UNITED STATES DEPARTMENT OF THE INTERIOR

WATER LEVELS AND ARTESIAN PRESSURE IN OBSERVATION WELLS IN THE UNITED STATES IN 1940

PART 3. NORTH-CENTRAL STATES

Prepared in cooperation with the States of
IOWA, KANSAS, MINNESOTA, MISSOURI, NEBRASKA
NORTH DAKOTA, SOUTH DAKOTA, and WISCONSIN
and other agencies

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 908

UNITED STATES DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary

GEOLOGICAL SURVEY
W. C. Mendenhall, Director

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BY

O. E. MEINZER, L. K. WENZEL
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INTRODUCTION

By O. E. Meinzer and L. K. Wenzel

The rock formations of the earth are great natural underground reservoirs in which a part of the water derived from rain and snow is stored to supply wells and springs and to maintain the flow of streams during periods of fair weather. Water levels in wells register the stages of these natural reservoirs; they show the extent to which water supplies are depleted by drought or by heavy pumping for public waterworks, for irrigation, or for industrial uses and the extent to which they are replenished in seasons of abundant rainfall or melting snow. The changes in pressure recorded on flowing wells may indicate depletion or replenishment of the artesian reservoirs.

The regular publication of records of water levels and artesian pressure in the United States was begun by the Geological Survey in 1935, and from that year through 1939 one volume containing these data was published each year. The volumes were issued as Water-Supply Papers 777, 817, 840, 845, and 886. This series of reports is in a sense an inventory, year by year, of the ground-water supplies of those parts of the country that it covers. The number of observation wells and the quantity of records on water levels and artesian pressure obtained from them have increased gradually from year to year. As a result it has been deemed advisable to publish the records for 1940 in six volumes, each volume containing records for one of the sections into which the United States has been divided. (See fig. 1.) The present volume covers the north-central section and gives records of water level or artesian pressure in about 1,340 observation wells in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin that were obtained by the Geological Survey and cooperating agencies. About 28 of these wells are equipped with automatic water-stage recorders. For some wells for which records had not heretofore been published complete records of water levels are given in this report, including those for years before 1940. For wells whose previous records have been published, however, this volume gives only current records. If complete descriptions of the wells were given in one of the previous reports, only the well numbers or the well numbers and brief identifying descriptions are given in this report.

The report includes about 19,550 individual measurements of water level or artesian pressure.

The water levels in this report are given with reference to datum planes of different kinds. Some are given in depth below the measuring point,--that is, below the recognized reference mark, at or near the top of the well, from which the depth to water level is usually measured; and some are given in height above an assumed datum plane. As the measuring points on some of the wells were changed in 1940, the records may not be directly comparable with those in previous annual volumes, but changes in measuring points are recorded in this report. Water levels given in height above sea level or above assumed datum planes are generally comparable with those given in the previous volumes. Unless otherwise stated, the depth of wells is usually the measured depth below the measuring point.

Acknowledgments for effective services in the preparation of this report are due Mrs. Charlotte P. Berger and Misses Dorothy M. Ireland, Ermelinda F. Mattera, and Goree M. Pellen, who typed the offset copy; and to Rodney Hart, who prepared many of the illustrations and gave other assistance in preparing the copy.

GENERAL SUMMARY OF CHANGES IN GROUND-WATER LEVEL IN 1940 IN THE NORTH-CENTRAL PART OF THE UNITED STATES

The precipitation in Minnesota, North Dakota, and Wisconsin was above normal in 1940, but in Iowa, Kansas, Missouri, Nebraska, and South Dakota it was below normal. Not all of the wells, however, had changes in water level that correspond to these moisture conditions. The fluctuations of water level and artesian pressure in observation wells depend upon many complex factors, such as the distribution and amount of precipitation, location of outcrop areas of the water-bearing formations, permeability and specific yield of the water-bearing materials, depth of the water table below the land surface,and proximity of the observation wells to areas of heavy withdrawals. Consequently, it is usually not possible to find a simple relation between the changes in water level or artesian pressure and the departures from normal precipitation. The fluctuations that occur in each observation well or group of similar wells must be studied separately in order to evaluate the effects of the many factors influencing them. It is not ordinarily possible to make general statements regarding changes in ground-water levels that will apply over large areas. The following

