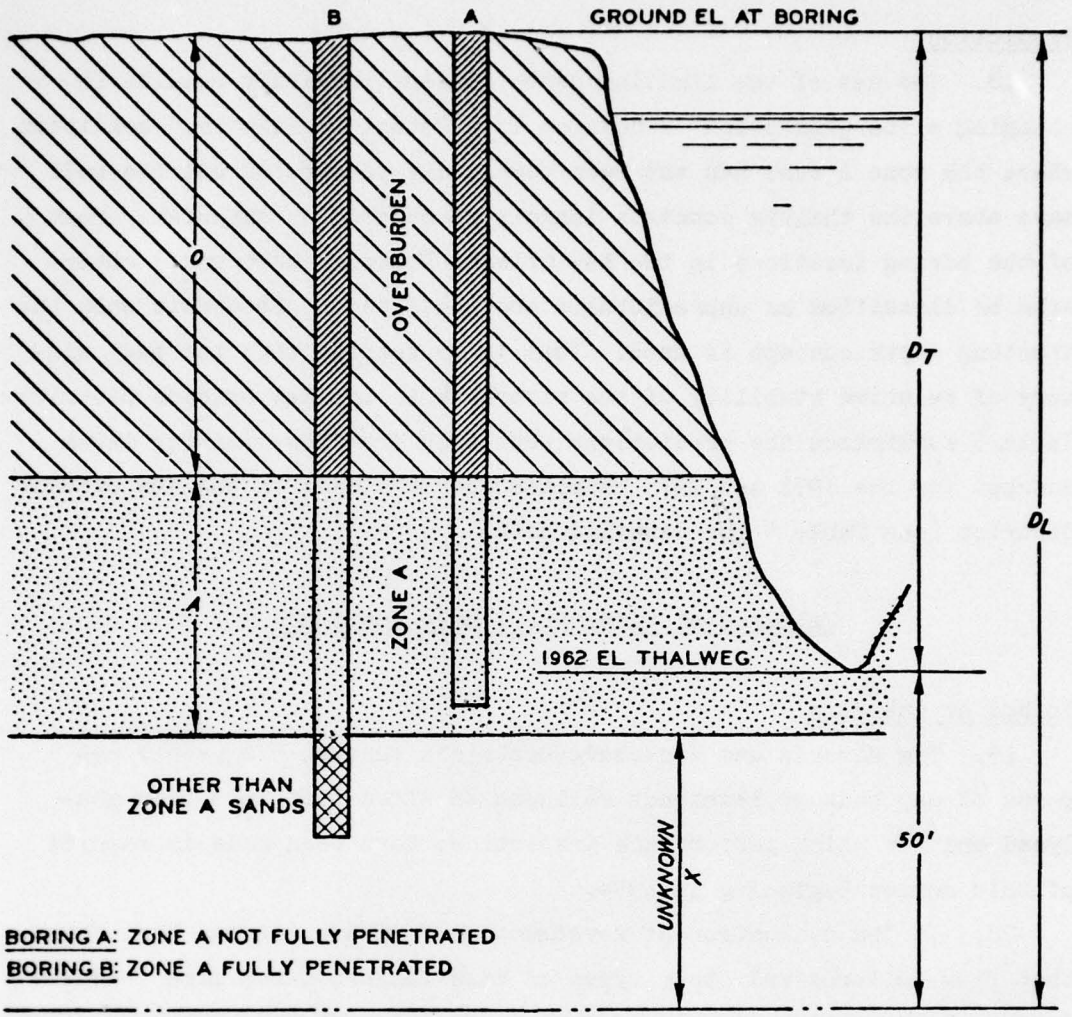
* U. S. Army Engineer District, New Orleans, "Mississippi River Hydrographic Survey 1961-63, Black Hawk, La., to Head of Passes, La.," Feb 1965, New Orleans, La., and U. S. Army Engineer District, Vicksburg, "Mississippi River Hydrographic Survey 1962-64, Mouth of White River, Ark., to Black Hawk, La.," Sep 1964, Vicksburg, Miss.



THE LIMITING DEPTH, D_L (= D_T + 50 FT), REPRESENTS THE MAXIMUM COMBINED THICKNESS OF OVERBURDEN AND ZONE A SANDS (O + A) THAT CAN BE USED IN THE EVALUATION OF STABILITY AGAINST FLOW SLIDES. THUS, THE THICKNESS OF ZONE A SANDS IS LIMITED TO A MAXIMUM VALUE OF (D_L − O).

	O/A	ZONE A THICKNESS	PREDICTION
D_L = O + A	≤0.85	≥20 FT	UNSTABLE
	>0.85		STABLE
D_L > O + A	≤0.85	≥20 FT	UNSTABLE
	≤0.85	<20 FT AND FULLY PENETRATED	STABLE
	≤0.85	<20 FT AND NOT PENETRATED	NO PREDICTION OR STABLE*
	>0.85	FULLY PENETRATED	STABLE
		NOT PENETRATED	NO PREDICTION OR STABLE*

* STABLE IF VALUE OF *X* IS SUCH THAT IT IS NOT POSSIBLE FOR A TO BE ≥20 FT AND FOR O/A TO BE ≤0.85.

Figure 1. Prediction criteria using the limiting depth concept

Predictions

18. The use of the limiting depth concept primarily results in changing a "no prediction" condition to a "stable prediction" condition where the zone A sand has not been completely penetrated but the soil mass above the thalweg consists largely of overburden material. Most of the boring locations in the New Orleans District that would otherwise be classified as unpredictable are predicted to be stable when the limiting depth concept is used. This is in keeping with the past history of relative stability of the riverbank in the New Orleans District. Table 5 summarizes the predictions resulting from the limiting depth concept for the 1972 and 1973 revetment borings made in the New Orleans District (see Table 4 for detailed data).

Failures at Sites Previously Analyzed

Method of analysis

19. The Memphis and Vicksburg Districts furnish WES yearly reports of any bank or revetment failures at sites that have been analyzed and for which performance predictions have been made in reports of this series beginning in 1954.

20. In the evaluation of revetment performance, it has been found that flow failures and other types of bank failure occur more frequently during or after high river stages than after low stages. The estimated ranges of maximum river stage at the revetment sites previously studied on the *Mississippi River in the Memphis and Vicksburg Districts for the* period 1954-1967 and in the Memphis, Vicksburg, and New Orleans Districts for the years 1968-1973 are tabulated below. Also shown are the total number of revetted boring locations analyzed and the number of reported failures that have been classified either as flow failure or shear failures (including those more than 500 ft from boring locations).

21. Based on the 1972 and 1973 river inspection and performance surveys, data on 81 failures that could be classified as either shear

or flow failures (51 within 500 ft of boring locations) at 44 revetment sites were reported.

Year	Maximum River Stage, ft* From	To	Cumulative Number of Revetted Boring Locations	Number of Failures Flow Failures	Shear Failures
1954	-10	-20	56	0	0
1955	+5	-10	158	9	3
1956	0	-14	270	10	3
1957	+2	-5	375	12	35
1958	0	-9	408	13	32
1959	-4	-14	447	5	11
1960	+3	-11	477	6	8
1961	+10	-2	532	10	11
1962	+7	-7	591	9	33
1963	+8	-9	648	6	12
1964	+4	-11	749	4	4
1965	+3	-10	783	11	12
1966	+7	-14	816	5**	5**
1967	+4	-14	885	7	19
1968	+3	-9	902	28	16
1969	+4	-6	939	25	17
1970	+5	-4	966	16	10
1971	+5	-7	1018	20	11
1972	+5	-10	1071	15	17
1973	+12	+4	1143	25	24

* Referenced to bank-full conditions (Lower Mississippi Valley River reach).

** Failures could not be classified at two sites and are not included in this total. See paragraphs 43 and 48 of Report 12-19.

22. Survey maps and cross sections of the failure areas that were forwarded to WES have been studied to determine whether the failures were flow slides or shear-type failures. The following criteria are used to identify flow failures:

a. The failure surface, in plan, tends to be bowl- or neck-shaped with a narrow throat at the outlet of the failure.

b. The failure surfaces usually encompass the top of bank.

c. The major portion of the failed material is not deposited at the toe of the failure area but is carried away by the river.

d. After-failure slopes are relatively flat.

The first three of the criteria above are considered to be the most important; where a flow failure is stated to have occurred in subsequent descriptions of individual failures, these criteria have been met unless otherwise stated. The last criterion, although significant, is difficult to verify because of the possibility of after-failure scour and cannot generally be used in establishing the occurrence of a flow failure. It should be noted that, in general, survey maps of failure areas are made from annual surveys conducted during the summer at low river stages probably several months after the failures occur. Consequently, it may reasonably be assumed that river currents may modify the contours of most of the failure areas by the time the surveys are made; for this reason it is difficult in some cases to establish whether failures are of the liquefaction or the shear type.

Predictions and observed performance

23. Flow-failure predictions and observed performance through 1973 for all sites for which predictions were made in the previous 17 reports and in this report for the 1973 data are summarized in Table 6. The estimated maximum river stages with reference to bank-full conditions at each of the sites studied from 1954-1973 are also shown in Table 6. Failures reported in the years 1955-1971 were discussed in Reports 12-4, 12-6 through 12-14, and 12-17 thorugh 12-22. Discussions of failures observed in 1972 and 1973 are presented below. Where shear failures occurred at locations predicted to be either stable or unstable

with respect to flow slides, the criteria are considered to have been neither verified nor contradicted.*

24. Failures observed in 1972 and 1973 which occurred within 500 ft of borings for which predictions have previously been made are presented in Tables 7 and 8, respectively. The key to the dimensions of the shear and flow failures (given in Columns 14-17 of Tables 7 and 8) is shown in Figure 2. Those failures observed in 1972 and 1973 which could not be classified as either a flow or shear failure, or which occurred more than 500 ft from boring locations, are described in Appendix A for record purposes only.

Summary of New Site Predictions and 1972 and 1973 Performance at Sites Previously Studied

New site predictions

25. Predictions with regard to flow failure were made using the modified criteria for 59 new boring locations at 13 sites in the Memphis and Vicksburg Districts. Based on the modified criteria, 27 locations are predicted to be unstable and 24 are predicted to be stable with regard to flow failure. No prediction was possible for 8 locations because thicknesses of zone A sand were not determined.

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* The original classification criteria were modified in 1959 as indicated in Table 1. Previously reported data were reevaluated and tabulated in Report 12-10 to show predictions based on the modified criteria. The summary tabulation was expanded in Report 12-11 to indicate those locations for which no prediction could be made because the full thickness of zone A sand was not penetrated in the boring, and the thickness that was penetrated was insufficient for prediction purposes. Report 12-11 and later reports list only those failures that occurred within 500 ft of a boring location. Table 4 was revised in Report 12-19 to group all information on a particular site together under the heading of the site name. The site locations are listed in order of MAHP from upstream to downstream. The maximum river stage shown in the table is the maximum stage preceding the observed performance of the riverbank.

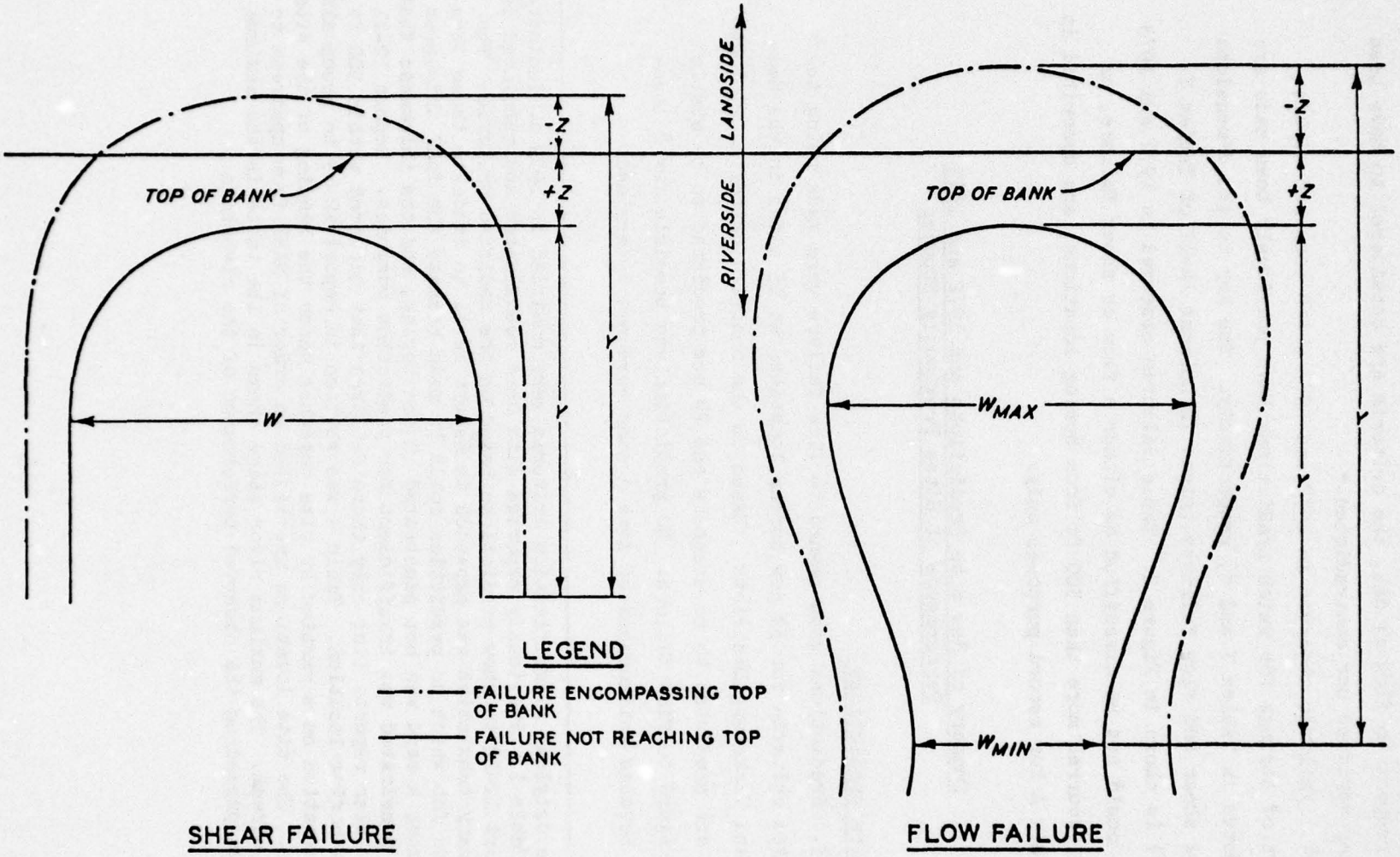


Figure 2. Failure dimensions reported in Tables 7 and 8

26. Predictions as to stability with regard to flow failure were made using an alternate method of applying the modified criteria for 53 new boring locations at 18 sites in the New Orleans District. Based on the limiting depth concept, 9 locations are predicted to be susceptible to flow failure and 38 are predicted to be stable. No prediction was possible for 6 locations.

Performance during 1972 and 1973 at sites previously studied

27. During the summer and fall of 1972 and 1973, 51 bank failures were reported along the Mississippi River near (within 500 ft of) 44 boring locations at 23 sites for which stability predictions had been made. Twenty-seven flow failures occurred near 24 boring locations predicted to be unstable with regard to flow failure. Three flow failures occurred near 3 boring locations predicted to be stable with regard to flow failure. Nine shear failures occurred near 7 boring locations predicted to be unstable with regard to flow failure; 9 shear failures occurred near 9 boring locations predicted to be stable. Thirteen flow failures and 17 shear failures were reported in areas where no borings were located within 500 ft. Five shear failures occurred near 4 boring locations for which no prediction had been made because of insufficient data on the depth of zone A sand. In addition, 19 revetment failures were thought to be the direct result of severe local scour.

Evaluation of Performance Predictions 1954-1973

28. Since 1954, data have been studied from 760 borings (of which 541 were at locations later revetted) made at 78 proposed revetment sites along the Mississippi River in the Memphis District and from 868 borings (of which 536 were at locations later revetted) made at 78 proposed revetment sites in the Vicksburg District. Starting in 1968, data from the New Orleans District were studied from 422 borings made at 103 proposed revetment sites along the Mississippi River. The susceptibility with regard to flow failure of all boring locations for which there were sufficient data has been evaluated using the modified criteria in the Memphis and Vicksburg Districts and an alternative method

of applying the modified criteria in the New Orleans District. Predicted performance, together with actual performance records, is given in Table 6. The only failures considered in this table are those that occurred within 500 ft of boring locations for which predictions have been made. To compare the actual performance with predicted performance, a summary of performance at those boring lcoations where revetments have been placed is given in the following tabulation:

Prediction with Respect to Flow Failure	Boring Locations	Performance		
	Number	Flow Failures	Shear Failures	No Failures
Memphis District				
Unstable	140	16	13	111
Stable	339	3	40	296
No prediction possible	62	2	6	54
Subtotal	541	21	59	461
Vicksburg District				
Unstable	244	125	25	94
Stable	239	21	74	144
No prediction possible	53	8	10	35
Subtotal	536	154	109	273
New Orleans District				
Unstable	(Data received not adequate for determining which failures were at revetted locations and contour maps were not adequate to establish type of failure)			
Stable				
No prediction				
Memphis and Vicksburg Districts				
Unstable	384	141	38	205
Stable	578	24	114	440
No prediction possible	115	10	16	89
Total	1077	175	168	734

29. Significant facts apparent from data shown in the preceding tabluation are discussed below:

a. In the Memphis District, 15 percent of the revetted boring locations have experienced failures of either the flow or shear type, while in the Vicksburg District, 49 percent of the revetted boring locations have experienced failures.

b. Eighty-eight percent of the flow failures have occurred in the Vicksburg District.

c. Approximately 46 percent of the revetted locations in the Vicksburg District are predicted to be potentially unstable, while in the Memphis District about 26 percent of the revetted locations are predicted to be unstable.

30. Table 9 summarizes soil conditions at the 18 locations where flow failures occurred in violation of the empirical criteria. It is considered significant that with only 18 exceptions, all flow failures have occurred either near locations predicted to be potentially unstable or where the full depth of zone A sand was not determined. However, since only 37 percent of the locations in the Vicksburg and Memphis Districts predicted to be susceptible to flow failures have actually experienced such failures over the 19-yr period of study, it is apparent the the modified criteria define only a part (i.e., thicknesses of overburden and zone A sand) of the conditions indicative of the probability of flow failure. This empirical method does not include consideration of the effect of density of the zone A sand or of geological and groundwater conditions in predicting susceptibility to flow failure. In addition, the empirical method ignores the effect of river attack. It is entirely possible that many of the unstable locations have not yet experienced flow failures simply because they have not been subjected to the degree of river assault required to trigger flow failure.

Conclusions

31. Since flow failures have occurred at those locations that have been predicted to be unstable, the modified classification criteria

are considered reliable in predicting susceptibility to flow failure. However, many locations predicted to be potentially unstable have not yet experienced flow failure; this may be because the density of the zone A sand is such as to prevent flow failure, the severity of river attack has not been sufficient to initiate a flow failure, or the influence of other possible factors that could prevent such failures has not been taken into account.

Table 1

Comparison of Original and Modified Classification Criteria

Material	Original Criteria*	Modified Criteria**
Overburden soils	More than 10% passing No. 200 sieve	More than 20% passing No. 200 sieve
Upper sands	50% or more passing No. 40 sieve	50% or more passing No. 40 sieve
Zone A	50% or more passing No. 60 sieve	25% or more passing No. 60 sieve
Zone B	Less than 50% passing No. 60 sieve	Less than 25% passing No. 60 sieve
Lower sands	Less than 50% passing No. 40 sieve	Less than 50% passing No. 40 sieve

* These classification criteria were used prior to 1959.

** These criteria are presently used in the classification of individual soil samples. However, in establishing thicknesses of overburden and zone A materials, strata of other soils may be included in these zones, as described in the text.

Table 2

Summary of Site and Map Identification Data, Memphis and Vicksburg Districts

Revetment Site Location	Boring No.	Miles Above Head of Passes*	General Title	Date	Sheet No.	File No.
			Memphis District (1972)			
Winchester Towhead, Mo.	1-U-72 thru 10-U-72	901.5 to 899.3	Miss. River Bank Protection, General Map, Island No. 9, Geological Investigation	July 1957 revised	2 of 2	60/248
Merriweather-Cherokee, Tenn.	2-72 and 1-72	874.1 to 873.9	Miss River Channel Improvement, General Map, Merriweather-Cherokee, Geological Investigation	Jan 1967 revised Jan 1973	1 of 1	Photo No. 39-73/821 dated 3 Oct 1964
Above Lee Towhead, Tenn.	1-72 thru 4-72	860.5 to 859.7	Miss. River Bank Protection, General Map, Lee Towhead, Geological Investigation	July 1957 revised June 1972	1 of 1	60/249
			Vicksburg District (1972)			
Smith Point, Miss.	SP-12-72U thru SP-10-72U	604.7 to 604.4	Miss. River - Potamology Studies, Detailed Study Reaches, Smith Point - Terrene, Hydrographic Survey	29 Feb-6 Mar 72	1 of 3	--
Eutaw-Mounds, Miss.	M-4-72U and M-5-72	559.7 to 559.5	Miss. River Channel Improvement Work, Record Map, Revetments and Dikes, Eutaw-Mounds, Miss., Revetment	1965	12 of 62	--
			Memphis District (1973)			
Robinson Bayou, Mo.	11-U-73	850.2	Miss. River Bank Protection, General Map, Little Prairie Bend, Geological Investigation	Mar 1948 revised Sep 1952 Mar 1973	1 of 1	60/63
Obion-Tamm, Tenn.	24-AU-73 thru 27-U-73	813.95 to 813.4	Miss. River Channel Improvement, General Map, River Styx, Geological Investigation	Apr 1960 revised Mar 1972	1 of 1	60/256
Kate Aubrey, Tenn.	A-U-73 and B-U-73	788.2 to 788.0	Miss. River Bank Protection, General Photo Map, Keys Point-Island 30, Comparative Bank Lines	Nov 1965 revised June 1973	1 of 1	Photo No. 87-73/821 dated Oct 1964
Sunrise Towhead, Tenn.	1-73	776.95	Miss. River Bank Protection, General Map, Bend of Island 34, Geological Investigation	July 1952 revised June 1965	1 of 1	60/221
Island 63 Bar, Miss.	A-G-73 thru 3-G-73	639.2 to 637.6	Miss. River Channel Improvement, General Map, Island 63 Bar, Miss. Before Construction Survey	Sep 1973	1 of 1	77/1015
			Vicksburg District (1973)			
Belle Island, La.	B-7-73U thru B-1-73U	463.2 to 462.1	Miss. River - Potamology Studies, Detailed Study Reaches, Belle Island, La., Revetment Borings Location Map	Rev. May 1973	1 of 1	--
Grand Gulf, Miss.	G-4-73 thru G-1-73	410.8 to 410.2	Miss. River - Potamology Studies, Detailed Study Reaches, Grand Gulf, Miss. and La., Revetment Borings Location Map	--	1 of 1	--
Carthage Point, Miss.	C-1-73U thru C-9-73U	360.9 to 359.4	Miss. River - Potamology Studies, Detailed Study Reaches, Carthage Point, Miss., Revetment Borings Location Map	Rev. May 1973	1 of 1	--

* 1962 mileage.

