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GROUND-WATER DATA COLLECTED IN
THE MISSOURI RIVER BASIN UNITS IN KANSAS
DURING 1950

By Delmar W. Berry

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

GROUND-WATER DATA COLLECTED IN
THE MISSOURI RIVER BASIN UNITS IN KANSAS
DURING 1950

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Compiled as part of the program of the Interior Department for development of the Missouri River basin. Coordinated with the cooperative program of the United States Geological Survey, the State Geological Survey of Kansas, the Division of Sanitation of the Kansas State Board of Health, and the Division of Water Resources of the Kansas State Board of Agriculture.

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October 1951

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GROUND-WATER DATA COLLECTED IN THE
MISSOURI RIVER BASIN UNITS IN KANSAS DURING 1950

By Delmar W. Berry

INTRODUCTION

Ground-water studies in the Missouri River basin were begun by the United States Geological Survey during the fall of 1945 as a part of a program for the development of the resources of the basin by the United States Bureau of Reclamation and other Federal Agencies. The studies of the ground-water resources in the part of Kansas that lies within the basin have been coordinated with the cooperative program of ground-water studies already being carried on in Kansas by the United States Geological Survey, the State Geological Survey of Kansas, the Division of Sanitation of the Kansas State Board of Health, and the Division of Water Resources of the Kansas State Board of Agriculture.

Areas in which ground-water data have been collected under the Missouri Basin program include the Almena unit in Norton and Phillips Counties; the Bostwick unit in Jewell, Republic, and Cloud Counties; the Cedar Bluff unit in Ellis, Rush, and Trego Counties; the Glen Elder unit in Mitchell County; the Kanopolis unit in Ellsworth, McPherson, and Saline Counties; the Kirwin unit in Phillips, Smith, and Osborne Counties; the St. Francis unit in Cheyenne County; the Webster unit in Osborne County; and the Wilson unit in Lincoln County. (See fig. 1.)

This report is the fourth of a series of annual reports on ground-water data that have been collected in the Missouri Basin units in Kansas and contains data that were collected mostly during 1950.

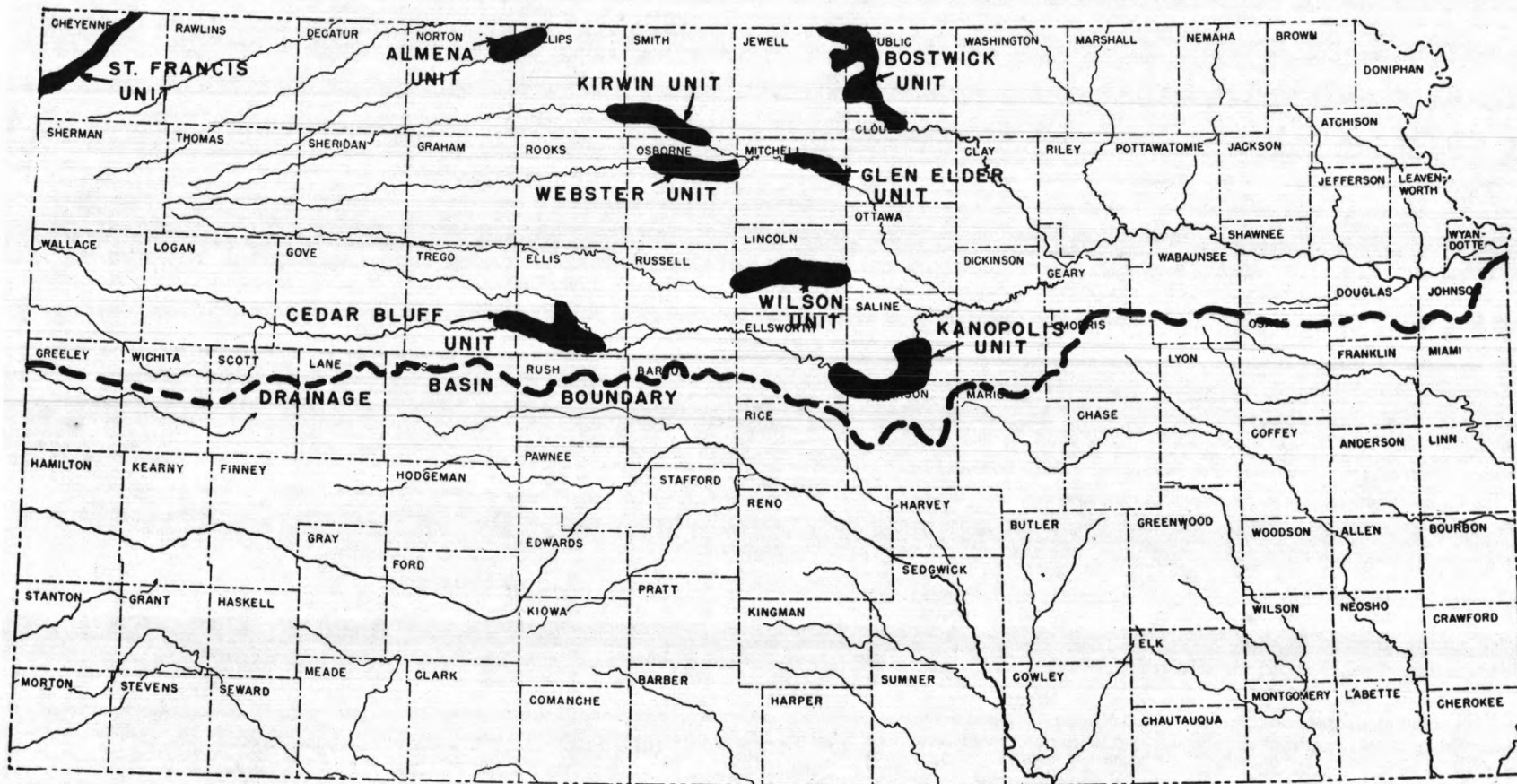


Figure 1.--Units of the Missouri Basin in Kansas on which ground-water data are being collected

Table 1.--Index to data collected within the Missouri Basin units of Kansas

	Page in reports			
	1947	1948	1949	1950
Almena unit				
Map showing locations of wells and test holes.....	18	..	...	...
Water-level measurements.....	7	8	9	9
Highest and lowest water levels.....	...	7	8	8
Difference between highest and lowest and net change in water levels.....	...	7	9	9
Hydrographs of five wells.....	...	10	12	12
Records of wells.....	10	..	..	...
Logs of drilled test holes.....	19	..	..	...
Bostwick unit				
Geology as related to ground water.....	46	..	..	...
Map showing locations of jetted wells.....	...	..	..	14
Map showing locations of wells, test holes, and water-table contours during 1948.....	49	..	..	...
Water-level measurements.....	60	12	14	21
Highest and lowest water levels.....	...	11	13	15
Difference between highest and lowest and net change in water levels.....	..	11	13	17
Hydrographs of five wells.....	...	..	15	20
Records of wells.....	51	..	..	38
Logs of drilled test holes.....	65	..	..	...
Logs of jetted or bored wells.....	...	..	..	43
Cedar Bluff unit				
Map showing locations of jetted wells.....	...	..	..	62
Map showing locations of wells and test holes.....	108	..	23	...
Water-level measurements.....	112	14	17	63
Highest and lowest water levels.....	...	13	16	61
Difference between highest and lowest and net change in water levels.....	...	13	17	63
Hydrographs of five wells.....	...	15	24	70
Chemical analyses of water samples.....	110	..	20	...
Records of wells.....	114	..	51	71
Logs of drilled test holes.....	118	..	25	...
Logs of jetted observation wells.....	...	..	..	73
Glen Elder unit				
Map showing locations of wells and test holes.....	125	..	..	...
Water-level measurements.....	126	18	59	98
Highest and lowest water levels.....	...	17	58	97
Difference between highest and lowest and net change in water levels.....	...	17	58	98

Table 1.--Index to data collected within the Missouri Basin units of Kansas--Continued

	Page in reports			
	1947	1948	1949	1950
Glen Elder unit--Continued				
Hydrographs of five wells.....	136	19	61	100
Records of wells.....	129
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Difference between highest and lowest and net change in water levels.....	...	21	63	102
Hydrographs of five wells.....	153	24	66	109
Logs of drilled test holes.....	154	..	...	124
Logs of jetted observation wells.....	...	..	...	110
Logs of Porter soil sampler test holes....	...	..	...	117
Records of wells.....	106
Kirwin unit				
Map showing locations of observation wells	...	26
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Highest and lowest water levels.....	...	25	67	127
Difference between highest and lowest and net change in water levels.....	...	27	68	128
Hydrographs of five wells.....	...	36	107	132
Chemical analyses of water samples.....	...	..	72	...
Logs of drilled test holes.....	...	..	74	...
St. Francis unit				
Geology in relation to ground water.....	...	37	...	...
Map showing locations of wells.....	...	42	...	...
Water-level measurements.....	...	43	109	134
Highest and lowest water levels.....	...	41	108	133
Difference between highest and lowest and net change in water levels.....	...	43	109	134
Hydrographs of five wells.....	...	48	113	136
Records of wells.....	...	49	...	...
Webster unit				
Map showing locations of wells.....	171	..	...	...
Water-level measurements.....	172	57	115	138
Highest and lowest water levels.....	...	56	114	137
Difference between highest and lowest and net change in water levels.....	...	56	114	137
Hydrographs of five wells.....	178	58	116	139
Records of wells.....	174	..	...	...

Table 1.--Index to data collected within the Missouri Basin units of Kansas--Continued

	Page in reports			
	1947	1948	1949	1950
Wilson unit				
Geology in relation to ground water.....	...	59	...	...
Map showing locations of wells.....	180	..	...	...
Map showing locations of wells and test holes.....	...	62	...	...
Water-level measurements.....	181	64	118	141
Highest and lowest water levels.....	...	63	117	140
Difference between highest and lowest and net change in water levels.....	...	64	118	141
Hydrographs of five wells.....	...	67	121	144
Chemical analyses of water samples.....	188	68	...	...
Records of wells.....	184	83	...	...
Logs of drilled test holes.....	...	69	...	...

report on the geology and ground-water resources of a part of south-central Kansas with special reference to the Wichita municipal water supply, by C. C. Williams and S. W. Lohman,⁵ contain ground-water data that were collected in the Kanopolis unit.

Included in this report are data on fluctuations of the water level in each of the units, map of the Bostwick, Cedar Bluff, and Kanopolis units; logs of jetted wells in the Bostwick, Cedar Bluff, and Kanopolis units; records of wells in the Bostwick, Cedar Bluff, and Kanopolis units; and logs of drilled test holes and Porter soil sampler test holes in the Kanopolis unit.

At the beginning of 1950 a total of 128 wells were being observed in the Missouri Basin units. During 1950, 3 wells were dropped and 215 wells were added to the program so that at the end of 1950 a total of 340 wells were being observed. The wells are distributed by units as given in table 2 on the following page.

⁵ Kansas Geological Survey, Bulletin 79.

Table 2.--Observation-well program in the Missouri Basin in Kansas, by units, in 1950

Unit	Wells included at beginning of year	Wells discontinued during year	Wells added during year	Wells included at end of year
Almena.....	15	0	0	15
Bostwick...	5	2	98	101
Cedar Bluff	21	0	80	101
Glen Elder.	11	0	0	11
Kanopolis..	15	0	36	51
Kirwin.....	21	0	0	21
St. Francis	17	1	1	17
Webster....	8	0	0	8
Wilson.....	<u>15</u>	<u>0</u>	<u>0</u>	<u>15</u>
Total...	128	3	215	340

The ground-water studies in the Missouri Basin units in Kansas are made under the general supervision of A. N. Sayre, Chief of the Ground-Water Branch of the U. S. Geological Survey, and of G. H. Taylor, regional engineer in charge of ground-water investigations under the program of the Interior Department for development of the Missouri Basin. The maps were drafted by W. W. Wilson and the hydrographs by B. W. Kittle; part of the data was assembled by W. A. Carlson. The stratigraphic nomenclature used in the well tables and logs is that of the Kansas Geological Survey; it does not accord in all respects with the usage of the U. S. Geological Survey.

WELL-NUMBERING SYSTEM

The well and test-hole numbers in this report are based on the location of the wells and test holes with respect to the General Land Office survey of the area. The first numeral of the number indicates the township, the second the range, and the third the section in which

the well is located. The lower-case letters (a, b, c, and d) following the section number indicate the location of the well within the section. The first letter denotes the quarter section and the second the quarter-quarter section. The letters are assigned in a counterclockwise direction, beginning in the northeast quarter of the section or quarter-quarter section. If two or more wells are located within the same quarter-quarter section, the wells are numbered serially according to the order in which they were inventoried. (See fig. 2.)

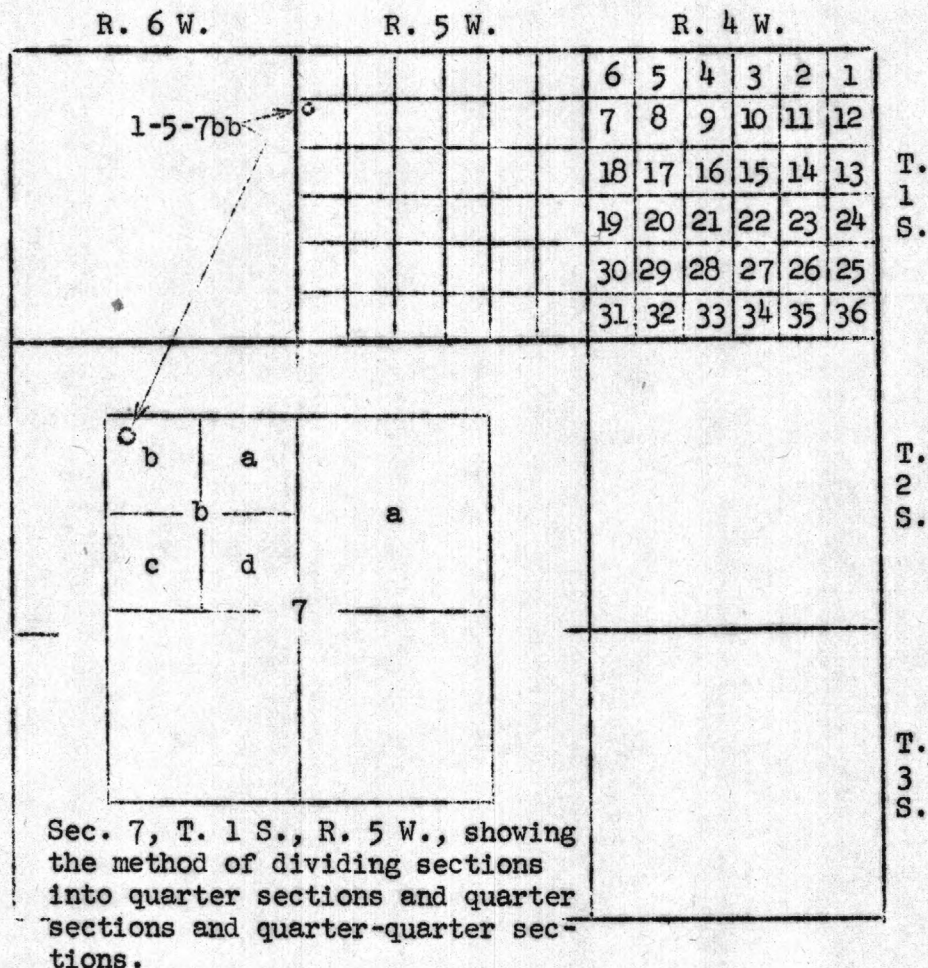


Figure 2.--Sketch illustrating well-numbering system.

Measurements of the water level in 11 wells in Norton County and in four wells in Phillips County are made periodically. The highest and lowest water levels for the period of record are given in table 3; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 4; and the water-level measurements made in 1950 are given in table 5. Hydrographs of five of the observation wells are shown in figure 3.

Table 3.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 15 wells in the Almena unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
1-19-19cc	3	14.95	July 7, 1949	26.01	Nov. 19, 1950
1-20-13ad	3.5	20.15	Sept.22, 1950	29.35	Oct. 8, 1948
-30cc	3	77.00	Sept.22, 1950	79.16	Nov. 19, 1950
-34ba	3	26.58	July 7, 1949	30.50	Oct. 8, 1948
1-21-35dc	4.5	29.34	Dec. 30, 1949	33.74	Oct. 7, 1948
2-21-1bb	4.5	20.99	July 7, 1949	27.01	June 24, 1946
-2bd	4.5	22.14	July 7, 1949	26.19	Oct. 7, 1948
-11aa	5	28.66	Dec. 30, 1949	35.25	June 1, 1950
-18aa	3.5	42.18	Apr. 14, 1950	43.89	Feb. 9, 1950
-19dd	4.5	62.30	Sept.22, 1950	64.90	Oct. 7, 1947
2-22-1ldc	4	60.79	Apr. 14, 1950	67.35	May 7, 1947
-26ac	4	26.63	Apr. 14, 1950	29.80	Apr. 26, 1949
-28aa	3.5	47.30	July 31, 1947	49.70	Sept. 2, 1949
2-23-36cd	4.5	26.93	July 31, 1947	31.59	Mar. 13, 1950
3-23-8aa	3.5	36.01	Sept.22, 1950	39.10	Apr. 14, 1950

Table 4.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 15 wells in the Almena unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
1-19-19cc	11.06	-8.21	-8.51
1-20-13ad	9.20	-.06	+1.16
-30cc	2.16	-1.97	-1.29
-34ba	3.92	-.23	+1.02
1-21-35dc	4.40	+.09	+3.84
2-21-1bb	6.02	+.27	+2.57
-2bd	4.05	+.25	+2.52
-11aa	6.59	+.06	+2.47
-18aa	1.71	+1.22	+.78
-19dd	2.60	+.16	+1.12
2-22-11dc	6.56	-1.72	+.28
-26ac	3.17	-.55	+.27
-28aa	2.40	-.45	-.06
2-23-36cd	4.66	-.49	-.23
3-23-8aa	3.09	+1.18	+.60

Table 5.--Water-level measurements, in feet below land-surface datum, in the Almena unit, 1950

1-19-19cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 9	17.80	Apr. 14	18.50	Sept. 22	24.43
Mar. 13	17.45	June 1	17.80	Nov. 19	26.01

1-20-13ad.

Date	Water level	Date	Water level	Date	Water level
Jan. 20	26.49	Apr. 14	27.40	Sept. 22	20.15
Mar. 13	25.24	June 1	26.65	Nov. 19	26.55

1-20-30cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 9	77.19	Apr. 14	77.05	Sept. 22	77.00
Mar. 13	77.15	June 1	78.65	Nov. 19	79.16

1-20-34ba. Feb. 9, 26.80; Mar. 13, 26.90; Apr. 14, 27.03.

Table 5.--Water-level measurements, in feet below land-surface datum,
in the Almema unit, 1950--Continued

1-21-35dc.

Date	Water level	Date	Water level	Date	Water level
Feb. 9	29.49	June 1	31.90	Nov. 19	29.40
Apr. 14	29.40	Sept. 22	29.69		

2-21-1bb.

Feb. 9	23.54	Apr. 14	23.70	Sept. 22	22.44
Mar. 13	24.60	June 1	23.80	Nov. 19	23.27

2-21-2bd.

Feb. 9	23.49	Apr. 14	23.43	Nov. 19	23.24
Mar. 13	23.49	Sept. 22	22.45		

2-21-11aa.

Feb. 9	29.03	Apr. 14	28.99	Nov. 19	28.97
Mar. 13	28.75	June 1	34.25		

2-21-18aa.

Feb. 9	43.48	Apr. 14	41.77	Sept. 22	42.22
Mar. 13	42.72	June 1	42.49	Nov. 19	42.26

2-21-19dd.

Feb. 9	63.00	Apr. 14	63.20	Sept. 22	62.30
Mar. 13	63.13	June 1	63.90	Nov. 19	62.84

2-22-11dc.

Feb. 9	65.17	Apr. 14	60.79	Sept. 22	65.82
Mar. 13	61.29	June 1	60.80	Nov. 19	66.89

2-22-26ac.

Feb. 9	28.49	Apr. 14	26.63	Sept. 22	27.74
Mar. 13	28.38	June 1	28.75	Nov. 19	29.04

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Table 5.--Water-level measurements, in feet below land-surface datum,
in the Almena unit, 1950--Continued

2-22-28aa.

Date	Water level	Date	Water level	Date	Water level
Feb. 9	48.78	Apr. 14	48.71	Sept. 22	48.79
Mar. 13	48.89	June 1	48.50	Nov. 19	49.23

2-23-36cd.

Feb. 9	28.19	Apr. 14	27.27	Sept. 22	27.38
Mar. 13	31.59	June 1	27.50	Nov. 19	28.68

3-23-8aa.

Feb. 9	38.43	Apr. 14	38.85	Sept. 22	36.01
Mar. 13	38.37	June 1	38.25	Nov. 19	37.25

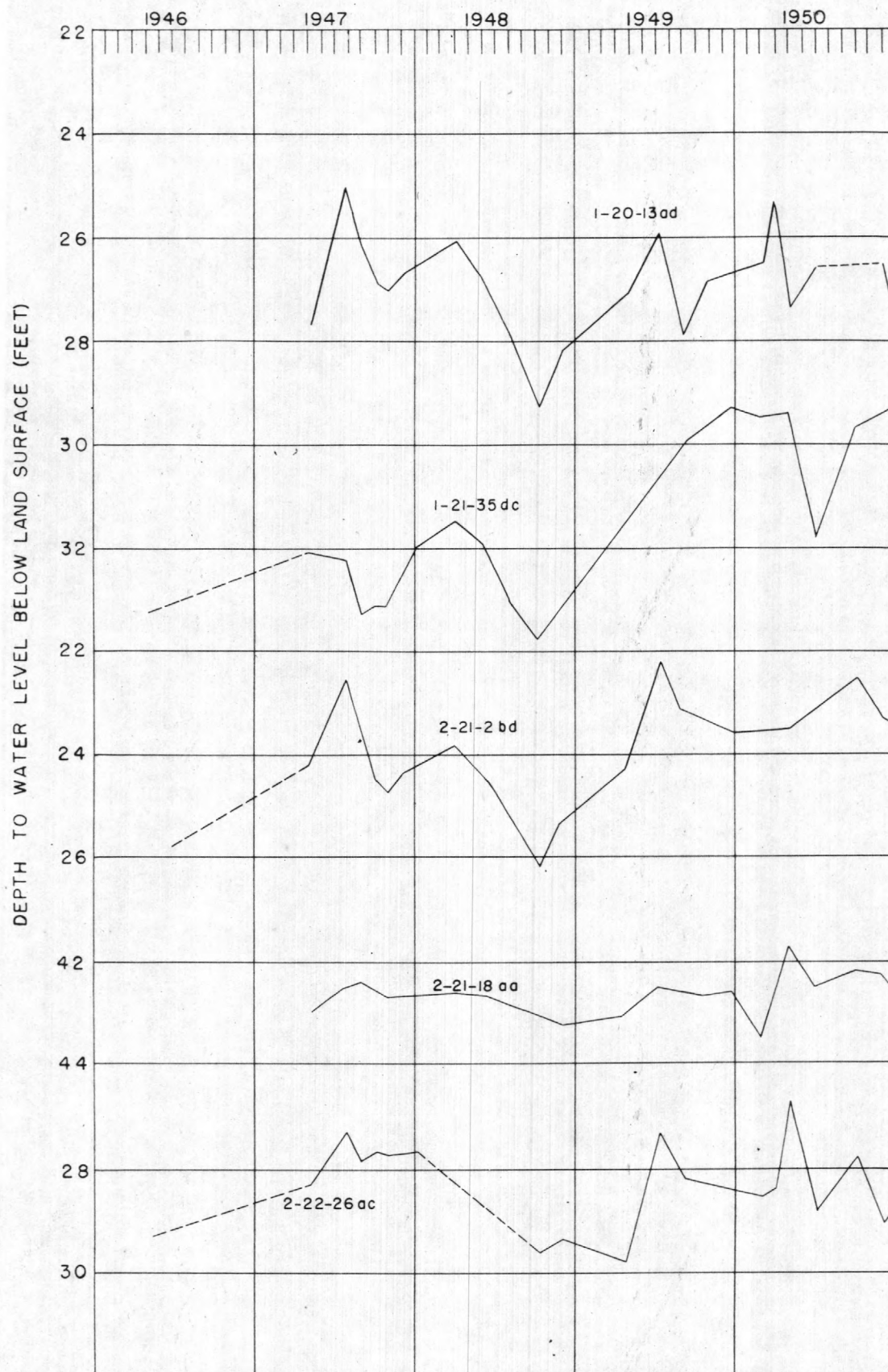


Figure 3.-Hydrographs of five wells, Almendra unit

During the fall of 1947 five drive-point observation wells were constructed along the Republican River in Kansas; three of these wells are in Jewell County and two are in Republic County. The Bureau of Reclamation constructed 38 wells by boring and driving and the Geological Survey constructed 53 wells by jetting. One well constructed by the Bureau of Reclamation (3-4-8bb) and one constructed by the Geological Survey (5-3-25bc) have been destroyed. Also seven privately-owned wells were selected for periodic measurements. At the end of 1950, 101 wells were being measured periodically. The location of these wells is shown in figure 4 and other data pertaining to these wells are given in table 9. Logs of the jetted and bored wells are given in table 10. The highest and lowest water levels for the period of record are given in table 6; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 7; and the water levels for 1950 are given in table 8. Hydrographs of five observation wells are shown in figure 5.

Table 6.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 101 wells in the Bostwick unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
1-5-7bb	3	3.77	Sept. 30, 1950	8.83	Nov. 2, 1948
-7cb	3	18.10	Nov. 30, 1950	22.04	Feb. 7, 1949
-8dc	1	1.25	May 31, 1950	4.46	June 30, 1950
			Sept. 30, 1950		
-9ba	1	20.30	Nov. 28, 1950	22.10	June 30, 1950
-14dc	1	4.90	June 1, 1950	7.36	June 30, 1950
-16dd	1	11.03	July 31, 1950	12.26	Nov. 30, 1950
-17dd	1	10.89	Sept. 30, 1950	13.12	Feb. 24, 1950
-22ab	1	7.58	Sept. 27, 1950	8.99	Apr. 27, 1950
-23cc	1	5.37	Sept. 27, 1950	8.17	Jan. 31, 1950
-25cd	1	2.86	Nov. 28, 1950	5.52	Mar. 28, 1950
-25dc	1	6.93	Sept. 27, 1950	9.00	Jan. 31, 1950
-26cc	1	7.61	Aug. 24, 1950	8.83	June 28, 1950
					Jan. 31, 1950
-26dd	1	4.05	July 31, 1950	6.48	June 28, 1950
-27dc	1	16.25	Feb. 21, 1950	17.33	June 28, 1950
-28aa	1	14.90	Nov. 30, 1950	15.81	June 30, 1950
-33ba	1	3.83	Aug. 24, 1950	11.28	Apr. 25, 1950
-34bb	1	15.89	Aug. 24, 1950	19.91	Apr. 25, 1950
1-6-4ac	1	4.98	Oct. 1, 1950	8.16	Apr. 25, 1950
-4dc	1	13.82	Nov. 30, 1950	15.88	June 30, 1950
-5da	3	3.80	June 20, 1949	9.80	Nov. 2, 1948
-5dd	1	18.30	Jan. 23, 1950	23.34	Nov. 30, 1950
-6bc	1	2.17	Oct. 1, 1950	9.95	June 30, 1950
-6cc	1	27.59	July 31, 1950	28.04	June 30, 1950
-6da	1	16.47	Nov. 30, 1950	18.50	June 30, 1950
-11aa	1	1.43	Sept. 30, 1950	3.83	June 29, 1950
1-7-1bb	3	4.29	June 20, 1949	10.80	Nov. 2, 1948
-2da	3	1.57	June 20, 1949	7.97	Nov. 2, 1948
-2dd	1	11.98	Jan. 16, 1950	13.72	May 28, 1950
2-4-7ba	1	8.94	Feb. 21, 1950	11.58	Nov. 28, 1950
-18cc	1	12.00	Sept. 27, 1950	15.29	Apr. 25, 1950
-18dc	1	24.94	Nov. 28, 1950	27.92	Feb. 21, 1950
-31aa	1	1.08	Aug. 30, 1950	3.96	June 27, 1950
-31cc	1	5.16	Aug. 31, 1950	7.12	Jan. 31, 1950
-32cc	1	.98	Aug. 30, 1950	4.43	Feb. 21, 1950
2-5-1cd	1	8.86	Aug. 30, 1950	9.60	June 27, 1950
-2ac	1	4.15	Aug. 31, 1950	5.30	Jan. 31, 1950
-2ba	1	8.34	Sept. 30, 1950	9.75	Apr. 25, 1950
-11da	1	2.05	Aug. 31, 1950	5.02	Apr. 25, 1950
-13dc	1	3.41	Nov. 28, 1950	5.44	June 27, 1950
-14dd	1	8.07	Nov. 29, 1950	9.15	June 28, 1950
-23dd	1	4.71	Aug. 31, 1950	6.85	June 28, 1950
-24cc	1	6.95	Aug. 31, 1950	7.98	Nov. 29, 1950
-25cc	1	5.17	Aug. 31, 1950	8.83	Apr. 25, 1950

Table 6.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 101 wells in the Bostwick unit--Con.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
2-5-36ab	1	19.29	Nov. 28, 1950	20.08	June 27, 1950
3-4-7ad	1	5.96	Aug. 31, 1950	7.85	Jan. 31, 1950
-7cc	1	8.14	Aug. 31, 1950	12.59	Apr. 27, 1950
-7dc	1	2.18	Aug. 31, 1950	5.94	Apr. 25, 1950
-8bb2	1	7.50	Aug. 31, 1950	9.40	Apr. 25, 1950
-8cb	1	4.77	Aug. 31, 1950	7.56	Apr. 25, 1950
-8cc1	1	4.14	Aug. 31, 1950	7.00	June 28, 1950
-8cc2	1	3.59	Aug. 31, 1950	6.44	Feb. 23, 1950
-8cd	1	4.96	Aug. 31, 1950	6.91	June 28, 1950
-17bb	1	2.96	Aug. 31, 1950	6.35	Apr. 27, 1950
-17cc	1	1.92	Aug. 31, 1950	5.70	Apr. 27, 1950
-18ad	1	1.97	Aug. 31, 1950	3.96	Nov. 29, 1950
-18dc	1	5.94	Sept. 30, 1950	8.59	Apr. 27, 1950
-19aa	1	2.08	Aug. 31, 1950	5.67	Jan. 31, 1950
-20ba	1	5.56	Aug. 31, 1950	6.85	Feb. 23, 1950
-20bc	1	2.69	Aug. 30, 1950	5.16	Nov. 29, 1950
-28ab	1	22.28	Aug. 30, 1950	25.50	Apr. 27, 1950
-29ab	1	2.95	Aug. 30, 1950	7.17	Apr. 27, 1950
-29bc	1	3.76	Mar. 31, 1950	7.01	June 28, 1950
-29cc	1	7.60	May 31, 1950	9.00	Jan. 31, 1950
-32cb	1	4.50	Aug. 31, 1950	7.54	Nov. 29, 1950
-32cc	1	2.40	Aug. 31, 1950	6.10	June 28, 1950
3-5-1aa	1	4.28	Aug. 31, 1950	5.50	May 31, 1950
-1ab	1	7.66	Aug. 31, 1950	10.21	Apr. 25, 1950
-9dc	1	1.30	May 31, 1950	4.54	June 28, 1950
-11cc	1	13.21	Aug. 31, 1950	15.70	Apr. 25, 1950
-11dd	1	17.35	Aug. 31, 1950	19.56	June 28, 1950
-16dd	1	3.16	May 31, 1950	6.65	June 28, 1950
-21dd	1	9.87	Aug. 31, 1950	13.13	Apr. 27, 1950
-35dc	1	11.60	Nov. 29, 1950	13.53	June 28, 1950
4-4-4aa	1	7.05	Feb. 23, 1950	12.19	Nov. 28, 1950
-4cc	1	6.56	Aug. 30, 1950	10.00	Apr. 27, 1950
-5aa	1	3.30	Aug. 30, 1950	5.73	June 27, 1950
-8bc	1	10.45	Aug. 31, 1950	12.95	Jan. 31, 1950
-17dc	1	2.93	July 27, 1950	5.63	June 27, 1950
-20bb	1	3.30	Aug. 30, 1950	6.94	Nov. 28, 1950
-21aa	1	11.86	Aug. 30, 1950	15.88	Apr. 27, 1950
-21bb	1	4.58	Aug. 30, 1950	6.94	Apr. 27, 1950
-27dd	1	19.96	Nov. 28, 1950	23.76	Feb. 23, 1950
-28cc	1	2.73	Aug. 30, 1950	6.63	Apr. 27, 1950
-28dd	1	13.10	Aug. 30, 1950	16.99	Apr. 27, 1950
-29cb	1	16.13	Aug. 30, 1950	17.68	June 27, 1950
-32cd	1	18.14	Aug. 30, 1950	21.57	Apr. 27, 1950
4-5-1ac	1	28.65	Apr. 27, 1950	34.10	June 28, 1950
5-3-19bb	1	16.83	Aug. 30, 1950	19.97	Apr. 27, 1950

Table 6.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 101 wells in the Bostwick unit--Con.

