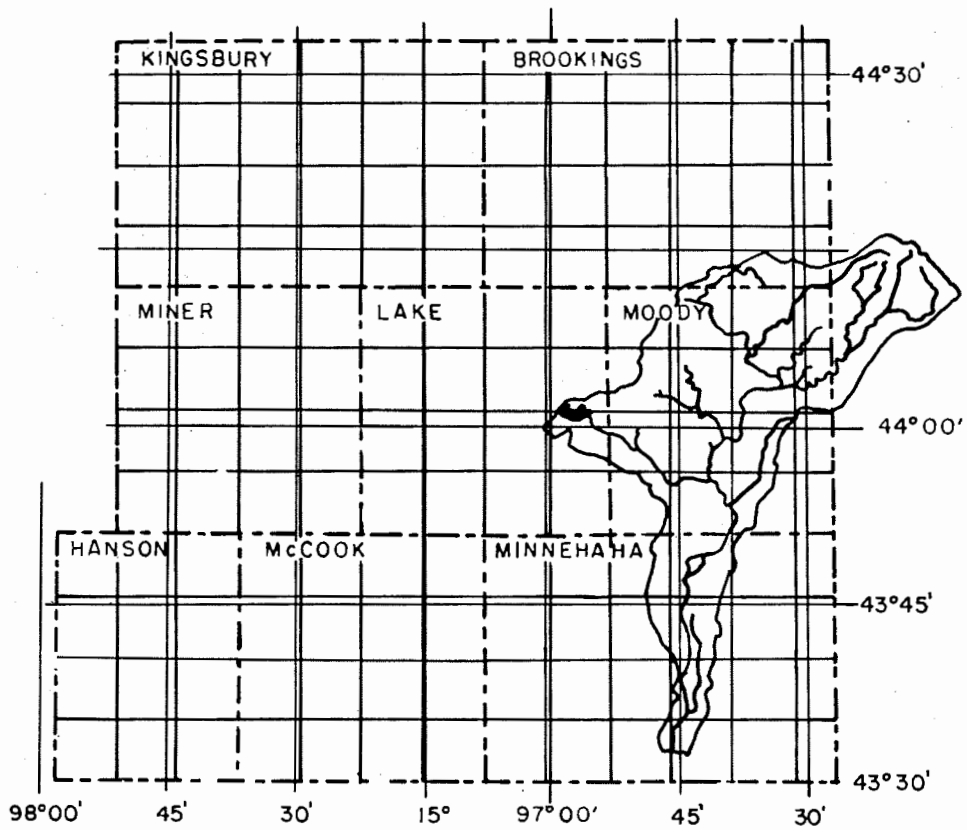
SOUTH DAKOTA GEOLOGICAL SURVEY
and
SOUTH DAKOTA WATER RESOURCES COMMISSION

Water Resources Report No. 5

BASIC HYDROLOGIC DATA, FOR A PART OF THE BIG SIOUX DRAINAGE BASIN EASTERN SOUTH DAKOTA



by
Michael J. Ellis and Donald G. Adolphson
U. S. Geological Survey

Science Center
University of South Dakota
Vermillion, South Dakota
1969

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TABLE OF CONTENTS

Page

Introduction..... 1

Well numbering system..... 1

Index of data collection points..... 4

Table 1. Logs of test holes and observation wells..... 9

Table 2. Measurements of water levels in observation wells..... 83

Table 3. Selected physical properties of unconsolidated materials..... 109

Table 4. Surface-water records..... 116

Table 5. Chemical analyses of water..... 118

Appendix I. Glossary of selected geologic and hydrologic terms..... 121

References Cited..... 124

ILLUSTRATIONS

Figure — Page

1. Data-collection points in project area..... 2
2. System of numbering data-collection points.... 3
3. Size-distribution curves for mechanical analyses of samples from data-collection points 52, 73, 86, and 124..... 112
4. Size-distribution curves for mechanical analyses of samples from data-collection points 164, 173, and 198..... 113
5. Size-distribution curves for mechanical analyses of samples from data-collection points 218, 243, and 287..... 114
6. Size-distribution curves for mechanical analyses of samples from data-collection points 303, 304, and 310..... 115

INTRODUCTION

This report is intended to serve two purposes: (1) to make basic hydrologic data available for planning and studying water resources development and (2) to supplement an interpretive report by M. J. Ellis, D. G. Adolphson, and R. E. West that describes the hydrology of the Big Sioux River drainage basin between Sioux Falls and the Moody-Brookings County line. The interpretive report will be published by the U. S. Geological Survey as Hydrologic Atlas HA311.

Data contained in this report were collected as part of an investigation of the hydrogeology of the glacial drift in selected drainage basins in eastern South Dakota. The investigation was made by the U. S. Geological Survey in cooperation with the South Dakota Geological Survey and the South Dakota Water Resources Commission from July 1963 to April 1967.

The combined data contained in the 5 tables of this report can be useful as a guide in locating and drilling a single well or in planning large-scale water-supply developments. The data, however, will be more useful if they are examined together with U. S. Geological Survey Hydrologic Atlas HA311.

An appendix entitled "Glossary of geologic and hydrologic terms" is included at the back of this report.

Well Numbering System

The data-collection points in both the interpretive report and in this report have been arbitrarily numbered from 1 to 323. (See fig. 1.) Numbering starts in the southern part of the project area and is from right to left. The use of the same numbers in both reports for the same point facilitates cross reference between the interpretive report and this report.

In addition to the arbitrary numbering system, a location number is given for each data point in this report. The location number is based on the United States Bureau of Land Management's system of land subdivision (township, range, and section). Figure 2 illustrates the system of numbering data-collection points for location.

The first numeral of a location number indicates the township, the second the range, and the third the section in which the point is located. Lowercase letters after the section number indicate the location within the section; the first letter denotes the 160-acre tract, the second the 40-acre tract, and the third the 10-acre tract. The letters a, b, c, and d are assigned in a counterclockwise direction, beginning in the northeast corner of each tract. The number of lowercase letters indicates the accuracy of the location number; if a

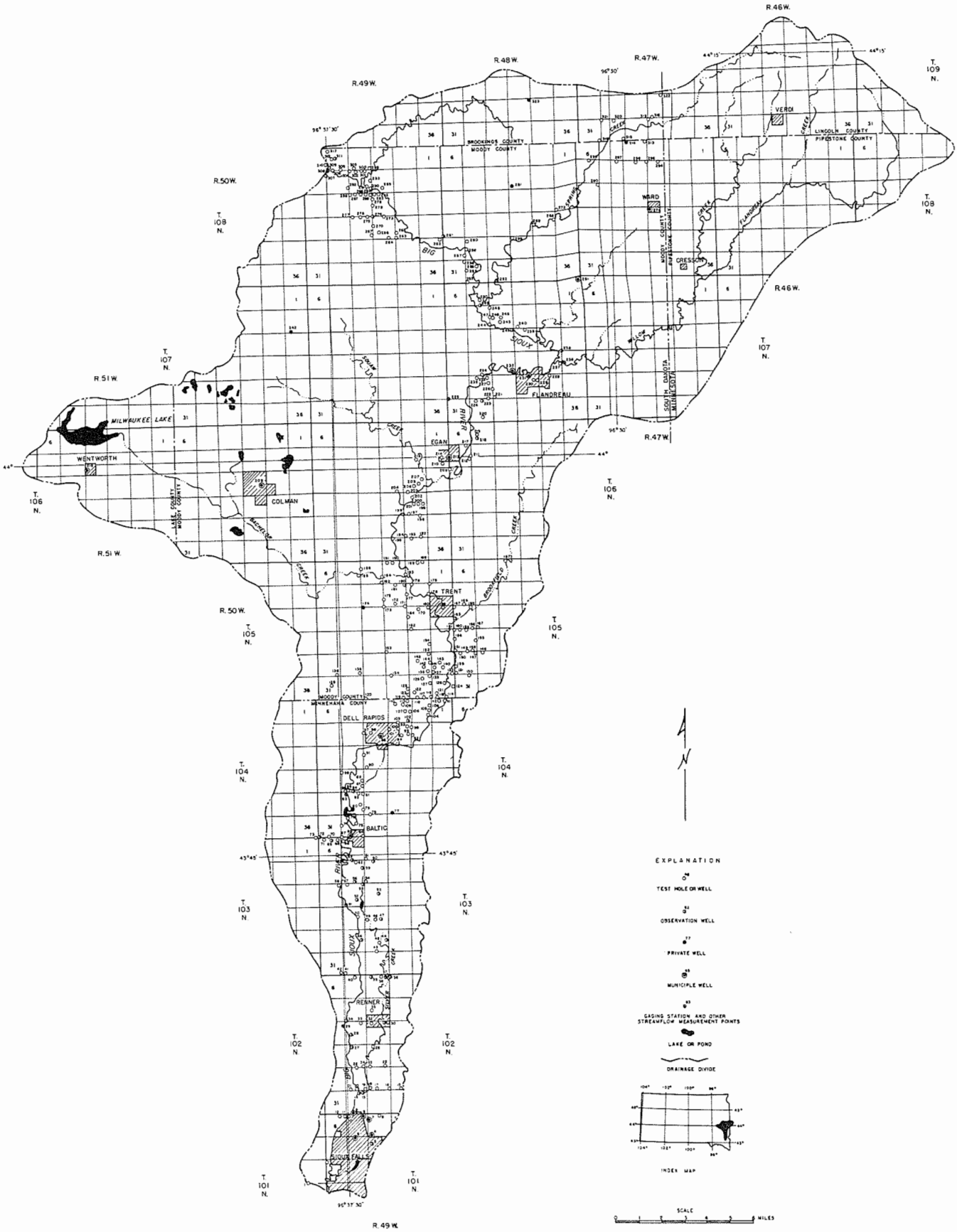


FIGURE 1. -- MAP SHOWING DATA-COLLECTION POINTS IN PROJECT AREA

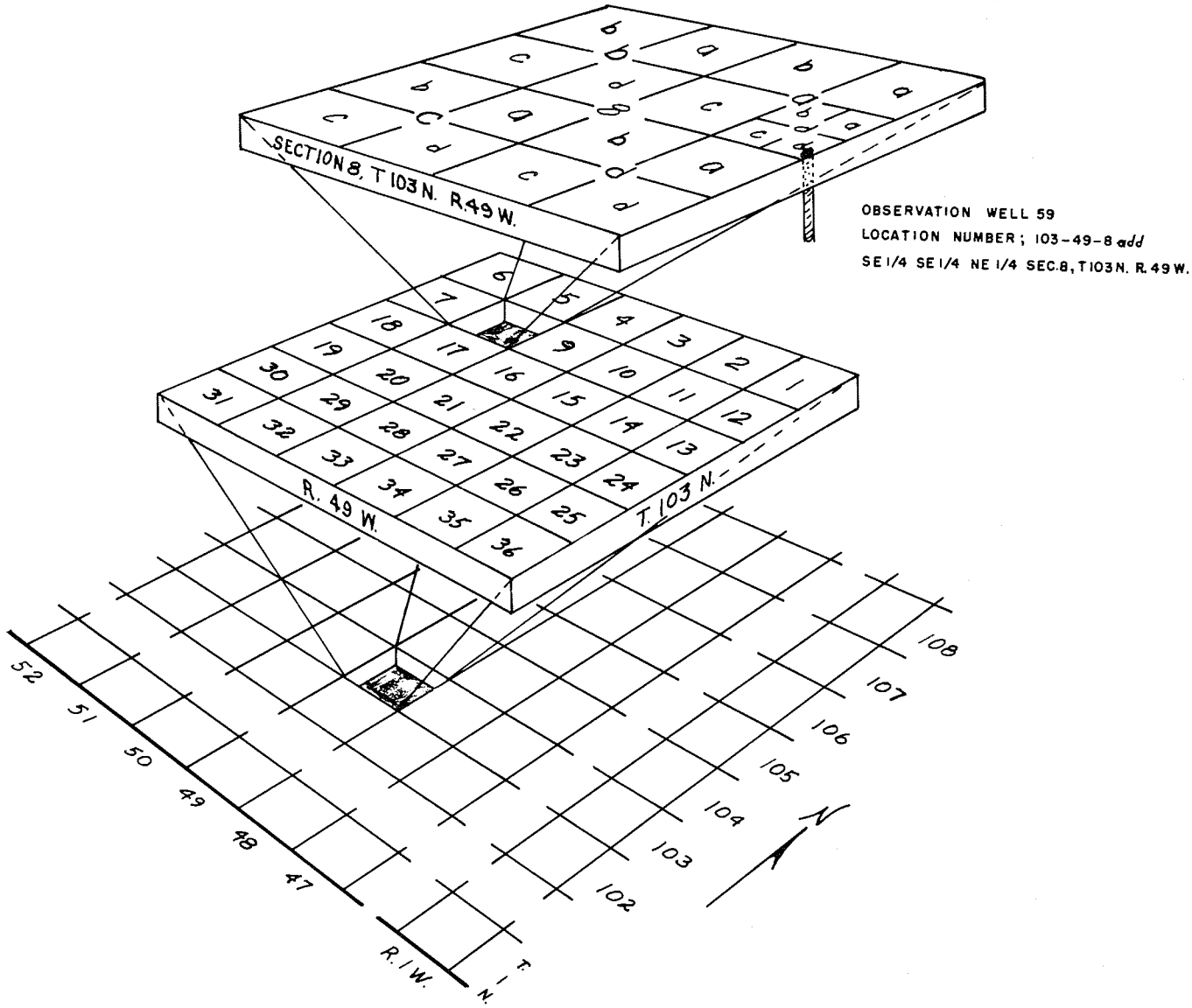


FIGURE 2. System of numbering data – collection points

point can be located within a 10-acre tract, three lowercase letters are shown in the location number. For example, data-collection point 59 (an observation well) located in the SE¼SE¼NE¼, section 8, T. 103 N., R. 49 W., would have the location number 103-49-8add.

Index of Data-Collection Points

Often more than one type of information was collected at a single data-collection point. The following index table is provided as an aid in locating information about any specific point. For example, information on data-collection point 36, an observation well, is found on page 16 (table 1) and on page 88 (table 2). The locations of all 323 data-collection points are shown on figure 1 of this report and on figure 2 of the interpretive report.

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
1	10				
2	10				
3	10	84			119
4	10		111		
5			111		
6	10				
7			111		
8			111		
9			111		
10	11				
11	11				
12	11				
13		84			
14		85			
15	11				
16	12				
17	12				
18	12				
19	12				
20	13				
21	13				
22	13				
23	13				
24	14		111		
25	14				

Data Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
26	14				
27		85			
28		86			
29				116	
30	14				
31	15	87			
32	15				
33	15				
34	15	87			
35			111		
36	16	88			
37				116	119
38	16				
39	16	88			
40	17				
41	17				
42	17				
43	17				
44		90			
45	18				
46		90			
47		91			
48	18				
49	18				
50	18				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
51				116	
52	19	91	110		119
53	19	92			
54	19				
55	19	93			
56	20	93			
57	20				
58	20				
59	20	94			
60	21	94			
61	21				
62	21				
63		95			
64	21				
65					119
66	22				
67	22				
68	22				
69	22	95			
70	23				
71	23				
72	23	97			119
73			110-111		
74	23				
75	24				
76	24				
77					119
78	24				
79	24				
80	25				
81	25				
82	25				
83				116	119
84	25	98			
85	26				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
86	26		110		
87	26				
88	26				
89	27				
90	27				
91	27				
92	27				
93	28				
94	28				
95					119
96	28				
97	28				
98	29				
99	29				
100	29				
101	29				
102	30	99			119
103	30				
104	30				
105	30				
106	31				
107	31				
108	31				
109	31				
110	32				
111	32				
112	32				
113	32				
114	33				
115	33				
116	33				
117	33				
118	34				
119	34				
120	34				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
121	34				
122	35				
123	35				
124	35		110		
125	35				
126	36				
127	36				
128	36				
129	36				
130	37				
131	37				
132	37				
133	37				
134	38				
135	38				
136	38				
137	38				
138	39				
139	39				
140	39				
141	39				
142	40				
143	40				
144	40				
145	40				
146	41				
147	41				
148	41				
149	41				
150	42				
151	42				
152	42				
153	42				
154	43				
155	43				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
156	44				
157	44				
158	44				
159	44				
160	45				
161	45				
162	45				
163	45	100			119
164	46		110-111		
165	46				
166	46				
167	46				
168	47				
169	47				
170	47				
171	47				
172	48				
173	48		110		
174					119
175	48				
176	48				
177	49				
178	49				
179	49				
180	49	101			119
181	50				
182	50				
183	50				
184	50				
185	51				
186	51				
187	51				
188	51				
189	52				
190	52				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
191	52				
192	52				
193	52				
194	53				
195	53				
196	53				
197	53				
198	54	101	110-111		119
199	54				
200	54				
201	54				
202	55				
203	55				
204	55				
205	55				
206	56				
207	56				
208					119
209	56				
210	56				
211	57				
212	57				
213					119
214	57				
215	57				
216					119
217	58				
218	58	103	110-111		119
219	58				
220	58				
221	59				
222	59				
223	59	104			119
224	59				
225					119

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
226	60				
227	60				
228	60				
229	60				
230	61				
231	61		111		119
232					119
233	61				
234	61				
235	62				
236				117	119
237	62				
238	62	104			119
239	62				
240	63				
241	63	105			119
242					119
243	63		110		
244	63				
245	64				
246	64		111		120
247	65				
248	65				
249	65	105			120
250	65				
251					120
252				117	120
253	66				
254	66				
255	66				
256	66				
257	67				
258	67				
259	67				
260	67				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
261	67	106			120
262	68				
263	68				
264	68				
265	69				
266	69				
267	69				
268	69				
269	69				
270	70				
271					120
272	70				
273	70				
274	70	107			120
275	71				
276	71				
277	71				
278	71				
279	72				
280	72				
281					120
282	72				
283	72				
284	73				
285	73				
286	73				
287	74		110		
288	74				
289	74				
290	75				
291	75				
292	75				
293	75				
294	76				
295	76				

Data-Collection Point Number	Table Number (Numbers in columns refer to page numbers in this report.)				
	1	2	3	4	5
296	76				
297	76				
298	76				
299	77				
300	77				
301	77				
302	78				
303	78		110		
304	78		110-111		
305	78				
306	79				
307	79	108			120
308				117	120
309	79				
310	79		110		
311	80	108	111		
312	80				
313	80				
314					120
315	80				
316	81				
317	81				
318	81				
319	81				
320	82				
321	82				
322	82				
323					120

TABLE 1.--LOGS OF TEST HOLES AND OBSERVATION WELLS

Test holes are an important aid in delineating the area of the water bearing sand and gravel deposits, and in determining the thickness, character, and lateral variations of water bearing deposits. By studying logs of test holes near any selected location it is possible to estimate the kind of materials that would be found in drilling a well. Logs also indicate the physical properties of the materials that might be found and their approximate thickness. From this information the potential yield of any well that might be drilled can be estimated.

The general order for the description of material in each interval is as follows:

a. The first element of the description is the principal constituent material found in that interval (sand, clay, gravel, and so forth).
b. The second element of the description is the color of the material, if it was noted.
c. The third element (second if color is omitted) describes the size or range in size of the principal constituent materials (fine, coarse, medium to coarse, and so forth).
d. The next element describes secondary constituent material which modifies the composition of the principal constituent materials (sandy, silty, and coarse gravel, and so forth).
e. The last element of a description may be any other pertinent information about the material described.

Some minor variations from this order of description may occur in the following table, especially if the log is quoted from another publication, or if a change in wording might change the meaning of the person who first described the material.

Altitude of land surface in feet above mean sea level was determined by spirit leveling (L), reported in files and publications (R), or estimated from topographic map (T). Depth to water level is given in feet below land surface. Logs listed include those published by Rothrock and Otton (1947) (reproduced as originally published); by Lee and Powell (1961) (reproduced as originally published); and unpublished records of test holes and observation wells drilled by the South Dakota Geological Survey (SDGS), the South Dakota Water Resources Commission (SDWRC), the U. S. Geological Survey (USGS), the U. S. Bureau of Reclamation (USBR), and the Soil Conservation Service (SCS).

MINNEHAHA COUNTY

Test hole 1 (101-50-13cc). Altitude, 1,433 feet (R). Well 170 of Rothrock and Otton (1947, p. 65).

Material	Thickness (feet)	Depth (feet)
Soil and clay with some mixed gravel....	15	15

Test hole 2 (101-49-18bb). Altitude, 1,420 feet (T). Drilled by SDWRC.

Material	Thickness (feet)	Depth (feet)
Soil.....	5	5
Gravel.....	9	14
Quartzite at 14'.....		

Observation well 3 (101-49-9bcb). Altitude, 1,419 feet (L). Observation well S-29 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil.....	4	4
Sand, fine.....	7	11
Gravel, medium.....	19	30

Test hole 4 (101-49-9bbc). Altitude, 1,422 feet (R). Well 19 of Rothrock and Otton (1947, p. 36-37). Well 19 of City of Sioux Falls.

Material	Thickness (feet)	Depth (feet)
Soil and clay.....	8	8
Sand and gravel.....	28	36
Clay.....		36+

Test hole 6 (101-49-4ba). Altitude, 1,424 feet (R). Well 69 of Rothrock and Otton (1947, p. 63).

Material	Thickness (feet)	Depth (feet)
No sample.....	10	10
Sand and gravel.....	2	12
Gravel, coarse.....	9	21
Gravel, sandy.....	4	25
Gravel, coarse, with quartzite pebbles..	6	31
Clay, blue.....		31+

Minnehaha County -- continued

Test hole 10 (101-49-5bb). Altitude, 1,418 feet (T). Well 75A of Rothrock and Otton (1947, p. 63).

Material	Thickness (feet)	Depth (feet)
Soil and loam	6	6
Sand, brown, silty	1	7
Gravel, fine, clean	5	12
Gravel, clean, medium	8	20
Sand, coarse, clean	5	25
Sand, coarse, gravel, clean, medium	10	35
Sand and gravel	5	40
Clay, gray, pebbles (till)		40+

Test hole 11 (101-49-6aa). Altitude, 1,421 feet (R). Well 107 of Rothrock and Otton (1947, p. 63).

Material	Thickness (feet)	Depth (feet)
Soil and clay	6	6
Sand and gravel, reddish	6	12
Sand and gravel	4	16
Sand, silty, fine (termed quicksand)	1½	17½
Sand and gravel	20½	38
Clay		38+

Test hole 12 (101-49-6ab). Altitude, 1,421 feet (R). Well 108 of Rothrock and Otton (1947, p. 63).

Material	Thickness (feet)	Depth (feet)
Soil and clay	6	6
Gravel, dirty	10	16
Gravel, coarse, clean	13	29
Gravel, sandy	2	31
Sand and gravel (fragment of soft white rock)	2	33
Clay	½	33½

Test hole 15 (102-49-34abb). Altitude, 1,481 feet (T). Depth to water 23 feet (estimated April 30, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, sandy, olive-gray	15	15
Clay, smooth	8	23
Sand, fine, clayey, pebbly	7	30
Clay, olive-brown (till)	3	33

Minnehaha County -- continued

Test hole 16 (102-49-28ddd). Altitude, 1,435 feet (T). Depth to water 13 feet (reported summer 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil changing to dirty medium sand.....	4	4
Sample missing.....	5	9
Sand, fine.....	5	14
Sand, medium.....	20	34
Sand, fine to medium.....	5	39
Clay, gray (till).....	7	46
Bedrock (?).....	8	54

Test hole 17 (102-49-28cdd). Altitude, 1,428 feet (R). Well 54 of Rothrock and Otton (1947, p. 62).

