A TECHNIQUE FOR MAPPING TERRAIN MICROGEOMETRY

TECHNICAL REPORT NO. 3-612

November 1962

U. S. Army Engineer Waterways Experiment Station
CORPS OF ENGINEERS
Vicksburg, Mississippi

U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss. A TECHNIQUE FOR MAPPING TERRAIN MICROGEOMETRY, by R. T. Saucier and J. D. Broughton. November 196<, vii, 25 pp and 2 appendices - illus. (Technical Report No. 3-612)
Unclassified report

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UNCLASSIFIED
1. Soils
2. Terrain
3. Mapping
4. Soil moisture
5. Microgeometry

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PREFACE

This report is part of a comprehensive project being conducted by the Army Mobility Research Center to determine methods of predicting soil-moisture conditions. The work was authorized by suballotment from the Army Mobility Research Center's Research and Development Project No. 8S70-05-001-02 on 9 September 1961.

The method described in this report was developed by Messrs. Jerald D. Broughton and Roger T. Saucier, Geology Branch, U. S. Army Engineer Waterways Experiment Station. The text was prepared by Mr. Saucier. Other Geology Branch personnel assisted with portions of the field work at various times. The study was accomplished under the direct supervision of Dr. Charles R. Kolb, Chief of the Geology Branch, and the general supervision of Mr. W. G. Shockley and Mr. W. J. Turnbull, Assistant Chief and Chief, respectively, of the Soils Division, Waterways Experiment Station.

Director of the Waterways Experiment Station during the conduct of this study and preparation and publication of this report was Col. Alex G. Sutton, Jr., CE. Technical Director was Mr. J. B. Tiffany.

CONTENTS

SUMMARY

Among the many factors considered significant in regard to soil moisture at various field sites where soil-moisture instrumentation has been placed is terrain microgeometry. No valid classification has as yet been developed for this environmental factor. This report presents a method of microgeometry classification which should prove useful in cataloging soil-moisture prediction sites.

After an evaluation of a group of terrain factors, four (overall slope, slope reversals, relief, and percentage increase of surface length over plan length) were selected to form the basis of a microgeometry classification. The mapping technique involved, which consists of measuring elevations along four 50-ft-long profiles, was applied to 19 localities in Warren County, Mississippi.

The classification is fundamentally quantitative, is relatively simple to determine, does not demand an excessive amount of time, and should yield consistent results among various workers. All factors are objectively determined from profiles, and processed according to standard mathematical procedures. The final site designation is a four-factor numerical array in which the factors can be either actual values or ranges of values.

With or without the addition of supplemental factors, the microgeometry classification can be employed effectively in a variety of specialized studies such as soil-moisture prediction. In this particular case, the addition of a factor evaluating surface-water storage or ponding is considered desirable. All attempts to define and map such a factor proved to be unsuccessful, however.

The microgeometry classification developed in this study is supplemented with a macrogeometry classification to provide a reasonably complete picture of the total landscape. A simple classification is also included to designate the topographic position of individual sites discussed in this report.

A TECHNIQUE FOR MAPPING TERRAIN MICROGEOMETRY

PART I: INTRODUCTION

Definition

1. This report presents a system for mapping and classifying terrain microgeometry. Microgeometry is here defined as the surface configuration of terrain that exhibits relief of less than 10 ft. Thus defined, microgeometry is synonymous with "microrelief" or "surface roughness." The mapping technique, which is based on surveys of four 50-ft-long parallel profiles, allows a lower limit of approximately 0.1 ft of relief under most terrain conditions.

Purpose

2. The described mapping technique was developed for a study concerned with soil-moisture prediction. For prediction purposes it was desired to evaluate quantitatively and statistically the influence of surface configuration on the retention of soil moisture. The microgeometry classification was developed primarily to fulfill this requirement. Ideally, microgeometry type was to be determined at each soil-moisture prediction test site as was done for other environmental factors such as soil consistency, parent material, macrogeometry, etc., and its possible effect on soil-moisture variation at the site was to be assessed.

Scope of Study

3. Nineteen soil-moisture prediction sites in the southern and eastern portions of Warren County, Mississippi, served as the testing ground for the development of this classification. Each of these sites has been mapped according to the finally adopted system, and the classification for each is included in Appendix A of this report. The sites varied in size from 30 by 100 ft to 30 by 540 ft and were in cultivation or pasture. Detailed profile survey data are given in Appendix B.

Application of Technique

4. Although developed and tested in a humid environment, the system is not limited by climatic or physiographic restrictions. In addition to being as quantitative as time and expenditure allowed, the microgeometry mapping technique affords rapid and uniform results among several workers. From the initial surveying of profiles to the final tabulation of data, subjectivity plays a relatively minor role.

5. The classification is potentially applicable to a wide variety of studies in addition to soil-moisture prediction. The system includes no special factors that restrict its application; furthermore, it can be modified through the addition of one or more supplemental factors. The classification can be used in its present form or it can serve as a foundation for a more comprehensive system. It by no means includes all the factors and, in fact, may not include those considered by others to be most important.

PART II: APPROACH TO THE PROBLEM

Factors Considered

6. All classifications of microgeometry or macrogeometry are necessarily concerned with certain basic terrain factors or attributes such as slope, relief, and spacing, but there are numerous ways in which these can be measured, interrelated, and classified. Several factors were evaluated by trial and error and either rejected or accepted. The following discussion of the evaluation and final selection of factors for use in the mapping system should be of value in future similar studies, and should also provide a clearer understanding of the complexity of the problem.

Drainage density

7. Drainage density is a terrain factor which has been widely investigated and successfully used in terms of macrogeometry. This factor is usually calculated by dividing the total length of streams or drainage channels in miles by the area of drainage (drainage basin) in square miles. The resulting value is a measure of the texture of an area.

8. In terms of microgeometry, however, drainage density is inapplicable. In areas measured in only hundreds of square feet, it is normally difficult or impossible to isolate drainage channels. If such channels do exist, they usually lack distinctive limits or frequently bifurcate and coalesce.

Slope reversals

9. Another method of determining the texture or degree of dissection of an area is to measure the distance between or spacing of "highs" or "lows." This factor would be applicable to mapping microgeometry were it not for the difficulty and subjectivity involved in determining exactly what are highs or, conversely, what are lows. Rather than establish arbitrary definitions or limits, the same purpose can be achieved by using slope reversals. These are defined as the points on the surface of the ground or on its representative profile at which the surface slope changes from a down to an up direction or vice versa. Level areas or terraces along a sloping surface are not considered slope reversals. This terrain characteristic is highly suitable for a microgeometry classification and

is one of four factors selected for the system reported herein.

Surface length versus plan length

10. Calculation of the actual surface area of a measured area in square feet is one method of determining roughness. Obviously with increased relief or decreased spacing between individual slope reversals there will be a corresponding increase in the difference between the area of the surface of a site and the area as measured along a horizontal datum. Calculating such a difference, however, would be impossible without (a) a relief map with a contour interval of not more than 1 or 2 in., or (b) surface profiles spaced not more than 1 or 2 ft apart.

11. Since preparation of relief maps of such detail, or of a satisfactory number of profiles would require a prohibitive amount of time, a reasonable approximation can be achieved by calculating surface length versus plan length along a much smaller number of profiles.

12. All calculations of surface length made from profiles are necessarily dependent upon the spacing of the field measurements of elevation on which the profiles are based. However, this is a relative matter since even an infinite number of individual measurements could not produce a profile exactly duplicating conditions in nature where curved surfaces predominate. Since other methods of determining surface length (e.g. with the use of a flexible cloth tape) proved unsatisfactory, it was decided that measurements obtained by keeping the distance between field measurement points as uniform as possible without sacrificing important detail would be acceptable (explained more fully in paragraph 39). Although this method does not permit the percentage of error to be reduced, it does permit valid comparisons between two or more profiles surveyed in the same manner.

Slope

13. Measurement of the characteristic slope at a given site may at first thought appear to be a simple matter; however, this was not found to be the case. In this study, two types of slope were considered. The first, characteristic slope, may be considered as the slope or narrow range of slopes which predominates within a given area. The second, overall slope, is the mean slope of a mapping site or given unit of area.

14. Valid measurements of characteristic slope must be made in the field; they cannot be made from profiles. Profiles are unidirectional in

nature, and rarely encounter the maximum slope of each feature that they cross. Maximum slopes could be measured more accurately on detailed contour maps, but as stated previously, these have been ruled out because of the great length of time required to prepare them.

15. Several unsuccessful attempts were made to measure characteristic slopes in the field. It was soon realized that widely varying results could be obtained by varying the length of the segment being measured. Furthermore, characteristic slopes are meaningless unless defined in terms of the relief difference involved.

16. Since overall slope is considerably more meaningful and somewhat less difficult to measure than characteristic slope, it has been included as one of the factors in this classification. Initially, thought was given to measuring the slope between the highest and lowest points within a given area or points spaced a certain distance apart. However, the resulting value would always be the maximum possible value and, in reality, would not be indicative of the area. Pronounced highs or lows, sometimes of insignificant areal extent, could sharply influence the slope value. The method of determining overall slope that was finally adopted is based on the end points of profiles and will be discussed in detail later (paragraphs 45-47). In essence, it is comparable to using random points.

Relief

17. The relief of an area is a terrain factor which lends itself to measurement in a variety of ways. The average relief of a mapping unit, the maximum relief of a unit, the average or maximum per profile or other unit distance, and the modal occurrence per unit or per profile were measurement methods considered in this study.

18. The relief-mapping method finally selected takes into consideration the effect that an appreciable overall slope may have in augmenting relief. In a profile length of 50 ft, an overall slope of only 3 deg produces a relief of approximately 2.6 ft. Since this is so, it was decided to select the maximum relief occurring between slope reversals along profile segments not more than 10 ft in length. This reduces the effect of overall slope to a minimum. Maximum relief is considered to be more definitive than either average or modal relief.

Factor Relation

19. In summary, the four factors included in the system described herein are slope reversals, surface length versus plan length, overall slope, and relief. Excluding overall slope, it may appear at first glance that there is an overlap or duplication of purpose between the other three factors. Although there is indeed a slight correlation among them, all three are needed in order to classify or visualize the microgeometry of an area.

20. Given a certain number of slope reversals per unit distance and a certain percentage increase in surface length over plan length, a certain amount of relief will automatically be generated. However, the relief can be predicted in this manner only if the slope reversals are equally spaced and the surface length increase is equally distributed among them, e.g. an ideal situation with a dentate or saw-toothed pattern. Unfortunately this situation is rare in nature, hence the need for a separate relief factor.

21. Similarly, a certain number of slope reversals per unit distance with a certain amount of relief will produce a discernible increase in surface length only if the slope reversals are uniformly spaced and the relief is consistent throughout. Any departure from an ideal situation will produce a marked change in surface length.

22. An attempt was made to combine these three factors into a single factor which would quantitatively evaluate the degree of departure of a profile from an ideal situation. The best results, however, proved to be too subjective for inclusion in the system.

PART III: MAPPING TECHNIQUE

Introduction

23. For this classification, it was decided that basic field data would be obtained from four parallel profiles. This technique has its limitations but, on the other hand, has certain distinct advantages over other methods such as the use of random or grid points and radiating profiles.

24. Although either random points or grid points could provide better areal coverage than profiles, these methods involve the constantly present problem of determining just how many is a "sufficient number" of points. To determine a statistically valid number of points would require more time than was available for this study. Furthermore, the problem of correlating between points and establishing boundaries would still exist.

25. Of the four factors included within this system, only relief and slope could feasibly be determined from random points. Calculation of surface length versus plan length and slope reversals can be accomplished only from profiles.

26. Profiles radiating from a point along either fixed bearings, such as 0 deg, 30 deg, etc., or random bearings have been used in the past in microgeometry classifications. These methods have the disadvantage of constantly decreasing coverage with distance from the point of convergence because of increasing distance between profiles.

27. Use of four 50-ft-long profiles is not essential to the mapping technique described in this report. In fact, as will be shown later, all calculations can be made and factor values derived for as short a distance as a single 10-ft-long profile. The use of 200 ft of profile rather than just 10 ft increases the areal coverage and permits calculations based on averages and modes rather than specific values. The adopted spacing between profiles is essentially an arbitrary choice, but it does have some significance in terms of surface-water mapping (paragraph 69) and subdivision of areas (paragraph 61).

Site Layout

28. The initial step in surveying a site consists of laying out four profiles which are 50 ft long, parallel to each other, and 10 ft apart (fig. 1). Henceforth, these will be referred to as a profile group. Distances are determined with a tightly stretched steel or cloth tape, and the end points of each of the four profiles are marked with stakes.

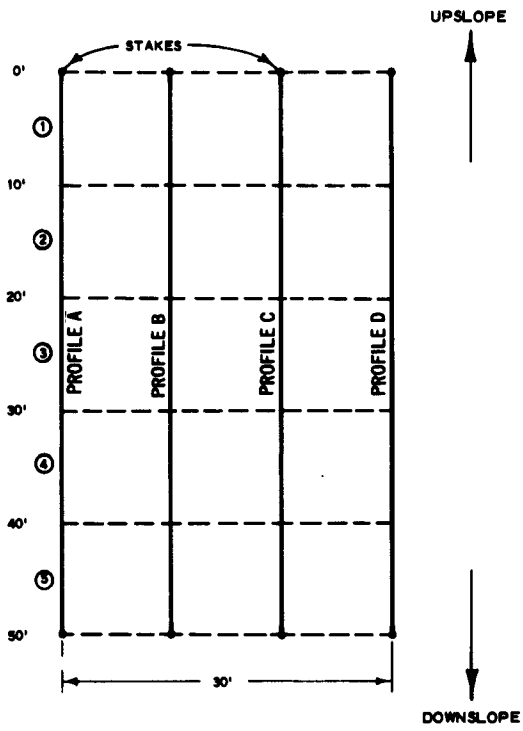

Fig. 1. Profile group layout

29. It is essential to the system that the profile group be oriented parallel to the overall slope of the land. In cases where the slope is questionable or is only 1 or 2 deg, slope can be quickly determined through the use of a hand level and calibrated surveying rod.

30. When a site to be mapped is a plowed field or other type of terrain with linear and parallel ridges and swales, the profiles should be laid out roughly perpendicular to these features. Since most cultivation employs the principle of contour plowing, possibilities of conflict between orientation for slope and for linear features are greatly diminished.

31. Although the presence or absence of linearity must be determined subjectively by the worker, little or no difficulty is anticipated. If linearity is so subdued as to be questionable, there should be very little variation in the factor values with varying orientation of the profile group.

32. Should a situation be encountered where furrows or other linear features do not trend perpendicular to slope, the profile group should be correctly oriented with reference to the linear features. In a case of this type, slope is of secondary importance and can be measured separately. To do this, a second profile group is laid out parallel to the slope

according to the instructions given in paragraph 28. Elevation measurements are made only at the end points of each of the four profiles, and slope is calculated according to the instructions in paragraph 45.

33. Facing in an upslope direction and parallel to the profiles, the profiles are designated from left to right by the letters A, B, C, and D (fig. 1). Distances along the profiles are measured from 0.0 at their upslope ends to 50.0 ft at their downslope ends; hence a grid system is formed whereby each subsequent measurement can be located as a point.

34. Before elevation measurements are taken, the bearings of the profile group should be determined by a compass reading and the value entered in the appropriate place on the microgeometry data sheet (fig. 2).

Measurements

35. The initial step in taking field measurements is to stretch a tape between the two stakes marking profile A with the 0.0 mark on the tape at the upslope stake. The tape may rest on the ground and need not be supported a certain distance above it.

36. The surveying done to develop this system was accomplished with a tripod-supported Zeiss level and a Philadelphia-type surveying rod. Any comparable combination of level or transit and surveying rod that permits an accuracy of at least 0.1 ft may be used.

37. The level or transit should be set up in a position from which all site measurements can be made, and about 10 or 15 ft from the nearest profile. Two or more instrument positions could be used, but with a loss in time and convenience. In setting up the level, there is no need to determine the height of instrument nor the location of the instrument station.

38. While one worker operates the level and notes the readings on the data sheet (fig. 2), the second worker holds the surveying rod and determines at what points measurements are to be taken.