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
5-3-20aa	1	11.13	Aug. 30, 1950	14.84	Apr. 27, 1950
-20dd	1	5.36	July 27, 1950	9.43	Apr. 27, 1950
-23cb	1	2.55	July 27, 1950	6.17	Apr. 27, 1950
-24cb	1	2.35	Aug. 30, 1950	3.81	June 27, 1950
-27dd	1	2.97	July 27, 1950	7.30	Apr. 27, 1950
-29dd	1	6.55	Aug. 30, 1950	11.45	Apr. 27, 1950
-31bc	1	18.94	Aug. 30, 1950	23.42	Mar. 30, 1950
-34aa	1	13.17	July 27, 1950	20.95	Mar. 30, 1950
5-4-8dd	1	12.25	Aug. 30, 1950	14.51	Apr. 27, 1950
-9aa	1	.21	May 29, 1950	3.10	Apr. 27, 1950
-11dd	1	12.56	Aug. 30, 1950	20.33	Apr. 27, 1950
-14bc	1	4.45	Aug. 30, 1950	7.37	Apr. 27, 1950
-15aa	1	8.77	Aug. 30, 1950	12.00	Apr. 27, 1950

Table 7.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 101 wells in the Bostwick unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
1-5-7bb	5.06	+1.44	+3.57
-7cb	3.94	+1.77	+3.25
-8dc	3.21	+0.02	+0.02
-9ba	1.80	+0.61	+0.61
-14dc	2.46	+0.35	+0.35
-16dd	1.23	-.23	-.23
-17dd	2.23	+1.53	+1.53
-22ab	1.41	+1.14	+1.14
-23cc	2.80	+1.13	+1.13
-25cd	2.66	+2.28	+2.28
-25dc	2.07	+0.69	+0.69
-26cc	1.22	+0.19	+0.19
-26dd	2.43	+1.86	+1.86
-27dc	1.08	+0.29	+0.29
-28aa	.91	+0.48	+0.48
-33ba	7.45	+4.85	+4.85
-34bb	4.02	+2.52	+2.52
1-6-4ac	3.18	+0.70	+0.70
-4dc	2.06	+2.06	+2.06
-5da	6.00	+0.06	+2.31
-5dd	5.04	-5.04	-5.04

Table 7.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 101 wells in the Bostwick unit--Con.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
1-6-6bc	7.78	+1.27	+1.27
-6cc	.45	+.13	+.13
-6da	2.03	+1.56	.....
-11aa	2.40	+.25	.....
1-7-1bb	6.51	+.71	+1.24
-2da	6.40	+1.66	+2.46
-2dd	1.74	-.07	-.07
2-4-7ba	2.64	-2.64	-2.64
-18cc	3.29	+2.43	+2.43
-18dc	2.98	+2.98	+2.98
-31aa	2.88	+1.02	+1.02
-31cc	1.96	+.33	+.33
-32cc	3.45	+1.29	+1.29
2-5-1cd	.74	-.13	-.13
-2ac	1.15	+.08	+.08
-2ba	1.41	+1.19	+1.19
-11da	2.97	+.30	+.30
-13dc	2.03	+.80	+.80
-14dd	1.08	+.90	+.90
-23dd	2.14	+1.30	+1.30
-24cc	1.03	-.13	-.13
-25cc	3.66	+.85	+.85
-36ab	.79	+.73	+.73
3-4-7ad	1.89	+.79	+.79
-7cc	4.45	+2.91	+2.91
-7dc	3.76	+1.75	+1.75
-8bb2	1.90	+.71	+.71
-8cb	2.79	+1.36	+1.36
-8cc1	2.86	+.14	+.14
-8cc2	2.85	+1.11	+1.11
-8cd	1.95	-.09	-.09
-17bb	3.39	+1.32	+1.32
-17cc	3.78	+.94	+.94
-18ad	1.99	-.26	-.26
-18dc	2.65	+1.69	+1.69
-19aa	3.59	+1.65	+1.65
-20ba	1.29	+.48	+.48
-20bc	2.47	-1.56	-1.56
-28ab	3.22	+2.91	+2.91
-29ab	4.22	+1.26	+1.26
-29bc	3.25	-.88	-.88
-29cc	1.40	+.22	+.22
-32cb	3.04	-1.44	-1.44

Table 7.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 101 wells in the Bostwick unit--Con.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
3-4-32cc	3.70	+0.28	+0.28
3-5-1aa	1.22	+0.06	+0.06
-1ab	2.55	+1.90	+1.90
-9dc	3.24	+.67	+.67
-11cc	2.49	+1.11	+1.11
-11dd	2.21	+.20	+.20
-16dd	3.49	+1.09	+1.09
-21dd	3.26	+2.63	+2.63
-35dc	1.93	+.95	+.95
4-4-4aa	5.14	-5.14	-5.14
-4cc	3.44	+.70	+.70
-5aa	2.43	-.12	-.12
-8bc	2.50	+1.00	+1.00
-17dc	2.70	-.25	-.25
-20bb	3.64	-1.99	-1.99
-21aa	4.02	+1.94	+1.94
-21bb	2.36	+.99	+.99
-27dd	3.80	+3.80	+3.80
-28cc	3.90	+2.49	+2.49
-28dd	3.89	+3.15	+3.15
-29cb	1.55	-.14	-.14
-32cd	3.43	+1.30	+1.30
4-5-1ac	5.45	-.65	-.65
5-3-19bb	3.14	+.86	+.86
-20aa	3.71	+1.72	+1.72
-20dd	4.07	+.59	+.59
-23cb	3.62	-.05	-.05
-24cb	1.46	-.74	-.74
-27dd	4.33	+.51	+.51
-29dd	4.90	+2.64	+2.64
-31bc	4.48	+4.01	+4.01
-34aa	7.78	+4.82	+4.82
5-4-8dd	2.26	+.18	+.18
-9aa	2.89	+.64	+.64
-11dd	7.77	+2.97	+2.97
-14bc	2.92	+.46	+.46
-15aa	3.23	+.49	+.49

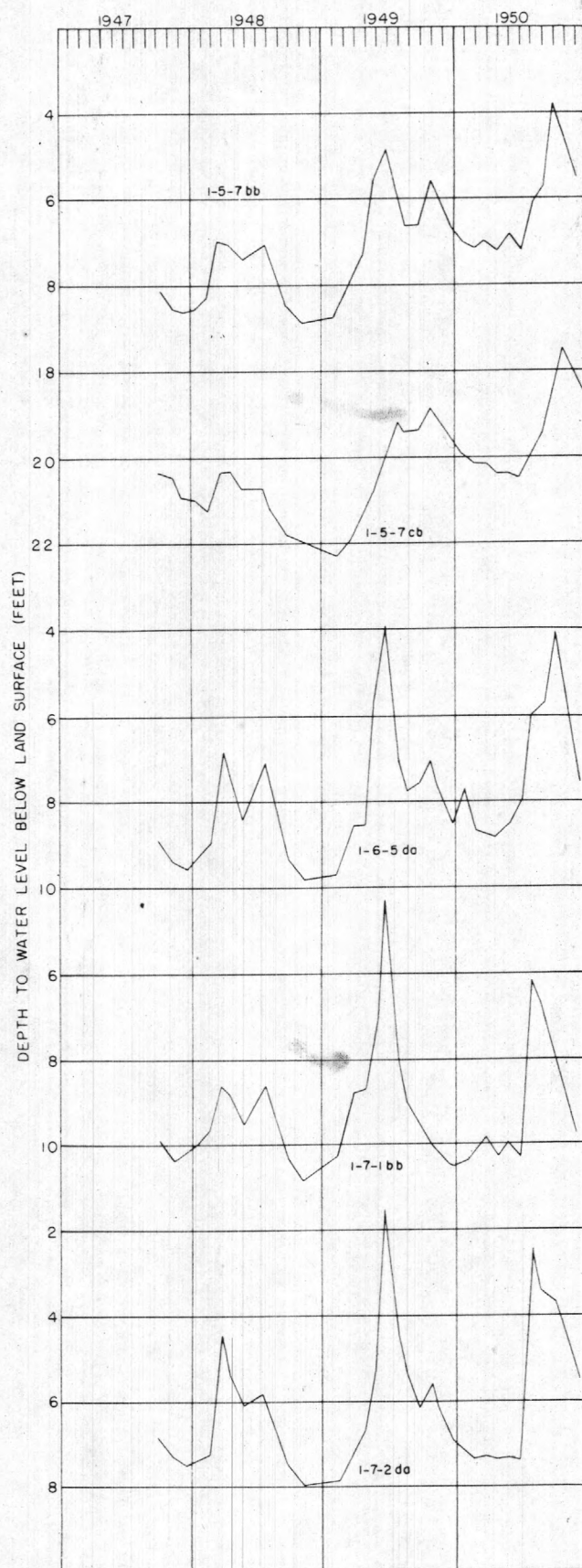


Figure 5—Hydrographs of five wells, Bostwick unit

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950

1-5-7bb.

Date	Water level	Date	Water level	Date	Water level
Jan. 23	6.94	May 30	6.77	Aug. 24	5.73
Feb. 24	7.09	June 29	7.20	Sept. 30	3.77
Mar. 27	6.97	July 31	6.05	Nov. 30	5.50
Apr. 25	7.19				

1-5-7cb.

Jan. 23	19.87	May 30	20.34	Aug. 24	19.45
Feb. 24	20.16	June 29	20.43	Sept. 30	18.28
Mar. 27	20.17	July 31	19.85	Nov. 30	18.10
Apr. 25	20.37				

1-5-8dc.

Mar. 27	2.17	June 30	4.46	Sept. 30	1.25
Apr. 25	2.91	July 31	3.76	Nov. 30	2.15
May 31	1.25	Aug. 24	3.08		

1-5-9ba.

Jan. 16	20.91	June 1	20.73	Aug. 24	21.15
Feb. 23	20.95	30	22.10	Sept. 27	20.60
Mar. 28	20.98	July 31	21.57	Nov. 28	20.30
Apr. 25	21.05				

1-5-14dc.

Jan. 16	6.33	June 1	4.90	Aug. 24	6.12
Feb. 23	5.98	30	7.36	Sept. 27	5.94
Mar. 28	5.62	July 31	6.07	Nov. 28	5.98
Apr. 25	6.45				

1-5-16dd.

Jan. 16	12.03	May 31	11.68	Aug. 24	10.89
Feb. 24	11.65	June 30	11.91	Sept. 30	11.65
Mar. 27	11.81	July 31	11.03	Nov. 30	12.26
Apr. 25	11.94				

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

1-5-17dd.

Date	Water level	Date	Water level	Date	Water level
Jan. 16	13.03	May 31	11.51	Aug. 24	11.30
Feb. 24	13.12	June 30	13.08	Sept. 30	10.89
Mar. 27	12.64	July 31	12.24	Nov. 30	11.50
Apr. 25	12.77				

1-5-22ab.

Jan. 16	8.73	June 1	8.75	Aug. 24	7.74
Feb. 23	8.93	30	8.58	Sept. 27	7.58
Mar. 28	8.96	July 31	7.98	Nov. 28	7.59
Apr. 27	8.99				

1-5-23cc.

Jan. 31	8.17	June 1	7.57	Aug. 24	5.89
Feb. 21	8.15	30	7.90	Sept. 27	5.37
Mar. 28	7.94	July 31	6.14	Nov. 11	7.04
Apr. 25	8.03				

1-5-25cd.

Jan. 31	5.14	Apr. 25	4.88	June 28	5.09
Feb. 21	4.83	May 31	3.01	Nov. 28	2.86
Mar. 28	5.52				

1-5-25dc.

Jan. 31	9.00	June 1	8.63	Aug. 24	7.55
Feb. 21	8.85	28	9.55	Sept. 27	6.93
Mar. 28	8.97	July 28	7.85	Nov. 28	8.31
Apr. 25	9.06				

1-5-26cc.

Jan. 31	8.70	May 31	8.58	Aug. 24	7.61
Feb. 21	8.50	June 28	8.83	Sept. 30	8.00
Mar. 28	8.73	July 28	8.24	Nov. 29	8.51
Apr. 25	8.72				

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

1-5-26dd.

Date	Water level	Date	Water level	Date	Water level
Jan. 31	6.48	Apr. 25	6.17	July 31	4.05
Feb. 21	6.43	May 31	4.15	Nov. 29	4.62
Mar. 28	5.94	June 28	6.48		

1-5-27dc.

Jan. 31	16.89	May 31	17.14	Aug. 24	16.31
Feb. 21	16.25	June 28	17.33	Sept. 30	16.39
Mar. 28	16.95	July 28	16.54	Nov. 29	16.60
Apr. 25	17.05				

1-5-28aa.

Jan. 16	15.38	May 31	15.66	Aug. 24	15.56
Feb. 24	15.55	June 30	15.81	Sept. 30	15.27
Mar. 27	15.53	July 31	15.79	Nov. 30	14.90
Apr. 25	15.54				

1-5-33ba.

Jan. 31	10.37	May 31	8.51	Aug. 24	3.83
Feb. 21	10.61	June 28	10.47	Sept. 30	3.89
Mar. 27	11.02	July 28	3.84	Nov. 29	5.52
Apr. 25	11.28				

1-5-34bb.

Jan. 31	19.22	May 31	19.48	Aug. 24	15.89
Feb. 21	19.27	June 28	19.86	Sept. 30	16.05
Mar. 28	19.34	July 28	16.51	Nov. 29	16.70
Apr. 25	19.91				

1-6-4ac.

Jan. 16	8.08	May 28	7.87	Aug. 24	6.09
Feb. 24	7.96	June 30	8.09	Oct. 1	4.98
Mar. 27	7.99	July 31	6.02	Nov. 30	7.38
Apr. 25	8.16				

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Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

1-6-4dc.

Date	Water level	Date	Water level	Date	Water level
June 30	15.88	Aug. 24	15.13	Nov. 30	13.82
July 31	15.19	Oct. 1	14.77		

1-6-5da.

Jan. 23	7.65	May 28	8.53	Aug. 24	5.76
Feb. 24	8.67	June 30	7.97	Oct. 1	4.10
Mar. 27	8.70	July 31	5.97	Nov. 30	7.59
Apr. 25	8.80				

1-6-5dd.

Jan. 23	18.30	May 28	21.55	Aug. 24	22.41
Feb. 24	19.23	June 30	21.90	Oct. 1	22.77
Mar. 27	19.42	July 31	22.24	Nov. 30	23.34

1-6-6bc.

Jan. 16	9.83	May 28	9.91	Aug. 24	6.88
Feb. 24	9.73	June 30	9.95	Oct. 1	2.17
Mar. 27	9.59	July 31	6.83	Nov. 30	8.56
Apr. 25	9.93				

1-6-6cc.

Jan. 16	27.81	May 28	27.77	Aug. 24	27.97
Feb. 24	27.78	June 30	28.04	Oct. 1	27.90
Mar. 27	27.75	July 31	27.59	Nov. 30	27.68
Apr. 25	27.80				

1-6-6da.

Jan. 16	18.03	May 28	18.44	Aug. 24	17.98
Feb. 24	18.14	June 30	18.50	Oct. 1	17.61
Mar. 27	18.21	July 31	18.37	Nov. 30	16.47
Apr. 25	18.36				

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Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

1-6-11aa.

Date	Water level	Date	Water level	Date	Water level
Apr. 25	3.10	July 31	2.05	Sept. 30	1.43
May 30	2.46	Aug. 24	2.15	Nov. 30	2.85
June 29	3.83				

1-7-1bb.

Jan. 23	10.40	May 28	9.95	Aug. 24	6.71
Feb. 24	10.18	June 30	10.26	Oct. 1	8.10
Mar. 27	9.77	July 31	6.14	Nov. 30	9.69
Apr. 25	10.13				

1-7-2da.

Jan. 23	7.10	May 28	7.28	Aug. 24	3.35
Feb. 24	7.30	June 30	7.38	Oct. 1	3.60
Mar. 27	7.22	July 31	2.28	Nov. 30	5.44
Apr. 25	7.37				

1-7-2dd.

Jan. 16	11.98	May 28	13.72	Aug. 24	12.24
Feb. 24	12.82	June 30	13.43	Oct. 1	12.01
Mar. 27	13.00	July 31	12.09	Nov. 30	12.05
Apr. 25	13.12				

2-4-7ba.

Feb. 21	8.94	May 31	10.45	Aug. 30	11.31
Mar. 29	9.57	June 27	10.78	Sept. 27	11.46
Apr. 25	9.96	July 27	11.09	Nov. 28	11.58

2-4-18cc.

Feb. 21	15.28	May 31	14.56	Aug. 30	12.73
Mar. 29	14.44	June 27	15.11	Sept. 27	12.00
Apr. 25	15.29	July 27	14.02	Nov. 28	12.85

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Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

2-4-18dc.

Date	Water level	Date	Water level	Date	Water level
Feb. 21	27.92	May 31	27.19	Aug. 30	26.03
Mar. 29	27.18	June 27	27.20	Sept. 27	25.56
Apr. 25	27.30	July 27	26.85	Nov. 28	24.94

2-4-31aa.

Feb. 21	2.84	May 31	1.93	Aug. 30	1.08
Mar. 29	3.03	June 27	3.96	Sept. 27	1.68
Apr. 25	3.44	July 27	2.69	Nov. 28	1.82

2-4-31cc.

Jan. 31	7.12	July 28	5.88	Sept. 30	5.76
Feb. 23	6.79	Aug. 31	5.16	Nov. 29	6.79
May 31	6.39				

2-4-32cc.

Feb. 21	4.43	May 31	1.68	Aug. 30	0.98
Mar. 29	4.25	June 27	4.36	Sept. 27	1.80
Apr. 25	4.41	July 27	3.14	Nov. 28	3.14

2-5-1cd.

Feb. 21	9.28	May 31	9.08	Aug. 30	8.86
Mar. 29	9.47	June 27	9.60	Sept. 27	8.99
Apr. 25	9.58	July 27	9.25	Nov. 28	9.41

2-5-2ac.

Jan. 31	5.30	May 31	4.78	Aug. 31	4.15
Feb. 23	5.09	June 28	5.43	Sept. 30	5.23
Mar. 30	5.16	July 28	4.26	Nov. 29	5.22
Apr. 25	5.12				

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Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

2-5-2ba.

Date	Water level	Date	Water level	Date	Water level
Apr. 25	9.75	July 28	8.93	Sept. 30	8.34
May 31	9.54	Aug. 31	8.48	Nov. 29	8.56
June 28	9.43				

2-5-11da.

Jan. 31	5.00	May 31	3.10	Aug. 31	2.05
Mar. 30	4.87	June 28	4.80	Sept. 30	3.15
Apr. 25	5.02	July 28	3.26	Nov. 29	4.70

2-5-13dc.

Mar. 29	4.21	June 27	5.44	Nov. 28	3.41
Apr. 25	4.67				

2-5-14dd.

Jan. 31	8.97	May 31	8.72	Aug. 31	8.54
Feb. 23	8.91	June 28	9.15	Sept. 30	8.49
Mar. 30	8.91	July 28	9.04	Nov. 29	8.07
Apr. 25	8.87				

2-5-23dd.

Apr. 25	6.77	July 28	6.20	Sept. 30	4.90
May 31	6.22	Aug. 31	4.71	Nov. 29	5.47
June 28	6.85				

2-5-24cc.

May 31	7.85	Aug. 31	6.95	Nov. 29	7.98
July 28	7.76	Sept. 30	7.30		

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

2-5-25cc.

Date	Water level	Date	Water level	Date	Water level
Jan. 31	7.89	May 31	5.69	Aug. 31	5.17
Feb. 23	8.81	June 28	7.81	Sept. 30	6.02
Mar. 30	8.67	July 28	6.52	Nov. 29	7.04
Apr. 25	8.83				

2-5-36ab.

Feb. 21	20.02	May 31	20.03	Aug. 30	19.49
Mar. 29	20.06	June 27	20.08	Sept. 27	19.40
Apr. 25	20.07	July 27	19.96	Nov. 28	19.29

3-4-7ad.

Jan. 31	7.85	July 28	6.70	Sept. 30	6.36
May 31	7.14	Aug. 31	5.96	Nov. 29	7.06
June 28	7.44				

3-4-7cc.

Jan. 31	12.29	May 31	10.82	Aug. 31	8.14
Feb. 23	12.34	June 28	11.57	Sept. 30	8.90
Mar. 30	12.48	July 28	10.49	Nov. 29	9.38
Apr. 27	12.59				

3-4-7dc.

Jan. 31	5.77	May 31	3.88	Aug. 31	2.18
Feb. 23	5.53	June 28	5.59	Sept. 30	2.49
Mar. 30	5.67	July 28	3.81	Nov. 29	4.02
Apr. 25	5.94				

3-4-8bb2.

Apr. 25	9.40	July 28	8.41	Sept. 30	7.89
May 31	8.80	Aug. 31	7.50	Nov. 29	8.69
June 28	9.07				

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Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

3-4-8cb.

Date	Water level	Date	Water level	Date	Water level
Jan. 31	7.45	May 31	6.50	Aug. 31	4.77
Feb. 23	7.43	June 28	7.03	Sept. 30	5.16
Mar. 30	7.40	July 28	6.55	Nov. 29	6.09
Apr. 25	7.56				

3-4-8cc1.

May 31	6.15	July 28	6.38	Sept. 30	4.69
June 28	7.00	Aug. 31	4.14	Nov. 29	6.01

3-4-8cc2.

Jan. 31	6.41	June 28	6.04	Sept. 30	4.18
Feb. 23	6.44	July 28	5.03	Nov. 29	5.30
May 31	5.78	Aug. 31	3.59		

3-4-8cd.

Jan. 31	6.59	May 31	5.68	Aug. 31	4.96
Feb. 23	6.22	June 28	6.91	Sept. 30	5.57
Mar. 30	6.53	July 28	5.49	Nov. 29	6.68
Apr. 25	6.72				

3-4-17bb.

Apr. 27	6.35	July 28	5.06	Sept. 30	3.56
May 31	4.67	Aug. 31	2.96	Nov. 29	5.03
June 28	5.93				

3-4-17cc.

Apr. 27	5.70	July 28	3.75	Sept. 30	3.00
May 31	3.60	Aug. 31	1.92	Nov. 29	4.76
June 28	5.23				

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

3-4-18ad.

Date	Water level	Date	Water level	Date	Water level
May 31	3.70	Aug. 31	1.97	Nov. 29	3.96
July 28	3.68	Sept. 30	2.56		

3-4-18dc.

Jan. 31	8.58	May 31	6.36	Aug. 31	6.16
Feb. 23	8.31	June 28	8.48	Sept. 30	5.94
Mar. 30	7.70	July 28	7.19	Nov. 29	6.89
Apr. 27	8.59				

3-4-19aa.

Jan. 31	5.67	May 31	3.24	Aug. 31	2.08
Feb. 23	5.35	June 28	5.37	Sept. 30	2.65
Mar. 30	5.18	July 28	3.94	Nov. 29	4.02
Apr. 27	5.54				

3-4-20ba.

Feb. 23	6.85	July 28	6.09	Sept. 27	6.37
May 31	5.72	Aug. 31	5.56		

3-4-20bc.

May 31	3.60	Aug. 30	2.69	Nov. 29	5.16
July 28	4.02	Sept. 30	2.84		

3-4-28ab.

Feb. 23	25.21	May 29	25.14	Aug. 30	22.28
Mar. 29	25.33	June 27	25.07	Sept. 27	22.52
Apr. 27	25.50	July 27	24.33	Nov. 28	22.30

3-4-29ab.

Feb. 23	7.04	May 29	5.77	Aug. 30	2.95
Mar. 30	6.94	June 27	6.85	Sept. 27	4.81
Apr. 27	7.17	July 27	4.77	Nov. 28	5.78

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

3-4-29bc.

Date	Water level	Date	Water level	Date	Water level
Jan. 31	5.94	May 31	3.76	Aug. 31	5.40
Feb. 23	5.44	June 28	7.01	Sept. 30	5.22
Mar. 30	6.08	July 28	5.40	Nov. 29	6.82
Apr. 27	6.26				

3-4-29cc.

Jan. 31	9.00	May 31	7.60	Aug. 31	8.70
Feb. 23	8.37	July 28	8.81	Sept. 30	8.78

3-4-32cb.

May 31	6.10	Aug. 31	4.50	Nov. 29	7.54
July 28	5.90	Sept. 30	6.07		

3-4-32cc.

Apr. 27	5.63	July 28	3.00	Sept. 30	3.37
May 31	3.79	Aug. 31	2.40	Nov. 29	5.35
June 28	6.10				

3-5-1aa.

May 31	5.50	Aug. 31	4.28	Sept. 30	5.44
July 28	5.04				

3-5-1ab.

Apr. 25	10.21	July 28	9.10	Sept. 30	7.99
May 31	9.66	Aug. 31	7.66	Nov. 29	8.31
June 28	9.75				

3-5-9dc.

Feb. 23	3.28	May 31	1.30	Aug. 31	1.36
Mar. 30	3.00	June 28	4.54	Sept. 30	2.36
Apr. 25	3.22	July 28	2.43	Nov. 29	2.61

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

3-5-11cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 23	15.39	May 31	13.63	Aug. 31	13.21
Mar. 30	15.65	June 28	15.19	Sept. 30	13.83
Apr. 25	15.70	July 28	14.38	Nov. 29	14.28

3-5-11dd.

Feb. 23	17.87	May 31	18.69	Aug. 31	17.35
Mar. 30	18.96	June 28	19.56	Sept. 30	18.20
Apr. 25	19.04	July 28	18.57	Nov. 29	17.67

3-5-16dd.

Feb. 23	5.43	May 31	3.16	Aug. 31	4.12
Mar. 30	5.32	June 28	6.65	Sept. 30	4.24
Apr. 27	5.44	July 28	4.82	Nov. 29	4.34

3-5-21dd.

Feb. 23	12.75	May 31	11.56	Aug. 31	9.87
Mar. 30	13.07	June 28	12.68	Sept. 30	9.93
Apr. 27	13.13	July 28	11.25	Nov. 29	10.12

3-5-35dc.

Feb. 23	12.55	May 31	12.16	Aug. 31	12.57
Mar. 30	13.10	June 28	13.53	Sept. 30	11.80
Apr. 27	12.15	July 28	12.58	Nov. 29	11.60

4-4-4aa.

Feb. 23	7.05	May 29	9.68	Aug. 30	11.38
Mar. 29	8.32	June 27	10.49	Sept. 27	11.70
Apr. 27	9.13	July 27	10.93	Nov. 28	12.19

Table 8.--Water- level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

4-4-4cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 23	9.72	May 29	8.85	Aug. 30	6.56
Mar. 29	9.87	June 27	9.58	Sept. 27	8.03
Apr. 27	10.00	July 27	7.80	Nov. 28	9.02

4-4-5aa.

Feb. 23	5.09	May 29	4.28	Aug. 30	3.30
Mar. 29	5.44	June 27	5.73	Sept. 27	4.42
Apr. 27	5.39	July 27	3.87	Nov. 28	5.21

4-4-8bc.

Jan. 31	12.95	May 31	12.29	Aug. 31	10.45
Feb. 23	12.91	June 28	12.31	Sept. 30	11.11
Mar. 30	11.98	July 28	10.68	Nov. 29	11.95
Apr. 27	12.92				

4-4-17dc.

Feb. 23	5.17	May 29	4.69	Aug. 30	3.28
Mar. 29	4.93	June 27	5.63	Sept. 27	4.32
Apr. 27	5.56	July 27	2.93	Nov. 28	5.42

4-4-20bb.

Mar. 29	4.95	June 27	6.13	Sept. 27	5.13
Apr. 27	5.78	July 27	5.84	Nov. 28	6.94
May 31	6.37	Aug. 30	3.30		

4-4-21aa.

Feb. 23	15.61	May 29	15.25	Aug. 30	11.86
Mar. 29	15.72	June 27	15.61	Sept. 27	13.23
Apr. 27	15.88	July 27	13.45	Nov. 28	13.67

BOSTWICK UNIT

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Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

4-4-21bb.

Date	Water level	Date	Water level	Date	Water level
Feb. 23	6.64	May 29	6.20	Aug. 30	4.58
Mar. 29	6.80	June 27	6.82	Sept. 27	5.26
Apr. 27	6.94	July 27	5.32	Nov. 28	5.65

4-4-27dd.

Feb. 23	23.76	May 29	22.88	Aug. 30	20.34
Mar. 30	23.43	June 27	22.29	Sept. 27	20.40
Apr. 27	23.47	July 27	21.68	Nov. 28	19.96

4-4-28cc.

Feb. 23	6.46	May 29	5.07	Aug. 30	2.73
Mar. 30	6.44	June 27	5.43	Sept. 27	3.52
Apr. 27	6.63	July 27	3.42	Nov. 28	3.97

4-4-28dd.

Feb. 23	16.81	May 29	15.46	Aug. 30	13.10
Mar. 30	16.88	June 27	16.41	Sept. 27	13.49
Apr. 27	16.99	July 27	14.23	Nov. 28	13.66

4-4-29cb.

Mar. 30	17.05	June 27	17.68	Sept. 27	16.64
Apr. 27	17.05	July 27	16.55	Nov. 28	17.19
May 29	16.75	Aug. 30	16.13		

4-4-32cd.

Mar. 30	21.39	June 27	21.20	Sept. 27	19.40
Apr. 27	21.57	July 27	18.71	Nov. 28	20.09
May 29	20.50	Aug. 30	18.14		

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

4-5-lac.