Material	Thickness (feet)	Depth (feet)
No sample.....	9	9
Gravel.....	15	24
Gravel and sand.....	4	28
Clay.....	½	28½

Test hole 18 (102-49-28ccc). Altitude, 1,427 feet (R). Well 55 of Rothrock and Otton (1947, p. 62).

Material	Thickness (feet)	Depth (feet)
Soil and clay.....	5	5
Gravel, fine sand at base.....	18	23
Gravel, coarse.....	13½	36½
Clay.....		36½+

Test hole 19 (102-49-29dd). Altitude, 1,428 feet (R). Well 56 of Rothrock and Otton (1947, p. 62).

Material	Thickness (feet)	Depth (feet)
No sample.....	10	10
Gravel.....	20	30
Gravel, fine.....	3	33
Gravel, very coarse.....	2½	35½
Clay.....		35½+

Minnehaha County -- continued

Test hole 20 (102-49-29cd). Altitude, 1,435 feet (T). Depth to water 13 feet (reported summer of 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Silt, clayey	4	4
Clay, sandy	5	9
Silt, brown, clayey changing to silty medium sand	5	14
Sand, fine to coarse	5	19
Sand, medium to coarse	5	24
Sand, fine to medium	5	29
Sand, medium to coarse	7	36
Clay, gray (till)	8	44

Test hole 21 (102-49-29ccc). Altitude, 1,429 feet (R). Well 58 of Rothrock and Otton (1947, p. 62).

Material	Thickness (feet)	Depth (feet)
No sample	10	10
Gravel, coarse, some clay at top	7	17
Gravel	8	25
Sand, fine	2	27
Clay		27+

Test hole 22 (102-49-21dcc). Altitude, 1,430 feet (R). Well 53 of Rothrock and Otton (1947, p. 61).

Material	Thickness (feet)	Depth (feet)
Soil and clay	5½	5½
Gravel	7½	13
Sand, fine	3	16
Sand, coarse	5	21
Gravel, coarse (boulders and clay streaks)	5	26
Sand and gravel	8	34
Clay		34+

Test hole 23 (102-49-21ccc). Altitude, 1,430 feet (R). Well 52 of Rothrock and Otton (1947, p. 61).

Material	Thickness (feet)	Depth (feet)
No sample	9	9
Sand and gravel	1	10
Sand	10	20
Sand, coarse, some gravel	5	25
Sand, medium, clean	7	32
Clay		32+

Minnehaha County -- continued

Test hole 24 (102-49-20dcc). Altitude, 1,430 feet (R). Well 50 of Rothrock and Otton (1947, p. 61).

Material	Thickness (feet)	Depth (feet)
Soil and clay	8	8
Gravel, coarse	2	10
Gravel and sand	20	30
Sand, clean	8	38
Clay		38+

Test hole 25 (102-49-20cdd). Altitude, 1,428 feet (R). Well 51 of Rothrock and Otton (1947, p. 61).

Material	Thickness (feet)	Depth (feet)
Soil and loam	9	9
Sand and gravel	6	15
Gravel	5	20
Sand	5	25
Gravel	20	45
Sand and gravel	5	50

Test hole 26 (102-49-21bba). Altitude, 1,434 feet (T). Depth to water 9.5 feet (measured July 11, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Gravel, fine to coarse, clayey	13	15
Gravel, coarse	5	20
Sand, fine to coarse, and coarse gravel	7	27
Clay, dark-gray (till)	5	32

Test hole 30 (102-49-16aaa). Altitude, 1,445 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, coarse	2	4
Rock or hard material, could not penetrate	2	6

Minnehaha County -- continued

Observation well 31 (102-49-16abb). Altitude, 1,439 feet (R). Well 41 of Rothrock and Otton (1947, p. 60). Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil and clay, depth uncertain.....	9	9
Gravel, coarse, sandy at top.....	8	17
Sand, silty.....	3	20
Gravel and sand.....	10	30
Gravel, coarse.....	2	32
Clay, blue.....	4	36

Test hole 32 (102-49-16bbb). Altitude, 1,438 feet (R). Well 43 of Rothrock and Otton (1947, p. 60).

Material	Thickness (feet)	Depth (feet)
No sample.....	9	9
Gravel, coarse, clean, fine at top.....	6	15
Gravel, coarse, clean, some sand at base.....	9	24
Gravel.....	2½	26½
Clay, sandy, yellow.....	18½	45
Clay.....	15	60

Test hole 33 (102-49-17ab). Altitude, 1,434 feet (R). Well 44 of Rothrock and Otton (1947, p. 60).

Material	Thickness (feet)	Depth (feet)
Coarse sand.....	10	10
Gravel and sand, clean at top.....	10	20
Sand and gravel, coarse at base.....	10	30
Sand, clean, coarse.....	7	37
Clay, blue, sandy.....	½	37½

Observation well 34 (102-49-8ccc). Altitude, 1,436 feet (R). Well 38 of Rothrock and Otton (1947, p. 60). Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
No samples.....	11	11
Sand, fine.....	1	12
Gravel, fine, clean at base.....	8	20
Gravel, fine, medium.....	5	25
Sand, fine, clean.....	5	30
Gravel, coarse, sandy at top.....	10	40
Same, presumably.....	3	43
Clay, blue.....		43+

Minnehaha County -- continued

Observation well 36 (102-49-3bbb). Altitude, 1,442 feet (R). Well 34 of Rothrock and Otton (1947, p. 59). Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil and silt	10	10
Sand, coarse, dirty	10	20
Sand and some gravel	5	25
Gravel, fine, and sandy	5	30
Sand, medium	5	35
Gravel and sand	5	40
Sand, medium	5	45
Gravel, coarse, clean	2	47
Clay, blue		47+

Test hole 38 (102-49-4ab). Altitude, 1,442 feet (R). Well 35 of Rothrock and Otton (1947, p. 59).

Material	Thickness (feet)	Depth (feet)
Soil and silt	12	12
Sand, fine	3	15
Sand, coarse in upper part	15	30
Gravel, sandy	2	32
Sand, very fine	3	35
Gravel, coarse	7	42
Clay		42+

Observation well 39 (102-49-4bbb). Altitude, 1,444 feet (R). Well 39 of Rothrock and Otton (1947, p. 59). Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
No sample	10	10
Sand and gravel, fine	2	12
Sand, coarse, clean	3	15
Gravel, coarse	5	20
Sand (wood fragments at 20½)	5	25
Sand or gravel	3	28
Clay		28+

Minnehaha County -- continued

Test hole 40 (102-49-5ab). Altitude, 1,445 feet (R). Well 37 of Rothrock and Otton (1947, p. 59).

Material	Thickness (feet)	Depth (feet)
Soil and fine sand	5	5
Coarse sand	5	10
Clay, sandy	2	12
Coarse sand	3	15
Gravel	11	26
Clay	½	26½

Test hole 41 (103-49-32ccc). Altitude, 1,475 feet (T). Depth to water 11.5 feet (measured January 14, 1962). Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Soil, clayey, black	2	2
Clay, black	4½	6½
Clay, brown	4	10½
Sand, coarse, and gravel	19½	30

Test hole 42 (103-49-31dda). Altitude, 1,499 feet (L). Drilled by USBR.

Material	Thickness (feet)	Depth (feet)
Soil	1	1
Sand, fine, brown, silty, moist	13	14
Clay, brown, moist	11	25

Test hole 43 (103-49-28cdd). Altitude, 1,447 feet (T). Depth to water 12 feet (reported summer of 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	4	4
Clay, brown	5	9
Clay, brown changing to medium sand	5	14
Sand, medium to coarse	10	24
Sand, medium	4	28
Clay, brown	1	29
Clay, green	1	30
Bedrock? at 30'		

Minnehaha County -- continued

Test hole 45 (103-49-28db). Altitude, 1,450 feet (T). Depth to water 5 feet (reported summer of 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium	4	4
Sand, fine, silty	5	9
Sand, fine, grading to coarse sand	5	14
Sand, medium to coarse	26	40
Clay (till)	9	49

Test hole 48 (103-49-21ca). Altitude, 1,449 feet (R). Well 33 of Rothrock and Otton (1947, p. 58).

Material	Thickness (feet)	Depth (feet)
Soil and fine sand	15	15
Coarse sand and gravel	5	20
Sand and some gravel	10	30
Gravel with small amount of sand	5	35
Sand and gravel	1	36
Clay		36+

Test hole 49 (103-49-21cb). Altitude, 1,450 feet (R). Well 32 of Rothrock and Otton (1947, p. 58).

Material	Thickness (feet)	Depth (feet)
Sand, fine, and clay	10	10
Coarse sand	10	20
Gravel, fine	5	25
Gravel, coarse	5	30
Gravel and sand	5	35
Clay, yellow, sandy	2½	37½

Test hole 50 (103-49-20db). Altitude, 1,453 feet (R). Well 31 of Rothrock and Otton (1947, p. 58).

Material	Thickness (feet)	Depth (feet)
Soil and sandy clay	10	10
Silt, sand, and gravel	5	15
Sand and gravel	10	25
Fine sand	5	30
Sand and gravel	10	40
Clay, sandy	1	41

Minnehaha County -- continued

Observation well 52 (103-49-17dbd). Altitude, 1,452 feet (L). Observation well S-25 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil	13	13
Gravel, fine	21	34
Clay, blue	21	55

Observation well 53 (103-49-16dbb). Altitude, 1,457 feet (L). Drilled by SCS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Silt, alluvial; sand and clay	2	2
Silt and sand, water-laid. Moderately permeable	4	6
Sand, water-laid, with much silt and clay. Highly oxidized. Slightly permeable	5	11
Poor sample. Appears to be sand and gravel from 14 to 21 feet	10	21

Test hole 54 (103-49-9cc). Altitude, 1,454 feet (R). Well 28 of Rothrock and Ottom (1947, p. 75).

Log not available but results of size analysis indicate sand and gravel are present from 15 to 30 feet.

Observation well 55 (103-49-17aaa). Altitude, 1,454 feet (L). Drilled by SCS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil, alluvial, silty, clayey	4	4
Clay, brown, silty, water-laid	6	10
Sand and silt, fine, some clay, saturated. Slightly to moderately permeable	2	12
No sample	9	21

Minnehaha County -- continued.

Observation well 56 (103-49-8dcc). Altitude, 1,453 feet (R). Well 27 of Rothrock and Otton (1947, p. 57). Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Clay and sand	9	9
Coarse sand	5	14
Coarse sand and gravel	11	25
Coarse gravel and boulders	3	28
Sandy clay	1½	29½

Test hole 57 (103-49-17ba). Altitude, 1,455 feet (R). Well 29 of Rothrock and Otton (1947, p. 57).

Material	Thickness (feet)	Depth (feet)
Clay, blue, and sand	15	15
Coarse sand and gravel, clean	5	20
Coarse gravel	8	28
Fine sand and loam	2	30
Coarse sand and gravel, clean	5	35
Clean dark sand and gravel	5	40
Clay, blue	½	40½

Test Hole 58 (103-49-18aa). Altitude, 1,456 feet (R). Well 30 of Rothrock and Otton (1947, p. 58).

Material	Thickness (feet)	Depth (feet)
Soil	9	9
Coarse sand and gravel	6	15
Coarse sand	10	25
Gravel and sand	10	35
Sandy clay	3	38

Observation well 59 (103-49-8add). Altitude, 1,454 feet (L). Drilled by SCS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Clay, silty, alluvial soil	7	7
Silt, alluvial, clay and sand with many pebbles, gray	5	12
Poor sample. Dirty gravel. Appears to be permeable	5	17
Sand, clean, very coarse, and fine to medium gravel	7	24

Minnehaha County -- continued

Observation well 60 (103-49-9baa). Altitude, 1,478 feet (L). Drilled by SCS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Clay, silty, alluvium.....	10	10
Sand with some clay, water-laid, silty, fine, moderately permeable.....	5	15
Silt, clayey, water-laid, alternately oxidized and unoxidized, lenses of fine to medium sand.....	5	20

Test hole 61 (103-49-4ccc). Altitude, 1,514 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil.....	1	1
Clay, light-brown, silty, moist.....	9	10
Clay, brown, silty, moist.....	10	20
Clay, gray.....	10	30
Clay, dark-gray.....	15	45

Test hole 62 (103-49-8ab). Altitude, 1,458 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	4	4
Clay, brown-gray, silty.....	10	14
Clay, sandy.....	5	19
Sand, medium to coarse.....	5	24
Clay, light-tan (till).....	4	28
Bedrock? at 28'.....		

Test hole 64 (104-49-32ddd). Altitude, 1,530 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil.....	1	1
Clay, light-brown.....	9	10
Clay, brown, changing to light-gray.....	42	52
Bedrock, quartzite.....		52+

Minnehaha County -- continued

Test hole 66 (103-49-5bb). Altitude, 1,462 feet (R). Well 22 of Rothrock and Otton (1947, p. 56).

Material	Thickness (feet)	Depth (feet)
Fill and alluvium	10	10
Clean, coarse sand	10	20
Quartzite		20+

Test hole 67 (104-49-32ccc). Altitude, 1,460 feet (R). Depth to water 5 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, brown	3	5
Clay, sandy, gray	10	15
Sand, coarse, and gravel	9	24
Bedrock?		24+

Test hole 68 (103-49-6aa). Altitude, 1,460 feet (R). Well 23 of Rothrock and Otton (1947, p. 56).

Material	Thickness (feet)	Depth (feet)
Soil and sand	15	15
Coarse sand	10	25
Gravel and small amount of sand	8	33
Quartzite		33+

Observation well 69 (103-49-6abb). Altitude, 1,456 feet (R). Well 25 of Rothrock and Otton (1947, p. 56). Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Clay and soil	15	15
Coarse and fine sand	5	20
Coarse sand and gravel	5	25
Coarse gravel and quartzite boulders	9	34
Quartzite	1	35

Minnehaha County -- continued

Test hole 70 (104-49-31cdd). Altitude, 1,462 feet (T). Depth to water 17 feet (reported July 8, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black, clayey	4	4
Silt, gray-brown, sandy	5	9
Silt, grayish-brown	5	14
Silt, gray, changing to medium sand	5	19
Sand, medium	10	29
Sand, medium to coarse	5	34
Sand, coarse to gravel	15	49
Clay (till)	30	79

Test hole 71 (103-49-6ba). Altitude, 1,460 feet (R). Well 26 of Rothrock and Otton (1947, p. 57).

Material	Thickness (feet)	Depth (feet)
Soil and clay	15	15
Clay, sand, and gravel	5	20
Very coarse gravel	5	25
Sand and gravel	5	30
Sandy clay	3	33

Observation well 72 (104-49-31ccc). Altitude, 1,465 feet (L). Observation well S-24 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil	9	9
Sand, fine	34	43
Gravel, coarse	2	45
Sioux Quartzite at 45'		

Test hole 74 (104-49-32cbb). Altitude, 1,475 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay	8	10
Sand, gray, clayey, changing to coarse sand with some clay	15	25
Bedrock?		25+

Minnehaha County -- continued

Test hole 75 (104-49-32dbb). Altitude, 1,465 feet (R). Depth to water 7 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, fine to medium, clayey, black; coarser sand and less clay at 15 feet	33	35
Clay, gray (till)	44	79

Test hole 76 (104-49-32bac). Altitude, 1,465 feet (T). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, brown, clayey	23	25
Rocks	3	28
Sand, coarse, and gravel	9	37
Clay	12	49

Test hole 78 (104-49-28ccd). Altitude, 1,505 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Clay, reddish-brown	4	7
Clay, reddish, sandy	7	14
Gravel (rock?)		14+

Test hole 79 (104-49-29dad). Altitude, 1,485 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Clay, brown	3	5
Sand, brown, clayey, changing to coarse sand and clay	25	30
Rock	2	32
Clay	12	44

Minnehaha County -- continued

Test hole 80 (104-49-29dba). Altitude, 1,470 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay	15	17
Hard rock?, could not penetrate		17+

Test hole 81 (104-49-29aaa). Altitude, 1,471 feet (T). Depth to water 8 feet (estimated October 19, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, very fine to medium, silty and clayey	21	23
Silt, sandy and some gravel	3	26
Gravel, very sandy and silty	4	30
Quartzite		30+

Test hole 82 (104-49-29aba). Altitude, 1,469 feet (T). Depth to water 24 feet (reported July 9, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium	14	14
No cuttings	10	24
Clay, gray, silty	5	29
Gravel, very silty, fine	10	39
Gravel, silty, fine	5	44
Sand, coarse to gravel, fine	5	49
Bedrock		49+

Observation well 84 (104-49-20cdd). Altitude, 1,470 feet (T). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, dark-brown, fine clayey	13	15
Sand, gray, fine, and fine gravel, clayey	10	25
Clay	10	35
Quartzite		35+

Minnehaha County -- continued

Test hole 85 (104-49-20cdc). Altitude, 1,465 feet (T). Depth to water 12 feet (estimated October 19, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to medium, silty.....	10	10
Sand, fine, silty and clayey.....	7	17
Bedrock, quartzite.....		17+

Test hole 86 (104-49-20ccd). Altitude, 1,463 feet (T). Depth to water 7.1 feet (measured October 19, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, brown, sandy.....	1	1
Sand, fine to medium, silty.....	7	8
Sand, very fine to coarse, some gravel, silty and thin clay beds.....	13	21
Gravel, sandy and silty.....	1	22
Sand, very fine, some gravel, very silty and clayey.....	4	26
Sand, very fine to medium, very silty and clayey.....	5	31
Clay.....	25	56
Quartzite.....		56+

Test hole 87 (104-49-20ddd). Altitude, 1,475 feet (T). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil.....	2	2
Sand.....	13	15
Gravel.....	10	25

Test hole 88 (104-49-20daa). Altitude, 1,470 feet (T). Depth to water 9 feet (estimated October 19, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	2	2
Sand, very fine to medium, silty and clayey.....	14	16
Quartzite.....		16+

Minnehaha County -- continued

Test hole 89 (104-49-20bbc). Altitude, 1,477 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Clay, dark-brown	12	15
Clay, dark-brown, sandy	7	22
Rock?	2	24
Sand, medium to coarse, some clay	6	30
Clay, gray	15	45
Bedrock		45+

Test hole 90 (104-49-21bbb). Altitude, 1,480 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay	8	10
Bedrock		10+

Test hole 91 (104-49-17ada). Altitude, 1,495 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium	4	4
Till, brownish-gray	4	8
Bedrock		8+

Test hole 92 (104-49-11bcc). Altitude, 1,486 feet (T). Depth to water 5.1 feet (measured October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, medium to coarse, some gravel	8	10
Gravel, fine to medium, sandy	3	13
Clay	3½	16½

Minnehaha County -- continued

Test hole 93 (104-49-10add). Altitude, 1,490 feet (R). Depth to water 3 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Clay, gray, sandy	3	5
Sand, medium to coarse, some clay	6	11
Clay, tan, some pebbles (till)	24	35
Bedrock		35+

Test hole 94 (104-49-10dab). Altitude, 1,485 feet (R). Depth to water 5 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, brown	3	5
Sand, brown, some clay	4	9
Gravel	1	10
Sand, coarse, some clay	6	16
Clay	5	21
Bedrock		21+

Test hole 96 (104-49-9bdc). Altitude, 1,537 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil	1	1
Clay, brown, silty	26	27
Bedrock, quartzite		27+

Test hole 97 (104-49-9bcb). Altitude, 1,570 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Silt, buff	2	4
Clay, buff (till)	65	69

Minnehaha County -- continued

Test hole 98 (104-49-11bbc). Altitude, 1,490 feet (R). Depth to water 10 feet (estimated summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, medium to coarse	11	13
Clay	36	49

Test hole 99 (104-49-10aaa). Altitude, 1,492 feet (R). Depth to water 5 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Clay	2	5
Sand, brown, coarse, some clay	10	15
Clay	19	34
Bedrock		34+

Test hole 100 (104-49-10acc). Altitude, 1,495 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, brown	5	5
Sand, brown, clayey	10	15
Gravel, coarse	2	17
Clay	3	20
Bedrock		20+

Test hole 101 (104-49-10bbc). Altitude, 1,530 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, brown	19	19
Bedrock		19+

Minnehaha County -- continued

Observation well 102 (104-49-3ddc). Altitude, 1,497 feet (L). Observation well S-22 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil	4	4
Clay, yellow	5	9
Sand, fine	9	18
Gravel	4	22
Clay, blue	10	32
Sioux Quartzite		32+

Test hole 103 (104-49-3cdc). Altitude, 1,505 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Topsoil, black	1	1
Loess	3	4
Bedrock		4+

Test hole 104 (104-49-2dab). Altitude, 1,480 feet (R). Depth to water 7 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	3	3
Sand, medium to coarse, some gravel	6	9
Hard rock	1	10
Sand, coarse	1	11
Clay	29	40

Test hole 105 (104-49-1bcc). Altitude, 1,488 feet (R). Depth to water 5 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, sandy	2	2
Sand, medium to coarse, some gravel	11	13
Clay, gray (till)	16	29

Minnehaha County -- continued

Test hole 106 (104-49-2cbc). Altitude, 1,495 feet (T). Depth to water 6.6 feet (measured October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, very fine to medium, silty	7	8
Gravel, fine to very coarse, sandy	3	11
Sand, medium to very coarse, some gravel	2	13
Clay	3½	16½

Test hole 107 (104-49-3daa). Altitude, 1,498 feet (T). Depth to water 9 feet (reported October 10, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium, tan, sandy and clayey	4	4
Sand, fine to medium	5	9
Gravel, very coarse	1	10
Clay, sandy	4	14
Clay, gray (till)	15	29

Test hole 108 (104-49-1bbc). Altitude, 1,488 feet (R). Depth to water 7 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	2	2
Sand, medium to coarse, some gravel	15	17
Clay and pebbles (till)	12	29

Test hole 109 (104-49-3abd). Altitude, 1,505 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown	2	2
Clay, brown	3	5
Sand, brown, coarse, clayey	5	10
Gravel, fine	1	11
Sand, coarse, some gravel	8	19
Clay (till)	25	44

Minnehaha County -- continued

Test hole 110 (104-49-3bdb). Altitude, 1,505 feet (R). Depth to water 6 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay	4	6
Gravel	7	13
Clay	16	29

Test hole 111 (104-49-1aab). Altitude, 1,485 feet (T). Depth to water 19 feet (reported July 10, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium, black	9	9
Sand, medium to coarse	5	14
Sand, coarse	5	19
Clay, grayish-brown (till)	15	34

Test hole 112 (104-49-1baa). Altitude, 1,485 feet (R). Depth to water 10 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown, sandy	5	5
Sand, dark-brown, clayey	5	10
Gravel	2	12
Sand, medium to coarse	8	20
Clay, gray	20	40

Test hole 113 (104-49-2bbb). Altitude, 1,496 feet (T). Depth to water 9 feet (reported July 10, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil and alluvium	4	4
Clay, silty, sandy	5	9
Gravel, medium to coarse	5	14
Gravel, coarse	2	16
Very coarse material	2	18
Gravel, coarse	1	19
Sand, coarse	1	20
Clay, brownish-gray (till)	24	44

MOODY COUNTY

Test hole 114 (105-49-36dcd). Altitude, 1,490 feet (T). Depth to water 11 feet (estimated October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to coarse	4	5
Gravel, fine to coarse, and medium to very coarse sand	10	15
Sand, medium to very coarse, and fine to medium gravel	8	23
Gravel, fine to coarse, sandy and silty	2	25
Clay	6½	31½