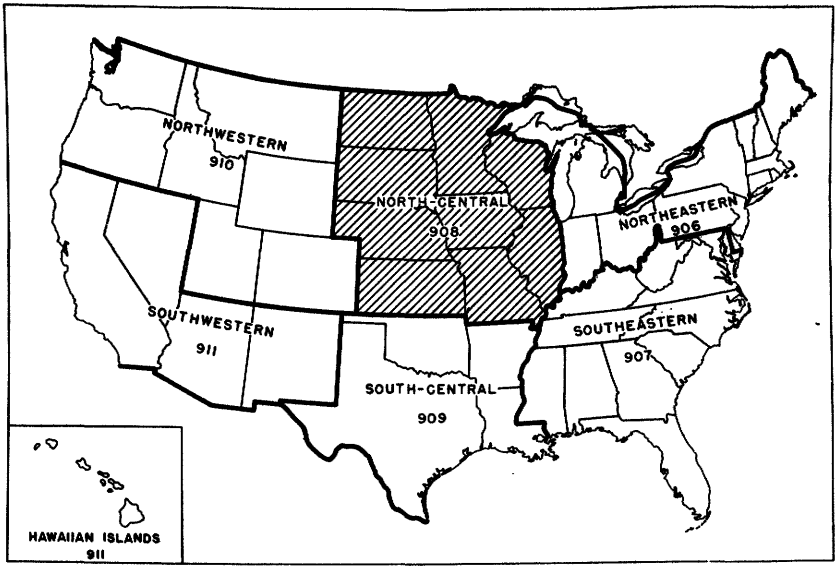

Figure 1.--Outline map of the United States, showing sections of the country covered by the six water-supply papers on water levels and artesian pressure in observation wells in 1940. The shaded section represents the part of the country covered by this volume.

summaries are taken chiefly from the interpretive texts of the several State sections in this volume. They note very briefly the changes in ground-water levels or artesian pressure that occurred in 1940 in the parts of the underground reservoirs in the north-central States that the observation wells tap.

Iowa.--The average of the water levels in observation wells in Page and Montgomery Counties rose about 1.4 feet in 1940. At the end of the year the average was 0.6 foot above the average stage at the end of 1934.

Kansas.--Of 271 representative wells with records of more than 1 year, the water levels declined during 1940 in 172 wells, rose in 98 wells, and the water level in 1 well was unchanged.

The water levels in most of the observation wells in four western counties (Finney, Ford, Hamilton, and Stanton) rose during the year. The precipitation was above normal in only 2 of these counties, but it was above the average of the precipitation for the last 5 to 10 years in each of them. In 9 other counties of central and western Kansas, however, the water levels in most wells declined slightly during the year despite the fact that in 4 of the counties the precipitation was above normal.

The water levels in 31 of 38 wells under observation in Jewell County showed net declines in 1940 ranging from 0.41 foot to 12.31 feet. Thirty-four of the wells have been observed periodically since 1934. The water levels in 21 of the wells were higher and the water levels in 13 of the wells were lower at the end of 1940 than when measurements were begun in 1934.

The water level in a key observation well in Scott County declined 1.15 feet in 1940. The record on this well extends back to 1931 and shows that there has been a slow but persistent downward trend of the water level since measurements were begun. The net decline in water level in the period of record has been about 4.4 feet. The well is situated in an area where heavy withdrawals are made from wells for irrigation.

Nebraska.--The average of the water levels in 133 key observation wells distributed over the State declined 0.18 foot in 1940. It is estimated that this decline represents a net loss in ground-water storage in Nebraska of about 1,300,000 acre-feet of water. At the end of 1940 the averages of the water levels in all sections of the State were lower than at the end of 1934, during which year observations on most of the wells were begun. The average net decline in ground-water level over the State in the 6-year period was 0.56 foot.