Date	Water level	Date	Water level	Date	Water level
Feb. 23	32.80	May 31	32.79	Aug. 30	32.53
Mar. 30	32.98	June 28	34.10	Sept. 30	32.95
Apr. 27	28.65	July 28	32.88	Nov. 29	33.45

5-3-19bb.

Mar. 30	19.61	June 27	18.99	Sept. 27	17.72
Apr. 27	19.97	July 27	17.38	Nov. 28	18.75
May 29	18.78	Aug. 30	16.83		

5-3-20aa.

Mar. 30	14.78	June 27	13.58	Sept. 27	12.32
Apr. 27	14.84	July 27	11.47	Nov. 28	13.06
May 29	13.26	Aug. 30	11.13		

5-3-20dd.

Mar. 30	9.30	June 27	8.47	Sept. 27	7.76
Apr. 27	9.43	July 27	5.36	Nov. 28	8.71
May 29	7.35	Aug. 30	5.96		

5-3-23cb.

Mar. 30	5.89	July 27	2.55	Sept. 27	4.86
Apr. 27	6.17	Aug. 30	3.08	Nov. 28	5.94
June 27	5.94				

5-3-24cb.

Mar. 30	2.49	June 27	3.81	Sept. 27	3.16
Apr. 27	3.48	July 27	2.40	Nov. 28	3.23
May 29	3.12	Aug. 30	2.35		

Table 8.--Water-level measurements, in feet below land-surface datum, in the Bostwick unit, 1950--Continued

5-3-27dd.

Date	Water level	Date	Water level	Date	Water level
Mar. 30	7.07	June 27	6.03	Sept. 27	5.51
Apr. 27	7.30	July 27	2.97	Nov. 28	6.56
May 29	4.65	Aug. 30	3.45		

5-3-29dd.

Mar. 30	11.11	June 27	9.83	Sept. 27	8.39
Apr. 27	11.45	July 27	7.08	Nov. 28	8.47
May 29	8.43	Aug. 30	6.55		

5-3-31bc.

Mar. 30	23.42	June 27	20.37	Sept. 27	19.15
Apr. 27	22.24	July 27	18.97	Nov. 28	19.41
May 29	20.52	Aug. 30	18.94		

5-3-34aa.

Mar. 30	20.95	June 27	17.76	Sept. 27	15.35
Apr. 27	20.37	July 27	13.17	Nov. 28	16.13
May 29	17.22	Aug. 30	13.34		

5-4-8dd.

Mar. 30	14.38	June 27	14.38	Sept. 27	13.01
Apr. 27	14.51	July 27	12.62	Nov. 28	14.20
May 29	13.70	Aug. 30	12.25		

5-4-9aa.

Mar. 30	2.87	May 29	0.21	Sept. 27	1.20
Apr. 27	3.10	June 27	2.40	Nov. 28	2.23

5-4-11dd.

Mar. 30	20.17	June 27	18.41	Sept. 27	15.57
Apr. 27	20.33	July 27	13.04	Nov. 28	17.20
May 29	17.56	Aug. 30	12.56		

BOSTWICK UNIT

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Table 8.--Water-level measurements, in feet below land-surface datum,
in the Bostwick unit, 1950--Continued

5-4-14bc.

Date	Water level	Date	Water level	Date	Water level
Mar. 30	7.09	June 27	6.94	Sept. 27	5.61
Apr. 27	7.37	July 27	4.88	Nov. 28	6.63
May 29	6.39	Aug. 30	4.45		

5-4-15aa.

Apr. 27	12.00	July 27	9.45	Sept. 27	10.41
May 29	10.81	Aug. 30	8.77	Nov. 28	11.51
June 27	11.60				

Well Records

During 1950, a total of 103 wells were constructed or visited and data pertaining to depth, aquifer, and type of well were obtained. The location of these wells is shown in figure 4 and the data relating to these wells are given in table 9.

Table 9.--Records of wells in the Bostwick unit

Well number: Description of well-numbering system is given in text.

Type of well: B, bored; Dr, drilled; Du, dug; J, jetted.

Depth of well: Measured depths are given in feet and tenths below measuring point; reported depths are given in feet below land surface.

Type of casing: B, brick; GI, galvanized iron; I, iron; R, rock; S, steel; T, tile.

Character of principal water-bearing material: C,

clay; Gr, gravel; S, sand; Si, silt.

Method of lift: C, centrifugal; Cy, cylinder; N, none; T, turbine.

Type of power: G, gasoline engine; T, tractor; W, wind.

Use of water: D, domestic; I, irrigation; O, observation; S, stock.

Measuring point: Bp, base of pump; Tca, top of casing; Tpl, top of platform.

Well number	Owner or tenant	Type of well	Depth of well (feet)	Diameter of well (inches)	Type of casing	Character of principal water-bearing material	Method of lift and type of power	Use of water	Measuring point			Depth to water level below land surface (feet)	Date of measurement
									Description	Distance above land surface (feet)	Altitude		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

Cloud County

5-3-19bb	U. S. Geol. Survey...	J	38.6	3/4	I	Si,S	N	O	Tca	2.0	1,375	19.61	3-30-50
-20aa	.....do.....	J	25.7	3/4	I	Si,S	N	O	Tca	1.0	1,358	14.78	3-30-50
-20dd	.....do.....	J	15	3/4	I	S	N	O	Tca	1.0	1,351	9.30	3-30-50
-23cb	.....do.....	J	21	3/4	I	S,Gr	N	O	Tca	1.5	1,340	5.89	3-30-50
-24cb	.....do.....	J	21	3/4	I	S	N	O	Tca	2.5	1,336	2.49	3-30-50

Table 9.--Records of wells in the Bostwick unit--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
5-3-25bc	U. S. Geol. Survey...	J	21	3/4	I	S	N	0	Tca	2.0	1,335	.....	.....
-27dd	.....do.....	J	31	3/4	I	S	N	0	Tca	2.0	1,341	7.07	3-30-50
-29dd	.....do.....	J	21	3/4	I	S	N	0	Tca	1.5	1,351	11.11	3-30-50
-31bc	Roy Ward.....	Du	54	8	I	S,Gr	C,G	I,0	Tpl	.2	1,373	23.42	3-30-50
-34aa	.....do.....	Dr	35	6	S	....	N	0	Tca	.5	1,353	20.95	3-30-50
5-4-8dd	U. S. Geol. Survey...	J	42	3/4	I	C,S	N	0	Tca	2.5	1,391	14.38	3-30-50
-9aa	.....do.....	J	21	3/4	I	S	N	0	Tca	1.5	1,381	2.87	3-30-50
-11dd	.....do.....	J	39.5	3/4	I	S	N	0	Tca	2.0	1,385	20.17	3-30-50
-14bc	.....do.....	J	21	3/4	I	S	N	0	Tca	1.5	1,373	7.09	3-30-50
-15aa	.....do.....	Dr	20	24	GI	S	T,Tr	I,0	Tca	.0	1,379	12.00	4-27-50

Jewell County

1-6-4ac	U. S. Geol. Survey...	J	23.6	3/4	I	S	N	0	Tca	2.0	1,536	8.08	1-16-50
-4dc	.....do.....	Dr	27.4	6	GI	Gr	Cy,W	S,0	Tca	.5	1,546	15.88	6-30-50
-5da	U. S. Geol. Survey...	Dn	13.1	1 1/4	I	S	N	0	Tca	1.0	1,538	7.65	1-23-50
-5dd	.....do.....	Dn	36	1 1/4	I	L	N	0	Tca	2.0	1,564	18.30	1-23-50
-6bc	.....do.....	J	21.4	3/4	I	S	N	0	Tca	2.0	1,548	9.83	1-16-50
-6cc	.....do.....	J	39	3/4	I	S	N	0	Tca	3.0	1,577	27.81	1-16-50
-6da	.....do.....	J	26.7	3/4	I	S	N	0	Tca	1.0	1,553	18.03	1-16-50
-11aa	.....do.....	J	44	3/4	I	S	N	0	Tca	1.5	1,516	3.10	4-25-50
1-7-1bb	.....do.....	Dn	16	1 1/4	I	S,Gr	N	0	Tca	1.0	1,552	10.40	1-23-50
-2da	.....do.....	Dn	13	1 1/4	I	S,Gr	N	0	Tca	1.0	1,551	7.10	1-23-50
-2dd	.....do.....	J	17.4	3/4	I	S	N	0	Tca	2.0	1,561	11.98	1-16-50

Republic County

1-5-7bb	U. S. Geol. Survey...	Dn	13.2	1 1/4	I	S	N	0	Tca	1.0	1,516	6.94	1-23-50
-7cb	.....do.....	Dn	25	1 1/4	I	S	N	0	Tca	1.0	1,530	19.87	1-23-50
-8dc	.....do.....	J	19	3/4	I	S,Gr	N	0	Tca	2.0	1,508	2.17	3-27-50
-9ba	.....do.....	J	38.3	3/4	I	S	N	0	Tca	1.0	1,526	20.91	1-16-50
-14dc	.....do.....	J	21.1	3/4	I	S	N	0	Tca	2.0	1,499	6.33	1-16-50

BOSTWICK UNIT

Table 9.--Records of wells in the Bostwick unit--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
			Republic County--Continued										
1-5-16dd	U. S. Geol. Survey...	J	18.1	3/4	I	S,Gr	N	0	Tca	3.0	1,499	12.03	1-16-50
-17dd	.....do.....	J	38.9	3/4	I	S	N	0	Tca	3.0	1,513	13.03	1-16-50
-22ab	.....do.....	J	22.4	3/4	I	S	N	0	Tca	2.0	1,497	8.73	1-16-50
-23cc	U.S. Bur. Reclamation	B	8	1 1/4	I	S	N	0	Tca	1.0	1,489	8.17	1-31-50
-25cd	.....do.....	B	8	1 1/4	I	S	N	0	Tca	1.5	1,485	5.14	1-31-50
-25dc	.....do.....	B	11.5	1 1/4	I	S	N	0	Tca	1.5	1,495	9.00	1-31-50
-26cc	.....do.....	B	8	1 1/4	I	S	N	0	Tca	1.0	1,483	8.70	1-31-50
-26dd	.....do.....	B	8	1 1/4	I	S	N	0	Tca	1.5	1,484	6.48	1-31-50
-27dc	.....do.....	B	17	1 1/4	I	S	N	0	Tca	3.0	1,494	16.89	1-31-50
-28aa	U. S. Geol. Survey...	J	28.3	3/4	I	S	N	0	Tca	2.5	1,503	15.38	1-16-50
-33ba	U.S. Bur. Reclamation	B	13	1 1/4	I	C	N	0	Tca	1.5	1,498	10.37	1-31-50
-34bb	.....do.....	B	23.2	1 1/4	I	S,C	N	0	Tca	2.0	1,499	19.22	1-31-50
2-4-7ba	U. S. Geol. Survey...	J	30	3/4	I	Si,C	N	0	Tca	2.0	1,486	8.94	2-21-50
-18cc	.....do.....	J	36	3/4	I	S	N	0	Tca	3.0	1,475	15.28	2-21-50
-18dc	.....do.....	J	44	3/4	I	S	N	0	Tca	2.5	1,489	27.92	2-21-50
-31aa	.....do.....	J	17	3/4	I	S	N	0	Tca	2.0	1,451	2.84	2-21-50
-31cc	U.S. Bur. Reclamation	B	7	1 1/4	I	S	N	0	Tca	2.0	1,448	7.12	1-31-50
-32cc	U. S. Geol. Survey...	J	24	3/4	I	S	N	0	Tca	2.5	1,448	4.43	2-21-50
2-5-1cd	.....do.....	J	23	3/4	I	S	N	0	Tca	2.5	1,473	9.28	2-21-50
-2ac	U.S. Bur. Reclamation	B	6.6	1 1/4	I	S	N	0	Tca	1.5	1,470	5.30	1-31-50
-2ba	U. S. Geol. Survey...	J	21	3/4	I	S	N	0	Tca	1.0	1,478	9.75	4-25-50
-11da	U.S. Bur. Reclamation	B	9.1	1 1/4	I	C	N	0	Tca	1.0	1,448	5.00	1-31-50
-13dc	U. S. Geol. Survey...	J	21	3/4	I	S,Gr	N	0	Tca	2.0	1,461	4.21	3-29-50
-14dd	U.S. Bur. Reclamation	B	10.6	1 1/4	I	S	N	0	Tca	1.0	1,461	8.97	1-31-50
-23dd	U. S. Geol. Survey...	J	13	3/4	I	S	N	0	Tca	3.0	1,459	6.77	4-25-50
-24cc	U.S. Bur. Reclamation	B	8.5	1 1/4	I	S	N	0	Tca	1.5	1,458	7.85	5-31-50
-25cc	.....do.....	B	9.5	1 1/4	I	S	N	0	Tca	2.5	1,457	7.89	1-31-50
-36ab	U.S. Geol. Survey....	J	28	3/4	I	S	N	0	Tca	2.5	1,468	20.02	2-21-50

BOSTWICK UNIT

Table 9.--Records of wells in the Bostwick unit--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Republic County--Continued													
3-4-7ad	U.S. Bur. Reclamation	B	8.2	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,440	7.85	1-31-50
-7cc	.....do.....	B	15	$1\frac{1}{4}$	I	S	N	0	Tca	2.0	1,446	12.29	1-31-50
-7dc	.....do.....	B	7.4	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,437	5.77	1-31-50
-8bb1	.....do.....	B	8	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,440	.....	.....
-8bb2	U.S. Geol. Survey....	J	21	$3/4$	I	S	N	0	Tca	1.5	1,442	9.40	4-25-50
-8cb	U.S. Bur. Reclamation	B	8.1	$1\frac{1}{4}$	I	S	N	0	Tca	1.0	1,439	7.45	1-31-50
-8cc1	.....do.....	B	7.5	$1\frac{1}{4}$	I	S	N	0	Tca	.5	1,436	6.15	5-31-50
-8cc2	.....do.....	B	7	$1\frac{1}{4}$	I	S	N	0	Tca	1.0	1,435	6.41	1-31-50
-8cd	.....do.....	B	8.4	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,435	6.59	1-31-50
-17bb	U.S. Geol. Survey....	J	22	$3/4$	I	S	N	0	Tca	2.0	1,436	6.35	4-27-50
-17cc	.....do.....	J	21	$3/4$	I	S	N	0	Tca	1.0	1,430	5.70	4-27-50
-18ad	U.S. Bur. Reclamation	B	4.5	$1\frac{1}{4}$	I	S	N	0	Tca	2.0	1,433	3.70	5-31-50
-18dc	.....do.....	B	12.5	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,435	8.58	1-31-50
-19aa	.....do.....	B	6.4	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,431	5.67	1-31-50
-20ba	.....do.....	B	7.7	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,432	6.85	2-23-50
-20bc	.....do.....	B	6.3	$1\frac{1}{4}$	I	S	N	0	Tca	2.0	1,430	3.60	5-31-50
-28ab	U.S. Geol. Survey....	J	43	$3/4$	I	S	N	0	Tca	3.0	1,450	25.21	2-23-50
-29ab	.....do.....	J	25	$3/4$	I	S	N	0	Tca	2.5	1,428	7.04	2-23-50
-29bc	U.S. Bur. Reclamation	B	12	$1\frac{1}{4}$	I	C	N	0	Tca	2.0	1,425	5.94	1-31-50
-29cc	.....do.....	B	10	$1\frac{1}{4}$	I	S	N	0	Tca	1.5	1,425	9.00	1-31-50
-32cb	U.S. Bur. Reclamation	B	10	$1\frac{1}{4}$	I	C	N	0	Tca	1.5	1,423	6.10	5-31-50
-32cc	U.S. Geol. Survey....	J	16	$3/4$	I	S	N	0	Tca	3.0	1,421	5.63	4-27-50
3-5-1aa	U.S. Bur. Reclamation	B	6	$1\frac{1}{4}$	I	S	N	0	Tca	2.0	1,447	5.50	5-31-50
-1ab	U.S. Geol. Survey....	J	26.5	$3/4$	I	S	N	0	Tca	2.0	1,452	10.21	4-25-50
-9dc	U.S. Bur. Reclamation	B	6	$1\frac{1}{4}$	I	C	N	0	Tca	1.5	1,478	3.28	2-23-50
-11cc	.....do.....	B	16	$1\frac{1}{4}$	I	C	N	0	Tca	1.0	1,493	15.39	2-23-50
-11dd	Rex Farrell.....	Du	40	36	B	....	Cy,W	S,0	Tca	.5	1,507	17.87	2-23-50
-16dd	U.S. Bur. Reclamation	B	9	$1\frac{1}{4}$	I	C	N	0	Tca	1.0	1,468	5.43	2-23-50

BOSTWICK UNIT

Table 9.--Records of wells in the Bostwick unit--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Republic County--Continued													
3-5-21dd	U.S. Bur. Reclamation	B	16	1 $\frac{1}{4}$	I	C	N	0	Tca	2.0	1,474	12.75	2-23-50
-35dc	.....do.....	Dr	85	12	T	....	Cy,W	S,0	Tpl	.0	1,445	12.55	2-23-50
4-4-4aa	U.S. Geol. Survey....	J	40	3/4	I	Si,C	N	0	Tca	2.0	1,433	7.05	2-23-50
-4cc	.....do.....	J	20	3/4	I	S	N	0	Tca	1.0	1,419	9.72	2-23-50
-5aa	.....do.....	J	34	3/4	I	S	N	0	Tca	1.5	1,417	5.09	2-23-50
-8bc	U.S. Bur. Reclamation	B	14	1 $\frac{1}{4}$	I	S,C	N	0	Tca	1.0	1,476	12.95	1-31-50
-17dc	U.S. Geol. Survey....	J	21	3/4	I	S	N	0	Tca	2.5	1,404	5.17	2-23-50
-20bb	.....do.....	J	21	3/4	I	S	N	0	Tca	1.0	1,404	4.95	3-29-50
-21aa	.....do.....	J	45	3/4	I	S	N	0	Tca	2.0	1,414	15.61	2-23-50
-21bb	.....do.....	J	23	3/4	I	S	N	0	Tca	1.5	1,404	6.64	2-23-50
-27dd	L. H. Stensass.....	Du	27.3	36	R	S,Gr	Cy,W	S,0	Tpl	1.5	1,411	23.76	2-23-50
-28cc	U.S. Geol. Survey....	J	21	3/4	I	S	N	0	Tca	2.0	1,395	6.46	2-23-50
-28dd	.....do.....	J	35	3/4	I	S	N	0	Tca	2.0	1,404	16.81	2-23-50
-29cb	.....do.....	J	27.5	3/4	I	S	N	0	Tca	1.0	1,405	17.05	3-30-50
-32cd	.....do.....	Dr	30	4	I	S	N	0	Bp	4.0	1,409	21.39	3-30-50
4-5-lac	U.S. Bur. Reclamation	Dr	79	12	T	....	Cy,W	D,0	Tpl	.0	1,464	32.80	2-23-50

BOSTWICK UNIT

Logs of Jetted or Bored Observation Wells

In order to determine more accurately the fluctuations of the water table in the Bostwick unit, 96 observation wells were jetted or bored along the Republican River. During the jetting or boring process a driller's log was prepared from examination of the cuttings. The location of these wells is shown on figure 4 and the logs of 83 of the wells are listed in table 10.

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit

1-5-8dc. Surface altitude, 1,508 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, sandy.....	2	2
Sand, medium.....	11	13
Sand, coarse, and gravel.....	3	16
Sand, medium.....	3	19+

1-5-9ba. Surface altitude, 1,526 feet.

QUATERNARY--Pleistocene		
Silt and fine sand.....	4	4
Clay and silt.....	27	31
Sand, fine.....	5	36
CRETACEOUS--Gulfian		
Carlile shale		
Shale.....	....	36+

1-5-14bc. Surface altitude, 1,499 feet.

QUATERNARY--Pleistocene		
Silt.....	4	4
Silt.....	2	6
Clay.....	3	9
Sand, fine.....	4	13
Sand, coarse.....	6	19
CRETACEOUS--Gulfian		
Carlile shale		
Shale.....	....	19+

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

1-5-17dd. Surface altitude, 1,513 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt.....	5	5
Clay and silt.....	13	18
Clay.....	4	22
Sand, fine.....	3	25
Sand, coarse.....	2	27
Sand, fine.....	3	30

1-5-22ab. Surface altitude, 1,497 feet.

QUATERNARY--Pleistocene		
Silt.....	2	2
Silt.....	6	8
Sand, fine.....	5	13
Sand, medium, blue.....	5	18
Sand, fine.....	2	20
Sand, coarse.....	1.2	21.2
CRETACEOUS--Gulfian		
Carlile shale		
Shale.....	....	21.2+

1-5-23cc. Surface altitude, 1,489 feet.

QUATERNARY--Pleistocene		
Silt.....	2	2
Sand, very fine to fine.....	6	8

1-5-25cd. Surface altitude, 1,485 feet.

QUATERNARY--Pleistocene		
Silt.....	2	2
Clay.....	3.5	5.5
Clay, sandy.....	1.5	7
Sand.....	1	8

1-5-25dc. Surface altitude, 1,495 feet.

QUATERNARY--Pleistocene		
Silt.....	2	2
Sand.....	9.5	11.5

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

1-5-26cc. Surface altitude, 1,483 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt.....	3	3
Clay, sandy.....	1	4
Sand.....	4	8

1-5-26dd. Surface altitude, 1,484 feet.

QUATERNARY--Pleistocene		
Silt.....	2	2
Clay, sandy.....	3.5	5.5
Clay.....	.5	6
Sand.....	2	8

1-5-27dc. Surface altitude, 1,494 feet.

QUATERNARY--Pleistocene		
Silt, sandy.....	4	4
Silt, sandy.....	11	15
Sand, fine.....	2	17

1-5-33ba. Surface altitude, 1,498 feet.

QUATERNARY--Pleistocene		
Silt, black.....	4	4
Clay, sandy.....	1	5
Clay.....	8	13

1-5-34bb. Surface altitude, 1,499 feet.

QUATERNARY--Pleistocene		
Silt, black.....	3	3
Clay, sandy.....	2	5
Clay.....	1	6
Sand.....	.5	6.5
Clay.....	11.5	18
Clay, sandy.....	3	21

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

1-6-4ac. Surface altitude, 1,536 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Sand, fine.....	3	3
Clay.....	2	5
Sand.....	2	7
Clay, sandy.....	1	8
Sand.....	14	22
Sand, coarse, and gravel.....	8	30

1-6-6cc. Surface altitude, 1,577 feet.

QUATERNARY--Pleistocene		
Silt.....	16	16
Clay; contains sand lens at 26 feet.....	15	31
Sand.....	4	35
Sand, coarse.....	2	37

1-6-6da. Surface altitude, 1,553 feet.

QUATERNARY--Pleistocene		
Silt.....	5	5
Sand, fine.....	11	16
Clay.....	6	22

1-6-11aa. Surface altitude, 1,516 feet.

QUATERNARY--Pleistocene		
Silt.....	1	1
Sand, medium to coarse.....	12	13
Sand, coarse, and fine gravel..	5	18
Sand, medium to coarse.....	4	22

2-4-7ba. Surface altitude, 1,486 feet.

QUATERNARY--Pleistocene		
Clay, heavy, and silt.....	27	27
Sand, fine.....	3	30

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Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

2-4-18cc. Surface altitude, 1,475 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt.....	4	4
Sand, fine, and silt.....	13	17
Sand.....	11	28
Sand, coarse, and fine gravel.	2	30
Sand, fine.....	3	33
CRETACEOUS--Gulfian		
Carlile shale		
Shale.....	....	33+

2-4-18dc. Surface altitude, 1,489 feet.

QUATERNARY--Pleistocene		
Silt.....	4	4
Clay, silty.....	32	36
Sand, fine.....	8	44
CRETACEOUS--Gulfian		
Carlile shale (?)		
Shale (?).....	....	44+

2-4-31aa. Surface altitude, 1,451 feet.

QUATERNARY--Pleistocene		
Silt.....	3	3
Sand, medium.....	9	12
Sand, coarse.....	5	17
CRETACEOUS--Gulfian		
Carlile shale		
Shale.....	....	17+

2-4-31cc. Surface altitude, 1,448 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	1	1
Sand.....	6	7

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

2-4-32cc. Surface altitude, 1,448 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Clay, silty.....	6	6
Sand, fine.....	12	18
Sand, medium.....	6	24
CRETACEOUS--Gulfian		
Greenhorn limestone (?)		
Shale (?).....	....	24+

2-5-1cd. Surface altitude, 1,473 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Sand, fine.....	3	7
Sand, coarse, and fine gravel; stratified.....	9	16
Sand, fine.....	7	23

2-5-2ac. Surface altitude, 1,470 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	4	4
Sand.....	2.6	6.6

2-5-2ba. Surface altitude, 1,478 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Sand, medium brown.....	7	11
Sand, coarse and fine, and gray gravel.....	9	20

2-5-1lda. Surface altitude, 1,448 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	1	1
Clay, sandy.....	3.5	4.5
Clay, blue.....	3.5	8
Sand.....	1.1	9.1

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

2-5-13dc. Surface altitude, 1,461 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil, silty, black.....	2	2
Sand, fine to medium.....	3	5
Sand, coarse, and fine gravel..	4	9
Sand, medium to fine.....	12	21

2-5-14dd. Surface altitude, 1,461 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	6	6
Sand.....	4.6	10.6

2-5-23dd. Surface altitude, 1,459 feet.

QUATERNARY--Pleistocene		
Topsoil, dark.....	4	4
Sand, fine, brown, and silt.....	5	9
Sand, medium, gray.....	1	10
CRETACEOUS--Gulfian		
Carlile shale		
Shale.....	....	10+

2-5-24cc. Surface altitude, 1,458 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	4	4
Clay, black.....	3	7
Sand.....	1.5	8.5

2-5-25cc. Surface altitude, 1,457 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Clay.....	4.5	8.5
Sand.....	.5	9

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

2-5-36ab. Surface altitude, 1,468 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil and silt.....	4	4
Silt and fine sand.....	14	18
Sand, medium.....	2	20
Sand, fine.....	3	23
Sand, coarse.....	2	25
Sand, fine.....	3	28
CRETACEOUS--Gulfian		
Carlile shale (?)		
Shale (?).....	....	28+

3-4-7ad. Surface altitude, 1,440 feet.

QUATERNARY--Pleistocene		
Sand.....	5	5
Clay, sandy.....	.5	5.5
Sand.....	2.7	8.2

3-4-7cc. Surface altitude, 1,446 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	2.5	2.5
Clay, sandy.....	12.5	15

3-4-7dc. Surface altitude, 1,437 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	2	2
Clay, sandy.....	2	4
Sand.....	3.6	7.6

3-4-8bb. Surface altitude, 1,440 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	3	3
Sand.....	5	8

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

3-4-8bbc. Surface altitude, 1,442 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil, sandy.....	3	3
Sand, fine.....	3	6
Sand, medium.....	5	11
Sand, medium, silty.....	2	13
Sand, coarse, and gravel.....	3	16
Sand, medium, gray.....	5	21

3-4-8cb. Surface altitude, 1,439 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	4.5	4.5
Clay, sandy.....	1	5.5
Sand.....	2.6	8.1

3-4-8cc. Surface altitude, 1,436 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	4.5	4.5
Sand.....	3	7.5

3-4-8cc2. Surface altitude, 1,435 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	1.5	1.5
Clay, sandy.....	2	3.5
Loam, sandy.....	1	4.5
Sand.....	2.5	7

3-4-8cd. Surface altitude 1,435 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	2.5	2.5
Sand.....	5.9	8.4

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

3-4-17bb. Surface altitude, 1,436 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil and silty sand.....	4	4
Sand, fine.....	4	8
Sand, medium to coarse.....	5	13
Gravel, coarse.....	2	15
Sand, coarse.....	3	18
Sand, medium to coarse.....	3	21

3-4-17cc. Surface altitude, 1,430 feet.

QUATERNARY--Pleistocene		
Topsoil, sandy loam.....	3	3
Sand, fine.....	8	11
Sand, medium to coarse.....	5	16
Sand, coarse, and gravel.....	5	21
CRETACEOUS--Gulfian		
Greenhorn limestone		
Shale.....	....	21+

3-4-18ad. Surface altitude, 1,433 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	3	3
Sand.....	1.5	4.5

3-4-18dc. Surface altitude, 1,435 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	2	2
Clay, sandy.....	8	10
Sand.....	2.5	12.5

3-4-19aa. Surface altitude, 1,431 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	3	3
Clay, sandy.....	1	4
Sand.....	2.4	6.4

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

3-4-20ba. Surface altitude, 1,432 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Loam, sandy.....	2.5	2.5
Clay, sandy.....	2	4.5
Sand.....	3.2	7.7

3-4-20bc. Surface altitude, 1,430 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	2.5	2.5
Sand.....	4.2	6.7

3-4-28ab. Surface altitude, 1,450 feet.

QUATERNARY--Pleistocene		
Topsoil, silty.....	3	3
Silt, sandy.....	35	38
Sand, fine.....	5	43
CRETACEOUS--Gulfian		
Greenhorn limestone (?)		
Shale (?).....	....	43+

3-4-29ab. Surface altitude, 1,428 feet.

QUATERNARY--Pleistocene		
Topsoil, sandy silt.....	8	8
Sand, fine.....	8	16
Sand, medium, and fine gravel..	7	23
Sand, fine.....	2	25

3-4-29bc. Surface altitude, 1,425 feet.

QUATERNARY--Pleistocene		
Loam, sandy.....	3.5	3.5
Clay, sandy.....	4	7.5
Sand.....	1.5	9
Clay, blue.....	9+

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Table 10.--Logs of Jettied or bored observation wells in the Bostwick unit--Continued

3-4-29cc. Surface altitude, 1,425 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Loam, sandy.....	4	4
Sand.....	6	10

3-4-32cb. Surface altitude, 1,423 feet.

QUATERNARY--Pleistocene		
Topsoil.....	3	3
Clay, yellow.....	7	10

3-4-32cc. Surface altitude, 1,421 feet.

QUATERNARY--Pleistocene		
Topsoil, rich, black.....	6	6
Sand, fine, brown.....	5	11
Sand, coarse, blue.....	5	16
CRETACEOUS--Gulfian		
Greenhorn limestone		
Shale.....	....	16+

3-5-1aa. Surface altitude, 1,447 feet.

QUATERNARY--Pleistocene		
Sand.....	6	6

3-5-1ab. Surface altitude, 1,452 feet.

QUATERNARY--Pleistocene		
Topsoil, sandy.....	4	4
Sand, fine, silty.....	4	8
(No sample).....	10	18
Clay, blue.....	1	19
Sand, medium.....	5	24
CRETACEOUS--Gulfian		
Greenhorn limestone		
Shale.....	....	24+

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

3-5-9dc. Surface altitude, 1,478 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Loam, sandy.....	3	3
Clay, dark.....	3	6

3-5-11cc. Surface altitude, 1,493 feet.

QUATERNARY--Pleistocene		
Loam, clay.....	3	3
Clay, yellow.....	6	9
Clay, dark.....	1	10
Clay, yellow.....	6	16

3-5-16dd. Surface altitude, 1,468 feet.

QUATERNARY--Pleistocene		
Loam, clayey, sandy.....	3	3
Clay, yellow.....	4	7
Clay, yellow; contains limestone fragments.....	2	9

3-5-21dd. Surface altitude, 1,474 feet.

QUATERNARY--Pleistocene		
Loam, sandy, clayey.....	3	3
Clay, sandy.....	3	6
Clay, sandy, gray.....	4	10
Clay, yellow with trace of lime- stone.....	6	16

4-4-4aa. Surface altitude, 1,433 feet.