Table 3

Summary of Soil Conditions at 1972 and 1973 Sites, Memphis and Vicksburg Districts

Revetment Site Location	No.	Miles Above Head of Passes*	Date	Station or Range	Boring No.	Boring MAHP	Boring Depth ft	Overburden Thickness ft	Zone A Thickness ft	R Values**	Predictions†
Memphis District, 1972 Borings											
Winchester Towhead, Mo.	326	901.5 to 899.3	Apr 72	122+90	1-U-72	901.5	56	56	0	--	S
				132+50	2-U-72	901.3	56	8	9	--	S
				141+65	3-U-72	901.1	74	13	6	--	S
				152+00	4-U-72	900.9	53	8	21	0.38	U
			July 72	161+50	5-U-72	900.7	53	19	20	0.95	S
				172+00	6-U-72	900.5	56	11	13	--	S
			Aug 72	182+00	7-U-72	900.2	51	27	24+	1.13	NP
				191+50	8-U-72	899.8	76	11	17	--	S
				201+35	9-U-72	899.5	53	22	31+	0.71	U
				212+00	10-U-72	899.3	54	17	37+	0.46	U
Merriweather-Cherokee, Tenn.	327	874.1 to 873.9	Aug 72	590+00	2-72	874.1	57	22	20	1.10	S
				599+00	1-72	873.9	70	18	25	0.72	U
Above Lee Towhead, Tenn.	328	860.5 to 859.7	June 72	147+00	1-72	860.5	58	0	45	--	U
				161+00	2-72	860.2	52	19	30	0.63	U
				176+50	3-72	859.95	53	0	53+	--	U
				191+50	4-72	859.7	50	0	50+	--	U
Vicksburg District, 1972 Borings											
Smith Point, Miss.	321	604.7 to 604.4	July 72	R-93-U	SP-12-72U	604.7	91	22	46	0.48	U
				R-86-U	SP-11-72U	604.5	88	0	24	--	U
				R-80-U	SP-10-72U	604.4	88	5	77	0.06	U
Eutaw-Mounds, Miss.	193	559.7 to 559.5	July 72	R-125-D	M-4-72U	559.7	91	19	68	0.28	U
				R-133-D	M-5-72	559.5	91	0	47	--	U
Memphis District, 1973 Borings											
Robinson Bayou, Mo.	316	850.2	July 73	344+00	11-U-73	850.2	52	52	0	--	S
Obion-Tamm, Tenn.	100	813.5 to 813.4	Aug 73	386+00	24-AU-73	813.95	57	38	16	--	S
				394+77	25-U-73	813.8	86	42	24	1.75	S
				405+00	26-U-73	813.6	53	25	28+	0.89	NP
				415+60	27-U-73	813.4	58	33	25+	1.32	NP
Kate Aubrey, Tenn.	319	788.2 to 788.0	Aug 73	466+00	A-U-73	788.2	52	15	37+	0.41	U
				478+00	B-U-73	788.0	53	23	30+	0.76	U
Sunrise Towhead, Tenn.	329	776.95	Aug 73	40+00	1-73	776.95	52	0	10	--	S
Island 63 Bar, Miss.	170-A	639.2 to 637.6	Sep 73	135+00	A-G-73	639.2	72	0	51	--	U
				156+00	B-G-73	638.8	52	0	49	--	U
				165+60	D-G-73	638.7	72	20	29	0.69	U
				173+57	C-G-73	638.5	72	28	8	--	S
				184+00	E-G-73	638.3	62	26	21	1.23	S
				195+00	1-G-73	638.1	47	0	47+	--	U
				202+00	4-G-73	637.95	61	13	31	0.34	U
				209+00	2-G-73	637.8	39	0	27	--	U
				217+00	5-G-73	637.7	57	12	45+	0.27	U
				220+00	3-G-73	637.6	41	0	35	--	U
Vicksburg District, 1973 Borings											
Belle Island, La.	330	463.2 to 462.1	Nov 73 and Dec 73		B-7-73U	463.2	111	37	19	--	S
					B-6-73U	463.0	111	58	35	1.66	S
					B-5-73U	462.8	121	48	50	0.96	S
					B-4-73U	462.6	116	58	15	--	S
					B-3-73U	462.4	111	69	24	2.88	S
					B-2-73U	462.3	111	3	10	--	S
					B-1-73U	462.1	111	18	36	0.50	U
Grand Gulf, Miss.	185	410.8 to 410.2	Nov 73	R-224-U	G-4-73	410.8	91	13	15	--	S
				R-216-U	G-3-73	410.6	91	13	35	0.37	U
				R-208-U	G-2-73	410.4	91	23	30	0.77	U
				R-200-U	G-1-73	410.2	91	28	35	0.80	U
Carthage Point, Miss.	331	360.9 to 359.4	Nov 73		C-1-73U	360.9	101	53	48+	--	NP
					C-2-73U	360.65	101	78	23+	--	NP
					C-3-73U	360.5	101	87	14+	--	NP
					C-4-73U	360.3	151	69	59	1.17	S
					C-5-73U	360.1	101	58	43+	--	NP
					C-6-73U	359.95	101	53	10	--	S
					C-7-73U	359.95	101	73	28+	--	NP
					C-8-73U	359.55	101	48	25	1.92	S
					C-9-73U	359.4	101	63	10	--	S

Note: Where bottom of boring did not completely penetrate zone A sand stratum, a + symbol is used to indicate that the thickness of stratum is greater than shown.

* *1962 mileage.*

** Ratio of overburden thickness. Not shown when zone A sand was less than 20 ft thick.

† U = unstable; S = stable; NP = no prediction.

Table 4

Summary of Soil Conditions at 1972 and 1973 Sites, New Orleans District

Revetment Site Location	No.	Miles Above Head of Passes	Boring Date	Boring No.	MAHP	Ground Surface El ft msl ①	Thalweg El ft msl ②	Limiting Depth D_L (① - ② + 50 ft) ft ③	Boring Depth ft ④	X (③ - ④) ft ⑤	Over-burden Thickness ft ⑥	Zone A Thickness ft ⑦	R ⑥/⑦ ⑧	Pre-diction ⑨
1972 Sites														
Waterford, La.	261	127.3	Jan 72	W-127.3-U	127.3	28	-100	178	178	0	178	0	>0.85	S
New Orleans Harbor, La.	332	99.0 to 98.3	Sep 72	E-99.0-U	99.0	17	-126	193	164	29	43	54	0.80	U
			Oct 72	E-98.7-U	98.7	18	-124	192	171	21	76	10	>0.85*	S
			Sep 72	E-98.3-G	98.3	16	-107	173	160	13	55	50	>0.85*	S
	333	95.4 to 95.0	Jan 73	E-95.41-U	95.41	6	-140	196	177	19	79	60	>0.85*	S
			Nov 72	E-95.27-UT	95.27	21	-144	215	179	36	119	16	>0.85*	S
			Dec 72	E-95.26-U	95.26	13	-144	207	178	29	109	21	>0.85*	S
			Nov 72	E-95.1-U	95.1	14	-133	197	176	21	117	59+	>0.85*	S
			Oct 72	E-95.04-U	95.04	21	-133	204	178	26	112	19	>0.85*	S
			Nov 72	E-95.02-UT	95.02	16	-133	199	178	21	103	18	>0.85*	S
			Feb 72	R-95.0-LU	95.0	21	-140	211	141	70	141	?	>0.85*	S
Meraux, La.	334	88.1	Feb 72	E-88.1-G	88.1	21	-93	164	122	42	45	77+	0.58	U
Story, La.	335	85.5	Mar 72	E-85.5-G	85.5	23	-140	213	141	72	82	8	>0.85*	S
Twelve Mile Point, La.	299	83.5	Jan 72	W-83.5-UT	83.5	11	-70	131	140	--	48	52	>0.85	S
Poydras, La.	228	81.3	Apr 72	E-81.3-UT	81.3	9	-110	169	128	41	32	6	>0.85	S
English Turn, La.	300	78.5	Aug 72	E-78.5-U	78.5	19	-100	169	171	--	78	54	>0.85	S
Oak Point, La.	301	74.6	Jan 72	W-74.6-U	74.6	20	-110	180	129	51	76	53+	?	NP
Belair, La.	268	66.5	Sep 72	E-66.5-UT	66.5	5	-85	140	135	5	21	26	0.81	U
1973 Sites														
Black Hawk, La.	336	319.2 to 315.9	Oct 73	R-316.8-UT	319.2	50	-27	127	161	--	73	61	>0.85	S
			Oct 73	R-316.4-G	319.0	68	-48	166	142	24	98	44+	>0.85*	S
			Oct 73	R-316.1-GT	318.7	50	-50	150	100	50	83	9	>0.85*	S
			Oct 73	R-315.7-G	318.3	66	-90	206	117	89	86	31+	?	NP
			Oct 73	R-315.3-UT	317.7	41	-80	171	89	82	89	?	>0.85*	S
			Oct 73	R-314.95-G	317.3	58	-73	181	107	74	107	?	>0.85*	S
			Sep 73	R-314.65-UT	317.0	42	-80	172	91	81	68	20	>0.85	S
			Sep 73	R-314.2-G	316.5	59	-72	181	109	72	83	26+	?	NP
			Sep 73	R-313.65-UT	315.9	49	-70	169	98	71	55	42+	?	NP

(Continued)

Note:

Col	Notation	Explanation
5	--	Not applicable if zone A was fully penetrated or if total depth of boring exceeded D_L.
7	+	Zone A not fully penetrated.
8	*	R >0.85 even if zone A thickness (5 + 7) thick.
9	U	Unstable with regard to flow failure.
	S	Stable with regard to flow failure.
	NP	No prediction possible.

Table 4 (Concluded)

Revetment Site Location	No.	Miles Above Head of Passes	Boring Date	Boring No.	MAHP	Ground Surface El ft msl ①	Thalweg El ft msl ②	Limiting Depth D_L (① - ② + 50 ft) ft ③	Boring Depth ft ④	X (③ - ④) ft ⑤	Overburden Thickness ft ⑥	Zone A Thickness ft ⑦	R ⑥/⑦ 8	Prediction ⑨
1973 Sites (Continued)														
Point Breeze, La.	337	314.2 to 311.6	Jul 73	R-312.01-R	314.2	49	-20	119	96	23	96	?	>0.85*	S
			Sep 73	R-311.5-G	313.8	71	-11	132	120	12	68	52+	>0.85*	S
			Jul 73	R-311.23-R	313.6	52	-14	116	89	27	32	57+	0.56	U
			Jul 73	R-310.83-R	313.2	46	-17	113	88	25	27	61+	0.44	U
			Sep 73	R-310.6-GT	312.8	54	-30	134	104	30	58	46+	?	NP
			Jul 73	R-309.9-R	312.2	58	-24	132	86	46	69	17+	>0.85*	S
			Sep 73	R-309.05-UT	311.6	50	-70	170	99	71	43	55+	0.78	U
Little Gypsy Setback, La.	338	131.1 to 128.9	Apr 73	R-131.1-L	131.1	29	-80	159	98	61	98	?	>0.85*	S
			Apr 73	R-130.98-L	131.98	31	-80	161	98	63	98	?	>0.85*	S
			Apr 73	R-130.92-L	130.92	30	-104	184	128	56	128	?	>0.85*	S
			Mar 73	R-130.62-L	130.62	22	-120	192	183	9	114	42	>0.85*	S
			Mar 73	R-130.40-L	130.4	31	-150	231	168	63	128	26	>0.85*	S
			Mar 73	R-130.25-L	130.25	28	-120	198	200	--	42	117	0.36	U
			Mar 73	R-130.05-L	130.05	32	-115	197	73	124	55	18+	?	NP
			Apr 73	R-129.40-L	129.4	31	-110	191	166	25	64	90	0.71	U
			Apr 73	R-128.9-L	128.9	31	-110	191	160	31	67	82	0.82	U
Good Hope, La.	289	125.1	Aug 73	R-125.5-UT	125.1	16	-80	146	152	--	152	?	>0.85	S
Destrehan, La.	339	121.6	--	E-121.6-UT	121.6	14	-120	184	142	42	105	30	>0.85*	S
Luling, La.	262	121.6	Nov 73	W-121.6-UT	121.6	15	-120	185	142	43	31	12	>0.85	S
New Orleans Harbor, La.	333	95.4 to 94.8	Sep 73	E-95.43-UT	95.4	21	-135	206	178	28	86	63	>0.85*	S
			Feb 73	E-95.35-GT	95.35	21	-144	215	178	37	94	52	>0.85*	S
			Mar 73	E-95.12-GT	95.1	16	-133	199	175	24	114	61+	>0.85*	S
			Feb 73	E-94.83-G	94.8	17	-160	227	198	29	114	22	>0.85*	S
Algiers, La.	297	93.5	Mar 73	W-93.5-UT	93.5	21	-121	192	158	34	75	78	>0.85	S
Sixty Mile Point, La.	340	33.9 to 33.8	Aug 73	6-BS	33.9	4	-130	184	41	143	41	?	>0.85	S
			Aug 73	8-BS	33.8	3	-130	183	41	142	41	?	>0.85	S

Table 5

Summary of Predictions, 1972 and 1973 Borings in New Orleans District

Revetment Site				Predictions*				
Location	No.	Miles Above Head of Passes (1962 Mileage)	No. of Borings	Stable (A)	Stable (B)	Stable (C)	Unstable	No Prediction Possible (D)
			1972 Borings					
Waterford, La.	261	127.3	1	1	--	--	--	--
New Orleans Harbor, La.	332	99.0 to 98.3	3	--	2	--	1	--
New Orleans Harbor, La.	333	95.4 to 95.0	7	--	6	1	--	--
Meraux, La.	334	88.1	1	--	--	--	1	--
Story, La.	335	85.5	1	--	1	--	--	--
Twelve Mile Point, La.	299	83.5	1	--	1	--	--	--
Poydras, La.	228	81.3	1	--	1	--	--	--
English Turn, La.	300	78.5	1	--	1	--	--	--
Oak Point, La.	301	74.6	1	--	--	--	--	1
Belaire, La.	268	66.5	1	--	--	--	1	--
		Total	18	1	12	1	3	1
			1973 Borings					
Black Hawk, La.	336	319.2 to 315.9	9	2	3	1	--	3
Point Breeze, La.	337	314.2 to 311.6	7	1	--	2	3	1
Little Gypsy Setback, La.	338	131.1 to 128.9	9	3	2	--	3	1
Good Hope, La.	289	125.1	1	1	--	--	--	--
Destrehan, La.	339	121.6	1	--	1	--	--	--
Luling, La.	262	121.6	1	--	1	--	--	--
New Orleans Harbor, La.	333	95.4 to 94.8	4	1	2	1	--	--
Algiers, La.	297	93.5	1	--	1	--	--	--
Sixty Mile Point, La.	340	33.9 to 33.8	2	2	--	--	--	--
		Total	35	10	10	4	6	5

* (A) No sand A encountered in boring.
(B) Sand A fully penetrated, R value >0.85.
(C) Sand A not fully penetrated, but R value >0.85 based on D_L concept.
(D) Sand A not fully penetrated and boring not carried to D_L; R value could be either greater than or less than 0.85.

Table 6

Summary of Performance Data at Sites Previously Studied

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																			
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	MEMPHIS DISTRICT																						
	Mayfield Creek, Ky., 950 MAHP																				+5	+5	+12
318	Sta 11+15 to 55+00	12-22	Stable																		R	N	N
318	Sta 65+00		Unstable																		-	-	-
318	Sta 75+00		Stable																		-	-	-
	Prichard, Mo.. 947 MAHP			+7	+1	+2	0	-4	-3	+10	+6	+8	+4	+3	+3	+1	-1	+3	+5	+5	+5	+12	
14	Sta 264+00 to 284+00	12-4	Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	Campbell Point, Ky., 943 MAHP			+5	-1	0	-1	-4	+3	+10	+6	+8	+2	+2	+3	+1	-1	+2	+4	+4	+4	+11	
111	Sta 127+00 to 137+00	12-11	Stable							-	-	-	-	-	-	-	-	-	-	-	-	-	
15	Sta 147+00 to 196+00	12-4	Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
15	Sta 205+00	12-4	No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
111	Sta 215+00 to 225+00	12-11	Stable							-	-	-	-	-	-	-	-	-	-	-	-	-	
	Islands 2, 3, and 4, Ky., 940 MAHP					+2	0	-4	+3	+10	+6	+8	+4	+3	+3	+1	-1	-2	+4	+4	+4	+11	
235	Sta 13+00 to 43+00	12-21	Stable															-	-	-	-	-	
235	Sta 53+00		Unstable															-	-	-	-	-	
47	Sta 64+00	12-7	Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
47	Sta 74+00 to 93+75		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
47	Sta 104+25		No prediction				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
47	Sta 114+00 to 173+50		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
47	Sta 183+00 to 193+50		Unstable				N	0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
47	Sta 203+25 to 214+00		No prediction				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	Wolf Island, Ky., 934 MAHP								-4	+3	+10	+6	+7	+4	+3	+3	+1	-1	+2	+4	+4	+4	+11
81	Sta 120+00	12-9	Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
81	Sta 130+00		Unstable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
81	Sta 140+00 to 160+00		Unstable						R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
81	Sta 172+00		Stable						R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
81	Sta 182+00 to 192+50		Unstable						R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
81	Sta 203+50 to 224+00		Stable						-	-	-	-	-	-	-	-	R	N	N	N	N	N	N
81	Sta 234+00		Unstable						-	-	-	-	-	-	-	-	R	N	N	N	N	N	N
81	Sta 244+00		No prediction						-	-	-	-	-	-	-	-	R	N	N	N	N	N	N
81	Sta 254+00		Unstable						-	-	-	-	-	-	-	-	-	R	N	N	N	N	N
81	Sta 264+00 and 273+50		Stable						-	-	-	-	-	-	-	-	-	R	N	N	N	N	N
81	Sta 284+00 and 294+00		Unstable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
	Williams, Ky., 927 MAHP										+10	+6	+8	+4	+3	+3	+1	-1	+2	+4	+4	+4	+11
112	Sta 100+00 to 110+00	12-11	Stable								-	-	-	-	-	-	-	-	-	-	-	-	-
112	Sta 120+50 to 130+50		Stable								R	N	N	N	N	N	N	N	N	N	N	N	N

(Continued)

Note: Site locations are listed in order of miles above Head of Passes (MAHP) from upstream to downstream. Predictions for all sites based on modified classification criteria.

N = No failure reported.
- = No revetment built.
R = Revetment built.
F = Flow failure occurred as predicted.
(F) = Flow failure occurred at location predicted to be stable.
F = Flow failure occurred; prediction not possible since zone A sand was not sufficiently penetrated.
0 = Failure other than flow type occurred.
RO = Revetment built and failure other than flow type occurred in the same year.