Observations on the water level in a key well in the Platte River Valley about midway between Grand Island and Kearney have been made since 1930. The record of this well indicates that there has been a general downward trend of the water level during the 10-year period of record. The net decline of the water level in the period has been about 4 feet. During this time the precipitation has been about 68 inches below normal.

North Dakota.--Water levels in observation wells continued the gradual decline in 1940 that has been in progress since measurements were begun in 1937. The average of the water levels in 25 key wells distributed over the State was 0.39 foot lower at the end of the year than at the end of 1939. The water levels in 20 of the key wells stood lower at the end of 1940 than at the beginning of the year and the water levels in 5 of the key wells stood higher at the end than at the beginning of the year. The average of the water levels declined 1.13 feet in the 3-year period ending December 1940.

South Dakota.--The average of the water levels in a group of 24 observation wells in southeastern South Dakota was 0.39 foot higher at the end of 1940 than at the end of 1939. The wells are mostly shallow wells that tap water in glacial drift or alluvium.

Wisconsin.--Water levels in wells in the Coon Creek area, in La Crosse, Monroe, and Vernon Counties, fluctuated through a comparatively small range in 1940 and ended the year at about the same stages as they had at the beginning of the year. The average of the water levels in the wells on December 31, 1940 was about 0.6 foot higher than on December 31, 1934.

IOWA

STATE-WIDE PROJECT

By T. W. Robinson

The cooperative investigation of the ground-water resources of Iowa (see Water-Supply Paper 886) was continued in 1940 by the Federal Geological Survey and the Iowa Geological Survey. The chief purpose of the investigation is to obtain records of water levels in wells and data on past and present pumpage of water from the water-bearing formations of the State. The cooperative studies, started in the fall of 1938, were expanded during 1940, and Mr. A. L. Detweiler, junior engineer of the Federal Survey, was assigned to the investigation.

About 1,100 individual measurements of water level were made in 106 observation wells in 1940. This is an increase of about 950 water level measurements and 74 observation wells over 1939. Six of the wells under observation in 1939 were not measured in 1940, and measurements in 4 wells were discontinued. Water levels in many of the wells were measured once or twice a month, but in some wells they were measured less frequently, and in a few wells measurements were made only once in the year. During 1940, water-stage recorders were maintained for periods ranging from 2 to 12 months on 7 wells. Five water-stage recorders were in operation at the end of the year. In addition to the regular observation-well measurements, numerous measurements of water level and artesian pressure were made on other wells whenever the opportunity afforded.

Over half the observation wells tap water in glacial drift or in alluvial deposits; the rest of the wells tap water in underlying bed rock. The water in many of the wells is under artesian pressure, but in only one well is the pressure sufficient to cause the well to flow at the surface. Some of the wells are pumped for domestic, stock, or public use, and the water levels in a few of the wells are affected by pumping of other wells nearby.

The observation wells that tap water in glacial drift or in alluvial deposits are mostly shallow wells situated in groups of 2 to 9 wells, such as in Adair, Buena Vista, Calhoun, Cerro Gordo, Linn, Palo Alto and Marion Counties. The deeper wells, which tap water in the underlying bed rock are situated, with one exception, either singly or in pairs. Most of the deep wells are in or near cities or villages and the water levels in them may be affected by pumping. At Cedar Rapids,

in Linn County, the water levels in a group of 13 wells that tap water in the bedrock have been measured regularly since the spring of 1940.

Considerable progress was made in 1940 on the collection of data on past and present pumpage of water from underground sources, particularly pumpage by municipalities. This work is done through the cooperation of water superintendents who furnish past records and keep current records of pumpage. During 1940, members of the State and Federal Surveys made about 20 pumping tests for the purpose of determining the water-yielding capacities of wells and water-bearing formations.

In the spring of 1940, regular measurements of water level were started in a group of 13 wells that tap water in the bed rock at Cedar Rapids. The municipal water supply of Cedar Rapids is taken from the Cedar River but a considerable quantity of ground water is pumped for industrial use and for air conditioning, particularly in the summer months. The purpose of the water-level measurements is to determine the effect of the pumpage on the ground-water levels.