39. Starting at the 0.0 grid point, elevations should be taken frequently enough to ensure coverage of discernible slope reversals and features exhibiting relief of more than 0.1 ft. Only in cases where the terrain is exceptionally flat should measurements be spaced as much as

MICROGEOMETRY DATA SHEET

Site No. (Example) Date 21 March 1962
Location Warren County, Miss.
Profile Bearing N 23° E
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.8	4.8		A37.0	0.7	4.9		B16.5	0.6	5.0
A 1.0	0.7	4.9		A38.0	0.4	5.2		B18.0	0.4	5.2
A 2.0	0.9	4.7		A40.0	0.6	5.0		B19.0	0.6	5.0
A 3.0	0.9	4.7		A40.5	0.6	5.0		B20.0	0.5	5.1
A 3.5	0.5	5.1		A41.0	0.5	5.1		B21.0	0.4	5.2
A 5.0	0.7	4.9		A41.5	0.5	5.1		B22.0	0.5	5.1
A 5.5	0.8	4.8		A42.0	0.4	5.2		B22.5	0.6	5.0
A 7.0	0.8	4.8		A43.0	0.5	5.1		B23.0	0.4	5.2
A 7.5	0.7	4.9		A44.0	0.7	4.9		B23.5	0.3	5.3
A 8.5	0.6	5.0		A44.5	0.6	5.0		B24.0	0.7	4.9
A10.0	0.7	4.9		A45.5	0.5	5.1		B25.0	0.6	5.0
A10.5	0.6	5.0		A46.5	0.8	4.8		B26.0	0.6	5.0
A11.5	0.6	5.0		A47.0	0.5	5.1		B26.5	0.4	5.2
A12.0	0.9	4.7		A48.5	0.5	5.1		B27.0	0.6	5.0
A13.0	0.8	4.8		A49.0	0.7	4.9		B28.0	0.5	5.1
A13.5	0.6	5.0		A49.5	0.5	5.1		B28.5	0.5	5.1
A15.0	0.6	5.0		A50.0	0.5	5.1		B29.0	0.8	4.8
A16.0	0.7	4.9						B30.0	0.7	4.9
A16.5	0.4	5.2		B 0.0	0.8	4.8		B31.0	0.6	5.0
A17.0	0.6	5.0		B 1.0	0.7	4.9		B31.5	0.6	5.0
A18.0	0.6	5.0		B 2.0	0.5	5.1		B32.0	0.3	5.3
A19.0	0.5	5.1		B 2.5	0.6	4.0		B33.0	0.4	5.2
A20.0	0.6	5.0		B 3.0	0.4	5.2		B34.0	0.8	4.8
A21.0	0.7	4.9		B 4.0	0.7	4.9		B34.5	0.7	4.9
A21.5	0.7	4.9		B 4.5	0.8	4.8		B35.5	0.6	5.0
A22.5	0.4	5.2		B 5.0	0.5	5.1		B36.0	0.4	5.2
A24.0	0.6	5.0		B 5.5	0.6	4.0		B36.5	0.3	5.3
A24.5	0.5	5.1		B 6.0	0.5	5.1		B37.0	0.6	5.0
A25.0	0.8	4.8		B 8.0	0.5	5.1		B38.5	0.7	4.9
A26.0	0.7	4.9		B 8.5	0.4	5.2		B39.0	0.5	5.1
A26.5	0.5	5.1		B 9.0	0.6	5.0		B40.0	0.7	4.9
A27.0	0.7	4.9		B 9.5	0.6	5.0		B40.5	0.7	4.9
A27.5	0.7	4.9		B10.0	0.4	5.2		B41.0	0.5	5.1
A28.0	0.4	5.2		B11.0	0.4	5.2		B42.0	0.5	5.1
A29.0	0.6	5.0		B11.5	0.6	5.0		B42.5	0.4	5.2
A30.0	0.7	4.9		B12.0	0.4	5.2		B44.0	0.7	4.9
A30.5	0.5	5.1		B13.0	0.5	5.1		B44.5	0.4	5.2
A32.0	0.8	4.8		B14.0	0.5	5.1		B45.5	0.5	5.1
A33.0	0.5	5.1		B14.5	0.3	5.3		B46.5	0.7	4.9
A34.0	0.7	4.9		B15.0	0.6	5.0		B47.5	0.7	4.9
A35.0	0.8	4.8		B15.5	0.3	5.3		B48.5	0.8	4.8
A36.0	0.8	4.8		B16.0	0.4	5.2		B50.0	0.5	5.1

* Rod reading.

Fig. 2. Form for recording field data

2 or 3 ft apart. Observing this limit will ensure coverage of elevation changes occurring on uniform but gently sloping surfaces.

40. At the soil-moisture prediction sites used (in Warren County, Mississippi) best results were obtained from measurements spaced either 0.5 or 1 ft apart. Because of the rounded nature of the topography, measurements at the exact point of each slope reversal (e.g. 0.3 or 1.35 ft) rather than at the nearest 0.5 ft yielded no significantly greater degree of accuracy. In fact, the additional time required to make calculations from "odd intervals" as compared to 0.5- or 1-ft intervals greatly overshadowed any increase in accuracy. It is emphasized, however, that this mapping technique has not been tried in rocky or otherwise angular topography. In this type of terrain, measurements at intervals less than 0.5 ft may be necessary.

41. After completion of surveying of the first profile, the three remaining profiles in the group are surveyed and the data recorded in the same manner. Once the procedure has been learned, it should be possible for two workers to complete the surveying of a site in 1 to 2 hr.

42. On the data sheet (fig. 2), only the grid point and its corresponding measurement (rod reading, or "RR" on data sheet) should be recorded at the site. The elevations of the grid points should be calculated only upon completion of surveying. The elevation of each point is based on an arbitrarily selected datum equal to the lowest point along any of the four profiles. This datum is selected so that all elevations will be plus values. The actual rod readings themselves could be used; however, elevations above a datum are easier to visualize and are not "reversed" as are the rod readings.

Plotting of Profiles

43. Cross-section paper divided into inches and tenths of inches was found to be the most satisfactory medium for plotting profiles. The scale adopted was 1 in. equals 1 ft both horizontally and vertically, i.e. no vertical exaggeration. This scale permits the construction of all four profiles on a single sheet of paper 20 to 24 in. wide and slightly more than 50 in. long.

44. The individual elevations are plotted on the cross-section paper and connected by straight lines. After the profiles are plotted, each should be divided into five 10-ft segments. These are the primary working units of the profiles and should be designated A1 through A5, B1 through B5, etc., starting at the upslope ends of the profiles.

Calculation of Factor Values

Overall slope

45. On each of the four profiles (for this calculation, the 10-ft profile segments are ignored), the difference in elevation between the upslope end (grid point 0.0) and downslope end (grid point 50.0) is calculated. The derived value in feet is converted to slope in percent by multiplying by two. This value can then be converted to slope in degrees by referring to a table of natural trigonometric functions.

46. The derived slope value expressed in degrees and minutes is then entered on the microgeometry tabulation form (fig. 3) in the correct position. If slope expressed in percent proves to be more applicable to data processing techniques, it can be substituted readily for degrees and minutes.

47. The overall slope value for the entire site is the average of the values for the four profiles. Rather than expressing the actual value, it is more convenient to round off the value to the nearest 0.5 deg. For example, the average of the four profile values shown in fig. 3 is $0^{\circ}23'$. This is expressed as 0.5 and entered in the appropriate position under "Site Classification." For those who may want to use it, the slope in percent is also included.

Slope reversals

48. Slope reversals (previously defined in paragraph 9) are located along each of the four profiles and are indicated by a symbol such as the one shown in fig. 4. It is pointed out that slope reversals can occur at any point along the profile except at the end points (grid points 0.0 and 50.0). These must be excluded since it is not known how the surface slopes beyond these points.

49. In counting slope reversals, it makes no difference whether one

MICROGEOMETRY TABULATIONS

Site No. (Example) Date 21 March 1962
Location Warren County, Miss.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		6	0.4	2.71	
A2		6	0.6	2.93	
A3	0°21'	5	0.4	2.45	
A4	(0.6%)	7	0.4	2.93	
A5		6	0.3	2.64	
B1		6	0.4	2.10	
B2		9	0.4	5.35	
B3	0°28'	7	0.4	1.77	
B4	(0.8%)	9	0.4	3.70	
B5		4	0.4	2.21	
C1		6	0.4	2.22	
C2		7	0.3	2.73	
C3	0°21'	9	0.3	3.45	
C4	(0.6%)	6	0.4	1.96	
C5		9	0.3	3.36	
D1		6	0.4	3.17	
D2		10	0.3	3.73	
D3	0°21'	8	0.4	3.84	
D4	(0.6%)	5	0.5	3.34	
D5		6	0.4	3.21	

Site Classification

	0.5 (0.67%)	6.8	0.4	2.99	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - TC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

Fig. 3. Final site tabulation form

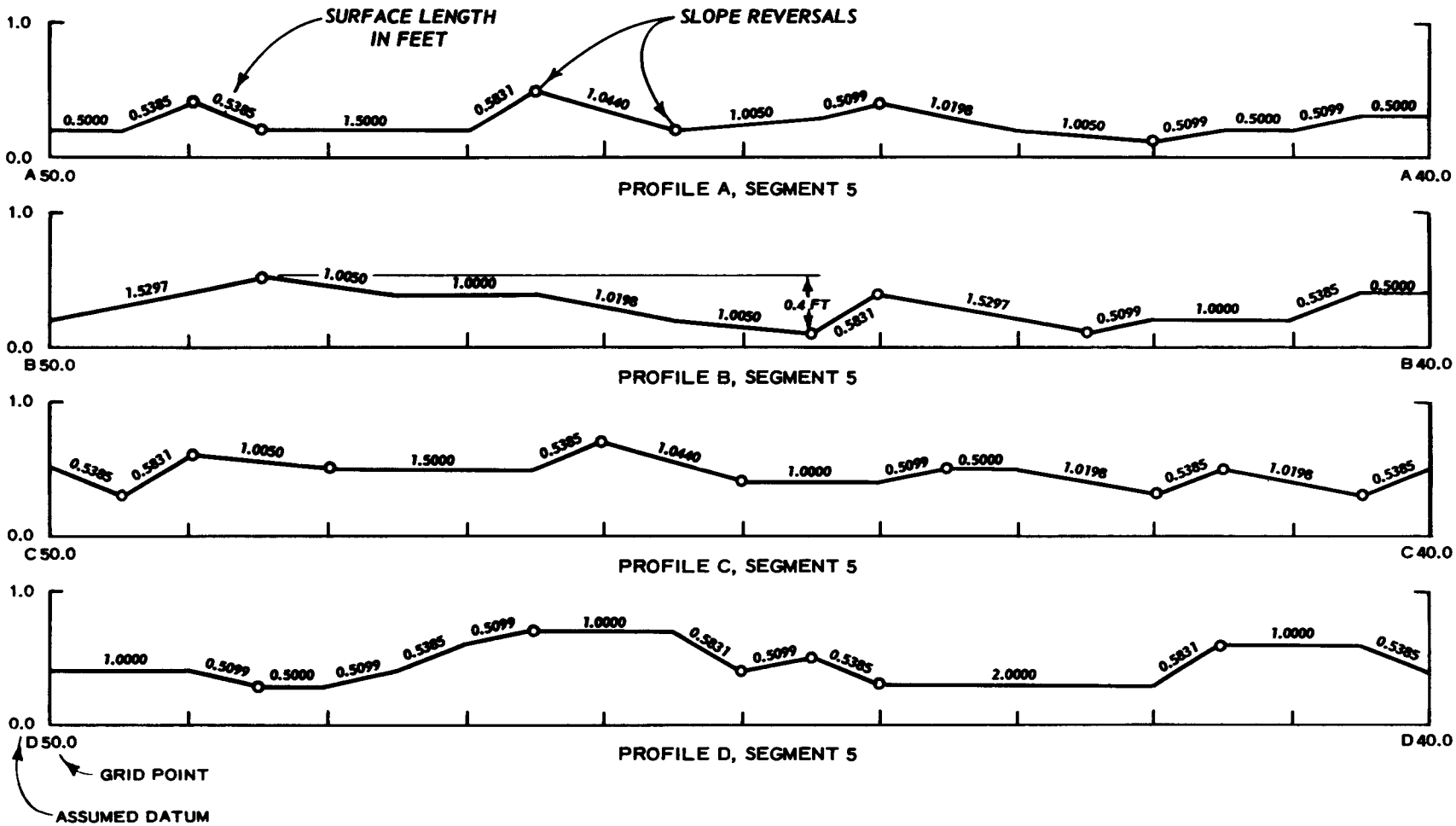

Fig. 4. Example of profiles with factor values (example site)

begins at the 0.0 or the 50.0 grid point. For uniformity, however, it is suggested that the 0.0 grid point be used as the starting point. If a slope reversal occurs at the point separating profile segments (e.g. grid point 10.0, 20.0, etc.), the slope reversal is included in the upslope segment (segment with the lower grid number).

50. The number of slope reversals per 10-ft profile segment is determined as indicated and recorded on the tabulation form (fig. 3). The 20 individual values are then averaged to derive a single value for the entire site. This is expressed as the average number of slope reversals per 10 ft of profile line.

Relief

51. To determine relief, each profile segment is examined to ascertain the maximum difference in elevation that exists between slope reversals or between a slope reversal and either end of a profile segment. If no slope reversals occur, relief is then the maximum difference in elevation occurring within a profile segment. In the example shown in fig. 4, the relief along the indicated segment of profile B is 0.4 ft. This occurs between the slope reversals located at grid points B44.5 and B48.5. The relief value for each profile segment is recorded on the tabulation form (fig. 3).

52. The relief value for the entire site is the modal occurrence of the 20 individual profile segment values. In the event of a polymodal occurrence, the highest relief value is selected.

53. Modal occurrence, rather than an average, was selected as a means of expressing relief since it is less influenced by extreme values. The most frequently occurring relief is believed to be more indicative than either average relief or maximum relief for the final site value.

Surface length versus plan length

54. A mathematical calculation of surface length can be accomplished more rapidly and accurately than a graphic calculation. Dividing the plan length in feet of each unit to be measured by the cosine of the angle formed between the surface and the horizontal gives the surface length in feet. For the desired degree of accuracy, quotients should be carried out to four decimal places. For example, the plan length of the unit shown in fig. 4 between grid points C45.0 and C46.0 is 1 ft. The angle formed

between the surface and the horizontal is 30 percent (a rise of 0.3 ft in 1 ft or 30.0 ft in 100 ft) or $16^{\circ}42'$. Dividing 1 by the cosine of this angle (0.95782) gives a surface length of 1.0440 ft.

55. As shown in fig. 4, a value for surface length is calculated between each elevation measurement. If three or more consecutive elevation measurements are connected by a straight line (i.e. a constant slope), one surface length value can be calculated for the entire unit. The derived values for each unit are noted above the profile as indicated.

56. The surface length of each 10-ft profile segment is equal to the sum of the individual unit values and is expressed as a percentage increase over the plan length of 10 ft. The profile segment values, carried out to the nearest one hundredth of 1 percent, are entered in the fifth column of the tabulation form (fig. 3). The percentage increase in surface length for the entire site is the average of the 20 profile segment values.

Site Classification

57. In the present system, sites are designated by a numerical array consisting of the actual factor values for overall slope, slope reversals, relief, and percentage of surface length increase. For example, the designation for the hypothetical site illustrated in fig. 3 would be expressed as 0.5/6.8/0.4/2.99. Units of measure (i.e. degrees, feet, percent) are excluded from the array.

58. Ultimately, it may prove desirable (perhaps even necessary) to group individual factor values into ranges, each designated by a single numeral. Groupings of relief values, for example, might be 0.0 to 0.2 ft = 1, 0.2 to 0.5 ft = 2, 0.5 to 1.0 ft = 3, etc. Under a system of this type, the final numerical array for a site might appear as 1/3/2/3.

59. A system of factor value groupings was not developed during this study for several reasons. First, the number of sites surveyed was insufficient to determine truly naturalistic group limits. Moreover, the sites fall within a narrow range of relief and slopes, i.e. a range that should be greatly exceeded when all climatic and/or physiographic conditions are considered. Second, effective groupings often depend upon the purpose for which the classification is to be used. Two or three groupings of relief

values may suffice for a study of trafficability, whereas a study of soil-moisture prediction may require a much larger number.

60. For most uses now visualized, it will be sufficient to derive a single classification for each site, i.e. a single numerical array. Under this system of classification, however, it is possible to subdivide a given site into two or more separate classifications. This may prove to be necessary when mapping small areas, such as soil-moisture prediction sites, or in those cases where distinct changes in microgeometry occur over short distances.

61. However obvious changes in microgeometry may be, no attempt should be made to subdivide a site before the microgeometry factors have been calculated for each of the 20 profile segments. These segments will serve as the basis for determining where divisions should be made. Divisions within a given profile segment are permissible, but should be done prudently in order to avoid excessive subjectivity. Of course, subdivision of sites will be feasible only upon the development of a system of factor groupings.

PART IV: UTILIZATION OF THE CLASSIFICATION

Areal Mapping of Microgeometry

62. Since this classification was developed on predetermined and precisely measured soil-moisture prediction sites, there was no problem concerning the placement of profile groups. One profile group was employed at each site, and was oriented essentially parallel to the long axis of the site and approximately centered between the end points. Although several sites exceeded 300 ft in longest dimension, the topography was not considered diverse enough to warrant two or more profile groups.

63. In cases where there are no dimensional limitations, there are no exact rules regarding number and placement of profile groups. Number and placement will vary widely from one area to another, and will have to be determined by the worker according to the degree of accuracy desired. It is strongly suggested, however, that once a distribution of profile groups has been established by random points, grid points, or some other method, it should not be altered to include an "unusual feature."

64. It is emphasized that this microgeometry classification indicates magnitude and frequency of features, but not their areal distribution. Along a horizontal plane, the four profiles are essentially dimensionless; the only surface area involved is limited to the width of the surveying rod.

65. Unfortunately, therefore, correlations between profiles are primarily subjective. If an "unusual feature" such as an uncommonly deep depression occurs along a profile, its areal limits must be defined without benefit of numerical values. If a profile does not actually encounter such a feature but one is nearby, it must be ignored or subjectively located and described. If a reasonable number of profile groups is placed within an area, a true picture of the relative importance of such "unusual features" should be obtained.

Application in Soil-Moisture Prediction Studies

66. In its present state of development, the microgeometry

classification should be useful in soil-moisture prediction studies by enabling terrain configuration to be cataloged and evaluated similarly to other environmental factors such as precipitation, vegetation, soil consistency, and soil density. Ultimately, it is hoped that a purely objective and entirely quantitative system will be developed. An approach to this goal, employing Fourier analysis of profiles, is currently (1962) being investigated by Drs. R. O. Stone and J. Dugundji at the University of Southern California.