Test hole 115 (105-49-36ccd). Altitude, 1,487 feet (T). Depth to water 6 feet (estimated October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium, silty	2	3
Gravel, fine to coarse, sandy	5	8
Sand, medium to very coarse, and gravel	2	10
Gravel, fine to coarse, sandy	2	12
Clay	4	16

Test hole 116 (105-49-35ddd). Altitude, 1,495 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, fine to coarse	4	6
Gravel, fine to coarse, sandy quartzite pebbles common	2	8
Clay	3½	11½

Test hole 117 (105-49-35dcd). Altitude, 1,498 feet (T). Depth to water 5.4 feet (measured October 19, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, very fine to medium, silty	2	4
Gravel, fine to coarse, sandy	16	20
Gravel, fine and medium and very coarse sand, silty and clayey	5	25
Clay	2	27

Moody County -- continued

Test hole 118 (105-49-35cdc). Altitude, 1,503 feet (R). Depth to water 5 feet (reported summer of 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black, clayey	2	2
Sand, fine to medium	2	4
Gravel, sandy, brown	6	10
Sand, coarse, brown	15	25
Clay	19	44

Test hole 119 (105-49-34dcd). Altitude, 1,508 feet (T). Depth to water 5.7 feet (measured October 19, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Gravel, fine, sandy and silty	6	8
Sand, medium to very coarse, some gravel	11	19
Gravel, very coarse, sandy	2	21
Sand, fine to medium, some gravel, silty	5	26
Clay	1	27

Test hole 120 (105-49-33ccc). Altitude, 1,600 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, brown	3	3
Clay (till)	36	39

Test hole 121 (105-49-36cbc). Altitude, 1,495 feet (R). Depth to water 5 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, medium, brown	3	5
Sand, medium to coarse	5	10
Clay, gray	4	14

Moody County -- continued

Test hole 122 (105-49-35cbd). Altitude, 1,508 feet (R). Depth to water 7 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Loess	3	5
Sand, brown, clayey	3	8
Gravel	2	10
Clay and pebbles (till)	19	29

Test hole 123 (105-49-34dda). Altitude, 1,505 feet (R). Depth to water 10 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Loess	3	5
Rock	1	6
Sand, clayey, brown, changing to gray	12	18
Clay and pebbles (till)	21	39

Test hole 124 (105-49-36daa). Altitude, 1,495 feet (T). Depth to water 8.4 feet (measured October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, very fine to medium, silty and clayey	7	9
Sand, medium to very coarse, some gravel	5	14
Gravel, fine to medium and medium to very coarse sand, much lignite or charcoal	10	24
Sand, medium to very coarse, and gravel	10	34
Clay	7½	41½

Test hole 125 (105-49-34daa). Altitude, 1,510 feet (R). Depth to water 5 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Clay, brown, some pebbles	3	5
Sand, medium to coarse	26	31
Clay	8	39

Moody County -- continued

Test hole 126 (105-49-36acc). Altitude, 1,490 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, gray	5	7
Rock	2	9
Sand, coarse	3	12
Clay, gray	13	25
Clay, yellow	5	30
Clay, gray: cemented in casing	6	36

Test hole 127 (105-49-35ada). Altitude, 1,502 feet (R). Depth to water 5 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown	2	2
Clay, grayish-brown	3	5
Sand, coarse, some gravel	15	20
Clay	12	32
Hard material, could not penetrate		32+

Test hole 128 (105-49-31acc). Altitude, 1,525 feet (R). Depth to water 15 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay	3	5
Sand, clayey, brown	25	30
Clay (till)	14	44

Test hole 129 (105-49-35abd). Altitude, 1,505 feet (R). Depth to water 7 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown	2	2
Sand, medium to coarse	3	5
Sand, coarse, and clay	6	11
Rocks, gravel	1	12
Sand, coarse, some clay	5	17
Clay and pebbles	17	34

Moody County -- continued

Test hole 130 (105-48-31abb). Altitude, 1,505 feet (R). Depth to water 11 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Sand, coarse, clayey	7	10
Gravel, coarse	1	11
Sand	9	20
Gravel, coarse	1	21
Clay (till)	13	34

Test hole 131 (105-48-30ccc). Altitude, 1,495 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, medium, brown	2	4
Gravel	2	6
Sand	4	10
Clay	15	25
Hard rock, could not penetrate		25+

Test hole 132 (105-49-25ddd). Altitude, 1,493 feet (T). Depth to water 9 feet (reported July 11, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	3	3
Gravel, coarse	9	12
Clay, tan, gray (till)	7	19

Test hole 133 (105-49-35aaa). Altitude, 1,505 feet (R). Depth to water 8 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown	4	4
Gravel, sand, coarse, and clay	14	18
Clay and pebbles (till)	16	34

Moody County -- continued

Test hole 134 (105-49-27cdc). Altitude, 1,575 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	4	4
Clay, yellow	3	7
Clay, gray	3	10
Clay, yellow	48	58
Clay, gray	22	80
Clay, reddish-brown	28	108
Clay, gray	14	122
Sand and gravel	10	132
Clay, with sand stringers; brown	13	145
Clay, gray	28	173
Gravel	57	230
Quartzite		230+

Test hole 135 (105-49-29ddb). Altitude, 1,585 feet (R). Depth to water 15 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown	2	2
Till, brown	12	14
Clay, sandy, brown; some gravel	2	16
Clay, brown	31	47

Test hole 136 (105-49-30ddd). Altitude, 1,505 feet (R). Depth to water 8 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, brown	3	5
Sand, clayey, brown, clay content decreasing and sand becoming coarser at depth	15	20
Clay	19	39

Test hole 137 (105-49-25cca). Altitude, 1,505 feet (R). Depth to water 5 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, coarse, brown	17	19
Clay	15	34

Moody County -- continued

Test hole 138 (105-49-26ddb). Altitude, 1,515 feet (R). Depth to water 10 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown	2	2
Loess	4	6
Sand, coarse, clayey, clay content decreasing with depth	19	25
Gravel, coarse	1	26
Clay and pebbles (till)	13	39

Test hole 139 (105-48-30cbc). Altitude, 1,492 feet (T). Depth to water 7.8 feet (measured October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Gravel, fine to coarse, sandy	2	3
Till	13½	16½

Test hole 140 (105-49-25dbc). Altitude, 1,512 feet (R). Depth to water 15 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, brown	5	5
Clay, sandy, brown, changing to clayey sand	25	30
Clay	14	44

Test hole 141 (105-49-25cbd). Altitude, 1,515 feet (R). Depth to water 15 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, sandy	7	9
Clay	25	34

Moody County -- continued

Test hole 142 (105-49-26dba). Altitude, 1,530 feet (R). Depth to water 15 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, brown (loess?)	11	13
Clay, black, compact, changing to gray-brown till	21	34

Test hole 143 (105-49-25bdd). Altitude, 1,522 feet (R). Depth to water 15 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	3	3
Sand, coarse, some gravel	32	35
Clay	14	49

Test hole 144 (105-49-26daa). Altitude, 1,525 feet (R). Depth to water 11 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Clay, brown	6	8
Rocks	1	9
Sand and rocks	12	21
Clay and pebbles (till)	13	34

Test hole 145 (105-49-26bdd). Altitude, 1,555 feet (R). Depth to water 10 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, brown (loess)	13	15
Clay	14	29

Moody County -- continued

Test hole 146 (105-49-29bba). Altitude, 1,510 feet (T). Depth to water 19 feet (reported July 11, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, fine	2	4
Sand, fine changing to gravel	5	9
Gravel, medium, sandy	5	14
Sand, fine to medium	10	24
Sand, fine	10	34
Sand, fine, gravelly	5	39
Clay, gray	15	54

Test hole 147 (105-48-30aaa). Altitude, 1,504 feet (T). Depth to water 2.1 feet (measured October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, very fine to coarse, silty	2	3
Gravel, silty and sandy	9	12
Sand, medium to very coarse, and gravel	2	14
Gravel, fine to coarse, sandy	1½	15½
Clay	6	21½

Test hole 148 (105-48-19ddc). Altitude, 1,502 feet (T). Depth to water 9 feet (reported July 10, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	1	1
Gravel	3	4
Sand, coarse, and fine gravel	5	9
Coarse material	1	10
Till, gray brown	30	40
Rock, could not continue		

Test hole 149 (105-48-19dcc). Altitude, 1,498 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Till, brown	10	12
Clay, gray	22	34

Moody County -- continued

Test hole 150 (105-48-30bab). Altitude, 1,492 feet (T). Depth to water 8 feet (estimated October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, medium to very coarse, some fine gravel	10	12
Clay	4½	16½

Test hole 151 (105-48-19ccc). Altitude, 1,490 feet (T). Depth to water 9 feet (reported July 10, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil and sandy alluvium	4	4
Sand, fine, silty	5	9
Sand, medium	4	13
Sand, coarse and fine gravel	2	15
Clay, tan (till)	9	24
Clay, gray (till)	5	29

Test hole 152 (105-49-26aaa). Altitude, 1,545 feet (R). Depth to water 20 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Till, may have 4 feet of loess on top(?)	31	34

Test hole 153 (105-49-22ccc). Altitude, 1,600 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay	4	5
Clay, sandy, brown	5	10
Clay	29	39

Moody County -- continued

Test hole 154 (105-49-23dad). Altitude, 1,550 feet (R). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, brown to light-gray	5	7
Gravel	9	16
Clay, gray	76	92
Gravel; with clay stringers	3	95
Clay, gray	7	102
Gravel	2	104
Clay, gray	3	107
Clay, olive	25	132
Clay, gray	10	142
Clay, gray; with gravel stringers	3	145
Clay, gray	67	212
Clay, gray; with gravel stringers	13	225
Gravel	10	235
Clay, gray; with gravel stringers	15	250
Clay, tan	5	255
Clay, green	20	275
Clay, gray	26	301
Clay, gray; with gravel stringers	11	312
Gravel	8	320
Gravel; with hard clay stringers	14	334
Clay, gray	21	355
Gravel	2	357
Clay, gray	2	359
Gravel	17	376
Clay, gray	3	379
Gravel	4	383
Shale?, gray	57	440

Test hole 155 (105-48-19daa). Altitude, 1,505 feet (R). Depth to water 10 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, clayey, brown	18	20
Clay	14	34

Moody County -- continued

Test hole 156 (105-48-19bcc). Altitude 1,493 feet (R). Depth to water 10 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, clayey, changing to coarse sand	23	25
Clay	14	39

Test hole 157 (105-48-17ccc). Altitude, 1,511 feet (T). Depth to water 6.4 feet (measured October 18, 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, very fine to fine, silty and clayey	5	7
Sand, very fine to medium, some gravel, silty	6	13
Sand, fine to coarse, and gravel, silty	3	16
Clay	5½	21½

Test hole 158 (105-48-18ddc). Altitude, 1,510 feet (R). Depth to water 8 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Topsoil, black	2	2
Sand, clayey, dark-brown	3	5
Sand, clayey, brown	10	15
Clay, sandy	19	34

Test hole 159 (105-48-19abb). Altitude, 1,507 feet (T). Depth to water 6.6 feet (measured October 15, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium	2	3
Gravel, medium to coarse	20	23
Clay (till)	3	26

Moody County -- continued

Test hole 160 (105-48-19bab). Altitude, 1,505 feet (R). Depth to water 5 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, clayey, brown, changing to coarse sand	7	9
Gravel, coarse	1	10
Sand, clayey, brown	5	15
Clay	19	34

Test hole 161 (105-48-19bbb). Altitude, 1,498 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium	3	4
Gravel, medium to coarse	16	20
Clay	2	22

Test hole 162 (105-49-23bba). Altitude 1,600 feet (R). Depth to water 7 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, black	10	10
Clay, some fine sand, brown	2	12
Clay, brown	27	39

Observation well 163 (105-48-18cbc). Altitude, 1,500 feet (T). Observation well S-20 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil	4	4
Gravel, coarse	9	13
Clay, blue	12	25

Moody County -- continued

Test hole 164 (105-49-14bcc). Altitude, 1,517 feet (T). Depth to water 4.8 feet (measured August 1, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine; sand, fine to coarse, clean	15	15
Gravel, coarse, clean	10	25
Gravel, coarse; pebbles and cobblestones	3	28
Till, light-gray	4	32

Test hole 165 (105-48-18aab). Altitude 1,530 feet (T). Depth to water 14 feet (reported July 14, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	4	4
Sand, medium, very silty	10	14
Till, dark-gray	15	29
Till, gray	5	34

Test hole 166 (105-48-7cdd). Altitude, 1,520 feet (T). Depth to water 5.6 feet (measured October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil	1	1
Sand, very fine to medium, silty	3	4
Sand, fine to coarse, and gravel, silty	2	6
Sand, medium to very coarse and fine to medium gravel	3	9
Gravel, fine to coarse and sand, medium to very coarse	4	13
Clay	3½	16½

Test hole 167 (105-48-18bbb). Altitude, 1,516 feet (T). Depth to water 6 feet (estimated October 18, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to coarse	8	9
Sand, fine to coarse, slightly silty	6	15
Gravel, fine to medium, silty	5	20
Clay	2½	22½

Moody County -- continued

Test hole 168 (105-49-13abb). Altitude, 1,500 feet (T). Depth to water 13 feet (reported July 14, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	3	3
Sand, coarse	6	9
Sand, medium	8	17
Clay, light bluish-green	2	19
Clay, gray	5	24

Test hole 169 (105-49-14aaa). Altitude, 1,497 feet (T). Depth to water 14 feet (reported July 14, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Sand, coarse	2	4
Sand, coarse	10	14
Gravel, fine	5	19
Clay, bluish-gray	5	24
Clay, yellowish-green	5	29
No cuttings	5	34
Till, gray	5	39

Test hole 170 (105-49-14baa). Altitude, 1,515 feet (T). Depth to water 7.3 feet (measured October 14, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium	5	6
Sand, medium to very coarse	4	10
Gravel, coarse	1	11
Sand, coarse	5	16
Clay	5	21

Test hole 171 (105-49-15aaa). Altitude, 1,517 feet (T). Depth to water 14 feet (reported July 11, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil changing to sand, very fine	4	4
Sand, fine	15	19
Sand, coarse and fine gravel	5	24
Sand, coarse	8	32
Till, tannish-gray	12	44

Moody County -- continued

Test hole 172 (105-49-10dcc). Altitude, 1,520 feet (T). Depth to water 13 feet (estimated October 14, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, very fine	9	10
Sand, fine to medium	10	20
Gravel, medium to coarse	13	33
Clay	8	41

Test hole 173 (105-49-15bbb). Altitude, 1,525 feet (T). Depth to water 17 feet (estimated October 14, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, brown	4	5
Sand, fine	22	27
Gravel, fine	8	35
Gravel, fine to very coarse	20	55
Clay	10	65

Test hole 175 (105-49-10cbc). Altitude, 1,530 feet (T). Depth to water 20 feet (estimated October 14, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, brown	2	3
Gravel, fine to coarse	4	7
Sand, fine to coarse, clayey	8	15
Sand, fine	10	25
Sand, fine to coarse	5	30
Gravel, fine to coarse	25	55
Clay	10	65

Test hole 176 (105-49-11daa). Altitude, 1,498 feet (T). Depth to water 13 feet (estimated October 14, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, very fine	15	16
Sand, medium to coarse	4	20
Clay	2	22

Moody County -- continued

Test hole 177 (105-49-10daa). Altitude, 1,515 feet (T). Depth to water 9 feet (estimated July 24, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine to coarse; pebbles, clean..	5	5
Sand, coarse, and fine to coarse gravel, clean.....	13	18
Clay, dark-gray (till).....	7	25

Test hole 178 (105-49-12bbb). Altitude, 1,503 feet (T). Depth to water 9.3 feet (measured July 24, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	2	2
Gravel, fine; and coarse sand, clean....	15	17
Sand, coarse, clean.....	3	20
Sand, fine to coarse, clean.....	12	32
Clay, gray (till).....	3	35

Test hole 179 (105-44-11bab). Altitude, 1,500 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	2	2
Sand, fine to coarse, clayey.....	5	7
Gravel, fine to coarse, clayey.....	5	12
Clay, gray (till).....	10	22

Observation well 180 (105-49-10aaa). Altitude, 1,505 feet (T). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Gravel, fine, and fine to coarse sand, clean.....	10	10
Sand, medium to coarse, clean.....	7	17
Gravel, medium to coarse, clean.....	7	24
Clay, light-gray (till).....	1	25

Moody County -- continued

Test hole 181 (105-49-10abb). Altitude, 1,526 feet (T). Depth to water 14 feet (estimated October 13, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium, and coarse gravel	36	37
Clay	5	42

Test hole 182 (105-49-4ddd). Altitude, 1,525 feet (T). Depth to water 9.4 feet (measured July 24, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Gravel, fine to coarse, and fine sand, clean	10	12
Gravel, fine to coarse; pebbles and cobblestones, clean	3	15
Clay, dark-gray (till)	2	17

Test hole 183 (105-49-3daa). Altitude, 1,495 feet (R). Depth to water 5 feet (reported summer 1965). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, clayey, brown	3	5
Sand, medium to coarse, and gravel; some clay	7	12
Clay and pebbles (till)	17	29

Test hole 184 (105-49-4dad). Altitude, 1,517 feet (T). Depth to water 6.6 feet (measured October 13, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, brown	2	3
Gravel, fine to very coarse	17	20
Clay	2	22

Moody County -- continued

Test hole 185 (105-49-5daa). Altitude, 1,540 feet (T). Depth to water 9.1 feet (measured October 13, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, brown	3	4
Gravel, fine to coarse	18	22
Clay	4	26

Test hole 186 (105-49-4bcb). Altitude, 1,540 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, silty	3	4
Gravel, fine to coarse	11	15
Clay	4	19

Test hole 187 (105-48-4baa). Depth to water 8 feet (reported July 24, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black; grading into gray, clayey sand	4	4
Sand, coarse, and fine gravel	5	9
Gravel, medium to coarse	10	19
Gravel, medium	8	27
Clay, gray (till)	2	29
Clay, dark-gray (till)	10	39

Test hole 188 (105-49-2aab). Altitude, 1,512 feet (T). Depth to water 13.2 feet (measured July 25, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, gray, sandy	4	4
Sand and gravel, clayey	12	16
Gravel, fine to medium, clean	10	26
Clay, olive-gray (till)	6	32

Moody County -- continued

Test hole 189 (105-49-2aba). Altitude, 1,508 feet (T). Depth to water 9.2 feet (measured July 25, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, gray, sandy	2	4
Sand, fine to medium, silty	4	8
Sand, medium to coarse, and fine gravel, clean	20	28
Clay, olive-gray (till)	4	32

Test hole 190 (105-49-3baa). Altitude, 1,542 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	6	6
Gravel, coarse	4	10

Test hole 191 (105-49-3bba). Altitude 1,550 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	4	4
Clay, tan (till)	5	9
Clay, grayish-tan (till)	5	14
Clay, yellowish-brown (till)	5	19

Test hole 192 (106-49-26ddc). Altitude, 1,519 feet (T). Depth to water 19 feet (reported July 14, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium	4	4
Alluvium; changing to silty sand	5	9
Clay, brown, silty	5	14
Sand, medium, silty	5	19
Sand, medium	5	24

Test hole 193 (106-49-35bab). Altitude, 1,515 feet (T). Depth to water 5.5 feet (measured July 25, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, gray, sandy	2	2
Sand, coarse, and fine gravel, clean	13	15
Clay, olive-gray (till)	2	17

Moody County -- continued

Test hole 194 (106-49-26ccc). Altitude, 1,510 feet (T). Depth to water 10 feet (reported July 14, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Alluvium; changing to fine sand.....	4	4
Sand, medium to coarse.....	5	9
Sand, medium.....	2	11
Clay, yellowish-gray (till).....	3	14
Clay, grayish-tan (till).....	15	29
Clay, gray (till).....	5	34

Test hole 195 (106-49-34abb). Altitude, 1,510 feet (T). Depth to water 19 feet (reported July 15, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil, black; changing to tan clay.....	4	4
Clay, dark-brown, silty.....	5	9
Clay, grayish-brown, silty.....	5	14
Sand, silty, medium to fine.....	10	24
Sand, silty, fine.....	5	29
Sand, silty, medium.....	3	32
Clay, gray (till).....	7	39

Test hole 196 (106-49-23ddc). Altitude, 1,540 feet (T). Depth to water 10 feet (reported July 15, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Gravel, coarse, silty.....	4	4
Sand, fine to medium.....	5	9
Sand, fine.....	1	10
Clay, dark-gray (till).....	9	19

Test hole 197 (106-49-23ccd). Altitude, 1,518 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil; changing to fine sand.....	4	4
Sand, coarse, grading into fine sand....	5	9
Sand, fine to medium.....	5	14
Clay, dark-gray (till).....	10	24

Moody County -- continued

Observation well 198 (106-49-22ddd). Altitude, 1,516 feet (T). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Sand, fine, silty	7	7
Gravel, fine to coarse, and coarse sand, clean	17	24
Clay, light-gray (till)	1	25

Test hole 199 (106-49-23adc). Altitude, 1,560 feet (T). Depth to water 14.1 feet (measured July 25, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, sandy, pebbles	14	15
Sand, light-gray, fine, clayey, changing to dark-gray	15	30
Clay, olive-gray (till)	5	35

Test hole 200 (106-49-23acd). Altitude, 1,550 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Gravel, fine to coarse	4	5
Sand, fine to coarse	9	14
Gravel, fine to coarse	1	15
Clay, gray	5	20

Test hole 201 (106-49-23bdd). Altitude, 1,545 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, brown, sandy	4	4
Sand, fine to coarse, and coarse gravel, clayey	11	15
Clay, dark-gray to black, smooth; has small grains of sand (till?)	27	42

Moody County -- continued

Test hole 202 (106-49-23bda). Altitude, 1,520 feet (T). Depth to water 5.4 feet (measured July 25, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, fine, silty	4	6
Gravel, fine to coarse, and coarse sand	9	15
Clay, olive-gray	4	19

Test hole 203 (106-49-14ccd). Altitude, 1,518 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to coarse, and fine gravel	6	7
Gravel, fine to coarse, pebbles	15	22
Clay, dark-gray	3	25

Test hole 204 (106-49-15dcd). Altitude, 1,520 feet (T). Depth to water 11 feet (estimated October 8, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Gravel, coarse, clayey	5	7
Sand, coarse	15	22
Gravel, fine, and coarse sand	14	36
Clay, dark-gray	2	38

Test hole 205 (106-49-14dbd). Altitude, 1,518 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine to coarse, sand, and pebbles, clean	3	3
Gravel, fine to medium, and coarse sand, clean	10	13
Clay, light-gray	4	17

Moody County -- continued

Test hole 206 (106-49-14cda). Altitude, 1,520 feet (T). Depth to water 10 feet (estimated October 18, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, black	5	7
Gravel, medium to coarse, silty	8	15
Clay, dark-gray (till)	5	20

Test hole 207 (106-49-14adc). Altitude, 1,518 feet (T). Depth to water 11 feet (estimated October 18, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, gravelly	5	7
Gravel, fine	5	12
Sand, fine to coarse	11	23
Clay, olive-gray (till)	2	25

Test hole 209 (108-48-18bbb). Altitude, 1,518 feet (T). Depth to water 10 feet (estimated October 7, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black, silty	2	2
Sand, fine to coarse	8	10
Sand, coarse, and fine to medium gravel	5	15
Gravel, medium to coarse	14	29
Clay, olive-gray	3	32

Test hole 210 (106-49-12ddb). Altitude, 1,518 feet (T). Depth to water 15 feet (measured July 24, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine to coarse, sand, and cobblestones	3	3
Gravel, fine to medium, and cobblestones	12	15
Clay, bluish-gray	10	25
Clay, olive-gray to gray (till)	32	57

Moody County -- continued

Test hole 211 (106-48-7add). Altitude, 1,522 feet (T). Depth to water 10.8 feet (measured October 1, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to medium, and coarse gravel clean	8	8
Gravel, coarse	2	10
Sand, fine to medium, and coarse gravel.	31	41
Clay, olive-gray	1	42

Test hole 212 (106-48-7daa). Altitude, 1,524 feet (T). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Gravel, fine	2	4
Sand, fine to medium	7	11

Test hole 214 (106-49-12dab). Altitude, 1,530 feet (T). Depth to water 22 feet (reported July 15, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Soil	4	4
Gravel, coarse	8	12
Gravel, fine to medium	2	14
Sand, medium to coarse	5	19
Sand, coarse	7	26
Coarse material, could not drill deeper at 26'		

Test hole 215 (106-49-11dbb). Altitude, 1,544 feet (T). Depth to water 7 feet (reported July 15, 1958). Drilled by SDGS.