In the winter and spring of 1940 periodic measurements of water level were started in cooperation with the Soil Conservation Service in three groups of shallow wells that tap water in glacial drift, and which are in areas covered by projects of the Soil Conservation Service in Adair, Linn, and Marion Counties. The measurements of water levels in wells in Adair and Marion Counties were made in part by the Soil Conservation Service; the measurements in Linn County were made by the Soil Conservation Service until the middle of August, and thereafter by the Federal Survey.

Periodic measurements of water level were started in groups of wells near Storm Lake in Buena Vista County, Twin Lakes in Calhoun County, Clear Lake in Cerro Gordo County, and Lost Island Lake in Clay and Palo Alto Counties.

Figure 2 shows the fluctuations of water level in two wells that penetrate the Dakota sandstone at Sioux City, Iowa. Well 89-47-22B1 (Lowell 4) is in the Lowell well field at Sioux City and the water level in it is affected by heavy pumping for the municipal supply of Sioux City. Well 89-48-23B1 (Riverside west) is about 5 miles west of well 89-47-22B1 in an area from which only very little or no water is pumped. The fluctuations of water level in well 89-47-22B1 are much larger than the fluctuations in well 89-48-23B1, but the water levels in both wells have downward trends. In general, the water level in well 89-47-22B1 reaches a seasonal low stage in the summer or early fall when pumping is heaviest, and then recovers during the fall and winter months when pumping is lighter. The fluctuations of water level in well 89-48-23B1 during the fall and winter of 1939-40 were somewhat similar to those in well 89-47-22B1. The rise of water level in June 1940 is believed to have been caused by the high stages of the nearby Missouri and Big Sioux Rivers, which, locally at least, may recharge the Dakota sandstone.

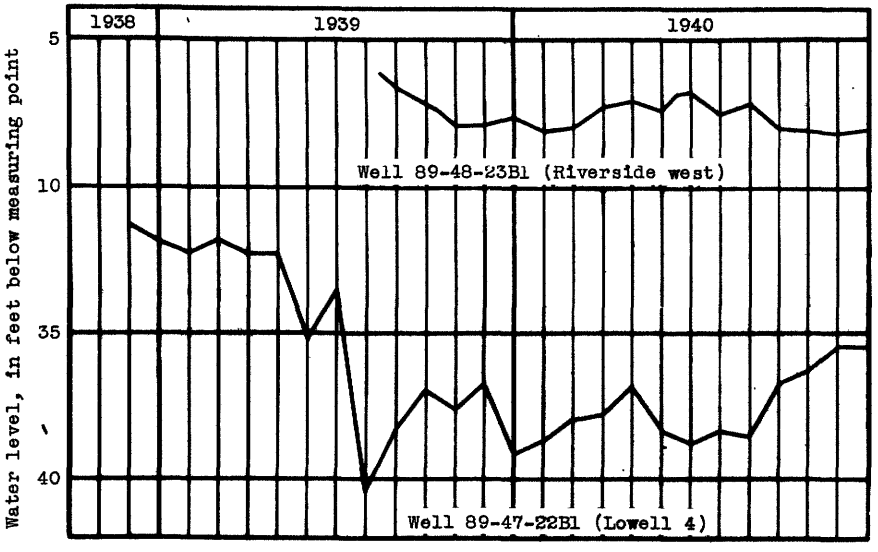

Figure 2.--Graphs showing fluctuations of water level in wells penetrating the Dakota sandstone near Sioux City, Iowa.

According to records of the United States Weather Bureau, the precipitation in Iowa in 1940 was nearly normal, amounting to about 97.5 percent of the 68-year average. The distribution throughout the year, however, varied considerably. The precipitation from January through April was nearly normal. For May and June, however, the precipitation was 3.01 inches, or about 65 percent below the 68-year average, whereas for July and August it was 3.73 inches, or about 50 percent above the 68-year average. August 1940 was the fourth wettest August on record, whereas September 1940 was the fourth driest September on record. Precipitation for September was only 0.94 inch, or about 25 percent of the 68-year average. For the remainder of the year the precipitation was nearly normal. Two exceptionally heavy rain storms occurred during the year, one in northwestern Iowa in June and the other in north-central Iowa in July.