QUATERNARY--Pleistocene		
Topsoil.....	2	2
Clay and silt.....	36	38
Sand, fine to medium.....	2	40

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

4-4-4cc. Surface altitude, 1,419 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt.....	3	3
Clay and silt.....	5	8
Sand, fine to medium.....	12	20

4-4-5aa. Surface altitude, 1,417 feet.

QUATERNARY--Pleistocene		
Topsoil.....	2	2
Silt.....	5	7
Sand, fine.....	8	15
Sand, coarse to fine gravel....	19	34

4-4-8bc. Surface altitude, 1,476 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Clay, yellow.....	4	8
Clay, sandy.....	5	13
Sand.....	....	13+

4-4-17dc. Surface altitude, 1,404 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Sand, fine.....	9	13
Sand, coarse.....	2	15
Sand, medium.....	4	19
Sand, fine.....	4	23

4-4-20bb. Surface altitude, 1,404 feet.

QUATERNARY--Pleistocene		
Topsoil, silty.....	3	3
Clay, silty.....	4	7
Sand, fine to medium.....	2	9
Sand, coarse, and fine gravel..	12	21

Table 10.--Logs of Jetted or bored Observation wells in the Bostwick unit--Continued

4-4-21aa. Surface altitude, 1,414 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil.....	2	2
Clay, silty.....	8	10
Clay.....	12	22
Sand, fine.....	8	30
Sand.....	17	47

4-4-21bb. Surface altitude, 1,404 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Sand, fine.....	4	8
Sand, fine, blue.....	2	10
Sand, medium.....	2	12
Sand, coarse.....	3	15
Sand, fine.....	10	25

4-4-28cc. Surface altitude, 1,395 feet.

QUATERNARY--Pleistocene		
Silt, sandy.....	3	3
Sand, fine.....	7	10
Clay, blue.....	2	12
Sand, fine.....	6	18
Clay.....	2	20
Sand, fine.....	3	23

4-4-28dd. Surface altitude, 1,404 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Sand, silty.....	11	15
Sand, medium.....	5	20
Sand, fine, and silt.....	5	25
Sand, medium to coarse.....	3	28
Sand, fine.....	9	37

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

4-4-29cb. Surface altitude, 1,405 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt; contains limestone fragments.....	10	10
Assorted materials; unknown....	5	15
Sand, medium to fine.....	5	20
Sand, coarse.....	7	27

✓ 5-3-19bb. Surface altitude, 1,375 feet.

QUATERNARY--Pleistocene		
Topsoil.....	2	2
Clay, silty.....	19	21
Sand, medium to coarse, silty..	18+	39+

5-3-20aa. Surface altitude, 1,358 feet.

QUATERNARY--Pleistocene		
Silt, sandy.....	4	4
Clay, silty.....	5	9
Sand, fine, and silt.....	11	20
Sand, coarse.....	6	26

X 5-3-20dd. Surface altitude, 1,351 feet.

QUATERNARY--Pleistocene		
Topsoil, silty.....	4	4
Sand, fine.....	6	10
Sand, medium to fine.....	5	15

X 5-3-23cb. Surface altitude, 1,340 feet.

QUATERNARY--Pleistocene		
Topsoil.....	4	4
Clay, silty.....	2	6
Sand, medium to coarse.....	7	13
Gravel, medium to fine.....	8+	21+

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

5-3-24cb. Surface altitude, 1,336 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil, sandy.....	7	7
Sand, fine to medium.....	3	10
Sand, coarse, and fine gravel..	5	15
Gravel, coarse.....	6	21

5-3-27dd. Surface altitude, 1,341 feet.

QUATERNARY--Pleistocene		
Topsoil, silty.....	3	3
Sand, fine to medium.....	15	18
Sand, coarse, and fine gravel..	3	21
Sand, medium.....	10+	31+

X 5-3-29dd. Surface altitude, 1,351 feet.

QUATERNARY--Pleistocene		
Topsoil.....	2	2
Silt and fine sand.....	6	8
Sand, medium to fine.....	7	15
Sand, coarse, and fine gravel..	3	18
Gravel, medium to coarse.....	3+	21+

X 5-4-8dd. Surface altitude, 1,390 feet.

QUATERNARY--Pleistocene		
Topsoil.....	2	2
Clay.....	16	18
Sand, medium.....	6	24
Sand, coarse, and fine gravel..	15+	39+

X 5-4-9aa. Surface altitude, 1,381 feet.

QUATERNARY--Pleistocene		
Topsoil and silt.....	3	3
Sand, medium to coarse.....	10	13
Gravel, medium.....	4	17
Sand, medium.....	4+	21+

Table 10.--Logs of jetted or bored observation wells in the Bostwick unit--Continued

x 5-4-11dd. Surface altitude, 1,385 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil, sandy.....	4	4
Clay; contains fine sand and silt.....	16	20
Sand, medium.....	20	40
CRETACEOUS--Gulfian		
Dakota formation (?)		
Shale (?).....	....	40+

x 5-4-14bc. Surface altitude, 1,373 feet.

QUATERNARY--Pleistocene		
Topsoil, silty.....	5	5
Sand, medium.....	7	12
Sand, blue; contains weathered shale.....	4	16
Gravel, medium.....	2	18
Gravel, coarse to medium.....	3+	21+

Periodic measurements were made of the water level in 72 observation wells in the Cedar Bluff unit. Periodic checks were made on 29 additional wells that were constructed with the screen above an impervious clay layer and which have always been dry. The location of the wells that were constructed during 1950 is shown in figure 6. The highest and lowest water levels for the period of record for 21 wells are given in table 11; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 12. The water-level measurements for 1950 for 72 wells are given in table 13. Records of jetted observation wells are given in table 14. Hydrographs of five observation wells are shown in figure 7.

Table 11.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 21 wells in the Cedar Bluff unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
14-16-17cb	4	17.67	July 6, 1949	19.88	Nov. 16, 1950
-36bc	4	19.26	Feb. 10, 1950	21.74	May 10, 1947
14-18-12bb	4	22.98	Nov. 16, 1950	27.15	July 30, 1946
-26aa	4	17.90	July 7, 1949	20.85	Jan. 8, 1948
14-19-31cc	1	31.01	Feb. 10, 1950	31.79	Oct. 22, 1949
14-20-32aa	1	34.94	Mar. 16, 1950	37.36	June 1, 1950
-35dc	4	13.95	July 7, 1949	16.29	Aug. 8, 1946
					May 16, 1950
14-22-36aa	1	39.65	Nov. 15, 1950	43.11	Mar. 16, 1950
15-16-6dd	4	21.07	Nov. 16, 1950	24.33	Aug. 9, 1946
-13bb	4	13.87	June 4, 1948	14.85	July 17, 1946
15-17-19ab	3	132.40	July 7, 1949	140.50	July 22, 1946
-25cb	4	11.25	Nov. 16, 1950	12.99	Feb. 10, 1950
15-18-1bb	4	17.27	Aug. 22, 1949	28.22	July 24, 1946
-16bb	4	5.62	July 23, 1947	9.55	July 12, 1946
-27cb	1	9.20	June 1, 1950	10.66	Nov. 16, 1950
15-19-6aa	4	51.65	Dec. 30, 1949	53.12	Aug. 22, 1949
-9cc	1	33.85	Dec. 30, 1949	35.98	June 1, 1950
-13ab	4	5.75	Aug. 8, 1948	9.30	Oct. 8, 1947
-15dd	1	24.45	Apr. 14, 1950	25.60	June 1, 1950
-35aa	4	59.45	Jan. 8, 1948	70.70	Apr. 8, 1948
15-20-12aa	1	39.11	Feb. 10, 1950	39.31	Mar. 6, 1950

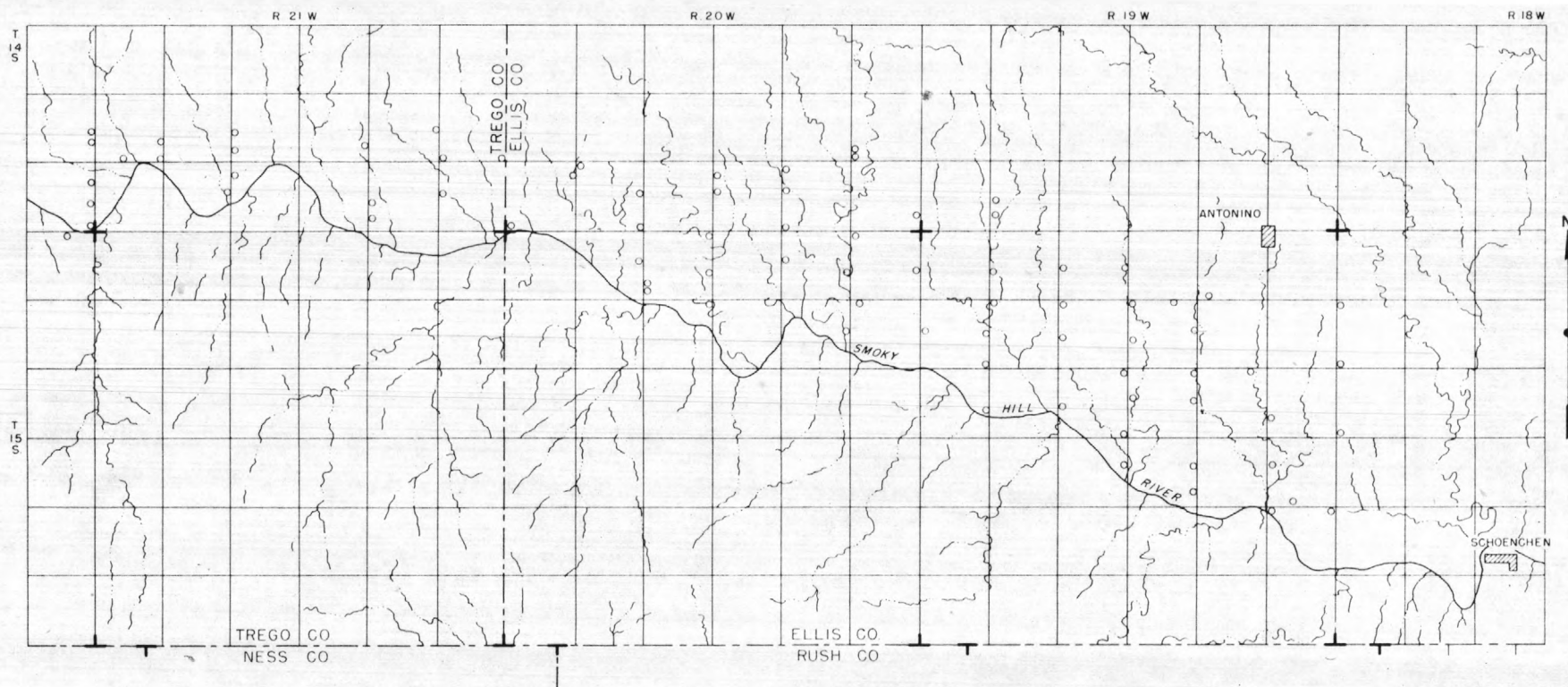


Figure 6.—Map of Cedar Bluff unit showing location of jetted observation wells.

Table 12.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 21 wells in the Cedar Bluff unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
14-16-17cb	2.21	-0.97	-0.28
-36bc	2.48	-.60	-.09
14-18-12bb	4.17	+.39	+4.17
-26aa	2.95	+1.82	+2.52
14-19-31cc	.78	-.28	+.05
14-20-32aa	2.42	-.98	-1.07
-35dc	2.34	-.15	+1.07
14-22-36aa	3.46	+3.20	+3.00
15-16-6dd	3.26	+.73	+3.26
-13bb	.98	+.19	+.58
15-17-19ab	8.10	(a)	+1.12
-25cb	1.74	+1.47	+.58
15-18-1bb	10.95	+.23	+10.35
-16bb	3.93	+3.05	+3.70
-27cb	1.46	-.93	-.79
15-19-6aa	1.47	-.84	-.11
-9cc	2.13	-1.11	-2.13
-13ab	3.55	+.37	+2.17
-15dd	1.15	+.05	+.18
-35aa	11.25	-.20	+.31
15-20-12aa	.20	-.19	-.07

a Only one measurement in 1950.

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950

14-16-17cb.

Date	Water level	Date	Water level	Date	Water level
Feb. 10	18.91	Apr. 14	19.19	Nov. 16	19.88
Mar. 16	18.80	June 1	19.00		

14-16-36bc.

Date	Water level	Date	Water level	Date	Water level
Feb. 10	19.26	Apr. 14	19.58	Nov. 16	19.86
Mar. 16	19.39	June 1	19.65		

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950--Continued

14-18-12bb.

Date	Water level	Date	Water level	Date	Water level
Feb. 10	23.37	June 1	23.59	Nov. 16	22.98
Mar. 16	23.89				

14-18-26aa.

Feb. 10	20.06	Apr. 14	20.15	Nov. 16	18.24
Mar. 16	19.97	June 1	20.00		

14-19-31cc.

Feb. 10	31.01	Apr. 14	31.49	June 1	31.29
Mar. 16	31.37				

14-19-32ccb. Sept. 8, 16.90; Nov. 16, 19.78.

14-20-31cc. Aug. 16, 8.20; Nov. 15, 12.17.

14-20-32aa.

Feb. 10	36.38	Apr. 13	37.01	June 1	37.36
Mar. 16	34.94				

14-20-32dd. Aug. 15, 22.30; Nov. 15, 22.79.

14-20-34bb. Sept. 27, 15.66.

14-20-34bc. Sept. 27, 13.94; Nov. 16, 15.67.

14-20-35bc. Sept. 27, 9.05; Nov. 16, 12.29.

14-20-35dc. Feb. 10, 15.07; Mar. 16, 16.29; Apr. 14, 15.22.

14-20-36dda. Sept. 16, 16.25; Nov. 16, 17.05.

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950--Continued

14-21-25cc. Sept. 15, 12.90; Nov. 15, 13.79.

14-21-25dd. Sept. 15, 12.20; Nov. 15, 14.19.

14-21-27dd. Sept. 15, 27.30; Nov. 15, 28.17.

14-21-28cc. Aug. 3, 12.50; Nov. 15, 22.29.

14-21-30cd. July 14, 12.90; Nov. 15, 11.50.

14-21-32ad. Aug. 3, 6.50; Nov. 15, 8.79.

14-21-33bb. Aug. 3, 6.90; Nov. 15, 9.50.

14-21-35cc. Sept. 15, 12.20; Nov. 15, 12.79.

14-22-25da1. Sept. 15, 6.90; Nov. 15, 6.36.

14-22-25da2. Sept. 15, 5.25; Nov. 15, 5.58.

14-22-36aa.

Date	Water level	Date	Water level	Date	Water level
Feb. 10	42.85	Apr. 14	42.35	Nov. 15	39.65
Mar. 16	43.11	June 1	40.90		

14-22-36ada. Sept. 15, 6.95; Nov. 15, 8.86.

14-22-36da. Sept. 15, 6.50; Nov. 15, 8.82.

14-22-36dd. Sept. 15, 3.85; Nov. 15, 5.10.

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950--Continued

15-16-6dd.

Date	Water level	Date	Water level	Date	Water level
Mar. 16	21.80	June 1	21.41	Nov. 16	21.07
Apr. 13	22.49				

15-16-13bb.

Feb. 10	14.46	Apr. 14	14.57	Nov. 16	14.27
Mar. 16	14.35	June 1	14.49		

15-17-19ab. Feb. 10, 139.38.

15-17-25cb.

Feb. 10	12.99	Apr. 14	12.30	Nov. 16	11.52
Mar. 16	12.10	June 1	11.25		

15-18-1bb.

Feb. 10	18.10	Apr. 14	18.61	Nov. 16	17.87
Mar. 16	18.54	June 1	18.40		

15-18-7bb. July 14, 6.80; Nov. 16, 6.09.

15-18-7cc. July 14, 7.55; Nov. 16, 5.81.

15-18-16bb.

Feb. 10	8.90	Apr. 14	9.18	June 1	5.85
Mar. 16	8.90				

15-18-18cc. Sept. 15, 11.50; Nov. 16, 11.61.

15-18-27cb.

Feb. 10	9.73	Apr. 14	9.77	Nov. 16	10.66
Mar. 16	9.40	June 1	9.20		

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950--Continued

15-19-4cbb. Sept. 16, 6.90; Nov. 16, 8.72.

15-19-4da. Sept. 16, 7.94; Nov. 16, 6.77.

15-19-5cbb. Sept. 16, 31.10; Nov. 16, 31.94.

15-19-6aa. Feb. 10, 51.86; Mar. 16, 52.70.

15-19-7ad. Sept. 27, 10.80; Nov. 16, 10.80.

15-19-7bc. Sept. 16, 9.65; Nov. 16, 12.28.

15-19-8bbb. Sept. 16, 21.80; Nov. 16, 20.55.

15-19-9bbb. Sept. 16, 26.00; Nov. 16, 26.66.

15-19-9cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 10	34.87	Apr. 14	35.00	June 1	35.98
Mar. 16	35.90				

15-19-10ab. Sept. 15, 7.40; Nov. 16, 7.65.

15-19-10add. Sept. 15, 13.85; Nov. 16, 13.88.

15-19-10bbb. Sept. 15, 5.80; Nov. 16, 10.30.

15-19-10cbb. Sept. 15, 21.95; Nov. 16, 22.24.

15-19-13ab. Feb. 10, 7.27; Mar. 16, 6.90; Apr. 14, 7.30;
Nov. 16, 6.90.

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950--Continued

15-19-14aab. Sept. 15, 4.35; Nov. 16, 5.20.

15-19-15add. July 28, 12.61; Nov. 16, 12.89.

15-19-15bc. Sept. 15, 24.60; Nov. 16, 24.20.

15-19-15dd.

Date	Water level	Date	Water level	Date	Water level
Feb. 10	25.39	Apr. 14	24.45	Nov. 16	25.34
Mar. 16	25.37	June 1	25.60		

15-19-16cb. Sept. 16, 27.70; Nov. 16, 28.75.

15-19-18daa. Sept. 19, 8.68.

15-19-22add. Sept. 15, 16.08; Nov. 16, 16.05.

15-19-22dd. Sept. 15, 16.35; Nov. 16, 15.71.

15-19-24bcc. Sept. 15, 9.05; Nov. 16, 9.10.

15-19-24cd. July 24, 22.40; Nov. 16, 22.10.

15-19-25aa. July 24, 16.20; Nov. 16, 15.55.

15-19-35aa. Feb. 10, 59.65; Mar. 16, 59.70; Apr. 14, 59.85.

15-20-1bbb. Sept. 16, 22.10; Nov. 16, 21.98.

15-20-4cc. Sept. 15, 8.50; Nov. 15, 9.18.

Table 13.--Water-level measurements, in feet below land-surface datum, in the Cedar Bluff unit, 1950--Continued

15-20-4ccb. Sept. 15, 23.90; Nov. 15, 24.68.

15-20-4da. Sept. 20, 18.90; Nov. 16, 18.67.

15-20-9aaa. Sept. 20, 5.30; Nov. 16, 5.01.

15-20-1lad. Sept. 16, 11.13.

15-20-12aa. Feb. 10, 39.11; Mar. 16, 39.31; Apr. 14, 39.29;
June 1, 39.30.

15-22-1ab. July 14, 8.30; Nov. 15, 10.02.

Well Records

During the summer and fall of 1950, 80 observation wells were constructed, and data pertaining to the depth to water and the type of water-bearing material were obtained. The location of these wells is shown in figure 6 and the data pertaining to these wells are given in table 14.

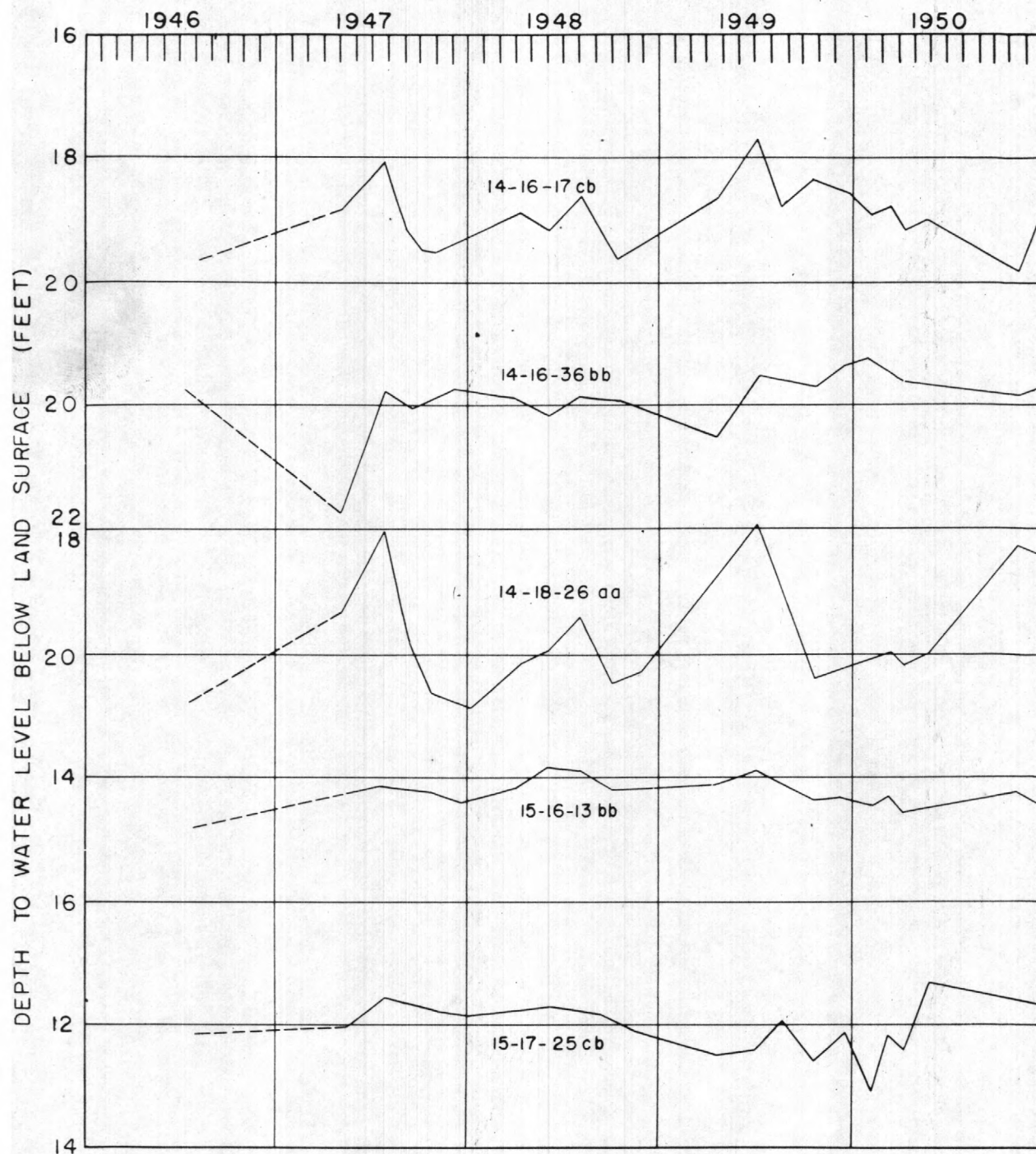


Figure 7.—Hydrographs of five wells, Cedar Bluff unit

Table 14.--Records of jetted observation wells in the Cedar Bluff unit

[All wells constructed by U. S. Geological Survey from galvanized pipe 3/4-inch in diameter. Measuring point of each well is top of casing.]

Well number: Description of well-numbering system is given in text.

Character and geologic source of principal water-bearing material: C, clay; G, gravel; S, sand; Ssi, sandy silt; T, terrace deposits.

Well number	Depth of well below measuring point (feet)	Character and geologic source of principal water-bearing material	Measuring point		Depth to water level below measuring point (feet)	Date of measurement
			Distance above land surface (feet)	Height above mean sea level (feet)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
14-19-32cb	19.7	.....	3.0	2,080.4	Dry	9-27-50
-32ccb	24.5	.....	1.0	2,071.0	17.90	9-16-50
14-20-25cc1	21.0	S,G,T	3.0	2,079.6	Dry	9-27-50
-25cc2	20.7	.....	4.5	2,072.4	Dry	9-26-50
-31aa	31.5	S	3.0	2,086.0	Dry	8- 9-50
-31cc	20.6	S,G,T	2.5	2,020.6	10.70	9-16-50
-32ad	26.0	S,G,T	3.0	2,082.2	Dry	8-16-50
-32bb	23.9	S,G,T	3.7	2,092.7	Dry	8-19-50
-32dd	26.1	S,T	1.0	2,057.4	23.30	9-15-50
-34bb	26.5	.....	4.0	2,093.9	19.66	9-27-50
-34bc	30.0	.....	3.0	2,082.7	16.94	9-27-50
-35bb	8.8	.....	1.3	2,085.4	Dry	9-22-50
-35bc	19.5	S,G	.7	2,072.6	9.75	9-27-50
-35cc	26.4	S,G,T	1.0	2,055.0	12.39	9-22-50
-36dda	26.3	.....	1.8	2,074.7	18.05	9-16-50
14-21-25cc	21.0	S,T	4.5	2,077.9	17.40	9-15-50
-25dd	31.0	T	4.0	2,110.2	16.20	9-15-50
-26da	21.0	S,G,T	2.0	2,102.6	Dry	9- 7-50
-27dd	31.4	S,G,T	1.0	2,100.5	28.30	9-15-50
-28cb	30.6	T	3.5	2,121.9	Dry	8- 3-50

Table 14.--Records of jetted observation wells in the Cedar Bluff unit--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)
14-21-28cc	29.1	S,G,T	4.0	2,100.7	16.50	8- 3-50
-30cd	21.0	S,G,T	4.2	2,069.6	17.10	7-14-50
-30da	24.0	S,G,T	3.0	2,125.7	Dry	9-15-50
-30dd	16.0	S,G,T	2.0	2,114.9	Dry	7-19-50
-32ad	22.0	S,G,T	1.0	2,050.1	7.50	8- 3-50
-33bb	30.6	S,C,T	2.0	2,059.7	8.90	8- 3-50
-35cb	10.5	T	2.5	2,049.9	Dry	8- 4-50
-35cc	20.3	S,G,T	3.0	2,036.7	15.20	9-15-50
-36bc	21.0	S,T	1.0	2,074.8	Dry	9- 7-50
14-22-25da1	9.1	S,T	2.0	2,105.3	8.90	9-15-50
-25da2	10.6	S	3.5	2,102.4	8.75	9-15-50
-36ada	26.7	S	2.3	2,071.5	9.25	9-15-50
-36da	21.0	S,T	3.6	2,071.9	10.10	9-15-50
-36dd	13.1	S,G,T	1.5	2,064.9	5.35	9-15-50
15-18-7bb	10.0	S	1.0	2,066.7	7.80	7-14-50
-7cc	10.0	G	1.8	2,071.7	9.35	7-14-50
-18cc	14.6	S	2.0	2,016.8	13.50	9-15-50
15-19-2cc	22.3	S,C	1.9	2,043.1	Dry	8- 1-50
-4cbb	24.0	S	2.7	2,057.0	9.60	9-16-50
-4da	17.0	.....	4.3	2,068.4	12.24	9-16-50
-5cbb	35.8	S	1.0	2,042.5	32.10	9-16-50
-7ad	20.5	T	3.0	2,006.8	13.80	9-27-50
-7bc	24.2	S,T	2.0	2,031.1	11.65	9-16-50
-7dd	26.4	T	3.5	2,022.3	Dry	9-27-50
-8bbb	23.3	S,T	1.0	2,021.7	22.80	9-16-50
-9bbb	37.1	Ssi	2.3	2,047.4	28.30	9-16-50
-9cbb	33.8	S,T	1.2	2,028.4	Dry	9- 6-50
-10ab	31.0	.....	4.3	2,048.6	11.70	9-15-50
-10add	19.1	S,C	3.1	2,024.2	16.95	9-15-50
-10bbb	26.0	S,T	3.0	2,046.1	8.80	9-15-50
-10cbb	32.0	S,T	2.3	2,034.7	24.25	9-15-50
-13cbc	32.0	S,T	1.5	2,005.5	Dry	7-25-50
-14aab	10.1	S,C	2.4	2,020.2	6.75	9-15-50
-15aaa	28.5	S,C	2.7	2,010.2	Dry	7-28-50
-15add	24.6	S	2.0	2,004.1	14.61	7-28-50
-15bc	25.6	S	.8	2,002.0	25.40	9-15-50
-16aaa	34.5	S,T	2.3	2,025.4	Dry	8-18-50
-16cb	31.0	S,T	2.0	2,010.8	29.70	9-16-50
-16dd	21.0	S,T	2.2	1,999.6	Dry	8- 7-50
-18daa	23.1	S,T	2.0	1,977.8	10.68	9-19-50

Table 14.--Records of jetted observation wells in the Cedar Bluff unit--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)
15-19-21ad	10.0	T	3.9	1,982.1	Dry	8- 7-50
-22add	21.0	S	2.3	1,984.7	18.38	9-15-50
-22dd	23.8	S,T	2.5	1,968.0	18.85	9-15-50
-24bc	16.8	S,T	1.6	1,970.7	10.65	9-15-50
-24cd	31.4	S	3.0	1,978.8	25.4	7-24-50
-25aa	21.0	S	2.5	1,970.2	18.7	7-24-50
-25bb	15.5	T	2.0	1,977.8	Dry	9-15-50
15-20-1bbb	26.1	S,T	2.0	2,036.4	24.10	9-16-50
-1daa	32.9	S,T	1.0	2,045.6	Dry	9-12-50
-2bc	28.8	S,G,T	3.6	2,061.5	12.34	9-21-50
-2da	13.5	S	1.0	2,018.7	10.49	9-20-50
-4aa	31.0	S	2.5	2,056.5	9.62	9-23-50
-4cc1	20.0	T	2.2	2,006.7	10.70	9-15-50
-4cc2	32.2	S,Ss1	1.8	2,026.6	25.70	9-15-50
-4da	25.9	S,T	3.0	2,043.7	21.9	9-20-50
-5ad	32.0	S,T	2.0	2,055.5	Dry	8-15-50
-9aaa	26.0	S,T	3.0	2,017.6	8.30	9-20-50
-1lad	18.4	S,T	1.3	2,002.8	12.43	9-16-50
-12bb	34.6	S,G,T	1.0	2,044.3	Dry	9-13-50
15-22-1ab	17.5	S,T	2.0	2,070.6	10.30	7-14-50

Logs of Jetted Observation Wells

During 1950, 80 observation wells were constructed by jetting in the Cedar Bluff unit. Logs of the samples of the cuttings were made during the jetting. The location of the wells is shown in figure 6 and other pertinent data are given in table 14. Logs of the observation wells are given in table 15 on the following page.

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit

14-19-32cb. (0.4 mile north of SW corner of sec. 32 and 18 feet east of center north-south road.) Surface altitude, 2,077.4 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, dark-gray.....	1	1
Silt, clayey, sandy, gray.....	1	2
Silt, sandy, brown, and fine sand.....	6	8
Silt, very hard, slightly sandy, tan to brown.....	6	14
Sand, very coarse, and silt; contains some limestone gravel; contains white to brown caliche at base.....	2.7	16.7

14-19-32ccb. (0.15 mile north of SW corner of sec. 32 and 20 feet east of center north-south road.) Surface altitude, 2,070.0 feet. Water level, 16.90 feet below land surface.

QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, clayey, plastic, calcareous, tan.	4	5
Silt, hard, blocky, calcareous, dark-brown.....	5	10
Silt, sandy, calcareous, brown; contains fine sand.....	10	20
Silt, clayey, sandy, calcareous, brown.	3	23

14-20-25ccl. (25 feet north of center of east-west road.) Surface altitude, 2,076.6 feet.

QUATERNARY--Pleistocene		
Silt, sandy, hard, tan.....	1	1
Silt; contains medium and fine sand and limestone gravel.....	7	8
Gravel, limestone, medium to coarse; contains pebbles and light-brown silt	1	9
Silt, sandy, light-brown, and medium limestone gravel.....	3	12

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-20-25cc2. (0.1 mile north of SW corner sec. 25 and 25 feet east of center of north-south road.) Surface altitude, 2,067.9 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, gray.....	1	1
Silt, slightly sandy, loose, gray to brown.....	5	6
Sand, medium, and hard brown silt.....	8	14
Gravel, fine, limestone and igneous...	4	18

14-20-31aa. (0.24 mile south of NE corner of sec. 31.) Surface altitude, 2,083.0 feet.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	2	2
Clay, silty, calcareous, gray.....	2	4
Silt, slightly clayey, calcareous, dark brown.....	12	16
Sand, medium to coarse; contains some subrounded, fine gravel.....	12.5	28.5

14-20-31cc. (300 feet north of SW corner sec. 31.) Surface altitude, 2,018.1 feet. Water level, 8.2 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1	1
Clay, silty, soft, calcareous, light-gray.....	7	8
Sand, medium to coarse; contains some gravel.....	10	18

14-20-32ad. (0.51 mile north of SE corner sec. 32 and 28 feet west of center of north-south road.) Surface altitude, 2,079.2 feet.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1	1
Silt, clayey, blocky, calcareous, dark-brown.....	10.5	11.5
Sand, medium to coarse; contains some limestone pebbles and clay.....	11.5	23

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-20-32bb. (30 feet south of center of east-west road.)
Surface altitude, 2,089.0 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1	1
Clay, silty, calcareous, dark-brown....	1	2
Silt, clayey, calcareous, brown.....	3.5	5.5
Sand, very fine, silty.....	2.5	8
Silt, sandy, calcareous, dark-gray.....	5	13
Gravel, medium, angular, limestone.....	4	17
Gravel, fine, limestone; contains fine sand.....	3	20

14-20-32dd. (20 feet north of center of east-west road.)
Surface altitude, 2,056.4 feet. Water level 22.30 feet below land
surface.

QUATERNARY--Pleistocene		
Silt, sandy, calcareous, dark-gray.....	1	1
Clay, sandy, calcareous, dark-gray.....	4	5
Sand, coarse.....	1	6
Sand, fine.....	2	8
Sand, very coarse, and gravel.....	7	15

14-20-34bb. (1.24 miles south of NW corner sec. 34 and 20 feet
east of center of north-south road.) Surface altitude, 2,089.9 feet.
Water-level, 15.66 feet below land surface.

QUATERNARY--Pleistocene		
Silt, gray.....	0.5	0.5
Silt, clayey, calcareous, tan.....	1.5	2
Silt, loose, calcareous, brown.....	4	6
Silt, loose, sandy, tan.....	6	12
Sand, fine to very fine, silty, well- sorted.....	5	17
Caliche, hard, white.....	.1	17.1
Sand, fine, very silty, tan.....	5.4	22.5

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-20-34bc. (0.51 mile north of SW corner sec. 34 and 20 feet east of center of north-south road.) Surface altitude, 2,079.7 feet. Water-level, 13.94 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, gray.....	0.5	0.5
Silt, loose, calcareous, brown.....	2.5	3
Silt, powdery, calcareous, tan.....	2	5
Silt, loose, clayey, noncalcareous, brown.....	7	12
Silt, clayey, calcareous, light-brown..	4	16
Silt, sandy, calcareous, dark-brown; contains medium sand.....	5	21
Sand, fine to medium, silty, igneous...	6	27

14-20-35bb. (0.1 mile south of NW corner of sec. 35 and 18 feet east of center of north-south road.) Surface altitude, 2,084.1 feet.

QUATERNARY--Pleistocene		
Silt, gray.....	1	1
Silt, hard, tight, slightly sandy, gray.....	1	2
Silt, clayey, slightly sandy, tan.....	1	3
Clay, noncalcareous, white.....	1	4
Sand, coarse, igneous, and clay, silty, calcareous, light-brown.....	2.5	6.5
Silt, clayey, noncalcareous, rust; contains calcium carbonate nodules...	1	7.5
CRETACEOUS--Gulfian		
Carlile shale		
Shale, clayey, noncalcareous, olive-green.....	....	7.5+

14-20-35bc. (0.51 mile north of SW corner of sec. 35 and 18 feet east of center of north-south road.) Surface altitude, 2,071.9 feet. Water level, 9.05 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-gray.....	1	1
Silt, compact, clayey, gray.....	1	2
Silt, powdery, calcareous, tan.....	12	14
Silt, clayey; contains caliche nodules	1.5	15.5
Sand, medium, very silty.....	1.5	17
Gravel, fine, silty, limestone, igneous	1.8	18.8

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-20-35cc. (21 feet east of center of north-south road.) Surface altitude, 2,054.0 feet. Water level, 11.39 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, compact, calcareous, tan.....	2	3
Silt, loose, clayey, gray.....	1	4
Silt, blocky, sandy, brown; contains clayey zones.....	14	18
Sand, coarse, well sorted; contains fine gravel.....	7.4	25.4

14-20-36dda. (0.24 mile north of SE corner of sec. 36 and 20 feet west of center of north-south road.) Surface altitude, 2,072.9 feet. Water level, 16.26 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-brown.....	2	2
Silt, blocky, sandy, gray.....	6	8
Silt, hard, sandy, clayey, light-tan...	7	15
Silt, soft, clayey, light-tan.....	2	17
Silt, hard, clayey, tan.....	7.5	24.5
CRETACEOUS--Gulfian		
Carlile shale		
Shale, clayey, noncalcareous, gray- green.....	....	24.5+

14-21-25cc. (25 feet north of center of east-west road.) Surface altitude, 2,073.4 feet. Water level, 12.90 feet below land surface.

QUATERNARY--Pleistocene		
Silt, clayey, sandy, calcareous, dark- brown.....	6	6
Sand, medium.....	5	11
Sand and gravel.....	5	16

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-21-25dd. (25 feet north of center of east-west road.)
Surface altitude, 2,106.2 feet. Water level, 12.20 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, tan.....	1	1
Silt, calcareous, dark-gray.....	8	9
Silt, blocky, clayey, calcareous, dark-brown.....	18	27

14-21-26da. (In fence line 0.4 mile north of SE corner of sec. 26.) Surface altitude, 2,100.6 feet.

QUATERNARY--Pleistocene		
Silt, black.....	2	2
Silt, loose, dark-gray.....	3	5
Silt, hard, blocky, dark-brown.....	2	7
Silt, loose, clayey, sandy, tan.....	12	19

14-21-27dd. (0.24 mile north of SE corner of sec. 27 and 18 feet west of center of north-south road.) Surface altitude, 2,099.5 feet. Water level, 27.30 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, light-gray.....	3	3
Clay, calcareous, light-tan; contains coarse sand.....	14	17
Sand, coarse to very coarse; contains poorly sorted gravel.....	13	30

14-21-28cb. (0.45 mile north of SW corner of sec. 28 and 35 feet east of center of north-south road.) Surface altitude, 2,118.4 feet.

QUATERNARY--Pleistocene		
Silt, calcareous, light-gray.....	1	1
Clay, sandy, calcareous, brown.....	8	9
Sand, fine to very coarse, poorly sorted; contains limestone gravel...	18.1	27.1

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-21-28cc. (0.2 mile north of SW corner of sec. 28 and 33 feet east of center of north-south road.) Surface altitude, 2,096.7 feet. Water level, 12.50 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, tan.....	1	1
Clay, sandy, calcareous, tan to gray..	6	7
Sand, very coarse, and gravel.....	12	19

14-21-30cd. Surface altitude, 2,065.4 feet. Water level 13.08 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-brown.....	1	1
Sand, silty, tan.....	15	16
CRETACEOUS--Gulfian		
Carlile shale		
Shale, blue.....	....	16+

14-21-30da. (0.25 mile north of SE corner of sec. 30.) Surface altitude 2,122.7 feet.

QUATERNARY--Pleistocene		
Silt, black.....	3	3
Silt, sandy, tan.....	5	8
Sand, coarse to very coarse; contains pebbles.....	13	21

14-21-30dd. Surface altitude, 2,112.9 feet.

QUATERNARY--Pleistocene		
Silt, black; contains very coarse sand	3	3
Sand, very coarse; contains gravel....	7	10
(No sample).....	.5	10.5
Sand, medium.....	1.5	12
Sand, very coarse; contains gravel....	2	14

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-21-32ad. (27 feet west of center of north-south road and 40 feet north of bridge.) Surface altitude, 2,049.1 feet. Water level, 6.50 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, light-tan.....	2	2
Sand, very coarse, clayey.....	.5	2.5
Clay, sandy, calcareous, dark-gray; contains coarse gravel.....	4.5	7
Sand, very coarse, and fine gravel....	9	16
Clay, soft, sandy, calcareous, blue- gray.....	5	21
CRETACEOUS--Gulfian		
Carlile shale		
Shale, calcareous, black to dark-gray..	....	21+

14-21-33bb. (0.15 mile south of NW corner sec. 33 and 25 feet east of center of north-south road.) Surface altitude, 2,057.7 feet. Water level, 7.90 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, tan.....	1	1
Clay, slightly sandy, calcareous, dark- gray.....	4	5
Clay, sandy, calcareous, tan.....	18	23
Sand, very coarse.....	5	28
CRETACEOUS--Gulfian		
Carlile shale		
Shale, weathered, clayey, calcareous, dark-gray to black.....	.6	28.6

14-21-35cb. (0.65 mile south of NW corner of sec. 35 and 25 feet east of center of north-south road.) Surface altitude, 2,047.4 feet.

QUATERNARY--Pleistocene		
Silt and very coarse sand.....	1	1
Sand, very coarse, poorly sorted.....	5	6
CRETACEOUS--Gulfian		
Carlile shale		
Shale, clayey, calcareous, dark-gray to tan.....	5	11

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-21-35cc. (0.2 mile north of bridge and 15 feet east of center of north-south road.) Surface altitude, 2,033.7 feet. Water level, 12.20 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, very sandy, calcareous.....	3	3
Clay, very sandy, calcareous, tan.....	7	10
Sand, medium to coarse, well sorted...	2	12
Sand, very coarse; contains limestone pebbles.....	8	20

14-21-36bc. (0.5 mile south of NW corner of sec. 36 and 21 feet east of center of north-south road.) Surface altitude, 2,073.8 feet.

QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, clayey, calcareous, gray.....	2	3
Silt, very sandy, gray.....	2	5
Sand, coarse to very coarse; contains poorly sorted gravel.....	15	20

14-22-25dal. Surface altitude, 2,103.3 feet. Water level 6.90 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-brown, and coarse sand.....	0.5	0.5
Sand, very coarse, and gravel.....	7.6	8.1

14-22-25da2. Surface altitude, 2,098.9 feet. Water level, 5.25 feet below land surface.

QUATERNARY--Pleistocene		
Silt and very coarse sand.....	1	1
Sand, very coarse, and coarse gravel..	6.1	7.1

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

14-22-36ada. Surface altitude, 2,069.2 feet. Water level, 6.95 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, dark-brown.....	1	1
Silt, very sandy; contains gravel.....	4	5
Clay, calcareous, light-brown; contains very coarse sand.....	7	12
Sand, coarse, quartz, and limestone pebbles.....	4	16
Sand, very coarse, subrounded; contains fine gravel.....	8.4	24.4

14-22-36da. Surface altitude, 2,068.3 feet. Water level, 6.50 feet below land surface.

QUATERNARY--Pleistocene		
Sand, fine, and silt.....	3	3
Sand, very coarse.....	9	12
Gravel; contains sand and limestone pebbles.....	2	14
Sand, very coarse; contains gravel....	3.4	17.4

14-22-36dd. Surface altitude, 2,063.4 feet. Water level 3.85 feet below land surface.

QUATERNARY--Pleistocene		
Silt, sandy, brown.....	0.5	0.5
Sand, very coarse.....	4.5	5
Gravel, very coarse; contains quartz and limestone pebbles up to 1 inch in diameter.....	5	10
Sand and gravel.....	1.6	11.6

15-18-7bb. (25 feet east of center of north-south road and 40 feet south of center of intersection.) Surface altitude, 2,065.7 feet. Water level, 6.80 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-brown.....	1	1
Clay, sandy, gray.....	4	5
Clay, very sandy, tan.....	5	10
CRETACEOUS--Gulfian		
Carlile shale		
Shale, weathered, buff to blue.....	2	12

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-18-7cc. (15 feet north of center of east-west road.)
Surface altitude, 2,069.9 feet. Water level, 7.55 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, brown.....	1	1
Silt, sandy, tan; contains quartz gravel.....	5	6
Gravel, subrounded, quartz, chert.....	.5	6.5
Clay, sandy, buff to tan.....	2	8.5
CRETACEOUS--Gulfian		
Carlile shale		
Shale, clayey, light-gray.....	.5	9

15-18-18cc. (30 feet east of center of north-south road.)
Surface altitude, 2,014.8 feet. Water level, 11.5 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-brown.....	2	2
Sand and gravel; contains clay.....	2.5	4.5
Clay, calcareous, light-tan; contains coarse sand.....	4.5	9
Sand, very coarse, and gravel.....	1	10
Sand, very coarse, clayey; contains fibroid calcium carbonate nodules and weathered limestone.....	2.6	12.6

15-19-2cc. (0.1 mile east of SW corner of sec. 2 and 20 feet
north of center of east-west road.) Surface altitude, 2,041.2 feet.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1.5	1.5
Clay, slightly sandy, calcareous, tan..	7.5	9
Clay, calcareous, tan to buff; contains very coarse sand.....	3	12
Sand, very coarse to fine, frosted quartz.....	2	14
Clay, sandy zones, calcareous, yellow to tan.....	7	21
CRETACEOUS--Gulfian		
Carlile shale		
Shale, calcareous, buff.....	....	21+

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-4cbb. (0.5 mile south of NW corner of sec. 4 and 25 feet east of center of north-south road.) Surface altitude, 2,054.3 feet. Water level, 6.90 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, dark-gray.....	1	1
Silt, soft, clayey, sandy, tan.....	5	6
Silt, blocky, dark-brown; contains coarse sand.....	5	11
Silt, soft, clayey, sandy, tan.....	1	12
Silt, hard, blocky, very sandy, brown.	4	16
Sand, very coarse, well sorted, yellow	5	21

15-19-4da. (0.5 mile north of SE corner of sec. 4 and 25 feet west of center of north-south road.) Surface altitude, 2,064.1 feet. Water level, 7.94 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-brown.....	2	2
Clay, silty, calcareous, tan; contains fine sand.....	7	9
Silt, hard, blocky, sandy, brown.....	1	10
Silt, hard, clayey, calcareous, buff..	2	12
CRETACEOUS--Gulfian		
Carlile shale		
Shale, plastic, noncalcareous, blue- green.....	1	13

15-19-5cbb. (0.5 mile south of NW corner of sec. 5 and 19 feet east of center of north-south road.) Surface altitude, 2,041.5 feet. Water level, 31.10 feet below land surface.

QUATERNARY--Pleistocene		
Silt, dark-gray.....	1	1
Silt, loose, clayey, dark-gray.....	2	3
Silt, soft, plastic, clayey, sandy, tan.....	3	6
Clay, silty, tan; contains coarse sand and limestone pebbles.....	1	7
Silt, blocky, clayey, sandy, dark- brown to tan; contains limestone fragments.....	26	33
Sand, fine to medium, silty.....	1.8	34.8

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-7ad. (0.5 mile south of NE corner of sec. 7 and 1.5 feet west of fence intersection.) Surface altitude, 2,003.8 feet. Water level, 10.80 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, sandy.....	1	1
Sand, medium to fine, igneous.....	2	3
Sand, very coarse, and fine gravel....	14.5	17.5

15-19-7bc. (0.45 mile south of NW corner sec. 7 and 0.8 foot from from wooden fence post on east side of road.) Surface altitude, 2,029.1 feet. Water level, 9.65 feet below land surface.

QUATERNARY--Pleistocene		
Silt, hard, sandy, tan.....	1	1
Silt, loose, sandy, buff.....	2	3
Silt, sandy, dark-brown, and coarse sand.....	4	7
Sand, fine to coarse, poorly sorted, and gravel.....	15.2	22.2

15-19-7dd. (In fence corner.) Surface altitude, 2,018.8 feet.

QUATERNARY--Pleistocene		
Silt, sandy.....	1	1
Sand, medium to fine, silty, igneous..	3	4
Sand, medium to very coarse, igneous;. contains fine gravel.....	18.9	22.9

15-19-8bbb. (20 feet south of center of east-west road.) Surface altitude, 2,020.7 feet. Water level, 21.80 feet below land surface.

QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, clayey, calcareous, tan.....	4	5
Silt, clayey, sandy, tan.....	1	6
Sand, medium to very coarse; contains poorly sorted fine gravel.....	16	22

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-9bbb. Surface altitude, 2,045.1 feet. Water level, 26.30 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, dark-gray.....	1	1
Silt, soft, clayey, calcareous, light-tan.....	5	6
Silt, hard, sandy, dark-brown.....	3	9
Sand, fine to very fine, silty.....	9	18
Silt, loose, very sandy, calcareous, tan, and fine sand.....	16.8	34.8

15-19-9cbb. (0.5 mile south of NW corner of sec. 9 and 25 feet east of center of north-south road.) Surface altitude, 2,027.2 feet.

QUATERNARY--Pleistocene		
Silt, black.....	2	2
Silt, soft, clayey, light-tan.....	2	4
Silt, hard, calcareous, brown.....	5	9
Silt, loose, very sandy, tan.....	9	18
Sand, fine, silty.....	14.6	32.6

15-19-10ab. (0.25 mile west of NE corner of sec. 10 and 20 feet south of center of east-west road.) Surface altitude, 2,044.3 feet. Water level, 7.40 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1	1
Clay, sandy, calcareous, dark-gray....	3	4
Clay, slightly calcareous, tan.....	8	12
Clay, hard, sandy, calcareous, tan; contains limestone fragments.....	3	15
Silt, clayey, sandy.....	11.7	26.7

15-19-10add. (0.5 mile south of NE corner of sec. 10.) Surface altitude, 2,021.1 feet. Water level, 13.85 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	2	2
Clay, calcareous, dark-gray.....	2	4
Silt, sandy, noncalcareous, black.....	4	8
Clay, calcareous, brown; contains limestone fragments.....	6	14
Sand, fine to medium, clayey.....	2	16

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-10bbb. (10 feet south of center of east-west road.)
Surface altitude, 2,043.1 feet. Water level, 5.80 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, dark-gray.....	1	1
Silt, hard, sandy, calcareous, brown..	10	11
Sand, very coarse, silty.....	6	17
Silt, clayey, sandy, brown.....	3	20
Sand, medium to coarse; contains fine gravel.....	3	23
CRETACEOUS--Gulfian		
Carlile shale		
Shale, noncalcareous, gray-green.....	....	23+

15-19-10cbb. (0.5 mile south of NW corner sec. 10, 1 foot
south and 25 feet east of stone corner post.) Surface altitude, 2,032.4
feet. Water level, 21.95 feet below land surface.

QUATERNARY--Pleistocene		
Silt, black.....	3	3
Silt, blocky, slightly sandy, gray; black-stained joints.....	3	6
Silt, tough, sandy, gray.....	21	27
Sand, fine to medium, well sorted, yellowish.....	6	33

15-19-11da. (Test hole)

QUATERNARY--Pleistocene		
Silt, clayey, dark-brown.....	3	3
Clay, calcareous, gray-brown.....	2	5
Clay, plastic, calcareous, yellow- brown.....	7	12

15-19-13cbc. (0.25 mile north of SW corner sec. 13 and 15
feet east of center of north-south road.) Surface altitude, 2,004.0
feet.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	4	4
Clay, light-tan; contains coarse sand.	10	14
Sand, medium to coarse.....	16.5	30.5

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-14aab. (0.25 mile west of NE corner of sec. 14 and 15 feet south of center of east-west road.) Surface altitude, 2,017.8 feet. Water level, 4.35 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, gray to black.....	1	1
Clay, calcareous, light-gray.....	6	7
Sand, fine, clayey.....	1	8
Clay, sandy, calcareous, yellow.....	1	9
CRETACEOUS--Gulfian		
Carlile shale		
Shale, weathered, clayey, calcareous..	....	9+

15-19-15aaa. (17 feet south of center of east-west road.) Surface altitude, 2,007.5 feet.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-brown.....	1	1
Clay, silty, calcareous, light-gray to tan.....	3	4
Clay, sandy, calcareous.....	1.5	5.5
Sand, coarse to very coarse, clayey; contains limestone pebbles as much as one-fourth inch in diameter.....	4.5	10
Clay, sandy, calcareous, tan.....	11	21
Clay, sandy, and coarse to very coarse sand.....	4.8	25.8

15-19-15add. (0.5 mile north of SE corner of sec. 15 and 15 feet west of center of north-south road.) Surface altitude, 2,002.1 feet. Water level, 12.61 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1	1
Clay, calcareous, light-gray; contains fine sand.....	5	6
Sand, medium, clayey.....	1	7
Clay, calcareous, light-gray; contains medium to coarse sand.....	7	14
Sand, coarse to very coarse, well sorted, clayey.....	11	25

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-15bc. (0.5 mile south of NW corner of sec. 15 and 25 feet east of center of north-south road.) Surface altitude, 2,001.2 feet. Water level, 23.40 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1.5	1.5
Clay, soft, calcareous, light-gray.....	5	6.5
Clay, sandy, calcareous, gray.....	.5	7
Sand, medium, well sorted, igneous.....	17.8	24.8

15-19-16aaa. (20 feet south of east-west road.) Surface altitude, 2,023.1 feet.

QUATERNARY--Pleistocene		
Clay, loose, silty, calcareous, black..	2	2
Clay, loose, calcareous, light-gray....	5.5	7.5
Silt, clayey, calcareous, dark-brown...	16.5	24
Silt, sandy, calcareous, light-brown...	2	26
Sand, medium, well sorted; contains clay fragments.....	6	32

15-19-16cb. (0.5 mile south of NW corner of sec. 16 and 25 feet east of center of north-south road.) Surface altitude, 2,008.8 feet. Water level, 27.70 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	1	1
Clay, silty, calcareous, dark-gray.....	3	4
Silt, clayey, calcareous, tan.....	6	10
Sand, medium to coarse, subrounded.....	21	31

15-19-16dd. (20 feet north of center of east-west road.) Surface altitude, 1,997.4 feet.

QUATERNARY--Pleistocene		
Silt, clayey, sandy, calcareous, dark- brown.....	7	7
Sand.....	11.8	18.8

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-18daa. (0.5 mile north of SW corner of sec. 18.) Surface altitude, 1,975.8 feet. Water level, 8.68 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Sand, very fine, silty.....	8	8
Sand, medium.....	7	15
Sand, coarse to very coarse; contains fine gravel and clay.....	6	21

15-19-21ad. (0.5 mile south of NE corner of sec. 21.) Surface altitude, 1,978.2 feet.

QUATERNARY--Pleistocene		
Silt, calcareous, black to dark-gray; grades to very sandy silt.....	5	5
Sand, coarse.....	.5	5.5
CRETACEOUS--Gulfian		
Greenhorn limestone		
Limestone, light-tan.....	.2	5.7
Clay, calcareous, white.....	.4	6.1
Limestone, dense, white to buff.....	....	6.1+

15-19-22add. (0.5 mile south of NE corner of sec. 22 and 15 feet west of center of north-south road.) Surface altitude, 1,982.4 feet. Water level, 16.08 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	3	3
Clay, calcareous, light-gray.....	7	10
Clay, calcareous, blue-gray; contains very fine sand.....	4	14
Sand, medium to coarse, rounded, well sorted.....	4.7	18.7

15-19-22dd. (0.25 mile north of SE corner of sec. 22 and 15 feet west of center of north-south road.) Surface altitude, 1,965.5 feet. Water level, 16.25 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	4	4
Clay, sandy, calcareous, light-gray...	14	18
Sand, medium to fine.....	3	21

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-24bcc. (0.5 mile south of NW corner of sec. 24 and 15 feet east of center of north-south road.) Surface altitude, 1,969.1 feet. Water level, 9.05 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, dark-gray.....	3	3
Clay, calcareous, gray; contains coarse sand.....	9	12
Gravel, fine, well sorted, and coarse sand.....	3.2	15.2

15-19-24cd. (0.5 mile west of SE corner of sec. 24 and 20 feet north of center of east-west road.) Surface altitude, 1,975.8 feet. Water level, 22.4 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-brown.....	1	1
Clay, sandy, calcareous, dark-brown....	4	5
Sand, fine.....	2	7
Sand, medium to fine.....	7	14
Gravel, coarse.....	1	15
Sand, coarse.....	1	16
Sand, coarse, and gravel.....	3	19
Gravel, pebbles up to 3/4 inch in diameter.....	2	21
Gravel, very coarse.....	3.5	24.5
Sand and gravel, coarse, clayey, limestone.....	1.5	26
Sand, very coarse, limestone fragments.	2.4	28.4
CRETACEOUS--Gulfian		
Greenhorn limestone		
Limestone, hard, chalky, white to gray.	....	28.4+

15-19-25aa. (20 feet south of center of east-west road.) Surface altitude 1,967.7 feet. Water level, 16.2 feet below land surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-brown.....	1.5	1.5
Sand and gravel; clayey, calcareous, light-tan.....	3.5	5
Sand and gravel, medium; contains limestone fragments.....	1	6
Sand, very coarse, subrounded, quartz, calcareous.....	1	7
Sand and gravel, medium, subrounded, quartz.....	10	17
Sand, fine.....	1.5	18.5

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-19-25bb. Surface altitude, 1,975.8 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, light-gray.....	3	3
Sand, medium to coarse, well sorted, silty.....	10.5	13.5
CRETACEOUS--Gulfian		
Greenhorn limestone		
Shale, gray to buff.....	....	13.5+

15-20-1bbb. (30 feet south of center of east-west road.)
Surface altitude, 2,034.4 feet. Water level, 22.10 feet below land
surface.

QUATERNARY--Pleistocene		
Silt, calcareous, dark-brown.....	2	2
Silt, clayey, calcareous, light-brown.	3	5
Silt, calcareous, light-brown; con- tains medium sand and limestone gravel.....	14	19
Sand, medium to coarse, well sorted, igneous.....	5	24

15-20-1daa. (0.5 mile south of NE corner of sec. 1 and 25
feet west of center of north-south road; 1 foot southwest of stone
fence post.) Surface altitude, 2,044.6 feet.

QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, hard, sandy, brown.....	1	2
Silt, soft, sandy and clayey, calcare- ous, tan.....	8	10
Silt, loose, clayey, calcareous, brown	10	20
Silt, sandy, noncalcareous, dark-gray.	4	24
Sand, medium, well sorted; contains gravel.....	7.9	31.9

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-20-2bc. (0.5 mile south of NW corner of sec. 2 and 1 foot northwest of stone corner post.) Surface altitude, 2,057.9 feet. Water level, 8.74 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, sandy, dark-brown.....	2	3
Silt, plastic, clayey, gray.....	2	5
Silt, loose, sandy, light-brown; contains black organic material.....	10	15
Sand, fine to medium, well sorted, igneous, silty.....	3	18
Sand, very coarse; contains fine gravel.....	7.2	25.2

15-20-2da. (0.5 mile south of NE corner of sec. 2 and 15 feet west of center of north-south road.) Surface altitude, 2,015.7 feet. Water level, 9.49 feet below land surface.

QUATERNARY--Pleistocene		
Silt, sandy, dark-gray.....	1	1
Silt, loose, sandy, gray.....	4	5
Sand, medium to very coarse, poorly sorted; contains medium limestone gravel near top.....	7.5	12.5

15-20-4aa. (27 feet south of center of east-west road.) Surface altitude, 2,054.0 feet. Water level, 7.12 feet below land surface.

QUATERNARY--Pleistocene		
Silt, sandy, black.....	1	1
Silt, soft, clayey, sandy, gray.....	2	3
Silt, soft, sandy, tan.....	2	5
Sand, medium to coarse, silty.....	1	6
Silt, loose, sandy, tan.....	6	12
Sand, coarse to very coarse; contains some gravel.....	4.5	16.5
Silt, clayey, gray; contains coarse gravel.....	11.5	28
Gravel, medium, and silt.....	.5	28.5

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-20-4cc1. (108 feet north of north end of bridge and 45 feet east of center of north-south road.) Surface altitude, 2,004.5 feet. Water level, 8.30 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, sandy, clayey, dark-gray.....	3	3
Sand, medium to very coarse; contains gravel.....	17	20

15-20-4cc2. (0.25 mile north of SW corner of sec. 4 and 33 feet east of center of north-south road.) Surface altitude, 2,024.8 feet. Water level, 23.90 feet below land surface.

QUATERNARY--Pleistocene		
Silt, sandy, clayey, calcareous, dark- gray.....	26	26
Sand, coarse to very coarse.....	4	30

15-20-4da. (0.5 mile south of NE corner of sec. 4.) Surface altitude, 2,040.7 feet. Water level, 18.90 feet below land surface.

QUATERNARY--Pleistocene		
Silt, black.....	1	1
Silt, sandy, dark-gray.....	2	3
Silt, plastic, clayey, sandy, light- gray.....	3	6
Silt, loose, blocky, brown.....	10	16
Sand, medium to coarse; contains fine gravel.....	7	23

15-20-5ad. (0.5 mile south of NE corner of sec. 5 and 30 feet west of center of north-south road.) Surface altitude, 2,053.5 feet.

QUATERNARY--Pleistocene		
Silt, sandy, calcareous, dark-gray....	1	1
Sand, very fine, silty.....	6.5	7.5
Sand, coarse to very coarse; contains fine gravel.....	7.5	15
Sand, fine.....	1	16
Sand, very coarse.....	14	30

Table 15.--Logs of jetted observation wells in the Cedar Bluff unit--
Continued

15-20-9aaa. (10 feet south of section corner.) Surface altitude, 2,014.6 feet. Water level, 5.30 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Silt, calcareous, dark-brown.....	2	2
Clay, soft, sandy, calcareous, light-gray.....	2	4
Clay, brown; contains very coarse sand and gravel.....	1	5
Sand, very coarse; contains poorly sorted gravel.....	4	9
Sand, medium, clayey.....	1	10
Sand, medium, very clayey.....	5	15
Sand, fine; contains gray silty clay..	10	25

15-20-11ad. (0.5 mile south of NE corner of sec. 11.) Surface altitude, 2,001.5 feet. Water level, 11.13 feet below land surface.

QUATERNARY--Pleistocene		
Silt, very sandy, tan.....	1	1
Sand, very fine to coarse, poorly sorted, silty.....	6	7
Silt, plastic, sandy, clayey, tan.....	10	17

15-20-12bb. (15 feet south of center of east-west road and 33 feet east of center of road intersection.) Surface altitude, 2,043.3 feet.