Material	Thickness (feet)	Depth (feet)
Clay, sandy	4	4
Sand, medium to coarse	3	7
Till, tan	2	9
Till, dark-gray	10	19
No cuttings	5	24
Clay, light bluish-green changing to yellowish-green	5	29
Clay, greenish-tan to brown, very hard..	5	34

Moody County -- continued

Test hole 217 (106-48-7aba). Altitude, 1,520 feet (T). Depth to water 10 feet (estimated July 24, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine to coarse, coarse sand, and cobblestones	15	15
Clay, light-gray	2	17

Observation well 218 (106-48-5cdb). Altitude, 1,521 feet (L). Observation well S-19 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil	4	4
Gravel, fine	23	27
Clay, yellow	8	35

Test hole 219 (106-48-5cab). Altitude, 1,525 feet (T). Depth to water 11.1 feet (measured August 1, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to medium, clayey	5	5
Sand, fine to coarse, and fine gravel	3	8
Gravel, coarse, and fine to medium sand	2	10
Sand, fine to coarse	10	20
Gravel and cobblestones	2	22
Clay, olive-gray	3	25

Test hole 220 (107-48-32cda). Altitude, 1,523 feet (R). Depth to water 8 feet (reported August 13, 1958). Drilled by SDGS. Test hole 55 of Lee and Powell (1961, p. 34).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty	4	4
Sand, medium	8	12
Pebble clay, bluish-gray	7	19

Moody County -- continued

Test hole 221 (107-48-28ccc). Altitude, 1,560 feet (T). Dry to 40 feet (measured July 29, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine	5	5
Clay, brown, sandy	3	8
Sand, fine to coarse	12	20
Gravel, medium	2	22
Sand, fine to coarse	8	30
Sand, fine, clayey	5	35
Clay, dark-brown, sandy	5	40

Test hole 222 (107-48-29ddc). Altitude, 1,525 feet (T). Depth to water 37 feet (estimated July 29, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to medium, and fine-to-coarse gravel with pebbles and cobblestones	45	45
Clay, blue-gray (till)	2	47

Observation well 223 (107-48-32abb). Altitude, 1,525 feet (T). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Sand, fine to medium, silty	8	8
Sand, coarse, clean	4	12
Gravel, fine to medium, and coarse sand.	16	28
Clay, dark-gray (till)	4	32

Test hole 224 (107-48-32bab). Altitude, 1,526 feet (R). Depth to water 14 feet (reported August 7, 1958). Drilled by SDGS. Test hole 61 of Lee and Powell (1961, p. 34).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand, medium to coarse	15	19
Gravel	5	24
Pebble clay, bluish-gray	5	29

Moody County -- continued

Test hole 226 (107-48-29daa). Altitude, 1,550 feet (T). Depth to water 37 feet (estimated August 1, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to coarse	5	5
Gravel, coarse, and fine to coarse sand, clean	5	10
Sand, coarse, and fine to coarse gravel.	5	15
Gravel, coarse, and coarse sand with pebbles and cobblestones, clean	15	30
Sand, fine to coarse, and fine to coarse gravel	20	50
Clay, light gray	2	52

Test hole 227 (107-48-29adb). Altitude, 1,540 feet (T). Depth to water 18 feet (estimated July 29, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to coarse, and coarse gravel with pebbles and cobblestones	35	35
Clay, olive-gray (till)	2	37

Test hole 228 (107-48-26baa). Altitude, 1,522 feet (R). Depth to water 12 feet (reported July 31, 1958). Drilled by SDGS. Test hole 60 of Lee and Powell (1961, p. 32).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, brownish-gray near base; silty	4	4
Silt; some clay	5	9
Sand, medium	16	25
Pebble clay, bluish-gray	3	28

Test hole 229 (107-48-27aad). Depth to water 6 feet (reported October 7, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, dark-gray, silty	8	10
Sand, fine to medium, silty	10	20
Sand, fine to coarse	10	30
Sand, coarse, and fine to coarse gravel.	13	43

Moody County -- continued

Test hole 230 (107-48-27aac). Altitude, 1,526 feet (R). Depth to water 11 feet (reported July 31, 1958). Drilled by SDGS. Test hole 45 of Lee and Powell (1961, p. 32).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty	4	4
Clay and silt	5	9
Sand, medium	5	14
Sand and gravel	8	22
Pebble clay, bluish-gray	7	29

Well 231 (107-48-27bab). Well 3 of City of Flandreau.

Material	Thickness (feet)	Depth (feet)
Soil	2	2
Clay	6	8
Sand, coarse, and clay balls	2	10
Sand, fine to coarse	15	25
Sand, fine and gravel streaks	5	30
Boulders	1	31

Test hole 233 (107-48-29aba). Altitude, 1,523 feet (R). Depth to water 17 feet (reported July 29, 1958). Drilled by SDGS. Test hole 46 of Lee and Powell (1961, p. 33).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	1	1
Sand and gravel	19	20
Pebble clay, bluish-gray	4	24

Test hole 234 (107-48-20dcc). Altitude, 1,530 feet (T). Depth to water 17 feet (estimated July 22, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Clay, dark-brown, gravelly	5	7
Sand, dark-brown, medium to coarse, gravelly, clean	13	20
Gravel, medium to coarse, clean, with medium to coarse sand and cobble-stones	20	40
Clay, light-gray (till)	2	42

Moody County -- continued

Test hole 235 (107-48-29bab). Altitude, 1,514 feet (R). Depth to water 12 feet (reported July 30, 1958). Drilled by SDGS. Test hole 47 of Lee and Powell (1961, p. 33).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy.....	4	4
Sand and gravel.....	5	9
Sand, medium to coarse.....	20	29
Gravel.....	1	30
Clay.....	1	31

Test hole 237 (107-48-23daa). Altitude, 1,529 feet (R). Depth to water 11 feet (reported July 29, 1958). Drilled by SDGS. Test hole 43 of Lee and Powell (1961, p. 31).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy.....	4	4
Sand, medium.....	5	9
Sand and gravel.....	9	18
Pebble clay, bluish-gray.....	6	24

Observation well 238 (107-48-14ddd). Altitude, 1,541 feet (L). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown, sandy.....	10	10
Clay, dark-brown, gravelly.....	2	12
Sand, medium to coarse, clayey.....	8	20
Gravel, fine, clayey.....	5	25
Sand, fine, clayey.....	3	28
Clay, light-gray (till).....	4	32

Test hole 239 (107-48-15baa). Altitude, 1,548 feet (R). Depth to water 11 feet (reported July 31, 1958). Drilled by SDGS. Test hole 40 of Lee and Powell (1961, p. 31).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty.....	4	4
Silt and clay, black to gray.....	5	9
Sand, medium to coarse.....	10	19
Gravel.....	9	28
Pebble clay, bluish-gray.....	6	34

Moody County -- continued

Test hole 240 (107-48-10ccc). Altitude, 1,550 feet (R). Depth to water 11 feet (reported July 29, 1958). Drilled by SDGS. Test hole 39 of Lee and Powell (1961, p. 29).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty.....	4	4
Silt and clay, dark-gray.....	5	9
Sand, very coarse to coarse; some pebbles.....	10	19
Pebble clay, bluish-gray.....	5	24

Observation well 241 (107-48-16aaa). Altitude, 1,542 feet (L). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown, sandy.....	10	10
Gravel, fine to medium, dark-brown.....	10	20
Clay, olive-green, gravelly (till?).....	3	23

Test hole 243 (107-48-9caa). Depth to water 15 feet (estimated September 17, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	1	1
Gravel, fine to coarse, and fine sand...	7	8
Sand, fine to coarse.....	7	15
Gravel, fine to medium, and coarse sand.	24	39
Clay, light-brown (till).....	1	40

Test hole 244 (107-48-8dda). Depth to water 9.1 feet (measured July 17, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine, clayey.....	12	12
Sand, coarse, clayey.....	6	18
Sand, medium to coarse, clean.....	16	34
Clay, light-brown (till).....	3	37

Moody County -- continued

Test hole 245 (107-48-9bdd). Altitude, 1,554 feet (R). Depth to water 9 feet (reported July 28, 1958). Drilled by SDGS. Test hole 38 of Lee and Powell (1961, p. 28-29).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy, calcareous at base	4	4
Sand, medium to very coarse, rounded, granules and pebbles of limestone, dolomite, slate, granite, and shale, accessory minerals include feldspar, iron oxides, tourmaline, and hornblende	5	9
Sand, medium to very coarse, rounded; gravel, granules and pebbles of limestone, dolomite, slate, schist, granite, shale, and ironstone; accessory minerals include feldspar, tourmaline, iron oxides, and chert	15	24
Sand, medium to very coarse, rounded, small fragments of limestone, dolomite, granite, schist, slate, and shale; accessory minerals include tourmaline, feldspar, iron oxides, pyrite, and chert	5	29
Sand, medium to very coarse, rounded; gravel, granules and pebbles of limestone, dolomite, granite, slate, shale, and gneiss; accessory minerals include chert, feldspar, mica, epidote, pyrite, iron oxides, tourmaline, and others	12	41
Clay, bluish-gray to gray, silty, some oxidized streaks, granules and pebbles of rock fragments	3	44

Test hole 246 (107-48-9cbb). Depth to water 8.3 feet (measured May 4, 1964). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil	3	3
Sand, medium, clean	9	12
Sand, coarse, and fine gravel	8	20
Gravel, fine to coarse	17	37
Clay	2	39

Moody County -- continued

Test hole 247 (107-48-8add). Depth to water 16 feet (estimated August 5, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine	4	4
Gravel, fine to coarse, and fine sand with pebbles and cobblestones	14	18
Gravel, fine to coarse	35	53
Clay, olive-gray (till)	2	55

Test hole 248 (107-48-8aaa). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Silt, gravel	3	3
Gravel, silty and sandy	9	12

Observation well 249 (107-48-5dcc). Altitude, 1,557 feet (L). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, coarse, silty	7	8
Gravel, medium to coarse, silty	2	10
Sand, medium to coarse	10	20
Gravel, fine to medium, and coarse sand	10	30
Gravel, fine to coarse, silty	10	40
Clay, gray	2	42

Test hole 250 (107-48-5dbc). Altitude, 1,551 feet (R). Depth to water 16 feet (reported July 28, 1958). Drilled by SDGS. Test hole 35 of Lee and Powell (1961, p. 27).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty	4	4
Silt and clay, black to gray	5	9
Sand, medium	5	14
Sand and gravel	13	27
Pebble clay, gray	7	34

Moody County -- continued

Test hole 253 (108-48-32ccc). Altitude, 1,555 feet (T). Depth to water 16 feet (estimated August 5, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, dark-brown, sandy	4	5
Gravel, fine to coarse, clayey	5	10
Sand, fine to coarse, gravelly and clayey	20	30
Boulders	1	31

Test hole 254 (108-48-32bcc). Altitude, 1,564 feet (R). Depth to water 25 feet (reported July 24, 1958). Drilled by SDGS. Test hole 32 of Lee and Powell (1961, p. 38).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty	4	4
Sand and gravel	20	24
Sand, coarse	4	28
Pebble clay, bluish-gray	6	34

Test hole 255 (108-48-32bda). Altitude, 1,548 feet (R). Depth to water 11 feet (reported July 24, 1958). Drilled by SDGS. Test hole 31 of Lee and Powell (1961, p. 38).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy	4	4
Sand, medium to coarse	15	19
Gravel	12	31
Pebble clay, bluish-gray	8	39

Test hole 256 (108-48-31aaa). Altitude, 1,565 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown, sandy	4	4
Gravel, fine to coarse, clayey, dry	10	14
Clay, dark-brown, gravelly, dry	3	17

Moody County -- continued

Test hole 257 (108-48-30dda). Altitude, 1,560 feet (T). Depth to water 6.1 feet (measured July 17, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown	6	6
Gravel, fine to coarse, clayey	9	15
Till, dark-gray	7	22

Test hole 258 (108-48-29cbb). Altitude, 1,555 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, coarse, and fine gravel	6	7
Gravel, fine to coarse	5	12
Boulders		12+

Test hole 259 (108-48-27bbb). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-brown, gravelly	12	12
Clay, dark-gray	15	27

Test hole 260 (108-48-29bbc). Altitude, 1,566 feet (R). Depth to water 8 feet (reported July 24, 1958). Drilled by SDGS. Test hole 29 of Lee and Powell (1961, p. 37).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand, medium	10	14
Gravel	9	23
Pebble clay, bluish-gray	6	29

Observation well 261 (108-48-19ccc). Altitude, 1,550 feet (L). Drilled by USGS. Water levels given in table 2.

Materials	Thickness (feet)	Depth (feet)
Soil, black	1	1

Moody County -- continued

Observation well 261 -- continued.

Sand, fine to coarse, and fine to medium gravel, clean	7	8
Gravel, fine to coarse, clean	4	12
Gravel, fine to medium, and fine sand, clean	6	18
Clay, dark-gray	4	22

Test hole 262 (108-49-25aaa). Altitude, 1,561 feet (R). Depth to water 8 feet (reported July 24, 1958). Drilled by SDGS. Test hole 28 of Lee and Powell (1961, p. 44).

Materials	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy	4	4
Sand and gravel	20	24
Pebble clay, bluish-gray	10	34

Test hole 263 (108-49-24ccc). Altitude, 1,562 feet (R). Depth to water 11 feet (reported July 24, 1958). Drilled by SDGS. Test hole 26 of Lee and Powell (1961, p. 43).

Materials	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand, fine	5	9
Sand and gravel	8	17
Pebble clay, bluish-gray	7	24

Test hole 264 (108-49-23dcd). Altitude, 1,567 feet (R). Depth to water 8 feet (reported July 22, 1958). Drilled by SDGS. Test hole 23 of Lee and Powell (1961, p. 43).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand and gravel	5	9
Sand, coarse	5	14
Gravel	4	18
Pebble clay, bluish-gray	6	24

Moody County -- continued

Test hole 265 (108-49-24cbc). Altitude, 1,566 feet (R). Depth to water 12 feet (reported July 24, 1958). Drilled by SDGS. Test hole 25 of Lee and Powell (1961, p. 43).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand, coarse	10	14
Pebble clay, bluish-gray	5	19

Test hole 266 (108-49-23cac). Altitude, 1,567 feet (R). Depth to water 8 feet (July 22, 1958). Drilled by SDGS. Test hole 24 of Lee and Powell (1961, p. 42).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand, coarse	5	9
Sand and gravel	2	11
Pebble clay, bluish-gray	8	19

Test hole 267 (108-49-21dda). Altitude, 1,565 feet (T). Depth to water 6.5 feet (measured October 8, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Clay, gray	3	6
Sand, very fine to fine	2	8
Sand, medium to very coarse	22	30
Till	2	32

Test hole 268 (108-48-23ada). Depth to water 20.5 feet (measured July 16, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, dark-gray, sandy	15	15
Till	7	22

Test hole 269 (108-48-23cbb). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, medium to coarse, silty	7	7

Moody County -- continued

Test hole 270 (108-49-22bcc). Altitude, 1,565 feet (T). Depth to water 6.7 feet (measured October 8, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Sand, fine to medium, silty	6	9
Gravel, medium to coarse	11	20
Clay	2	22

Test hole 272 (108-48-13ddd). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, buff, sandy	7	7
Clay, light-brown, sandy	11	18
Clay, buff, sandy	8	26
Clay, buff	6	32

Test hole 273 (108-49-22abb). Altitude, 1,562 feet (R). Depth to water 8 feet (reported July 22, 1958). Drilled by SDGS. Test hole 22 of Lee and Powell (1961, p. 42).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	1	1
Sand and gravel	11	12
Pebble clay, bluish-gray	7	19

Observation well 274 (108-49-22bbb). Altitude, 1,562 feet (L). Observation well S-18 of SDWRC. Drilled by SDWRC. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil	6	6
Gravel, fine	8	14
Clay, gray	16	30

Moody County -- continued

Test hole 275 (108-49-21aba). Altitude, 1,568 feet (T). Depth to water 4.9 feet (measured October 8, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown	3	3
Sand, fine to medium	2	5
Gravel, coarse	2	7
Sand, medium to very coarse	12	19
Sand, very fine to fine, silty	8	27
Clay	5	32

Test hole 276 (108-49-21baa). Altitude, 1,568 feet (T). Depth to water 14 feet (reported July 21, 1958). Drilled by SDGS. Test hole 20 of Lee and Powell (1961, p. 41).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty	4	4
Gravel	10	14
Sand, medium to coarse	15	29
Pebble clay, bluish-gray	5	34

Test hole 277 (108-49-21bba). Altitude, 1,570 feet (T). Depth to water 10.1 feet (measured October 8, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, brown	2	2
Sand, very fine to fine	3½	5½
Gravel, coarse	1½	7
Sand, fine to coarse	5	12
Sand, coarse to very coarse	18	30
Clay	6	36

Test hole 278 (108-49-15cbb). Altitude, 1,555 feet (T). Depth to water 1.4 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to coarse, some gravel, slightly silty	7	8
Sand, fine to coarse, and fine gravel	7	15
Gravel, fine to medium, sandy	6	21
Clay	6	27

Moody County -- continued

Test hole 279 (108-49-15cbb). Altitude, 1,555 feet (T). Depth to water 2.6 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium, some gravel, silty	3½	4½
Gravel, fine to medium, sandy	1½	6
Gravel, fine, some sand, clayey and silty	5	11
Sand, fine to coarse, some gravel, clayey and silty	4	15
Clay	6	21

Test hole 280 (108-47-18aaa). Altitude, 1,690 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, medium to coarse; sand, fine, very silty	17	17

Test hole 282 (108-49-15baa). Altitude, 1,550 feet (T). Depth to water 10.1 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	3	3
Sand, very fine to medium, silty and clayey	6	9
Sand, fine to coarse, some gravel, silty	5	14
Sand, medium to coarse, and fine to medium gravel	10½	24½
Gravel, sandy	2½	27
Sand, medium to coarse, and gravel	1½	28½
Clay	3½	32

Test hole 283 (108-49-15bba). Altitude, 1,555 feet (T). Depth to water 11.1 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, very fine to medium, silty and clayey	5	7

Moody County -- continued

Test Hole 283 -- continued.

Material	Thickness (feet)	Depth (feet)
Sand, fine to coarse, some gravel, silty	5	12
Sand, coarse to very coarse, and fine to medium gravel	8	20
Gravel, fine to coarse, sandy	2	22
Sand, fine to coarse, some gravel	3	25
Clay	2	27

Test hole 284 (108-49-15bbb). Altitude, 1,560 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil	1	1
Sand, fine to medium	7	8
Sand, coarse	10	18
Clay	2	20

Test hole 285 (108-49-16abb). Altitude, 1,560 feet (T). Depth to water 4.4 feet (measured October 11, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, silty and sandy, black	2	3
Sand, medium to coarse, and gravel	3	6
Gravel, fine to coarse, sandy	7	13
Clay	3	16

Test hole 286 (108-49-16abb). Altitude, 1,560 feet (T). Depth to water 6 feet (estimated October 11, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, very fine to medium, silty	2	4
Sand, medium to coarse, and gravel	2½	6½
Gravel, fine to medium, and medium to very coarse sand, slightly silty	5	11½
Sand, medium to coarse, and gravel	1½	13
Clay	3½	16½

Moody County -- continued

Test hole 287 (108-49-16bab). Altitude, 1565 feet (T). Depth to water 6 feet (estimated October 11, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, medium to coarse	12	14
Gravel, fine to coarse, and medium to very coarse sand	4	18
Gravel, fine, and fine to very coarse sand	3	21
Sand, fine to coarse	2	23
Clay	3	26

Test hole 288 (108-49-16bbb). Altitude, 1,564 feet (T). Depth to water 6 feet (estimated October 11, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1½	1½
Sand, medium to coarse, and fine to coarse gravel	8½	10
Sand, coarse to very coarse, and fine to coarse gravel	4	14
Gravel, fine to coarse, and medium to very coarse sand	4	18
Sand, medium to very coarse, and fine to medium gravel	5	23
Gravel, fine, sandy, and silty	3	26
Sand, fine to coarse, silty; thin gravel beds	4	30
Clay	6½	36½

Test hole 289 (108-49-10cda). Altitude, 1,569 feet (R). Depth to water 9 feet (reported July 21, 1958). Drilled by SDGS. Test hole 18 of Lee and Powell (1961, p. 41).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy	2	2
Sand and gravel	26	28
Pebble clay, bluish-gray	6	34

Moody County -- continued

Test hole 290 (108-49-9dda). Altitude, 1,560 feet (T). Depth to water 7.6 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium	3	4
Gravel, fine to medium, and coarse to very coarse sand	13	17
Sand, medium to coarse, some gravel	9	26
Clay	6	32

Test hole 291 (108-49-9dbd). Altitude, 1,568 feet (R). Depth to water 13 feet (reported July 21, 1958). Drilled by SDGS. Test hole 17 of Lee and Powell (1961, p. 41).

Material	Thickness (feet)	Depth (feet)
Soil, brownish-gray, silty, sandy	4	4
Sand, fine to coarse	15	19
Sand and gravel	5	24
Pebble clay, bluish-gray	5	29

Test hole 292 (108-49-8dda). Altitude, 1,566 feet (R). Depth to water 8 feet (reported July 21, 1958). Drilled by SDGS. Test hole 19 of Lee and Powell (1961, p. 40).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy	4	4
Sand and gravel	10	14
Pebble clay, bluish-gray	10	24

Test hole 293 (108-49-9add). Altitude, 1,562 feet (T). Depth to water 9.6 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, fine to medium, silty	2	4
Gravel, fine to coarse, sandy	8	12
Sand, medium to very coarse, and gravel	6	18
Gravel, medium, sandy	10	28
Sand, medium to coarse	4	32
Clay	4	36

Moody County -- continued

Test hole 294 (108-47-10abb). Altitude, 1,694 feet (R). Drilled by SDGS. Test hole 64 of Lee and Powell (1961, p. 37).