Records for the 106 observation wells are listed alphabetically by county name on the following pages. All water levels are expressed in feet above or below the measuring points.

Adair County

76-31-21R1. John Breheny. SE¼SE¼ sec. 21, T. 76 N., R. 31 W. Domestic bored well, diameter 12 inches, depth 40 feet. Measuring point, top of tile casing 0.4 foot above land surface. Taps water in glacial drift.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 17	24.72	June 19	23.35	Aug. 15	20.76	Dec. 4	20.88
May 9	a 11.20	Aug. 2	a 22.35	Sept.24	21.18		
June 11	a 11.70	12	a 23.25	Oct. 22	a 25.65		

76-31-25R1. Harold Bochart. SE¼SE¼ sec. 25, T. 76 N., R. 31 W. Stock dug well, diameter 36 inches, depth 20 feet. Measuring point, top of brick curb 0.6 foot above land surface.

Water level, in feet below measuring point, 1940

Mar. 18	4.67	June 11	a 7.45	Aug. 12	a 7.40	Oct. 22	a 7.76
Apr. 16	7.08	19	7.61	15	4.25	Dec. 4	7.97
May 9	a 6.86	Aug. 1	a 5.68	Sept. 24	7.35		

75-31-15B1. John E. Soderberg. NW¼NE¼ sec. 15, T. 75 N., R. 31 W. Unused dug well, diameter 36 inches, depth 15.7 feet. Measuring point, top of concrete curb, 0.3 foot above land surface. Taps water in glacial drift.

Water level, in feet below measuring point, 1940

Mar. 11	a 12.15	May 7	a 10.81	Aug. 1	a 6.53	Sept.24	6.33
Apr. 16	a 10.98	June 18	a 9.25	12	a 5.72	Oct. 22	a 7.92
17	11.01	19	9.23	15	4.20	Dec. 4	9.75

75-31-18B1. Charles Gilham. NW¼NE¼ sec. 18, T. 75 N., R. 31 W. Unused bored well, diameter 12 inches, depth 35.5 feet. Measuring point, top of wood well platform at 1-inch hole at land surface. Taps water in glacial drift.

Water level, in feet below measuring point, 1940

Apr. 17	9.94	June 19	10.65	Aug. 15	8.58	Dec. 4	9.82
May 22	9.97	Aug. 2	a 10.91	Sept. 24	12.17		
June 18	a 10.48	13	a 10.18	Oct. 23	a 12.86		

75-30-8A1. Edward Snethen and Ernest Miller. NE¼NE¼ sec. 8, T.75 N., R. 30 W. Stock dug well, diameter 30 inches, depth 30 feet. Measuring point, top of plank well platform. 1.1 feet above land surface. Taps water in glacial drift.

Water level, in feet below measuring point, 1940

Feb. 28	22.40	May 21	7.14	Aug. 12	a 9.57	Oct. 22	a 11.30
Apr. 16	12.80	June 19	8.78	15	6.40	Dec. 4	8.80
May 7	a 10.26	Aug. 1	a 7.75	Sept.24	11.42		

Benton County

85-10-16M3. Owner's number 3. City of Vinton. NW¼SW¼ sec. 16, T. 85 N., R. 10 W. Measurement by R. G. Miller, water superintendent. Water level affected by pumping. Water level, in feet below measuring point, 1940: Mar. 19, 29.33.

Buena Vista County
(Vicinity of Storm Lake)

91-37-32E1. SW¼NW¼ sec. 32, T. 91 N., R. 37 W. Dug well, diameter 30 inches, depth 20.5 feet. Measuring point, top of concrete tile casing 1.0 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
June 26	4.99	Oct. 2	6.70	Dec. 12	5.38
July 30	5.84	Nov. 20	5.92		

a Measurement made by Soil Conservation Service.

Buena Vista County--Continued.

90-37-3E1. Emil Schmitz. SW¼NW¼ sec. 3, T. 90 N., R. 37 W. Unused bored well, diameter 8 inches, depth 14.5 feet. Measuring point, top of concrete curb, 0.2 foot above land surface. Water levels, in feet below measuring point, 1940: June 26, 8.73; July 30, 9.47; October 2, 14.42; Nov. 20, 14.17.