QUATERNARY--Pleistocene		
Silt, compact, gray.....	1	1
Silt, loose, sandy, clayey, brown; contains caliche.....	9	10
Sand, medium to coarse; contains gravel.....	23.6	33.6

15-22-lab. (100 feet east of road intersection and 15 feet south of center of east-west road.) Surface altitude, 2,068.6 feet. Water level, 8.30 feet below land surface.

QUATERNARY--Pleistocene		
Silt, clayey, dark-brown.....	9	9
Sand, medium to coarse.....	6	15
CRETACEOUS--Gulfian		
Carlile shale		
Shale, blue.....	....	15+

Periodic measurements of the water level in 11 wells have been made as a continuation of the observation-well program in the Glen Elder unit; this program is in cooperation with the Bureau of Reclamation. The highest and lowest water levels for the period of record are given in table 16; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 17; and the water-level measurements made in 1950 are given in table 18. Hydrographs of five wells are shown in figure 8.

Table 16.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 11 wells in the Glen Elder unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
6-8-34cc	3	a 16.65	July 29, 1947	18.59	Feb. 7, 1950
6-9-27ab	15	22.13	Sept. 20, 1950	31.10	May 11, 1935
-30da	4	23.93	Nov. 15, 1950	29.30	Nov. 29, 1948
7-6-30bc	4	23.50	Nov. 15, 1950	30.40	Feb. 7, 1950
-34cb	4	22.18	June 29, 1949	32.19	Nov. 29, 1943
7-7-7aa	4	26.14	Sept. 20, 1950	30.35	Apr. 21, 1949
-15dc	4	16.80	Sept. 20, 1950	22.90	May 27, 1948
7-8-5cb	4	22.02	Sept. 20, 1950	29.18	Nov. 29, 1948
7-9-2bc	4	25.00	Sept. 20, 1950	33.10	June 6, 1950
7-10-10cc	4	24.52	Sept. 21, 1950	26.84	Oct. 14, 1946
8-6-12dd	4	30.57	Sept. 20, 1950	34.13	Sept. 29, 1947

a Well pumping.

Table 17.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 11 wells in the Glen Elder unit.

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
6-8-34cc	1.94	+1.42	+0.35
6-9-27ab	8.97	-2.79	-.38
-30da	5.37	+3.68	+3.13
7-6-30bc	6.90	+6.90	+5.05
-34cb	10.01	+4.09	+.49
7-7-7aa	4.21	+2.83	+2.83
-15dc	6.10	+4.09	+3.85
7-8-5cb	7.16	+3.02	+1.16
7-9-2bc	8.10	+4.10	+2.67
7-10-10cc	2.32	+1.66	+1.91
8-6-12dd	3.56	+.12	-.08

Table 18.--Water-level measurements, in feet below land-surface datum, in the Glen Elder unit, 1950

6-8-34cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 7	18.59	Apr. 12	17.73	Sept. 20	17.36
Mar. 8	17.98	June 3	17.30	Nov. 15	17.17

6-9-27ab.

Date	Water level	Date	Water level	Date	Water level
Feb. 7	15.13	Apr. 12	14.67	Sept. 20	18.73
Mar. 8	14.65	June 6	16.36	Nov. 15	17.92

6-9-30da.

Date	Water level	Date	Water level	Date	Water level
Feb. 7	27.61	Apr. 12	28.13	Sept. 21	23.96
Mar. 8	26.79	June 3	27.00	Nov. 15	23.93

7-6-30bc.

Date	Water level	Date	Water level	Date	Water level
Feb. 7	30.40	Apr. 12	29.27	Sept. 20	24.40
Mar. 8	28.39	June 3	30.22	Nov. 15	23.50

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Table 18.--Water-level measurements, in feet below land-surface datum, in the Glen Elder unit, 1950--Continued

7-6-34cb.

Date	Water level	Date	Water level	Date	Water level
Feb. 7	27.95	Apr. 12	28.38	Sept. 20	22.55
Mar. 8	27.78	June 3	27.15	Nov. 15	23.86

7-7-7aa.

Feb. 7	29.10	Apr. 12	29.39	Sept. 20	26.14
Mar. 8	29.45	June 3	28.70	Nov. 15	26.27

7-7-15dc.

Feb. 7	21.50	Apr. 12	21.90	Sept. 20	16.80
Mar. 8	21.97	June 3	20.95	Nov. 15	17.41

7-8-5cb.

Feb. 7	26.90	Apr. 12	28.78	Sept. 20	22.02
Mar. 8	28.58	June 3	25.10	Nov. 15	23.88

7-9-2bc.

Feb. 7	29.78	Apr. 12	30.40	Sept. 20	25.00
Mar. 8	30.27	June 3	33.10	Nov. 15	25.68

7-10-10cc.

Mar. 8	26.59	June 3	25.05	Nov. 15	24.93
Apr. 12	26.30	Sept. 21	24.52		

8-6-12dd.

Feb. 7	32.10	Apr. 12	32.47	Sept. 20	30.57
Mar. 8	32.19	June 3	32.00	Nov. 15	31.98

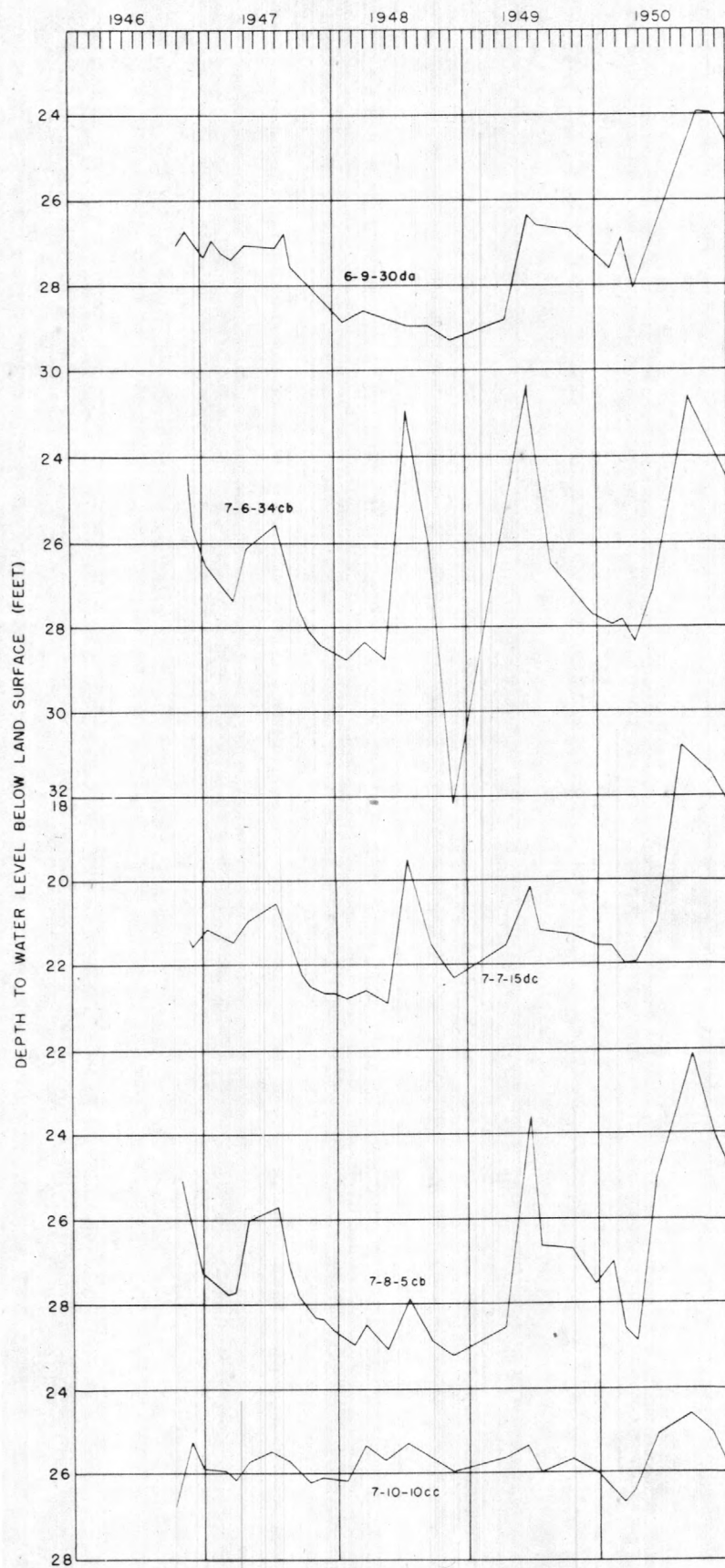


Figure 8.—Hydrographs of five wells, Glen Elder unit

An observation-well program was begun in the Kanopolis unit in the spring of 1946. Periodic measurements of the water level in the 15 drive-point observation wells were continued through 1950. The highest and lowest water levels for the period of record are given in table 19; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 20; and the water-level measurements made in 1950 are given in table 21.

During the fall of 1950, 36 jetted observation wells were constructed and 32 additional wells were inventoried. The location of these wells is shown in figure 9, and data pertaining to these wells are given in table 22. Hydrographs of five wells are shown in figure 10.

Table 19.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 15 wells in the Kanopolis unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
15-2-17cd	5	20.89	{Nov. 20, 1950 Nov. 18, 1950	25.44	Jan. 6, 1948
-18cd	5	20.96	Nov. 20, 1950	25.50	Jan. 6, 1948
-30dc	5	19.06	July 1, 1949	22.42	Sept. 5, 1946
15-3-24dd	5	17.49	Aug. 6, 1948	20.64	Jan. 6, 1948
-36ab	5	19.44	Nov. 20, 1950	27.35	Jan. 6, 1948
16-2-7bb	5	18.30	Aug. 6, 1948	22.08	Aug. 1, 1946
-18cc	5	20.31	Sept. 19, 1950	26.52	{Dec. 1, 1947 Jan. 6, 1948
-19ab	5	17.99	Sept. 19, 1950	24.67	Dec. 1, 1947
16-3-13cd	5	20.43	Nov. 20, 1950	24.38	Jan. 6, 1948
-26dc	5	16.32	Nov. 20, 1950	21.60	Jan. 6, 1948
-34dd	5	18.14	Nov. 20, 1950	23.15	Jan. 6, 1948
17-3-17dd	4.5	22.95	Nov. 20, 1950	28.18	Dec. 1, 1947
-18dd	4.5	23.33	Sept. 19, 1950	28.40	Jan. 6, 1948
-30dd	4.5	21.59	Nov. 20, 1950	31.36	Jan. 6, 1948
17-4-25dd	4.5	21.33	Sept. 19, 1950	25.80	Jan. 6, 1948

Table 20.--Difference between highest and lowest recorded water levels, net changes in water level in 1950, and net change in water level for period of record, in feet, in 15 wells in the Kanopolis unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
15-2-17cd	4.55	+3.06	+2.64
-18cd	4.54	+2.68	+2.21
-30dc	3.36	+1.88	+1.74
15-3-24dd	3.15	-.91	-.61
-36ab	7.91	+7.16	+5.86
16-2-7bb	3.78	+.90	+.93
-18cc	6.21	+3.74	+4.24
-19ab	6.68	+4.69	+5.24
16-3-13cd	3.95	+2.67	+.27
-26dc	5.28	+3.97	+4.28
-34dd	5.01	+3.47	+4.42
17-3-17dd	5.23	+2.01	+4.01
-18dd	5.07	+2.77	+3.43
-30dd	9.77	+8.26	+8.94
17-4-25dd	4.47	-2.06	-1.85

Table 21.--Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1950

15-2-17cd.

Date	Water level	Date	Water level	Date	Water level
Feb. 4	23.95	Apr. 11	24.53	Sept. 19	21.61
Mar. 6	24.20	May 31	24.10	Nov. 20	20.89

15-2-18cd.

Feb. 4	24.59	May 31	24.40	Nov. 18	20.96
Mar. 6	24.28	Sept. 19	21.86	20	20.96
Apr. 11	24.70	Oct. 16	21.33	Dec. 19	21.91

15-2-30dc.

Feb. 4	21.52	Apr. 11	21.35	Sept. 19	19.64
Mar. 6	21.80	May 31	21.90		

Table 21.--Water-level measurements, in feet below land-surface datum, in the Kanopolis unit, 1950--Continued

15-3-24dd.

Date	Water level	Date	Water level	Date	Water level
Feb. 4	18.60	Apr. 11	20.29	Sept. 19	19.95
Mar. 6	19.59	May 31	19.65	Nov. 20	19.51

15-3-36ab.

Feb. 4	26.60	Apr. 11	26.65	Sept. 19	26.02
Mar. 6	26.73	May 31	26.70	Nov. 20	19.44

16-2-7bb.

Feb. 4	20.17	Apr. 11	20.70	Sept. 19	18.67
Mar. 6	20.20	May 31	20.05	Nov. 20	19.27

16-2-18cc.

Feb. 4	25.30	Apr. 11	25.20	Sept. 19	20.31
Mar. 6	25.00	May 31	25.10	Nov. 20	21.56

16-2-19ab.

Feb. 4	23.35	Apr. 11	23.58	Nov. 20	18.66
Mar. 6	22.09	Sept. 19	17.99		

16-3-13cd.

Feb. 4	23.10	Apr. 11	23.35	Sept. 19	21.15
Mar. 6	22.90	May 31	22.95	Nov. 20	20.43

16-3-26dc.

Feb. 6	20.29	Apr. 11	20.65	Sept. 19	16.87
Mar. 6	20.43	May 31	20.55	Nov. 20	16.32

16-3-34dd.

Feb. 6	21.61	Apr. 11	21.15	Sept. 19	18.76
Mar. 6	22.01	May 31	22.00	Nov. 20	18.14

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Table 21.--Water-level measurements, in feet below land-surface datum,
in the Kanopolis unit, 1950--Continued

17-3-17dd.

Date	Water level	Date	Water level	Date	Water level
Feb. 4	24.96	Apr. 11	26.30	Sept. 19	23.17
Mar. 6	26.39	May 31	26.28	Nov. 20	22.95

17-3-18dd.

Feb. 4	26.78	Apr. 11	26.05	Sept. 19	23.33
Mar. 6	25.90	May 31	26.45	Nov. 20	24.01

17-3-30dd.

Feb. 4	29.85	Apr. 11	29.55	Sept. 19	26.61
Mar. 6	29.90	May 31	29.90	Nov. 20	21.59

17-4-25dd.

Feb. 4	24.09	Apr. 11	25.49	Nov. 20	26.15
Mar. 6	24.15	Sept. 19	21.33		

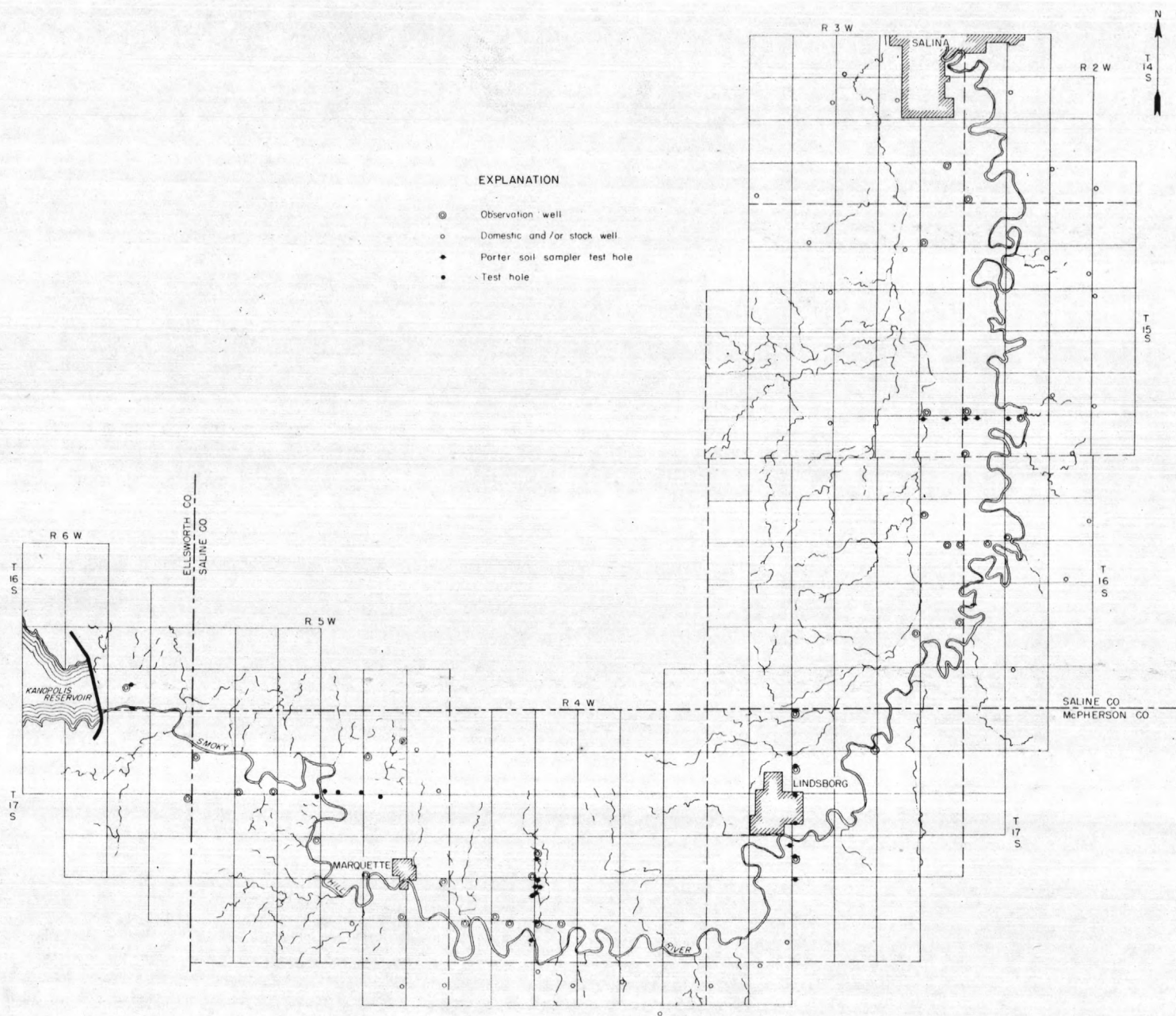


Figure 9—Map of the Kanopolis unit showing location of wells and test holes.

Table 22.--Record of wells in the Kanopolis unit, Kans.

Well number: Description of well-numbering system is given in text.
 Type of well: Dn, driven; Dr, drilled; Du, dug; J, jetted; Sp, spring.
 Type of casing: GI, galvanized iron; S, stone; Tn, tin; W, wood.
 Character of material: G, gravel; S, sand; Sh, shale; Si, silt; Ss, sandstone.
 Geologic source: A, alluvium; C, colluvium; K, Kiowa shale; M, Meade gravel; N, Ninnescah shale; Td, terrace deposits; W,

Wellington formation.
 Method of lift: B, bucket; Cy, cylinder; J, jet; N, none.
 Type of power: E, electric; H, hand; N, none; W, wind.
 Use of water: D, domestic; N, none; O, observation; S, stock.
 Measuring point: Bpu, base of pump; Tca, top of casing; Tcu, top of curb; Tlbc, top of lower board cover; Tpl, top of platform.

Well number	Owner or tenant	Type of well	Depth of well (feet)	Diameter of well (inches)	Type of casing	Character and geologic source of principal water-bearing material	Method of lift and type of power	Use of water	Measuring point		Depth to water level below measuring point (feet)	Date of measurement
									Description	Distance above land surface (feet)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

Ellsworth County

16-6-35bdd	U. S. Geol. Survey	J	26.6	3/4	GI	G,Td	N	O	Tca	1.0	21.40	10-10-50
17-6-13aa	.....do.....	J	26.6	3/4	GI	G,Td	N	O	Tca	2.7	19.04	12-12-50

McPherson County

17-3-3ddd	.....do.....	J	29.4	3/4	GI	Si,Td	N	O	Tca	1.3	10.72	11-18-50
17-3-4bbb	.....do.....	J	27.5	3/4	GI	Si,Td	N	O	Tca	3.5	22.40	10- 9-50

Table 22.--Record of wells in the Kanopolis unit, Kans.--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
McPherson County--Continued												
17-3-9bcc	U. S. Geol. Survey	J	30.0	3/4	GI	S,Td	N	0	Tca	1.0	9.99	10-11-50
-21cbb	.....do.....	J	30.0	3/4	GI	S,Td	N	0	Tca	1.6	10.65	10-11-50
-32daa	Raymond Johnson...	Du	40.5	42	S	Sh,W	Cy,N	N	Tpl	.2	13.30	11- 6-50
17-4-20ddd	U. S. Geol. Survey	J	21.0	3/4	GI	S,G,C	N	0	Tca	3.5	7.15	10-11-50
-21bcc	.....do.....	J	11.0	3/4	GI	G,C	N	0	Tca	1.3	8.04	10-11-50
-29ccc	.....do.....	J	31.5	3/4	GI	S,G,Td	N	0	Tca	1.2	14.10	11-30-50
-31baa	.....do.....	J	31.5	3/4	GI	S,Td	N	0	Tca	3.0	22.60	10-23-50
-32baa	.....do.....	J	31.8	3/4	GI	S,G,Td	N	0	Tca	2.0	18.50	10-26-50
-33abb	.....do.....	J	26.0	3/4	GI	S,Si,Td	N	0	Tca	2.0	20.79	10-27-50
-33bbb	.....do.....	J	26.0	3/4	GI	S,Td	N	0	Tca	1.6	15.20	10-11-50
17-5-1ccd	Peterson.....	Du	21.1	40	S	G,M	Cy,W	S	Tpl	.8	19.70	11- 2-50
-2dad	U. S. Geol. Survey	J	21.0	3/4	GI	G,Td	N	0	Tca	1.2	10.50	12-17-50
-7bbb	.....do.....	J	35.0	3/4	GI	Si,Td	N	0	Tca	3.5	23.50	12-17-50
-8ccc	.....do.....	J	20.0	3/4	GI	G,A	N	0	Tca	1.9	10.34	12- 9-50
-8ddd	.....do.....	J	17.9	3/4	GI	S,Td	N	0	Tca	1.8	9.02	12- 9-50
-11bbb	.....do.....	J	21.0	3/4	GI	S,A	N	0	Tca	1.5	6.60	12-10-50
-12dcd	Patrick.....	Du	30.5	36	S	Sh,N	Cy,N	S	Bpu	.6	26.21	11- 2-50
-21aaa	U. S. Geol. Survey	J	24.5	3/4	GI	S,Td	N	0	Tca	2.0	14.50	12-17-50
-23ccc	.....do.....	J	25.0	3/4	GI	S,Td	N	0	Tca	2.6	12.21	12-17-50
-25aaa	.....do.....	J	31.5	3/4	GI	S,Td	N	0	Tca	1.6	22.50	10-21-50
-26ddd	.....do.....	J	30.5	3/4	GI	S,G,Td	N	0	Tca	1.0	20.73	10-25-50
-34aba	.....do.....	Dr	55.0	3/4	GI	Si,G,C	N	N	Tca	.5	12.10	11- 6-50
18-3-5bba	Ed. Prickett.....	Dr	60.3	6	GI	Sh,W	Cy,W	S	Bpu	1.8	20.00	11- 6-50
-6cbb	Marvin Landgren...	Du	47.2	6	GI	C,N	Cy,N	D	Tlbc	.3	34.50	11- 6-50
18-4-2bcc	.....do.....	Dr	31.2	6	GI	Sh,N	Cy,N	N	Tca	.2	14.85	11- 6-50
-4bbcdo.....	Du	41.1	36	S	Sh,N	Cy,N	D,S	Bpu	.9	31.10	11- 6-50
-4daa	O. Lindquist.....	Dr	83.0	6	GI	Sh,N	Cy,N	N	Tca	1.2	46.10	11- 6-50

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Table 22.--Record of wells in the Kanopolis unit, Kans.--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>McPherson County--Continued</u>												
18-4-11aad	Turnquist.....	Dr	43.7	6	GI	Sh,N	J,E	D	Tca	-5.8	13.50	11- 6-50
18-5-1daa	.....	Dr	75.0	8	GI	S,G,A	Cy,W	D,S	Tca	1.2	29.20	11- 6-50
-2daa	Carstensen.....	Du,Dr	60.0	6	GI	Sh,N	Cy,E	D	Bpu	.6	26.20	11- 6-50
<u>Saline County</u>												
14-2-20bc	R. Cravens.....	Dr	57.3	6	GI	Sh,W	N	N	Tca	.0	40.50	10-31-50
-31ccc	U. S. Geol. Survey	J	27.9	3/4	GI	Si,Td	N	O	Tca	1.4	7.50	10-17-50
-33bbc	M. Craig.....	Du	22.4	36	S	Sh,W	N	N	Tcu	.8	11.60	10-31-50
-34cb	.....	Du	12.3	30	S	Sh,W	N	N	Tpl	.0	9.97	10-31-50
14-3-15ccd	.....	Dr	....	6	W	S,G,Td	Cy,H	N	Tca	.5	21.50	12-12-50
-21daa	Prewett.....	Dr	....	6	GI	G,C	W	S	Bpu	2.5	5.19	10-30-50
-23caa	.....	Du	....	48	S	S,G,Td	Cy,W	D	Tpl	.9	31.41	12-12-50
-32cca	C. Renard.....	Du	45.3	36	S	Ss,K	B,H	D	Tpl	2.8	22.50	11- 2-50
-36abb	U. S. Geol. Survey	J	27.0	3/4	GI	S,Td	N	O	Tca	1.0	18.35	10-17-50
15-2-8ada	.....	Dr	76.3	4	GI	Ss,K	N	N	Tca	1.6	1.75	10-31-50
-9dad	Sjogren.....	Dr	42.9	6	GI	Ss,K	Cy,W	D	Tca	.5	36.52	10-31-50
-15bbc	William Henry.....	Dr	30.7	6	GI	Ss,K	N	N	Tca	.8	22.18	10-31-50
-27ccb	.....	Du	31.0	40	S	Ss,K	Cy,N	S	Tpl	1.8	24.10	11- 1-50
-28cbb	Johnson.....	Dr	84.0	4	GI	Sh,W	N	N	Tca	.0	11.90	10-31-50
-30ccc	U. S. Geol. Survey	J	31.5	3/4	GI	Si,Td	N	O	Tca	1.5	27.30	10- 4-50
-31ccc	.....do.....	J	27.4	3/4	GI	S,Td	N	O	Tca	1.0	14.70	10-19-50
-32baa	.....do.....	J	31.0	3/4	GI	S,Td	N	O	Tca	1.0	28.60	10- 5-50
-33dcc	J. Kalb, Jr.....	Du	28.9	....	..	Ss,K	N	N	Tpl	.8	21.30	11- 1-50
15-3-1ccc	U. S. Geol. Survey	J	24.9	3/4	GI	Si,S,Td	N	O	Tca	1.4	6.74	10-18-50
-4cdd	Brown.....	Du	48	S	Sh,N	Cy,W	S	Bpu	1.0	20.17	12-12-50
-11ab	Dr	5	Tn	S,G,A	N	N	Tca	1.8	19.05	12-12-50
-16aaa	Du	40	S	S,G,Td	Tca	3.2	43.87	12-12-50

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Table 22.--Record of wells in the Kanopolis unit, Kans.--Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>Saline County--Continued</u>												
15-3-25ccd	U. S. Geol. Survey	J	21.0	3/4	GI	S,Td	N	O	Tca	2.5	15.14	10- 3-50
-33aad	.....	Du,Dn	....	....	..	Si,S,Td	Cy,H	S	Bpu	.0	29.65	12-12-50
16-2-8ccc	.....do.....	J	31.0	3/4	GI	S,Td	N	O	Tca	1.1	9.04	10-20-50
-9daa	Daily.....	Du	29.9	36	S	Ss,K	Cy,N	S	Tpl	.7	20.10	11- 1-50
-16cdd	.....	Sp	....	....	..	Ss,K	N	N	Tpl	.1	1.50	11- 6-50
-18abb	U. S. Geol. Survey	J	30.0	3/4	GI	S,Td	N	O	Tca	2.0	28.50	10-20-50
-32bba	A. Bloomberg.....	Du	20.9	60	S	Sh,W	Cy,W	D,S	Tpl	1.1	8.80	11- 1-50
16-3-12bcb	U. S. Geol. Survey	J	30.2	3/4	GI	Si,Td	N	O	Tca	2.4	25.50	11-21-50
-13aaa	.....do.....	J	30.0	3/4	GI	S,Td	N	O	Tca	1.1	22.40	10-20-50
-13abb	.....do.....	J	30.7	3/4	GI	S,Td	N	O	Tca	1.3	22.40	10-19-50
-24ddd	.....do.....	J	31.0	3/4	GI	S,Td	N	O	Tca	1.0	10.62	11-14-50
-26aad	.....do.....	J	29.0	3/4	GI	Si,Td	N	O	Tca	1.4	9.89	11-30-50

KANOPOLIS UNIT

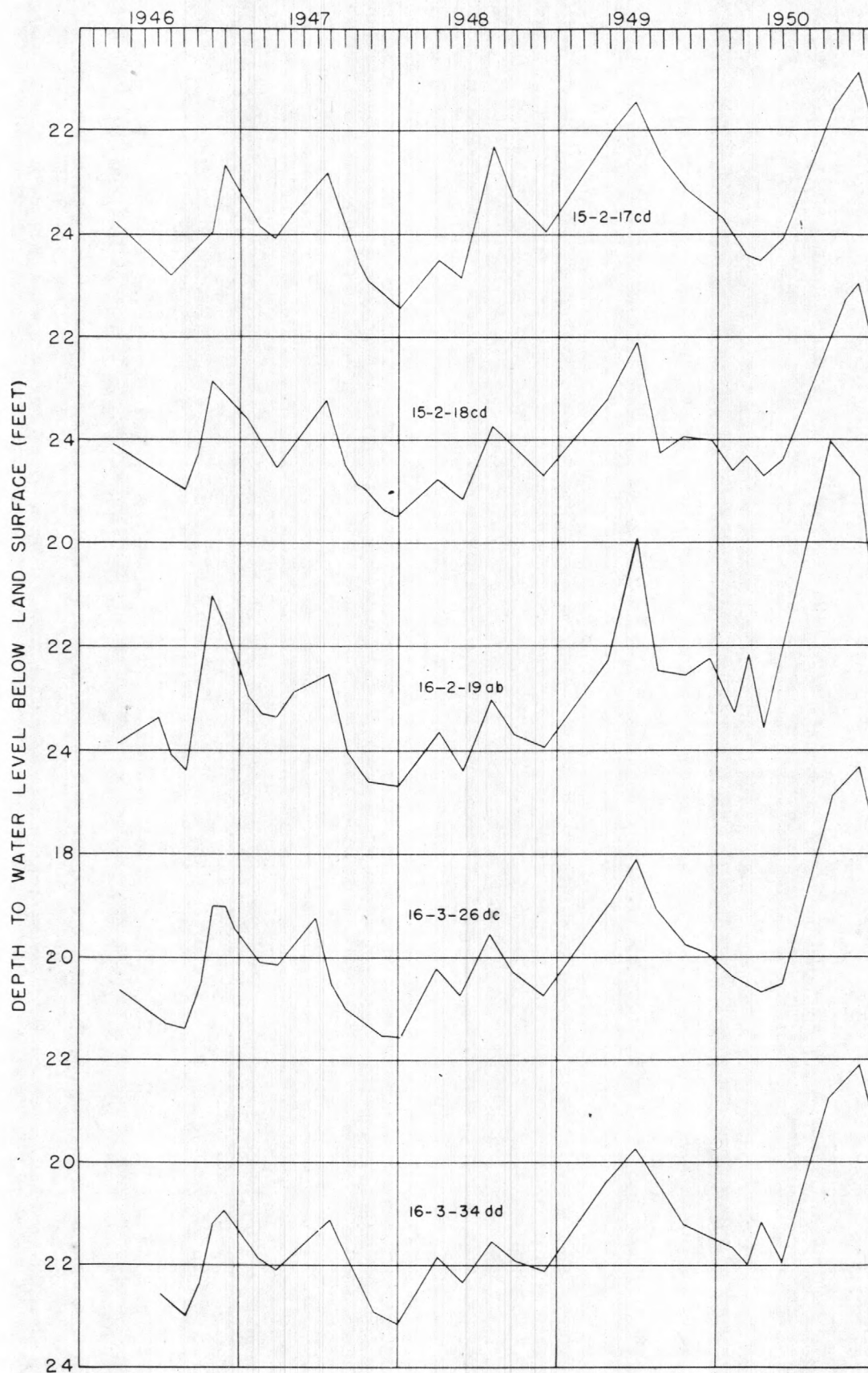


Figure 10.—Hydrographs of five wells, Kanopolis unit

Logs of Jetted Observation Wells

During the course of ground-water investigations in the Kanopolis unit in 1950, 36 observation wells were installed by aid of a jetting apparatus. A field log of the samples recovered from the jetting process was prepared by the driller. The location of these wells is shown in figure 9. Other data relating to these wells are given in table 22. Logs of 32 of the wells are given in table 23.