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Continued)																			
	Hickman-Reelfoot, Ky., 919 MAHP										+10	+6	+7	+4	+2	+3	+1	-2	+2	+4	+4	+4	+11
113	Sta 285+00		Stable								-	-	-	-	-	-	-	-	R	N	N	N	N
113	Sta 295+00		No prediction								-	-	-	-	-	-	-	-	R	N	N	N	N
113	Sta 305+00 and 315+00		Stable								-	-	-	-	-	-	-	-	R	N	N	N	N
236	Sta 326+00	12-21	Unstable																-	-	-	-	-
236	Sta 336+00		Stable																-	-	-	-	-
	Island No. 8, Ky., 914 MAHP						+1	-1	-4	+3	+10	+6	+7	+4	+3	+3	+1	-2	+2	+4	+4	+4	+11
48	Sta 25+75 and 36+00	12-7	Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
48	Sta 46+00		No prediction				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
48	Sta 56+00		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
48	Sta 66+00 to 86+00		Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
189	Sta 100+00	12-19	Stable														-	-	-	-	-	-	R
189	Sta 110+00 to 120+00		Unstable														-	-	-	-	-	-	R
	Milton Bell, Mo., 907 MAHP																			+4	+4	+4	+11
315	Sta 99+00	12-22	Unstable																	-	R	N	N
315	Sta 110+00 to 260+00		Stable																	-	R	N	N
	Winchester Towhead, Mo., 901 MAHP																					+4	+11
326	Sta 122+90 to 141+65	12-23	Stable																			-	-
326	Sta 152+00		Unstable																			-	-
326	Sta 161+50 and 172+00		Stable																			-	-
326	Sta 182+00		No prediction																			-	-
326	Sta 191+50		Stable																			-	-
326	Sta 201+35 and 212+00		Unstable																			-	-
	Slough Landing Neck, Tenn., 895 MAHP							-1	-4	+3	+10	+6	+7	+3	+2	+4	+2	-2	+1	+3	+4	+4	+11
64	Sta 312+00 to 332+00	12-8	Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 340+75 to 351+75		Unstable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 362+50		Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 372+00		Unstable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 381+25 to 392+00		Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 402+00		Unstable					-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 412+75		Stable					-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
64	Sta 422+50		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	Sta 432+50	12-10	Unstable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	Sta 442+50		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	La Forge, Mo., 891 MAHP					-6	+1	-1	-4	+3	+10	+5	+7	+3	+2	+4	+2	-2	+1	+3	+4	+4	+11
99	Sta 105+00 to 125+00	12-10	Stable							-	-	-	-	-	R	N	N	N	N	N	N	N	N
29	Sta 146+00	12-6	Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
29	Sta 156+00 to 176+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
29	Sta 186+00		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
29	Sta 195+00 to 217+50		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
29	Sta 227+50		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
29	Sta 238+00 to 257+50		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																	
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	MEMPHIS DISTRICT (Continued)																						
	Kentucky Point, Ky., 886 MAHP																		+1	+3	+4	+4	+11
237	Sta 106+00	12-21	Stable																-	-	-	-	-
237	Sta 115+15 to 130+00		Unstable																-	-	-	-	-
237	Sta 135+05		Stable																-	-	-	-	-
237	Sta 145+20 to 175+60		Unstable																-	-	-	R	N
237	Sta 182+30		No prediction																-	-	-	R	N
	New Madrid Bend, Mo., 882 MAHP																	-2	+1	+3	+4	+4	+11
213	Sta 435+00 to 475+00	12-21	Unstable															-	-	-	-	-	-
213	Sta 485+00 to 505+00		Stable															-	-	-	-	-	-
213	Sta 512+00		Unstable															-	-	-	-	-	-
	Toney's Towhead, Tenn., 880 MAHP				0	-6	+1	-1	-4	+2	+9	+5	+6	+3	+2	+4	+2	-2	+1	+3	+4	+4	+10
1	Sta 236+00	12-3	Unstable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1	Sta 245+00		Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1	Sta 255+00		No prediction		N	N	N	N	N	F	N	N	N	N	N	N	N	N	N	N	N	N	N
1	Sta 265+00 to 274+25		Unstable		N	N	N	N	N	N	F	N	N	N	N	N	N	N	N	N	N	N	N
	Merriweather-Cherokee Bend, Tenn., 870 MAHP				0	-6	0	-1	-4	+2	+9	+5	+6	+3	+2	+4	+2	-3	+1	+3	+4	+4	+10
175	Sta 78+00	12-18	Unstable													N	N	N	N	N	N	N	N
175	Sta 88+00 and 98+50		Stable													N	N	N	N	N	N	N	N
2	Sta 326+00	12-3	Stable		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Sta 336+00		Stable		-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
49	Sta 344+00	12-7	Unstable				-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
49	Sta 353+75 to 363+75		Stable				-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
49	Sta 374+75		No prediction				-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
327	Sta 590+00	12-23	Stable																			-	R
327	Sta 599+00		Unstable																			-	R
	Little Cypress Bend, Mo., 863 MAHP				0	-6	0	-1	-4	+2	+9	+5	+6	+3	+2	+4	+2	-3	+1	+3	+3	+3	+10
3	Sta 104+50	12-3	No prediction		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Sta 115+00		Stable		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Sta 124+25 to 145+75		Stable		-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N
3	Sta 160+50		Unstable		R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3	Sta 170+00 and 180+25		Stable		R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3	Sta 191+00		Unstable		R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3	Sta 203+00		No prediction		R	N	N	N	O	N	N	N	N	N	N	N	O	N	N	O	N	N	N
3	Sta 213+00		Stable		R	N	N	N	N	N	N	N	N	N	N	N	O	N	N	N	N	N	N
3	Sta 223+75		No prediction		R	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3	Sta 232+75 to 303+75		Stable		R	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N
50	Sta 318+00 to 339+00	12-7	Stable		-	R	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N
82	Sta 390+00 and 400+00	12-9	Stable		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	Sta 410+00		Unstable		-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N
82	Sta 420+00		Stable		-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N
82	Sta 430+00		Unstable						-	-	-	-	-	R	N	N	N	N	N	N	N	N	N
168	Sta 430+00 to 441+00	12-17	Stable											R	N	N	N	N	N	N	N	N	N
168	Sta 451+00		Stable											-	-	-	-	-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																			
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Continued)																				
	Above Lee Towhead, Tenn., 860 MAHP																					+3	+10
328	Sta 147+00 to 191+50	12-23	Unstable																			R	N
	Lee Towhead, Mo., 858 MAHP							-1	-4	+2	+9	+5	+6	+2	+2	+4	+2	-3	+1	+3	+3	+3	+10
65	Sta 100+00	12-8	Stable					-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
65	Sta 110+00		Unstable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	Sta 120+00 to 150+00		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	Sta 160+00		Unstable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	Sta 170+00 and 178+00		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fritz Landing, Tenn., 856 MAHP											+5	+6	+2	+2	+4	+2	-3	0	+2	+3	+3	+10
133	Sta 70+00	12-13	Unstable										-	R	N	N	N	N	N	N	N	O	N
133	Sta 80+00		No prediction										-	R	N	N	N	N	N	N	N	N	N
133	Sta 90+00 and 100+00		Stable										-	R	N	N	N	N	N	N	N	O	N
122	Sta 110+00	12-12	Unstable									-	-	R	N	N	N	N	N	N	N	N	N
122	Sta 120+00 and 130+00		Stable									N	N	N	N	N	N	N	N	N	N	N	N
122	Sta 140+00		*No prediction*									N	N	N	N	N	N	N	N	N	N	N	N
122	Sta 150+00 to 170+00		Stable									N	N	N	N	N	N	N	N	N	N	N	N
122	Sta 180+00		No prediction									N	N	N	N	N	N	N	N	N	N	N	N
122	Sta 190+00		Stable									N	N	N	N	N	N	N	N	N	N	N	N
122	Sta 200+00		No prediction									R	N	N	N	N	N	N	N	N	N	N	N
	Hathaway Landing, Tenn., 852 MAHP			0	-6	0	-1	-4	+2	+9	+5	+6	+2	+2	+4	+2	-3	0	+2	+3	+3	+10	
4	Sta 210+00 to 230+00	12-3	No prediction	-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
4	Sta 240+00 to 250+00		Stable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Sta 260+00		Unstable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Sta 270+00 to 290+00		Stable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Sta 303+00		Unstable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Sta 312+00 and 322+00		Stable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Robinson Bayou, Mo., 850 MAHP																			+2	+3	+3	+10
316	Sta 240+00 to 270+00	12-22	Unstable																	-	-	R	N
316	Sta 280+00		Stable																	-	-	R	N
316	Sta 292+00 to 312+00		Unstable																	-	-	R	N
316	Sta 322+00 to 335+00		Stable																	-	-	R	N
316	Sta 344+00	12-23	Stable																			-	R
	Blaker Towhead, Tenn., 845 MAHP															+5	+2	-3	0	+2	+2	+2	+9
176	Sta 107+00 to 136+00	12-18	Unstable													N	N	N	N	N	N	N	N
176	Sta 151+00		No prediction													N	N	N	N	N	N	N	N
176	Sta 167+00		Unstable													N	N	N	N	N	N	N	N
214	Sta 188+00	12-21	Unstable															-	-	-	-	-	-
214	Sta 198+00		Stable															-	-	-	-	-	-
214	Sta 200+00 to 203+50		No prediction															-	-	-	-	-	-
214	Sta 208+00		Unstable															-	-	-	-	-	-
214	Sta 208+50		No prediction															-	-	-	-	-	-
214	Sta 212+00 to 254+00		Unstable															-	-	R	N	N	N
214	Sta 258+00		Stable															-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Continued)																			
	Linwood Bend, Tenn., 840 MAHP				0	-5	0	-2	-5	+2	+9	+5	+6	+2	+2	+5	+2	-3	0	+2	+2	+2	+9
16	Sta 280+00 to 292+00	12-4	Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Heloise, Tenn., 830 MAHP				0	-6	0	-2	-4	+2	+9	+4	+6	+2	+2	+5	+3	-4	0	+2	+2	+2	+9
5	Sta 98+40 to 128+00	12-3	Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
5	Sta 138+00 to 158+00		Unstable		N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N
5	Sta 168+00 to 178+20		No prediction		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
5	Sta 188+00 to 208+10		Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
5	Sta 218+00		Unstable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Obion Bar, Tenn., 821 MAHP												+5	+2	+1	+5	+3	-4	0	+2	+2	+2	+9
134	Sta 102+00	12-13	Stable										-	-	-	-	-	-	-	-	-	-	-
134	Sta 112+00		Unstable										-	-	-	-	-	-	-	-	-	-	-
134	Sta 122+00		Stable										-	-	-	-	-	-	-	-	-	-	-
134	Sta 132+00 and 142+00		Stable										N	N	N	N	N	N	N	N	N	N	N
134	Sta 152+00		Unstable										N	N	N	N	N	N	N	N	N	N	N
134	Sta 159+00		No prediction										N	N	N	N	N	N	N	N	N	N	N
	Tamm Bend, Tenn., 817 MAHP					-6	0	-2	-5	+2	+9	+4	+5	+2	+1	+5	+3	-4	0	+2	+2	+1	+8
51	Sta 83+00	12-7	Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
51	Sta 93+00 to 113+00		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 123+00 to 164+00	12-6	Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 174+50		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 184+50		No prediction			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 195+50		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 205+00 to 214+50		No prediction			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 225+00 to 236+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 246+50		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30	Sta 259+00 to 269+50		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	Sta 280+00	12-10	Unstable							-	-	-	R	N	N	N	N	N	N	N	N	N	N
51	Sta 290+00 to 310+00	12-7	Stable				-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
100	Sta 321+00	12-10	Stable							-	-	-	R	N	N	N	N	N	N	N	N	N	N
100	Sta 331+00		Unstable							-	-	-	R	N	N	N	N	N	N	N	N	N	N
100	Sta 341+00 to 361+00		Stable							-	-	-	R	N	N	N	N	N	N	N	N	N	N
100	Sta 386+00 and 394+77	12-23	Stable																			-	R
100	Sta 405+00 and 415+60		No prediction																			-	R
	Barfield, Ark., 809 MAHP				0	-6	-1	-2	-4	+1	+8	+4	+5	+2	+1	+5	+3	-4	-1	+1	+1	+1	+8
6	Sta 269+00 to 307+00	12-3	Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 320+00 to 352+00		No prediction		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 362+00		Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 372+00		No prediction		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 380+00 to 392+00		Stable		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 403+00		No prediction		N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 412+75 to 471+00		Stable		N	N	O	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6	Sta 483+00		No prediction		F	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Continued)																			
	Bend of Island 25, Tenn., 803 MAHP					-6	-1	-2	-5	+1	+8	+4	+5	+2	+1	+5	+3	-4	-1	+1	+1	+1	+8
31	Sta 265+50 to 286+00	12-6	Stable			N	N	O	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N
31	Sta 295+00		Unstable			N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
31	Sta 306+00		Stable			N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
31	Sta 316+00		Unstable			N	N	N	N	N	O	O	O	N	N	N	N	N	N	N	N	N	N
31	Sta 326+00 to 330+00		Unstable			N	N	O	N	N	N	O	O	N	N	N	N	N	N	N	N	N	N
31	Sta 335+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Island 26, Tenn., 799 MAHP					-6	-1	-2	-5	+1	+8	+4	+5	+1	+1	+6	+3	-4	-1	+1	+1	+1	+8
32	Sta 61+50	12-6	Stable			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	Sta 72+00		Unstable			-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 80+50 and 90+50		Stable			-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 101+00		Stable			-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 111+50 and 121+50		Unstable			-	-	-	-	R	N	N	F	N	N	N	N	N	N	N	N	N	N
32	Sta 132+00		Stable			-	-	-	-	R	N	N	N	N	N	N	O	N	N	N	N	N	N
32	Sta 142+00		Unstable			-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 152+00		Stable			-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 161+50		Unstable			-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 172+00 to 212+00		Stable			-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
32	Sta 222+00		Unstable			-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Keyes Point, Tenn., 792 MAHP					-6	-1	-2	-5	+1	+8	+4	+5	+1	+1	+6	+3	-4	-1	+1	+1	+1	+8
145	Sta 20+50	12-14	Stable										-	-	-	-	-	-	-	-	-	-	-
145	Sta 30+57 and 40+40		Stable										R	N	N	N	N	N	N	N	N	N	N
83	Sta 50+00 to 60+00	12-9	Stable						-	-	-	-	R	N	N	O	N	N	N	N	N	N	N
83	Sta 70+00		No prediction						-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
83	Sta 80+00 to 90+00		Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Sta 110+00 to 119+50	12-6	Unstable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Sta 130+50		Stable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Sta 140+00 to 159+00		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
33	Sta 168+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
33	Sta 177+50		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
33	Sta 188+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
33	Sta 200+00		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
238	Sta 199+00	12-21	Unstable																-	-	-	-	-
238	Sta 209+50		Stable																-	-	-	-	-
238	Sta 219+00 and 229+00		Unstable																-	-	-	-	-
177	Sta 491+00 to 1+00U	12-18	Unstable													N	N	N	N	N	N	N	N
177	Sta 11+00U		Stable													N	N	N	N	N	N	N	N
	Kate Aubrey, Ark., 792 MAHP																			+1	+1	+1	+8
319	Sta 368+00 to 424+00	12-22	Stable																	-	-	R	N
319	Sta 434+00		Unstable																	-	-	R	N
319	Sta 466+00 and 478+00	12-23	Unstable																			-	R
	Island 30, Tenn., 786 MAHP									+1	+8	+4	+5	+1	+1	+6	+3	-5	-1	+1	+1	+1	+8
101	Sta 108+00	12-10	Stable							N	N	N	N	N	N	N	N	N	N	N	N	N	N
101	Sta 118+00		Unstable							N	N	N	N	N	N	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	MEMPHIS DISTRICT (Continued)																						
	Island 30, Tenn., 786 MAHP (Continued)																						
101	Sta 128+00		Stable							N	N	N	N	N	N	N	N	N	N	N	N	N	N
101	Sta 138+00		Unstable							N	N	N	N	N	N	N	N	N	N	N	N	N	N
101	Sta 148+00 to 178+00		Stable							N	N	N	N	N	N	O	N	N	N	N	N	N	N
101	Sta 196+00		Unstable							N	N	N	N	N	N	N	N	N	N	N	N	N	N
101	Sta 208+00 to 218+00		Unstable							R	N	N	N	N	N	N	O	N	N	N	N	N	N
	Lower Bullerton, Ark., 782 MAHP							-2	-5	+1	+8	+4	+5	+1	+1	+6	+3	-5	-1	+1	+1	+1	+8
66	Sta 368+00 to 388+00	12-8	Stable					R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
66	Sta 398+00		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66	Sta 408+00 and 418+00		Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
66	Sta 427+75		Unstable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
66	Sta 438+75		Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
66	Sta 449+00 and 457+50		Unstable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sunrise Towhead, Tenn., 777 MAHP																					+1	+8
329	Sta 40+00	12-23	Stable																			-	R
	Lookout, Tenn., 773 MAHP							-2	-5	-1	+8	+4	+5	+1	+1	+6	+4	-5	-1	+1	+1	+1	+8
67	Sta 226+00 and 236+00	12-8	Unstable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
67	Sta 246+25 to 266+00		Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
67	Sta 276+00		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chute of Island 35, Tenn., 765 MAHP								-5	+1	+8	+3	+4	+1	+1	+6	+4	-5	-2	0	0	0	+7
102	Sta 40+00U	12-10	Stable							-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	Sta 30+00U to 10+50U		Stable							N	N	N	N	N	N	N	N	N	N	N	N	N	N
84	Sta 0+00	12-9	Unstable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	Sta 10+00L to 40+00L		Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cedar Point, Tenn., 759 MAHP					-5	-1	-2	-5	+1	+8	+3	+4	+1	+1	+6	+4	-5	-2	0	0	0	+7
34	Sta 112+00 and 122+00	12-6	Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
34	Sta 131+50		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
34	Sta 142+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
34	Sta 152+00		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
34	Sta 162+00 and 172+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
34	Sta 182+00		Unstable			N	N	N	F	N	N	N	N	N	N	N	N	N.	N	N	N	N	N
	Dean Island, Ark., 756 MAHP					-5	-1	-2	-5	+1	+8	+3	+4	+1	+1	+6	+4	-5	-2	0	0	0	+7
135	Sta 76+00	12-13	Stable										-	-	-	-	-	-	-	-	-	-	-
135	Sta 86+00		Unstable										-	-	-	-	-	-	-	-	-	-	-
135	Sta 97+00		Stable										-	-	-	R	N	N	N	N	N	N	N
35	Sta 105+00	12-6	Unstable			-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	N
35	Sta 115+00		Stable			-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	N
35	Sta 125+00		Unstable			-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	N
35	Sta 135+00		No prediction			-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	N
35	Sta 144+00 to 164+00		Unstable			-	-	-	-	-	-	-	-	-	-	-	R	F	N	N	N	N	N
35	Sta 174+00		Unstable			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	Sta 184+00		Stable			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Continued)																				
	Shelby Forest, Tenn., 752 MAHP																			0	0	0	+7
317	Sta 100+00	12-22	Stable																	-	-	-	-
317	Sta 108+00		No prediction																	-	-	-	-
317	Sta 118+00 to 138+00		Unstable																	R	N	N	N
317	Sta 144+00		Stable																	R	N	N	N
317	Sta 156+00		Unstable																	R	N	N	N
317	Sta 166+00 to 214+00		Stable																	R	N	N	N
	Brandywine, Ark., 751 MAHP						-1	-3	-5	+1	+8	+3	+4	0	0	+6	+4	-5	-2	0	0	0	+7
52	Sta 63+00	12-7	Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
52	Sta 84+00		Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
52	Sta 104+00 to 186+00		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Randolph Point, Tenn., 748 MAHP																		-2	0	0	0	+7
239	Sta 91+00	12-21	Stable																-	-	-	-	-
239	Sta 101+00		No prediction																-	-	-	-	-
239	Sta 112+00		Stable																-	-	-	-	-
239	Sta 122+00		Unstable																-	-	-	-	-
	Island 40, Tenn., 742 MAHP									+1	+8	+3	+4	0	0	+7	+4	-6	-2	-1	-1	-1	+6
123	Sta 96+00	12-12	Unstable									-	-	-	-	-	-	-	-	-	-	-	-
123	Sta 106+50 to 126+25		Stable									-	-	-	-	-	-	R	N	N	N	N	N
123	Sta 136+00		Unstable									-	-	-	-	-	-	R	N	N	N	N	N
123	Sta 146+00 and 156+00		Unstable									R	N	N	N	N	N	N	N	N	N	N	N
123	Sta 166+00 and 186+00		Unstable								R	N	N	N	N	N	N	N	N	N	N	N	N
103	Sta 215+00	12-10	No prediction							R	N	N	N	N	N	N	N	N	N	N	N	N	N
103	Sta 224+00 to 234+00		Stable							R	N	N	N	N	N	N	N	N	N	N	N	N	N
	Loosahatchie, Tenn., 738 MAHP										+7	+3	+4	0	0	+7	+4	-6	-2	-1	-1	-1	+6
114	Sta 97+00	12-11	Unstable								-	-	-	-	-	-	R	N	N	N	N	N	N
114	Sta 107+70		Unstable								-	R	N	N	N	N	N	N	N	N	N	N	N
114	Sta 118		Stable								R	N	N	N	N	N	N	N	N	N	N	N	N
114	Sta 128+00 to 148+00		Unstable								N	N	N	N	N	N	N	N	N	N	N	N	N
114	Sta 158+00 and 168+00		Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
124	Sta 177+00 and 187+00	12-12	Stable									-	-	-	R	N	N	N	N	N	N	N	N
124	Sta 196+00		Unstable									-	-	-	R	N	N	N	N	N	N	N	N
124	Sta 207+00		Stable									-	-	-	R	N	N	N	N	N	N	N	N
178	Sta 218+00 to 253+00	12-18	Stable													R	N	N	N	N	N	N	N
178	Sta 253+00 and 258+00		No prediction													R	N	N	N	N	N	N	N
178	Sta 265+00		Stable													R	N	N	N	N	N	N	N
178	Sta 271+00 and 279+00		No prediction													R	N	N	N	N	N	N	N
178	Sta 284+00		Stable													R	N	N	N	N	N	N	N
178	Sta 289+00 and 299+00		No prediction													R	N	N	N	N	N	N	N
178	Sta 307+00		Stable													R	N	N	N	N	N	N	N
178	Sta 310+00 and 320+00		No prediction													R	N	N	N	N	N	N	N
178	Sta 332+00		Stable													R	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	MEMPHIS DISTRICT (Continued)																					
	Hopefield Point, Ark., 737 MAHP									0	+7	+3	+4	0	0	+7	+4	-6	-2	-1	-1	-1	+6
104	Sta 129+00	12-10	No prediction							-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	Sta 134+00		No prediction							N	N	N	N	N	N	N	N	N	N	N	N	N	N
136	Sta 160+00	12-13	Stable									R	N	N	N	N	N	N	N	N	N	N	N
136	Sta 170+00		Unstable									R	N	N	N	N	N	N	N	N	N	N	N
136	Sta 180+00		Stable									R	N	N	N	N	N	N	N	N	N	N	N
136	Sta 190+00		Stable									-	-	-	-	-	-	-	-	-	-	-	-
	Bauxippi-Wyanoke, Ark., 729 MAHP			+3	-4	-2	-3	-5	0	+7	+3	+4	0	0	+7	+4	-6	-2	-1	-1	-1	-1	+6
17	Sta 80+00 to 84+00	12-4	Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
17	Sta 217+00 to 234+50		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Ensley, Tenn., 723 MAHP			+3	-4	-2	-3	-5	0	+7	+3	+4	0	0	+6	+4	-6	-2	-1	-1	-1	-1	+6
18	Sta 248+00 to 269+00	12-4	Unstable	N	F	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
18	Sta 278+00		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
85	Sta 288+00 and 298+00	12-9	Unstable					-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
85	Sta 308+00 and 318+00		Unstable					-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
146	Sta 327+00	12-14	Stable										R	N	N	N	N	N	N	N	N	N	N
146	Sta 337+00		*Stable*										-	-	R	N	N	N	N	N	N	N	N
146	Sta 348+00 and 359+50		Unstable										-	-	R	R	N	N	N	N	N	N	N
146	Sta 369+50		No prediction										-	-	-	-	-	R	N	N	N	N	N
146	Sta 378+00		Unstable										-	-	-	-	-	R	N	N	N	N	N
215	Sta 377+00 to 397+00	12-21	Stable															-	-	-	-	-	-
	Coahoma, Tenn., 717 MAHP			+2	-4	-2	-3	-5	0	+7	+3	+3	0	0	+6	+4	-6	-2	-1	-1	-1	-1	+6
19	Sta 122+00 to 193+00	12-4	Stable	N	0	0	0	0	N	0	N	N	N	N	N	N	N	N	N	N	N	N	N
	Norfolk Star, Miss., 708 MAHP											+3	0	0	+6	+4	-5	-2	0	0	-1	+7
137	Sta 168+00	12-13	Stable									N	N	N	N	N	N	N	N	N	N	N	N
137	Sta 178+00		Stable									-	-	R	N	N	N	N	N	N	N	N	N
137	Sta 188+00 and 198+00		Unstable									-	-	R	N	N	N	N	N	N	N	N	N
	Pickett, Miss., 702 MAHP						-2	-3	-5	0	+6	+3	+3	-1	0	+6	+4	-5	-2	0	0	-1	+7
57	Sta 117+50	12-7	Unstable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	Sta 127+00		Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	Sta 139+50 to 175+75		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
53	Sta 185+00 to 194+50		Unstable				F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
190	Sta 225+00	12-19	Unstable														R	N	N	N	N	N	N
190	Sta 235+00		Unstable														R	N	N	N	N	N	N
190	Sta 245+00		No prediction														R	N	N	N	N	N	N
190	Sta 255+00		Unstable														-	-	-	-	-	-	-
	Porter Lake, Ark., 701 MAHP			+1	-5	-2	-2	-5	0	+6	+3	+3	-1	0	+6	+4	-5	-2	0	0	-1	+7	
20	Sta 281+50	12-4	Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20	Sta 291+50		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20	Sta 299+00 to 311+50		Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	0	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Continued)																				
	Commerce Landing, Miss., 695 MAHP					-5	-2	-2	-5	0	+6	+3	+3	-1	0	+6	+4	-5	-2	0	0	-1	+8
36	Sta 122+00 to 172+50	12-6	Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
36	Sta 182+00		No prediction			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
36	Sta 192+00		Stable			N	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N
	Peters, Ark., 691 MAHP				+1	-5	-2	-2	-5	0	+5	+3	+3	-1	0	+6	+4	-5	-2	0	0	-1	+8
169	Sta 30+00	12-17	Unstable												N	N	N	N	N	N	N	N	N
169	Sta 41+00		No prediction												N	N	N	N	N	N	N	N	N
7	Sta 187+00	12-3	No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
7	Sta 198+00 to 210+00		Stable	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N
7	Sta 220+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
7	Sta 230+00		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
7	Sta 240+00 to 250+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
7	Sta 260+00		Stable	N	N	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
7	Sta 270+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Harbert Point, Miss., 675 MAHP				+2	-4	-2	-2	-5	0	+5	+4	+2	-1	0	+6	+4	-5	-2	0	0	-1	+8
21	Sta 101+75	12-4	No prediction	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N
21	Sta 112+00 to 121+75		Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	O
21	Sta 133+25 and 143+00		Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
21	Sta 153+00 to 174+50		Stable	N	N	O	N	O	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
21	Sta 184+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	St. Francis, Ark., 671 MAHP					-4	-2	-2	-5	0	+4	+4	+2	-1	0	+6	+4	-5	-2	0	0	-1	+8
125	Sta 311+00 and 323+00	12-12	Unstable									-	-	-	-	-	-	-	-	-	-	-	-
125	Sta 330+00 to 350+00		Stable									-	-	-	-	-	-	-	-	-	-	-	-
179	Sta 359+00	12-18	No prediction													N	N	N	N	N	N	N	N
179	Sta 370+00 and 380+00		Stable													N	N	N	N	N	N	N	N
179	Sta 400+00		No prediction													N	N	N	N	N	N	N	N
179	Sta 410+00		Stable													N	N	N	N	N	N	N	N
179	Sta 420+00		Unstable													N	N	N	N	N	N	N	N
54	Sta 430+00	12-7	Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
54	Sta 440+00		Unstable				N	N	N	N	N	N	N	R	N	N	N	N	N	N	N	N	N
54	Sta 450+00 and 460+00		Stable				N	N	N	N	N	N	N	R	N	N	N	N	N	N	N	N	N
37	Sta 470+50 to 490+00	12-6	Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	O	N	N	N
37	Sta 494+50 to 508+50		No prediction			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
37	Sta 520+00 to 529+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
68	Sta 539+00	12-8	Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
68	Sta 549+00		Unstable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
68	Sta 559+00		Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	Sta 570+00 and 580+00	12-9	No prediction						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helena Delta, Ark., 660 MAHP				+2	-3	-2	-2	-5	0	+4	+3	+1	-2	0	+5	+3	-5	-2	0	0	-1	+8
22	Sta 350+00 and 360+00	12-4	No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
22	Sta 369+50		Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
22	Sta 380+00		No prediction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
87	Sta 390+00	12-9	Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	MEMPHIS DISTRICT (Continued)																						
	Helena Delta, Ark., 660 MAHP (Continued)																						
87	Sta 400+00		No prediction						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	Sta 410+00		Stable						-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
115	Sta 420+00 to 440+00	12-11	Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
115	Sta 450+00		Stable								-	-	-	-	-	-	-	-	-	-	-	-	-
	Old Town Bend, Ark., 643 MAHP							-2	-6	-2	+3	+2	0	-3	-1	+1	0	-6	-3	-1	-1	-1	+8
69	Sta 272+25 to 293+75	12-8	Stable					-	R	N	N	N	N	0	N	N	N	N	0	N	N	N	N
88	Sta 304+50 and 314+50	12-9	Stable						-	R	N	N	N	N	0	N	N	N	N	N	N	N	0
88	Sta 324+50		Stable						-	-	-	R	N	N	0	N	N	N	N	N	N	N	N
	Island 63 Bar, Miss., 639 MAHP													-3	-1	0	-1	-6	-3	-1	-1	-1	+8
170	Sta 134+00 to 154+00	12-17	Unstable											R	N	N	N	F	N	N	N	F	N
170	Sta 164+00		Stable											R	N	N	N	N	N	N	N	N	0
170	Sta 174+00 to 184+00		Unstable											R	N	N	N	N	N	N	N	N	0
170	Sta 135+00 to 165+00	12-23	Unstable																			F	R
170	Sta 173+37 and 184+00		Stable																			-	R
170	Sta 195+00 to 220+00		Unstable																			-	-
	Island 62, Ark., 639 MAHP						-2	-2	-7	-2	+3	+2	-1	-3	-2	0	-1	-6	-3	-1	-1	-1	+8
55	Sta 73+75	12-7	Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
55	Sta 93+50		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
55	Sta 104+00		No predictions				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
55	Sta 114+50 to 134+25		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
116	Sta 160+00	12-11	Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
116	Sta 170+00		Unstable								-	-	-	-	-	-	-	-	-	-	-	-	-
116	Sta 180+00 and 190+00		Stable								-	-	-	-	-	-	-	-	-	-	-	-	-
	Fair Landing, Ark., 633 MAHP							-2	-7	-3	+2	+1	-1	-3	-1	-1	-2	-7	-4	-2	-2	-2	+7
70	Sta 264+00	12-8	Stable					N	N	N	N	N	N	N	(F)	N	N	N	N	N	N	N	N
70	Sta 274+50		Unstable					N	N	N	N	N	N	N	F	N	N	N	N	N	N	N	N
70	Sta 283+50		Stable					N	N	N	N	N	N	N	0	N	N	N	N	N	N	N	N
70	Sta 294+00		Stable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Rescue Landing, Miss., 628 MAHP				-5	-10	-2	-2	-8	-3	+2	+1	-1	-4	-3	-2	-3	-7	-4	-2	-2	-2	+7
8	Sta 70+50 to 180+00	12-3	Stable		N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
8	Sta 202+00 to 215+00		Unstable		F	N	N	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N
	Ludlow, Ark., 625 MAHP					-10	-2	-3	-8	-4	+3	0	-2	-4	-3	-3	-4	-7	-4	-2	-2	-2	+7
38	Sta 27+00	12-6	Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
38	Sta 39+00		Stable			N	N	N	N	N	N	N	N	N	(F)	N	N	N	N	N	N	N	N
38	Sta 47+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
38	Sta 58+00		Stable			N	N	N	N	N	N	N	N	O	N	N	(F)	N	N	N	N	N	N
38	Sta 68+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
38	Sta 76+00		Stable			N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
38	Sta 86+00 and 96+00		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			MEMPHIS DISTRICT (Concluded)																				
	Sunflower-Island No.68, Ark., 621 MAHP																				-2	-2	+7
320	Sta 220+00 to 250+00	12-22	Stable																		-	-	-
320	Sta 260+00		Unstable																		R	N	N
320	Sta 270+00 to 280+00		Stable																		R	N	N
	Henrico, Ark., 606 MAHP												-3	-6	-4	-7	-8	-8	-5	-3	-3	-3	+7
138	Sta 66+00 to 69+00	12-13	Unstable										N	N	N	N	N	F	O	N	N	N	N
138	Sta 76+00		Stable										R	N	N	N	N	N	N	N	N	N	N
138	Sta 86+00		No prediction										-	-	-	-	R	N	N	N	N	N	N
138	Sta 96+00		Stable										-	-	-	-	-	R	N	N	N	N	N
138	Sta 106+00 and 116+00		No prediction										-	-	-	-	-	-	-	-	-	-	-
			VICKSBURG DISTRICT																				
	Dennis, Miss., 612 MAHP													-5	-3	-6	-6	-8	-5	-3	-6	-6	+7
147	613.20 to 612.80 MAHP	12-14	Stable											-	-	-	-	-	-	-	-	-	-
147	612.60 MAHP		Unstable											-	-	-	-	-	-	-	-	-	-
147	612.45 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
191	610.10 MAHP		Unstable														R	N	N	N	N	N	N
191	609.90 MAHP		Stable														-	-	-	-	-	-	-
191	609.70 MAHP		Unstable														-	-	-	-	-	-	-
	Smith Point, Miss., 602 MAHP							-3	-11	-6	+1	+2	-4	-6	-5	-9	-8	-8	-5	-3	-6	-6	+7
321	Ranges 93U to 80U	12-23	Unstable																			-	-
321	Range 74+90U	12-22	Unstable																	-	R	N	N
321	Range 66U		Unstable																	-	R	N	N
321	Range 58+30U		Unstable																	-	R	N	N
321	Range 49U		Stable																	-	R	N	N
321	Range 41U		Stable																	-	R	N	N
321	Range 32+100U		Unstable																	-	R	N	N
321	Range 25+80U		Unstable																	-	R	N	N
321	Range 20-20U		Unstable																	-	R	F	N
71	Range 16+20U	12-8	Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	N	N
321	Range 13+50U	12-22	Unstable				R	N	N	N	N	N	N	N	N	N	N	N	N	N	F	F	N
71	Range 0+50D	12-8	Stable	R	N		N	O	N	N	N	N	N	N	N	N	N	N	N	O	O	O	N
71	Range 23+50D		Unstable	R	N		N	O	N	N	F	N	N	N	N	N	N	N	N	N	N	F	N
	Big Island, Ark., 598 MAHP					-10	-2	-3	-11	-6	0	-2	-5	-7	-6	-9	-9	-9	-6	-4	-7	-7	+7
72	600.1 and 599.9 MAHP	12-8	Unstable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	Range 51U		No prediction					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
40	Range 22U	12-6	No prediction			N	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
40	Range 7U		Stable			O	O	O	N	N	N	O	O	N	N	N	N	N	N	N	N	N	N
40	Range 9D		Unstable			N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
139	Ranges 43D to 58D	12-13	Stable									R	N	N	N	N	N	N	N	N	N	N	N
139	Range 66D		Unstable									R	N	N	N	N	N	N	N	N	N	N	N
139	Range 73D		Stable									-	R	N	N	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																			
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Big Island, Ark., 598 MAHP (Continued)																						
171	596.00 MAHP	12-17	Stable												-	-	-	-	-	-	-	-	-
171	595.8 and 595.60 MAHP		Unstable												-	-	-	-	-	-	-	-	-
171	595.30 MAHP		No prediction												-	-	-	-	-	-	-	-	-
	Victoria Bend, Miss., 595 MAHP					-9	-2	-4	-12	-7	0	-3	-5	-7	-6	-10	-10	-9	-6	-4	-7	-7	+7
89	596.2 MAHP	12-9	Unstable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
89	595.7 to 595.5 MAHP		Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
89	Range 31U		Unstable						N	N	N	N	N	N	R	N	N	N	N	N	N	N	N
41	Ranges 30U to 21D	12-6	Unstable			F	F	O	N	F	F	O	N	N	N	N	N	N	N	N	N	N	N
	Terrene, Miss., 591 MAHP							-4	-12	-7	0	-3	-5	-7	-5	-11	-11	-9	-6	-4	-7	-7	+7
126	Range 33D	12-12	Stable								-	R	N	N	N	N	N	N	N	N	N	N	N
148	Range 39D	12-14	Unstable											R	N	N	N	N	N	N	N	N	N
126	593.8 MAHP	12-12	Stable									-	-	R	N	N	N	N	N	N	N	N	N
148	Range 45D	12-14	Stable											R	N	N	N	N	N	N	N	N	N
148	Range 53D	12-14	Unstable											R	N	N	N	N	N	N	N	N	N
73	593.5 MAHP	12-8	Stable					-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N
148	Range 59D	12-14	Stable											R	N	N	N	N	N	N	N	N	N
126	593.20 MAHP	12-12	Stable								-	-	-	R	N	N	N	N	N	N	N	N	N
148	Range 66D	12-14	Unstable											R	N	N	N	N	N	N	N	N	N
148	593.00 MAHP	12-14	Stable											R	N	N	N	N	N	N	N	N	N
73	592.90 MAHP	12-8	Stable					-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N
148	592.8 MAHP	12-14	No prediction										R	N	N	N	N	N	N	N	N	N	N
73	Range 11D	12-8	Stable					-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
73	Range 23D	12-8	No prediction					-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
73	Range 49D	12-8	Unstable					-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
126	Range 61D	12-12	Stable								R	N	N	N	N	N	N	N	N	N	N	N	N
	Klondike, Ark., 588 MAHP						-3	-5	-12	-7	0	-3	-6	-7	-6	-11	-11	-9	-6	-4	-7	-7	+7
56	Range 77+50U	12-7	Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	Range 70+100U	12-22	Unstable																		-	-	-
56	Ranges 64+30U to 57+100U		Unstable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	N	N
56	Ranges 56U to 29D	12-7	Stable			R	N	O	O	O	N	N	N	N	N	O	O	N	N	N	O	N	N
56	Range 49D		Unstable				-	-	R	N	N	F	N	N	N	N	N	N	N	N	N	N	N
90	Range 70D	12-9	Unstable						-	R	N	F	N	N	F	N	N	N	N	N	N	N	N
90	Range 85D		Unstable						-	R	N	O	N	N	F	N	N	N	N	N	N	N	N
149	Range 93D	12-14	No prediction										N	N	O	N	N	N	N	N	N	N	N
90	Range 100D	12-9	Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
149	585.65 MAHP	12-14	Unstable										-	-	-	-	-	-	-	-	-	-	-
	Rosedale Bend, Ark., 585 MAHP																			-4	-7	-7	+7
322	Range 1U	12-22	Stable																	-	-	-	-
322	Range 5D		Stable																	-	-	-	-
322	Range 12D		Stable																	-	-	-	-
322	Range 19D		Stable																	R	N	N	N
322	Range 25D		Unstable																	R	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Rosedale Bend, Ark., 585 MAHP (Continued)																						
322	Range 31+50D		No prediction																	R	F	N	N
322	Range 38+40D		No prediction																	-	R	N	N
	Prentiss, Miss., 583 MAHP							-5	-13	-7	-1	-4	-6	-8	-6	-11	-11	-9	-6	-4	-7	-7	+6
150	584.50 to 584.20 MAHP	12-14	Unstable										-	-	R	N	N	N	N	F	N	N	N
150	584.05 MAHP		Unstable										R	N	N	N	N	N	N	N	N	N	F
74	Ranges 45U to 12U	12-8	Stable					-	-	R	N	N	O	N	N	N	O	N	N	N	N	N	N
74	Range 1D		Unstable					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F
74	Ranges 12D and 19D		Stable					N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N
	Ozark, Ark., 578 MAHP								-14	-8	-1	-4	-7	-9	-8	-12	-12	-9	-5	-3	-6	-6	+5
91	580.6 MAHP	12-9	Unstable						-	-	-	-	-	-	-	-	-						
91	579.8 MAHP		Unstable						-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
91	Ranges 16U and 3U		Stable						-	R	N	N	N	N	N	N	N	N	N	N	N	N	N
91	Ranges 10D to 51D		Stable						N	N	O	N	N	N	N	N	N	N	N	N	N	N	N
91	Range 64D		No prediction						N	N	N	N	N	N	N	N	O	N	N	N	N	N	N
91	Range 78D		*Stable*						N	N	N	N	N	N	N	N	O	N	N	N	N	N	O
91	Range 92D		Unstable						R	N	N	N	N	N	N	N	N	F	N	N	F	N	N
151	Range 99D	12-14	Stable										R	N	N	N	N	N	N	N	N	N	N
151	Range 106D		No prediction						-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
151	575.75 MAHP		Stable										R	N	N	N	N	N	N	N	N	N	N
151	575.50 MAHP		Unstable										-	-	-	-	-						
	Catfish Point, Miss., 574 MAHP			-7	-13	-4	-6	-14	-9	-1	-5	-7	-9	-8	-12	-12	-9	-5	-3	-6	-6	+5	
152	575.85 to 575.20 MAHP	12-14	Stable										-	R	N	N	N	N	N	N	N	N	N
152	574.95 and 574.75 MAHP		Unstable										-	R	N	N	N	N	N	N	N	N	N
152	574.55 and 574.30 MAHP		Stable										-	R	N	N	N	N	N	N	N	N	N
24	Ranges 26U and 21U	12-4	Stable	N	N	N	N	N	N	O	N	N	N	N	N	(F)	N	O	N	N	N	N	N
24	Range 13U		Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	F	N	N	N	N	N	N
24	Range 5U		Stable	N	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N
24	Range 2D		Unstable	N	O	O	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
24	Range 38D		Stable	N	N	N	O	N	N	N	O	N	N	O	N	N	N	N	N	N	N	N	N
	Cypress Bend, Ark., 568 MAHP					-5	-7	-15	-10	-1	-5	-8	-10	-8	-13	-13	-9	-5	-3	-6	-7	+5	
324	571.7 MAHP	12-22	Stable																	-	-	-	
324	571.5 MAHP		Stable																	-	-	-	
324	571.3 MAHP		Stable																	-	-	-	
324	571.1 MAHP		Stable																	-	-	-	
324	570.9 MAHP		Stable																	-	-	-	
192	570.80 MAHP	12-19	Unstable													-	-	-	-	-	-	-	
192	570.70 MAHP		Unstable													R	N	N	N	N	N	N	
192	570.50 MAHP		Stable													R	N	N	N	N	N	N	
192	570.40 MAHP		Unstable													R	N	N	N	N	N	N	
192	570.30 MAHP		Stable													R	N	N	N	N	N	N	
192	570.10 MAHP		Stable													R	N	N	N	N	N	N	
57	Range 49U	12-7	Stable			-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Cypress Bend, Ark., 568 MAHP (Continued)																						
57	Range 35U		Unstable				N	N	N	N	N	N	N	N	N	N	F	N	N	N	N	N	
57	Range 20U		Stable				N	N	N	N	N	N	N	N	N	N	N	O	N	N	N	N	
57	Range 6U		Unstable				N	N	N	N	N	N	N	N	N	N	F	N	N	N	N	N	
57	Ranges 8D and 23D		Stable				O	N	N	N	N	N	N	N	N	N	O	N	N	N	N	N	
57	Range 35D		Unstable				N	N	N	N	N	O	N	N	N	N	F	N	N	N	N	N	
57	Range 51D		Stable				N	O	N	N	N	N	N	N	N	N	O	N	N	N	N	N	
140	Range 57D	12-13	Stable									R	N	N	N	N	O	N	N	N	N	N	
140	Ranges 58D to 86D	12-13	Stable									R	N	N	N	N	O	N	N	N	N	O	
172	566.50 to 566.00 MAHP	12-17	Stable											R	N	N	N	N	N	N	N	N	
	Eutaw, Miss., 564 MAHP						-5	-8	-16	-10	-1	-6	-8	-10	-9	-13	-13	-9	-5	-3	-6	-8	+4
58	566.5 and 566.2 MAHP	12-7	Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	Range 33D		Unstable				-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	
58	Ranges 44D to 68D		Stable				-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	
58	Range 79D		Stable				-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N	
	Mounds, Miss., 562 MAHP													-10	-8	-13	-13	-9	-5	-3	-6	-9	+4
153	563.90 to 563.50 MAHP	12-14	Unstable											R	N	N	N	N	N	N	N	N	
153	563.35 to 562.95 MAHP		Stable											R	N	N	N	N	N	N	N	N	
153	562.70 to 562.10 MAHP		Stable											N	N	N	O	N	N	N	N	O	
153	561.40 to 561.00 MAHP		Unstable											N	N	R	N	N	F	N	N	F	
153	560.90 MAHP		Unstable											-	-	R	N	N	N	N	N	N	
193	560.80 MAHP	12-19	Unstable														-	-	R	N	N	N	
193	560.60 MAHP		Unstable														-	-	-	-	R	N	
193	560.50 MAHP		Unstable														-	-	-	-	R	N	
193	559.7 to 559.5 MAHP	12-23	Unstable																			R	
	Pair-O-Dice, Ark., 561 MAHP						-6	-9	-16	-11	-2	-6	-9	-10	-9	-13	-13	-9	-5	-3	-6	-10	+4
59	562.6 MAHP	12-7	No prediction				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	Ranges 26U to 1U		Stable				N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	
59	Range 13D		Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
59	Range 25+50D		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
59	559.40 MAHP		Unstable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Huntington Point, Miss., 557 MAHP									-11	-2	-6	-9	-11	-9	-14	-14	-8	-5	-3	-6	-9	+5
105	557.5 to 557.0 MAHP									-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yellow Bend, Ark., 552 MAHP										-1	-6	-9	-10	-9	-14	-13	-8	-4	-2	-6	-8	+6
117	Range 163D	12-11	Stable								R	N	N	N	N	N	N	N	N	N	N	N	
117	Range 170D		Unstable								R	N	N	N	N	N	N	N	N	N	N	N	
117	Range 176D		Stable								R	N	N	N	N	N	N	N	N	N	N	N	
154	551.20 MAHP	12-14	Stable										R	N	N	N	N	(F)	N	N	N	N	(F)
154	551.05 MAHP		Unstable										R	N	N	N	N	N	F	N	N	N	
154	550.75 MAHP		Stable										R	N	N	N	N	N	N	N	N	N	
154	550.55 MAHP		Unstable										R	N	N	N	N	N	N	N	N	N	
154	550.35 to 550.15 MAHP		No prediction										R	N	N	N	N	N	N	N	N	N	