67. After the present classification has been applied at a number of sites and a sufficient amount of data collected, it should be possible to evaluate the relative significance of each of the four terrain factors in soil-moisture prediction. If this can be done, each factor value can be qualified by an appropriate constant or modifying value. Adding the corrected factor values will then result in a single numerical value for each site. The final values can be compared for a quantitative evaluation of the total importance of microgeometry to soil-moisture prediction.

68. In order to make the present classification an even more effective measure of the surface geometry for soil-moisture prediction studies, it can be supplemented with one or more related factors. One such factor which appears to be highly relevant is the nature and extent of surface-water storage or ponding. This factor is a direct reflection not only of the magnitude and frequency of surface features, but also of their areal distribution. The amount of water that actually stands on a surface in enclosed depressions is considered to be more significant than the various factors that regulate surface drainage or surface runoff.

69. The ideal method of mapping ponding would be to contour the surface of a given area using a contour interval approximating 0.1 ft. This technique must be rejected because of reasons already mentioned (paragraph 11). Perhaps even more important is the fact that any given site is not an entity in itself, but rather is affected by its surroundings. In other words, it would be extremely difficult or impossible to isolate and map those terrain conditions (perhaps hundreds or thousands of feet away) that have a direct bearing on surface-water conditions at a site.

70. Several less time-consuming methods of estimating ponding were tested at several of the Warren County sites, but none were completely

successful. The first method employed a series of six profiles 10 ft apart run at right angles to the four primary profiles. Care was taken to ensure that the lowest points between each primary profile were discerned and measured. The results of the two sets of profiles were 15 squares--each 100 sq ft in area--bounded by lines of elevation measurements. In theory, if any of the inner profile elevations are lower than those on the perimeter, an enclosed depression or area of potential ponding exists. According to this method, it is possible to isolate the depression only to a minimum area of 200 sq ft or about 13 percent of the total site area.

71. More accurate results were obtained by measuring existing ponds during periods of rainfall, or subsequent to rainfall by measuring areas of stained grass or "strandlines." Ponding so measured and expressed as a certain percentage of the total area was found to correspond closely to ponding measured along the four primary profiles and expressed as a certain percentage of the total linear distance.

72. The most serious problems encountered in mapping ponding, however, were in defining the areas involved rather than their actual measurement. Obviously the extent of ponding is closely related to both the intensity and duration of precipitation. Because dense grass cover retards runoff, ponding may also occur in areas other than enclosed depressions. Conversely, an enclosed depression in an area of porous soil may never exhibit ponding.

73. Ultimately it may prove more desirable to handle the problem of ponding as a separate environmental factor rather than include it as an integral part of the microgeometry. Should the converse be more appropriate, a value for ponding could be added as a fifth factor in the numerical array designation of a site and included in a calculation of a single site value as outlined in paragraph 67.

Macrogeometry Classification

74. Regardless of how valid a microgeometry classification may be, it is nevertheless an incomplete description of a landscape. In order to be meaningful, it should be combined with a description or classification of the gross features of the area or the macrogeometry. The method of

classifying macrogeometry that is used in this report is described in detail in Waterways Experiment Station Technical Report No. 3-506, A Technique for Preparing Desert Terrain Analogs (May 1959). In essence, this system uses four terrain geometry factors: (a) characteristic plan-profile, (b) occurrence of slopes steeper than 50 percent, (c) characteristic slope, and (d) characteristic relief. On the tabulation form (fig. 3 herein), these are abbreviated as PP, SO, CS, and CR, respectively.

75. To avoid a lengthy and necessarily involved discussion of the classification, the range of the indicated grouping for each factor is listed at the bottom of the tabulation form under "Comments." This gives the data that are necessary to derive a mental image of the landscape. The macrogeometry classification for each site was determined by stereoscopically examining aerial photographs. In each instance, the mapping unit was a 1-mile-diameter circle centered on the site. The aerial photos used were at scale of 1:20,000 and were dated 1956.

Topographic Position

76. Included either as part of the macrogeometry classification or as a separate factor, some indication of a site's topographic position is considered highly desirable. The macrogeometry classification used in this report may indicate that a landscape is characterized by closely spaced, steep-sided hills, but it does not indicate whether the site is located on top of a hill, on the side slope, or at the base of a hill. Needless to say, topographic position is quite important in soil-moisture prediction site descriptions.

77. In order to be at least semiquantitative and applicable to the microgeometry classification, topographic position must be designated by a number or numerical array rather than by some purely qualitative term like "base of a hill." Various methods were tried to develop a system of this type, but only a small degree of success was achieved.

78. Ideally, it was hoped that a formula based on such factors as height of site above base of hill, total height of hill, slope of hillside, and/or distance from slope reversals could be worked out. It would be even more desirable if the derived numbers would indicate, at least relatively,

the varying depths to water table at varying points in a landscape. In other words, a formula should be developed that would give higher values at the base of a hill than at its top, higher values for low hills than for high hills, etc. The derived value for topographic position could be either handled separately from the site classification array (or single site value) or included within it as an additional factor.

79. In attempts to develop such a formula, several distinct problems were encountered. First, it was found to be no simple task to locate and define the break between the top and the side of a hill and between the side of a hill and an adjacent floodplain, for example. According to present thinking, this would have to be done to allow the use of different formulas for the different units. Second, numerous situations could arise in which it would be very difficult or impossible to isolate a single terrain feature or even several features which, by themselves, control the groundwater conditions at a site. For example, a site in a narrow floodplain would be affected by the bordering hills, by the width of the floodplain, and by the location and characteristics of any stream that might be present. Third, no satisfactory method of obtaining field measurements could be developed. The methods considered would either demand an excessive amount of time or detail or would defy description and explanation in precise terms. Topographic position could be given in terms of a schematic profile, but this is not as desirable as a true profile made in the field.

80. Rather than omit consideration of such an important factor as topographic position because of the lack of a perfected system, a two-part qualitative designation has been included for each Warren County soil-moisture prediction site. The first part is a schematic profile of the landscape as determined by the macrogeometry classification. On this profile, the topographic position of the site is indicated by a dot (see fig. 3).

81. Since a graphic description of this type cannot be processed mathematically or used in a computer, a simple letter designation is also included. As elementary as this designation is, it should be of some value for classification and data-processing purposes. The following legend explains the letter designations listed next to the schematic profiles on the microgeometry tabulation forms (Appendix A).

Flat-topped highs (type 1 plan-profile)

Top of hill, outer 50% of area	TE
Top of hill, center 50% of area	TM
Side of hill, upper 25% of area	ST
Side of hill, center 50% of area	SC
Side of hill, lower 25% of area	SL
Base of hill	BC

Peaked or crested highs (type 4 plan-profile)

Crest of hill	TC
Side of hill, upper 25% of area	ST
Side of hill, center 50% of area	SC
Side of hill, lower 25% of area	SL
Base of hill	BC

82. An arbitrary slope break of 6 deg is used to separate the summit area of a hill (characteristic slope less than 6 deg) from the hillside (characteristic slope greater than 6 deg). Similarly, a 6-deg slope break is used to separate the hillside from the relatively flat area at the base of the hill (characteristic slope less than 6 deg).

83. Although plan-profile types 2, 3, 5, and 6 were not encountered in the 19 Warren County sites (and should rarely be encountered when mapping at scales larger than about 1:100,000), the system described above can be adapted to include them. The hilltop and hillside designations will remain the same, but it will be necessary to further subdivide the larger flat areas between hills into an outer 50 percent of the area (designated BE) and a central 50 percent of the area (designated BM).

PART V: SUMMARY AND RECOMMENDATIONS

Summary

84. This report presents a method for mapping microgeometry which is based on the four terrain factors of overall slope, slope reversals, relief, and percentage increase of surface length over plan length. Other factors such as drainage density and characteristic slope were considered for inclusion in the classification, but were abandoned because of difficulties encountered in defining or mapping.

85. The adopted method was tested at 19 localities in Warren County, Mississippi, which have been used for soil-moisture prediction sites. The field data collected at the sites and the derived classification for each site are included in Appendices A and B.

86. The field mapping necessary to derive the classification is simple and rapid; it consists of taking an average of 200 to 300 elevation measurements along four parallel 50-ft-long profiles. Rules for laying out the profile groups under varying terrain conditions and a step-by-step procedure for calculating factor values from profiles have been discussed herein.

87. Final site designations are numerical arrays composed of actual factor values. Although not done in this report, factor values may be grouped into ranges at the user's discretion.

88. Although not developed exclusively for this purpose, the classification is applicable in its present form to studies involving soil-moisture prediction. A discussion is included concerning the advisability and feasibility of adding one or more supplemental factors, such as surface-water storage or ponding, which have direct application in soil-moisture prediction. In addition, a simple classification of the macrogeometry and topographic position of each of the Warren County sites is included.

Recommendations

89. When a substantial amount of data has been obtained from a number of sites (preferably sites representing a variety of environments), an

effort should be made to evaluate the importance of each terrain factor in soil-moisture prediction. Possibly through the use of constant values, the numerical array for each site could then be worked into a single numerical value. Single values should lend themselves to data processing more readily than a series of values.

90. Provided the nature and extent of surface-water storage or ponding are considered pertinent to soil-moisture prediction, efforts should be made to develop a satisfactory mapping technique. As stated previously, a value for ponding could be either included as an additional factor in the numerical array, handled as an entirely separate value, or combined with a modifying constant and worked into a calculation of a single site value.

91. Considerable effort should be made to define topographic position in quantitative terms. Solution of this problem will necessarily involve the development of a field mapping technique as well as a method of classifying the data obtained. As in the case of ponding, a decision will have to be made concerning the importance of topographic position to and correlation with the other terrain factors. Topographic position could be classified with or without its relation to soil-moisture prediction being considered.

92. It is recommended that the soil-moisture prediction sites already established on the islands of Oahu, Hawaii, and Kauai be mapped according to the technique developed herein. These sites, located and described in WESSG Memorandum for Record (11 July 1961), Subject: Terrain Classification of Soil-Moisture Prediction Sites on Hawaii by Dr. Charles R. Kolb, have been classified on the basis of slope, relief, and pattern through the use of four 36-ft-long radiating profiles. Conversion of the field measurements from the original system to the one described herein will result in a slight loss in detail and possible error; however, these can be minimized through the use of mean values of factor groupings rather than specific factor values.

APPENDIX A: WARREN COUNTY SITE TABULATIONS AND CLASSIFICATIONS

1. The following tabulations give the profile-segment and total-site factor values, macrogeometry factor values, and topographic position for the 19 Warren County soil-moisture prediction sites.

2. Site F-3 was flooded by backwater from the Big Black River during most of the study period and could not be surveyed.

3. Sites L-3 and L-4 were included within a single mapping site because of their close proximity to each other and similar surface configuration.

MICROGEOMETRY TABULATIONS

Site No. C-1 Date 20 March 1962
Location Warren County, Miss. 32°27'30" N. lat., 90°41'30" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		2	0.1	0.15	
A2		4	0.1	0.20	
A3	0°28'	4	0.1	0.25	
A4	(0.8%)	1	0.2	0.10	
A5		3	0.1	0.20	
B1		1	0.1	0.10	
B2		0	0.1	0.05	
B3	0°42'	0	0.2	0.10	
B4	(1.2%)	0	0.2	0.10	
B5		0	0.1	0.05	
C1		0	0.2	0.10	
C2		2	0.2	0.20	
C3	0°42'	0	0.1	0.05	
C4	(1.2%)	2	0.1	0.15	
C5		0	0.0	0.00	
D1		0	0.2	0.10	
D2		0	0.1	0.05	
D3	0°35'	1	0.1	0.10	
D4	(1.0%)	1	0.2	0.15	
D5		2	0.2	0.20	

Site Classification

	0.5 (0.87%)	1.1	0.1	0.12	

Macrogeometry Classification PP 4 SO 4 CS 4 CR 4

Position

Topographic Position - BC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 14 and 26.5 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. C-2 Date 19 March 1962
Location Warren County, Miss. 32°21'00" N. lat., 90°40'20" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		0	0.3	0.15	
A2		0	0.3	0.15	
A3	1°02'	1	0.2	0.15	
A4	(1.8%)	3	0.2	0.20	
A5		3	0.1	0.20	
B1		2	0.2	0.15	
B2		2	0.3	0.25	
B3	1°09'	0	0.2	0.10	
B4	(2.0%)	0	0.2	0.10	
B5		2	0.2	0.20	
C1		2	0.1	0.10	
C2		0	0.2	0.10	
C3	0°55'	2	0.3	0.35	
C4	(1.6%)	2	0.2	0.20	
C5		2	0.1	0.15	
D1		3	0.2	0.25	
D2		2	0.2	0.20	
D3	0°55'	1	0.1	0.10	
D4	(1.6%)	1	0.2	0.10	
D5		0	0.3	0.15	

Site Classification

	1.0 (1.75%)	1.4	0.2	0.17	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2

Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

MICROGEOMETRY TABULATIONS

Site No. C-3 Date 19 March 1962
Location Warren County, Miss. 32°21'10" N. lat., 90°43'00" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		6	0.2	0.35	
A2		2	0.3	0.25	
A3	1°16'	2	0.2	0.15	
A4	(2.2%)	0	0.3	0.15	
A5		2	0.2	0.35	
B1		4	0.1	0.25	
B2		1	0.3	0.20	
B3	1°09'	5	0.3	0.30	
B4	(2.0%)	3	0.2	0.25	
B5		1	0.3	0.20	
C1		1	0.2	0.15	
C2		1	0.3	0.15	
C3	1°16'	3	0.3	0.40	
C4	(2.2%)	0	0.2	0.10	
C5		1	0.4	0.25	
D1		0	0.2	0.10	
D2		0	0.1	0.05	
D3	1°23'	0	0.3	0.15	
D4	(2.4%)	2	0.3	0.25	
D5		0	0.3	0.15	

Site Classification

	1.5 (2.6%)	1.7	0.3	0.21	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2
Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

MICROGEOMETRY TABULATIONS

Site No. C-4 Date 5 February 1962
Location Warren County, Miss. 32°10'40" N. lat., 90°50'30" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		2	0.2	0.23	
A2		4	0.2	0.15	
A3	0°21'	2	0.2	0.13	
A4	(0.6%)	4	0.3	0.40	
A5		3	0.3	0.36	
B1		3	0.2	0.33	
B2		1	0.2	0.13	
B3	0°28'	4	0.2	0.30	
B4	(0.8%)	1	0.2	0.10	
B5		3	0.3	0.23	
C1		2	0.2	0.29	
C2		3	0.1	0.13	
C3	0°21'	2	0.1	0.08	
C4	(0.6%)	1	0.2	0.15	
C5		3	0.2	0.18	
D1		3	0.1	0.18	
D2		3	0.2	0.20	
D3	0°21'	2	0.1	0.03	
D4	(0.6%)	2	0.2	0.49	
D5		0	0.2	0.10	

Site Classification

	0.5 (0.87%)	2.4	0.2	0.21	

Macrogeometry Classification PP 1 SO 3 CS 1b CR 1

Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 5 to 20 per 10 miles
Characteristic slope between 1/2 and 2 deg
Characteristic relief between 0 and 10 ft

MICROGEOMETRY TABULATIONS

Site No. C-5 Date 23 January 1962
Location Warren County, Miss. 32°09'20" N. lat., 90°54'30" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		1	0.1	0.10	
A2		1	0.1	0.03	
A3	0°35'	2	0.3	0.15	
A4	(1.0%)	4	0.2	0.20	
A5		0	0.3	0.15	
B1		1	0.1	0.05	
B2		3	0.1	0.08	
B3	0°35'	2	0.1	0.10	
B4	(1.0%)	3	0.3	0.32	
B5		3	0.3	0.25	
C1		1	0.1	0.08	
C2		0	0.1	0.05	
C3	0°28'	2	0.2	0.30	
C4	(0.8%)	0	0.1	0.03	
C5		2	0.2	0.16	
D1		4	0.1	0.15	
D2		1	0.2	0.08	
D3	0°28'	4	0.2	0.22	
D4	(0.8%)	3	0.4	0.55	
D5		2	0.2	0.35	

Site Classification

	0.5 (0.87%)	1.9	0.1	0.17	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - BC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. C-6 Date 29 January 1962
Location Warren County, Miss. 32°12'40" N. lat., 90°50'30" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		0	0.2	0.05	
A2		0	0.1	0.03	
A3	1°43'	1	0.5	0.18	
A4	(3.0%)	3	0.2	0.13	
A5		0	0.6	0.20	
B1		2	0.2	0.15	
B2		0	0.1	0.03	
B3	1°23'	0	0.3	0.08	
B4	(2.4%)	0	0.1	0.03	
B5		0	0.5	0.13	
C1		1	0.1	0.05	
C2		0	0.3	0.08	
C3	1°09'	0	0.2	0.10	
C4	(2.0%)	0	0.2	0.05	
C5		0	0.2	0.08	
D1		0	0.1	0.03	
D2		0	0.2	0.05	
D3	1°02'	0	0.3	0.08	
D4	(1.8%)	0	0.1	0.03	
D5		0	0.2	0.05	

Site Classification

	1.5 (2.6%)	0.3	0.2	0.08	

Macrogeometry Classification PP 4 SO 4 CS 4 CR 4

Position

Topographic Position - BC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 14 and 26.5 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. F-2 Date 24 January 1962
Location Warren County, Miss. 32°36'10" N. lat., 90°41'00" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		1	0.1	0.10	
A2		2	0.2	0.21	
A3	0°07'	2	0.2	0.13	
A4	(0.2%)	6	0.3	0.63	
A5		1	0.5	0.67	
B1		3	0.2	0.29	
B2		5	0.2	0.28	
B3	0°07'	3	0.1	0.20	
B4	(0.2%)	2	0.2	0.07	
B5		2	0.4	0.36	
C1		2	0.2	0.27	
C2		3	0.2	0.14	
C3	0°14'	2	0.3	0.23	
C4	(0.4%)	1	0.5	0.51	
C5		1	0.3	0.13	
D1		1	0.2	0.22	
D2		3	0.2	0.38	
D3	0°14'	3	0.2	0.51	
D4	(0.4%)	1	0.3	0.24	
D5		1	0.3	0.15	