Table 23.--Logs of jetted observation wells in the Kanopolis unit
14-2-31ccc. (3 feet west of corner post.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil	1.5	1.5
Silt, buff.....	6.5	8.0
Clay, gray.....	1.5	9.5
Silt, loose, buff.....	18.5	28.0

14-3-36abb. (39 feet east of railroad track and 23.5 feet south of center line of east-west road.)

QUATERNARY--Pleistocene		
Soil.....	1.0	1.0
Silt, buff.....	7.5	8.5
Clay, sandy, gray.....	1.5	10.0
Silt, buff.....	5.0	15.0
Sand, fine.....	10.0	25.0
Sand, medium to coarse.....	2.0	27.0

15-2-30ccc. (25 feet south of center line of east-west road and 24 feet east of center line of north-south road.)

QUATERNARY--Pleistocene		
Soil (loam), black.....	1.5	1.5
Silt, sandy, buff.....	8.5	10.0
Silt, dark buff.....	7.0	17.0
Sand, silty, fine, tan.....	3.0	20.0
Sand, medium to coarse, tan.....	7.3	27.3

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

15-2-31ccc. (50 feet north of center line of east-west road and 24 feet east of center line of north-south road.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Soil (loam), black.....	1.8	1.8
Silt, sandy, very fine, buff.....	8.2	10.0
Silt, dark buff.....	6.5	16.5
Sand, silty, very fine, buff.....	4.0	20.5
Sand, medium to coarse.....	6.9	27.4

15-2-32baa. (25 feet south of center line of east-west road and 9 feet west of west edge of cement culvert.)

QUATERNARY--Pleistocene		
Soil.....	3.5	3.5
Clay, silty, buff..... (1 foot soil horizon at 11.5 feet be- neath surface)	10.5	14.0
Silt, clayey, brown.....	3.5	17.5
Sand, silty, brown.....	2.2	19.7
Clay, silty, buff.....	.8	20.5
Sand, silty, fine.....	10.5	31.0

15-3-1ccc. (25.5 feet north of center line of east-west road and 54 feet east of center line of north-south road.)

QUATERNARY--Pleistocene		
Topsoil	2.5	2.5
Silt, buff.....	4.5	7.0
Clay, silty, gray.....	1.0	8.0
Silt, slightly sandy, buff.....	16.4	24.4

15-3-25ccd. (27 feet south of center line of east-west road and 87 feet east of northeast bridge abutment.)

QUATERNARY--Pleistocene		
Soil (loam), black.....	6.5	6.5
Silt, clayey, tan.....	1.5	8.0
Silt, slightly sandy, brown.....	5.0	13.0
Sand, fine to medium.....	12.0	25.0

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

16-2-8ccc. (On east side of telephone post 69 feet east of section corner and 21 feet north of center line of east-west road.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil	2.2	2.2
Silt, clayey, buff.....	5.0	8.0
Clay, slightly silty, gray.....	3.0	11.0
Silt, nodular, buff.....	4.0	15.0
Sand, medium, tan.....	16.0	31.0

16-2-18abb. (22 feet south of center line of east-west road and 1 foot north of corner post.)

QUATERNARY--Pleistocene		
Topsoil	1.5	1.5
Silt, nodular, buff.....	15.5	17.0
Sand, silty, fine, tan.....	13.0	30.0

16-3-12bcb. (21 feet south of center line of east-west road and 60 feet east of center line of U. S. Highway 81.)

QUATERNARY--Pleistocene		
Topsoil	1.5	1.5
Silt, loose, buff.....	7.5	9.0
Clay, silty.....	1.5	10.5
Silt, loose, reddish.....	17.1	27.6
Clay, hard.....	2.6	30.2

16-3-13abb. (8 feet north of corner post and 45 feet east of pole of Kansas Power and Light Co.)

QUATERNARY--Pleistocene		
Topsoil	2.2	2.2
Silt, nodular.....	28.8	31.0

16-3-24ddd. (25 feet south of north corner post.)

QUATERNARY--Pleistocene		
Topsoil	1.5	1.5
Clay, silty, buff.....	13.5	15.0
Silt.....	14.0	29.0
Sand, coarse.....	2.0	31.0

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

16-3-26aad. (7.5 feet north of look-out-for-cars sign at rail-road crossing.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Soil.....	1.5	1.5
Clay, gray.....	16.5	18.0
Silt, sandy, buff.....	12.2	30.2

16-6-35bdd. (4 feet east of R.E.A. pole at center of section)

QUATERNARY--Pleistocene		
Topsoil	1.5	1.5
Silt, clayey, brown.....	4	5.5
Clay, slightly silty, brown.....	8.2	13.7
Silt, sandy, buff.....	3.3	17
Sand, medium, tan.....	5	22
Sand, coarse, tan.....	4.6	26.6

17-3-3ddd. (10 feet north of center line of east-west road and aligned with edge of north-south road.)

QUATERNARY--Pleistocene		
Soil.....	1.5	1.5
Clay, silty.....	21.5	23.0
Clay, red-brown.....	2.0	25.0
Silt.....	5.7	30.7

17-3-4bbb. (36 feet south of center line of north-south road and 58 feet south of center line of east-west road.)

QUATERNARY--Pleistocene		
Topsoil	1.8	1.8
Silt, clayey, brown.....	8.4	10.2
Silt, clayey, red-brown.....	16.3	26.5
Clay, green.....	....	26.5+

17-3-9bcc. (26 feet east of center line of north-south road and 9.3 feet northwest of sign.)

QUATERNARY--Pleistocene		
Silt, sandy, very fine.....	3.2	3.2
Clay, silty.....	3.8	7.0
Clay, slightly silty, gray-brown.....	1.7	8.7
Sand, silty, very fine.....	5.8	14.5
Sand, medium.....	4.5	19.0

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

17-3-21cbb. (South edge of east-west road, 92 feet east of center line of U. S. Highway 81.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil.....	2.0	2.0
Silt, clayey, buff.....	9.0	11.0
Clay, silty, dense, gray.....	4.0	15.0
Silt, nodular, buff.....	3.6	18.6
Sand, medium to very coarse.....	11.4	30.0

17-4-20odd. (12 feet west of cement culvert and 8 feet south of telephone pole.)

QUATERNARY--Pleistocene		
Topsoil, reddish.....	1.9	1.9
Clay, silty, red-brown.....	10.1	12.0
Sand, coarse, and gravel, fine; contains shale fragments.....	9.0	21.0

17-4-21bcc. (17 feet east of cement culvert and 14 feet north of corner post.)

QUATERNARY--Pleistocene		
Soil (loam), black.....	1.8	1.8
Clay, silty, dark red.....	6.2	8.0
Sand, very coarse, and gravel, fine.....	3.0	11.0

17-4-29ccc. (25 feet east of corner post and 18 feet north of center line of east-west road.)

QUATERNARY--Pleistocene		
Topsoil.....	1.9	1.9
Silt, clayey, buff.....	9.1	11.0
(No recovery of samples).....	20.5	31.5

17-4-31baa. (2.5 feet west of telephone pole on south side of the road.)

QUATERNARY--Pleistocene		
Topsoil.....	2.8	2.8
Silt, nodular, buff.....	22.2	25.0
Sand, medium to coarse, tan.....	6.5	31.5

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

17-4-32baa. (18 feet south of center line of east-west road and 22.5 feet west of corner post.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil.....	2.6	2.6
Silt, clayey, gray.....	9.3	11.9
Clay, silty.....	.9	12.8
Silt, slightly clayey, buff.....	8.0	20.0
• Sand, fine to medium.....	2.4	22.4
Sand, medium to coarse, and gravel, fine	9.4	31.8

17-4-33abb. (21 feet south of center line of east-west road and 18 feet west of corner post in lane.)

QUATERNARY--Pleistocene		
Topsoil.....	3.0	3.0
Silt, clayey, gray.....	13.5	16.5
Silt, nodular, buff.....	3.9	20.4
Sand, silty, fine.....	3.6	24.0

17-4-33bbb. (30 feet east of center line of north-south road and 36 feet south of center line of east-west road.)

QUATERNARY--Pleistocene		
Topsoil.....	2.5	2.5
Silt, clayey, gray.....	5.5	8.0
Silt, nodular, buff.....	7.4	15.4
Sand, silty, very fine.....	4.2	19.6
Sand, fine to medium.....	2.4	22.0
Sand, medium to coarse.....	4.0	26.0

17-5-7bbb. (27 feet east of center of road intersection.)

QUATERNARY--Pleistocene		
(Believed to be nodular silt below topsoil. Water loss prevented sample recovery.).....	.... *	35.0

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

17-5-8ccc. (3 feet northwest of telephone pole on northeast corner of intersection.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil.....	1.1	1.1
Sand, silty, very fine to fine.....	12.9	14.0
Sand, coarse, and gravel, fine to medium	6.0	20.0

17-5-8ddd. (3.5 feet southwest of telephone pole.)

QUATERNARY--Pleistocene		
Topsoil.....	1.3	1.3
Silt, sandy, very fine, buff.....	8.0	9.3
Sand, fine to medium.....	5.7	15.0
Sand, coarse and gravel, fine.....	2.9	17.9

17-5-23ccc. (22 feet east of center line of north-south road and 54 feet north of center line of State Highway 4.)

QUATERNARY--Pleistocene		
Topsoil.....	3.0	3.0
Silt, clayey, gray.....	9.2	12.2
Silt, nodular, buff.....	5.3	17.5
Sand, fine to medium.....	7.5	25.0

17-5-25aaa. (100 feet west of center line of north-south road and 39 feet south of center line of east-west road beside telephone pole.)

QUATERNARY--Pleistocene		
Topsoil.....	2.5	2.5
Clay, silty, gray.....	4.4	6.9
Silt, clayey, buff.....	12.1	19.0
Sand, silty, fine.....	3.5	22.5
Sand, silty, medium.....	9.0	31.5

Table 23.--Logs of jetted observation wells in the Kanopolis unit--Con.

17-5-26ddd. (36 feet west of center line of north-south road and 31.5 feet north of center line of east-west road, 9 feet north and slightly east of telephone support pole.)

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Topsoil.....	3.1	3.1
Silt, clayey, gray.....	8.1	11.2
Clay, silty, dense, gray.....	2.2	13.4
Silt, nodular, buff.....	9.6	23.0
Sand, silty, fine to medium.....	7.5	30.5

17-6-13aaa. (3 feet NW of northwest abutment of bridge on south road of intersection.)

Road fill.....	7.0	7.0
QUATERNARY--Pleistocene		
Silt, clayey, buff.....	7.0	14.0
Sand, silty, very fine.....	5.0	19.0
Sand, very coarse, well-sorted.....	7.6	26.6

Logs of Porter Soil Sampler Test Holes

During the fall of 1950, A. I. Johnson, M. R. Klug, and W. D. Waterman made a study of the soil and unconsolidated material that immediately underlies the surface in parts of the Kanopolis unit. During the course of the investigation, test holes were made by use of an auger and a Porter Soil Sampler, samples of the formation were collected, and logs were prepared. The location of these test holes is shown in figure 9. Logs of the test holes are given in table 24.

Table 24.--Logs of Porter Soil Sampler test holes in the Kanopolis unit

15-2-31baa. (58 feet south of center of east-west road and 20 feet west of row of trees.)

	Thickness (feet)	Depth (feet)
Soil, black.....	1.0	1.0
Silt, clayey, medium-brown; contains calcareous nodules at 4.0 feet.....	4.4	5.4
Silt, dense, light-brown.....	1.4	6.8
Sand, very fine, silty, light-buff; contains calcareous nodules at 9.7 feet.....	8.2	15.0
Sand, fine to medium, light-buff.....	4.5	19.5
Sand, very fine, light-brown.....	.5	20.0

15-2-31bbb. (38.5 feet south of center line of east-west road and 35 feet east of center line of north-south road.)

Soil, black.....	1.8	1.8
Silt, very fine, sandy, medium-buff...	8.2	10.0
Silt, slightly sandy, dark-buff.....	6.5	16.5
Sand, very fine, silty, medium-buff...	4.0	20.5
Clay, gray-brown.....	.3	20.8

15-2-32bbb. (25.5 feet southeast of northeast corner of granary and 38.5 feet northeast of southeast corner of granary.)

Soil, black.....	3.5	3.5
Clay, slightly silty, light gray-brown to brown, black from 11.5 to 11.8 feet.....	10.5	14.0
Silt, slightly clayey, medium-brown; contains calcareous nodules at 16.5 feet.....	3.5	17.5
Sand, very fine, silty, medium-brown..	2.2	19.7
Clay, silty, medium-brown.....	.8	20.5
Sand, very fine, sandy, medium-brown..	3.0	23.5

15-3-36abb.- (30 feet south of center line of east-west road, 25 feet east of center line of Union Pacific R. R. and 13 feet west of observation well.)

Soil, dark-brown.....	1.0	1.0
Silt, medium-buff; contains some sand and some clay lenses.....	21.5	22.5
Silt, very fine, sandy, medium-buff...	4.0	26.5

Table 24.--Logs of Porter Soil Sampler test holes in the Kanopolis unit--Continued

15-3-36bbb. (In cattle lane, 19 feet south of east-west fence along road and 14.5 feet east of north-south fence.)

	Thickness (feet)	Depth (feet)
Soil, black to dark-brown.....	6.5	6.5
Silt, clayey, medium-brown; contains some sand.....	1	7.5
Silt, slightly sandy, medium-brown; contains some iron stains.....	5.5	13

16-6-35acc. (In ditch, 20 feet east of center of north-south road and 31 feet north-northwest from telephone post.)

Road fill.....	1.5	1.5
Clay, dense, slightly silty, dark- brown; contains calcareous nodules at 8.5 feet and 12.5 to 12.6 feet...	12.2	13.7
Silt, very fine, sandy, dark-buff; contains clay lenses from 14.0 to 14.5 feet and medium sand lens from 14.5 to 14.7 feet.....	3.5	17.2
Sand, medium, reddish-brown; contains clay lens from 17.3 to 17.5 feet....	.8	18.0

16-6-35dcc. (Midway between two gate posts leading into field on south side of bridge.)

Soil, silty, loam, dark-buff.....	1.4	1.4
Sand, very fine, silty, dark-brown....	.8	2.2
Sand, very fine, light-buff; contains silty zone from 15.0 to 15.4 feet...	13.3	15.5
Silt, gray-brown.....	1	16.5
Sand, coarse, red to buff.....	1.3	17.8

17-3-4bbb. (36 feet east of center line of north-south road and 58 feet south of east-west road.)

Silt, dark to light-brown.....	10.2	10.2
Silt, dense, crumbly, reddish-brown; clayey at 15.0 feet; coarse plastic silt at 18.0 feet.....	16.3	26.5
Clay, greenish-gray..... (Wellington or lower Ninnescah)	.4	26.9

Table 24.--Logs of Porter Soil Sampler test holes in the Kanopolis unit--Continued

17-3-8aaa. (Low area in northeast corner of school yard, approximately 20 feet from each fence line.)

	Thickness (feet)	Depth (feet)
Soil (loam), black.....	3.5	3.5
Silt, dark brown, grades to reddish brown; some very fine sand; clayey at 6.0 feet; calcareous nodules.....	12.3	15.8

17-3-9bcc. (26 feet east of center line of north-south road and 9.3 feet northwest of corner of signboard.)

Silt, sandy, very fine, medium brown; more sandy with depth; dark- and light-brown laminations at 2.5 feet.....	3.2	3.2
Clay, silty, medium gray-brown to medium-brown; calcareous streaks throughout..	3.8	7.0
Clay, slightly silty, gray-brown; very fine, iron-stained sand streaks.....	1.7	8.7
Clay, silty, medium gray-brown; calcareous streaks throughout.....	.7	9.4
Silt, medium buff; calcareous nodules...	2.1	11.5
Sand, silty, very fine, medium-buff.....	3.0	14.5
Clay, slightly silty, dark-brown.....	1.0	15.5
Silt, slightly clayey, dark-buff.....	3.5	19.0

17-3-16bbb. (In ditch, 139 feet east of center line of U. S. Highway 81 and 20 feet south of center line of east-west road.)

Soil and fill.....	1.5	1.5
Silt, clayey, dense and plastic, gray-brown; more clayey with depth; some very fine sand; lenses of medium-buff silt.....	14.0	15.5
Sand, silty, very fine, medium-buff.....	1.3	16.8

Table 24.--Logs of Porter Soil Sampler test holes in the Kanopolis unit--Continued

17-3-16cbc. (On edge of road, 20 feet south of southwest corner of road intersection.)

	Thickness (feet)	Depth (feet)
Silt, dark-buff.....	3.0	3.0
Silt, sandy, very fine, medium-buff.....	6.3	9.3
Clay, silty, dark-buff; becomes siltier with depth; medium sand lens 9.75- 9.80 feet.....	.5	9.8
Silt, medium-buff, thin solidified cal- careous layer at 10.0 feet.....	1.2	11.0
Silt, clayey, dark-brown.....	2.5	13.5
Silt, medium-buff.....	1.0	14.5
Silty clay, dark-buff; small calcareous nodules; larger nodules at 19.5 feet..	6.7	21.2
Silt, medium-buff.....	3.1	24.3

17-3-20aad. (50 feet north-northwest of telephone post.)

Fill (sand and clay, lenticular).....	2.0	2.0
Clay, silty, plastic, greenish-gray.....	2.8	4.8
Sand, silty, very fine, dark-gray.....	2.0	6.8
Sand, slightly silty, fine, dark-gray...	3.7	10.5
Sand, silty, very fine, dark-gray; lami- nations of silt and clay at 11.0 feet.	1.3	11.8
Sand, fine to medium, light gray-brown...	1.5	13.3

17-3-21cbb. (On south edge of east-west road, 92 feet east of center line of U. S. Highway 81.)

Road fill.....	3.2	3.2
Silt, sandy, very fine, medium-buff; some calcareous concretions.....	2.0	5.2
Sand, silty, very fine, medium-buff.....	1.4	6.6
Sand, very fine to fine, light-buff.....	12.0	18.6
Sand, slightly gravelly, medium coarse, medium-buff; many colored grains.....	2.2	20.8

Table 24.--Logs of Porter Soil Sampler test holes in the Kanopolis unit--Continued

17-3-28bbb. (45 feet south of center line of east-west road, 60 feet east of center line of U. S. Highway 81.)

	Thickness (feet)	Depth (feet)
Soil (silty clay; loam), plastic, dark-brown.....	2.5	2.5
Clay, with calcareous nodules (caliche), gray-white.....	1.9	4.4
Clay, slightly silty, crumbly, gray to greenish-gray; gypsum lenses (Welling- ton formation).....	2.4	6.8

17-4-21cbb. (55 feet east of center line of north-south road, 25 feet north of center line of east-west lane.)

Soil, black.....	1.8	1.8
Clay, slightly silty, dark reddish-orange; contains some sand, whitish salts, greenish clay, and calcareous nodules.	10.2	12.0

17-4-28bbb. (173 feet south of center line of east-west road, 55 feet east of center line of north-south road.)

Soil, dark-brown to dark reddish-brown..	2.5	2.5
Clay, dense, slightly silty, dark reddish-orange; contains some sand, greenish clay, and some calcareous nodules.....	4.3	6.8

17-4-28bbc1. (In ditch on east side of road, midway between railroad and northwest corner of section.)

Fill.....	1.0	1.0
Clay, reddish-brown; contains some sand from 2.5 feet.....	2.0	3.0
Silt, clayey, dark-brown; contains cal- careous nodules.....	3.0	6.0

17-4-28bbc2. (At northeast corner of road and railroad crossing.)

Fill.....	3.5	3.5
Clay, light gray-green.....	1.5	5.0

Table 24.--Logs of Porter Soil Sampler test holes in the Kanopolis unit--Continued

17-4-28bcb. (At east corner on south side of crossing of road and railroad.)

	Thickness (feet)	Depth (feet)
Fill.....	2.0	2.0
Clay, reddish-brown.....	1.3	3.3
Shale, gray-green; contains calcareous nodules at 4.5 feet and iron stains below 4.5 feet.....	3.7	7.0
Limestone, argillaceous, light-gray.....	.5	7.5

17-4-29add. (41 feet west of center line of north-south road and 41 feet southwest of telephone post.)

Soil, black.....	1	1
Clay, dense, silty, dark-brown; contains some sand and calcareous nodules.....	4	5
Silt, dense, clayey, light-brown; light- gray and more clayey at 8.7 feet.....	4.5	9.5
Silt, light-buff.....	14.5	24
Sand, fine, silty, reddish-brown.....	1	25

17-4-32add. (In diversion ditch into river, 43.5 feet west of center line of north-south road.)

Clay, slightly silty, dark gray-brown....	9.0	9.0
Silt, slightly clayey, dark-gray to brown	2.2	11.2
Clay, dark gray-brown.....	1.3	12.5
Silt, very fine, sandy, dark gray-brown; contains clayey and sandy lenses.....	3.0	15.5
Silt, clayey; contains buried soil zone..	2.3	17.8
Sand, very fine, silty, dark-brown.....	5.4	23.2

17-4-33bbb. (30 feet east of center line of north-south road, 36 feet south of center line of east-west road.)

Soil, dark gray-brown.....	1.2	1.2
Silt, slightly sandy, dark-brown.....	4.3	5.5
Clay, silty, dark-brown; contains lens of medium sand from 10.7 to 10.8 feet.....	6	11.5
Silt, clayey; buried soil zone.....	1.5	13
Silt, clayey, medium-brown.....	1.5	14.5
Sand, very fine, silty, brown.....	5.1	19.6
Sand, fine to medium, silty, medium-brown	.2	19.8

Logs of Test Holes

In the fall of 1950, five test holes were drilled to determine the character of the material in a cross section in the valley of the Smoky Hill River near Marquette in McPherson County. The location of the test holes is shown in figure 9. Logs of the test holes are given in table 25.

Table 25.--Logs of test holes in the Smoky Hill River valley

17-5-10cc. (10 feet north of center line of east-west road and 40 feet west of end of hedge row.) Surface altitude, 1,394.6 feet.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Alluvium		
Clay, silty, dark-gray.....	3.0	3.0
Clay, silty, buff.....	5.0	8.0
Clay, buff to gray; contains some gravel.....	2.0	10.0
Sand, medium to coarse.....	9.0	19.0
Sand, medium to very coarse.....	4.0	23.0
Gravel, fine to medium, sandy.....	5.0	28.0
Permian-Leonardian		
Ninnescah shale		
Shale, red-brown.....	3.0	30.0

17-5-10cd. (40 feet south of center line of east-west road and 20 feet west of hedge row.) Surface altitude, 1,395.0 feet. Water level, 11.93 feet below land surface.

QUATERNARY--Pleistocene		
Alluvium		
Clay, slightly silty, gray.....	4.0	4.0
Clay, silty, buff.....	9.0	13.0
Sand, medium to very coarse.....	7.0	20.0
Sand, coarse; contains some fine gravel.....	8.0	28.0
Permian-Leonardian		
Ninnescah shale		
Shale, red-brown.....	1.5	29.5
Shale, gray-green.....	.5	30.0

Table 25.--Logs of test holes in the Smoky Hill River valley--Continued

17-5-10dd. (40 feet north of center line of east-west road and 60 feet west of center line of north-south road.) Surface altitude, 1,391.6 feet. Water level, 6.77 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Alluvium		
Clay, dark-gray.....	4.0	4.0
Clay, silty, light-gray.....	2.0	6.0
Clay, silty, buff.....	7.0	13.0
Sand, very fine to fine.....	5.0	18.0
Sand, coarse to very coarse, and fine gravel.....	12.0	30.0
Sand, very coarse, and fine to medium gravel.....	6.5	36.5
Permian-Leonardian		
Ninnescah shale		
Shale, gray-green.....	1.5	38.0
Shale, red-brown.....	2.0	40.0

17-5-14baa. (14 feet north and 3 feet west of third telephone pole east of section line on south side of road.) Surface altitude, 1,392.2 feet. Water level, 12.95 feet below land surface.

QUATERNARY--Pleistocene		
Alluvium		
Clay, slightly silty, dark-gray.....	5.0	5.0
Clay, silty, buff.....	11.0	16.0
Sand, fine to medium.....	3.0	19.0
Sand, coarse; contains some fine gravel.....	7.0	26.0
Sand, medium to very coarse, gray; contains some fine gravel.....	14.0	40.0
Sand, fine to medium, gray.....	3.0	43.0
Permian-Leonardian		
Ninnescah shale		
Shale, red-brown.....	3.0	46.0

Table 25.--Logs of test holes in the Smoky Hill River valley--Continued

17-5-16aa. (30 feet south of center line of east-west road and 40 feet east of culvert.) Surface altitude, 1,398.9 feet. Water level, 17.20 feet below land surface.

	Thickness (feet)	Depth (feet)
QUATERNARY--Pleistocene		
Alluvium		
Clay, silty, dark-gray.....	8.0	8.0
Clay, silty, slightly sandy, buff; contains some fine gravel.....	15.5	23.5
Sand, fine to coarse.....	1.0	24.5
Gravel, fine to medium; contains very fine to fine sand and buff clay....	1.0	25.5
Permian-Leonardian		
Ninnescah shale		
Shale, mottled, red-brown and gray- green.....	1.0	26.5

The depth to water has been measured periodically since 1945 in 21 wells in the Kirwin unit. The highest and lowest water levels for the period of record are given in table 26; the difference between the highest and lowest water levels, the net rise or decline in the water level in 1950, and the net rise or decline for the period of record are given in table 27; and the water-level measurements that were made in 1950 are given in table 28. Hydrographs of five wells are shown in figure 11.

Table 26.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 21 wells in the Kirwin unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
4-14-34bc	5	42.15	Nov. 21, 1945	43.05	Sept. 25, 1946
4-15-31bb	5	34.43	Sept. 22, 1950	36.26	Nov. 30, 1948
-35bc	5	32.20	Sept. 22, 1950	37.99	June 12, 1946
4-17-31bc	5	48.00	Apr. 13, 1950	52.72	Oct. 6, 1948
4-18-30ab	5	9.43	July 8, 1949	20.29	Sept. 25, 1946
4-19-21dd	5	8.80	July 8, 1949	15.10	Sept. 25, 1946
-35ab	5	12.17	Aug. 29, 1947	15.47	Mar. 10, 1950
4-20-21cc	5	48.20	Sept. 22, 1950	48.92	Feb. 6, 1946
5-13-4dc	5	16.95	Sept. 21, 1950	35.28	Dec. 17, 1945
-25cc	5	43.05	Oct. 27, 1949	46.53	Jan. 28, 1946
			(Sept. 21, 1950		
-33ba	5	22.25	Sept. 21, 1950	30.46	Jan. 2, 1948
5-14-3bc	5	34.75	Sept. 22, 1950	40.50	Oct. 27, 1947
5-15-2dc	5	31.55	Sept. 1, 1949	33.90	June 3, 1950
5-16-3aa	5	37.75	July 8, 1949	44.76	Dec. 17, 1945
5-17-1aa	5	.73	Mar. 31, 1948	7.60	Nov. 21, 1945
-3cd	5	1.18	May 6, 1947	27.00	June 12, 1946
-12aa	5	51.49	Dec. 29, 1949	54.20	Sept. 30, 1947
6-11-34aa	5	33.62	Sept. 21, 1950	37.07	June 11, 1946
6-12-20bb	5	36.30	Nov. 26, 1945	43.06	Jan. 28, 1946
-23cd	5	22.29	Sept. 21, 1950	27.17	Apr. 26, 1946
6-13-12ba	5	37.31	Sept. 21, 1950	40.95	Dec. 15, 1947

Table 27.--Difference between highest and lowest recorded water-levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 21 wells in the Kirwin unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
4-14-34bc	0.90	-0.19	-0.19
4-15-31bb	1.83	+0.96	+1.47
-35bc	5.79	+3.29	+3.40
4-17-31bc	4.72	+1.00	+1.20
4-18-30ab	10.86	-.62	+6.60
4-19-21dd	6.30	-.12	+1.18
-35ab	3.30	+2.07	+1.14
4-20-21cc	.72	+.29	+.72
5-13-4dc	18.33	+4.08	+18.15
-25cc	3.48	+.16	+3.45
-33ba	8.21	+4.74	+4.55
5-14-3bc	5.75	+1.09	+.86
5-15-2dc	2.35	+1.13	+2.16
5-16-3aa	7.01	+.54	+2.94
5-17-1aa	6.87	+2.84	+6.20
-3cd	25.82	-.19	+3.94
-12aa	2.71	+.34	+1.66
6-11-34aa	3.45	+1.59	+2.36
6-12-20bb	6.76	-1.27	-3.30
-23cd	4.88	+3.42	+4.55
6-13-12ba	3.64	+2.67	+3.19

Table 28.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1950

4-14-34bc.

Date	Water level	Date	Water level	Date	Water level
Feb. 8	42.15	Apr. 13	42.79	Sept. 22	42.34
Mar. 9	42.69	June 3	42.70		

4-15-31bb.

Date	Water level	Date	Water level	Date	Water level
Feb. 8	35.39	Apr. 13	35.70	Sept. 22	34.43
Mar. 9	35.43	June 3	35.70		

Table 28.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1950--Continued

4-15-35bc.

Date	Water level	Date	Water level	Date	Water level
Feb. 8	35.49	Apr. 13	36.00	Sept. 22	32.20
Mar. 9	35.62	June 6	36.30		

4-17-31bc.

Feb. 8	51.19	Apr. 13	48.00	Sept. 22	50.19
Mar. 10	51.09	June 2	51.40		

4-18-30ab.

Feb. 8	12.08	Apr. 13	12.00	June 2	12.70
Mar. 10	12.20				

4-19-21dd.