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																			
	Yellow Bend, Ark., 552 MAHP (Continued)																					
154	549.95 MAHP		Stable										R	N	N	N	N	N	N	N	N	N
154	549.80 MAHP		Unstable										R	N	N	N	N	N	N	N	N	N
154	549.55 to 549.40 MAHP		Stable										-	-	-	-	-	-	-	-	-	-
154	549.25 MAHP		Unstable										-	-	-	-	-	-	-	-	-	-
	Georgetown, Ark., 550 MAHP								-12	-11	-1	-6	-7	-9	-7	-13	-13	-8	-4	-2	-6	-7	+7
92	Range 188D to 240D	12-9	Stable						-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
	Island 82, Ark., 546 MAHP														-9	-12	-12	-8	-4	-2	-6	-6	+8
180	546.35 to 545.55 MAHP	12-18	Stable												R	N	N	N	N	N	N	N	N
	Miller Bend, Miss., 544 MAHP												-6	-7	-7	-11	-11	-8	-4	-2	-6	-5	+9
127	Range 204D	12-12	Unstable									N	N	F	N	N	N	N	N	N	N	N	N
127	Range 213D		Unstable									N	N	N	N	N	N	N	N	N	N	N	N
155	541.50 to 541.30 MAHP	12-14	Unstable										-	-	-	-	-	-	-	-	-	-	-
127	Range 223D	12-12	Stable									N	N	N	N	N	N	N	N	N	N	N	N
127	Range 233D		Stable									-	-	-	-	-	-	-	-	-	-	-	-
155	541.15 to 540.80 MAHP	12-14	Unstable										-	-	-	-	-	-	-	-	-	-	-
155	540.65 to 540.25 MAHP		Stable										-	-	-	-	-	-	-	-	-	-	-
155	540.10 to 539.65 MAHP		Unstable										-	-	-	-	-	-	-	-	-	-	-
	False Point, La., 541 MAHP																		-4	-2	-6	-4	+10
240	Ranges 7D to 25D	12-21	Stable																-	-	-	-	-
	La Grange, Miss., 538 MAHP													-7	-7	-9	-9	-8	-4	-2	-6	-4	+10
156	539.35 to 539.20 MAHP	12-14	Unstable											-	-	-	-	-	-	-	-	-	-
156	539.00 to 538.85 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
156	538.35 MAHP		Unstable										R	N	N	N	N	N	N	N	N	N	N
156	538.10 to 537.80 MAHP		Stable										R	N	O	N	N	N	N	N	N	N	N
156	537.60 to 537.45 MAHP		Stable											R	N	N	N	N	N	N	N	N	N
	Lakeport, Ark., 528 MAHP								-10	-11	+4	0	-3	-4	-3	-7	-8	-7	-4	-2	-6	-4	+10
157	530.50 MAHP	12-14	Stable											-	-	-	-	-	-	-	-	-	-
157	530.30 MAHP		No prediction											-	-	-	-	-	-	-	-	-	-
157	530.10 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
157	529.90 MAHP		No prediction											-	-	-	-	-	-	-	-	-	-
157	529.70 and 529.50 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
157	529.35 MAHP		Unstable											-	-	-	-	-	-	-	-	-	-
157	529.15 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
93	Ranges 14D to 33D	12-9	Stable						N	N	O	O	N	N	N	N	N	N	N	N	N	N	N
93	Range 56D		Unstable						N	N	N	F	N	N	N	N	N	N	N	N	N	N	O
93	Range 70D		No prediction						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	Range 112D	12-10	Stable							-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	Range 121D		Unstable							N	N	N	N	N	N	N	N	N	N	N	N	N	O
106	Range 131D		Stable							N	N	N	N	N	N	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																			
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	VICKSBURG DISTRICT (Continued)																						
	Lakeport, Ark., 528 MAHP (Continued)																						
106	Range 140D		Unstable							N	N	N	N	N	N	N	N	N	N	N	N	N	O
106	Range 151D	12-10	Stable							R	N	N	N	N	N	N	N	N	N	N	N	N	N
	Walnut Point, Miss., 522 MAHP						-1	-4	-10	-5	+4	0	-3	-4	-3	-7	-8	-7	-3	-1	-5	-3	+10
60	523.90 MAHP	12-7	Stable				-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N
60	523.70 MAHP		Unstable				-	-	-	-	-	-	-	-	-	-	R	N	N	N	N	N	N
60	Range 26U		Stable				N	N	N	N	N	N	N	N	N	N	N	O	N	N	N	N	N
60	Range 12U		Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	F	N	N	N
60	Ranges 2D and 16D		Stable				N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
60	Range 30D		Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
60	Ranges 39D and 53D		Stable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	O	N
158	Ranges 58D and 65D	12-14	Stable										R	N	N	N	N	N	N	N	N	N	N
60	Range 67D	12-7	Stable				-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N
158	Range 71D	12-14	Stable										R	N	N	N	N	N	N	N	N	N	N
158	520.3 MAHP		No prediction											R	N	N	N	N	N	N	N	N	N
60	520.2 MAHP	12-7	Stable				-	-	-	-	-	-	-	R	N	N	N	N	N	N	N	N	N
158	520.1 MAHP	12-14	Unstable											R	N	N	N	N	N	N	N	N	N
158	519.7 MAHP		Stable											R	N	N	N	N	N	N	N	N	N
158	519.5 MAHP	12-14	Unstable											R	N	N	N	N	N	N	N	N	N
	Kentucky Bend, Miss., 519 MAHP												-3	-4	-3	-7	-8	-7	-3	-1	-5	-3	+10
141	520.1 to 519.7 MAHP	12-13	Stable									-	-	R	N	N	N	N	N	N	N	N	N
141	Range 54D		Stable									N	N	N	N	N	N	N	(F)	O	N	N	N
141	Range 61D		Unstable									N	N	N	N	N	N	N	N	F	N	N	N
141	Ranges 65D and 72D		Stable									N	N	N	O	(F)	N	N	N	N	O	N	N
141	Range 79D		Unstable									N	N	N	F	N	N	N	N	F	O	N	N
141	Range 87D		Stable									N	N	N	O	N	N	N	N	N	O	N	N
141	Range 93D		Unstable									N	N	N	N	N	N	N	N	N	O	N	N
141	Ranges 96D to 97D		Unstable									N	N	N	N	N	N	N	N	N	F	N	N
141	Ranges 98D to 100D		Unstable									N	N	N	N	N	N	N	N	N	O	N	O
	Island No. 88 (Worthington), Miss., 514 MAHP																-8	-7	-3	-1	-5	-3	+10
194	514.6 MAHP	12-19	Unstable														-	-	-	-	-	-	-
194	514.5 MAHP		Stable														-	-	-	-	-	-	-
194	514.3 MAHP		Unstable														R	N	N	N	N	N	N
194	514.2 MAHP		Stable														R	N	N	N	N	N	N
194	514.1 MAHP		Stable														R	O	N	N	N	N	N
194	513.9 MAHP		Stable														RO	O	N	N	N	N	N
194	513.7 MAHP		Stable														RO	N	N	N	N	N	N
194	513.6 MAHP		Stable														R	N	(F)	(F)	N	N	N
194	513.5 MAHP		Stable														R	N	N	(F)	O	N	N
194	513.3 MAHP		Unstable														N	N	F	N	N	N	N
194	513.2 MAHP		No prediction														N	N	N	N	N	N	N
	Cracraft, Ark., 513 MAHP				-4	-9	-1	-4	-10	-6	+4	+1	-3	-4	-3	-7	-8	-7	-3	-1	-5	-3	+10
142	513.3 MAHP	12-13	Stable									-	-	-	-	-	-	-	-	-	-	-	-
142	513.1 and 512.9 MAHP		No prediction									-	-	-	-	-	-	-	-	-	-	-	-
142	512.7 MAHP		Stable									-	-	-	R	N	N	O	(F)	N	N	N	N
159	512.7 MAHP	12-14	No prediction											-	R	N	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																			
	Cracraft, Ark., 513 MAHP (Continued)																					
216	508.6 to 508.0 MAHP	12-21	Unstable															-	-	-	-	-	-
142	Range 80U	12-13	No prediction									-	-	-	R	N	N	O	O	N	N	N	O
142	Range 74U		Stable									O	N	N	O	N	N	N	N	N	N	N	N
9	Ranges 61U to 44U	12-3	Stable	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	(F)	N	O
9	Range 33U		Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
9	Ranges 26U and 18U		Stable	N	N	N	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N
9	Range 6U		Unstable	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
25	Range 30D	12-4	Unstable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Carolina, Miss., 507 MAHP			-4	-9	-1	-4	-10	-6	+4	+1	-3	-4	-3	-8	-7	-7	-3	-1	-5	-3	+10	
118	Ranges 60U to 44U	12-11	Stable							R	O	N	N	N	N	N	N	N	N	N	N	N	N
118	Range 37U		Unstable							R	O	O	F	N	N	N	N	N	N	N	N	N	N
26	Range 3D	12-4	Stable	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Sarah Island, Miss., 504 MAHP														-3	-8	-7	-7	-3	-1	-5	-3	+10
181	505.0 MAHP	12-18	Stable												-	-	-	-	-	-	-	-	-
181	504.85 to 503.85 MAHP		Unstable												R	N	N	N	N	N	N	N	N
181	503.70 MAHP		Stable												R	N	N	N	N	N	N	N	N
181	503.45 and 503.3 MAHP		Unstable												R	N	N	N	N	O	N	N	N
181	503.10 MAHP		Stable												-	-	R	N	N	N	N	N	N
181	502.95 MAHP		No prediction												-	-	R	N	N	N	N	N	N
	Mayersville, Miss., 496 MAHP								-11	-6	+4	+1	-3	-4	-3	-8	-7	-7	-3	-1	-5	-3	+10
217	500.85 to 500.20 MAHP	12-21	Stable															-	-	-	-	-	-
217	499.95 MAHP		Unstable															-	-	-	-	-	-
119	499.9 MAHP	12-11	Stable								-	-	-	-	-	-	-	-	-	-	-	-	-
217	499.8 MAHP	12-21	Stable															-	-	-	-	-	-
217	499.65 MAHP		Unstable															-	-	-	-	-	-
217	499.5 MAHP		Stable															-	-	-	-	-	-
119	499.4 MAHP	12-11	Unstable								-	-	-	-	-	-	-	-	-	-	-	-	-
217	499.3 MAHP	12-21	Stable															-	-	-	-	-	-
94	Range 80U	12-9	Unstable						N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
94	Range 56U		Stable						O	N	N	N	N	N	N	N	N	N	N	N	N	N	N
94	Range 48U		Unstable						N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
94	Range 40U		Stable						N	O	N	O	O	N	N	N	N	N	N	N	N	N	N
	Louisiana Bar, La., 490 MAHP							-4	-11	-6	+4	+1	-3	-4	-3	-8	-7	-6	-2	0	-4	-3	+10
78	491.4 to 490.3 MAHP	12-8	Stable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
78	489.7 MAHP		Unstable					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Baleshed-Stack Island, La., 489 MAHP													-4	-3	-8	-7	-6	-2	0	-4	-3	+10
325	493.9 MAHP	12-22	Unstable																		-	-	-
325	493.7 MAHP		Unstable																		-	-	-
325	493.5 MAHP		Unstable																		-	-	-
325	493.3 MAHP		Stable																		-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																			
	Baleshed-Stack Island, La., 489 MAHP (Continued)																					
325	493.1 MAHP		Stable																		-	-	-
173	492.90 MAHP	12-17	Unstable											-	-	-	-	-	-	-	-	-	-
173	492.70 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
173	492.50 MAHP		Unstable											-	-	-	-	-	-	-	-	R	N
173	492.30 MAHP		No prediction											-	-	-	-	-	-	-	-	R	N
173	492.10 MAHP		Unstable											-	-	-	-	-	-	-	-	R	N
173	491.90 to 491.75		Stable											-	-	-	-	-	-	-	-	R	N
173	491.55 MAHP		No prediction											-	-	-	-	-	-	R	N	N	N
173	491.40 MAHP		Unstable											-	-	-	-	-	-	R	F	F	F
173	491.15 and 491.00 MAHP		Stable											-	-	-	-	-	-	R	O	N	(F)
173	490.80 to 490.4 MAHP		Unstable											R	N	N	N	N	N	N	N	N	F
160	490.15 MAHP	12-14	Unstable											R	N	N	N	N	N	N	N	N	N
160	490.00 MAHP		Stable											R	N	N	N	N	N	N	N	N	N
160	489.80 to 489.70 MAHP		Unstable											R	N	N	N	N	N	N	N	N	N
160	489.50 and 489.35 MAHP		Unstable											-	R	N	N	N	N	N	N	N	N
160	489.15 MAHP		Unstable											-	-	R	N	N	N	N	N	N	N
160	489.00 to 488.60 MAHP		Unstable											N	N	N	N	N	N	N	N	N	N
160	488.45 MAHP		Stable											N	N	N	N	N	N	N	N	N	N
160	488.25 to 487.70 MAHP		Unstable											N	N	N	N	N	N	N	N	N	O
160	487.50 MAHP		Stable											N	N	N	N	N	N	N	N	N	N
160	487.35 MAHP		Unstable											N	N	N	N	N	N	N	F	F	N
160	487.15 MAHP		Unstable											R	N	N	N	N	F	N	N	N	N
160	486.95 to 486.75 MAHP		Unstable											-	R	N	N	N	N	N	N	N	N
182	486.60 MAHP	12-18	Unstable											-	R	N	N	N	N	N	N	O	N
182	486.40 and 486.20 MAHP		Unstable												-	R	N	N	N	N	N	N	N
195	486.00 MAHP	12-19	Unstable														R	N	N	N	N	N	N
195	485.80 to 485.40 MAHP		Unstable														-	-	R	N	N	N	O
218	485.3 to 484.2 MAHP	12-21	Unstable															-	-	R	N	N	N
	Ben Lomond, Miss., 487 MAHP					-9	-1	-4	-11	-7	+3	-3	-3	-4	-2	-8	-7	-6	-2	0	-4	-3	+10
42	Ranges 33U and 19U	12-6	Stable			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Ranges 5U to 21D		Stable			N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
42	Ranges 34D and 49D		Unstable			N	N	F	N	N	F	F	N	N	N	N	N	N	N	N	N	N	N
	Hagaman, La., 483 MAHP				-4	-9	-1	-4	-11	-7	+3	+1	-3	-4	-3	-8	-7	-6	-2	0	-4	-3	+10
95	Ranges 146 and 166	12-9	No prediction					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95	Range 176		Stable					-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N
27	Ranges 186 to 241	12-4	Stable		0	N	0	O	O	N	N	O	N	N	N	N	N	N	N	N	N	N	N
27	Range 265		Unstable		N	N	O	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
143	Ranges 288 to 309	12-13	Stable									R	N	N	N	N	N	N	N	N	N	N	N
143	Range 316		Unstable									R	N	N	N	N	N	N	N	N	N	N	N
143	Range 321		Stable									R	N	N	N	N	N	N	N	N	N	N	N
143	Range 335		No prediction									R	N	N	N	N	N	N	N	N	N	N	N
143	Range 342		Unstable									-	-	-	-	-	-	-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																			
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Cottonwood, Miss., 472 MAHP					-10	-1	-4	-12	-7	+3	0	-3	-5	-3	-8	-8	-6	-2	0	-4	-3	+10
128	Range 26U	12-12	Unstable								R	N	N	N	N	N	N	N	N	N	N	N	N
43	Range 11U	12-6	Unstable			-	R	N	N	F	F	N	N	N	N	N	N	N	N	N	N	N	F
43	Range 3D		Stable			-	R	N	N	N	O	N	N	N	N	N	N	N	N	N	(F)	N	N
43	Ranges 16D to 52D		Unstable			N	F	N	N	N	N	N	F	N	N	N	N	N	N	N	N	N	F
43	Range 72D		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
161	472.05 to 471.25 MAHP	12-14	Unstable											-	-	-	-	-	-	-	-	-	-
161	471.05 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
161	470.85 and 470.60 MAHP		Unstable											-	-	-	-	-	-	-	-	-	-
	Goodrich, La., 470 MAHP							-4	-12	-8	+4	0	-4	-5	-3	-8	-8	-6	-2	0	-4	-4	+10
96	470.2 MAHP	12-9	Stable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96	470.0 MAHP		Unstable						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
174	Range 120U	12-17	No prediction						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
174	Range 112U		No prediction						-	-	-	-	-	-	-	R	N	N	N	N	N	N	N
174	Range 105U		Unstable											R	N	N	N	F	N	N	N	N	N
174	Range 99U		No prediction											R	N	N	N	N	N	N	N	N	N
79	Ranges 88U to 64U	12-8	Unstable					0	F	N	N	F	F	F	N	N	N	N	N	N	N	N	N
	Belle Island, La. and Miss., 460 MAHP					-10	-2	-4	-13	-7	+3	0	-4	-6	-4	-8	-8	-6	-2	0	-4	-4	+10
330	463.2 to 462.3 MAHP	12-23	Stable																			-	-
330	462.1 MAHP		Unstable																			-	-
44	Range 39D	12-6	Stable			N	N	N	O	O	N	O	N	N	N	N	N	N	N	N	N	N	N
61	Range 54D	12-7	Unstable				N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	O
61	Ranges 67D and 74D		No prediction				O	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N
61	Range 87D		Stable				-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	(F)
61	Range 212D		Unstable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Milliken Bend, Ark., 455 MAHP			-21	-5	-10	-2	-5	-13	-8	+2	0	-4	-6	-4	-8	-8	-6	-2	0	-4	-4	+10
10	Ranges 112D and 124D	12-3	Stable	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
10	Range 134D		Unstable	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
97	Ranges 178D to 212D	12-9	Unstable						N	N	F	N	N	N	N	N	N	N	N	N	N	N	N
	Marshall Browns Point, Miss. and La., 447 MAHP				-5	-10	-2	-5	-13	-8	+2	-1	-4	-6	-4	-9	-9	-6	-2	0	-4	-5	+10
11	Ranges 16U and 8U	12-3	Unstable		F	N	N	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
11	Range 2U*		Stable		(F)	(F)	N	(F)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
11	Range 5D		Unstable		N	N	O	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
11	Ranges 11D and 18D		No prediction		F	N	O	O	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N
11	Ranges 24D and 31D		Unstable		F	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Kings Point, Miss., 439 MAHP										+2	-1	-5	-6	-4	-9	-9	-5	-2	0	-3	-5	+10
129	Range 6D	12-12	Stable								R	N	N	N	N	N	N	N	N	N	N	N	N
129	Ranges 19D and 29D		Unstable								R	N	N	N	N	N	N	N	N	N	N	N	N
162	439.80 to 439.40 MAHP	12-14	Unstable								-	-	-	R	N	N	N	N	N	N	N	N	N
129	439.25 MAHP	12-12	Unstable								-	-	-	R	N	N	N	N	N	N	N	N	N
162	439.15 to 438.10 MAHP	12-14	Unstable										-	R	N	N	N	N	N	N	N	N	N