Material	Thickness (feet)	Depth (feet)
Soil, dark brown, sandy.....	3	3
Sand and gravel.....	6	9
Pebble clay, bluish-gray.....	10	19

Test hole 295 (108-47-9aaa). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Clay, buff, sandy.....	20	20
Clay, light-gray; changing to dark-gray in depth, sandy, contains pebbles.....	12	32

Test hole 296 (108-47-9abb). Altitude, 1,679 feet (R). Depth to water 7 feet (reported August 11, 1958). Drilled by SDGS. Test hole 63 of Lee and Powell (1961, p. 37).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy.....	1	1
Sand and gravel.....	8	9
Pebble clay, bluish-gray.....	10	19

Test hole 297 (108-47-8aba). Altitude, 1,667 feet (R). Drilled by SDGS. Test hole 62 of Lee and Powell (1961, p. 36).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty.....	4	4
Sand and gravel.....	5	9
Pebble clay, bluish-gray.....	5	14

Test hole 298 (108-47-7abb). Depth to water 3.5 feet (measured July 16, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Topsoil, black.....	2	2
Silt, black, sandy.....	10	12
Sand, coarse.....	5	17
Gravel, medium to coarse.....	11	28
Clay, dark-gray.....	4	32

Moody County -- continued

Test hole 299 (108-49-4ddd). Altitude, 1,570 feet (T). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium, silty	5	6
Gravel, fine to coarse, and fine to very coarse gravel	5	11
Clay	1	12

Test hole 300 (108-49-9abb). Altitude, 1,554 feet (T). Depth to water 9.1 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, very fine to fine, silty	5	7
Sand, fine to coarse, silty	11	18
Sand, medium to very coarse, slightly silty	5	23
Sand, medium to very coarse, and fine to medium gravel	7	30
Gravel, fine to medium, and medium to very coarse sand	4	34
Clay	6	40

Test hole 301 (108-49-9abb). Altitude, 1,560 feet (T). Depth to water 6.9 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, medium to coarse, some gravel, silty	5	6
Sand, fine to coarse, silty	5½	11½
Sand, fine to coarse, thin gravel beds between 12 and 17 feet, very silty	6½	18
Gravel, fine to coarse, and medium to very coarse sand	13	31
Sand, fine to coarse, some gravel, silty	2	33
Clay	3½	36½

Moody County -- continued

Test hole 302 (108-49-9baa). Altitude, 1,563 feet (R). Depth to water 12 feet (reported July 21, 1958). Drilled by SDGS. Test hole 16 of Lee and Powell (1961, p. 40).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy.....	4	4
Clay, brownish-gray.....	5	9
Sand, fine.....	10	19
Gravel.....	13	32
Pebble clay, bluish-gray.....	7	39

Test hole 303 (108-49-4ccd). Altitude, 1,552 feet (T). Depth to water 6.1 feet (measured September 16, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	1	1
Sand, fine to medium.....	9	10
Gravel, fine to coarse.....	15	25
Clay, gray.....	2	27

Test hole 304 (108-49-9bbb). Altitude, 1,562 feet (T). Depth to water 9.8 feet (measured October 12, 1965). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil and clayey loam, black.....	7	7
Sand, fine to medium, silty.....	5	12
Sand, fine to coarse, some gravel, silty	7	19
Gravel, fine to medium, and sand, medium to coarse, silty.....	3	22
Sand, medium to coarse, and gravel, fine to medium, silty.....	2	24
Till.....	3	27

Test hole 305 (108-49-5dcd). Altitude, 1,565 feet (R). Depth to water 8 feet (reported July 21, 1958). Drilled by SDGS. Test hole 15 of Lee and Powell (1961, p. 39).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy.....	3	3
Sand and gravel.....	6	9
Sand, coarse.....	7	16
Pebble clay, bluish-gray.....	8	24

Moody County -- continued

Test hole 306 (108-49-5cdc). Altitude, 1,560 feet (T). Depth to water 7.7 feet (measured September 16, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	2	2
Sand, fine to coarse, silty	10	12
Sand, medium to coarse	10	22
Clay, olive-gray	3	25

Observation well 307 (108-49-7aaa). Altitude, 1,563 feet (L). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Clay, dark-brown, sandy	5	6
Clay, light-gray, sandy	4	10
Gravel, fine to coarse, clayey	5	15
Sand, coarse, clean	5	20
Clay, gray	7	27

Test hole 309 (108-49-5ccc). Altitude, 1,562 feet (T). Depth to water 2 feet (measured July 31, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine; sand, fine to coarse, clean	22	22
Clay, light-brown; changing to dark gray with depth	95	117

Test hole 310 (108-49-5cbc). Altitude, 1,565 feet (T). Depth to water 10 feet (estimated October 16, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black	1	1
Sand, fine to medium	9	10
Sand, fine to coarse, and fine gravel	5	15
Till, light-gray changing to brown	5	20

Moody County -- continued

Observation well 311 (108-49-5acb). Altitude, 1,567 feet (L). Drilled by USGS. Water levels given in table 2.

Material	Thickness (feet)	Depth (feet)
Soil, black, sandy	2	2
Gravel, fine to medium and coarse sand	30	32
Clay	2	34

Test hole 312 (108-49-5bdd). Altitude, 1,568 feet (R). Depth to water 9 feet (reported July 19, 1958). Drilled by SDGS. Test hole 13 of Lee and Powell (1961, p. 38).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	1	1
Sand and gravel	8	9
Sand, medium	10	19
Gravel	5	24
Pebble clay, bluish-gray	5	29

Test hole 313 (108-47-4aaa). Depth to water 23.5 feet (measured August 2, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine to coarse, clayey	12	12
Gravel, fine to medium; sand, coarse, clayey	38	50

BROOKINGS COUNTY

Test hole 315 (109-47-32ddd). Altitude, 1,680 feet (R). Depth to water 15 feet (reported August 12, 1958). Drilled by SDGS. Test hole 67 of Lee and Powell (1961, p. 50).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	4	4
Sand and gravel	22	26
Pebble clay, bluish-gray	3	29

Brookings County -- continued

Test hole 316 (109-47-31ddd). Altitude, 1,665 feet (R). Depth to water 22 feet (reported August 12, 1958). Drilled by SDGS. Test hole 68 of Lee and Powell (1961, p. 49).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, silty, sandy.....	4	4
Sand, fine.....	5	9
Sand and gravel.....	20	29
Pebble clay, bluish-gray.....	10	39

MOODY COUNTY

Test hole 317 (108-49-5bbb). Altitude, 1,572 feet (T). Depth to water 8 feet (estimated July 31, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine to coarse, clean.....	25	25
Clay, light-gray.....	2	27

BROOKINGS COUNTY

Test hole 318 (109-47-27cdc). Altitude, 1,706 feet (R). Drilled by SDGS. Test hole 71 of Lee and Powell (1961, p. 49).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy.....	4	4
Sand and gravel.....	1	5
Pebble clay, bluish-gray, brownish-gray.	9	14

Test hole 319 (109-47-34bbb). Altitude, 1,735 feet (T). Depth to water 15 feet (estimated September 18, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Soil, black.....	1	1
Clay, gravelly, buff.....	14	15
Sand, fine to coarse, silty, gravelly...	27	42
Clay, gravelly.....	3	45

Brookings County -- continued

Test hole 320 (109-47-32abb). Altitude, 1,686 feet (R). Depth to water 17.8 feet (measured August 19, 1958). Drilled by SDGS. Test hole 69 of Lee and Powell (1961, p. 50).

Material	Thickness (feet)	Depth (feet)
Soil, dark-brown, sandy	3	3
Sand and gravel	26	29
Pebble clay, bluish-gray	5	34

Test hole 321 (109-47-32bbb). Depth to water 4 feet (measured August 6, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Gravel, fine, and coarse sand	10	10
Sand, fine to coarse, clayey	11	21
Boulders	4	25
Sand, fine, clayey	7	32
Clay, gray	2	34

Test hole 322 (109-47-27aaa). Altitude, 1,760 feet (T). Depth to water 30 feet (estimated July 6, 1963). Drilled by USGS.

Material	Thickness (feet)	Depth (feet)
Sand, fine to coarse; pebbles and cobblestones	7	7
Gravel, coarse; pebbles and cobblestones	13	20
Sand, fine to coarse	9	29
Gravel, medium to coarse; pebbles and cobblestones	11	40
Till, light-brown, sandy, changing to gray with depth	12	52

TABLE 2.--MEASUREMENTS OF WATER LEVELS IN OBSERVATION WELLS

As part of the investigation, monthly measurements were made in 33 observation wells (2 additional observations wells in the project area were destroyed, but available records are included in this table). The dates of measurement and the depths of the water level, in feet, below land-surface datum are given for each well in the table. The highest and lowest water levels measured are indicated by underlined dates and measurements followed by "H" and "L" respectively.

Between October 1965 and December 1966, monthly measurements of the temperature and specific conductance of the water in 7 observation wells were made. The results of these measurements are listed in this table with the water-level measurements.

The significance of changes in water levels and the use of water-level data for determining hydraulic gradient, configuration of the water table, and changes in storage are described briefly in the interpretive report. Hydrographs of 4 representative observation wells (3, 72, 102, and 274) are also illustrated in the interpretive report.

TABLE 2.--MEASUREMENTS OF THE WATER LEVELS IN OBSERVATION WELLS

(Depth to water levels are given in feet below land-surface datum.)

MINNEHAHA COUNTY

Observation well 3 (101-49-9bcb). South Dakota Water Resources Commission observation well S-29. Diameter 1¼ inches, depth 30 feet. Land surface altitude 1,418.87 feet.

Date	Water level	Date	Water level	Date	Water level
7-22-58	12.6	7-23-64	9.61	3-30-66	9.67
11-28-58	12.7 L	8-28-64	10.22	5- 3-66	9.96
3-12-59	12.0	9-18-64	9.93	6- 6-66	9.74
7-14-59	12.3	10-21-64	9.91	6-28-66	9.88
11-18-59	11.7	11-23-64	10.04	7-29-66	10.58
5- 4-60	9.3	12-30-64	10.25	8-26-66	10.80
3- 7-61	11.2	1-28-65	10.38	10- 4-66	10.26
7-13-61	11.9	2-26-65	10.45	11- 9-66	10.41
11- 3-61	10.5	3-31-65	9.98	12-12-66	10.41
3- -62	7.7	4-30-65	9.21	1-26-67	10.79
7- -62	7.1 H	5-20-65	8.38	2-25-67	10.85
11- -62	9.4	7- 7-65	7.52	3-22-67	10.53
11-19-63	9.98	7-30-65	8.09	4-25-67	9.92
12-19-63	10.04	8-31-65	8.97		
1-23-64	10.11	9-30-65	9.07		
2-27-64	10.13	10-29-65	9.20		
3-17-64	10.19	11-24-65	9.38		
4-16-64	9.65	12-30-65	9.42		
5-12-64	9.20	1-25-66	9.70		
6-17-64	9.25	2-26-66	10.00		

Observation well 13 (102-49-32aab). City of Sioux Falls observation well T4. Diameter 4 inches. Land surface altitude 1,424.29 feet.

Date	Water level	Date	Water level	Date	Water level
10-25-63	3.10	3-17-64	6.67	9-18-64	3.55
11-19-63	6.67	4-16-64	1.40	10-21-64	3.04
12-19-63	6.82	5-12-64	1.20 H	11-23-64	3.73
1-23-64	6.70	6-17-64	2.83	12-30-64	7.61
2-27-64	7.40	7-23-64	3.22	1-28-65	8.09 L

Minnehaha County -- continued

Observation well 13 -- continued.

Date	Water level	Date	Water level	Date	Water level
2-26-65	8.05	1-25-66	6.94	12-12-66	4.36
3-31-65	4.98	2-26-66	5.16	1-26-67	4.93
4-30-65	1.42	3-30-66	3.80	2-25-67	4.97
7- 7-65	1.51	5- 3-66	1.64	3-22-67	3.40
7-30-65	3.02	6- 6-66	2.52	4-25-67	3.80
8-31-65	3.26	6-28-66	4.62		
9-30-65	4.73	7-29-66	2.95		
10-29-65	6.76	8-26-66	3.03		
11-24-65	6.68	10- 4-66	2.82		
12-30-65	6.71	11- 9-66	3.78		

Observation well 14 (102-49-32aba). City of Sioux Falls observation well MP. Diameter 4 inches. Land surface altitude 1,429.38 feet.

Date	Water level	Date	Water level
10-25-63	10.26	3-17-64	18.68 L
11-19-63	12.36	4-16-64	8.35 H
12-19-63	14.2	6-16-64	10.00
1-23-64	14.55	7-23-64	10.49
2-27-64	14.87	8-28-64	10.77

Observation well 27 (102-49-20bab). City of Sioux Falls observation well C9. Diameter 5 inches. Land surface altitude 1,432.86 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	9.22	3-17-64	7.65	9-16-64	10.03
10-25-63	9.02	4-16-64	6.91	10-21-64	10.16
11-19-63	9.35	6-16-64	9.10	12-30-64	9.27
1-23-64	10.81 L	7-23-64	9.71	4-30-65	3.58 H
2-27-64	8.84	8-28-64	10.02	7- 7-65	7.25

Minnehaha County -- continued

Observation well 27 (102-49-20bab) continued.

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (micromhos/cm at 25°C)
7-30-65	8.88	-	-
8-31-65	9.54	-	-
9-30-65	9.41	-	-
10-29-65	9.28	54	650
11-24-65	9.44	53	650
12-30-65	9.46	53	650
1-25-66	9.69	53	625
2-26-66	6.80	47	625
3-30-66	4.90	51	650
5- 3-66	6.39	51	700
6- 6-66	8.50	50	700
6-28-66	9.02	54	650
7-14-66	9.52	52	660
8-25-66	9.69	-	-
10- 4-66	10.01	52	660
11- 8-66	9.86	50	660
12-12-66	10.13	-	-
2-25-67	9.15	-	-
3-22-67	7.61	-	-
4-25-67	8.40	-	-

Observation well 28 (102-49-17cba). City of Sioux Falls observation well C12. Diameter 5 inches. Land surface altitude 1,434.92 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	9.04	3-17-64	8.43	9-18-64	9.99
10-25-63	9.05	4-16-64	7.49 H	10-21-64	10.00 L
11-19-63	9.28	6-17-64	8.98	11-23-64	9.94
1-23-64	8.95	7-23-64	9.54	4-30-65	8.22
2-27-64	8.97	8-28-64	9.92		

Minnehaha County -- continued

Observation well 31 (102-49-16abb). City of Sioux Falls observation well SPD 1. Diameter 2 inches, depth 30 feet. Land surface altitude 1,436.51 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	6.82	1-28-65	8.65	6- 6-66	4.78
10-25-63	7.02	2-26-65	8.73 L	6-28-66	5.46
11-19-63	7.17	4-30-65	4.84	7-14-66	6.15
12-19-63	7.32	5-20-65	2.68 H	8-25-66	6.79
1-23-64	7.45	7- 7-65	3.95	10- 4-66	6.90
2-27-64	7.30	7-30-65	4.70	11- 9-66	7.08
3-17-64	7.55	8-31-65	5.57	12-12-66	7.30
4-16-64	7.20	9-30-65	5.51	1-26-67	7.53
6-17-64	7.49	10-29-65	5.35	2-25-67	7.54
7-23-64	7.73	11-24-65	5.42	4-25-67	5.78
8-28-64	8.06	12-30-65	5.32		
9-16-64	8.16	1-25-66	5.55		
10-21-64	8.26	2-26-66	5.34		
11-23-64	8.41	3-30-66	4.85		
12-30-64	8.56	5- 3-66	4.64		

Observation well 34 (102-49-8ccc). City of Sioux Falls observation well D4. Diameter 5 inches, depth 43 feet. Land surface altitude 1,437.69 feet.

Date	Water level	Date	Water level	Temperature (°Fahrenheit)
10-25-63	9.90	8-31-65	10.43	-
11-19-63	10.12	9-30-65	10.28	-
1-23-64	9.72	10-29-65	10.19	59
2-27-64	9.74	12-30-65	10.39	54
3-17-64	9.17	1-25-66	10.79	54
4-16-64	8.33	2-26-66	7.80	44
6-17-64	10.24	3-30-66	6.60	52
7-23-64	11.34	5- 3-66	8.45	52
8-28-64	12.01 L	6- 6-66	9.40	51
9-18-64	11.91	6-28-66	10.04	56
10-21-64	10.87	7-14-66	10.57	52
11-23-64	10.70	8-25-66	10.70	-
12-30-64	10.34	10- 4-66	10.86	52
1-28-65	10.15	11- 8-66	10.79	50
2-26-65	9.77	12-12-66	10.66	-

Minnehaha County -- continued

Observation well 34 -- continued.

Date	Water level		Date	Water level
3-31-65	8.44		1-26-67	10.40
4-30-65	6.30	H	2-25-67	10.12
5-20-65	6.71		3-22-67	8.70
7- 7-65	8.23		4-25-67	9.42
7-30-65	9.62			

Observation well 36 (102-49-3bb). City of Sioux Falls observation well SPE 1. Diameter 2 inches, depth 47 feet. Land surface altitude 1,442.30 feet.

Date	Water level		Date	Water level		Date	Water level
9-16-63	5.54		1-28-65	8.06		6- 6-66	3.50
10-25-63	6.60		2-26-65	8.11	L	6-28-66	4.25
11-19-63	6.70		3-31-65	4.45		7-14-66	5.18
12-19-63	6.83		4-30-65	2.30		8-25-66	6.09
1-23-64	6.95		5-20-65	1.07	H	10- 4-66	4.59
2-27-64	7.03		7- 7-65	2.37		11- 9-66	4.43
3-17-64	6.76		7-30-65	3.88		12-12-66	4.86
4-16-64	5.52		8-31-65	5.37		1-26-67	5.40
6-17-64	6.12		9-30-65	4.87		2-25-67	5.38
7-23-64	6.86		11-24-65	5.45		3-22-67	3.25
8-28-64	7.45		12-30-65	5.30		4-25-67	2.13
9-16-64	7.60		1-25-66	5.62			
10-21-64	7.73		2-26-66	3.00			
11-23-64	7.92		3-30-66	2.77			
12-30-64	7.98		5- 3-66	2.81			

Observation well 39 (102-49-4bbb). City of Sioux Falls observation well E 3. Diameter 5 inches, depth 28 feet. Land surface altitude 1,443.01 feet.

Date	Water level	Date	Water level	Date	Water level	
7-11-63	7.36	1-23-64	8.66	7-23-64	8.60	
8-14-63	7.75	2-27-64	8.71	8-28-64	9.27	
9-16-63	8.33	3-17-64	8.47	9-16-64	9.49	
10-25-63	8.48	4-16-64	7.86	10-21-64	9.58	
11-19-63	8.57	6-17-64	8.01	11-23-64	9.64	L

Minnehaha County -- continued

Observation well 39 -- continued.

Date	Water level		Date	Water level	
12-30-64	9.64	L	5-20-65	4.43	H
1-28-65	9.53		7- 7-65	5.45	
2-26-65	9.48		7-30-65	6.13	
3-31-65	8.33		8-31-65	7.52	
4-30-65	5.18		9-30-65	7.40	

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (Micromhos/cm at 25°C)
10-29-65	7.24	55	480
11-24-65	7.46	56	480
12-30-65	7.34	55	480
1-25-66	7.80	54	480
2-26-66	7.00	48	480
3-30-66	5.82	50	470
5- 3-66	5.55	50	480
6- 6-66	5.22	53	465
8-25-66	8.16	-	-
10- 4-66	7.81	54	460
11- 8-66	7.44	52	460
12-12-66	7.67	-	-
1-26-67	7.86	-	-
2-25-67	7.92	-	-
3-22-67	6.86	-	-
4-25-67	5.29	-	-

Minnehaha County -- continued

Observation well 44 (103-49-28add). City of Sioux Falls observation well SPF 2. Diameter 1¼ inches. Land surface altitude 1,446.96 feet.

Date	Water level		Date	Water level		Date	Water level
10-25-63	6.04		2-26-65	7.78		6-28-66	3.39
11-19-63	9.65	L	4-30-65	1.87		7-14-66	4.18
12-19-63	6.40		5-20-65	0.16	H	8-25-66	5.03
1-23-64	6.53		7- 7-65	1.30		10- 4-66	3.45
2-27-64	6.67		7-30-65	2.75		11- 9-66	3.43
3-17-64	6.48		8-31-65	4.22		12-12-66	3.94
4-16-64	5.90		9-30-65	3.86		1-26-67	4.64
6-17-64	5.86		10-29-65	3.57		2-25-67	4.92
7-23-64	6.54		11-24-65	3.39		3-22-67	2.86
8-28-64	7.08		12-30-65	3.20		4-25-67	1.40
9-16-64	7.18		1-25-66	3.53			
10-21-64	8.38		2-26-66	3.00			
11-23-64	7.52		3-30-66	2.34			
12-30-64	7.65		5- 3-66	2.32			
1-28-65	7.74		6- 6-66	2.40			

Observation well 46 (103-49-29adc). City of Sioux Falls observation well SPF 1. Diameter 1¼ inches. Land surface altitude 1,445.52 feet.

Date	Water level		Date	Water level		Date	Water level
9-16-63	8.44		1-28-65	9.28		5- 3-66	6.23
10-25-63	8.53		2-26-65	9.30		6- 6-66	6.70
11-19-63	5.22		3-31-65	8.42		6-28-66	7.28
12-19-63	8.70		4-30-65	5.44		7-14-66	7.85
1-23-64	8.65		5-20-65	4.24	H	8-25-66	8.54
2-27-64	8.72		7- 7-65	5.67		10- 4-66	8.25
3-17-64	8.46		7-30-65	6.94		11- 9-66	7.85
4-16-64	7.73		8-31-65	8.14		12-12-66	8.09
6-17-64	8.44		9-30-65	8.02		1-26-67	8.20
7-23-64	9.16		10-29-65	7.83		2-25-67	8.12
8-28-64	9.58		11-24-65	7.70		3-22-67	7.03
9-16-64	9.58		12-30-65	7.60		4-25-67	6.22
10-21-64	9.72	L	1-25-66	7.83			
11-23-64	9.63		2-26-66	7.04			
12-30-64	9.49		3-30-66	5.58			

Minnehaha County -- continued

Observation well 47 (103-49-21adc). City of Sioux Falls observation well SPF 3. Diameter 1¼ inches. Land surface altitude 1,447.92 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	5.70	1-30-65	7.64 L	7-14-66	4.20
10-25-63	5.98	4-30-65	3.43	8-25-66	4.82
11-19-63	6.12	7- 7-65	0.95 H	10- 4-66	3.05
12-18-63	6.30	7-30-65	2.67	11- 9-66	3.17
1-23-64	6.50	8-31-65	4.03	12-12-66	3.86
2-27-64	6.62	9-30-65	3.91	1-26-67	4.68
3-17-64	6.65	10-29-65	3.42	2-25-67	5.08
4-16-64	5.77	11-23-65	3.31	3-22-67	4.14
6-16-64	5.78	12-30-65	3.02	4-25-67	2.24
7-23-64	6.41	1-25-66			
8-28-64	6.82	2-26-66	4.60		
9-18-64	6.99	3-30-66	3.64		
10-21-64	7.20	5- 3-66	3.31		
11-23-64	7.37	6- 6-66	3.16		
12-30-64	7.53	6-28-66	3.89		

Observation well 52 (103-49-17dbd). South Dakota Water Resources Commission observation well S-25. Diameter 1¼ inches, depth 31 feet. Land surface altitude 1,451.7 feet.