Feb. 8	9.58	Apr. 13	9.35	Measurements discontinued	
Mar. 10	9.50	June 2	9.70		

4-19-35ab.

Feb. 8	13.59	Apr. 13	13.90	Sept. 22	11.52
Mar. 10	14.17	June 2	13.60		

4-20-21cc.

Feb. 8	48.49	Apr. 13	48.48	Sept. 22	48.20
Mar. 10	48.39	June 2	48.40		

5-13-4dc.

Feb. 8	21.03	Apr. 13	19.00	Sept. 21	16.95
Mar. 9	21.10	June 3	18.20		

Table 28.--Water-level measurements, in feet below land-surface datum, in the Kirwin unit, 1950--Continued

5-13-25cc.

Date	Water level	Date	Water level	Date	Water level
Feb. 8	43.01	Apr. 13	43.27	Sept. 21	42.85
Mar. 9	43.45	June 3	43.20		

5-13-33ba.

Feb. 8	26.79	Apr. 13	26.73	Sept. 21	22.05
Mar. 9	26.49	June 3	25.40		

5-14-3bc.

Feb. 8	35.84	Apr. 13	36.79	Sept. 22	34.75
Mar. 9	36.83	June 3	37.50		

5-15-2dc.

Feb. 8	32.12	Apr. 13	32.45	Sept. 22	30.99
Mar. 9	32.37	June 3	32.70		

5-16-3aa.

Feb. 8	41.64	Apr. 13	43.60	June 3	41.10
Mar. 9	40.88				

5-17-1aa.

Feb. 8	4.24	Apr. 13	4.20	Sept. 22	1.40
Mar. 9	4.03	June 2	3.10		

5-17-3cd. Mar. 9, 7.61; Apr. 13, 7.85; June 2, 7.80.

5-17-12aa.

Feb. 8	51.57	Apr. 13	51.70	Sept. 22	51.23
Mar. 9	52.53	June 3	51.30		

Table 28.--Water-level measurements, in feet below land-surface datum,
in the Kirwin unit, 1950--Continued

6-11-34aa.

Date	Water level	Date	Water level	Date	Water level
Jan. 1	35.21	Jan. 28	35.19	Feb. 20	35.32
12	35.20	Feb. 5	35.37	Sept. 21	33.62
20	35.25	11	35.30		

6-12-20bb.

Feb. 8	38.33	Apr. 13	38.70	June 3	39.60
Mar. 9	38.38				

6-12-23cd.

Feb. 8	25.71	Apr. 13	26.00	Sept. 21	22.29
Mar. 9	25.07	June 3	25.09		

6-13-12ba.

Feb. 8	24.96	Apr. 13	26.00	Sept. 21	22.29
Mar. 9	25.07	June 3	25.09		

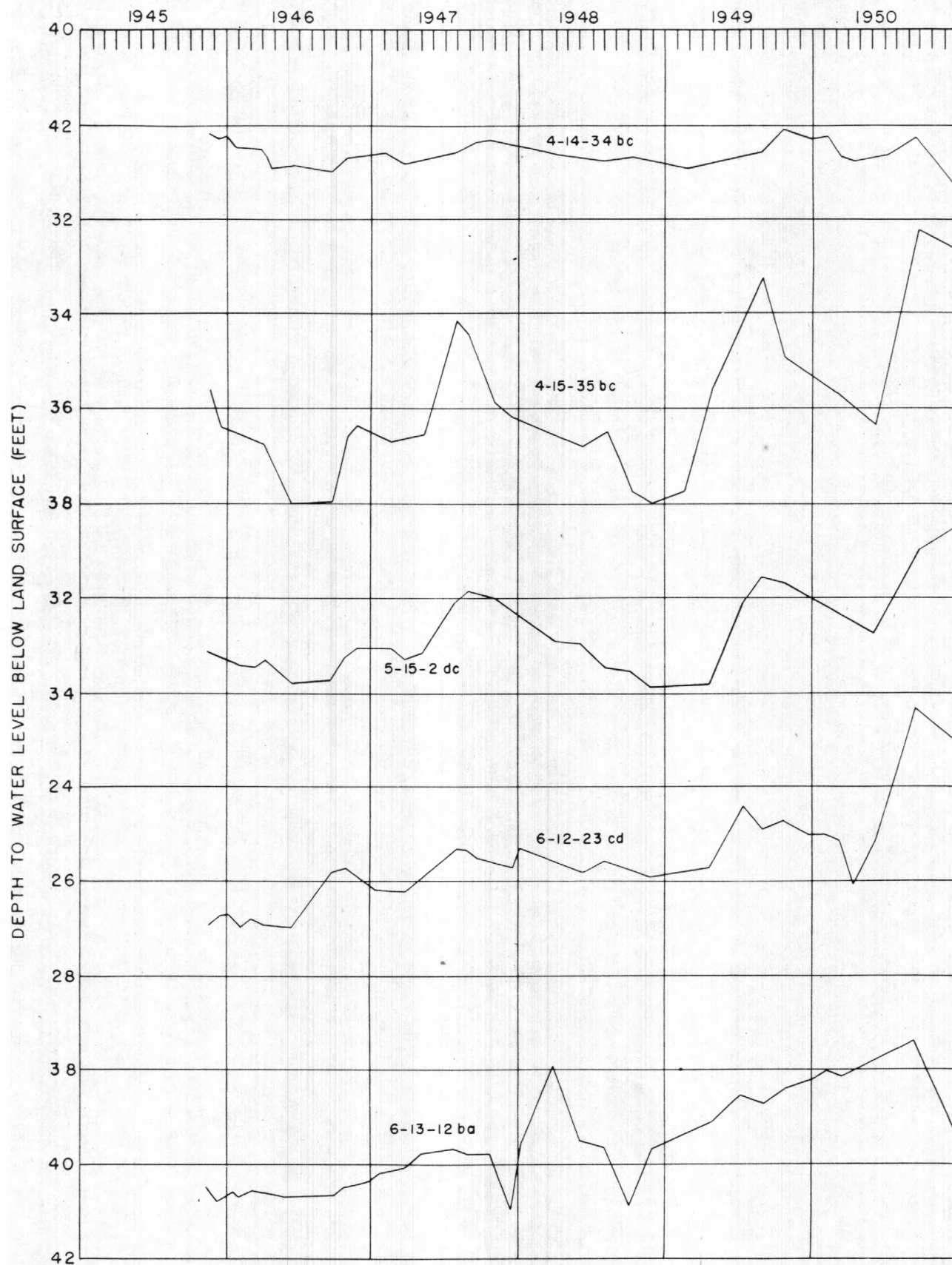


Figure 11.—Hydrographs of five wells, Kirwin unit

As a continuation of the observation-well program that was initiated in 1946, periodic measurements of the water level in 17 wells were made in 1950. The highest and lowest water levels for the period of record are given in table 29; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 30; and the water-level measurements that were made in 1950 are given in table 31. Hydrographs of five wells are shown in figure 12.

Table 29.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 18 wells in the St. Francis unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
1-38-1cd	3	21.90	June 8, 1949	23.09	Oct. 5, 1948
-8dd	5	11.24	Feb. 25, 1947	a 14.83	Aug. 2, 1949
			June 8, 1947		
-17cd	5	11.32	June 8, 1949	12.57	Oct. 5, 1948
2-39-2cb	5	12.42	Sept. 11, 1950	19.03	Mar. 28, 1946
-10bb	4	25.57	July 29, 1947	27.10	Aug. 3, 1948
-17ba	4	10.38	June 8, 1947	12.56	Sept. 7, 1947
-27bb	5	17.08	July 29, 1947	19.50	Mar. 27, 1946
2-40-25db	3	15.52	Aug. 2, 1949	16.45	Oct. 5, 1948
3-39-6aa b/	5	4.94	June 8, 1949	8.73	Dec. 5, 1947
3-40-9ba	5	11.69	Feb. 25, 1947	13.10	Sept. 7, 1947
-22ab	5	10.02	July 29, 1947	15.18	Mar. 9, 1946
-28bd	5	10.02	Mar. 20, 1946	12.75	Aug. 16, 1946
-33dd	5	11.90	July 29, 1947	14.50	Mar. 4, 1946
3-41-13cc	5	7.83	Nov. 16, 1949	15.78	Aug. 16, 1946
4-41-2aa	5	20.04	July 12, 1950	28.53	Oct. 4, 1949
-32dd	5	113.31	Nov. 10, 1950	114.76	Aug. 16, 1946
4-42-24ca	5	24.50	June 8, 1949	25.89	Sept. 7, 1947
5-42-4aa	5	21.83	Dec. 5, 1947	23.68	Aug. 2, 1949

a Pumped recently.

b/ Well destroyed.

Table 30.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 18 wells in the St. Francis unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
1-38-1cd	1.19	-0.21	-0.30
-8dd	a 3.59	+0.06	-.08
-17cd	1.25	-.08	-.48
2-39-2cb	6.61	+1.35	+5.80
-10bb	1.53	+0.75	-.28
-17ba	2.18	+0.61	-.22
-27bb	2.42	+0.39	+1.80
2-40-25db	.93	+0.10	-.21
3-39-6aa b/	3.79	.....	+0.06
3-40-9ba	1.41	+0.13	+0.02
-22ab	5.16	+2.19	+4.08
-28bd	2.73	+0.27	-1.06
-33dd	2.60	+0.04	+1.28
3-41-13cc	7.95	+0.57	+4.85
4-41-2aa	8.49	-5.38	-1.75
-32dd	1.45	+1.14	+1.39
4-42-24ca	1.39	+0.22	+0.82
5-42-4aa	1.85	.....	+0.20

a. Pumped recently.

b/ Well destroyed.

Table 31.--Water-level measurements, in feet below land-surface datum, in the St. Francis unit, 1950.

1-38-1cd. July 12, 22.58; Sept.11, 22.85; Nov. 10, 22.79.

1-38-8dd. July 12, 12.66; Sept.11, 12.73; Nov. 10, 12.60.

1-38-17cd. July 12, 12.14; Sept.11, 12.22.

2-39-2cb. July 12, 14.58; Sept.11, 12.42; Nov. 10, 13.23.

2-39-10bb. Sept.11, 26.78; Nov. 10, 26.03.

2-39-17ba. July 12, 11.86; Sept. 11, 11.28; Nov. 10, 11.25.

Table 31.--Water-level measurements, in feet below land-surface datum,
in the St. Francis unit, 1950--Continued

2-39-27bb. July 12, 18.09; Sept.11, 16.79; Nov. 10, 17.70.

2-40-25db. July 12, 16.08; Sept.11, 15.97; Nov. 10, 15.98.

3-40-9ba. July 12, 12.41; Sept.11, 12.53; Nov. 10, 12.28.

3-40-22ab. July 12, 13.29; Sept.11, 12.10; Nov. 10, 11.10.

3-40-28bd. July 12, 11.35; Sept.11, 11.08; Nov. 10, 11.08.

3-40-33dd. July 12, 13.26; Sept.11, 12.81; Nov. 10, 13.22.

3-41-13cc. July 12, 10.42; Sept.11, 8.13; Nov. 10, 9.85.

4-41-2aa. July 12, 20.04; Nov. 10, 25.42.

4-41-32dd. July 12, 114.45; Nov. 10, 113.31.

4-42-24ca. July 12, 25.18; Nov. 18, 24.96.

5-42-4aa. Dec. 2, 23.22.

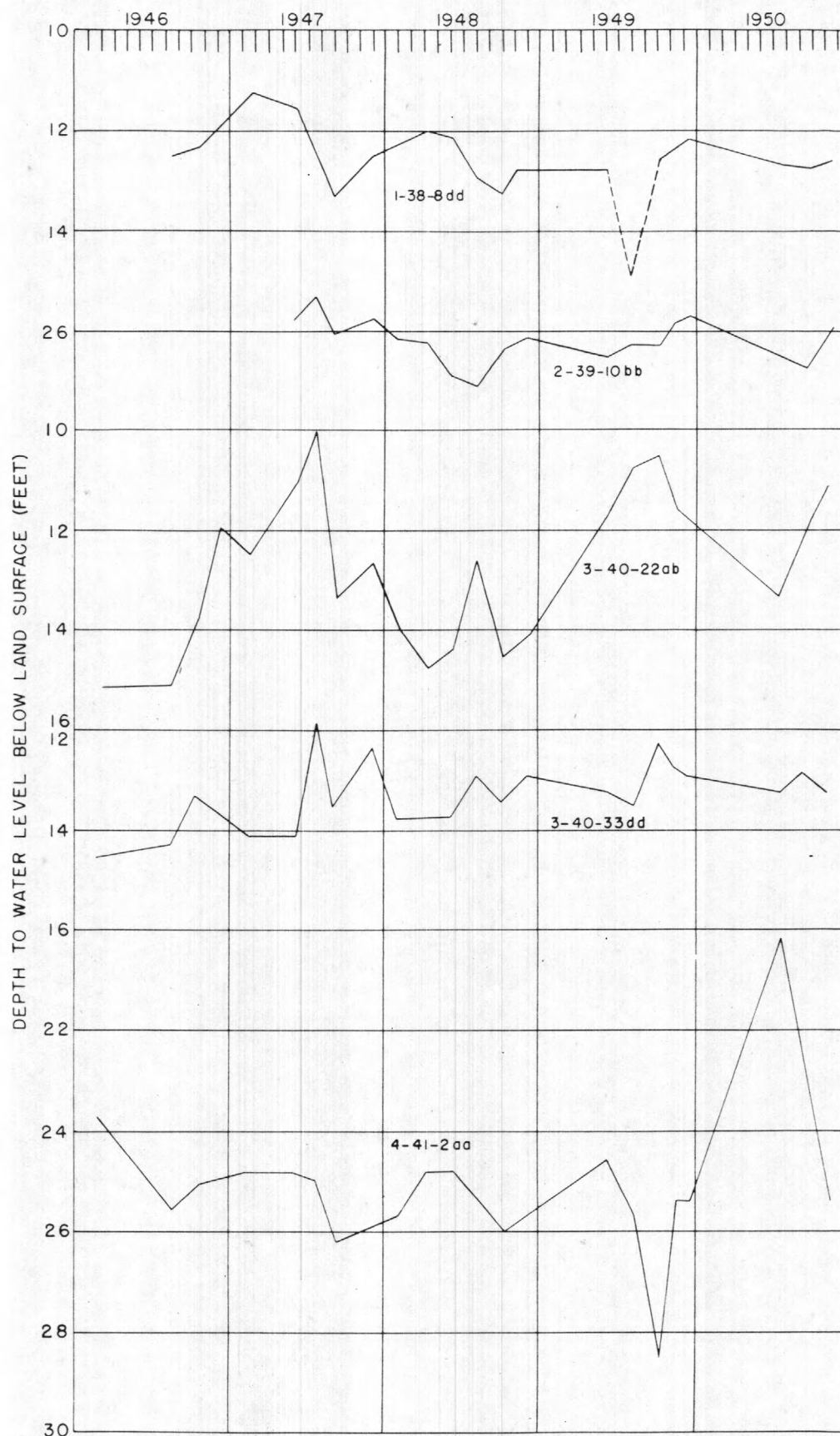


Figure 12.—Hydrographs of five wells, St. Francis unit

Periodic measurements of the water levels have been made since 1946 in eight observation wells in the valley of the South Fork of the Solomon River in Osborne County. The highest and lowest water levels for the period of record are given in table 32; the difference between the highest and lowest water levels, the net rise or decline in 1950, and the net rise or decline for the period of record are given in table 33; and the water-level measurements made in 1950 are given in table 34. Hydrographs of five wells are shown in figure 13.

Table 32.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 8 wells in the Webster unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
7-11-21da	4	29.42	Sept. 21, 1950	34.25	May 26, 1950
-26aa	4	13.85	May 26, 1950	26.42	Nov. 15, 1950
7-12-28ab	4	29.72	Sept. 21, 1950	34.60	Jan. 7, 1947
7-13-15da	4	35.79	Sept. 21, 1950	a 38.94	Sept. 30, 1947
7-14-6cb	4	22.22	Nov. 15, 1950	24.19	Nov. 29, 1948
-10dd	4	29.93	Sept. 21, 1950	32.22	Feb. 4, 1947
7-15-8cc	4	14.80	May 26, 1950	27.75	Apr. 14, 1950
-12dc	4	10.60	June 29, 1949	23.85	Apr. 12, 1950

a Well pumped recently.

Table 33.--Difference between highest and lowest recorded water levels, net change in water level in 1950, and net change in water level for period of record, in feet, in 8 wells in the Webster unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
7-11-21da	4.83	+3.36	+4.01
-26aa	12.57	-4.23	-6.62
7-12-28ab	4.88	+2.45	+3.62
7-13-15da	3.15	+1.33	-.10
7-14-6cb	1.97	+1.42	+1.48
-10dd	2.29	+1.26	+2.31
7-15-8cc	12.95	+1.53	+1.59
-12dc	13.25	+9.97	+1.41

Table 34.--Water-level measurements, in feet below land-surface datum, in the Webster unit, 1950

7-11-21da.

Date	Water level	Date	Water level	Date	Water level
Feb. 7	32.78	May 26	34.25	Measurements discontinued	
Mar. 8	32.89	Sept. 21	29.42		
Apr. 12	33.17				

7-11-26aa.

Feb. 7	22.19	Apr. 12	14.93	Sept. 21	17.22
Mar. 8	22.34	May 26	13.85	Nov. 15	26.42

7-12-28ab.

Feb. 7	32.67	Apr. 12	32.87	Sept. 21	29.72
Mar. 8	33.30	May 26	31.70	Nov. 15	30.22

7-13-15da.

Feb. 7	38.23	Apr. 12	38.47	Sept. 21	35.79
Mar. 9	38.38	May 26	38.80	Nov. 15	36.90

7-14-6cb.

Feb. 7	23.64	Apr. 12	23.50	Sept. 21	22.29
Mar. 8	23.21	May 26	23.45	Nov. 15	22.22

7-14-10dd.

Feb. 7	31.36	Apr. 12	31.45	Sept. 21	29.93
Mar. 8	31.58	May 26	31.45	Nov. 15	30.10

7-15-8cc.

Feb. 7	23.23	Apr. 12	27.75	Sept. 21	21.99
Mar. 8	25.78	May 26	14.80	Nov. 15	21.70

7-15-12dc.

Feb. 7	20.90	Apr. 12	23.85	Sept. 21	10.93
Mar. 8	22.73	May 26	23.52		

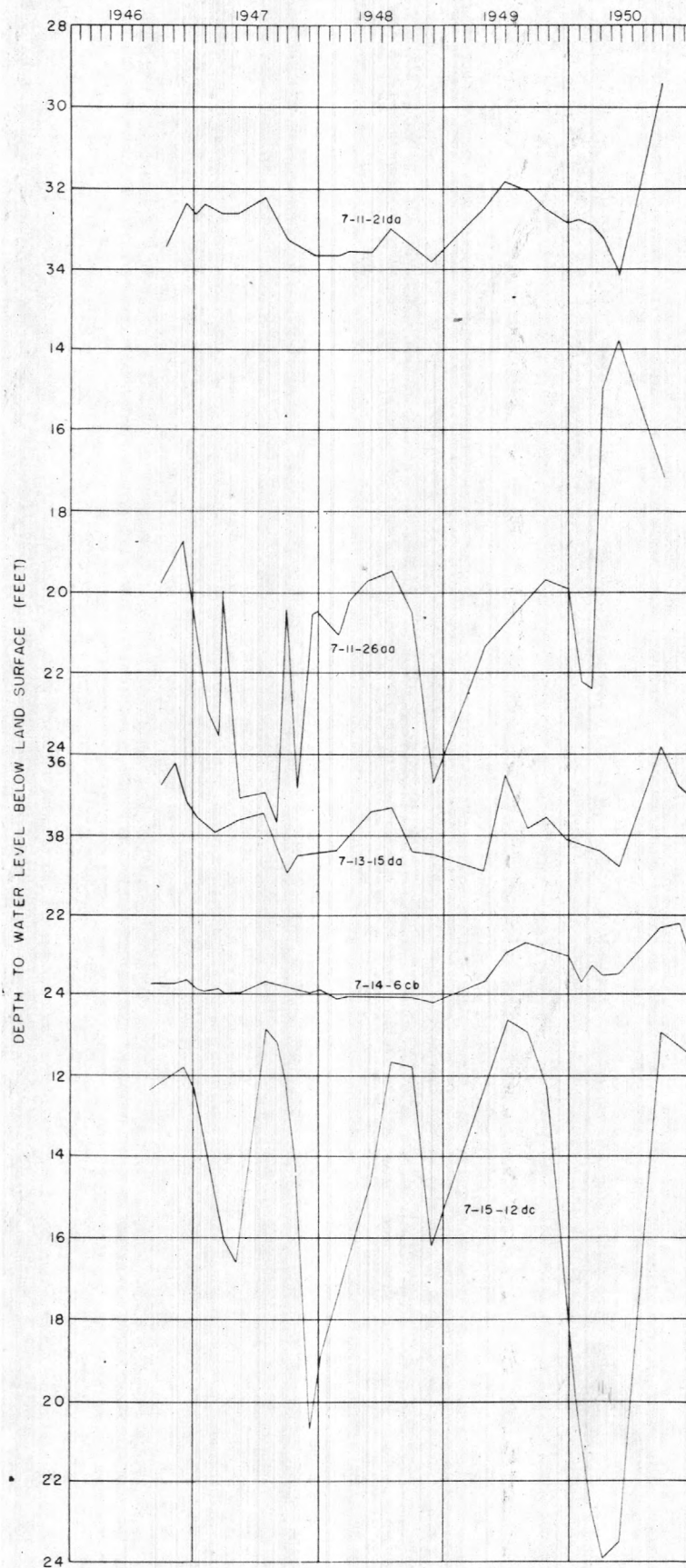


Figure 13 - Hydrographs of five wells, Webster unit

Measurements of the water level in 15 wells have been made periodically since 1947. The highest and lowest water levels for the period of record are given in table 35; the difference between the highest and lowest recorded water levels, the net rise or decline of the water level in 1950, and the net rise or decline of the water level for the period of record are given in table 36; and the water-level measurements that were made in 1950 are given in table 37. Hydrographs of five wells are shown in figure 14.

Table 35.--Highest and lowest water levels for the period of record, in feet below land-surface datum, in 15 wells in the Wilson unit

Well number	Length of record (years)	Highest water level	Date	Lowest water level	Date
11-7-32dc	4	72.90	Mar. 7, 1950	74.67	Sept. 8, 1947
12-6-12cd	4	11.64	Aug. 9, 1948	15.72	Jan. 12, 1948
-16cc	4	19.00	Sept. 20, 1950	24.87	Nov. 28, 1947
12-7-18aa	4	18.97	Sept. 20, 1950	23.55	May 26, 1950
-19dd	4	9.80	July 11, 1949	13.18	Jan. 12, 1948
-23aa	4	8.36	Apr. 26, 1949	13.43	Jan. 12, 1948
-34ad	4	49.10	Mar. 7, 1950	50.84	Feb. 21, 1947
12-8-6aa	4	5.92	Apr. 28, 1947	10.53	Sept. 8, 1947
-8cd	4	10.30	Sept. 20, 1950	14.30	Jan. 12, 1948
-11cb	4	14.89	Sept. 20, 1950	19.41	Mar. 7, 1950
12-9-10ad	4	17.85	May 26, 1950	20.26	Jan. 12, 1948
12-10-8bb	4	13.50	Sept. 20, 1950	16.58	Jan. 12, 1948
-13aa	4	16.92	July 11, 1949	24.48	Jan. 12, 1948
-17ab	4	23.70	Sept. 20, 1950	28.49	Dec. 7, 1948
-21dd	4	25.56	Sept. 20, 1950	27.85	Apr. 26, 1949

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Table 36.--Difference between highest and lowest water levels, net change in water level in 1950, and net change in water level for the period of record, in feet, in 15 wells in the Wilson unit

Well number	Difference between highest and lowest water level	Net rise (+) or net decline (-) in 1950	Net rise (+) or net decline (-) for period of record
11-7-32dc	1.77	+0.30	+0.39
12-6-12cd	4.08	-1.79	-.96
-16cc	5.87	+3.25	+1.36
12-7-18aa	4.58	+2.40	-.13
-19dd	3.38	+1.85	+1.90
-23aa	5.07	+.72	+2.33
-34ad	1.74	+.45	+.79
12-8-6aa	4.61	+2.18	+.22
-8cd	4.00	+2.70	+2.53
-11cb	4.52	+1.78	+.92
12-9-10ad	2.41	+1.17	+1.70
12-10-8bb	3.08	+1.47	+2.20
-13aa	7.56	+2.57	+5.85
-17ab	4.79	-.37	+2.09
-21dd	2.29	+1.30	+1.07

Table 37.--Water-level measurements, in feet below land-surface datum, in the Wilson unit, 1950

11-7-32dc.

Date	Water level	Date	Water level	Date	Water level
Feb. 6	74.25	Apr. 11	73.99	Sept. 20	73.62
Mar. 7	72.90	May 26	73.98	Nov. 20	73.95

12-6-12cd.

Feb. 6	12.76	Mar. 7	14.40	July 24	14.55
21	14.72	Apr. 21	14.47		

12-6-16cc.

Feb. 6	23.07	Apr. 11	24.70	Nov. 19	19.82
Mar. 7	22.10	Sept. 20	19.00		

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Table 37.--Water-level measurements, in feet below land-surface datum, in the Wilson unit, 1950--Continued

12-7-18aa.

Date	Water level	Date	Water level	Date	Water level
Feb. 6	23.15	Apr. 11	23.50	Sept. 20	18.97
Mar. 7	23.36	May 26	23.55	Nov. 20	20.75

12-7-19dd.

Feb. 6	12.55	Apr. 11	12.13	Sept. 20	11.14
Mar. 7	12.30	May 26	12.28	Nov. 19	10.70

12-7-23aa.

Feb. 6	11.79	Apr. 11	11.80	Nov. 19	11.07
Mar. 7	12.20	May 26	11.85		

12-7-34ad.

Feb. 6	50.50	Apr. 11	50.61	Sept. 20	50.40
Mar. 7	49.10	May 26	50.50	Nov. 19	50.05

12-8-6aa.

Feb. 6	8.30	Apr. 11	8.40	Sept. 20	6.18
Mar. 7	8.38	May 26	8.45	Nov. 20	6.12

12-8-8cd.

Feb. 6	13.84	Apr. 11	14.13	Sept. 20	10.30
Mar. 7	13.76	May 26	13.18	Nov. 20	11.14

12-8-11cb.

Feb. 6	19.23	Apr. 11	17.90	Sept. 20	14.89
Mar. 7	19.41	May 26	18.60	Nov. 20	17.45

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Table 37.--Water-level measurements, in feet below land-surface datum, in the Wilson unit, 1950--Continued

12-9-10ad.

Date	Water level	Date	Water level	Date	Water level
Feb. 6	19.08	Apr. 11	18.59	Sept. 20	18.28
Mar. 7	19.24	May 26	17.85	Nov. 20	17.91

12-10-8bb.

Feb. 6	15.47	Apr. 11	15.90	Sept. 20	13.50
Mar. 7	15.55	May 26	16.00	Nov. 20	14.00

12-10-13aa.

Feb. 6	20.80	Apr. 11	21.98	Sept. 20	18.15
Mar. 7	21.40	May 26	22.00	Nov. 20	18.23

12-10-17ab. Sept. 20, 23.70; Nov. 20, 24.07.

12-10-21dd.

Feb. 6	27.10	Apr. 11	27.39	Sept. 20	25.56
Mar. 7	26.98	May 26	27.40	Nov. 20	25.80

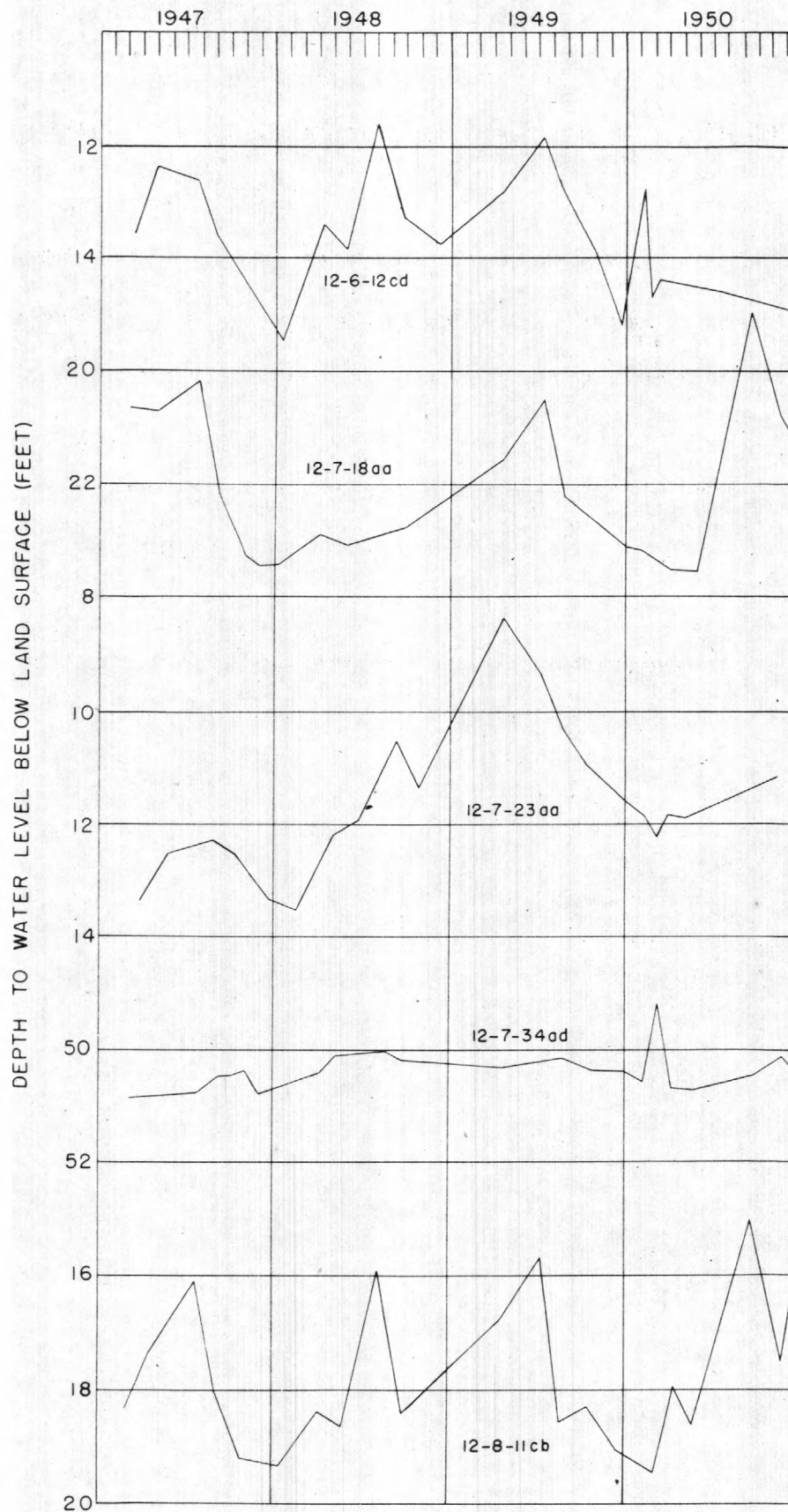


Figure 14.-Hydrographs of five wells, Wilson unit