(Continued)

* Boring location previously predicted to be unstable. See Appendix A, Report 12-13, for discussion.

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																			
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Delta Point, La., 437 MAHP					-11	-3	-5	-13	-8	+2	-1	-5	-7	-4	-9	-9	-5	-2	0	-3	-5	+10
45	Ranges 24D and 47D	12-6	Unstable			-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	O
45	Range 70D		Stable			-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N
	Racetrack, Miss., 433 MAHP					-10	-3	-5	-14	-8	+2	-1	-5	-6	-4	-9	-9	-5	-2	0	-3	-5	+10
196	435.4 to 434.7 MAHP	12-19	Stable														-						
46	Ranges 25U to 9D	12-6	Stable			-	-	-	-	-	R	N	N	N	N	N	N	N	N	N	N	N	N
46	Range 33D		Unstable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
46	Range 50D		Stable			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Oak Bend, Miss., 425 MAHP															-8	-8	-5	-2	0	-3	-5	+10
183	426.45 to 425.85 MAHP	12-18	Stable													-	-	-	-	-	-	-	-
	Reid-Bedford, La., 428 MAHP				-5	-10	-3	-5	-13	-8	+2	-1	-5	-6	-4	-8	-8	-5	-2	0	-3	-5	+10
28	429.15 MAHP	12-4	Stable		O	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N
28	428.75 to 427.65 MAHP		Unstable		N	F	F	F	F	N	N	N	N	N	F	N	N	N	N	N	N	N	F
28	427.25 MAHP		Stable		N	N	O	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Diamond, La. and Miss., 423 MAHP						-2	-4	-13	-8	+2	0	-4	-6	-4	-8	-8	-5	-2	0	-3	-5	+10
62	424.90 to 425.15 MAHP	12-7	Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	Range 14U		Unstable				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
62	Range 1D		No prediction				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
62	Ranges 7D to 40D		Unstable				-	R	N	F	N	O	N	N	F	N	N	N	N	N	N	N	N
	Lake Karnac, La. and Miss., 419 MAHP							-4	-13	-8	+2	+1	-4	-6	-4	-8	-8	-5	-2	0	-3	-4	-10
120	421.00 and 420.75 MAHP	12-11	Stable								-	-	-	-	-	-	-	-	-	-	-	-	-
120	420.5 MAHP		Stable								-	-	-	R	N	N	N	N	N	N	N	N	N
80	Ranges 18D to 36D	12-8	Stable					R	N	O	N	O	N	N	N	N	N	N	N	N	N	N	N
80	Range 46D		Unstable					-	R	O	O	N	N	N	N	N	N	N	N	N	N	N	N
80	Range 54D		Unstable					-	R	N	F	N	N	N	N	N	N	N	N	N	N	N	N
80	Range 65D		No prediction					-	R	F	N	O	N	N	N	N	N	N	O	N	N	N	N
144	Range 97D	12-13	Unstable									R	N	N	N	N	N	N	F	N	N	N	N
144	Ranges 106D and 112D		Stable									R	N	N	N	N	N	N	(F)	N	N	N	O
144	Range 119D		Unstable									R	N	N	N	N	N	N	N	N	N	N	O
144	Range 126D		Stable									R	N	N	N	N	N	N	N	N	N	N	O
	Point Pleasant, La. and Miss., 413 MAHP													-5	-3	-8	-8	-5	-2	0	-3	-4	+10
323	415.7 MAHP	12-22	Unstable																	R	N	N	N
323	415.5 MAHP		Stable																	R	N	N	N
241	415.4 to 415.3 MAHP	12-21	Unstable																F	N	N	N	N
197	415.3 to 415.1 MAHP	12-19	Unstable														N	N	N	N	N	N	N
163	414.20 MAHP	12-14	Stable											-	-	-	R	N	N	N	N	N	N
163	414.00 MAHP		Unstable											-	-	-	R	N	F	N	N	N	N
163	413.85 MAHP		Stable											-	-	-	R	O	N	N	N	N	N
163	413.65 MAHP		No prediction											-	-	R	N	N	N	N	N	N	N
163	413.45 MAHP		Unstable											-	-	R	N	N	N	N	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Point Pleasant, La. and Miss., 413 MAHP (Continued)																						
163	413.25 MAHP		No prediction											-	-	R	N	N	N	N	N	N	N
163	413.05 to 412.90 MAHP		Stable											-	-	R	N	N	N	N	N	N	N
163	412.75 MAHP		Unstable											-	-	R	N	N	N	N	N	F	N
163	412.55 to 412.40 MAHP		Stable											-	-	R	N	N	N	N	N	N	N
163	412.20 MAHP		No prediction											-	-	R	N	N	N	N	N	N	N
184	412.00 MAHP	12-18	No prediction													R	N	N	N	N	N	O	N
184	411.80 to 411.4 MAHP		Stable													R	N	N	N	N	N	N	O
184	411.20 MAHP		Unstable													-	-	-	-	-	-	-	-
184	411.00 MAHP		Stable													-	-	-	-	-	-	-	-
	Grand Gulf, Miss., 405 MAHP										+2	+1	-3	-5	-3	-7	-7	-5	-2	0	-3	-4	+10
185	410.8 MAHP	12-23	Stable																			-	-
185	410.6 to 410.2 MAHP		Unstable																			-	-
185	410.3 and 410.1	12-18	Unstable												R	N	N	N	N	N	N	N	N
185	409.95 MAHP		No prediction												R	N	N	N	N	N	N	N	N
185	409.80 MAHP		Stable												R	N	N	N	N	N	N	N	N
185	409.65 to 408.95 MAHP		Unstable												R	N	N	F	N	O	N	N	F
185	408.75 and 408.60 MAHP		No prediction												R	N	N	N	N	N	N	N	N
198	406.2 MAHP	12-19	No prediction														-	-	-	-	-	-	-
198	406.0 to 405.8 MAHP		Unstable														-	-	-	-	-	-	-
198	405.6 to 405.2 MAHP		No prediction														-	-	-	-	-	-	-
121	Ranges 0 to 11D	12-11	No prediction								-	-	-	-	-	-	-	-	-	-	-	-	-
121	Ranges 18D and 25D		No prediction								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Range 31D		Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Range 38D		Unstable								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Range 44D		No prediction								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Ranges 52D to 83D		Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Range 90D		No prediction								N	N	N	N	N	N	N	F	N	N	N	N	N
121	Range 98D		Unstable								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Range 104D		No prediction								N	N	N	N	N	N	N	F	N	N	N	N	N
121	Ranges 111D to 123D		Unstable								N	N	N	N	N	N	N	N	N	N	N	N	N
121	Range 130D		Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
130	Range 135D	12-12	Stable								N	N	N	N	N	N	N	N	N	N	N	N	N
130	Ranges 141D and 146D		Unstable								N	N	N	N	N	N	N	N	N	N	N	N	N
130	Range 151D		Stable								N	N	N	N	N	N	O	N	N	N	N	N	N
130	Range 156D		Unstable								N	N	N	N	N	N	F	N	N	N	N	N	N
130	Ranges 162D to 179D		Unstable								R	N	N	N	N	N	N	F	F	O	N	O	N
130	Range 186D		Unstable								-	-	-	-	-	-	-	-	-	-	-	-	-
	Browns Field, La., 390 MAHP																			O	-3	-3	+11
314	Range 4+50D	12-22	Unstable																	-	-	-	-
314	Range 10+100D		Unstable																	-	-	-	-
314	Range 18D		Unstable																	-	-	-	-
314	Range 26+50D		Unstable																	R	N	N	N
314	Range 31+50D		No prediction																	R	N	N	N
314	Range 39D		Stable																	R	N	N	N

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols)																		
				54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																			
	Browns Field, La., 390 MAHP (Continued)																					
314	Range 45+50D		No prediction																	R	N	N	N
314	Range 50+50D		No prediction																	R	N	N	N
314	Range 56+10D		No prediction																	R	N	O	N
314	Range 61+60D		Stable																	R	(F)	N	N
314	Range 67D		No prediction																	R	N	O	N
314	Range 73D		No prediction																	-	R	N	N
314	Range 79+30D		No prediction																		R	N	N
314	Range 86-15D		Stable																		-	-	-
314	Range 92+50D		No prediction																		-	-	-
314	Range 100D		No prediction																		-	-	-
314	Range 106D		Stable																	-	-	-	-
314	Range 113+75D		Stable																	-	-	-	-
314	Range 120D		No prediction																	-	-	-	-
	Goldbottom, Miss., 389 MAHP									-8	+2	+1	-3	-4	-3	-7	-7	-5	-2	0	-3	-3	+11
107	Range 22D	12-10	No prediction							-	-	-	-	R	N	N	N	N	N	N	N	N	N
107	Range 35D		No prediction							N	N	N	N	N	N	N	N	N	N	N	N	N	N
107	Ranges 50D and 65D		Stable							N	N	N	N	N	N	N	N	N	N	N	N	N	N
107	Range 78D		Unstable							N	N	F	N	N	O	N	F	N	N	N	N	N	O
107	Range 91D		No prediction							N	O	O	N	N	N	N	N	N	N	F	N	N	N
107	Ranges 104D to 142D		Unstable							N	O	F	N	N	F	N	N	F	F	N	N	N	F
131 164	Range 149D	12-12 12-14	Unstable						R	N	N	N	N	N	N	N	N	F	F	N	N	F	N
131 164	Range 154D to 168D		Unstable							-	-	-	R	N	N	N	N	N	N	N	N	F	F
131 164	Range 175D		Unstable							-	-	-	-	-	-	-	-	-	-	-	-	-	-
164 219	390.2 to 388.4 MAHP	12-14 12-21	Unstable											-	-	-	-	-	-	-	-	-	-
219	388.2 MAHP	12-21	Stable															-	-	-	-	-	-
219	388.0 MAHP		Unstable															-	-	-	-	-	-
219	387.8 to 386.8 MAHP		Stable															-	-	-	-	-	-
	Kempe Bend, La., 384 MAHP													-4	-3	-6	-7	-5	-2	0	-3	-3	+10
165	384.95 to 384.25 MAHP	12-14	Unstable											-	-	-	-	-	-	-	-	-	-
	Ashland, Miss., 377 MAHP													-4	-3	-6	-7	-5	-2	0	-3	-4	+9
166	378.95 and 378.75 MAHP	12-14	Unstable											-	-	-	-	-	-	-	-	-	-
166	378.55 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
166	378.35 and 378.20 MAHP		Unstable											-	-	-	-	-	-	-	-	-	-
166	378.00 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
166	377.80 MAHP		No prediction											-	-	-	-	-	-	-	-	-	-
166	377.55 and 377.30 MAHP		Unstable											-	-	-	-	-	-	-	-	-	-
166	377.10 MAHP		No prediction											-	-	-	-	-	-	-	-	-	-
166	376.95 to 376.40 MAHP		Stable											-	-	-	-	-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			VICKSBURG DISTRICT (Continued)																				
	Gibson, La., 370 MAHP									-8	+2	0	+5	-4	-4	-6	-8	-5	-2	0	-3	-5	+8
186	370.70 MAHP	12-18	Stable													N	N	N	N	N	N	N	O
186	370.55 MAHP		Unstable													N	N	N	N	N	N	N	N
108	370.40 MAHP	12-10	Unstable							-	-	-	-	-	-	-	-	-	-	-	-	-	-
186	370.35 and 370.15 MAHP	12-18	Unstable													N	N	N	N	N	N	N	N
108	370.10 MAHP	12-10	Unstable							-	-	-	-	-	-	-	-	-	-	-	-	-	-
186	369.95 MAHP	12-18	Unstable													N	N	N	N	N	N	N	N
186	369.75 MAHP		No prediction													N	N	N	N	N	N	N	N
199	369.6 to 369.4 MAHP	12-19	Unstable														N	N	N	N	N	N	N
199	369.2 MAHP		No prediction														N	N	N	N	N	N	N
	Natchez Harbor, Miss., 362 MAHP						-2	-3	-12	-8	+2	0	-5	-4	-4	-6	-8	-5	-2	0	-3	-6	+8
63	362.3 MAHP	12-7	Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	362.1 MAHP		No prediction				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	361.9 MAHP		Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	361.7 and 361.5 MAHP		No prediction				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	361.3 MAHP		Stable				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carthage, Miss., 361 MAHP													-4	-4	-6	-8	-5	-2	0	-3	-6	+8
167	362.30 MAHP	12-14	Stable											-	-	-	-	-	-	-	-	-	-
167	361.95 MAHP		Stable											N	N	N	N	N	N	N	N	N	N
167	361.20 and 361.00 MAHP		No prediction											N	N	N	N	N	N	N	N	N	N
167	360.90 and 360.70 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
167	360.55 MAHP		No prediction											-	-	-	-	-	-	-	-	-	-
167	359.95 MAHP		Stable											-	-	-	-	-	-	-	-	-	-
167	359.55 and 359.35 MAHP		No prediction											-	-	-	-	-	-	-	-	-	-
331	360.9 to 360.5 MAHP	12-23	No prediction																			-	-
331	360.3 MAHP		Stable																			-	-
331	360.1 MAHP		No prediction																			-	-
331	359.95 MAHP		Stable																			-	-
331	359.75 MAHP		No prediction																			-	-
331	359.55 to 359.4 MAHP		Stable																			-	-
	Morville, La., 354 MAHP															-5	-7	-5	-2	0	-3	-6	+8
187	355.7 to 355.3 MAHP	12-18	No prediction													-	-	-	-	-	-	-	-
187	355.15 to 354.75 MAHP		Stable													-	-	-	-	-	-	-	-
187	354.60 and 354.40 MAHP		No prediction													-	-	-	-	-	-	-	-
187	354.25 and 354.05 MAHP		Stable													-	-	-	-	-	-	-	-
187	353.85 MAHP		No prediction													-	-	-	-	-	-	-	-
187	353.65 MAHP		Stable													-	-	-	-	-	-	-	-
200	353.5 MAHP	12-19	No prediction														-	-	-	-	-	-	-
200	353.3 to 353.1 MAHP		Stable														-	-	-	-	-	-	-
200	352.9 to 352.4 MAHP		No prediction														-	-	-	-	-	-	-
200	352.2 MAHP		Stable														-	-	-	-	-	-	-
200	351.9 MAHP		Stable														-	-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	VICKSBURG DISTRICT (Continued)																						
	St. Catherine, La., 350 MAHP															-5	-6	-5	-2	0	-3	-6	+8
188	351.30 and 351.0 MAHP	12-18	Unstable													N	N	N	N	N	N	N	N
188	350.65 to 349.15 MAHP		No prediction													N	N	N	N	N	N	N	N
	Bougere Bend, La., 328 MAHP															-4	-3	-5	-2	0	-3	-6	+8
242	Range 60U	12-21	Stable																-	-	-	-	-
242	Range 52U		No prediction																-	-	-	-	-
242	Ranges 47U and 40U		Stable																-	-	-	-	-
132	Ranges 51U and 44U	12-12	No prediction									-	-	-	-	-	-	-	R	N	N	N	N
132 **	Range 38U		Stable									-	-	-	-	-	-	-	R	N	N	N	N
	NEW ORLEANS DISTRICT																						
	Palmetto Bend, Miss., 325 MAHP																		-2	0	-2	-2	+12
243	Ranges 324.15 to 323.5	12-21	Stable																-	-	-	-	-
243	Range 322.8		No prediction																-	-	-	-	-
	Black Hawk, La., 317 MAHP																					-2	+12
336	Ranges 316.8 to 316.1	12-23	Stable																			-	-
336	Range 315.7		No prediction																			-	-
336	Ranges 315.3 to 314.65		Stable																			-	-
336	Ranges 314.2 to 313.65		No prediction																			-	-
	Point Breeze, La., 312 MAHP																					-2	+12
337	Ranges 312.01 to 311.5	12-23	Stable																			-	-
337	Ranges 311.23 to 310.83		Unstable																			-	-
337	Range 310.6		No prediction																			-	-
337	Range 309.9		Stable																			-	-
337	Range 309.05		Unstable																			-	-
	Hog Point, La., 295 MAHP																		-2	0	-2	-2	+12
244	Range 296.3	12-21	Unstable																-	-	-	-	-
281	Ranges 296.1 to 295.95	12-22	Stable																	-	-	-	-
244	Range 293.7	12-21	Unstable																-	-	-	-	-
281	Range 293.1	12-22	No prediction																		-	-	-
244	Range 292.9	12-21	No prediction																	-	-	-	-
244	Range 291.9		Unstable																-	-	-	-	-
	Springfield Bend, La., 240 MAHP																		0	+2	0	+1	+12
245	Ranges 240.1 to 239.1	12-21	Unstable																-	-	-	-	-

(Continued)

** See Table 4 of Potamology Report 12-20 and earlier reports of this series for failure history of sites 23, 39, 75, 76, 77, 109, and 110 along the Arkansas River in the Vicksburg District and sites 12 and 13 along the Mississippi River in the New Orleans District.