90-37-3M1. L. B. Watt. NW¼SW¼ sec. 3, T. 90 N., R. 37 W. Unused well, depth 24.2 feet. Measuring point, top of well platform at ⅛-inch hole, 0.6 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
June 27	21.84	Oct. 1	20.86	Nov. 20	21.78
July 30	20.78	26	21.54	Dec. 12	22.06

90-37-11J1. U. S. Geological Survey. NE¼SE¼ sec. 11, T. 90 N., R. 37 W. Observation bored well, diameter 3 inches, depth 6.3 feet. Measuring point, top of casing, 0.6 foot above land surface.

Water level, in feet below measuring point, 1940

June 27	4.75	Oct. 3	5.36	Dec. 12	3.80
July 30	4.38	Nov. 20	4.58		

90-37-22J1. William Monteful. NE¼SE¼ sec. 22, T. 90 N., R. 37 W. Unused well, diameter 30 inches, depth 51 feet. Measuring point, top of concrete curb 1.0 foot above land surface.

Water level, in feet below measuring point, 1940

June 26	33.28	Oct. 2	33.98	Dec. 13	34.59
July 30	33.50	Nov. 20	34.44		

90-37-23D1. Biggins Bros. NW¼NW¼ sec. 23, T. 90 N., R. 37 W. Unused well, diameter 30 inches, depth 29 feet. Measuring point, top of concrete tile casing, 1.3 feet above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

June 26	26.29	Oct. 2	27.21	Dec. 12	27.53
July 30	26.43	Nov. 20	27.51		

Calhoun County
(Vicinity of Twin Lakes)

89-32-28N1. SW¼SW¼ sec. 28, T. 89 N., R. 32 W., about 70 feet from normal shore line of Twin Lakes. Domestic well, diameter 15 inches, depth 10.6 feet. Measuring point, top of wooden well cover 1.5 feet above land surface. Equipped with pitcher pump.

Water level, in feet below measuring point, 1940

June 20	8.72	Oct. 2	(a)	Dec. 19	8.53
July 31	9.36	Nov. 19	8.80		

89-32-31R1. E. F. Legg. SE¼SE¼ sec. 31, T. 89 N., R. 32 W. Standby bored well, diameter 15 inches, depth 50 feet. Measuring point, top of wood plank well platform 1.5 feet above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

June 21	13.83	Oct. 2	13.30	Dec. 19	12.14
July 31	13.71	Nov. 19	13.30		

89-32-33N1. Ben Burns. SW¼SW¼ sec. 33, T. 89 N., R. 32 W., about 150 feet south of normal shore line of Twin Lakes. Domestic well, diameter 8 inches, depth 30.3 feet. Measuring point, top of well platform, 0.5 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

June 21	15.36	Oct. 2	21.03	Dec. 19	15.23
July 31	20.81	Nov. 19	18.35		

a Dry.

Calhoun County--Continued.

88-33-1B1. Burns. NW¼NE¼ sec. 1, T. 88 N., R. 33 W., about 150 feet south of normal shore line of Twin Lakes. Unused well, diameter 14 inches, depth 35.3 feet. Measuring point, top of 2-inch plank well platform, 0.3 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
June 21	9.54	Oct. 2	13.14	Dec. 19	10.55
July 31	12.26	Nov. 19	12.51		

88-33-1D1. George Voss. NW¼NW¼ sec. 1, T. 88 N., R. 33 W. Standby unused well, diameter 14 inches, depth 105 feet. Measuring point, top of vitrified tile casing 0.7 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

June 20	13.15	Oct. 2	13.55	Dec. 19	11.82
July 31	14.32	Nov. 19	14.29		

Carroll County

85-35-18D1. City of Breda. NW¼NW¼ sec. 18, T. 85 N., R. 35 W. Unused drilled well, diameter 9 inches, depth 350 feet. Measuring point, top of 9-inch casing, 0.45 foot above concrete floor of pump house, and 0.8 foot above land surface. Water levels affected by pumping from new city well, 25 feet south. Water levels, in feet below measuring point, 1940: Oct. 1, [a]205.72; Dec. 13, 193.43.