Date	Water level	Date	Water level	Date	Water level
8-29-57	6.9	7- -62	1.8 H	6-16-64	7.46
11- 5-57	8.2	11- -62	7.0	7-23-64	9.33
3-11-58	7.9	3- -63	8.5	8-28-64	9.78
7-21-58	8.4	6-19-63	7.62	9-16-64	9.86
11-28-58	9.7	7-11-63	7.20	10-21-64	9.90 L
3-12-59	8.6	8-13-63	7.12	11-23-64	9.85
7-14-59	9.4	9-16-63	8.56	12-30-64	9.71
11-18-59	9.7	10-25-63	8.73	1-28-65	9.61
5- 4-60	4.9	11-19-63	8.95	2-26-65	9.51
7- 8-60	6.7	12-18-63	9.04	3-31-65	8.01
11- 1-60	8.9	1-23-64	9.10	4-28-65	4.28
3- 7-61	5.9	2-27-64	9.18	5-30-65	3.16
7-13-61	7.0	3-17-64	8.78	7- 7-65	4.39
11-29-61	9.2	4-16-64	7.40	7-30-65	6.48
3- -62	2.3	5-14-64	7.61	8-31-65	7.96

Minnehaha County -- continued

Observation well 52 -- continued.

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (Micromhos/cm at 25°C)
9-30-65	7.73	-	-
10-29-65	7.94	52	650
11-23-65	8.05	54	650
12-30-65	7.80	54	650
1-25-66	8.20	55	650
2-26-66	7.92	48	650
3-30-66	5.47	50	625
5- 3-66	6.54	49	625
6- 6-66	5.70	54	610
6-28-66	7.97	52	600
7-14-66	8.50	54	600
8-25-66	9.00	-	-
10- 4-66	8.57	54	540
11- 8-66	8.35	55	470
12-12-66	8.64		
1-26-67	8.78		
2-25-67	8.79		
3-22-67	6.75		
4-25-67	6.20		

Observation well 53 (103-49-16dbb). Soil Conservation Service Silver Creek Watershed project observation well 4. Diameter 1¼ inches, depth 21 feet. Land surface altitude 1,456.90 feet.

Date	Water level	Date	Water level	Date	Water level
8-25-55	8.90	5-20-65	7.47	10- 4-66	9.61
9-20-55	11.00	7- 7-65	5.30	11- 9-66	9.49
11-23-55	11.86	7-30-65	4.26 H	12-12-66	10.15
1- 5-56	11.95	8-31-65	9.00	1-26-67	11.41
4-17-56	12.09	9-30-65	9.18	2-25-67	11.70
6-17-64	11.73	10-28-65	9.28	3-22-67	11.30
7-23-64	11.36	11-23-65	9.55	4-25-67	8.73
8-28-64	12.80	12-30-65	9.52		
9-18-64	12.80	1-25-66	9.78		
10-21-64	13.10	2-26-66	10.75		
12-30-64	13.58	3-30-66	9.01		
1-28-65	13.54	6- 6-66	9.85		
2-26-65	13.63 L	6-28-66	10.07		
3-31-65	12.71	7-14-66	10.44		
4-30-65	11.85	8-25-66	11.33		

Minnehaha County -- continued

Observation well 55 (103-49-17aaa). Soil Conservation Service Silver Creek Watershed project observation well 3. Diameter 1¼ inches, depth 21 feet. Land surface altitude 1,453.60 feet.

Date	Water level	Date	Water level	Date	Water level
8-25-55	7.00	12-30-64	8.38	11-23-65	5.14
9-20-55	7.31	1-29-65	Dry L	12-30-65	5.07
11-23-55	7.90	2-26-65	Dry L	1-25-66	5.35
1- 5-56	8.16	4-30-65	2.10	2-26-66	6.00
4-17-56	7.59	5-20-65	0.41	3-30-66	5.60
6-17-64	6.75	7- 7-65	0.05 H	5- 3-66	4.40
7-23-64	6.90	7-30-65	2.35	6- 6-66	5.09
8-28-64	7.00	8-31-65	4.67	6-28-66	5.09
9-16-64	6.40	9-30-65	4.68	7- -66	Destroyed
10-21-64	7.80	10-29-65	4.84		

Observation well 56 (103-49-8dcc). City of Sioux Falls observation well G-2. Diameter 5 inches, depth 29 feet. Land surface altitude 1,453.51 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	7.84	9-16-64	9.14	2-26-65	9.37
10-25-63	8.26	10-21-64	9.34	3-31-65	8.03
11-19-63	8.50	11-23-64	9.49	4-30-65	3.44
1-23-64	8.90	12-30-64	9.50 L	5-20-65	1.45 H
2-27-64	9.03	1-28-65	9.44	7- 7-65	3.09
3-17-64	8.03				
4-16-64	7.65				
6-17-64	7.50				
7-23-64	8.26				
8-28-64	8.91				

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (Micromhos/cm at 25°C)
7-30-65	4.99	-	-
8-31-65	6.76	-	-
9-30-65	6.71	-	-
10-29-65	6.60	54	-
11-23-65	7.23	53	-

Minnehaha County -- continued

Observation well 56 -- continued.

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (Micromhos/cm at 25°C)
12-30-65	7.19	53	490
1-25-66	7.31	53	-
2-26-66	6.90	48	-
3-30-66	5.64	51	-
5- 3-66	6.08	49	-
6- 6-66	6.31	54	-
6-28-66	6.93	52	-
7-14-66	7.45	52	-
8-25-66	7.60	-	-
10- 4-66	7.86	52	560
11- 9-66	7.60		
12-12-66	8.04		
2-25-67	8.42		
3-22-67	7.00		
4-25-67	5.48		

Observation well 59 (103-49-8add). Soil Conservation Service Silver Creek Watershed project observation well 2. Diameter 1¼ inches, depth 24 feet. Land surface altitude 1,454.10 feet.

Date	Water level	
8-25-55	4.70	H
9-20-55	6.00	
11-23-55	6.69	L
4-17-55	6.23	
Destroyed		

Observation well 60 (103-49-9baa). Soil Conservation Service Silver Creek Watershed project observation well 1. Diameter 1¼ inches, depth 20 feet. Land surface altitude 1,478.30 feet.

Date	Water level	
9-20-55	7.67	L
11-23-55	7.17	
4-17-55	5.45	H
Destroyed		

Minnehaha County -- continued

Observation well 63 (103-49-5dcc). City of Sioux Falls observation well SPH 1. Diameter 2 inches. Land surface altitude 1,461.58 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	10.01	1-28-65	11.08	5- 3-66	7.60
10-25-63	10.24	2-26-65	10.97	6- 6-66	8.37
11-19-63	10.46	3-31-65	9.60	6-28-66	9.16
12-18-63	10.52	4-30-65	5.98	7-14-66	9.80
1-23-64	10.74	5-20-65	5.07 H	8-25-66	10.40
2-27-64	10.86	7- 7-65	6.37	10- 4-66	10.30
3-17-64	10.50	7-30-65	7.80	11- 9-66	10.24
4-16-64	9.30	8-31-65	9.42	12-12-66	10.55
6-17-64	9.70	9-30-65	9.36	1-26-67	10.71
7-23-64	10.54	10-29-65	9.30	2-25-67	10.63
8-28-64	11.08	11-23-65	9.60	3-22-67	9.17
9-16-64	11.16 L	12-29-65	9.54	4-25-67	8.51
10-21-64	11.12	1-25-66	9.92		
11-23-64	11.12	2-26-66	8.66		
12-30-64	11.09	3-30-66	6.34		

Observation well 69 (103-49-6abb). City of Sioux Falls observation well H-3. Diameter 5 inches, depth 35 feet. Land surface altitude 1,460.15 feet.

Date	Water level	Date	Water level	Date	Water level
9-16-63	6.90	8-28-64	7.10	1-28-65	8.14 L
10-25-63	8.05	9-16-64	7.54	3-31-65	6.99
11-19-63	7.07	10-21-64	7.76	4-30-65	3.67
12-18-63	7.22	11-23-64	7.90	5-20-65	3.03 H
1-23-64	5.70	12-30-64	8.04	7- 7-65	3.90
2-27-64	7.61				
3-17-64	7.10				
4-16-64	5.98				
6-17-64	5.25				
7-23-64	6.75				

Minnehaha County -- continued

Observation well 69 -- continued.

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (Micromhos/cm at 25°C)
7-30-65	5.06	-	-
8-31-65	6.21	-	-
9-30-65	6.01	-	-
10-29-65	5.55	52	-
11-23-65	5.71	52	-
12-29-65	5.69	51	-
1-25-66	6.00	52	-
2-26-66	6.23	48	-
3-30-66	4.60	51	-
5- 3-66	4.63	48	-
6- 2-66	3.83	49	600
6-28-66	5.54	53	-
7-14-66	6.23	51	-
8-25-66	7.67	-	-
10- 4-66	5.02	55	725
11- 8-66	4.61	56	-
12-12-66	5.27		
1-26-67	6.12		
2-25-67	6.46		
3-22-67	5.80		
4-25-67	4.33		

Minnehaha County -- continued

Observation well 72 (104-49-31ccc). South Dakota Water Resources Commission observation well S-24. Diameter 1¼ inches, depth 27 feet. Land surface altitude, 1,465.1 feet.

Date	Water level	Date	Water level	Date	Water level
8-29-57	9.1	2-27-64	13.03	10-29-65	10.64
11- 5-57	11.0	3-17-64	12.81	11-23-65	10.50
3-11-58	12.4	4-16-64	11.86	12-29-65	10.50
7-21-58	11.8	5-14-64	11.43	1-25-66	10.90
11-28-58	14.1	6-17-64	10.90	2-26-66	10.79
3-12-59	14.2	7-23-64	12.05	3-30-66	11.07
7-14-59	14.0	8-28-64	12.60	5- 3-66	10.63
11-18-59	14.5 L	9-18-64	13.63	6- 2-66	10.35
5- 4-60	9.9	10-21-64	13.49	6-28-66	10.56
7- 8-60	9.1	11-23-64	13.56	7-14-66	10.94
11- 1-60	11.5	12-20-64	13.71	8-25-66	11.63
3- 7-61	12.2	1-29-65	13.81	10- 4-66	9.89
7-12-61	10.7	2-26-65	13.92	11- 9-66	9.33
11- 2-61	11.7	3-31-65	13.05	12-12-66	10.03
3- -62	10.4	4-30-65	9.30	1-26-67	10.95
7- -62	6.8	5-20-65	7.07	2-25-67	11.40
11- -62	10.5	7- 7-65	6.39 H	3-22-67	11.02
3- -63	12.4	7-30-65	8.06	4-25-67	9.10
7-30-63	11.09	8-31-65	10.00		
8-13-63	11.19	9-30-65	10.23		
9-16-63	11.90				
10-25-63	13.08				
11-19-63	12.37				
12-18-63	12.58				
1-23-64	12.81				

MOODY COUNTY

Observation well 163 (105-48-18cbc). South Dakota Water Resources Commission observation well S-20. Diameter 1¼ inches, depth 25 feet. Land surface altitude 1,500 feet (topographic map).

Date	Water level	Date	Water level	Date	Water level
8-29-57	5.2	8-13-63	5.95	7- 7-65	4.09
11- 5-57	6.3	9-16-63	6.68	7-30-65	5.34
3-11-58	6.3	10-25-63	7.42	8-30-65	6.43
7-21-58	6.4	11-19-63	6.60	9-30-65	6.01
11-29-58	7.2	12-18-63	6.63	10-29-65	5.85
3-12-59	8.0 L	1-24-64	6.80	11-23-65	6.10
7-14-59	6.6	2-26-64	6.83	12-29-65	6.08
11-18-59	6.2	3-16-64	6.57	1-25-66	6.39
5- 4-60	2.2 H	4-17-64	5.32	2-25-66	6.30
7- 8-60	4.7	5-14-64	5.10	3-30-66	6.24
11- 1-60	5.5	6-16-64	6.01	5- 3-66	5.72
3- 7-61	5.2	7-23-64	6.72	6- 2-66	5.50
7-13-61	4.8	8-28-64	6.75	6-27-66	5.99
11- 2-61	5.7	9-16-64	6.74	7-14-66	6.38
3- -62	4.1	10-21-64	7.01	9- 6-66	6.99
7- -62	2.3	11-24-64	7.10	9-29-66	6.32
11- -62	5.7	2-26-65	6.69	11- 8-66	5.96
3- -63	6.4	3-31-65	6.56	12- 6-66	6.18
6-18-63	5.78	4-30-65	5.45	1- 4-67	6.43
7-18-63	6.43	5-20-65	4.08	2- 9-67	6.77
				3- 1-67	6.83

Moody County -- continued

Observation well 180 (105-49-10aaa). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 20 feet. Land surface altitude 1,505 feet (topographic map).

Date	Water level	Date	Water level	Date	Water level
7-15-63	4.93	9-17-64	5.26	1-25-66	4.79
7-18-63	4.43	10-21-64	5.13	2-25-66	4.83
8-13-63	3.08	11-24-64	5.04	3-30-66	3.93
9-16-63	3.35	12-30-64	5.13	5- 3-66	3.39
10-25-63	3.50	1-29-65	5.15	6- 2-66	3.90
11-19-63	4.67	2-26-65	5.11	6-27-66	4.50
12-18-63	4.68	4-30-65	2.76	7-14-66	4.94
1-24-64	4.79	5-19-65	2.19 H	9- 6-66	5.38 L
2-26-64	4.85	7- 7-65	2.98	9-29-66	4.25
3-16-64	4.67	7-30-65	4.39	11- 8-66	4.09
4-17-64	2.95	8-30-65	5.04	12- 6-66	4.34
5-14-64	3.12	9-30-65	4.16	1- 4-67	4.65
6-16-64	4.12	10-29-65	4.20	2- 9-67	4.84
7-23-64	4.99	11-23-65	4.40	3- 1-67	5.01
8-28-64	5.25	12-29-65	4.34		

Observation well 198 (106-49-22ddd). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 21 feet. Land surface altitude 1,516 feet (topographic map).

Date	Water level	Date	Water level	Date	Water level
7-18-63	10.40	5-14-64	8.49	3-31-65	9.79
8-13-63	7.63	6-16-64	9.02	4-30-65	8.06
9-16-63	8.37	7-23-64	9.31	5-20-65	7.73
10-25-63	8.52	8-28-64	9.62	7- 7-65	6.59 H
11-19-63	8.65	9-17-64	9.78	7-30-65	7.38
12-18-63	8.81	10-21-64	9.96		
1-24-64	9.08	11-24-64	10.07		
2-26-64	9.31	12-30-64	10.26		
3-16-64	9.25	1-29-64	10.39		
4-17-64	8.80	2-26-65	10.55 L		

Moody County -- continued

Observation well 198 -- continued.

Date	Water level	Temperature (°Fahrenheit)	Specific Conductance (Micromhos/cm at 25°C)
8-30-65	7.95	-	-
9-30-65	7.59	-	-
10-29-65	6.87	52	700
11-23-65	7.10	54	700
12-29-65	7.04	53	700
1-25-66	7.32	53	700
2-25-66	7.51	50	750
3-30-66	7.10	47	750
5- 3-66	7.13	50	750
6- 2-66	7.44	56	700
6-27-66	7.70	52	700
7-14-66	8.04	54	660
9- 6-66	9.42	56	650
9-29-66	8.97	54	660
11- 8-66	9.21	51	690
12- 6-66	9.42	53	675
1- 4-67	9.61	52	690
2- 9-67	9.85	54	660
3- 1-67	9.89	52	670

Moody County -- continued

Observation well 218 (106-48-5cdc). South Dakota Water Resources Commission observation well S-19. Diameter 1¼ inches, depth 35 feet. Land surface altitude 1,521.2 feet.

Date	Water level		Date	Water level		Date	Water level	
8-29-57	9.9		8-13-63	9.85		4-29-65	9.27	
11- 5-57	10.0		9-16-63	11.04		5-19-65	8.48	
3-11-58	11.9		10- 8-63	11.01		7- 7-65	8.16	
7-21-58	12.0		11-19-63	11.36		7-30-65	5.98	H
11-29-58	12.9		12-18-63	11.58		8-30-65	9.60	
3-12-59	13.0		1-24-64	11.75		9-30-65	9.88	
7-14-59	13.3	L	2-26-64	11.91		10-29-65	10.20	
11-18-59	13.3	L	3-16-64	11.54		11-23-65	9.49	
5- 4-60	11.4		4-17-64	11.54		12-29-65	9.41	
7- 8-60	11.2		5-14-64	11.45		1-25-66	9.90	
11- 1-60	11.7		6-16-64	11.68		2-25-66	9.66	
3- 7-61	11.4		7-22-64	11.83		3-29-66	10.32	
7-21-61	11.5		8-23-64	11.78		5- 3-66	10.80	
11- 2-61	11.7		9-17-64	11.71		6- 2-66	11.00	
3- -62	9.6		10-20-64	11.84		6-27-66	11.24	
7- -62	7.2		11-24-64	12.05		7-13-66	11.27	
11- -62	9.8		12-30-64	12.28		9- 6-66	11.32	
3- -63	11.3		1-29-65	12.37		9-29-66	11.30	
6-18-63	11.38		2-26-65	12.48		11- 8-66	11.58	
7-11-63	11.51		3-31-65	12.36		12- 6-66	11.78	
						1- 4-67	11.99	
						2- 9-67	12.19	
						3- 1-67	12.27	

Moody County -- continued

Observation well 223 (107-48-32abb). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 26 feet. Land surface altitude 1,535.61 feet (topographic map).

Date	Water level	Date	Water level	Date	Water level
7-11-63	20.45	9-16-64	21.06	1-25-66	18.10
7-18-63	20.10	10-20-64	21.24	2-25-66	18.73
8-13-63	19.69	11-24-64	21.42	3-29-66	15.60 H
9-17-63	19.73	12-30-64	21.56	5- 3-66	18.68
10- 8-63	19.98	1-29-65	21.65	6- 2-66	19.80
11-19-63	20.30	3-31-65	21.73 L	6-27-66	19.90
12-18-63	20.53	4-28-65	20.30	7-13-66	19.76
1-24-64	20.73	5-19-65	19.70	9- 6-66	20.44
2-26-64	20.87	7- 7-65	17.65	9-29-66	20.52
3-16-64	20.89	7-30-65	17.63	11- 8-66	20.77
4-17-64	20.60	8-31-65	18.06	12- 6-66	20.95
5-14-64	20.51	9-30-65	18.56	1- 4-67	21.09
6-16-64	20.54	10-29-65	18.95	2- 9-67	21.24
7-22-64	20.70	11-23-65	18.00	3- 1-67	21.32
8-28-64	20.95	12-29-65	18.90		

Observation well 238 (107-48-14ddd). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 26 feet. Land surface altitude 1,540.90 feet.

Date	Water level	Date	Water level	Date	Water level
7-10-63	13.50	9-16-64	13.64	12-29-65	12.75
7-19-63	13.10	10-20-64	13.69	1-25-66	13.00
8-13-63	11.76	11-24-64	13.80	2-25-66	12.58
9-16-63	12.75	12-30-64	14.00	3-29-66	11.44
10- 8-63	12.76	1-28-65	13.97	5- 2-66	12.23
11-20-63	13.14	2-25-65	14.05 L	6- 2-66	12.56
12-18-63	13.31	3-31-65	13.70	6-27-66	12.89
1-24-64	13.47	4-28-65	11.16	7-13-66	13.07
2-26-64	13.57	5-19-65	11.47	9- 6-66	13.38
3-16-64	13.35	7- 7-65	10.52 H	9-29-66	13.45
4-17-64	12.30	7-30-65	11.79	11- 8-66	13.57
5-12-64	12.19	8-31-65	13.60	12- 6-66	13.66
6-16-64	13.01	9-30-65	12.67	1- 4-67	13.82
7-22-64	13.30	10-29-65	12.85	2- 9-67	13.87
8-28-64	13.56	11-23-65	13.00	3- 1-67	13.87

Moody County -- continued

Observation well 241 (107-48-16aaa). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 20 feet. Land surface altitude 1,541.95 feet.

Date	Water level	Date	Water level	Date	Water level
7-10-63	6.40	9-16-64	8.65	12-29-65	6.81
7-19-63	7.60	10-20-64	8.60	1-25-66	7.08
8-13-63	5.29	11-24-64	9.02	2-25-66	8.10
9-16-63	5.28	12-30-64	9.07	3-29-66	5.70
10- 8-63	5.47	1-28-65	9.40	5- 2-66	6.06
11-20-63	7.60	2-25-65	9.55 L	6- 2-66	7.72
12-18-63	8.05	3-31-65	9.23	6-27-66	7.29
1-24-64	8.50	4-28-65	1.46 H	7-13-66	7.69
2-26-64	8.70	5-19-65	2.16	9- 6-66	8.41
3-16-64	8.30	7- 7-65	2.53	9-29-66	8.42
4-17-64	8.12	7-30-65	5.67	11- 8-66	8.63
5-12-64	6.75	8-30-65	6.40	12- 6-66	8.79
6-16-64	6.84	9-30-65	6.69	1- 4-67	9.01
7-22-64	6.81	10-29-65	6.82	2- 9-67	9.17
8-28-64	8.30	11-23-65	6.85	3- 1-67	9.27

Observation well 249 (107-48-5dcc). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 22 feet. Land surface altitude 1,556.90 feet.

Date	Water level	Date	Water level	Date	Water level
9-19-63	9.20	1-28-65	12.44 L	6-27-66	10.54
10- 8-63	8.21	4-28-65	7.04 H	7-13-66	10.90
11-20-63	11.78	5-19-65	7.30	9- 6-66	11.08
12-18-63	10.60	7- 7-65	7.46	9-29-66	10.97
1-24-64	11.28	7-30-65	9.03	11- 8-66	10.38
2-26-64	10.54	8-30-65	10.30	12- 6-66	10.49
3-16-64	10.10	9-30-65	10.15	1- 4-67	11.07
4-17-64	8.89	10-29-65	10.06	2- 9-67	11.75
5-12-64	8.70	11-23-65	10.46	3- 1-67	11.90
6-16-64	10.47	12-29-65	10.46		
7-22-64	11.18	1-25-65	10.81		
8-28-64	11.74	2-25-65	10.76		
9-16-64	11.55	3-29-66	9.10		
10-20-64	11.12	5- 2-66	9.05		
11-24-64	10.84	6- 2-66	9.82		

Moody County -- continued

Observation well 261 (108-48-19ccc). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 20 feet. Land surface altitude 1,550.39 feet.

Date	Water level	Date	Water level	Date	Water level
7-10-63	6.10	9-16-64	7.19	12-29-65	6.29
7-19-63	5.88	10-20-64	7.39	1-25-66	6.72
8-13-63	1.50 H	11-24-64	7.57	2-25-66	6.40
9-16-63	1.77	12-30-64	7.67	3-29-66	3.59
10- 8-63	1.77	1-28-65	7.75	5- 2-66	4.40
11-20-63	6.03	2-25-65	7.78 L	6- 2-66	5.08
12-18-63	6.33	3-31-65	6.75	6-27-66	5.66
1-24-64	6.49	4-28-65	2.85	7-13-66	6.05
2-26-64	6.62	5-19-65	2.88	9-29-66	6.39
3-16-64	6.09	7- 7-65	2.93	11- 8-66	7.23
4-17-64	5.08	7-30-65	3.85	12- 6-66	7.36
5-12-64	4.81	8-30-65	5.37	1- 4-67	7.51
6-16-64	5.51	9-30-65	5.64	2- 9-67	7.57
7-22-64	6.41	10-29-65	6.07	3- 1-67	7.53
8-28-64	6.92	11-23-65	6.34		

Moody County -- continued

Observation well 274 (108-49-22bbb). South Dakota Water Resources Commission observation well S-18. Diameter 1½ inches, depth 30 feet. Land surface altitude 1,562.1 feet.