Site Classification

	0.0 (0.0%)	2.2	0.2	0.29	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - BC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. F-7 Date 20 March 1962
Location Warren County, Miss. 32°22'30" N. lat., 90°41'00" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		4	0.2	0.25	
A2		4	0.2	0.40	
A3	0°42'	5	0.2	0.85	
A4	(1.2%)	4	0.2	0.55	
A5		4	0.3	0.74	
B1		3	0.3	0.65	
B2		5	0.2	0.50	
B3	0°55'	5	0.2	0.55	
B4	(1.6%)	3	0.3	0.35	
B5		4	0.2	0.25	
C1		5	0.3	1.04	
C2		4	0.3	0.60	
C3	0°35'	5	0.3	0.45	
C4	(1.0%)	4	0.2	0.30	
C5		4	0.2	0.35	
D1		4	0.2	0.40	
D2		4	0.2	0.50	
D3	0°49'	5	0.2	0.30	
D4	(1.4%)	3	0.3	0.60	
D5		4	0.2	0.35	

Site Classification

	1.0 (1.75%)	4.1	0.2	0.50	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - BC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. F-8 Date 26 January 1962
Location Warren County, Miss. 32°09'20" N. lat., 90°54'30" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		6	0.4	2.71	
A2		6	0.6	2.93	
A3	0°14'	5	0.4	2.45	
A4	(0.4%)	7	0.4	2.93	
A5		8	0.4	3.19	
B1		6	0.4	2.10	
B2		9	0.4	5.35	
B3	0°28'	7	0.4	1.77	
B4	(0.8%)	9	0.4	3.70	
B5		6	0.4	4.30	
C1		6	0.4	2.22	
C2		7	0.3	2.73	
C3	0°28'	9	0.3	3.45	
C4	(0.8%)	6	0.4	1.96	
C5		6	0.3	1.86	
D1		6	0.4	3.17	
D2		10	0.3	3.73	
D3	0°28'	8	0.4	3.84	
D4	(0.8%)	5	0.5	3.34	
D5		9	0.3	2.33	

Site Classification

	0.5 (0.87%)	7.0	0.4	3.00	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - BC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. L-1 Date 22 January 1962
Location Warren County, Miss. 32°08'30" N. lat., 90°54'40" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		0	0.2	0.10	
A2		0	0.2	0.05	
A3	0°55'	1	0.2	0.15	
A4	(1.6%)	1	0.1	0.03	
A5		0	0.2	0.05	
B1		0	0.2	0.10	
B2		2	0.3	0.25	
B3	1°09'	0	0.1	0.05	
B4	(2.0%)	0	0.2	0.10	
B5		0	0.2	0.10	
C1		2	0.3	0.79	
C2		1	0.3	0.13	
C3	1°09'	1	0.2	0.13	
C4	(2.0%)	0	0.2	0.08	
C5		0	0.2	0.05	
D1		3	0.2	0.15	
D2		0	0.3	0.08	
D3	0°55'	2	0.2	0.18	
D4	(1.6%)	0	0.2	0.10	
D5		2	0.1	0.13	

Site Classification

	1.0 (1.75%)	0.7	0.2	0.14	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2

Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

MICROGEOMETRY TABULATIONS

Site No. L-3 and L-4 Date 29 January 1962
Location Warren County, Miss. 32°08'25" N. lat., 90°53'45" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		0	0.7	0.47	
A2		2	0.3	0.45	
A3	2°38'	0	0.5	0.23	
A4	(4.6%)	2	0.6	1.19	
A5		1	0.7	0.57	
B1		1	0.3	0.10	
B2		3	0.6	0.65	
B3	2°38'	4	0.4	0.80	
B4	(4.6%)	2	0.5	0.47	
B5		1	1.1	1.07	
C1		1	0.5	0.25	
C2		0	0.6	0.25	
C3	2°04'	0	0.5	0.42	
C4	(3.6%)	4	0.4	1.04	
C5		2	0.6	0.80	
D1		0	0.5	0.42	
D2		1	0.4	0.20	
D3	2°38'	0	0.4	0.15	
D4	(4.6%)	2	0.7	0.45	
D5		2	0.4	0.82	

Site Classification

	2.5 (4.37%)	1.4	0.5	0.54	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - SC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. L-5 Date 24 January 1962
Location Warren County, Miss. 32°09'00" N. lat., 90°54'20" W. long.
Tabulated by Broughton and Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		0	0.2	0.03	
A2		0	0.1	0.02	
A3	0°35'	0	0.1	0.02	
A4	(1.0%)	0	0.1	0.02	
A5		0	0.0	0.00	
B1		0	0.1	0.02	
B2		0	0.2	0.03	
B3	1°02'	0	0.2	0.04	
B4	(1.8%)	0	0.2	0.07	
B5		0	0.2	0.04	
C1		0	0.2	0.04	
C2		0	0.2	0.03	
C3	1°16'	0	0.2	0.03	
C4	(2.2%)	0	0.2	0.04	
C5		0	0.3	0.05	
D1		0	0.2	0.04	
D2		0	0.2	0.02	
D3	1°23'	0	0.2	0.07	
D4	(2.4%)	0	0.3	0.05	
D5		0	0.3	0.05	

Site Classification

	1.0 (1.75%)	0.0	0.2	0.04	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - TC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. L-6 Date 20 March 1962
Location Warren County, Miss. 32°27'40" N. lat., 90°41'40" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		3	0.1	0.20	
A2		1	0.2	0.15	
A3	0°55'	0	0.0	0.00	
A4	(1.6%)	0	0.5	0.25	
A5		0	0.2	0.10	
B1		3	0.1	0.20	
B2		5	0.1	0.25	
B3	0°48'	1	0.2	0.15	
B4	(1.4%)	1	0.4	0.20	
B5		0	0.3	0.15	
C1		2	0.1	0.15	
C2		2	0.1	0.10	
C3	1°09'	0	0.1	0.05	
C4	(2.0%)	0	0.3	0.15	
C5		0	0.5	0.25	
D1		2	0.1	0.15	
D2		2	0.1	0.10	
D3	1°09'	0	0.2	0.10	
D4	(2.0%)	0	0.2	0.10	
D5		0	0.5	0.25	

Site Classification

	1.0 (1.75%)	1.1	0.1	0.15	

Macrogeometry Classification PP 4 SO 4 CS 4 CR 4

Position

Topographic Position - TC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 14 and 26.5 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. M-1 Date 20 March 1962
Location Warren County, Miss. 32°21'10" N. lat., 90°43'10" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		5	0.5	1.53	
A2		6	0.3	1.23	
A3	1°57'	5	0.3	1.43	
A4	(3.4%)	1	0.7	0.94	
A5		2	0.6	1.13	
B1		5	0.6	3.24	
B2		7	0.4	1.56	
B3	1°16'	2	0.3	0.45	
B4	(2.2%)	4	0.4	1.33	
B5		5	0.3	0.84	
C1		5	0.3	1.77	
C2		2	0.5	1.26	
C3	1°16'	6	0.4	2.20	
C4	(2.2%)	2	0.5	0.79	
C5		3	0.3	0.60	
D1		5	0.5	1.33	
D2		3	0.4	0.70	
D3	1°50'	7	0.3	1.09	
D4	(3.2%)	1	0.4	0.74	
D5		5	0.3	0.99	

Site Classification

	1.5 (2.6%)	4.0	0.3	1.26	

Macrogeometry Classification PP 4 SO 4 CS 3 CR 4

Position

Topographic Position - SC

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 6 and 14 deg
Characteristic relief between 0 and 100 ft

MICROGEOMETRY TABULATIONS

Site No. M-3 Date 19 March 1962
Location Warren County, Miss. 32°20'40" N. lat., 90°42'20" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		4	0.3	0.50	
A2		2	0.2	0.20	
A3	0°07'	0	0.1	0.05	
A4	(0.2%)	3	0.2	0.40	
A5		3	0.1	0.20	
B1		3	0.1	0.15	
B2		5	0.2	0.55	
B3	0°00'	3	0.2	0.40	
B4	(0.0%)	6	0.1	0.25	
B5		2	0.1	0.15	
C1		0	0.2	0.10	
C2		1	0.2	0.20	
C3	0°07'	2	0.1	0.10	
C4	(0.2%)	1	0.1	0.10	
C5		1	0.1	0.05	
D1		0	0.2	0.10	
D2		5	0.3	0.70	
D3	0°00'	1	0.2	0.25	
D4	(0.0%)	2	0.2	0.15	
D5		1	0.2	0.20	

Site Classification

	0.0 (0.0%)	2.2	0.2	0.24	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2

Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

MICROGEOMETRY TABULATIONS

Site No. M-4 Date 7 March 1962
Location Warren County, Miss. 32°21'30" N. lat., 90°40'10" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		2	0.1	0.15	
A2		0	0.6	0.50	
A3	1°16'	3	0.1	0.15	
A4	(2.2%)	1	0.6	0.40	
A5		6	0.2	0.60	
B1		1	0.4	0.35	
B2		1	0.7	0.35	
B3	1°29'	6	0.2	0.30	
B4	(2.6%)	4	0.3	0.84	
B5		3	0.2	0.20	
C1		1	0.3	0.35	
C2		0	0.6	0.40	
C3	1°16'	4	0.2	0.35	
C4	(2.2%)	0	0.6	0.40	
C5		2	0.2	0.30	
D1		2	0.2	0.30	
D2		1	0.5	0.35	
D3	1°16'	1	0.2	0.25	
D4	(2.2%)	1	0.6	0.60	
D5		4	0.2	0.35	

Site Classification

	1.5 (2.6%)	2.1	0.2	0.37	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2

Position

Topographic Position - TE

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

MICROGEOMETRY TABULATIONS

Site No. M-5 Date 19 March 1962
Location Warren County, Miss. 32°21'00" N. lat., 90°42'10" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		0	0.2	0.10	
A2		2	0.1	0.15	
A3	0°28'	3	0.1	0.15	
A4	(0.8%)	3	0.1	0.20	
A5		5	0.2	0.40	
B1		2	0.2	0.20	
B2		6	0.2	0.30	
B3	0°35'	3	0.2	0.25	
B4	(1.0%)	7	0.1	0.30	
B5		0	0.2	0.10	
C1		2	0.2	0.20	
C2		0	0.1	0.05	
C3	0°21'	2	0.2	0.20	
C4	(0.6%)	3	0.2	0.15	
C5		2	0.1	0.15	
D1		0	0.1	0.05	
D2		2	0.2	0.20	
D3	0°21'	2	0.1	0.10	
D4	(0.6%)	2	0.1	0.10	
D5		2	0.2	0.30	

Site Classification

	0.5 (0.87%)	2.4	0.2	0.18	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2

Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

MICROGEOMETRY TABULATIONS

Site No. M-6 Date 7 March 1962
Location Warren County, Miss. 32°21'00" N. lat., 90°42'12" W. long.
Tabulated by Saucier

Profile Segment	Overall Slope	Slope Reversals	Relief ft	Surface Length Increase, %	Classification
A1		1	0.3	0.35	
A2		1	0.1	0.10	
A3	0°14'	6	0.2	0.25	
A4	(0.4%)	3	0.2	0.25	
A5		2	0.3	0.35	
B1		3	0.2	0.25	
B2		2	0.3	0.64	
B3	0°07'	2	0.1	0.10	
B4	(0.2%)	2	0.1	0.10	
B5		2	0.1	0.15	
C1		2	0.3	0.40	
C2		3	0.2	0.20	
C3	0°14'	1	0.3	0.20	
C4	(0.4%)	1	0.2	0.15	
C5		2	0.2	0.15	
D1		2	0.2	0.20	
D2		2	0.2	0.25	
D3	0°14'	2	0.2	0.15	
D4	(0.4%)	1	0.2	0.25	
D5		0	0.1	0.05	

Site Classification

	0.0 (0.0%)	2.0	0.2	0.23	

Macrogeometry Classification PP 1 SO 4 CS 2 CR 2

Position

Topographic Position - TM

Comments Slopes steeper than 50 percent: 20 to 100 per 10 miles.
Characteristic slope between 2 and 6 deg
Characteristic relief between 10 and 50 ft

APPENDIX B: FIELD PROFILE MEASUREMENTS

1. The following tabulations give the grid points and elevations that are necessary to construct the four profiles for each of the 19 Warren County soil-moisture prediction sites.

2. The total number of field measurements has been reduced to only those which are essential for duplicating the original profile, i.e. many consecutive grid points with the same elevation have been omitted.