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	NEW ORLEANS DISTRICT (Continued)																						
	Allendale, La., 236 MAHP																		0	+2	0	+1	+12
246	Ranges 236.5 to 234.9	12-21	Stable																-	-	-	-	
	Scotlandville, La., 233 MAHP																				0	+1	+12
282	Ranges 234.3 to 230.2	12-22	Stable																	-	-	-	
	Port Allen, La., 232 MAHP																		0	+3	0	+1	+12
247	Ranges 232.9 to 231.7	12-21	Stable																-	-	-	-	-
283	Range 231.1	12-22	Stable																		-	-	-
247	Ranges 231.0 to 228.0	12-21	Stable																-	-	-	-	-
247	Ranges 227.3 to 226.8	12-21	Unstable																-	-	-	-	-
	Missouri Bend, La., 221 MAHP																				0	+1	+12
284	Ranges 223.1 to 219.6	12-22	Stable																		-	-	-
284	Range 218.8		Unstable																		-	-	-
	Manchac Bend, La., 215 MAHP																		+1	+3	0	+1	+12
248	Range 219.2	12-21	Stable																-	-	-	-	-
248	Ranges 218.8 to 218.2		Unstable																-	-	-	-	-
248	Range 217.6		No prediction																-	-	-	-	-
248	Ranges 217.1 to 211.9		Stable																-	-	-	-	-
248	Range 211.2		Unstable																-	-	-	-	-
	Plaquemine, La., 212 MAHP																				0	+1	+11
285	Range 212.1	12-22	Stable																		-	-	-
285	Range 211.5		Unstable																		-	-	-
285	Ranges 211.0 to 210.5		Stable																		-	-	-
	St. Gabriel, La., 202 MAHP																				0	+1	+11
202	Ranges 203.0 to 201.16	12-21	Stable															-	-	-	-	-	-
	White Castle, La., 195 MAHP																				0	+1	+11
286	Ranges 198.75 to 197.43	12-22	Stable																		-	-	-
286	Range 196.85		Unstable																		-	-	-
286	Ranges 191.02 to 189.75		Stable																		-	-	-
	New River, La., 187 MAHP																				0	+1	+10
287	Ranges 191.75 to 182.3	12-22	Stable																		-	-	-
	Phildelphia Point, La., 183 MAHP																		+1	+2	0	0	+9
249	Ranges 183.8 to 183.3	12-21	Unstable																-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	NEW ORLEANS DISTRICT (Continued)																						
	Marchand, La., 180 MAHP																	-1	+1	+2	0	0	+9
250	Range 181.3	12-21	Stable																-	-	-	-	-
221	Range 180.6		Stable															-	-	-	-	-	-
221	Ranges 180.0 to 179.6		Unstable															-	-	-	-	-	-
	Smoke Bend, La., 178 MAHP																	-1	+1	+2	0	0	+8
251	Ranges 179.0 to 178.5	12-21	Stable																-	-	-	-	-
222	Range 177.9		Stable															-	-	-	-	-	-
251	Ranges 177.2 to 176.6		Stable																-	-	-	-	-
251	Ranges 176.1 to 175.4		Unstable																-	-	-	-	-
	Aben, La., 173 MAHP																		+1	+2	0	0	+8
252	Ranges 174.5 to 170.9	12-21	Stable																-	-	-	-	-
	St. Elmo, La., 173 MAHP																		+1	+2	0	0	+8
253	Range 175.8	12-21	Unstable																-	-	-	-	-
253	Range 175.2		Stable																-	-	-	-	-
253	Range 174.6		No prediction																-	-	-	-	-
253	Range 173.3		Stable																-	-	-	-	-
	Burnside, La., 170 MAHP																	0	+2	+2	0	0	+9
223	Ranges 171.4 to 168.0	12-21	Stable															-	-	-	-	-	-
223	Range 171.2	12-22	Stable																		-	-	-
	Romeville, La., 162 MAHP																	+1	+3	+3	+1	+1	+10
224	Range 162.4	12-21	Stable															-	-	-	-	-	-
254	Ranges 163.0 to 159.2		Stable																-	-	-	-	-
	Rich Bend, La., 157 MAHP																	+2	+4	+4	+3	+3	+10
225	Ranges 160.0 and 159.3	12-21	Stable															-	-	-	-	-	-
225	Range 158.8		Unstable															-	-	-	-	-	-
225	Range 158.3 to 155.9		Stable															-	-	-	-	-	-
225	Ranges 155.4 and 154.8		No prediction															-	-	-	-	-	-
225	Range 154.2		Stable															-	-	-	-	-	-
	Belmont, La., 153 MAHP																		+4	+4	+3	+3	+10
255	Range 155.1	12-21	Unstable																-	-	-	-	-
255	Range 154.6		Stable																-	-	-	-	-
255	Range 154.0		Unstable																-	-	-	-	-
255	Ranges 153.5 to 151.8		Stable																-	-	-	-	-
255	Ranges 151.3 to 149.2		Unstable																-	-	-	-	-
	Vacherie, La., 148 MAHP																		+4	+4	+3	+3	+10
256	Ranges 150.3 to 146.6	12-21	Stable																-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			NEW ORLEANS DISTRICT (Continued)																				
	Angelina, La., 145 MAHP																		+4	+4	+3	+3	+10
257	Ranges 147.6 to 147.1	12-21	Unstable																-	-	-	-	-
257	Ranges 146.6 to 143.2		Stable																-	-	-	-	-
257	Range 142.5		Unstable																-	-	-	-	-
	Willow Bend, La., 141 MAHP																		+4	+4	+3	+3	+10
258	Ranges 143.2 to 140.1	12-21	Stable																-	-	-	-	-
258	Range 139.2		Unstable																-	-	-	-	-
	Reserve, La., 138 MAHP																		+4	+4	+3	+3	+10
259	Ranges 140.1 to 136.8	12-21	Stable																-	-	-	-	-
	Lucy, La., 135 MAHP																	+2	+4	+4	+3	+3	+10
226	Ranges 136.6 to 135.2	12-20	Stable															-	-	-	-	-	-
226	Ranges 134.6 and 134.2		Unstable															-	-	-	-	-	-
	Bonnet Carré, La., 132 MAHP																		+4	+4	+3	+3	+10
260	Ranges 134.4 to 130.7	12-21	Stable																-	-	-	-	-
260	Range 129.8		Unstable																-	-	-	-	-
	Little Gypsy Setback, La., 130 MAHP																					+3	+10
228	Ranges 131.1 to 130.4	12-23	Stable																			-	-
338	Range 130.25		Unstable																			-	-
338	Range 130.05		No prediction																			-	-
338	Ranges 129.4 to 128.9		Unstable																			-	-
	Waterford, La., 127 MAHP																		+4	+4	+3	+3	+10
261	Ranges 130.7 to 129.2	12-21	Stable																-	-	-	-	-
261	Range 128.5		No prediction																-	-	-	-	-
261	Ranges 127.8 to 126.0		Stable																-	-	-	-	-
261	Range 125.2		Unstable																-	-	-	-	-
288	Range 124.3	12-22	Unstable																		-	-	-
	Goodhope, La., 123 MAHP																				+3	+3	+9
289	Range 125.5	12-23	Stable																			-	-
289	Ranges 124.1 to 122.5	12-22	Stable																		-	-	-
	Destrehan, La., 121 MAHP																					+3	+9
339	Range 121.6	12-23	Stable																			-	-
	Luling, La., 118 MAHP																		+4	+4	+3	+3	+9
262	Ranges 123.4 to 121.3	12-21	Stable																-	-	-	-	-
290	Ranges 121.1 to 116.5	12-22	Stable																		-	-	-
262	Ranges 116.3 to 115.6	12-21	Stable																-	-	-	-	-
290	Ranges 114.8 to 113.9	12-22	Unstable																		-	-	-
290	Range 113.0		Stable																		-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
			NEW ORLEANS DISTRICT (Continued)																				
	Kenner, La., 115 MAHP																				+3	+3	+8
291	Ranges 117.6 to 110.1	12-22	Stable																		-	-	-
291	Range 109.4		Unstable																		-	-	-
291	Range 108.5		Stable																		-	-	-
	Avondale, La., 108 MAHP																		+4	+4	+3	+3	+7
292	Range 111.0	12-22	Unstable																		-	-	-
263	Ranges 109.8 to 109.4	12-21	Stable																-	-	-	-	-
292	Ranges 108.0 to 106.3	12-22	Stable																		-	-	-
294	Range 105.7		Stable																	-	-	-	-
263	Range 105.5	12-21	No prediction																-	-	-	-	-
294	Range 105.1	12-22	Stable																	-	-	-	-
263	Range 105.0	12-21	Stable																-	-	-	-	-
	Carrolton, La., 104 MAHP																				+3	+3	+7
293	Ranges 106.6 to 106.2	12-22	Stable																		-	-	-
293	Range 105.7		Unstable																		-	-	-
293	Range 105.2		Stable																		-	-	-
293	Range 102.3		Unstable																		-	-	-
293	Range 101.6		No prediction																		-	-	-
293	Range 101.0		Stable																		-	-	-
	Greenville Bend, La., 100 MAHP																		+4	+4	+3	+3	+7
264	Range 102.0	12-21	Stable																-	-	-	-	-
295	Range 100.3	12-22	Unstable																		-	-	-
264	Range 98.4	12-21	Stable																-	-	-	-	-
	New Orleans Harbor, La., 98 MAHP																					+3	+7
332	Range 99.0	12-23	Unstable																			-	-
332	Ranges 98.7 to 98.3		Stable																			-	-
333	Ranges 95.43 to 94.83		Stable																			-	-
	Gretna, La., 97 MAHP																			+4	+3	+3	+7
296	Ranges 97.8 to 96.2	12-22	Stable																	-	-	-	-
	Algiers, La., 94 MAHP																				+3	+3	+8
297	Range 95.5	12-22	Stable																		-	-	-
297	Range 93.5	12-23	Stable																			-	-
297	Range 93.05		Unstable																		-	-	-
	Third District, La., 90 MAHP																				+4	+4	+8
298	Ranges 94.65 to 89.6	12-22	Stable																		-	-	-
298	Range 88.9		Unstable																		-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	NEW ORLEANS DISTRICT (Continued)																						
	Meraux, La., 88 MAHP																					+4	+8
334	Range 88.1	12-23	Unstable																			-	-
	Cut Off, La., 88 MAHP																	+3	+4	+4	+4	+4	+8
227	Range 91.7	12-22	Unstable																		-	-	-
227	Ranges 90.8 to 86.8	12-21	Stable															-	-	-	-	-	-
227	Range 86.1	12-21	Unstable															-	-	-	-	-	-
	Story, La., 85 MAHP																					+4	+8
335	Range 85.5	12-23	Stable																			-	-
	Poydras, La., 82 MAHP																	+3	+4	+4	+4	+4	+8
228	Ranges 86.5 and 86.1	12-21	Stable															-	-	-	-	-	-
265	Range 85.5	12-21	Stable																-	-	-	-	-
228	Range 84.4		Unstable															-	-	-	-	-	-
228	Ranges 83.8 and 83.5		Stable															-	-	-	-	-	-
228	Ranges 82.8 and 82.5		Unstable															-	-	-	-	-	-
228	Ranges 82.2 and 78.8		Stable															-	-	-	-	-	-
	Twelve-Mile Point, La., 81 MAHP																				+4	+4	+8
299	Range 83.5	12-23	Stable																			-	-
299	Range 82.75	12-22	Stable																		-	-	-
299	Range 81.3		No prediction																		-	-	-
299	Range 81.0		Unstable																		-	-	-
299	Range 80.5		Stable																		-	-	-
299	Range 80.1		Unstable																		-	-	-
	English Turn, La., 79 MAHP																			+4	+4	+4	+8
300	Range 78.85	12-22	Stable																	-	-	-	-
300	Range 78.5	12-23	Stable																			-	-
	Oak Point, La., 74 MAHP																		+4	+4	+4	+4	+8
301	Range 74.6	12-23	No prediction																			-	-
301	Range 74.5	12-22	Stable																		-	-	-
267	Ranges 73.5 to 72.0	12-21	Stable																-	-	-	-	-
267	Range 71.3		Unstable																-	-	-	-	-
	Scarsdale, La., 74 MAHP																		+4	+4	+4	+4	+8
266	Ranges 77.3 to 74.3	12-21	Stable																-	-	-	-	-
266	Ranges 73.5 to 72.9		Unstable																-	-	-	-	-
	Linwood, La., 71 MAHP																	+3	+4	+4	+4	+4	+8
229	Ranges 71.5 to 70.4	12-21	Stable															-	-	-	-	-	-
229	Range 69.7		Unstable															-	-	-	-	-	-

(Continued)

Table 6 (Continued)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	NEW ORLEANS DISTRICT (Continued)																						
	Belair, La., 65 MAHP																		+4	+4	+4	+4	+7
303	Range 67.3	12-22	Stable																	-	-	-	-
268	Ranges 66.7 to 62.6	12-21	Stable																-	-	-	-	-
268	Range 66.5	12-23	Unstable																			-	-
	Alliance, La., 63 MAHP																		+4	+4	+4	+4	+7
269	Ranges 65.6 to 61.6	12-21	Stable																-	-	-	-	-
269	Range 60.9		No prediction																-	-	-	-	-
	Monsecour, La., 61 MAHP																	+3	+4	+4	+4	+4	+7
230	Ranges 62.0 to 60.7	12-21	Stable															-	-	-	-	-	-
270	Range 60.3		Stable																-	-	-	-	-
	Myrtle Grove, La., 58 MAHP																	+3	+4	+4	+4	+4	+6
271	Ranges 60.4 to 59.7	12-21	Stable																-	-	-	-	-
231	Range 58.8		Stable															-	-	-	-	-	-
271	Range 57.7		Stable																-	-	-	-	-
	Harlem, La., 58 MAHP																		+4	+4	+4	+4	+6
272	Range 58.0	12-21	Stable																-	-	-	-	-
	Junior, La., 54 MAHP																	+3	+4	+4	+4	+4	+5
273	Range 55.9	12-21	Stable																-	-	-	-	-
232	Range 54.5		Stable															-	-	-	-	-	-
	Gravolet, La., 52 MAHP																	+3	+4	+4	+3	+4	+5
274	Range 52.6	12-21	Stable																-	-	-	-	-
233	Range 51.7		Stable															-	-	-	-	-	-
274	Ranges 50.5 to 49.7		Stable																-	-	-	-	-
	Diamond, La., 48 MAHP																		+4	+4	+3	+3	+5
275	Range 50.9	12-21	Unstable																-	-	-	-	-
275	Ranges 50.2 to 48.6		Stable																-	-	-	-	-
275	Ranges 48.0 to 46.7		Unstable																-	-	-	-	-
	Bohemina, La., 47 MAHP																		+4	+4	+3	+3	+5
276	Range 46.95	12-21	Stable																-	-	-	-	-
	Point Michel, La., 44 MAHP																		+4	+4	+3	+3	+6
277	Range 43.9	12-21	Stable																-	-	-	-	-

(Continued)

Table 6 (Concluded)

No.	Revetment Site Location	Potamology Report in Which Borings Are Evaluated	Predicted Performance with Regard to Flow Failure	Estimated Maximum River Stage Referenced to Bank-Full Conditions (ft) Observed Performance (Letter Symbols) 54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	NEW ORLEANS DISTRICT (Concluded)																						
	Nestor, La., 42 MAHP																		+4	+3	+3	+3	+6
278	Ranges 44.2 to 41.8	12-21	Stable																-	-	-	-	-
304	Ranges 41.2 to 40.5	12-22	Stable																	-	-	-	-
304	Range 39.8		Unstable																	-	-	-	-
	Sixty Mile Point, La., 33 MAHP																					+4	+6
340	Ranges 33.9 to 33.8	12-23	Stable																			-	-
	Tropical Bend, La., 30 MAHP																	+3	+4	+2	+4	+4	+6
234	Range 32.4	12-21	Stable															-	-	-	-	-	-
234	Range 32.0		No prediction															-	-	-	-	-	-
234	Ranges 30.9 to 28.55		Stable															-	-	-	-	-	-
	Neptune, La., 24 MAHP																			+2	+4	+4	+6
305	Ranges 26.2 to 23.4	12-22	Stable																	-	-	-	-
305	Range 22.8		Unstable																	-	-	-	-
305	Ranges 21.9 to 21.2		Stable																	-	-	-	-
	Fort Jackson, La., 20 MAHP																		+3	+2	+4	+4	+5
280	Range 23.05	12-21	Unstable																-	-	-	-	-
306	Range 20.8	12-22	Stable																	-	-	-	-
306	Range 20.2		Unstable																	-	-	-	-
306	Range 19.6		Stable																	-	-	-	-
	Olga, La., 16 MAHP																			+2	+3	+3	+4
307	Ranges 20.6 to 17.0	12-22	Stable																	-	-	-	-
307	Range 16.4		Unstable																	-	-	-	-
307	Ranges 15.9 to 14.0		Stable																	-	-	-	-
307	Ranges 13.4 to 12.8		Unstable																	-	-	-	-
307	Ranges 12.2 to 11.6		Stable																	-	-	-	-
	Venice, La., 14 MAHP																		+3	+2	+3	+3	+4
280	Ranges 16.9 to 11.5	12-21	Stable																-	-	-	-	-

Table 7

1972 Failures at Sites in the Memphis and Vicks

No. (1)	Revetment Site Failure Location (2)	Year Site Revetted (3)	1972 Date Failure First Noted (4)	1972 Date Failure Surveyed (5)	Boring Data* No. (6)	Report in Which Analyzed (7)	O ft (8)	A ft (9)	R Value (10)	Prediction (11)	Location of Boring with Respect to Failure ft (12)	Failure Type (13)	Failure Dimen Position with to Top of F W or W_{max} ft (14)	W_{min} ft (15)
												MEMPHIS DISTRICT		
133	Fritz Landing, Tenn., 857 MAHP													
	R-96+00	1970	Jun	Jul	4	12-13	17	18	0.94	Stable	220 DS	Shear	100	--
	R-90+00	1968 and 1970	Jun	Jul	3	12-13	24	22	1.09	Stable	0	Shear	200	--
	R-68+00	1964	Feb	Jul	1	12-13	25	30	0.83	Unstable	120 DS	Shear	250	--
170	Island 63 Bar, Miss., 639 MAHP													
	R-133+00	1964	May	Aug	1	12-17	0	24	--	Unstable	0	Flow	500	225
	R-139+00	1964	--	Aug	2	12-17	0	47	--	Unstable	400 US	Flow	140	90
												VICKSBURG DISTRICT		
321	Smith Point, Miss., 602 MAHP													
	R-20-U	1971	Mar	Jul	SP-2-70U	12-22	13	66	0.20	Unstable	50 Landside	Flow	100	50
	R-18-U to R-16-U	1971	Mar	Jul	SP-2-70U	12-22	13	66	0.20	Unstable	220 US	Flow	370	120
	R-15-U to R-14-U	1971	Mar	Jul	SP-1-70U	12-22	23	60	0.38	Unstable	100 DS	Flow	230	150
	R-10-U	1971	Feb	Jul	SP-1-70U	12-22	23	60	0.38	Unstable	500 US	Shear	150	--
	R-2-U to R-0	1970	Jan	Jul	SPR-2-57	12-8	34	24	1.42	Stable	150 DS	Shear	300	--
	R-20-D	1955	Jun	Jul	SP-3-57	12-8	22	35	0.65	Unstable	500 US	Shear	210	--
	R-22-D	1955	Jun	Jul	SP-3-57	12-8	22	35	0.65	Unstable	220 Landside	Flow	230	100
173	Baleshed-Stack Island, Miss.-La., 492 MAHP													
	R-84-U	1970	Feb	Aug	L-26-64	12-17	25	67+	0.37	Unstable	0	Flow	310	100
	R-68-D	1964	Mar	Aug	L-4-63	12-16	22	42	0.52	Unstable	150 US	Flow	230	90
	R-91-D to R-93-D	1965	Jun	Aug	L-16-65U	12-18	0	91	--	Unstable	150 US	Shear	400	--
	R-95-D to R-96-D	1966	Oct	Oct	L-16-65U	12-18	0	91	--	Unstable	100US	Shear	275	--
163	Point Pleasant, La., 412 MAHP													
	R-149-D to R-151-D	1966	Jul	Aug	D-4-63U	12-16	36	64+	0.56	Unstable	450 Landside	Flow	350	130
	R-177-D to R-181-D	1966	Jul	Aug	P-1-65U	12-18	56	39+	--	No prediction	230 Landside	Shear	550	--
130	Grand Gulf, Miss., 401 MAHP													
	R-178-D	1968	Jul	Aug	GG-30-61	12-12	13	20	0.65	Unstable	150 DS	Shear	200	--
131 164	Goldbottom, Miss., 391 MAHP													
	R-149-D to R-151-D	1969	Jul	Aug	GB-11-61	12-12	13	30	0.43	Unstable	75 US	Flow	300	120
	R-168-D to R-169-D	1963	Jul	Aug	GB-4-63	12-16	42	50	0.84	Unstable	0	Flow	300	140
314	Browns Field, La., 388 MAHP													
	R-54-D to R-55-D	1970	Jul	Aug	BF-9-70U	12-22	64	37+	--	No prediction	150 DS	Shear	290	--
	R-58-D	1970	Jul	Aug	BF-9-70U	12-22	64	37+	--	No prediction	225 DS	Shear	200	--
	R-66-D to R-70-D	1970	Jul	Aug	BF-11-70U	12-22	59	42+	--	No prediction	0	Shear	550	--

* O = overburden thickness, ft; A = zone A sand thickness, ft; R = ratio of overburden thickness to zone A sand thickness (O/A).