Date	Water level	Date	Water level	Date	Water level
8-29-57	6.1	8-13-63	4.21	4-28-65	3.47
11- 5-57	6.0	9-16-63	5.21	5-19-65	3.45
3-11-58	6.2	10- 8-63	4.85	7- 7-65	3.90
7-21-58	6.4	11-20-63	4.86	7-30-65	5.10
11-29-58	6.8	12-18-63	5.17	8-30-65	5.84
3-13-59	6.5	1-24-64	5.50	9-30-65	4.28
7-14-59	6.8	2-26-64	5.55	10-29-65	4.89
11-18-59	7.2 L	3-16-64	5.30	11-23-65	5.07
5- 4-60	4.7	4-17-64	3.24	12-29-65	5.09
7- 8-60	5.9	5-13-64	3.40	1-25-66	5.57
11- 1-60	6.3	6-16-64	4.85	2-25-66	5.22
3- 7-61	5.4	7-22-64	5.71	3-29-66	3.75
7-13-61	4.6	8-28-64	5.59	5- 2-66	3.88
11- 2-61	6.4	9-16-64	6.11	6- 2-66	5.10
3- -62	3.2 H	10-20-64	6.03	6-27-66	5.59
7- -62	3.4	11-24-64	5.89	7-13-66	5.78
11- -62	5.1	12-30-64	6.08	9- 6-66	5.77
3- -63	5.8	1-28-65	5.37	9-29-66	5.90
6-18-63	4.64	2-25-65	5.19	11- 8-66	5.83
7-10-63	5.22	3-31-65	5.55	12- 6-66	5.94
				1- 4-67	6.08
				2- 9-67	6.28
				3- 1-67	6.32

Moody County -- continued

Observation well 307 (108-49-7aaa). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 20 feet. Land surface altitude 1,562.72 feet.

Date	Water level	Date	Water level	Date	Water level
7-10-63	6.50	8-28-64	6.92	12-29-65	6.44
7-19-63	6.10	9-16-64	7.05	1-25-66	7.00
7-31-63	5.09	10-20-64	7.24	5- 2-66	3.74
8-13-63	3.16	11-24-64	7.30 L	6- 2-66	4.72
9-16-63	3.86	12-30-64	7.16	6-27-66	5.76
10- 8-63	4.09	1-28-65	6.93	7-13-66	6.22
11-18-63	5.83	2-25-65	6.62	9- 6-66	6.88
12-18-63	6.05	4-28-65	1.35 H	9-29-66	7.06
1-24-64	6.15	5-19-65	2.75	11- 8-66	7.19
2-26-64	6.19	7- 7-65	3.07	12- 6-66	7.21
3-16-64	5.88	7-30-65	4.76	1- 4-67	7.12
4-17-64	3.80	8-30-65	6.15	2- 9-67	6.95
5-13-64	3.34	9-30-65	6.45	3- 1-67	6.82
6-16-64	5.19	10-29-65	6.28		
7-21-64	6.25	11-23-65	6.47		

Observation well 311 (108-49-5acb). Installed by U. S. Geological Survey. Diameter 1¼ inches, depth 32.5 feet. Land surface altitude 1,567.00 feet.

Date	Water level	Date	Water level	Date	Water level
8- 6-63	7.50	8-28-64	6.61	1-25-66	6.99
8-13-63	7.13	9-16-64	6.74	2-25-66	6.98
9-16-63	5.61	10-20-64	6.85	3-29-66	7.00
11-18-63	5.06 H	11-24-64	6.97	5- 2-66	6.78
12-18-63	5.16	5-19-65	7.30	6- 2-66	6.51
1-24-64	5.37	7- 7-65	6.46	6-27-66	6.49
2-26-64	5.67	8-30-65	7.18	9- 6-66	9.48 L
3-16-64	5.80	10-29-65	6.99	9-29-66	9.06
6-16-64	5.09	11-23-65	6.74	11- 8-66	8.92
7-21-64	5.43	12-29-65	6.73	12- 6-66	8.82
				1- 4-67	8.77
				2- 9-67	8.79
				3- 1-67	8.83

TABLE 3.--SELECTED PHYSICAL PROPERTIES OF UNCONSOLIDATED MATERIALS

Principal methods for determining the physical properties of unconsolidated materials are: (1) laboratory analyses of the unconsolidated materials, and (2) aquifer tests conducted in the field. In general, the results determined from aquifer tests are considered to be more desirable since they are representative of the entire saturated thickness of the aquifer. The results of laboratory analyses apply only to the interval sampled. To obtain approximately the same information as an aquifer test provides, a number of undisturbed samples representative of each lithology of the aquifer and proportional to the thickness of each lithology would have to be analyzed.

The results of laboratory analyses of disturbed composite samples are summarized in the following table and particle-size distribution curves are shown in figures 3-6.

The results of the aquifer tests in the project area are summarized in table 2 of the interpretive report; however, for convenience, their locations, coefficients of transmissibility (T), and average field coefficients of permeability (P) are listed on page 111.

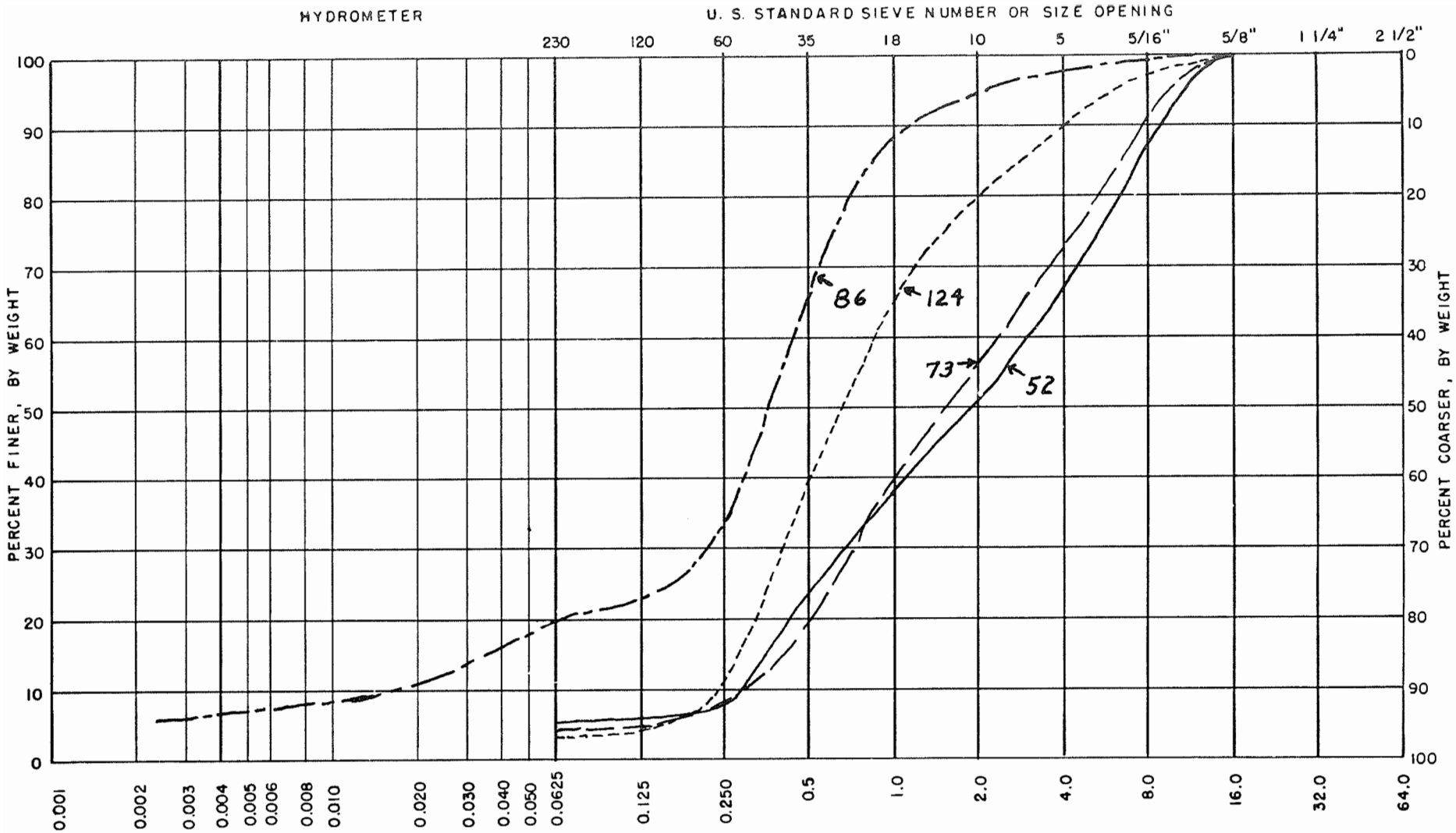
Data collection point number	Location number	Specific gravity of solids	Dry unit weight (g/cc)	Centrifuge moisture equivalent (percent)	Specific retention (percent)	Total porosity (percent)	Specific yield (percent)	Coefficient of permeability (gpd/sq.ft.)	Depth interval (feet)
52	103-49-17dbd		1.89	2.0	7.3	29.7	22.4	360	10 - 19
73[a]	104-50-36ddd		1.88	2.0	7.3	30.4	23.1	380	15 - 20
86	104-49-20ccd		1.61	4.2	10.2	39.9	29.7	14	18 - 26
124	105-49-36daa		1.79	1.6	6.0	33.5	27.5	370	24 - 34
164[a]	105-49-14bcc	2.68	2.04	1.0	4.83	23.9	19.1	280	20 - 25
173	105-49-15bbb		1.85	1.7	6.5	31.2	24.7	360	45 - 50
198[a]	106-49-22ddd	2.70	1.94	1.0	4.60	28.1	23.5	350	7 - 25
			2.06	2.3	8.9	23.7	14.8	60	10 - 19
218[a]	106-48-5cdb	2.69	1.92	1.1	4.86	28.6	23.7	225	15 - 22
243	107-48-9caa	2.70	2.00	2.8	9.7	29.9	16.2	4	5 - 39
287	108-49-16bab		1.86	1.3	5.3	31.9	26.6	350	14 - 18
303	108-49-4ccd	2.71	1.96	3.4	10.8	27.7	16.9	13	5 - 25
304[a]	108-49-9bbb		1.87	3.3	10.0	28.6	18.6	18	18 - 24
310	108-49-5cbc	2.70	1.97	3.4	10.9	27.0	16.1	2	5 - 15

[a]Aquifer tests conducted on well.

Aquifer tests

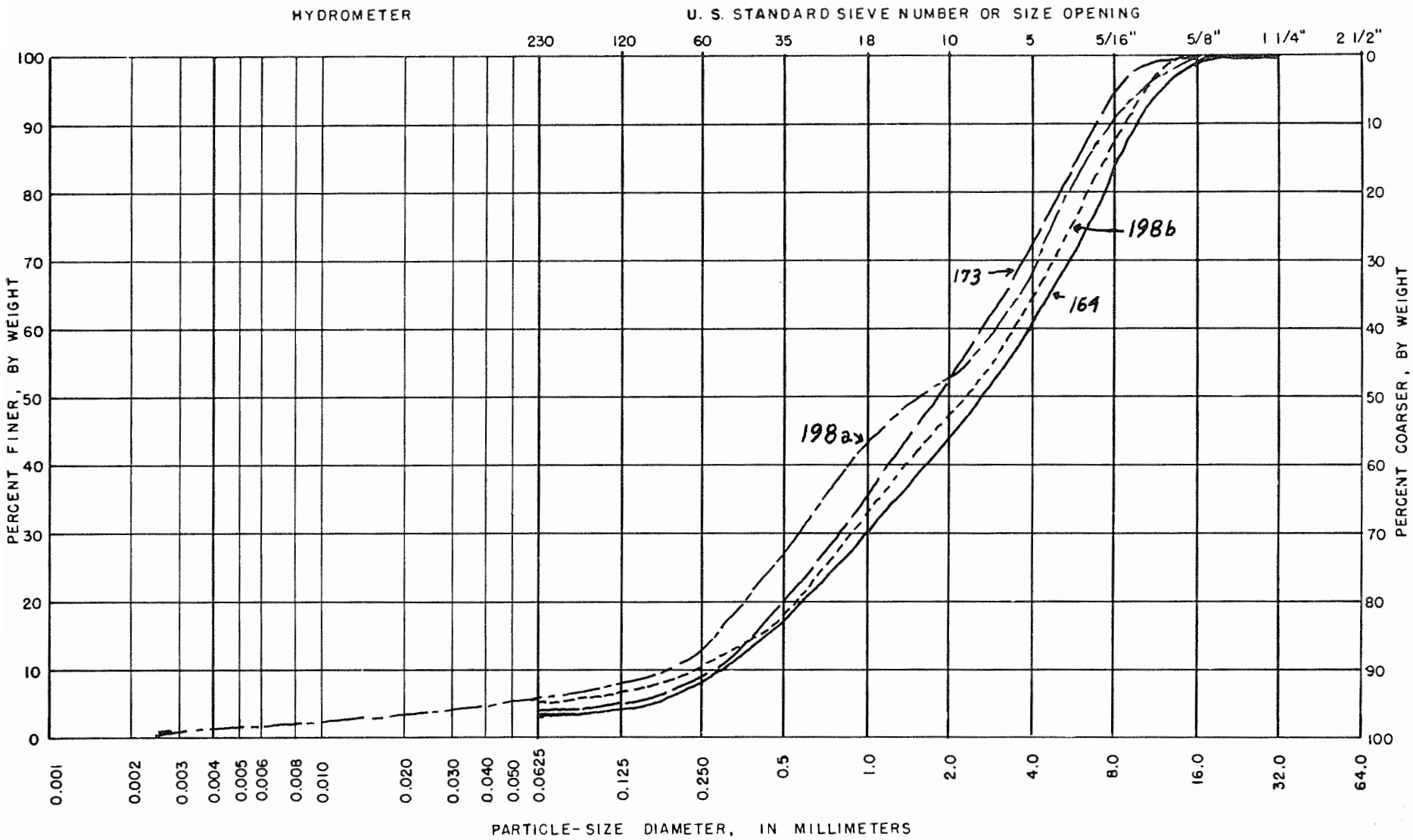
Data-collection point number	Location number	T (gpd/ft)	P (gpd/sq ft)
4	101-49-9bbc	76,000	3,800
5	101-49-5ccd	180,000	6,700
7	101-49-5add	83,000	5,500
8	101-49-5aab	180,000	8,000
9	102-49-32ccd	155,000	4,300
24	102-49-20dcc	130,000	4,100
35	102-49-9cba	60,000	3,000
73[a]	104-50-36ddd	90,000	2,800
164[a]	105-49-14bcc	130,000	6,200
198[a]	106-49-22ddd	90,000	6,900
218[a]	106-48-5cdb	70,000	4,100
231	107-48-27bab	28,000	1,200
246	107-48-9cbb	110,000	4,400
304[a]	108-49-9bbb	22,000	1,600
311	108-49-5acb	160,000	11,000

[a]Laboratory analysis run on sample from well.



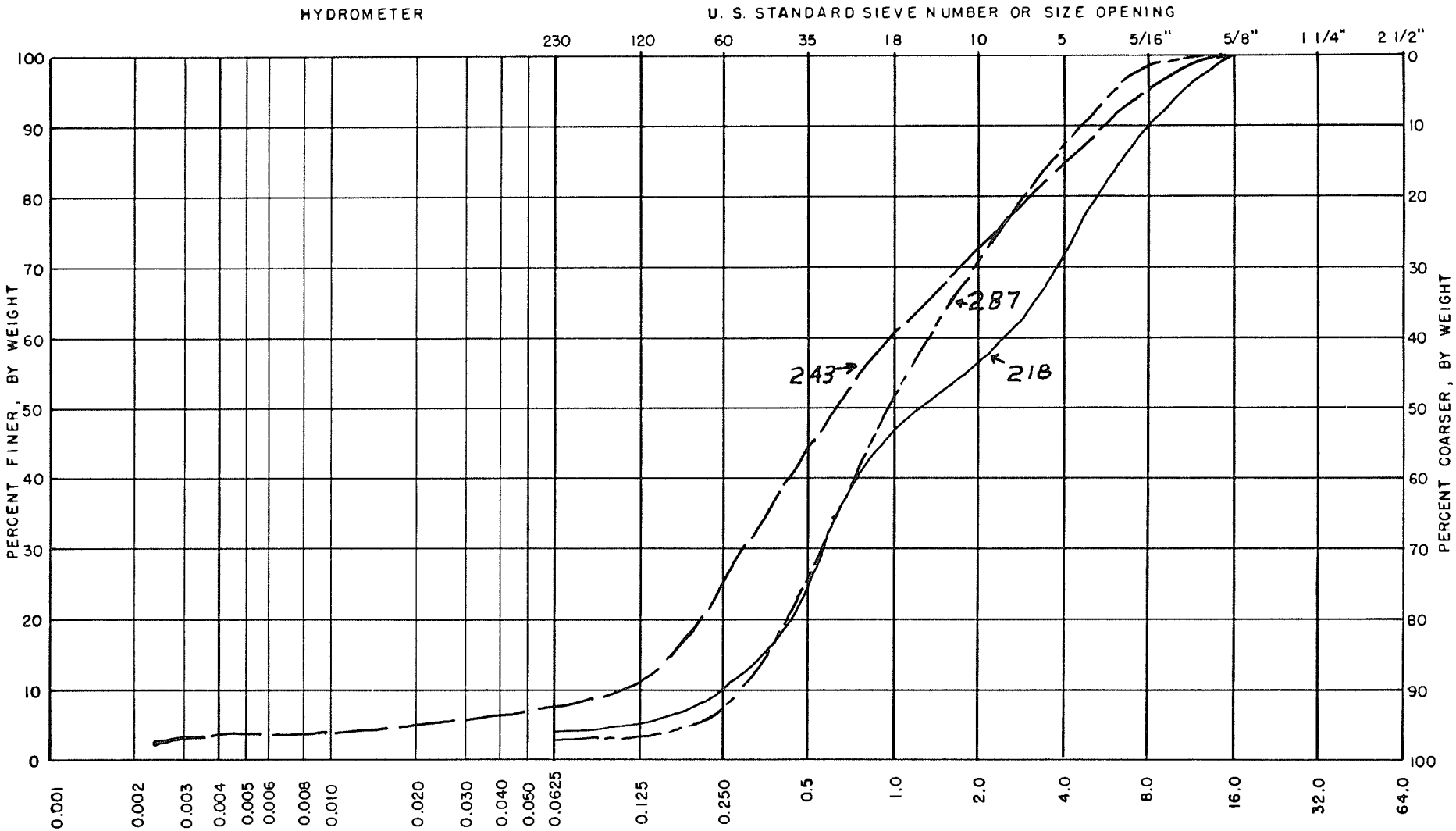
PERCENT OF SIZE	CLAY SIZES <0.004MM	SILT SIZES 0.004-0.0625MM	SAND SIZES V. FINE .0625-.125	SAND SIZES FINE .125-.25	SAND SIZES MEDIUM .25-.5	SAND SIZES COARSE .5-1	SAND SIZES V. COARSE 1-2	GRAVEL SIZES V. FINE 2-4	GRAVEL SIZES FINE 4-8	GRAVEL SIZES MEDIUM 8-16	GRAVEL SIZES COARSE 16-32	GRAVEL SIZES V. COARSE 32-64
———	5.0		0.5	1.9	14.2	16.9	12.2	15.5	20.6	13.2		
— —	4.3		.5	3.2	12.2	20.9	15.0	16.9	19.6	7.4		
— - —	6.5	12.8	3.2	10.0	33.7	22.3	6.0	3.4	1.9	.2		
- - - - -	3.7		.8	6.6	27.7	27.4	14.3	10.1	7.4	2.0		

Figure 3. -- Size-distribution curves for mechanical analyses of samples from data-collection points 52, 73, 86, and



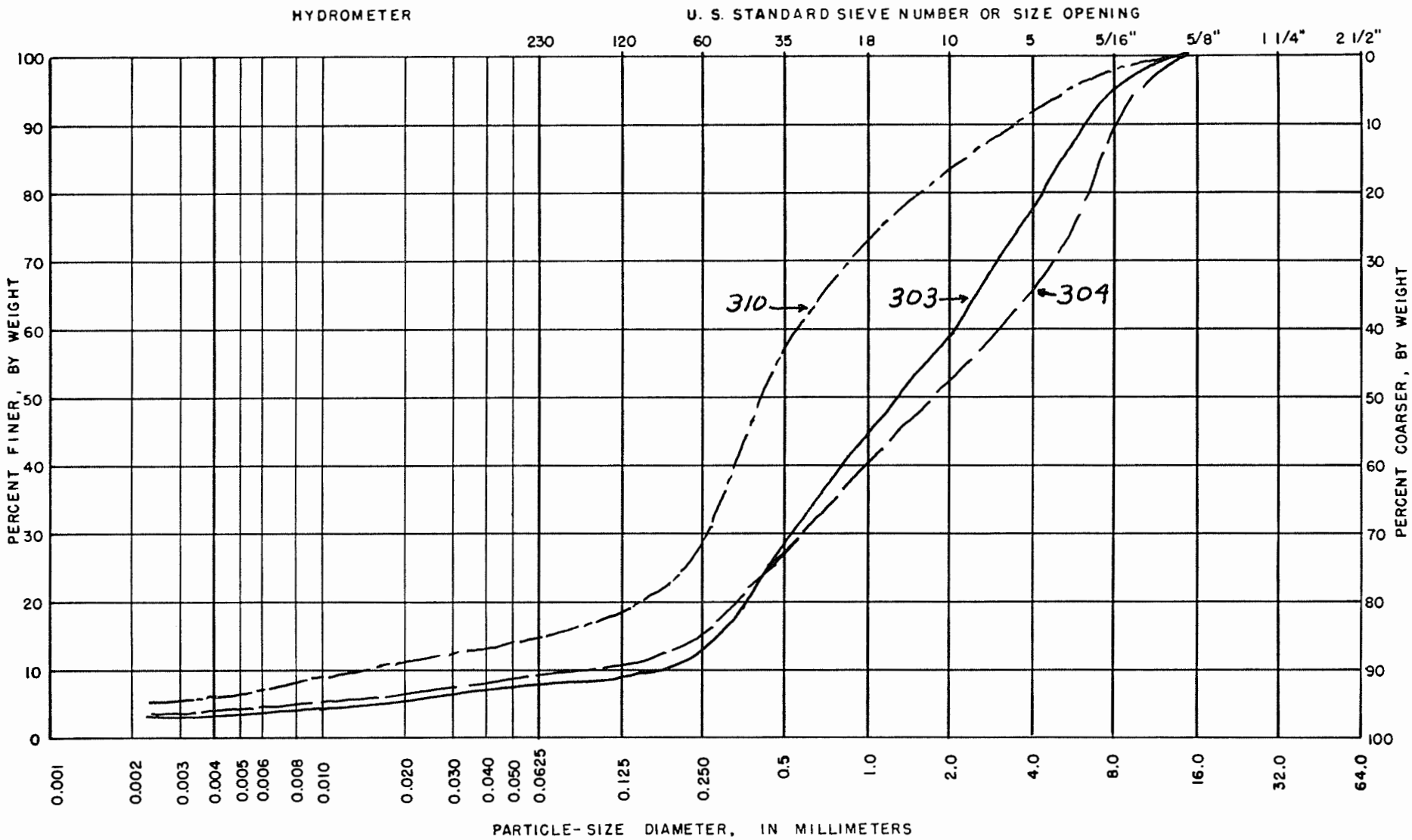
PERCENT OF SIZE	CLAY SIZES <0.004MM	SILT SIZES 0.004–0.0625MM	SAND SIZES V. FINE .0625–.125	SAND SIZES FINE .125–.25	SAND SIZES MEDIUM .25–.5	SAND SIZES COARSE .5–1	SAND SIZES V. COARSE 1–2	GRAVEL SIZES V. FINE 2–4	GRAVEL SIZES FINE 4–8	GRAVEL SIZES MEDIUM 8–16	GRAVEL SIZES COARSE 16–32	GRAVEL SIZES V. COARSE 32–64
———	3.2		0.5	3.8	9.5	13.2	12.9	16.7	22.7	17.2	0.3	
— —	3.6		1.2	4.1	11.4	15.1	18.4	19.5	21.8	4.9		
—·—·—	1.4	4.5	1.3	5.5	15.0	15.0	9.8	17.1	19.9	10.1	.4	
------	4.8		1.4	4.1	8.2	14.8	13.3	17.0	23.2	13.2		

Figure 4.--Size-distribution curves for mechanical analyses of samples from data-collection points 164, 173, and 198.