MICROGEOMETRY DATA SHEET

Site No. C-1 Date 9 March 1962
Location Warren County, Miss.
Profile Bearing N 75° W
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.2	5.88		B43.0	0.6	5.44		D35.0	0.4	5.69
A 1.0	0.2	5.86		B44.0	0.7	5.40		D45.0	0.4	5.63
A 2.0	0.3	5.80		B47.0	0.7	5.40		D46.0	0.5	5.55
A 3.0	0.2	5.84		B48.0	0.6	5.44		D48.0	0.5	5.56
A 8.0	0.2	5.83		B50.0	0.6	5.45		D49.0	0.6	5.49
A 9.0	0.3	5.82						D50.0	0.6	5.44
A10.0	0.2	5.85		C 0.0	0.1	5.97				
A14.0	0.2	5.84		C10.0	0.1	5.93				
A15.0	0.3	5.79		C11.0	0.2	5.90				
A18.0	0.3	5.73		C12.0	0.1	5.93				
A19.0	0.4	5.72		C14.0	0.1	5.94				
A22.0	0.4	5.63		C15.0	0.2	5.90				
A23.0	0.5	5.61		C22.0	0.2	5.85				
A24.0	0.4	5.63		C23.0	0.3	5.82				
A25.0	0.5	5.62		C31.0	0.3	5.73				
A26.0	0.4	5.63		C32.0	0.4	5.72				
A27.0	0.5	5.62		C33.0	0.3	5.75				
A30.0	0.5	5.60		C34.0	0.3	5.74				
A31.0	0.4	5.63		C35.0	0.4	5.72				
A32.0	0.5	5.62		C38.0	0.4	5.65				
A35.0	0.5	5.61		C39.0	0.5	5.58				
A36.0	0.4	5.63		C43.0	0.5	5.54				
A37.0	0.5	5.60		C44.0	0.6	5.51				
A42.0	0.5	5.55		C49.0	0.6	5.46				
A43.0	0.5	5.52		C50.0	0.7	5.42				
A44.0	0.5	5.54								
A46.0	0.5	5.53		D 0.0	0.1	5.98				
A47.0	0.6	5.51		D 1.0	0.2	5.91				
A50.0	0.6	5.49		D 2.0	0.1	5.93				
				D 4.0	0.1	5.97				
B 0.0	0.0	6.05		D 5.0	0.0	6.07				
B 1.0	0.1	6.02		D 6.0	0.0	6.03				
B10.0	0.1	5.99		D 7.0	0.2	5.85				
B11.0	0.2	5.92		D11.0	0.2	5.87				
B16.0	0.2	5.84		D12.0	0.3	5.78				
B17.0	0.3	5.81		D13.0	0.3	5.80				
B24.0	0.3	5.76		D14.0	0.4	5.72				
B25.0	0.4	5.69		D15.0	0.3	5.74				
B28.0	0.4	5.64		D21.0	0.3	5.80				
B29.0	0.5	5.60		D22.0	0.2	5.87				
B37.0	0.5	5.53		D23.0	0.3	5.80				
B38.0	0.6	5.51		D34.0	0.3	5.73				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. C-2 Date 8 March 1962
Location Warren County, Miss.
Profile Bearing N 10° E
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	1.0	3.96		B15.0	0.8	4.17		C39.0	0.4	4.52
A 1.0	0.9	4.01		B16.0	0.7	4.20		C40.0	0.3	4.61
A 4.0	0.9	4.06		B18.0	0.7	4.18		C43.0	0.3	4.67
A 5.0	0.8	4.09		B19.0	0.6	4.28		C44.0	0.2	4.72
A 9.0	0.8	4.19		B23.0	0.6	4.35		C45.0	0.3	4.61
A10.0	0.7	4.22		B24.0	0.5	4.44		C46.0	0.3	4.62
A13.0	0.7	4.24		B27.0	0.5	4.44		C47.0	0.2	4.68
A14.0	0.6	4.34		B28.0	0.4	4.49		C50.0	0.2	4.72
A15.0	0.6	4.34		B31.0	0.4	4.53				
A16.0	0.5	4.38		B32.0	0.3	4.59		D 0.0	1.1	3.85
A18.0	0.5	4.46		B37.0	0.3	4.67		D 1.0	1.2	3.77
A19.0	0.4	4.49		B38.0	0.2	4.71		D 2.0	1.1	3.82
A22.0	0.4	4.56		B41.0	0.2	4.75		D 4.0	1.1	3.81
A23.0	0.3	4.60		B42.0	0.1	4.80		D 5.0	1.0	3.88
A28.0	0.3	4.67		B43.0	0.1	4.79		D 8.0	1.0	3.88
A29.0	0.2	4.76		B44.0	0.2	4.77		D 9.0	1.1	3.87
A30.0	0.3	4.65		B45.0	0.1	4.81		D10.0	1.0	3.94
A31.0	0.3	4.65		B46.0	0.1	4.85		D13.0	1.0	3.96
A32.0	0.2	4.69		B47.0	0.0	4.92		D14.0	0.9	4.01
A33.0	0.3	4.63		B50.0	0.0	4.88		D16.0	0.9	3.98
A34.0	0.2	4.72						D17.0	1.0	3.97
A35.0	0.2	4.77		C 0.0	1.0	3.91		D18.0	0.9	4.02
A36.0	0.1	4.83		C 7.0	1.0	3.94		D19.0	0.8	4.10
A40.0	0.1	4.86		C 8.0	0.9	3.99		D20.0	0.8	4.16
A41.0	0.0	4.89		C 9.0	1.0	3.97		D21.0	0.7	4.20
A44.0	0.0	4.88		C10.0	1.0	3.97		D22.0	0.7	4.20
A45.0	0.1	4.86		C11.0	0.9	3.98		D23.0	0.8	4.17
A46.0	0.0	4.92		C15.0	0.9	4.07		D31.0	0.8	4.08
A47.0	0.1	4.86		C16.0	0.8	4.10		D32.0	0.7	4.22
A50.0	0.1	4.82		C21.0	0.8	4.16		D33.0	0.6	4.29
				C22.0	0.7	4.20		D41.0	0.6	4.36
B 0.0	1.0	3.94		C23.0	0.6	4.35		D42.0	0.5	4.38
B 1.0	1.0	3.93		C24.0	0.7	4.25		D45.0	0.5	4.43
B 2.0	0.9	3.98		C25.0	0.8	4.13		D46.0	0.4	4.55
B 5.0	0.9	4.01		C26.0	0.7	4.23		D48.0	0.4	4.53
B 6.0	0.8	4.09		C27.0	0.7	4.25		D49.0	0.3	4.61
B 7.0	0.8	4.12		C28.0	0.6	4.28		D50.0	0.3	4.60
B 8.0	0.9	4.14		C29.0	0.5	4.38				
B10.0	0.9	4.09		C35.0	0.5	4.45				
B11.0	0.8	4.11		C36.0	0.4	4.48				
B12.0	0.9	4.13		C37.0	0.5	4.45				
B13.0	0.8	4.18		C38.0	0.5	4.39				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. C-3 Date 7 March 1962
Location Warren County, Miss.
Profile Bearing N 51° W
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	1.1	3.78		B 8.0	1.1	3.84		C15.0	0.9	3.99
A 2.0	1.1	3.85		B 9.0	1.0	3.87		C18.0	0.9	4.02
A 3.0	1.0	3.88		B12.0	1.0	3.95		C19.0	0.8	4.07
A 4.0	1.0	3.86		B13.0	0.9	3.98		C20.0	0.8	4.08
A 5.0	1.1	3.85		B15.0	0.9	4.03		C21.0	0.9	3.98
A 6.0	1.0	3.89		B16.0	0.8	4.08		C22.0	0.9	3.98
A 7.0	1.1	3.85		B17.0	0.8	4.12		C23.0	0.8	4.12
A 8.0	1.0	3.89		B18.0	0.7	4.16		C24.0	0.8	4.14
A 9.0	0.9	3.97		B19.0	0.8	4.13		C25.0	0.9	4.17
A10.0	1.0	3.95		B21.0	0.8	4.13		C26.0	0.7	4.25
A11.0	0.9	3.96		B22.0	0.7	4.17		C28.0	0.7	4.25
A12.0	1.0	3.95		B23.0	0.7	4.16		C29.0	0.6	4.29
A13.0	0.9	4.01		B24.0	0.8	4.13		C36.0	0.6	4.32
A15.0	0.9	4.05		B25.0	0.7	4.23		C37.0	0.5	4.37
A16.0	0.8	4.07		B26.0	0.6	4.31		C39.0	0.5	4.45
A17.0	0.8	4.15		B28.0	0.6	4.34		C40.0	0.4	4.47
A18.0	0.7	4.19		B29.0	0.5	4.36		C41.0	0.4	4.53
A24.0	0.7	4.25		B30.0	0.6	4.31		C42.0	0.3	4.57
A25.0	0.6	4.29		B31.0	0.5	4.36		C45.0	0.3	4.62
A28.0	0.6	4.31		B33.0	0.5	4.42		C46.0	0.2	4.66
A29.0	0.5	4.39		B34.0	0.4	4.46		C47.0	0.1	4.78
A30.0	0.6	4.35		B35.0	0.4	4.47		C48.0	0.0	4.86
A31.0	0.5	4.44		B36.0	0.5	4.44		C49.0	0.1	4.77
A32.0	0.4	4.49		B38.0	0.5	4.41		C50.0	0.1	4.76
A37.0	0.4	4.53		B39.0	0.4	4.55				
A38.0	0.3	4.56		B40.0	0.3	4.56		D 0.0	1.3	3.62
A41.0	0.3	4.64		B41.0	0.4	4.53		D 2.0	1.3	3.65
A42.0	0.2	4.70		B42.0	0.3	4.61		D 3.0	1.2	3.67
A44.0	0.2	4.70		B44.0	0.3	4.61		D 6.0	1.2	3.74
A45.0	0.1	4.77		B45.0	0.2	4.73		D 7.0	1.1	3.78
A46.0	0.2	4.75		B46.0	0.1	4.82		D10.0	1.1	3.84
A48.0	0.2	4.71		B50.0	0.1	4.83		D11.0	1.0	3.86
A49.0	0.0	4.87						D20.0	1.0	3.93
A50.0	0.0	4.90		C 0.0	1.2	3.70		D21.0	0.9	4.01
				C 1.0	1.2	3.69		D24.0	0.9	4.05
B 0.0	1.1	3.80		C 2.0	1.3	3.65		D25.0	0.8	4.13
B 1.0	1.0	3.85		C 3.0	1.2	3.74		D29.0	0.8	4.15
B 3.0	1.0	3.85		C 4.0	1.2	3.74		D30.0	0.7	4.23
B 4.0	1.1	3.80		C 5.0	1.1	3.77		D31.0	0.6	4.27
B 5.0	1.1	3.85		C11.0	1.1	3.85		D34.0	0.6	4.28
B 6.0	1.0	3.87		C12.0	1.0	3.89		D35.0	0.7	4.21
B 7.0	1.0	3.88		C14.0	1.0	3.94		D36.0	0.6	4.26

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. C-3 (Cont'd) Date _____
Location _____
Profile Bearing _____
Surveyed by _____

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
D37.0	0.6	4.32								
D38.0	0.5	4.36								
D39.0	0.5	4.43								
D40.0	0.4	4.46								
D42.0	0.4	4.54								
D43.0	0.3	4.58								
D45.0	0.3	4.63								
D46.0	0.2	4.66								
D49.0	0.2	4.70								
D50.0	0.1	4.76								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. C-4 Date 5 February 1962
Location Warren County, Miss.
Profile Bearing N 70° W
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.7	3.6		B 8.5	0.5	3.8		C39.0	0.2	4.1
A 2.0	0.7	3.6		B10.0	0.6	3.7		C40.0	0.3	4.0
A 3.0	0.8	3.5		B12.0	0.7	3.6		C41.0	0.3	4.0
A 5.0	0.8	3.5		B13.0	0.6	3.7		C43.0	0.2	4.1
A 6.0	0.7	3.6		B19.0	0.6	3.7		C45.0	0.2	4.1
A 8.0	0.6	3.7		B20.0	0.5	3.8		C46.0	0.3	4.0
A 9.0	0.7	3.6		B20.5	0.5	3.8		C47.0	0.2	4.1
A10.0	0.8	3.5		B21.0	0.6	3.7		C48.0	0.2	4.1
A12.0	0.8	3.5		B22.0	0.7	3.6		C49.0	0.1	4.2
A13.0	0.7	3.6		B23.0	0.6	3.7		C50.0	0.1	4.2
A15.0	0.7	3.6		B24.0	0.7	3.6				
A16.0	0.8	3.5		B25.0	0.6	3.7		D 0.0	0.2	4.1
A18.0	0.7	3.6		B31.0	0.6	3.7		D 1.0	0.2	4.1
A20.0	0.6	3.7		B33.0	0.5	3.8		D 2.0	0.1	4.2
A21.0	0.7	3.6		B37.0	0.5	3.8		D 3.0	0.2	4.1
A22.0	0.8	3.5		B39.0	0.4	3.9		D 7.0	0.2	4.1
A25.0	0.8	3.5		B40.0	0.5	3.8		D 9.0	0.1	4.2
A27.0	0.7	3.6		B41.0	0.5	3.8		D10.0	0.2	4.1
A30.0	0.7	3.6		B42.0	0.4	3.9		D12.0	0.3	4.0
A31.0	0.8	3.5		B45.0	0.4	3.9		D14.0	0.2	4.1
A32.0	0.7	3.6		B46.0	0.5	3.8		D17.0	0.2	4.1
A33.0	0.6	3.7		B47.0	0.4	3.9		D18.0	0.3	4.0
A34.0	0.7	3.6		B49.0	0.3	4.0		D20.0	0.1	4.2
A36.0	0.7	3.6		B50.0	0.2	4.1		D22.0	0.1	4.2
A36.5	0.6	3.7						D24.0	0.2	4.1
A38.0	0.6	3.7		C 0.0	0.4	3.9		D30.0	0.2	4.1
A39.0	0.5	3.8		C 3.0	0.4	3.9		D32.0	0.1	4.2
A40.0	0.6	3.7		C 6.0	0.5	3.8		D33.0	0.0	4.3
A42.0	0.6	3.7		C 8.0	0.4	3.9		D34.0	0.0	4.3
A44.0	0.5	3.8		C 9.0	0.3	4.0		D34.5	0.2	4.1
A45.0	0.6	3.7		C10.0	0.5	3.8		D36.0	0.1	4.2
A45.5	0.7	3.6		C12.0	0.5	3.8		D43.0	0.1	4.2
A47.0	0.5	3.8		C13.0	0.4	3.9		D44.0	0.0	4.3
A49.0	0.5	3.8		C15.0	0.4	3.9		D50.0	0.0	4.3
A50.0	0.4	3.9		C17.0	0.5	3.8				
				C18.0	0.4	3.9				
B 0.0	0.6	3.7		C22.0	0.4	3.9				
B 2.0	0.5	3.8		C23.0	0.5	3.8				
B 3.0	0.7	3.6		C25.0	0.4	3.9				
B 5.0	0.6	3.7		C33.0	0.4	3.9				
B 6.0	0.6	3.7		C34.0	0.3	4.0				
B 7.0	0.5	3.8		C38.0	0.3	4.0				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. C-5 Date 23 January 1962
Location Warren County, Miss.
Profile Bearing N 105° E
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.5	5.2		B33.0	0.5	5.2		D20.0	0.5	5.2
A 2.0	0.5	5.2		B34.0	0.3	5.4		D23.5	0.5	5.2
A 3.0	0.4	5.3		B36.0	0.2	5.5		D24.5	0.4	5.3
A 4.0	0.5	5.2		B40.0	0.2	5.5		D25.0	0.5	5.2
A13.0	0.5	5.2		B41.0	0.3	5.4		D27.0	0.4	5.3
A15.0	0.4	5.3		B43.0	0.2	5.5		D28.0	0.3	5.4
A22.0	0.4	5.3		B45.0	0.0	5.7		D30.0	0.3	5.4
A24.0	0.5	5.2		B47.0	0.0	5.7		D31.0	0.4	5.3
A25.0	0.4	5.3		B49.0	0.1	5.6		D32.0	0.4	5.3
A26.0	0.4	5.3		B50.0	0.0	5.7		D33.0	0.3	5.4
A28.0	0.3	5.4						D34.0	0.3	5.4
A29.0	0.3	5.4		C 0.0	0.5	5.2		D35.0	0.1	5.6
A30.0	0.2	5.5		C 2.0	0.5	5.2		D36.0	0.2	5.5
A31.0	0.2	5.5		C 3.0	0.6	5.1		D37.0	0.3	5.4
A32.0	0.3	5.4		C 5.0	0.5	5.2		D38.0	0.4	5.3
A33.0	0.3	5.4		C19.0	0.5	5.2		D39.0	0.5	5.2
A35.0	0.2	5.5		C20.0	0.4	5.3		D40.0	0.4	5.3
A36.0	0.1	5.6		C22.0	0.4	5.3		D42.0	0.4	5.3
A37.0	0.2	5.5		C23.0	0.5	5.2		D43.0	0.3	5.4
A38.0	0.2	5.5		C25.0	0.5	5.2		D45.0	0.2	5.5
A40.0	0.3	5.4		C26.0	0.6	5.1		D46.0	0.3	5.4
A41.0	0.2	5.5		C27.0	0.4	5.3		D47.0	0.3	5.4
A43.0	0.1	5.6		C30.0	0.4	5.3		D47.5	0.4	5.3
A48.0	0.1	5.6		C32.0	0.3	5.4		D48.0	0.3	5.4
A49.0	0.0	5.7		C41.0	0.3	5.4		D50.0	0.2	5.5
A50.0	0.0	5.7		C42.0	0.2	5.5				
				C43.0	0.2	5.5				
B 0.0	0.5	5.2		C44.0	0.1	5.6				
B 3.0	0.5	5.2		C45.0	0.1	5.6				
B 5.0	0.4	5.3		C47.0	0.2	5.5				
B 7.0	0.5	5.2		C48.5	0.1	5.6				
B11.0	0.5	5.2		C50.0	0.1	5.6				
B13.0	0.4	5.3								
B16.0	0.4	5.3		D 0.0	0.5	5.2				
B18.0	0.5	5.2		D 1.0	0.5	5.2				
B20.0	0.4	5.3		D 2.0	0.6	5.1				
B22.0	0.3	5.4		D 4.0	0.5	5.2				
B24.0	0.3	5.4		D 8.0	0.5	5.2				
B26.0	0.4	5.3		D10.0	0.6	5.1				
B29.0	0.4	5.3		D12.0	0.5	5.2				
B30.0	0.3	5.4		D16.5	0.5	5.2				
B31.0	0.3	5.4		D18.0	0.4	5.3				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. C-6 Date 29 January 1962
Location Warren County, Miss.
Profile Bearing N 5° W
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	1.5	4.4		C 0.0	1.3	4.6				
A 2.0	1.4	4.5		C 2.0	1.4	4.5				
A 8.0	1.4	4.5		C 8.0	1.4	4.5				
A10.0	1.3	4.6		C10.0	1.3	4.6				
A14.0	1.3	4.6		C12.0	1.3	4.6				
A16.0	1.2	4.7		C14.0	1.2	4.7				
A20.0	1.2	4.7		C16.0	1.1	4.8				
A22.0	1.1	4.8		C18.0	1.1	4.8				
A24.0	1.0	4.9		C20.0	1.0	4.9				
A26.0	0.8	5.1		C26.0	1.0	4.9				
A28.0	0.8	5.1		C28.0	0.6	5.1				
A30.0	0.7	5.2		C30.0	0.6	5.1				
A32.0	0.8	5.1		C32.0	0.7	5.2				
A34.0	0.7	5.2		C34.0	0.6	5.3				
A36.0	0.8	5.1		C44.0	0.6	5.3				
A38.0	0.7	5.2		C46.0	0.5	5.4				
A40.0	0.6	5.3		C48.0	0.4	5.5				
A42.0	0.5	5.4		C50.0	0.3	5.6				
A44.0	0.4	5.5								
A46.0	0.3	5.6		D 0.0	1.3	4.6				
A48.0	0.2	5.7		D 4.0	1.3	4.6				
A50.0	0.0	5.9		D 6.0	1.2	4.7				
				D14.0	1.2	4.7				
B 0.0	1.4	4.5		D16.0	1.1	4.8				
B 4.0	1.4	4.5		D18.0	1.0	4.9				
B 6.0	1.2	4.7		D20.0	1.0	4.9				
B 8.0	1.3	4.6		D22.0	0.9	5.0				
B10.0	1.2	4.7		D24.0	0.9	5.0				
B14.0	1.2	4.7		D26.0	0.8	5.1				
B16.0	1.1	4.8		D28.0	0.8	5.1				
B22.0	1.1	4.8		D30.0	0.7	5.2				
B24.0	1.0	4.9		D32.0	0.6	5.3				
B26.0	0.9	5.0		D44.0	0.6	5.3				
B28.0	0.8	5.1		D46.0	0.5	5.4				
B30.0	0.8	5.1		D48.0	0.5	5.4				
B32.0	0.7	5.2		D50.0	0.4	5.5				
B40.0	0.7	5.2								
B42.0	0.6	5.3								
B44.0	0.5	5.4								
B46.0	0.4	5.5								
B48.0	0.3	5.6								
B50.0	0.2	5.7								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. F-2 Date 24 January 1962
Location Warren County, Miss.
Profile Bearing N 45° W
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.4	4.5		B20.0	0.4	4.5		C46.0	0.3	4.6
A 2.0	0.4	4.5		B21.0	0.5	4.4		C48.0	0.2	4.7
A 3.0	0.4	4.5		B22.5	0.5	4.4		C50.0	0.2	4.7
A 4.0	0.5	4.4		B23.5	0.4	4.5				
A 8.0	0.5	4.4		B26.0	0.4	4.5		D 0.0	0.4	4.5
A 9.0	0.4	4.5		B27.0	0.5	4.4		D 3.0	0.4	4.5
A11.5	0.4	4.5		B28.0	0.4	4.5		D 4.0	0.6	4.3
A13.0	0.6	4.3		B29.0	0.4	4.5		D 6.0	0.6	4.3
A15.0	0.5	4.4		B31.0	0.4	4.5		D 8.5	0.5	4.4
A16.0	0.4	4.5		B33.0	0.5	4.4		D10.0	0.5	4.4
A21.0	0.4	4.5		B35.0	0.4	4.5		D13.0	0.5	4.4
A23.0	0.3	4.6		B36.0	0.4	4.5		D14.5	0.4	4.5
A25.0	0.3	4.6		B38.0	0.3	4.6		D16.0	0.6	4.3
A27.0	0.5	4.4		B41.0	0.3	4.6		D17.0	0.6	4.3
A30.0	0.5	4.4		B42.0	0.3	4.6		D18.0	0.4	4.5
A31.5	0.3	4.6		B43.5	0.4	4.5		D21.0	0.5	4.4
A33.0	0.2	4.7		B45.0	0.6	4.3		D22.0	0.7	4.2
A34.0	0.3	4.6		B46.5	0.7	4.2		D23.0	0.5	4.4
A35.0	0.2	4.7		B50.0	0.4	4.5		D25.0	0.5	4.4
A37.0	0.4	4.5						D27.0	0.5	4.4
A38.0	0.3	4.6		C 0.0	0.4	4.5		D29.0	0.7	4.2
A39.0	0.5	4.4		C 1.5	0.6	4.3		D31.0	0.6	4.3
A41.0	0.4	4.5		C 3.0	0.5	4.4		D33.0	0.4	4.5
A42.5	0.1	4.8		C 6.0	0.4	4.5		D35.0	0.3	4.6
A44.0	0.0	4.9		C 7.0	0.5	4.4		D37.0	0.3	4.6
A45.0	0.1	4.8		C12.0	0.6	4.3		D39.0	0.5	4.4
A46.0	0.3	4.6		C14.0	0.5	4.4		D41.0	0.5	4.4
A47.5	0.3	4.6		C15.5	0.5	4.4		D42.0	0.4	4.5
A49.0	0.4	4.5		C16.5	0.4	4.5		D43.0	0.3	4.6
A50.0	0.5	4.4		C18.0	0.5	4.4		D47.0	0.3	4.6
				C20.0	0.4	4.5		D48.0	0.2	4.7
B 0.0	0.5	4.4		C23.5	0.4	4.5		D50.0	0.2	4.7
B 3.5	0.7	4.2		C25.0	0.5	4.4				
B 5.5	0.5	4.4		C29.0	0.5	4.4				
B 7.0	0.6	4.3		C30.0	0.7	4.2				
B 7.5	0.5	4.4		C32.0	0.6	4.3				
B10.5	0.5	4.4		C34.0	0.3	4.6				
B11.0	0.6	4.3		C35.5	0.2	4.7				
B12.5	0.5	4.4		C38.0	0.2	4.7				
B13.5	0.4	4.5		C40.0	0.5	4.4				
B14.5	0.5	4.4		C42.0	0.5	4.4				
B19.0	0.5	4.4		C44.0	0.5	4.4				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. F-7 Date 8 March 1962
Location Warren County, Miss.
Profile Bearing N 03° E
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.0	6.05		B 0.0	0.0	6.02		C 3.0	0.3	5.80
A 1.0	0.0	6.05		B 2.0	0.2	5.86		C 5.0	0.1	5.93
A 3.0	0.2	5.87		B 3.0	0.2	5.88		C 6.0	0.3	5.80
A 4.0	0.2	5.85		B 5.0	0.0	6.02		C 7.0	0.4	5.69
A 5.0	0.1	5.98		B 6.0	0.2	5.90		C 8.0	0.3	5.78
A 6.0	0.2	5.84		B 7.0	0.3	5.80		C 9.0	0.1	5.91
A 8.0	0.2	5.88		B 8.0	0.1	5.95		C10.0	0.3	5.75
A 9.0	0.1	5.99		B10.0	0.1	5.96		C11.0	0.4	5.66
A10.0	0.1	5.93		B11.0	0.2	5.83		C14.0	0.1	5.92
A12.0	0.3	5.80		B12.0	0.3	5.80		C15.0	0.2	5.82
A14.0	0.1	5.92		B14.0	0.1	5.95		C16.0	0.4	5.65
A16.0	0.3	5.75		B16.0	0.3	5.74		C18.0	0.2	5.83
A17.0	0.2	5.81		B17.0	0.3	5.77		C19.0	0.2	5.85
A18.0	0.2	5.83		B18.0	0.2	5.90		C20.0	0.3	5.74
A19.0	0.3	5.79		B19.0	0.3	5.75		C21.0	0.5	5.54
A20.0	0.3	5.72		B20.0	0.3	5.76		C22.0	0.5	5.59
A21.0	0.5	5.59		B21.0	0.4	5.66		C23.0	0.3	5.77
A22.0	0.3	5.73		B22.0	0.3	5.71		C25.0	0.5	5.60
A23.0	0.3	5.78		B23.0	0.3	5.78		C27.0	0.3	5.76
A25.0	0.5	5.52		B25.0	0.5	5.53		C30.0	0.6	5.46
A26.0	0.5	5.60		B26.0	0.4	5.65		C31.0	0.5	5.52
A27.0	0.4	5.69		B27.0	0.4	5.70		C33.0	0.5	5.52
A28.0	0.5	5.56		B29.0	0.6	5.49		C34.0	0.6	5.49
A29.0	0.5	5.57		B30.0	0.4	5.64		C35.0	0.6	5.50
A30.0	0.6	5.46		B32.0	0.4	5.69		C36.0	0.5	5.58
A32.0	0.4	5.69		B33.0	0.6	5.48		C37.0	0.5	5.55
A33.0	0.4	5.65		B36.0	0.6	5.51		C39.0	0.7	5.37
A34.0	0.6	5.48		B37.0	0.7	5.39		C40.0	0.6	5.45
A35.0	0.5	5.55		B38.0	0.7	5.32		C41.0	0.6	5.48
A37.0	0.5	5.54		B39.0	0.6	5.43		C42.0	0.7	5.35
A38.0	0.7	5.34		B40.0	0.7	5.40		C44.0	0.7	5.36
A40.0	0.7	5.39		B42.0	0.7	5.40		C45.0	0.6	5.45
A41.0	0.5	5.53		B43.0	0.6	5.49		C46.0	0.6	5.41
A42.0	0.7	5.36		B45.0	0.6	5.49		C47.0	0.8	5.28
A43.0	0.8	5.27		B47.0	0.8	5.24		C48.0	0.7	5.32
A44.0	0.6	5.44		B48.0	0.7	5.31		C50.0	0.7	5.32
A45.0	0.5	5.51		B49.0	0.7	5.34				
A47.0	0.7	5.31		B50.0	0.8	5.27		D 0.0	0.1	5.91
A48.0	0.7	5.39						D 2.0	0.3	5.73
A49.0	0.6	5.44		C 0.0	0.2	5.89		D 4.0	0.3	5.80
A50.0	0.6	5.49		C 1.0	0.1	5.94		D 5.0	0.2	5.83
				C 2.0	0.3	5.78		D 6.0	0.4	5.70