** See Figure 2 wherein: W = width of shear failure; W_{max} = maximum width of flow failure; W_{min} = minimum width of flow failure; Y = distance from top of fail

Table 7

Failures at Sites in the Memphis and Vicksburg Districts

diction (11)	Location of Boring with Respect to Failure ft (12)	Failure Type (13)	Failure Dimensions and Position with Respect to Top of Bank** W or W_{max} ft (14)	W_{min} ft (15)	Y ft (16)	Z ft (17)	Additional Information Concerning Failure Location (18)	Site Failure History Since 1954 (19)
		MEMPHIS DISTRICT						
able	220 DS	Shear	100	--	50	0	Failure first reported 5 June 75 ft long and caved to top of bank. 21 June, failure reported to be 100 ft long	No previous failures
able	0	Shear	200	--	50	0	5 June, failure reported to be 100 ft long and caved to top of bank. 21 June, failure reported to be 200 ft long	
stable	120 DS	Shear	250	--	75	0	Failure first reported 150 ft long on 1 Feb and had caved to top of bank. 6 Apr, no change was reported. 21 June, failure reported to be 250 ft long	
stable	0	Flow	500	225	400	-150	Failure reported on 31 May to be 500 ft long and caved to top of bank	One flow failure was reported in 1968 at R-146+00 as described in Report 12-21
stable	400 US	Flow	140	90	130	0		
		VICKSBURG DISTRICT						
stable	50 Landside	Flow	100	50	160	+40	General scour from R-3-U to R-5-D where revetment was originally placed in 1953, repaired and replaced in 1955, 1970, and 1971	Three shear failures were reported in 1958 between R-1-U and R-1-D, between R-14-D and R-18-D, and between R-22-D and R-25-D. One flow failure was reported in 1961 between R-29-D amd R-33-D. In 1971 one flow failure was reported at R-10-U and two shear failures were reported at R-4-D and R-18-D
stable	220 US	Flow	370	120	250	+40		
stable	100 DS	Flow	230	150	200	+50		
stable	500 US	Shear	150	--	100	+60		
able	150 DS	Shear	300	--	100	+50		
stable	500 US	Shear	210	--	200	+30		
stable	220 Landside	Flow	230	100	150	+10		
stable	0	Flow	310	100	180	+20	General scour from R-94-D to R-90-D	One flow failure was reported between R-4-D and R-7-D in 1969. In 1971 four flow failures were reported at R-67-D, between R-80-U and R-81-U, at R-31-D and between R-32-D and R-33-D. One shear failure reported at R-67-U
stable	150 US	Flow	230	90	190	+50		
stable	150 US	Shear	400	--	80	+80		
stable	100US	Shear	275	--	200	+90		
stable	450 Landside	Flow	350	130	200	+40		One shear failure was reported at R-110-D in 1968
pre-diction	230 Landside	Shear	550	--	170	+60		
stable	150 DS	Shear	200	--	150	+30		One flow failure was reported at R-118-D in 1965. One shear failure was reported at R-152-D and one flow failure at R-153-D in 1967. Five flow failures were reported at R-136-U, R-91-U, R-103-D, R-174-D, and R-176-D in 1968. One flow failure was reported in 1969 at R-173-D. In 1970, three shear failures were reported between R-148-U and R-144-U, R-153-U and R-151-U, and R-171-D and R-172-D. One flow failure was reported between R-157-D and R-159-D in 1971
stable	75 US	Flow	300	120	250	0		Two shear failures were reported at R-97-D and R-101-D in 1961. One shear failure at R-86-D and two flow failures at R-77-D and R-135-D were reported in 1962. Two shear failures at R-75-D and R-84-D and one flow failure were reported in 1965. Two flow failures were reported at R-77-D and R-79-D in 1967. Five flow failures were reported at R-142-D, R-144-D, R-146-D, R-150-D, and R-154-D in 1968. Seven flow failures were reported in 1969 at R-104-D, R-132-D, R-139-D, R-145-D, R-146-D, R-150-D, and R-152-D. One flow failure was reported between R-87-D and R-90-D in 1970. Four flow failures were reported at R-163-D, R-158-D, R-155-D, and R-86-D and one shear failure was reported in 1971 at R-31-D
stable	0	Flow	300	140	210	-40		
pre-diction	150 DS	Shear	290	--	80	+60		One flow failure was reported at R-63-D in 1971
pre-diction	225 DS	Shear	200	--	130	+30		
pre-diction	0	Shear	550	--	100	+60		

ness (O/A).
flow failure; Y = distance from top of failure to W_{min} (flow failure) or to toe of shear slide; Z = distance from top of slide to top of bank (+ if riverside, - if landside).

Table 8

1973 Failures at Sites in the Memphis and Vicksburg Districts

No. (1)	Revetment Site Failure Location (2)	Year Site Revetted (3)	1973 Date Failure First Noted (4)	1973 Date Failure Surveyed (5)	Boring Data* No. (6)	Report in Which Analyzed (7)	O ft (8)	A ft (9)	R Value (10)	Prediction (11)	Location of Boring with Respect to Failure ft (12)	Failure Type (13)	Failure Dimensions and Position with Respect to Top of Bank** W or W_{max} ft (14)	W_{min} ft (15)	Y ft (16)	Z ft (17)	
												MEMPHIS DISTRICT					
21	Harbert Point, Miss., 676 MAHP R-114+00 to R-116+00	1963	Jul	Aug	2	12-3	48	27	1.78	Stable	200 US	Shear	250	--	100	+10	Fai
												VICKSBURG DISTRICT					
150 74	Prentiss, Miss., 583 MAHP R-63-U	1965	Jul	Aug	P-2-63	12-14	20	28	0.71	Unstable	220 DS	Flow	220	100	275	-20	
	R-2-U to R-5-U	1964	Feb	Jul	PR-3-57	12-8	19	26	0.73	Unstable	450 DS	Flow	300	110	300	-50	
91	Ozark, Ark.-Miss., 576 MAHP R-76-D to R-77-D	1958	Jul	Aug	O-10-58	12-9	77	14	5.50	Stable	100 DS	Shear	200	--	200	+30	
153	Butaw-Mounds, Miss., 562 MAHP R-70-D to R-72-D	1969	Jul	Aug	M-14-63	12-14	22	70	0.31	Unstable	100 DS	Flow	350	150	300	-60	
	R-73-D to R-75-D	1969	Jul	Aug	M-14-63	12-14	22	70	0.31	Unstable	0	Flow	260	100	270	-20	
	R-76-D	1969	Jul	Aug	M-14-63	12-14	22	70	0.31	Unstable	200 US	Flow	150	70	180	+10	
154	Arkansas City-Yellow Bend, Ark., 551 MAHP R-197-D to R-198-D	1963	Jul	Aug	YB-1-63	12-14	49	35	1.40	Stable	100 US	Flow	300	150	220	-60	
93	Sunnyside-Lakeport, Ark., 528 MAHP R-53-D to R-55-D	1958	Jul	Aug	LP-3-58	12-9	30	38	0.79	Unstable	250 Landside	Shear	230	--	100	+10	
142	Cracraft, Ark., 512 MAHP R-82-U	1968	Jul	Sep	CR-5-62U	12-13	43	48+	--	No prediction	300 DS	Shear	130	--	90	+60	
	R-60-U to R-55-U	1957	Jul	Sep	C-5-53	12-4	38	37	1.02	Stable	50 US	Shear	800	--	200	-75	Sca
	R-52-U to R-51-U	1953	Jul	Sep	C-4-53	12-4	32	20	1.60	Stable	350 US	Shear	275	--	150	-70	
173	Baleshed-Stack Island, Miss.-La., 491 MAHP R-86-U	1972	Jul	Sep	L-26-64U	12-17	25	67+	0.37	Unstable	300 DS	Flow	200	100	150	0	
	R-73-U to R-71-U	1970	Jul	Sep	L-24-64U	12-17	40	20	2.00	Stable	200 DS	Flow	300	90	200	0	
	R-57-U to R-53-U	1964	Jul	Sep	L-22-64U	12-17	8	64	0.12	Unstable	0	Flow	500	175	450	-250	A l
43	Fitler-Cottonwood, Miss., 473 MAHP R-11-U to R-13-U	1961	Jul	Oct	C-1-55	12-6	30	45	0.67	Unstable	450 US	Flow	350	120	350	-60	
	R-12-D to R-15-D	1963	Jul	Oct	C-3-55	12-6	24	36	0.67	Unstable	200 DS	Flow	350	120	300	-20	
61	Belle Island, La.-Miss., 459 MAHP R-57-D to R-59-D	1961	Jul	Oct	B-1-56	12-7	28	63	0.44	Unstable	500 US	Shear	300	--	200	-40	
	R-85-D to R-91-D	1961	Jul	Oct	B-4-56	12-7	0	15	--	Stable	0	Flow	600	200	450	-200	Fa
28	Reid Bedford, La., 428 MAHP R-120 to R-122	1955	Jul	Oct	B-4-54	12-4	39	56	0.70	Unstable	375 US	Flow	300	130	250	-50	
184	Point Pleasant, La., 412 MAHP R-188-D to R-189-D	1966	Jul	Oct	P-2-65U	12-18	37	30	1.23	Stable	300 US	Shear	250	--	200	-10	
185	Grand Gulf, Miss., 409 MAHP R-149-U	1965	Jul	Oct	G-7-65U	12-18	20	45	0.44	Unstable	400 US	Flow	175	60	175	0	
131 164	Goldbottom, Miss., 391 MAHP R-80-D to R-82-D	1959	Jul	Oct	GB-6-59	12-10	34	55	0.62	Unstable	375 US	Shear	250	--	250	+20	
	R-130-D to R-132-D	1961	Jul	Oct	GB-2-59	12-10	24	64+	0.38	Unstable	0	Flow	350	150	500	-225	
	R-163-D to R-166-D	1971	Jul	Sep	GB-3-63	12-14	7	93	0.08	Unstable	225 US	Flow	400	175	500	-250	
186	Gibson, La., 371 MAHP R-32-D	1972	Jul	Oct	G-1-64U	12-17	46	39	1.18	Stable	50 DS	Shear	175	--	200	-20	
	R-33-D to R-34-D	1972	Jul	Oct	G-1-64U	12-17	46	39	1.18	Stable	0	Shear	300	--	250	-20	

* O = overburden thickness, ft; A = zone A sand thickness, ft; R = ratio of overburden thickness to zone A sand thickness (O/A).

** See Figure 2 wherein: W = width of shear failure; W_{max} = maximum width of flow failure; W_{min} = minimum width of flow failure; Y = distance from top of failure to W_{min}

Table 8

1973 Failures at Sites in the Memphis and Vicksburg Districts

Prediction (11)	Location of Boring with Respect to Failure ft (12)	Failure Type (13)	Failure Dimensions and Position with Respect to Top of Bank** W_{max} or W_{min} ft (14)	W_{min} ft (15)	Y ft (16)	Z ft (17)	Additional Information Concerning Failure Location (18)	Site Failure History Since 1954 (19)
			MEMPHIS DISTRICT					
Stable	200 US	Shear	250	--	100	+10	Failure first reported in July to be 100 ft long with an 8-ft bluff bank	Two shear failures were reported in 1957 at R-163+00 and R-174+50. In 1959 one shear failure was reported at R-163+50. One shear failure was reported in 1963 at R-163+00
			VICKSBURG DISTRICT					
Unstable	220 DS	Flow	220	100	275	-20		Three shear failures were reported in 1963 at R-45-U, R-43-U, and R-19-D. In 1967 two shear failures were reported at R-30-U and R-32-U. There was one flow failure at R-32-D and one shear failure between R-31-D and R-28-D
Unstable	450 DS	Flow	300	110	300	-50		
Stable	100 DS	Shear	200	--	200	+30		Three shear failures were reported at R-35-D, R-67-D, and R-81-D as described in Reports 12-12 and 12-20. One flow failure at R-89-D was reported in 1968 and one was reported at R-88-D in 1970
Unstable	100 DS	Flow	350	150	300	-60		One shear failure was reported in 1967 at R-12-D. Two flow failures were reported in 1969 at R-60-D and R-67-D
Unstable	0	Flow	260	100	270	-20		
Unstable	200 US	Flow	150	70	180	+10		
Stable	100 US	Flow	300	150	220	-60		One flow failure was reported between R-193-D and R-195-D in 1968 as described in Report 12-21. In 1970, a flow failure between R-202-D and R-204-D was described in Report 12-22
Unstable	250 Landside	Shear	230	--	100	+10		One shear type failure at R-32-D in 1961 as described in Report 12-12. Two shear type failures at R-40-D and R-48-D and one flow type failure in 1962 was described in Report 12-13
No prediction	300 DS	Shear	130	--	90	+60		Four shear type failures were reported at R-54-U, between R-68-U and R-74-U, R-26-U and R-72-U as described in Reports 12-9, 12-13, 12-14, and 12-18, respectively. Two flow type failures were reported at R-6-U and between R-64-U and R-67-U as described in Reports 12-6 and 12-22
Possible	50 US	Shear	800	--	200	-75	Scour	
Stable	350 US	Shear	275	--	150	-70		
Unstable	300 DS	Flow	200	100	150	0		(See Table 7)
Stable	200 DS	Flow	300	90	200	0		
Unstable	0	Flow	500	175	450	-250	A bank failure adjacent about 200 ft long appears to be caused by scour	
Unstable	450 US	Flow	350	120	350	-60		One flow failure was reported at R-52-D in 1957. Two flow failures were reported between R-12-U and R-8-U and between R-6-U and R-1-U in 1960. One flow failure was reported at R-7-U and one shear type failure was reported at R-2-D in 1961. Two flow type failures were reported at R-16-D and R-33-D in 1963. One flow failure was reported between R-4-D and R-8-D in 1971
Unstable	200 DS	Flow	350	120	300	-20		
Unstable	500 US	Shear	300	--	200	-40		Two shear failures were reported at R-35-D and R-44-D in 1959. One shear type failure was reported between R-35-D and R-49-D in 1960. Two shear failures were reported between R-29-D and R-34-D and at R-54-D in 1962
Stable	0	Flow	600	200	450	-200	Four other borings made in 1956, two indicate an unstable area and two no prediction was possible as the depth of the zone A sand was not penetrated, were located in the the general area	
Unstable	375 US	Flow	300	130	250	-50		Three flow failures were reported at R-90, R-110, and R-114 in 1956. Five flow failures at R-79, R-96, R-99, R-112, and R-116 and four shear failures at R-127, R-129, R-137, and R-141 were reported in 1957. Eight flow failures were reported between R-94 and R-139 in 1958. Three flow failures at R-119, R-124, and R-133 were reported in 1959. One shear failure was reported at R-81 in 1960. One flow failure was reported at R-133 in 1965
Stable	300 US	Shear	250	--	200	-10		(See Table 7)
Unstable	400 US	Flow	175	60	175	0		(See Table 7)
Unstable	375 US	Shear	250	--	250	+20		(See Table 7)
Unstable	0	Flow	350	150	500	-225		
Unstable	225 US	Flow	400	175	500	-250		
Stable	50 DS	Shear	175	--	200	-20		No previous failures reported
Stable	0	Shear	300	--	250	-20		

ickness (O/A).
f flow failure; Y = distance from top of failure to W_{min} (flow failure) or to toe of shear slide; Z = distance from top of slide to top of bank (+ if riverside, - if landside).

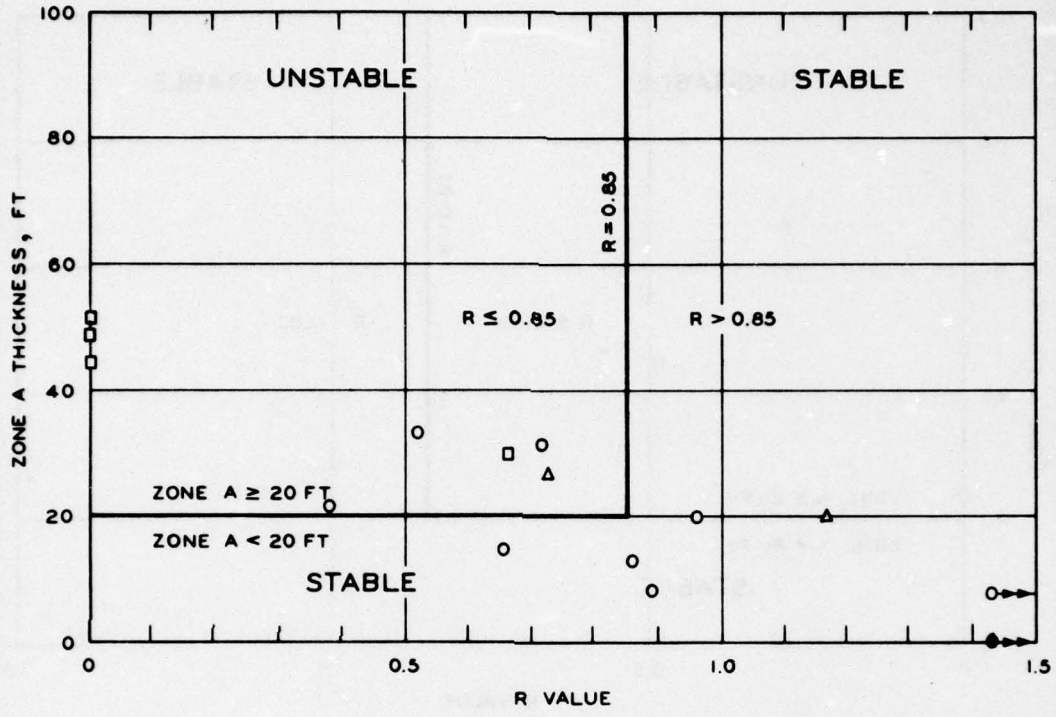
Table 9

Summary of Soil Conditions at Locations Where Flow Failures Occurred in Areas Predicted to be Stable

Failure Location*	Date of Failure	Distance to Nearest Boring ft	Soil Conditions: Overburden Thickness ft	Soil Conditions: Zone A Sand Thickness ft	R Value
Fair Landing, Ark., 633 MAHP					
Range 259+00 to 262+00	1965	250	26	28	0.93
Ludlow, Ark., 625 MAHP					
Sta 38+50 to 40+00	1965	0	40	37	1.08
Sta 60+00 to 62+00	1967	200	48	8	6.00
Arkansas City-Yellow Bend, Ark., 551 MAHP					
R-193-D to R-195-D } one boring location**	1968	250	49	39	1.40
R-197-D to R-198-D }	1973	100			
Island 88 (Worthington), Miss., 514 MAHP					
R-37-D	1967	50	9	5	1.80
R-49-D }	1969	200			
R-45-D } one boring location**	1970	250	9	0	--
R-50-D }	1970	375			
Cracraft, Ark., 513 MAHP					
R-85-U to R-84-U	1969	300	73	29	2.50
R-64-U to R-67-U	1970	450	38	37	1.02
Kentucky Bend, Miss., 519 MAHP					
R-67-D	1966	300	38	30	1.27
R-68-D to R-69-D	1966	450	43	25	1.72
R-54-D to R-56-D	1969	0	45	33	1.36
Baleshed-Stack Island, Miss., 491 MAHP					
R-73-U to R-71-U	1973	200	40	20	2.00
Fitler-Cottonwood, Miss., 474 MAHP					
R-4-D to R-8-D	1971	250	35	40	0.88
Belle Island, La.-Miss., 459 MAHP					
R-85-D to R-91-D	1973	0	0	15	--
Marshall Browns Point, Miss. and La., 447 MAHP					
R-4-U to R-2-U }	1955	0			
R-2-U to R-0 } one boring location**	1956	0	40	39	1.02
R-3-U }	1958	150			
Lake Karnac, Miss., 419 MAHP					
R-111-D to R-116-D	1969	0	13	5	2.60
Browns Field, La., 388 MAHP					
R-63-D	1971	100	64	60	1.07

* MAHP listed corresponds to mileage given in Table 6 and is not necessarily the exact location of the failure; the exact location of the failure is indicated by the range or station listed.

** Where multiple failures are located in the area of the same boring location, only one violation of criteria is considered.



LEGEND

	LOCATION	SITE NO.	NO. BORINGS	NO PREDICTION POSSIBLE
O	WINCHESTER TOWHEAD, MO	326	10	1
Δ	MERRIWEATHER-CHEROKEE, TN	327	2	-
□	ABOVE LEE TOWHEAD, TN	328	4	-

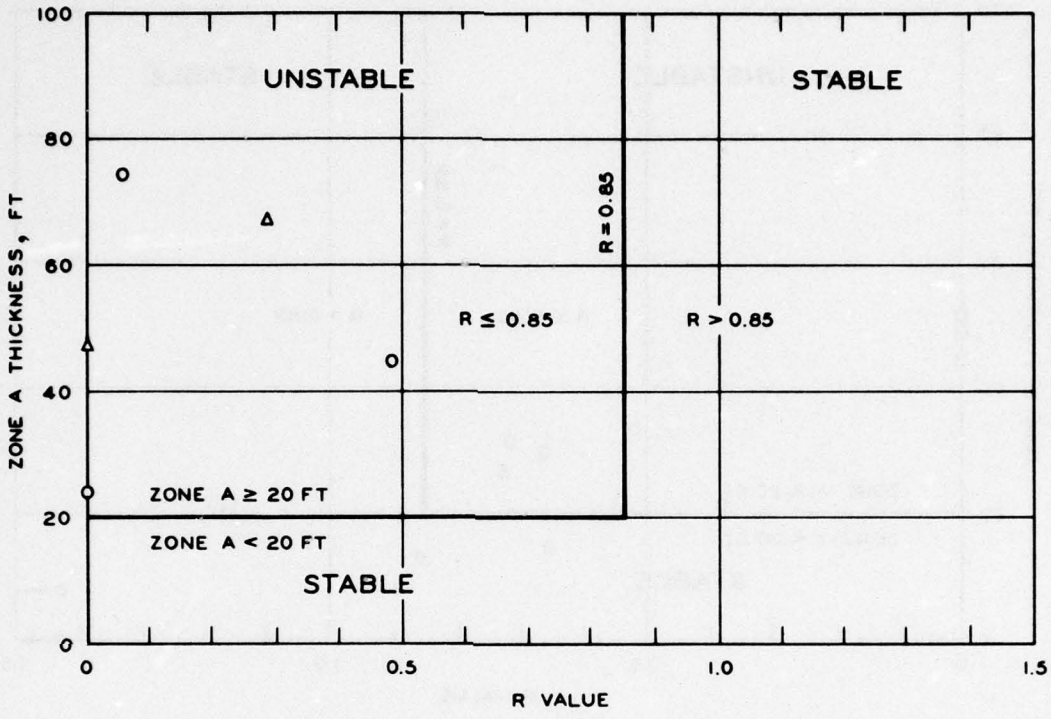
NOTE: →► R VALUE GREATER THAN 1.5

●►► 1 BORING ZERO ZONE A SAND THICKNESS

ZONE A THICKNESS VERSUS R VALUE

MEMPHIS DISTRICT
1972 BORINGS

PLATE 1



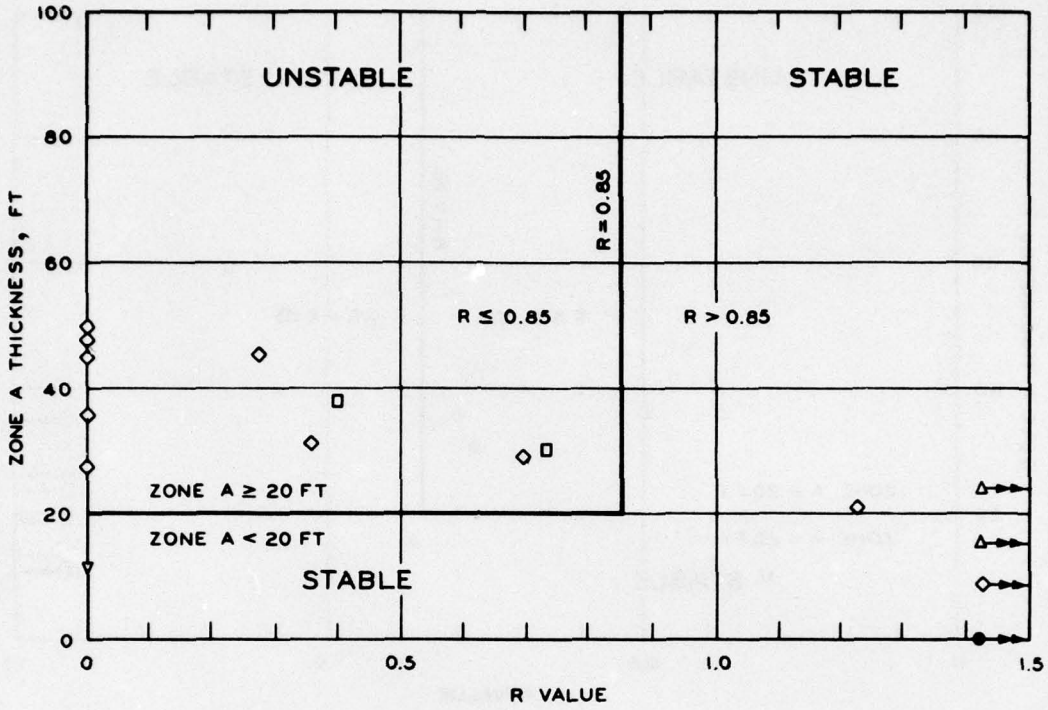
LEGEND

	LOCATION	SITE NO.	NO. BORINGS	NO PREDICTION POSSIBLE
O	SMITH POINT, MS	321	3	-
Δ	EUTAW-MOUNDS, MS	193	2	-

ZONE A THICKNESS VERSUS R VALUE

VICKSBURG DISTRICT
1972 BORINGS

PLATE 2



LEGEND

	LOCATION	SITE NO.	NO. BORINGS	NO PREDICTION POSSIBLE
O	ROBINSON BAYOU, MO	316	1	-
Δ	OBION-TAMM, TN	100	4	2
□	KATE AUBREY, TN	319	2	-
▽	SUNRISE TOWHEAD, TN	329	1	-
◇	ISLAND 63 BAR, MS	170	10	-