PERCENT OF SIZE	CLAY SIZES <0.004MM	SILT SIZES 0.004–0.0625MM	SAND SIZES					GRAVEL SIZES				
			V. FINE .0625-.125	FINE .125-.25	MEDIUM .25-.5	COARSE .5-1	V. COARSE 1-2	V. FINE 2-4	FINE 4-8	MEDIUM 8-16	COARSE 16-32	V. COARSE 32-64
———	3.9	3.8	1.0	5.2	15.7	21.1	10.4	15.5	17.5	9.7		
— —	3.7		3.6	14.5	18.9	16.7	11.1	12.3	11.1	4.3		
— - —	2.4		.5	4.5	18.4	25.2	19.4	15.5	11.9	1.2		

Figure 5.--Size-distribution curves for mechanical analyses of samples from data-collection points 218, 243, and 287.



PERCENT OF SIZE	CLAY SIZES <0.004MM	SILT SIZES 0.004-0.0625MM	SAND SIZES					GRAVEL SIZES				
			V. FINE .0625-.125	FINE .125-.25	MEDIUM .25-.5	COARSE .5-1	V. COARSE 1-2	V. FINE 2-4	FINE 4-8	MEDIUM 8-16	COARSE 16-32	V. COARSE 32-64
——— 3.0		4.5	0.8	4.1	16.7	15.9	13.7	18.3	18.5	4.5		
— — 3.5		5.5	1.1	4.5	12.2	13.7	11.1	13.5	23.3	11.6		
— - — 5.9		8.4	3.9	9.8	29.5	15.7	10.2	8.4	6.2	2.0		

Figure 6.--Size-distribution curves for mechanical analyses of samples from data-collection points 303, 304, and 310.

TABLE 4.--SURFACE WATER RECORDS

Surface-water data used in preparation of the interpretive report, except where indicated below, are contained in the following published reports: (1) U. S. Geological Survey Water-Supply Papers 1116, 1146, 1176, 1209, 1239, 1279, 1339, 1389, 1439, 1509, 1559, 1629, and 1709 and (2) U. S. Geological Survey basic data reports Surface Water Records of North and South Dakota 1961, 1962, 1963, and 1964; Water Resources Data for North Dakota and South Dakota, 1965, Part 1. Surface-Water Records; and Water Resources Data for South Dakota, 1966, Part 1. Surface-water Records.

Descriptions of Data-Collection Points

Data-Collection Point 29 (102-49-18aad), base flow measurement made 11-6-64 at bridge (100 feet downstream) 1½ miles west of Renner, South Dakota.

Data-Collection Point 37 (102-49-4aa), 6-4813, Silver Creek near Renner, South Dakota, water sample for chemical analysis collected 6-1-60. No flow could be observed, and possibly the water was ponded behind the Sioux Falls diversion dam. Record not given in publications listed above.

Data-Collection Point 51 (103-49-17ccc), base flow measurement made 11-6-64 at bridge (150 feet downstream) 3 miles southwest of Baltic, South Dakota.

Data-Collection Point 83 (104-49-29bb), 6-4810, U. S. Geological Survey stream gaging station, Big Sioux River near Dell Rapids, South Dakota.

Location.--Lat 43°47'25", long 96°44'45", on right bank at downstream side of highway bridge, a quarter of a mile downstream from confluence of divided channels, 1-3/4 miles upstream from nearest tributary, and 3 miles southwest of Dell Rapids, South Dakota

Records available.--May 1948 to present.

Gage.--Water-stage recorder. Datum of gage is 1,455.99 ft. above mean sea level, datum of 1929. Prior to November 11, 1949, wire-weight gage and November 11, 1949, to September 30, 1951, water-stage recorder, both at present site at datum 0.04 ft. lower.

Average discharge.--18 years, 267 cfs (190,400 acre-feet per year).

Extremes.--Maximum discharge, 18,400 cfs March 30, 1962, (gage height 15.14 ft); minimum daily discharge, 0.20 cfs January 31, 1965.

Remarks.--Records good except those for the winter months, which are poor.

Data-Collection Point 236 (107-48-24cb), 6-4807, Spring Creek near Flandreau, South Dakota, water samples for chemical analyses 6-2-60 (discharge 5.2 cfs) and 3-18-61 (discharge 26.7 cfs). Record not given in publications listed above.

Data-Collection Point 252 (108-48-33cc), 6-4804, Spring Creek near Flandreau, South Dakota, water samples for chemical analyses collected 6-2-60 (no flow was discernible), 10-11-60 (discharge 1.0 cfs), and 3-18-61 (discharge 25 cfs). Records not given in publications listed above.

Data-Collection Point 308 (108-49-8bb), 6-4800, U. S. Geological Survey stream gaging station, Big Sioux River near Brookings, South Dakota.

Location.--Lat 44°11', long 96°45', on right bank 3 ft. downstream from highway bridge, 1½ miles downstream from Deer Creek, and 9½ miles southeast of Brookings.

Records available.--August 1953 to present.

Gage.--Water-stage recorder. Datum of gage is 1,551.91 ft. above mean sea level, datum of 1929. Prior to May 30, 1959, wire-weight and crest-stage gages at same site and datum.

Average discharge.--13 years, 138 cfs (99,910 acre-feet per year).

Extremes.--Maximum discharge, 10,600 cfs, March 29, 1962 (gage height 12.95 ft.); no flow at times in 1956 and 1959.

Remarks.--Records good except those for the winter months, which are poor.

TABLE 5.--CHEMICAL ANALYSES OF WATER

The chemical composition of natural waters is affected by the soluble products of rock weathering and decomposition. Chemical analyses of representative water samples help determine the general suitability of water for specific uses. The analyses listed in the following table are representative of water from the sources shown in the vicinity of the data-collection point at which they were collected. It is suggested, however, that before water is used for irrigation, industrial supply, or municipal supply, it should be analyzed so that its suitability for a given use can be determined. Periodic analysis may be required after the initial sample since the quality of both surface and ground water can change.

In addition to the analyses shown in the table, monthly measurements of specific conductance and temperature were made for selected observation wells (data-collection points 27, 34, 39, 52, 56, 69, and 198), and are listed with the water-level measurements in table 3 of this report.

Table 5.--Chemical analyses of water[a]

[Concentrations of dissolved constituents, dissolved solids, and hardness given in parts per million]

Data-collection point number	Location number	Source[b]	Date of collection	Depth of well (feet)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos/cm at 25°C	pH
3	101-49-9bcb	O	11-13-63	23	--	21	0.05	3.9	309	65	19	7.4	305	675	107	0.5	0.2	0.16	1,460	1,040	790	4	0.3	1,820	7.3
37	102-49-4aa	S-ponded	6-1-60	--	71	--	---	---	87	25	9.6	---	268	---	--	---	---	---	419	320	100	6	.2	621	7.4
52	103-49-17dbd	O	11-13-63	31	53	24	.06	.62	80	32	16	2.5	329	80	9.6	.4	1.0	.09	404	333	63	9	.4	653	7.8
65[c]	104-49-32cdd	O[d]	4---59	243	--	--	.1	.0	118	40	16	2.0	366	65	21	.5	30	---	582[e]	457	--	7	.3	860[f]	7.4
72	104-49-31ccc	O	11-13-63	45	--	22	.10	.10	96	36	14	1.9	343	112	3.4	.4	16	.06	473	387	106	7	.3	731	7.6
77	104-49-27ccd	M	1-24-64	40	42	39	3.5	.17	323	261	110	12	736	146	531	.7	693	.21	2,740	1,880	1,280	11	1.1	3,820	7.7
83	104-49-29bb	S-186	6-1-60	--	--	10	.02	.00	88	43	31	7.9	268	207	18	.2	2.2	.15	586	395	175	14	.7	827	7.7
83	do	S-37	10-11-60	--	--	12	.03	.06	88	43	27	6.3	270	211	19	.2	.2	.13	559	397	176	13	.6	822	7.4
83	do	S-443	3-18-61	--	--	12	.09	.07	41	12	6.1	9.5	134	52	3.8	.2	6.0	.6	228	153	43	8	.2	345	6.9
83	do	S-15,900	3-30-62	--	--	4.6	.09	.27	15	5	2.3	7.8	61	12	0.0	.1	6.0	.04	109	58	8	7	.1	151	6.6
84	104-49-20cdd	O	11-13-63	35	--	21	.08	.56	84	38	12	2.5	311	90	26	.3	.2	.10	428	364	109	7	.3	717	7.7
95[c]	104-49-9dd	O[d]	9---57	226	--	--	.0	1.5	127	53	41	6.0	439	218	30	.5	4.5	---	793[e]	539	--	14	.8	1,120[f]	7.2
102	104-49-3ddc	O	11-13-63	32	--	21	.06	.93	175	90	88	8.6	322	668	18	.7	.2	.32	1,320	805	541	19	1.4	1,620	7.4
163	105-48-18cbc	O	11-13-63	25	--	18	.17	.43	205	87	142	7.6	352	812	18	.4	7.7	.54	1,570	868	579	26	2.1	1,860	7.6
174	105-49-16bb	M	1-24-64	Unk.	42	41	16	1.0	307	154	193	20	418	1,340	11	.4	26	.79	2,430	1,400	1,080	23	2.2	2,700	7.5
180	105-49-10aaa	O	11-13-63	20	--	23	.07	1.2	93	41	17	3.3	289	182	4.6	.4	.2	.09	539	400	163	8	.4	764	7.2
198	106-49-22ddd	O	11-14-63	21	52	18	.18	.03	71	32	15	4.8	241	82	28	.3	28	.06	415	308	110	9	.4	660	7.4
208[c]	106-50-15dab	M	5---58	330	--	--	16	1.0	206	116	165	13.9	423	949	14	.5	.0	---	1,881[e]	1,020	--	26	2.2	2,520[f]	7.4
213[c]	106-48-7cbb	O	2---57	24	--	--	.1	.0	115	33	20	6.7	344	96	30	.1	15	---	641[e]	422	--	9	.4	950[f]	7.6
216[c]	106-51-9ccb	M	2---61	430	--	--	---	.2	244	78	380	30.5	337	1,472	24	1.3	.0	---	2,595[e]	977	--	46	5.5	3,440[f]	7.9
218	106-48-5cdb	O	11-14-63	35	--	22	.45	.04	109	42	19	3.3	275	193	5.6	.4	53	.11	609	445	219	8	.4	857	7.4
223	107-48-32abb	O	11-14-63	26	--	23	.33	.27	79	29	5.4	2.5	246	69	16	.3	28	.05	393	315	113	3	.1	602	7.4
225	107-48-30ccc	M	9-19-61	408	50	8.8	12	.10	266	76	145	14	365	948	12	.8	4.0	.76	1,760	974	675	24	2.0	2,060	7.2
231[c]	107-48-27bab	O	8---56	33	--	--	.1	2.4	151	50	29	4.8	425	264	22	.4	2.0	---	840[e]	587	--	9	.5	1,150[f]	7.3
232[c]	107-48-21dd	O	11---58	35	--	--	3.5	2.0	94	41	32	5.3	382	113	18	.2	3.0	---	576[e]	414	--	14	.7	850[f]	7.4
236	107-48-24cb	S-5.2	6-2-60	--	76	11	---	---	116	49	27	5.9	339	521	.6	.2	.1	.17	674	490	212	11	.05	922	7.9
236	do	S-26.7	3-18-61	--	36	11	.10	.00	37	9.8	3.2	7.7	129	41	0.0	.2	6.3	.06	190	133	27	5	.1	293	6.9
238	107-48-14ddd	O	11-14-63	26	--	19	.28	.65	91	41	17	3.3	349	130	5.2	.3	.3	.13	505	397	111	8	.4	757	7.5
241	107-48-16aaa	O	11-14-63	20	--	10	.07	3.7	137	59	27	5.6	279	371	16	.8	.3	.29	822	580	351	9	.5	1,100	7.1
242	107-50-12cdc	M	1-24-64	76	46	28	11	4.8	366	92	57	11	292	1,080	12	.3	2.6	.65	1,980	1,290	1,050	9	.7	2,110	7.6

Table 5.--Chemical analyses of water[a] (Cont.)

Data-collection point number	Location number	Source[b]	Date of collection	Depth of well (feet)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos/cm at 25°C)	pH
																				Calcium-magnesium	Noncarbonate				
246[g]	107-48-9cbb	O	7-17-64	37	--	--	0.02	0.05	64	29	8.0	3.0	180	85	5.0	0.2	4.0	---	385[e]	280	--	6	0.2	550	--
249	107-48-5dcc	O	11-14-63	22	--	20	.05	.05	96	31	16	4.1	339	96	7.8	.3	6.2	.10	455	369	91	9	.4	695	7.6
251	107-48-1aaa	M	1-24-64	53	38	34	.11	.02	148	47	30	5.7	388	211	25	.3	11	.14	766	564	207	10	.5	1,040	8.5
252	108-48-33cc	S-no flow	6-2-60	--	--	5.2	---	---	84	40	12	2.7	336	109	6.3	.2	.4	.11	466	374	98	6	.3	568	7.9
252	do	S-1.0	10-11-60	--	--	7.9	.05	.01	72	31	11	3.1	268	103	4.9	.3	.9	.09	382	307	87	7	.3	600	7.6
252	do	S-25	3-18-61	--	--	16	.05	---	55	17	5.3	6.0	202	42	3.0	.2	8.8	.05	263	207	41	5	.2	421	7.0
261	108-48-19ccc	O	11-15-63	20	--	14	.56	7.1	125	45	26	7.6	220	296	53	.3	3.7	.39	714	496	316	10	.5	1,030	6.9
271	108-47-22bbb	O	1-24-64	50	40	29	.55	.02	83	39	15	2.3	460	14	1.9	.6	2.0	.07	410	369	0	8	.3	689	8.0
274	108-49-22bbb	O	11-15-63	30	--	23	.05	1.1	110	37	13	3.3	312	184	2.6	.4	4.2	.10	565	426	170	6	.3	805	7.5
281[g]	108-48-10c	O	5-27-60	45	--	--	---	---	97	49	27	3.9	405	132	17	---	---	---	534[e]	--	--	12	.6	1,100	7.9
307	108-49-7aaa	O	11-15-63	20	--	24	.11	3.4	128	74	18	4.1	464	195	43	.4	3.8	.11	765	624	244	6	.3	1,120	7.6
308	108-49-8bb	S-115	6-20-60	--	--	12	.02	.00	80	45	36	10	270	209	23	.2	2.4	.19	596	386	165	16	.8	846	7.6
308	do	S-15	10-11-60	--	--	17	.02	.22	78	55	29	5.5	301	200	27	.3	.7	.14	590	420	173	13	.6	866	7.4
308	do	S-288	3-18-61	--	--	13	.11	.06	48	16	9.5	9.6	152	74	7.1	.2	.5	.07	276	185	60	9	.3	418	7.0
308	do	S-7,740	3-30-62	--	--	6.7	.06	.30	25	12	5.5	8.3	81	54	0.0	.0	8.4	.06	179	110	44	9	.2	272	6.6
314[g]	108-47-4bb	O	3-11-60	35	--	--	---	---	78	26	8.5	2.0	280	37	11	---	---	---	354[e]	--	--	6	.2	600	7.6
323	109-48-27aaa	M	1-24-64	81	45	27	.49	.06	169	127	51	3.1	711	92	134	.4	207	.17	1,200	944	361	10	.7	1,850	7.6

[a]Analyses, except as noted in the Data-collection point number column, are by the U.S. Geological Survey's Quality of Water Laboratory, Lincoln, Nebraska.

[b]Source: O = outwash deposits; M = moraine deposits; S = stream, with discharge in cfs at time of collection.

[c]Analysis by South Dakota Department of Health, Pierre, South Dakota.

[d]Well completed in bedrock, but bedrock directly underlies outwash deposits and is recharged with water from the outwash deposits.

[e]Method of determining total dissolved solids unknown.

[f]Extrapolated value.

[g]Analysis by Soils Laboratory, South Dakota Agricultural Experiment Station, Brookings, South Dakota.

APPENDIX I

GLOSSARY OF SELECTED GEOLOGIC AND HYDROLOGIC TERMS

Acre-foot -- The volume of water required to cover 1 acre to a depth of 1 foot. Equivalent to 41,560 cubic feet or 325,851 gallons.

Aquifer -- A rock formation, bed, or zone containing water that is available to wells. An aquifer may be referred to as a water-bearing formation or water-bearing bed.

Aquifer test -- A means for determining the hydrologic properties of an aquifer. Conducted by pumping a well at a constant rate while measuring drawdown and recovery in the pumped well and in observation wells.

Base flow -- Sustained or fair weather flow in most streams -- base flow is composed largely of ground water discharged into stream channels.

Bedrock -- Any solid rock underlying the looser materials of the earth's surface.

Clay -- See grain size.

Coefficient of permeability -- The number of gallons of water per day that will pass through a cross-sectional area of 1 square foot of material under a unit hydraulic gradient at a temperature of 60°F. The field coefficient of permeability is the same, except that it is given at the local temperature of ground water.

Coefficient of storage -- The volume of water released from or taken into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface.

Coefficient of transmissibility -- The average field coefficient of permeability multiplied by the aquifer thickness in feet; it is the rate of flow of water, at the prevailing water temperature, in gallons per day, through a vertical strip of the aquifer 1 foot wide extending the full saturated height of the aquifer under a hydraulic gradient of 100 percent. A hydraulic gradient of 100 percent means a 1-foot drop in head in 1 foot of flow distance.

Cubic feet per second (cfs) -- A unit expressing rates of discharge, equal to the discharge through a rectangular cross section, 1 foot wide and 1 foot deep, flowing at an average velocity of 1 foot per second.

Direct runoff -- The water from rainfall or melting snow that enters the stream system rapidly either as overland flow or as subsurface flow that does not reach the zone of saturation and whose time spent underground is so brief that its rate of movement into the stream is almost as rapid as overland flow.

Drainage area -- Drainage area of a stream at a specified location is that upstream area, measured in a horizontal plane, which is enclosed by a drainage divide.

Drainage basin -- A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Duration curve -- A cumulative frequency curve that shows the percentage of time that specified water, dissolved-solids, or sediment discharges or dissolved solids concentration are equaled or exceeded. A duration curve of water discharge is called a flow duration curve.

Elevation -- Generally refers to the height in feet above mean sea level.

Evapotranspiration -- The process by which water is withdrawn from a land area by evaporation from water surfaces and moist soil and transpiration by plants.

Flood plain -- That part of a river valley adjacent to the river channel, which is built of sediments during the present regimen of the stream and which is covered with water when the river overflows its banks at flood stage.

Gaging station -- Is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or water discharge are obtained.

Gallons per minute (gpm) -- A unit expressing rate of discharge. 448.8 gpm equals 1 cfs and 1 gpm equals 1,440 gpd.

Glacial drift -- A collective term for all rock material, such as boulders, till, gravel, sand, and clay, transported by a glacier and deposited by the glacier or by glacial melt-water.

Grain size -- A term relating to the size of mineral or rock particles that make up a sediment. The U. S. Geological Survey uses the following classification:

Grain size description	Range of particle diameter (mm)
Very coarse gravel	32.0 - 64.0
Coarse gravel	16.0 - 32.0
Medium gravel	8.0 - 16.0
Fine gravel	4.0 - 8.0
Very fine gravel	2.0 - 4.0
Very coarse sand	1.0 - 2.0
Coarse sand	0.5 - 1.0
Medium sand	.25 - .5
Fine sand	.125 - .25
Very fine sand	.0625 - .125
Silt	.004 - .0625
Clay	< - .0045

Gravel -- See grain size.
Hydraulic gradient -- The gradient or slope of the water table or piezometric surface in the direction of the greatest slope, generally expressed in feet per mile.
Hydrograph -- A graph showing stage, flow, velocity, or other property of water with respect to time.
Infiltration -- The flow or movement of water into the surface soil.
Lithology -- Physical character of a rock, generally as determined megascopically or with the aid of a low power magnifier.
Loess -- A homogeneous, nonstratified, unconsolidated deposit consisting predominantly of silt with small amounts of very fine sand and/or clay; eolian in origin.
Moraine -- Glacial drift, deposited chiefly by direct glacial action; commonly has constructional topography independent of control by the surface on which it lies.
Observation well -- A well in which the depth to water is measured periodically.
Outwash -- Stratified drift deposited by meltwater streams beyond the glacier margin. Usually composed of sand and gravel.
Permeability -- The capacity of a rock to transmit water. See coefficient of permeability.
Porosity -- The ratio of total pore space in a rock or soil to total volume of the material; usually expressed as a percentage.
Quartzite -- A metamorphosed sandstone composed of grains of quartz that are tightly cemented by silica.
Runoff -- That part of the precipitation that appears in surface streams. It is the same as streamflow unaffected by artificial diversions, storage, or other works of man in or on the stream channels or on the drainage area.
Sand -- See grain size.
Shale -- A laminated sedimentary rock, in which the constituent particles are predominantly of the clay grade.
Silt -- See grain size.
Specific gravity -- Ratio of the mass of a body to the mass of an equal volume of water at 4°C.
Specific retention -- As applied to a rock or soil, it is the ratio of (1) the volume of water which, after being saturated, it will retain against the pull of gravity to (2) its own volume. It is stated as a percentage.
Specific yield -- The ratio of the volume of water that will drain by gravity from a saturated rock to the total volume of the rock; stated as a percentage.
Test hole -- An uncased hole drilled, augered, etc., to obtain earth samples for geologic and hydrologic data of an area.
Till -- An unstratified, unsorted glacial deposit, consisting mainly of clay and silt, with scattered coarser rock fragments.
Transmissibility -- The capacity of a rock to transmit water under pressure. See coefficient of transmissibility.
Water year -- The 12-month period October 1 through September 30 of the following calendar year. The water year is designated by the calendar year in which it ends.

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