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. F-7 (Cont'd) Date _____
Location _____
Profile Bearing _____
Surveyed by _____

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
D 7.0	0.4	5.69								
D 8.0	0.3	5.75								
D10.0	0.3	5.76								
D11.0	0.4	5.70								
D12.0	0.4	5.62								
D13.0	0.3	5.71								
D15.0	0.3	5.73								
D16.0	0.5	5.60								
D18.0	0.3	5.74								
D20.0	0.5	5.57								
D21.0	0.5	5.60								
D23.0	0.3	5.76								
D25.0	0.5	5.57								
D26.0	0.4	5.62								
D28.0	0.4	5.70								
D29.0	0.5	5.53								
D30.0	0.5	5.56								
D31.0	0.4	5.64								
D32.0	0.4	5.64								
D33.0	0.5	5.57								
D37.0	0.5	5.51								
D38.0	0.7	5.39								
D40.0	0.5	5.52								
D42.0	0.7	5.37								
D43.0	0.7	5.40								
D44.0	0.6	5.41								
D45.0	0.6	5.49								
D47.0	0.8	5.25								
D48.0	0.7	5.31								
D49.0	0.7	5.34								
D50.0	0.8	5.25								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. F-8 Date 26 January 1962
Location Warren County, Miss.
Profile Bearing N 10° E
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.8	4.8		A37.0	0.7	4.9		B20.0	0.5	5.1
A 1.0	0.7	4.9		A38.0	0.4	5.2		B21.0	0.4	5.2
A 2.0	0.9	4.7		A40.0	0.6	5.0		B22.0	0.5	5.1
A 3.0	0.9	4.7		A41.0	0.5	5.1		B22.5	0.6	5.0
A 3.5	0.5	5.1		A42.0	0.8	4.8		B23.0	0.4	5.2
A 5.0	0.7	4.9		A43.0	0.5	5.1		B23.5	0.3	5.3
A 5.5	0.8	4.8		A44.0	0.6	5.0		B24.0	0.7	4.9
A 7.0	0.8	4.8		A45.0	0.7	4.9		B25.0	0.6	5.0
A 7.5	0.7	4.9		A46.0	0.8	4.8		B26.0	0.6	5.0
A 8.5	0.6	5.0		A47.0	0.6	5.0		B26.5	0.4	5.2
A10.0	0.7	4.9		A48.0	0.8	4.8		B27.0	0.6	5.0
A10.5	0.6	5.0		A49.0	0.8	4.8		B28.0	0.5	5.1
A11.5	0.6	5.0		A49.5	0.6	5.0		B28.5	0.5	5.1
A12.0	0.9	4.7		A50.0	0.6	5.0		B29.0	0.8	4.8
A13.0	0.8	4.8						B30.0	0.7	4.9
A13.5	0.6	5.0		B 0.0	0.8	4.8		B31.0	0.6	5.0
A15.0	0.6	5.0		B 1.0	0.7	4.9		B31.5	0.6	5.0
A16.0	0.7	4.9		B 2.0	0.5	5.1		B32.0	0.3	5.3
A16.5	0.4	5.2		B 2.5	0.6	5.0		B33.0	0.4	5.2
A17.0	0.6	5.0		B 3.0	0.4	5.2		B34.0	0.8	4.8
A18.0	0.6	5.0		B 4.0	0.7	4.9		B34.5	0.7	4.9
A19.0	0.5	5.1		B 4.5	0.8	4.8		B35.5	0.6	5.0
A20.0	0.6	5.0		B 5.0	0.5	5.1		B36.0	0.4	5.2
A21.0	0.7	4.9		B 5.5	0.6	5.0		B36.5	0.3	5.3
A21.5	0.7	4.9		B 6.0	0.5	5.1		B37.0	0.6	5.0
A22.5	0.4	5.2		B 8.0	0.5	5.1		B38.5	0.7	4.9
A24.0	0.6	5.0		B 8.5	0.4	5.2		B39.0	0.5	5.1
A24.5	0.5	5.1		B 9.0	0.6	5.0		B40.0	0.5	5.1
A25.0	0.8	4.8		B 9.5	0.6	5.0		B41.0	0.7	4.9
A26.0	0.7	4.9		B10.0	0.4	5.2		B42.0	0.5	5.1
A26.5	0.5	5.1		B11.0	0.4	5.2		B42.5	0.7	4.9
A27.0	0.7	4.9		B11.5	0.6	5.0		B43.5	0.7	4.9
A27.5	0.7	4.9		B12.0	0.4	5.2		B44.0	0.6	5.0
A28.0	0.4	5.2		B13.0	0.5	5.1		B45.0	0.7	4.9
A29.0	0.6	5.0		B14.0	0.5	5.1		B45.5	0.7	4.9
A30.0	0.7	4.9		B14.5	0.3	5.3		B46.0	0.5	5.1
A30.5	0.5	5.1		B15.0	0.6	5.0		B46.5	0.5	5.1
A32.0	0.8	4.8		B15.5	0.3	5.3		B47.0	0.7	4.9
A33.0	0.5	5.1		B16.0	0.4	5.2		B48.0	0.6	5.0
A34.0	0.7	4.9		B16.5	0.6	5.0		B48.5	0.6	5.0
A35.0	0.8	4.8		B18.0	0.4	5.2		B49.0	0.7	4.9
A36.0	0.8	4.8		B19.0	0.6	5.0		B50.0	0.4	5.2

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. F-8 (Cont'd) Date _____
Location _____
Profile Bearing _____
Surveyed by _____

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
C 0.0	0.1	5.5		C34.5	0.4	5.2		D19.5	0.5	5.1
C 1.0	0.3	5.3		C35.0	0.7	4.9		D20.0	0.2	5.4
C 2.0	0.4	5.2		C36.0	0.4	5.2		D21.0	0.3	5.3
C 3.0	0.5	5.1		C37.0	0.5	5.1		D22.0	0.5	5.1
C 4.0	0.5	5.1		C38.0	0.3	5.3		D23.0	0.5	5.1
C 4.5	0.3	5.3		C39.0	0.5	5.1		D24.0	0.6	5.0
C 5.0	0.5	5.1		C39.5	0.6	5.0		D25.0	0.4	5.2
C 5.5	0.5	5.1		C40.5	0.2	5.4		D25.5	0.3	5.3
C 6.0	0.3	5.3		C41.5	0.3	5.3		D26.0	0.7	4.9
C 7.0	0.5	5.1		C42.0	0.5	5.1		D27.0	0.5	5.1
C 8.0	0.3	5.3		C44.0	0.5	5.1		D28.0	0.5	5.1
C 9.0	0.2	5.4		C44.5	0.2	5.4		D29.0	0.4	5.2
C10.0	0.4	5.2		C45.5	0.3	5.3		D30.0	0.6	5.0
C11.0	0.5	5.1		C46.0	0.6	5.0		D31.0	0.5	5.1
C11.5	0.1	5.5		C47.0	0.5	5.1		D32.0	0.2	5.4
C12.0	0.1	5.5		C48.0	0.5	5.1		D33.0	0.3	5.3
C12.5	0.5	5.1		C49.0	0.8	4.8		D34.0	0.5	5.1
C13.0	0.3	5.3		C49.5	0.5	5.1		D34.5	0.4	5.2
C14.0	0.2	5.4		C50.0	0.5	5.1		D35.5	0.3	5.3
C15.0	0.5	5.1						D36.5	0.6	5.0
C16.0	0.2	5.4		D 0.0	0.2	5.4		D37.0	0.3	5.3
C17.0	0.5	5.1		D 1.0	0.2	5.4		D38.5	0.3	5.3
C18.0	0.3	5.3		D 2.0	0.3	5.3		D39.0	0.5	5.1
C18.5	0.2	5.4		D 2.5	0.5	5.1		D39.5	0.3	5.3
C19.0	0.4	5.2		D 3.0	0.1	5.5		D40.0	0.3	5.3
C20.0	0.3	5.3		D 4.0	0.2	5.4		D40.5	0.7	4.9
C21.0	0.3	5.3		D 5.0	0.3	5.3		D42.0	0.5	5.1
C22.0	0.5	5.1		D 5.5	0.4	5.2		D42.5	0.3	5.3
C23.0	0.4	5.2		D 7.0	0.3	5.3		D43.5	0.5	5.1
C24.0	0.7	4.9		D 8.0	0.4	5.2		D44.0	0.4	5.2
C25.0	0.4	5.2		D 9.0	0.3	5.3		D45.0	0 4	5.2
C26.0	0.3	5.3		D10.0	0.0	5.6		D46.0	0.5	5.1
C27.0	0.3	5.3		D11.0	0.4	5.2		D47.0	0.4	5.2
C28.0	0.5	5.1		D12.0	0.6	5.0		D48.0	0.5	5.1
C28.5	0.6	5.0		D13.0	0.5	5.1		D48.5	0.3	5.3
C29.5	0.4	5.2		D14.0	0.4	5.2		D49.5	0.4	5.2
C30.0	0.5	5.1		D15.0	0.2	5.4		D50.0	0.6	5.0
C31.0	0.6	5.0		D15.5	0.1	5.5				
C31.5	0.3	5.3		D16.0	0.3	5.3				
C32.0	0.4	5.2		D17.0	0.3	5.3				
C33.0	0.7	4.9		D18.0	0.2	5.4				
C34.0	0.4	5.2		D19.0	0.4	5.2				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. L-1 Date 22 January 1962
Location Warren County, Miss.
Profile Bearing N 50° E
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.9	5.6		B 8.0	0.9	5.6		C15.0	0.7	5.8
A 1.0	0.9	5.6		B 9.0	0.8	5.7		C16.0	0.6	5.9
A 2.0	0.9	5.6		B10.0	0.8	5.7		C18.0	0.6	5.9
A 3.0	0.9	5.6		B11.0	0.7	5.8		C19.0	0.6	5.9
A 4.0	0.8	5.7		B13.0	0.7	5.8		C20.0	0.5	6.0
A 5.0	0.8	5.7		B14.0	0.7	5.8		C21.0	0.6	5.9
A 6.0	0.8	5.7		B15.0	0.6	5.9		C22.0	0.6	5.9
A 8.0	0.8	5.7		B16.0	0.6	5.9		C24.0	0.5	6.0
A 9.0	0.7	5.8		B17.0	0.7	5.8		C26.0	0.5	6.0
A10.0	0.7	5.8		B18.0	0.7	5.8		C28.0	0.5	6.0
A12.0	0.7	5.8		B19.0	0.6	5.9		C29.0	0.5	6.0
A13.0	0.7	5.8		B20.0	0.5	6.0		C30.0	0.4	6.1
A14.0	0.7	5.8		B22.0	0.5	6.0		C32.0	0.4	6.1
A16.0	0.6	5.9		B24.0	0.5	6.0		C34.0	0.4	6.1
A18.0	0.6	5.9		B26.0	0.5	6.0		C36.0	0.3	6.2
A20.0	0.5	6.0		B27.0	0.4	6.1		C38.0	0.3	6.2
A21.0	0.4	6.1		B29.0	0.4	6.1		C39.0	0.2	6.3
A22.0	0.3	6.2		B32.0	0.4	6.1		C41.0	0.2	6.3
A23.0	0.4	6.1		B33.0	0.3	6.2		C44.0	0.2	6.3
A24.0	0.4	6.1		B34.0	0.3	6.2		C46.0	0.1	6.4
A25.0	0.4	6.1		B35.0	0.2	6.3		C48.0	0.1	6.4
A26.0	0.4	6.1		B37.0	0.2	6.3		C50.0	0.0	6.5
A27.0	0.4	6.1		B39.0	0.2	6.3				
A28.0	0.4	6.1		B41.0	0.2	6.3		D 0.0	0.9	5.6
A29.0	0.4	6.1		B42.0	0.2	6.3		D 1.0	0.9	5.6
A30.0	0.4	6.1		B43.0	0.1	6.4		D 2.0	1.0	5.5
A32.0	0.4	6.1		B45.0	0.1	6.4		D 4.0	1.0	5.5
A34.0	0.4	6.1		B46.0	0.1	6.4		D 5.0	0.9	5.6
A36.0	0.4	6.1		B47.0	0.0	6.5		D 6.0	0.9	5.6
A38.0	0.3	6.2		B48.0	0.0	6.5		D 8.0	0.8	5.7
A40.0	0.3	6.2		B50.0	0.0	6.5		D10.0	0.9	5.6
A42.0	0.2	6.3						D12.0	0.8	5.7
A44.0	0.1	6.4		C 0.0	1.0	5.5		D14.0	0.7	5.8
A46.0	0.1	6.4		C 1.0	0.9	5.6		D16.0	0.7	5.8
A48.0	0.1	6.4		C 2.0	0.9	5.6		D18.0	0.7	5.8
A50.0	0.1	6.4		C 3.0	0.7	5.8		D20.0	0.6	5.9
				C 4.0	1.0	5.5		D22.0	0.6	5.9
B 0.0	1.0	5.5		C 6.0	1.0	5.5		D23.0	0.5	6.0
B 2.0	1.0	5.5		C 8.0	0.8	5.7		D24.0	0.6	5.9
B 3.0	0.9	5.6		C10.0	0.8	5.7		D25.0	0.5	6.0
B 5.0	0.9	5.6		C12.0	0.7	5.8		D26.0	0.5	6.0
B 7.0	0.9	5.6		C14.0	0.7	5.8		D28.0	0.4	6.1