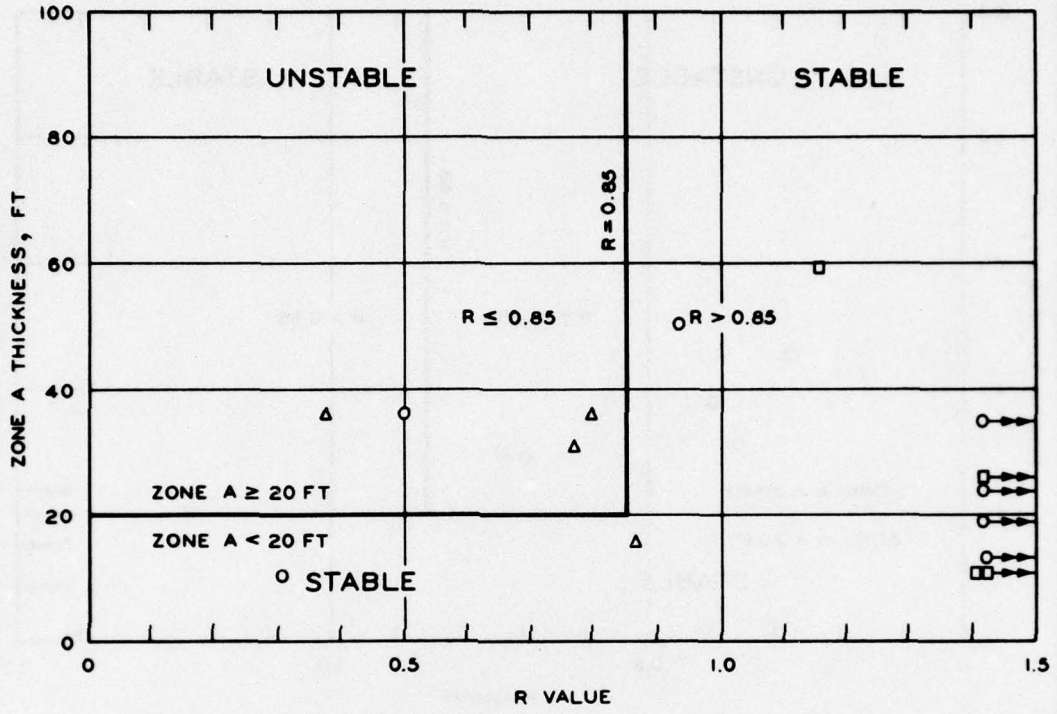
NOTE: →→ R VALUE GREATER THAN 1.5

●→→ 1 BORING ZERO ZONE A SAND THICKNESS

ZONE A THICKNESS VERSUS R VALUE

MEMPHIS DISTRICT
1973 BORINGS

PLATE 3



LEGEND

	LOCATION	SITE NO.	NO. BORINGS	NO PREDICTION POSSIBLE
O	BELLE ISLAND, LA	330	7	-
Δ	GRAND GULF, MS	185	4	-
□	CARTHAGE POINT	331	9	5

NOTE: →→ R VALUE GREATER THAN 1.5

ZONE A THICKNESS VERSUS R VALUE

VICKSBURG DISTRICT
1973 BORINGS

PLATE 4

Appendix A: 1972 and 1973 Bank Failures Not Analyzed in Main Report

1. The bank failures described in this appendix were reported in 1972 and 1973 but could not be evaluated on the basis of the criteria for stability against flow slides, either because the type of failure (shear or flow) could not be established or because there was inadequate information on the soil stratification within 500 ft of the failure. In the following paragraphs, the failures are grouped under these two categories.

Type of Failure Not Established

2. In some cases, it is not possible to identify the nature of a revetment failure using only the contour maps and cross sections provided by the Districts. The time lapse between occurrence of a failure and the survey of the scar may amount to several months. The failure shape may be modified significantly by scour during this period. Therefore, the characteristic shape of a flow or shear failure (see Figure 2, main text) may not be discernible. Furthermore, it may be that the revetment break was actually caused by severe localized scour, i.e., an erosional case not involving sliding or flowing of the soil. The failures described below are attributed to the latter conditions, but it cannot be said that they are not actually flow or shear failures obliterated by the apparent scour.

1972 failures

3. Smith Point, Miss. (site 71, 602 MAHP). One failure at R-7-D was first reported on 20 June and surveyed on 17 July 1972 where revetment was placed in 1955. The break was about 270 ft in length and extended 150 ft riverward and to within 30 ft of the top of the bank. This break could have been a shear failure that was later obscured by susequent scour.

4. Walnut Point, Miss. (site 60, 521 MAHP). One failure at R-51-D was reported in June and surveyed in August 1972 where revetment had been placed in 1960. A second failure was located between R-52-D and R-54-D. Both breaks were approximately 230 ft in length and appeared to be caused

by scour. Boring W-9-56 located at R-53-D, is now some 75 to 100 ft in the river and is not considered representative of the area.

5. Goodrich, La. (site 61, 466 MAHP). This failure was along a reach from R-87-D to R-92-D, was first reported in June and surveyed in August 1972 where revetment was placed in 1951. The break appeared to be the result of several shear failures resulting from a general scour. The failure area was approximately 500 ft long, extending from the top of the bank to 150 ft riverward.

1973 failures

6. Oldtown Bend, Ark. (site 88, 643 MAHP). Failures between R-294+00 and R-312+00 were reported in August to be of varied lengths with bluff banks from 2 to 6 ft. Contours shown by surveys in late August indicated what was probably a series of shear failures obscured by subsequent scour.

7. Island 63 Bar, Miss. (site 170, 638 MAHP). Two failures were reported in February at R-100+00 and R-102+00 to be 75 ft and 100 ft long respectively, and caved to the top of the bank. In March, additional failures were reported at R-78+00, R-80+00, R-87+00 and at R-93+00. During the 1973 flood, the river cut through the revetment and formed an additional channel about 2000 ft on the landward side behind the revetment. This channel began at about sta 99+00 and extends downstream approximately 6500 ft to about sta 176+00 where it re-enters the main channel. This extensive damage is the result of undermining and overbank scour and is not considered to be a stability failure. Extensive overbank scour also occurred at the other failures described above.

8. Prentiss, Miss. (site 74, 583 MAHP). One failure at R-24-D was reported on 18 July and surveyed on 28 July where revetment had been placed in 1958. The break had the appearance of a flow failure however the contours were not smooth and cannot be definitely classified. The failure was approximately 125 ft in width, extending 150 ft riverward and to within 50 ft of the top of the bank. The break may have been a flow or shear type failure obscurred by subsequent scour.

9. Ozark, Ark.-Miss. (site 91, 576 MAHP). One failure was first reported in July and surveyed in August 1973 at the downstream end of

of revetment placed in 1963. The break could not be classified as either a shear or flow failure but appeared to be sever local scour behind the revetment.

10. Cypress Bend, Ark. (site 140, 567 MAHP). One failure at R-65-D was first reported in July and surveyed in August 1973 where revetment was placed in 1962 and repaired in 1970. Failure was about 20 ft beyond the top of the bank, extending 150 ft riverward, and had a maximum width of about 150 ft. Contours shown were such that no classification could be given as to shear or flow failure and was probably caused by scour action. The only boring within 500 ft was made in 1956 and is now located in the river about 300 ft from the bank in 30 to 45 ft of water.

11. Eutaw-Mounds, Miss. (site 153, 562 MAHP). Failure at this location, R-124-D to R-134-D was approximately 1500 ft in length and extended 500 ft behind the revetment. This damage was the results of undermining and overbank scour and is not considered a stability failure. Revetment was placed along this reach in October 1972.

12. Warfield Point, Miss. (537 MAHP). The failure between R-23-D and R-25-D was first reported in July and surveyed in December 1973. Failure was about 400 ft in length, extending some 300 ft riverward and appeared to be caused by severe scour. Failure included the top of the bank behind the area paved in 1934. Revetment was placed in 1942, repaired or replaced in 1955 and repaired again in 1967.

13. Sunnyside-Lakeport, Ark. (site 106, 528 MAHP). This failure at R-145-D was first reported in July and surveyed in August 1973 where revetment was placed in 1960. The break was 150 ft in length and extended to the top of the bank. Contours indicated what was probably a shear failure that was obscurred by subsequent scour. Several scour holes were also noted in this area.

14. Walnut Point-Kentucky Bend, Miss. (site 141, 516 MAHP). One failure which could not be definitely classified was first reported in July and surveyed in September 1973 where revetment had been placed in 1963. The break was from the top of the bank at R-100-D and extended to about 50 ft beyond R-103-D. The contours in the area of R-100-D to R-101-D indicated a possible flow failure may have occured which was obscured by

subsequent scour.

15. Baleshed-Stack Island, Miss.-La. (site 160, 487 MAHP). Failure at R-77-D was first reported in July and surveyed in September 1973 where revetment was placed in 1965. The break was some 250 ft long and extending from the top of the bank to approximately 150 ft riverward. No previous failures were reported along this reach. The failure appeared to be the results of scour as evidenced by a scour hole 10 to 15 ft deep and to within 150 ft of the top of the bank. Boring L-3-63 located approximately 300 ft upstream, indicated an unstable condition with 27 ft of overburden, 55 ft of zone A sand and an R value of R= 0.49. A second failure location between R-120-D and R-123-D was first reported in July and surveyed in September 1973 where revetment was placed in 1968. This break was some 400 ft in length and extended from 75 ft beyond the top of the bank to approximately 200 ft riverward. This failure also appears to be the result of scour as evidenced by several scour holes 15 to 20 ft deep and one large scour hole about 75 ft in depth. Boring B-2-66 located between R-120-D and R-121-D indicated an unstable area with 4 ft of overburden, 55 ft of zone A sand and an R value of 0.07. A third break along this revetment between R-79-U and R-73-U was reported and surveyed in November 1973 where revetment was placed in 1970 and 1972. This failure area also appeared to be a general scour along the entire reach for approximately 900 ft. Boring L-25-64 located at R-77-U indicated a stable condition with 35 ft of overburden, 10 ft of zone A sand, and with an R value of 3.50.

16. Fitler-Cottonwood, Miss. (site 43, 473 MAHP). The failure between R-4-U and R-7-U was first reported in July and surveyed in October 1973 where revetment was placed in 1957 and again in 1961. This break appeared to be a general scour of approximately 400 ft in length, starting at the top of the bank and extending some 300 ft riverward. Boring C-1-55, located 500 ft upstream showed 30 ft of overburden, 45 ft of zone A sand, and an R value of 0.67. Although the configuration of this failure suggest a general scour, the break may actually have been a shear or flow-type failure that was later obscured by scour. A second failure between R-30-D and R-34-D was first reported in July and surveyed in October 1973 where revetment was placed in 1955 and repaired in 1972. The break was some

500 ft long and extended from 90 ft beyond the top of the bank to approximately 200 ft riverward. Boring C-4-55, located in the failure area, indicates an unstable area with 10 ft of overburden and 76 ft of zone A sand, (R=0.13). The contours indicate two separate failures could have occurred which were later obscurred by scour.

17. Goodrich, La. (site 79, 465 MAHP). The break along this revetment from R-59-D to R-67-D was first reported in July and surveyed in October 1973 where revetment was placed in 1951. This failure area was some 1000 ft in length and extended from the top of the bank to approximately 300 ft riverward. Although the configuration of this failure suggest a general scour, the contours from R-60-D to R-63-D indicate the fan shape of a possible flow failure that was later obscurred by scour.

18. Delta Point, La. (site 45, 438 MAHP). Two failures in this area were first reported in July and surveyed in October 1973. The failure in the area of R-4-U to R-8-D was approximately 1400 ft long, while the break from R-16-D to R-25-D was about 1000 ft in length. Both breaks appear to have been caused by high water scour.

19. Lake Karnac, Miss.-La. (site 144, 418 MAHP). The break in this area was first reported in July and surveyed in September 1973 where revetment was placed in 1962 and 1963 and again in 1969. The failure started at R-110-D approximately 50 ft beyond the top of the bank and continued downstream for about 300 ft to R-112-D where it turned landward for about 275 ft. At this point, the break turned downstream for about 2100 ft and was now appriximately 900 ft beyond the top of the original bank. A large scour area, with depths ranging from 30 to 55 ft was formed starting at R-114-D and approximately 200 ft behind the revetment and continuing beyond the end of the revetment to R-127-D. Failure appears to be caused by severe scour.

Inadequate Boring Data

1972 failures

20. Island No. 18, Mo. (833 MAHP). One failure at R-285 was

reported on 6 June to be 180 ft long and caved to mid-bank. On 14 June, site survey indicated a shear failure 200 ft long and extending 150 ft riverward and 50 ft from the top of the bank. A second failure was reported at R-300 on 6 June and surveyed on 14 June. Contours indicated a flow failure with a maximum width of 300 ft, a minimum or throat width of 125 ft, extending 275 ft riverward and had caved to the top of the bank. No boring was within 500 ft of either failure.

21. Big Island, Ark. (site 71, 597 MAHP). One failure was reported between R-39-D and R-40-D in June and surveyed in July 1972 where revetment was placed in 1958. Contours showed a flow failure with a maximum width of 225 ft, a minimum or neck width of 130 ft, extending approximately 180 ft riverward and had caved to the top of the bank. No prediction can be made about the stability of this location since no borings were within 500 ft.

22. Fitler-Cottonwood, Miss. (site 43, 473 MAHP). Four failures were first reported in June and surveyed in August 1972. These failures were located at R-2-U, R-11-D, between R-27-D and R-29-D and between R-30-D and R-31-D. The failure at R-2-U commenced about 20 ft from the top of the bank and continued riverward for approximately 210 ft. The typical fan shape of a flow failure was evident from the top width of 230 ft as opposed to the neck width of 100 ft. Revetment was placed in this area in 1957 and repaired in 1960 and again in 1970. The failure at R-11-D also showed the typican fan shape of a flow failure with a maximum width of 350 ft and a minimum or neck width of only 100 ft. The break extended from 40 ft beyond the top of the bank to 300 ft riverward. Revetment was placed at this location in 1957 and again in 1963. The area between R-27-D and R-29-D appeared to be a shear failure probably induced by scour. This break commenced about 150 ft riverward, was 250 ft wide and extended to the top of the bank. The failure between R-30-D and R-31-D also appeared to be a shear failure induced by scour. This break was about 90 ft wide and extended 100 ft riverward and to within 70 ft of the top of the bank. Revetment was placed in this area in 1955. No judgement could be made about the stability of these locations since no boring was within 500 ft of any of them.

23. Goldbottom, Miss. (site 131, 391 MAHP). This failure at R-519-D

was first reported in July and surveyed in August where revetment had been placed in 1963 and overlayed in 1971. The break, exhibiting the U shape of a shear failure, was 100 ft long, extended 180 ft riverward and to within 30 ft of the top of the bank. No boring was located within 500 ft.

1973 failures

24. La Forge, Mo. (897 MAHP). The failure at 288+00 was first reported in July to be 125 ft long with a 10 ft bluff. When site was surveyed in August 1973, contours indicated a shear failure with a maximum width of 240 ft, extending approximately 130 ft riverward and to within 20 ft of the top of the bank. No borings were located within 500 ft; therefore no prediction as to stability could be made.

25. Island No. 18, Mo. (833 MAHP). One failure at R-306+00 was reported in June to be 100 ft long and had caved to the top of the bank. In July the failure had increased to 150 ft in length and extended approximately 150 ft riverward. The break had the typical U shape of a shear failure. No boring was located within 500 ft.

26. Obion-Tamm, Tenn. (site 100, 813 MAHP). Two failures were reported in July and surveyed in August where revetment was placed in 1971. The failure at R-386+00 was first reported to be 75 ft long with a 4 ft bluff bank. When site was surveyed in August, contours indicated a shear failure about 100 ft long and extending 50 ft riverward and to within 100 ft of the top of the bank. The second failure at R-388+00 appeared to be a flow failure, 175 ft wide with a neck only 90 ft extending approximately 175 ft riverward and to the top of the bank. This failure was at the downstream end of the stone paving and concrete mattress placed in 1971 and not on the revetment proper. There was no boring located within 500 ft of either failure.

27. Walnut Bend, Ark. (677 MAHP). One failure at 215+00 was first reported in March to be 50 ft long with a 5 ft bluff bank. On 2 July it was reported to be 100 ft long with a 6 ft bluff. When survey was made in August, contours showed the typical U shape of a shear failure that was 200 ft long, extending 150 ft riverward and to within 20 ft of the top of the bank. No prediction could be made about the stability of this area since no boring was in the vicinity of the failure.

28. Oldtown Bend, Ark. (site 69, 643 MAHP). This failure at R-237+00 was first reported in March and had caved to the top of the bank. On 2 July it was reported to be 100 ft long. The survey on 31 July indicated a break 200 ft long extending 150 ft riverward and to the top of the bank. Countours indicated a shear failure probably aided by scour. No boring was within 500 ft.

29. Burke Landing, Miss. (633 MAHP). One failure at R-159+00 was first reported on 10 September to be 100 ft long with a 3 ft bluff bank. On 17 September it was reported to be 125 ft long with a 10 ft bluff. Later a 15 ft bluff bank was reported. The survey made on 28 September indicated a failure 125 ft long, extending approximately 50 ft riverward and to within 60 ft of the top of the bank. This break was classified as a shear failure. No prediction can be made about the stability of this location since no borings were within 500 ft.

30. Cessions Towhead, Ark. (616 MAHP). One failure at R-120+00 was reported on 17 July to be 75 ft long and with an 8 ft bluff bank. When the site was surveyed on 25 July, there was an apparent shear failure 120 ft wide, extending 75 ft riverward and to within 60 ft of the top of the bank. A second failure at R-131+00 was first reported to be 50 ft long with a 6 ft bluff bank. This break also appeared to be a shear failure when it was surveyed on 24 July. The break had expanded to 200 ft, extending 150 ft riverward and to within 60 ft of the top of the bank. No borings were located within 500 ft of either failure.

31. Smith Point, Miss. (site 71, 602 MAHP). This failure, between R-13-D and R-16-D, was first reported in February and surveyed in August 1973. Contours showed the typical fan shape of a flow failure with a maximum width of 375 ft, a neck approximately 130 ft across, extending 350 ft riverward and 80 ft beyond the top of the bank. Revetment was placed in this area in 1955, repaired and replaced in 1958 and again in 1972. No borings were located within 500 ft; therefore, no prediction as to stability could be made.

32. Sunnyside-Lakeport, Ark. (site 93, 528 MAHP). The failure between R-49-D and R-50-D was first reported in July and surveyed in August 1973 where revetment was placed in 1957. The U shape break indicated a

shear failure 230 ft in width, extending within 40 ft of the top of the bank and 130 ft in a riverward direction. No borings were located within 500 ft of the failure.

33. Walnut Point-Kentucky Bend, Miss. (site 141, 516 MAHP). The bank failure at R-106-D was first reported in July and surveyed in September 1973 where revetment was placed in 1963. The break had the fan shape typical of a flow failure. It commenced some 150 ft landward beyond the top of the bank and continued riverward for 300 ft. It had a maximum width of 300 ft and a neck width at its riverward limit of only 80 ft. There were insufficient boring data to make predictions as to flow failure stability at this location.

34. Mayersville, Miss.-La. (site 94, 495 MAHP). One failure at R-90-D was reported in July and surveyed in September 1973 where revetment was placed in 1950, overlayed in 1957 and again in 1969. The break was about 175 ft in width and extended about 20 ft beyond the top of the bank and approximately 150 ft in a riverward direction. The characteristic U shape identifies the break as a shear type, which was probably caused by severe scour. No adequate data were available on borings within 500 ft.

35. Fitler-Cottonwood, Miss. (476 MAHP). Two failures, between R-80 and R-82 and at R-109, were reported in July and surveyed in October 1973 where revetment was placed in 1930 and 1947. The break between R-80 and R-82 indicated the typical fan shape of a flow failure with a maximum width of 350 ft and a neck of only 80 ft across. It commenced about 100 ft beyond the top of the bank and extended 250 ft into the river. The other break at R-109 appears to be a shear failure approximately 100 ft wide and extending to within 60 ft of the top of the bank and 75 ft riverward. No borings were located along this reach.

36. Goodrich, La. (465 MAHP). One failure between R-93-D and R-97-D was first reported in July and surveyed in October 1973. This break had the typical fan shape of a flow failure. It commenced some 150 ft landward beyond the top of the bank and continued approximately 400 ft riverward. It had a maximun width of 500 ft and an neck width of 175 ft. Revetment was placed in this area in 1951. No prediction can be made about the stability of this failure location since no borings were within 500 ft.

37. Belle Island, La. (site 61, 459 MAHP). The bank failure between R-79-D and R-80-D was first reported in July and surveyed in October 1973 where revetment was placed in 1956 and again in 1961. The characteristic U shape of the failure area identifies the break as a shear type failure some 200 ft in width and extending from 50 ft beyond the top of the bank and continuing some 130 ft riverward. No boring was within 500 ft.

38. Milliken Bend, La. (site 10, 455 MAHP). Three failures, at R-19-U, between R-5-U and R-2-U and between R-11-D and R-18-D, were first reported in July and surveyed in September 1973. The break at R-19-U had the typical U shape of a shear failure with a width of 150 ft and extending from about 130 ft riverward, and to within 20 ft of the top of the bank. Revetment was originally placed in this area in January 1942 and again in October 1942. The break between R-5-U and R-2-U had the fan shape typical of a flow failure. It commenced some 50 ft beyond the top of the bank and continued 320 ft riverward. It had a maximum width of 330 ft and a neck width of about 150 ft. The break from R-11-D to R-18-D appears to be a very large flow type failure with a maximum width of about 950 ft and a neck width of 300 ft. It entended from approximately 200 ft beyond the top of the bank to about 500 ft riverward. This area was originally revetted in 1939 and again in 1945 with some repairs made in 1950 and 1964. No judgement could be made about the stability of these locations since no boring was within 500 ft of any of them.

39. Hardscrabble, La. (397 MAHP). The bank failure between 78-D and 83-D was first reported in July and surveyed in October 1973 where revetment was placed in 1948. The break had the typical fan shape of a flow failure. It commenced some 300 ft landward beyond the top of the bank and extended some 475 ft riverward. It had a maximum width of 500 ft and a neck width of 150 ft. There were insufficient boring data to make predictions as to flow failure stability at this location.

40. Gibson, La. (site 186, 371 MAHP). One failure between R-21-D and R-23-D was reported in July and surveyed in October 1973 where revetment was placed in 1960. The break was to the top of the bank and extended some 225 ft riverward. It was classified as a flow failure since the

maximum width was 300 ft and a neck of only 125 ft. No borings were located within 500 ft; therefore, no prediction as to stability could be made.

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Gann, Albert R
Verification of empirical method for determining riverbank stability, report 12-23 - 1972 and 1973 data / by Albert R. Gann. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1978.
20, [56] p., 4 leaves of plates : ill. : 27 cm. (Miscellaneous paper - U. S. Army Engineer Waterways Experiment Station ; S-78-5)
Prepared for The President, Mississippi River Commission, Vicksburg, Miss.

1. Bank stability. 2. Banks (Waterways). 3. Borings. 4. Empirical method. 5. Liquefaction (Soils). 6. Mississippi River. 7. Revetments. 8. Rivers. I. United States. Mississippi River Commission. II. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Miscellaneous paper ; S-78-5.
TA7.W34m no.S-78-5

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* Unless otherwise noted, all reports listed are publications of the Waterways Experiment Station.