84-34-25F1. Owner's test hole 1. City of Carroll. SE¼NW¼ sec.25, T. 84 N., (erroneously shown as T. 85 N., in W. S. Paper 886) R. 34 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	b 41.50	June 14	c 43.88	July 30	c 45.46	Oct. 1	44.63
Apr. 17	c 44.31	21	44.30	Aug. 17	43.30	Dec. 11	40.38
May 24	42.12						

Cerro Gordo County

96-22-12P1. Daughters of the American Revolution, Camp. SE¼SW¼ sec. 12, T. 96 N., R. 22 W. Unused drilled well, depth 52.7 feet. Measuring point, top of ⅜-inch hole in pump base, 0.2 foot above concrete base and 1.2 feet above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
July 18	45.61	Sept.16	45.40	Nov. 23	45.36
Aug. 22	45.75	Oct. 3	45.30	Dec. 21	44.83

96-22-14B1. A. A. Adams. NW¼NE¼ sec. 14, T. 96 N., R. 22 W. Stock well, diameter 10 inches, depth 46.3 feet. Measuring point July 16 and Aug. 23, 1940, top of concrete tile curb, 0.2 foot above land surface. Beginning Nov. 23, 1940, measuring point is top of 2-inch plank cover, 0.2 foot above old measuring point and 0.4 foot above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1940: July 16, 30.55; Aug. 23, 30.14; Nov. 23, 28.56; Dec. 21, 28.14.

96-22-14C1. Fred Stephens. NE¼NW¼ sec. 14, T. 96 N., R. 22 W. Unused drilled well, depth 227 feet. Measuring point, top of hole in pump base at pump rod entrance, 0.38 foot above curb of concrete well pit, and 0.6 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

July 16	35.75	Sept.16	35.16	Nov. 22	34.47
Aug. 22	35.80	Oct. 3	35.03	Dec. 21	33.98

a New city well pumping.
b Measurements made by W. J. Judge, Water Superintendent.
c Nearby wells pumping.

Cerro Gordo County--Continued.

96-22-20C1. The Willow Inn. NE¼NW¼ sec. 20, T. 96 N., R. 22 W., about 120 feet north of normal shore line of Clear Lake. Dug domestic well, diameter 24 inches, depth 10.4 feet. Measuring point, top of ⅛-inch hole in pump base, 0.4 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
July 18	8.50	Sept.16	5.20	Nov. 22	3.55
Aug. 22	7.03	Oct. 3	6.18	Dec. 21	5.32

96-22-20L1. NE¼SW¼ sec. 20, T. 96 N., R. 22 W., about 150 feet south of normal short line of Clear Lake. Unused drilled well, diameter 5 inches, depth 130 feet. Measuring point, top of ⅛-inch hole in well casing, 1.3 feet above land surface.

Water level, in feet below measuring point, 1940

July 16	40.69	Sept.16	34.59	Nov. 20	33.73
Aug. 22	36.40	Oct. 3	34.30	Dec. 21	33.21

96-22-23Q1. SW¼SE¼ sec. 23, T. 96 N., R. 22 W., about 90 feet south of normal shore line of Clear Lake. Domestic well, depth 32.2 feet. Measuring point, top of ⅛-inch hole in pump base, 0.18 foot above concrete platform and 0.8 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

July 17	22.18	Sept.16	24.61	Nov. 20	24.42
Aug. 23	23.44	Oct. 3	24.66	Dec. 21	23.87

96-22-25D2. U. S. Geological Survey. NW¼NW¼ sec. 25, T. 96 N., R. 25 W., about 150 feet east of normal shore line of Clear Lake. Observation well, diameter 1 inch, depth 9.4 feet. Measuring point, top of 1-inch pipe, 0.5 foot above land surface.