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. L-1 (Cont'd) Date _____
Location _____
Profile Bearing _____
Surveyed by _____

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
D30.0	0.4	6.1								
D32.0	0.4	6.1								
D33.0	0.3	6.2								
D35.0	0.3	6.2								
D37.0	0.3	6.2								
D39.0	0.3	6.2								
D40.0	0.2	6.3								
D42.0	0.2	6.3								
D44.0	0.1	6.4								
D45.0	0.1	6.4								
D46.0	0.2	6.3								
D48.0	0.2	6.3								
D49.0	0.1	6.4								
D50.0	0.1	6.4								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. L-3 and L-4 Date 29 January 1962
Location Warren County, Miss.
Profile Bearing N 50° E
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	2.5	6.0		B30.0	1.0	7.5		D 0.0	3.1	5.4
A 2.0	2.4	6.1		B32.0	1.3	7.2		D 2.0	3.1	5.4
A 4.0	2.3	6.2		B34.0	1.1	7.4		D 4.0	2.7	5.8
A 6.0	2.2	6.3		B36.0	0.9	7.6		D 6.0	2.6	5.9
A 8.0	2.2	6.3		B38.0	0.8	7.7		D 8.0	2.6	5.9
A10.0	1.8	6.7		B40.0	1.1	7.4		D10.0	2.6	5.9
A12.0	1.6	6.9		B41.0	1.3	7.2		D12.0	2.5	6.0
A14.0	1.5	7.0		B42.0	1.3	7.2		D14.0	2.4	6.1
A16.0	1.7	6.8		B44.0	1.0	7.5		D16.0	2.3	6.2
A18.0	1.4	7.1		B46.0	0.6	7.9		D18.0	2.2	6.3
A20.0	1.4	7.1		B48.0	0.3	8.2		D20.0	2.4	6.1
A22.0	1.2	7.3		B50.0	0.2	8.3		D22.0	2.4	6.1
A24.0	1.2	7.3						D24.0	2.3	6.2
A26.0	1.1	7.4		C 0.0	2.9	5.6		D26.0	2.1	6.4
A28.0	1.1	7.4		C 2.0	2.9	5.6		D28.0	2.0	6.5
A30.0	0.9	7.6		C 4.0	2.7	5.8		D30.0	2.0	6.5
A32.0	0.9	7.6		C 6.0	2.5	6.0		D32.0	1.8	6.7
A34.0	1.2	7.3		C 8.0	2.4	6.1		D34.0	1.8	6.7
A36.0	1.3	7.2		C10.0	2.5	6.0		D36.0	1.6	6.9
A38.0	1.2	7.3		C12.0	2.5	6.0		D38.0	1.3	7.2
A40.0	0.7	7.8		C14.0	2.4	6.1		D40.0	1.4	7.1
A42.0	0.3	8.2		C16.0	2.3	6.2		D42.0	1.0	7.5
A44.0	0.2	8.3		C18.0	2.1	6.4		D44.0	1.3	7.2
A46.0	0.0	8.5		C20.0	1.9	6.6		D46.0	1.1	7.4
A48.0	0.1	8.4		C22.0	1.9	6.6		D48.0	0.9	7.6
A50.0	0.2	8.3		C24.0	1.9	6.6		D50.0	0.9	7.6
				C26.0	1.5	7.0				
B 0.0	2.5	6.0		C28.0	1.5	7.0				
B 2.0	2.6	5.9		C30.0	1.4	7.1				
B 4.0	2.5	6.0		C32.0	1.2	7.3				
B 6.0	2.5	6.0		C34.0	1.4	7.1				
B 8.0	2.4	6.1		C36.0	1.0	7.5				
B10.0	2.3	6.2		C38.0	1.3	7.2				
B12.0	2.1	6.4		C40.0	1.0	7.5				
B14.0	2.0	6.5		C42.0	0.8	7.7				
B16.0	2.1	6.4		C43.0	0.8	7.7				
B18.0	1.9	6.6		C44.0	0.9	7.6				
B20.0	1.5	7.0		C46.0	1.3	7.2				
B22.0	1.6	6.9		C48.0	1.4	7.1				
B24.0	1.4	7.1		C50.0	1.1	7.4				
B26.0	1.2	7.3								
B28.0	1.4	7.1								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. L-5 Date 24 January 1962
Location Warren County, Miss.
Profile Bearing N 180° E
Surveyed by Broughton and Saucier

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	1.1	2.1		C12.0	1.3	1.9				
A 3.0	1.0	2.2		C15.0	1.2	2.0				
A 6.0	1.0	2.2		C18.0	1.2	2.0				
A 9.0	0.9	2.3		C21.0	1.2	2.0				
A12.0	0.9	2.3		C24.0	1.1	2.1				
A15.0	0.8	2.4		C27.0	1.0	2.2				
A18.0	0.8	2.4		C30.0	1.0	2.2				
A21.0	0.8	2.4		C33.0	0.9	2.3				
A24.0	0.8	2.4		C36.0	0.8	2.4				
A27.0	0.8	2.4		C39.0	0.8	2.4				
A30.0	0.7	2.5		C42.0	0.7	2.5				
A33.0	0.7	2.5		C45.0	0.6	2.6				
A36.0	0.7	2.5		C48.0	0.6	2.6				
A39.0	0.6	2.6		C50.0	0.5	2.7				
A42.0	0.6	2.6								
A45.0	0.6	2.6		D 0.0	1.2	2.0				
A48.0	0.6	2.6		D 3.0	1.2	2.0				
A50.0	0.6	2.6		D 6.0	1.1	2.1				
				D 9.0	1.0	2.2				
B 0.0	1.5	1.7		D12.0	0.9	2.3				
B 3.0	1.5	1.7		D15.0	0.9	2.3				
B 6.0	1.5	1.7		D18.0	0.9	2.3				
B 9.0	1.4	1.8		D21.0	0.8	2.4				
B12.0	1.4	1.8		D24.0	0.8	2.4				
B15.0	1.3	1.9		D27.0	0.8	2.4				
B18.0	1.3	1.9		D30.0	0.6	2.6				
B21.0	1.2	2.0		D33.0	0.5	2.7				
B24.0	1.2	2.0		D36.0	0.4	2.8				
B27.0	1.1	2.1		D39.0	0.3	2.9				
B30.0	1.0	2.2		D42.0	0.2	3.0				
B33.0	1.0	2.2		D45.0	0.1	3.1				
B36.0	0.8	2.4		D48.0	0.1	3.1				
B39.0	0.8	2.4		D50.0	0.0	3.2				
B42.0	0.8	2.4								
B45.0	0.7	2.5								
B48.0	0.7	2.5								
B50.0	0.6	2.6								
C 0.0	1.6	1.6								
C 3.0	1.5	1.7								
C 6.0	1.4	1.8								
C 9.0	1.4	1.8								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. L-6 Date 9 March 1962
Location Warren County, Miss.
Profile Bearing N 12° E
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.8	4.13		B27.0	1.1	3.75		C50.0	0.8	4.13
A 1.0	0.7	4.18		B28.0	1.2	3.73				
A 7.0	0.7	4.19		B32.0	1.2	3.71		D 0.0	2.2	2.19
A 8.0	0.8	4.13		B33.0	1.1	3.74		D 6.0	2.2	2.70
A 9.0	0.7	4.15		B34.0	1.0	3.85		D 7.0	2.1	2.78
A10.0	0.8	4.11		B36.0	1.0	3.93		D 8.0	2.2	2.72
A11.0	0.8	4.09		B37.0	0.9	3.97		D 9.0	2.2	2.73
A12.0	0.9	4.02		B39.0	0.9	4.03		D10.0	2.1	2.75
A13.0	0.8	4.09		B40.0	0.8	4.05		D15.0	2.1	2.76
A16.0	0.8	4.10		B42.0	0.8	4.12		D16.0	2.2	2.73
A17.0	0.7	4.14		B43.0	0.7	4.17		D18.0	2.2	2.71
A30.0	0.7	4.23		B46.0	0.7	4.23		D19.0	2.1	2.80
A31.0	0.6	4.27		B47.0	0.6	4.25		D22.0	2.1	2.80
A33.0	0.6	4.33		B48.0	0.5	4.34		D23.0	2.0	2.85
A34.0	0.5	4.41		B50.0	0.5	4.43		D29.0	2.0	2.90
A35.0	0.4	4.44						D30.0	1.9	2.94
A36.0	0.4	4.47		C 0.0	1.8	3.11		D34.0	1.9	3.03
A37.0	0.3	4.55		C 5.0	1.8	3.11		D35.0	1.8	3.04
A39.0	0.3	4.60		C 6.0	1.7	3.15		D37.0	1.8	3.11
A40.0	0.2	4.64		C 7.0	1.8	3.12		D38.0	1.7	3.16
A44.0	0.2	4.72		C 8.0	1.7	3.15		D40.0	1.7	3.23
A45.0	0.1	4.77		C13.0	1.7	3.19		D41.0	1.6	3.30
A47.0	0.1	4.82		C14.0	1.8	3.08		D42.0	1.6	3.31
A48.0	0.0	4.85		C17.0	1.8	3.13		D43.0	1.5	3.35
A50.0	0.0	4.87		C18.0	1.7	3.16		D44.0	1.4	3.44
				C23.0	1.7	3.22		D46.0	1.4	3.52
B 0.0	1.2	3.68		C24.0	1.6	3.26		D47.0	1.3	3.57
B 6.0	1.2	3.71		C30.0	1.6	3.27		D48.0	1.3	3.61
B 7.0	1.1	3.74		C31.0	1.5	3.35		D49.0	1.2	3.68
B 8.0	1.2	3.72		C34.0	1.5	3.38		D50.0	1.2	3.74
B 9.0	1.1	3.75		C35.0	1.4	3.44				
B10.0	1.2	3.71		C37.0	1.4	3.51				
B12.0	1.2	3.65		C38.0	1.3	3.56				
B13.0	1.3	3.59		C40.0	1.3	3.63				
B14.0	1.2	3.66		C41.0	1.2	3.66				
B15.0	1.3	3.61		C43.0	1.2	3.73				
B18.0	1.3	3.62		C44.0	1.1	3.76				
B19.0	1.2	3.64		C45.0	1.1	3.81				
B20.0	1.3	3.63		C46.0	1.0	3.86				
B21.0	1.2	3.65		C47.0	1.0	3.93				
B25.0	1.2	3.73		C48.0	0.9	4.00				
B26.0	1.1	3.75		C49.0	0.8	4.05				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-1 Date 9 March 1962
Location Warren County, Miss.
Profile Bearing N 02° E
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	1.7	3.11		A50.0	0.0	4.79		B45.0	0.5	4.30
A 1.0	1.8	3.02						B46.0	0.4	4.37
A 2.0	1.8	3.02		B 0.0	1.5	3.26		B47.0	0.4	4.38
A 3.0	1.7	3.14		B 1.0	1.2	3.61		B49.0	0.2	4.59
A 4.0	1.4	3.40		B 2.0	1.4	3.39		B50.0	0.4	4.41
A 5.0	1.6	3.22		B 3.0	1.4	3.41				
A 7.0	1.4	3.36		B 4.0	1.7	3.13		C 0.0	1.7	3.11
A 8.0	1.2	3.58		B 5.0	1.5	3.27		C 1.0	1.7	3.07
A 9.0	1.1	3.67		B 6.0	1.7	3.13		C 2.0	1.9	2.92
A10.0	1.4	3.41		B 7.0	1.1	3.68		C 3.0	1.6	3.25
A11.0	1.1	3.71		B 8.0	1.2	3.62		C 4.0	1.8	3.05
A12.0	1.3	3.46		B 9.0	1.2	3.64		C 5.0	1.5	3.35
A14.0	1.1	3.71		B10.0	1.3	3.52		C 6.0	1.5	3.29
A15.0	1.2	3.60		B11.0	1.3	3.46		C 7.0	1.6	3.19
A16.0	1.2	3.59		B12.0	1.2	3.59		C 8.0	1.8	3.03
A17.0	1.0	3.77		B13.0	1.3	3.50		C 9.0	1.7	3.13
A18.0	1.0	3.84		B14.0	1.1	3.74		C10.0	1.5	3.29
A19.0	1.2	3.63		B15.0	1.5	3.30		C12.0	1.5	3.34
A20.0	1.1	3.75		B17.0	1.3	3.48		C13.0	1.4	3.43
A22.0	1.1	3.74		B18.0	1.3	3.47		C17.0	1.4	3.42
A23.0	1.0	3.79		B19.0	1.1	3.66		C18.0	1.0	3.79
A24.0	1.0	3.81		B20.0	1.3	3.51		C19.0	1.3	3.50
A25.0	0.8	3.97		B23.0	1.0	3.78		C20.0	1.3	3.49
A26.0	1.1	3.72		B24.0	1.0	3.80		C21.0	0.9	3.86
A27.0	1.0	3.77		B25.0	1.1	3.67		C22.0	1.0	3.78
A28.0	1.2	3.62		B26.0	1.0	3.76		C23.0	0.9	3.89
A29.0	0.9	3.89		B28.0	1.0	3.81		C24.0	1.2	3.65
A30.0	1.0	3.85		B29.0	0.8	4.02		C25.0	1.0	3.80
A32.0	1.4	3.41		B30.0	0.8	3.96		C26.0	1.2	3.65
A34.0	1.0	3.85		B31.0	0.6	4.18		C27.0	1.3	3.52
A36.0	0.8	4.02		B32.0	0.9	3.86		C28.0	1.0	3.83
A37.0	0.8	4.00		B33.0	1.0	3.79		C32.0	1.0	3.83
A38.0	0.7	4.11		B35.0	0.8	3.96		C34.0	0.8	4.00
A40.0	0.7	4.07		B36.0	0.8	4.00		C36.0	0.8	4.00
A41.0	0.6	4.22		B37.0	0.7	4.10		C37.0	0.5	4.34
A42.0	0.6	4.22		B38.0	0.8	3.93		C38.0	0.7	4.12
A43.0	0.4	4.42		B39.0	0.5	4.27		C39.0	0.7	4.11
A44.0	0.6	4.25		B40.0	0.5	4.35		C40.0	0.6	4.16
A46.0	0.6	4.16		B41.0	0.4	4.40		C42.0	0.6	4.24
A47.0	0.5	4.32		B42.0	0.5	4.30		C43.0	0.5	4.34
A48.0	0.2	4.60		B43.0	0.3	4.50		C44.0	0.5	4.32
A49.0	0.0	4.80		B44.0	0.3	4.46		C45.0	0.6	4.19

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-1 (Cont'd) Date _____
Location _____
Profile Bearing _____
Surveyed by _____

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
C46.0	0.6	4.17		D50.0	0.5	4.26				
C47.0	0.7	4.13								
C48.0	0.5	4.31								
C49.0	0.4	4.45								
C50.0	0.6	4.22								
D 0.0	2.1	2.68								
D 3.0	1.8	3.04								
D 4.0	1.6	3.18								
D 5.0	1.8	3.04								
D 6.0	1.5	3.30								
D 7.0	1.6	3.25								
D 8.0	1.4	3.39								
D11.0	1.7	3.10								
D12.0	1.9	2.92								
D13.0	1.8	2.96								
D14.0	1.6	3.23								
D15.0	1.5	3.28								
D17.0	1.5	3.32								
D18.0	1.6	3.24								
D21.0	1.3	3.54								
D22.0	1.3	3.46								
D23.0	1.4	3.37								
D24.0	1.2	3.63								
D25.0	1.3	3.54								
D26.0	1.0	3.80								
D27.0	1.0	3.85								
D28.0	1.1	3.69								
D29.0	1.0	3.76								
D30.0	0.8	4.00								
D31.0	1.1	3.69								
D33.0	1.1	3.66								
D34.0	0.9	3.95								
D35.0	0.9	3.88								
D36.0	0.8	3.99								
D39.0	0.8	4.02								
D42.0	0.5	4.35								
D43.0	0.6	4.17								
D44.0	0.3	4.47								
D45.0	0.5	4.33								
D46.0	0.5	4.32								
D48.0	0.3	4.47								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-3 Date 7 March 1962
Location Warren County, Miss.
Profile Bearing N 00° E
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.3	4.59		B14.0	0.2	4.71		C46.0	0.2	4.60
A 1.0	0.3	4.52		B15.0	0.0	4.86		C47.0	0.3	4.55
A 2.0	0.4	4.49		B16.0	0.2	4.68		C50.0	0.3	4.57
A 3.0	0.3	4.60		B17.0	0.2	4.67				
A 4.0	0.2	4.62		B18.0	0.1	4.73		D 0.0	0.4	4.49
A 5.0	0.2	4.68		B19.0	0.1	4.73		D 1.0	0.3	4.57
A 6.0	0.1	4.74		B20.0	0.2	4.71		D 5.0	0.3	4.53
A 7.0	0.2	4.79		B21.0	0.1	4.74		D 6.0	0.2	4.68
A 8.0	0.0	4.82		B22.0	0.2	4.69		D10.0	0.2	4.69
A 9.0	0.1	4.79		B23.0	0.3	4.61		D11.0	0.1	4.76
A10.0	0.1	4.76		B24.0	0.1	4.80		D12.0	0.3	4.53
A11.0	0.2	4.71		B27.0	0.1	4.76		D13.0	0.4	4.51
A12.0	0.1	4.75		B28.0	0.2	4.70		D14.0	0.3	4.53
A14.0	0.1	4.79		B33.0	0.2	4.68		D15.0	0.1	4.75
A15.0	0.0	4.83		B34.0	0.1	4.75		D16.0	0.2	4.69
A17.0	0.0	4.86		B35.0	0.2	4.68		D17.0	0.2	4.71
A18.0	0.1	4.75		B36.0	0.1	4.73		D18.0	0.1	4.72
A23.0	0.1	4.77		B37.0	0.2	4.66		D19.0	0.2	4.69
A24.0	0.2	4.70		B39.0	0.2	4.68		D25.0	0.2	4.68
A31.0	0.2	4.70		B40.0	0.1	4.72		D26.0	0.4	4.46
A32.0	0.3	4.60		B41.0	0.2	4.66		D27.0	0.3	4.59
A33.0	0.2	4.62		B48.0	0.2	4.63		D31.0	0.3	4.59
A34.0	0.1	4.73		B49.0	0.1	4.75		D32.0	0.2	4.62
A35.0	0.3	4.54		B50.0	0.2	4.70		D37.0	0.2	4.63
A37.0	0.3	4.54						D38.0	0.3	4.56
A38.0	0.2	4.62		C 0.0	0.4	4.50		D39.0	0.3	4.54
A42.0	0.2	4.64		C 1.0	0.3	4.59		D40.0	0.4	4.46
A43.0	0.1	4.83		C 3.0	0.3	4.60		D41.0	0.3	4.54
A46.0	0.1	4.74		C 4.0	0.2	4.63		D44.0	0.3	4.57
A47.0	0.2	4.71		C11.0	0.2	4.68		D45.0	0.2	4.62
A48.0	0.2	4.69		C12.0	0.1	4.73		D46.0	0.2	4.62
A49.0	0.1	4.77		C13.0	0.0	4.85		D47.0	0.3	4.60
A50.0	0.2	4.69		C14.0	0.1	4.76		D49.0	0.3	4.55
				C18.0	0.1	4.74		D50.0	0.4	4.50
B 0.0	0.2	4.64		C19.0	0.2	4.68				
B 4.0	0.2	4.69		C24.0	0.2	4.66				
B 5.0	0.1	4.73		C25.0	0.1	4.72				
B 6.0	0.2	4.70		C26.0	0.2	4.70				
B 8.0	0.2	4.69		C37.0	0.2	4.65				
B 9.0	0.1	4.73		C38.0	0.3	4.61				
B10.0	0.1	4.74		C39.0	0.3	4.61				
B11.0	0.2	4.68		C40.0	0.2	4.65				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-4 Date 7 March 1962
Location Warren County, Miss.
Profile Bearing N 02° E
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	1.3	3.82		B 3.0	1.4	3.79		C 8.0	1.7	3.45
A 2.0	1.3	3.87		B 4.0	1.3	3.80		C 9.0	1.6	3.50
A 3.0	1.2	3.94		B 9.0	1.3	3.80		C10.0	1.5	3.63
A 7.0	1.2	3.93		B10.0	1.4	3.73		C11.0	1.5	3.66
A 8.0	1.3	3.85		B11.0	1.4	3.74		C12.0	1.4	3.71
A 9.0	1.3	3.83		B12.0	1.3	3.83		C14.0	1.4	3.77
A10.0	1.2	3.90		B13.0	1.3	3.88		C15.0	1.3	3.80
A13.0	1.2	3.94		B14.0	1.2	3.92		C16.0	1.2	3.98
A14.0	1.0	4.03		B15.0	1.2	3.93		C17.0	1.0	4.11
A16.0	1.0	4.13		B16.0	1.1	4.04		C19.0	1.0	4.17
A17.0	0.8	4.35		B17.0	1.0	4.19		C20.0	0.9	4.20
A18.0	0.7	4.45		B18.0	0.9	4.22		C22.0	0.9	4.22
A19.0	0.7	4.46		B19.0	0.8	4.32		C23.0	1.1	4.08
A20.0	0.6	4.54		B20.0	0.7	4.41		C24.0	1.0	4.11
A22.0	0.6	4.56		B23.0	0.7	4.44		C25.0	1.1	4.05
A23.0	0.5	4.60		B24.0	0.8	4.38		C28.0	1.1	4.04
A24.0	0.5	4.61		B25.0	0.9	4.27		C29.0	1.0	4.11
A25.0	0.6	4.59		B26.0	0.8	4.36		C32.0	1.0	4.14
A29.0	0.6	4.55		B27.0	0.9	4.27		C33.0	0.9	4.24
A30.0	0.5	4.60		B28.0	0.8	4.33		C34.0	0.7	4.44
A31.0	0.6	4.57		B29.0	0.8	4.35		C35.0	0.7	4.43
A32.0	0.5	4.66		B30.0	0.9	4.29		C36.0	0.6	4.50
A34.0	0.5	4.68		B31.0	0.7	4.43		C37.0	0.5	4.66
A35.0	0.4	4.73		B33.0	0.7	4.48		C38.0	0.5	4.69
A36.0	0.4	4.79		B34.0	0.6	4.50		C39.0	0.4	4.70
A37.0	0.2	4.98		B35.0	0.7	4.49		C42.0	0.4	4.70
A38.0	0.1	5.01		B36.0	0.6	4.54		C43.0	0.5	4.64
A39.0	0.1	5.08		B37.0	0.4	4.74		C45.0	0.5	4.61
A40.0	0.0	5.11		B38.0	0.5	4.66		C46.0	0.6	4.59
A42.0	0.0	5.14		B39.0	0.3	4.82		C48.0	0.6	4.56
A43.0	0.2	4.96		B40.0	0.2	4.91		C49.0	0.4	4.70
A44.0	0.1	5.00		B45.0	0.2	4.93		C50.0	0.4	4.73
A45.0	0.3	4.89		B46.0	0.3	4.89				
A46.0	0.2	4.99		B47.0	0.2	4.90		D 0.0	1.8	3.33
A47.0	0.3	4.81		B48.0	0.3	4.85		D 1.0	1.7	3.40
A48.0	0.3	4.86		B49.0	0.3	4.86		D 2.0	1.7	3.47
A49.0	0.2	4.93		B50.0	0.4	4.79		D 3.0	1.6	3.50
A50.0	0.2	4.93						D 4.0	1.6	3.52
				C 0.0	1.6	3.54		D 5.0	1.7	3.43
B 0.0	1.7	3.40		C 3.0	1.6	3.50		D 6.0	1.8	3.39
B 1.0	1.7	3.48		C 4.0	1.8	3.33		D 7.0	1.7	3.45
B 2.0	1.6	3.58		C 5.0	1.7	3.42		D 8.0	1.7	3.45

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-4 (Cont'd) Date _____
Location _____
Profile Bearing _____
Surveyed by _____

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
D 9.0	1.6	3.51								
D11.0	1.6	3.52								
D12.0	1.5	3.62								
D13.0	1.5	3.60								
D14.0	1.3	3.81								
D15.0	1.2	3.93								
D18.0	1.2	3.99								
D19.0	1.1	4.02								
D20.0	1.1	4.00								
D21.0	1.3	3.89								
D27.0	1.3	3.88								
D28.0	1.2	3.97								
D30.0	1.2	3.97								
D31.0	1.0	4.16								
D32.0	0.9	4.20								
D33.0	0.9	4.27								
D34.0	0.8	4.34								
D35.0	0.8	4.37								
D36.0	0.7	4.45								
D37.0	0.7	4.49								
D38.0	0.6	4.50								
D39.0	0.6	4.50								
D40.0	0.8	4.36								
D45.0	0.8	4.38								
D46.0	0.7	4.43								
D47.0	0.8	4.37								
D48.0	0.6	4.52								
D49.0	0.7	4.43								
D50.0	0.7	4.47								

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-5 Date 7 March 1962
Location Warren County, Miss.
Profile Bearing N 58° W
Surveyed by Shamburger and Woods

Grid Point	El	RR*		Grid Point	El	RR*		Grid Point	El	RR*
A 0.0	0.5	4.35		B19.0	0.2	4.63		C41.0	0.2	4.71
A 3.0	0.5	4.42		B20.0	0.3	4.59		C43.0	0.2	4.72
A 4.0	0.4	4.46		B21.0	0.2	4.63		C44.0	0.1	4.77
A 8.0	0.4	4.50		B25.0	0.2	4.67		C46.0	0.1	4.74
A 9.0	0.3	4.54		B26.0	0.1	4.74		C47.0	0.2	4.71
A17.0	0.3	4.60		B27.0	0.2	4.69		C50.0	0.2	4.66
A18.0	0.2	4.65		B28.0	0.1	4.75				
A19.0	0.3	4.61		B29.0	0.1	4.76		D 0.0	0.5	4.36
A20.0	0.2	4.66		B30.0	0.2	4.65		D 3.0	0.5	4.40
A27.0	0.2	4.72		B32.0	0.2	4.66		D 4.0	0.4	4.44
A28.0	0.1	4.73		B33.0	0.1	4.73		D11.0	0.4	4.46
A29.0	0.2	4.68		B34.0	0.1	4.76		D12.0	0.3	4.56
A30.0	0.1	4.75		B35.0	0.2	4.70		D13.0	0.3	4.55
A31.0	0.2	4.72		B36.0	0.1	4.73		D14.0	0.4	4.52
A32.0	0.1	4.77		B37.0	0.2	4.69		D15.0	0.3	4.55
A35.0	0.1	4.80		B38.0	0.1	4.75		D18.0	0.3	4.62
A36.0	0.2	4.70		B39.0	0.1	4.74		D19.0	0.2	4.63
A37.0	0.2	4.72		B40.0	0.2	4.72		D26.0	0.2	4.63
A38.0	0.1	4.77		B41.0	0.1	4.74		D27.0	0.3	4.58
A43.0	0.1	4.79		B49.0	0.1	4.81		D28.0	0.2	4.68
A44.0	0.2	4.72		B50.0	0.0	4.85		D36.0	0.2	4.65
A45.0	0.2	4.70						D37.0	0.3	4.56
A46.0	0.0	4.84		C 0.0	0.5	4.35		D38.0	0.3	4.61
A47.0	0.0	4.87		C 3.0	0.5	4.37		D39.0	0.2	4.67
A48.0	0.1	4.82		C 4.0	0.4	4.44		D47.0	0.2	4.66
A49.0	0.0	4.83		C 5.0	0.3	4.56		D48.0	0.1	4.74
A50.0	0.1	4.82		C 6.0	0.4	4.49		D49.0	0.3	4.61
				C 8.0	0.4	4.46		D50.0	0.2	4.66
B 0.0	0.5	4.36		C 9.0	0.3	4.55				
B 1.0	0.4	4.43		C18.0	0.3	4.61				
B 2.0	0.5	4.42		C19.0	0.2	4.64				
B 3.0	0.5	4.41		C24.0	0.2	4.71				
B 4.0	0.4	4.45		C25.0	0.1	4.76				
B 9.0	0.4	4.48		C26.0	0.2	4.69				
B10.0	0.3	4.56		C27.0	0.3	4.62				
B11.0	0.3	4.55		C28.0	0.3	4.62				
B12.0	0.4	4.52		C29.0	0.2	4.68				
B13.0	0.3	4.61		C34.0	0.2	4.67				
B14.0	0.2	4.65		C35.0	0.3	4.61				
B15.0	0.3	4.59		C36.0	0.2	4.68				
B17.0	0.3	4.58		C39.0	0.2	4.68				
B18.0	0.2	4.63		C40.0	0.1	4.75				

* Rod reading.

MICROGEOMETRY DATA SHEET

Site No. M-6 Date 7 March 1962
Location Warren County, Miss.
Profile Bearing N 100 E
Surveyed by Shamburger and Woods

Grid Point	El	RR*	Grid Point	El	RR*	Grid Point	El	RR*
A 0.0	0.2	4.72	B 8.0	0.3	4.63	C38.0	0.3	4.65
A 4.0	0.2	4.69	B 9.0	0.4	4.55	C39.0	0.2	4.69
A 5.0	0.3	4.61	B10.0	0.3	4.59	C43.0	0.2	4.68
A 7.0	0.3	4.56	B11.0	0.3	4.57	C44.0	0.3	4.64
A 8.0	0.5	4.40	B12.0	0.5	4.42	C45.0	0.2	4.67
A 9.0	0.4	4.55	B13.0	0.2	4.66	C48.0	0.2	4.75
A10.0	0.3	4.64	B21.0	0.2	4.70	C49.0	0.1	4.76
A11.0	0.3	4.63	B22.0	0.3	4.65	C50.0	0.1	4.76
A12.0	0.2	4.67	B25.0	0.3	4.64			
A16.0	0.2	4.70	B26.0	0.2	4.70	D 0.0	0.0	4.90
A17.0	0.3	4.65	B33.0	0.2	4.66	D 1.0	0.1	4.84
A21.0	0.3	4.59	B34.0	0.3	4.65	D 3.0	0.1	4.83
A22.0	0.2	4.68	B35.0	0.2	4.70	D 4.0	0.0	4.88
A23.0	0.3	4.64	B41.0	0.2	4.75	D 5.0	0.1	4.85
A24.0	0.2	4.70	B42.0	0.1	4.79	D 8.0	0.1	4.77
A25.0	0.1	4.76	B47.0	0.1	4.80	D 9.0	0.2	4.75
A26.0	0.2	4.75	B48.0	0.2	4.73	D18.0	0.2	4.74
A28.0	0.2	4.75	B49.0	0.1	4.80	D19.0	0.1	4.78
A29.0	0.1	4.77	B50.0	0.1	4.76	D20.0	0.3	4.65
A30.0	0.2	4.74				D21.0	0.3	4.63
A31.0	0.2	4.75	C 0.0	0.3	4.63	D22.0	0.2	4.72
A32.0	0.3	4.65	C 1.0	0.4	4.54	D23.0	0.1	4.78
A33.0	0.2	4.69	C 2.0	0.2	4.66	D28.0	0.1	4.80
A35.0	0.2	4.68	C 3.0	0.1	4.76	D29.0	0.2	4.75
A36.0	0.3	4.59	C 4.0	0.2	4.71	D30.0	0.2	4.69
A37.0	0.2	4.74	C 6.0	0.2	4.68	D31.0	0.4	4.55
A38.0	0.2	4.71	C 7.0	0.3	4.65	D34.0	0.4	4.51
A39.0	0.1	4.80	C13.0	0.3	4.59	D35.0	0.3	4.59
A42.0	0.1	4.76	C14.0	0.2	4.71	D49.0	0.3	4.62
A43.0	0.2	4.75	C15.0	0.2	4.74	D50.0	0.2	4.69
A44.0	0.2	4.75	C16.0	0.3	4.64			
A45.0	0.3	4.64	C17.0	0.2	4.76			
A46.0	0.1	4.83	C18.0	0.1	4.79			
A48.0	0.1	4.85	C23.0	0.1	4.85			
A49.0	0.1	4.85	C24.0	0.0	4.88			
A50.0	0.0	4.89	C25.0	0.1	4.82			
			C26.0	0.2	4.73			
B 0.0	0.2	4.74	C28.0	0.2	4.74			
B 3.0	0.2	4.74	C29.0	0.3	4.61			
B 4.0	0.3	4.60	C35.0	0.3	4.56			
B 5.0	0.2	4.70	C36.0	0.4	4.50			
B 7.0	0.2	4.66	C37.0	0.4	4.49			

* Rod reading.