Water level, in feet below measuring point, 1940

Aug. 23	8.26	Oct. 3	8.06	Dec. 21	7.55
Sept.16	7.37	Nov. 20	7.31		

96-21-7P1. Buttleman. SE¼SW¼ sec. 7, T. 96 N., R. 21 W. Domestic bored well, diameter 7 inches, depth 20.3 feet. Measuring point, top of casing, 0.1 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

July 17	15.80	Sept.16	15.13	Nov. 23	16.98
Aug. 22	16.18	Oct. 3	15.77	Dec. 21	17.03

96-21-13E1. Mason City and Clear Lake Railway. SW¼NW¼ sec. 13, T. 96 N., R. 21 W. Unused drilled well, diameter 5 inches, depth 120 (?) feet. Measuring point, top of casing, 0.84 foot above concrete curb and 1.5 feet above land surface. Water levels, in feet below measuring point, 1940: Nov. 23, 6.04; Dec. 21, 6.30.

96-21-17B1. Clear Lake Sand and Gravel Company. NW¼NE¼ sec. 17, T. 96 N., R. 21 W. Industrial bored well, diameter 8 inches, depth 21.8 feet. Measuring point, top of casing, 6.4 feet below land surface. Equipped with ¼ horse-power suction pump.

Water level, in feet below measuring point, 1940

July 17	12.84	Sept.16	11.80	Nov. 23	11.90
Aug. 23	12.32	Oct. 3	12.66	Dec. 21	11.80

96-21-17M1. NW¼SW¼ sec. 17, T. 96 N., R. 21 W. Unused dug well, diameter 24 inches, depth 4.7 feet. Measuring point, top of concrete-block curb, 1.8 feet above land surface. Water levels, in feet below measuring point, 1940: Sept. 17, 4.22; Oct. 3, 4.44; Nov. 20, 3.55; Dec. 21, 4.25.

96-21-18H1. Sam Kennedy. SE¼NE¼ sec. 18, T. 96 N., R. 21 W. Domestic well, depth 14.3 feet. Measuring point, top of 2-inch plank platform, 0.8 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

July 17	12.76	Sept.16	11.63	Nov. 23	11.47
Aug. 23	12.31	Oct. 3	11.84	Dec. 21	11.54

Cerro Gordo County--Continued.

96-20-16J1. Owner's number 11, City of Mason City. NE¼SE¼ sec. 16, T. 96 N., R. 20 W. Water levels, in feet below measuring point, 1940: Aug. 22, 203.0; Dec. 3, 198.42.

Cherokee County

92-40-26P1. Owner's number 2 South, City of Cherokee. SE¼SW¼ sec. 26, T. 92 N., R. 40 W. New measuring point, top edge of pump frame, 0.8 foot above base of pump and 0.95 foot above concrete floor. Water level, in feet below measuring point, 1940: Dec. 12, 19.48.

Clay County

96-35-2P1. Eva D. Monselle. SE¼SW¼ sec. 2, T. 96 N., R. 35 W. Domestic dug well, diameter 20 inches, depth 48.4 feet. Measuring point, top of tile casing, 1.5 feet above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1940: Aug. 1, 30.23; Oct. 2, 31.98; Nov. 20, 31.82; Dec. 20, 32.01.

96-35-3R1. Allis Wilson. SE¼SE¼ sec. 3, T. 96 N., R. 35 W. Stock dug well, 4 feet square, depth 7.9 feet. Measuring point, top of wood casing at arrow, 1.8 feet above land surface. Water levels, in feet below measuring point, 1940: Aug. 1, 7.62; Oct. 2, 8.55; Nov. 20, 7.05; Dec. 20, 6.42.

Clayton County

94-4-4L1. NE¼SW¼ sec. 4, T. 94 N., R. 4 W. Unused drilled well, diameter 6 inches, depth 100.5 feet. Measuring point, top of casing and concrete curb, 0.4 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: April 6, 81.58; June 21, 81.45; Oct. 3, 80.19; Dec. 28, 81.01.

Clinton County

81-6E-22H1. Owner's number 2. E. I. duPont de Nemours & Company. SE¼NE¼ sec. 22, T. 81 N., R. 6 E. Industrial drilled well, diameter 20 inches, depth 2,150 feet. Measuring point, top of 16-inch steel casing, 2.0 feet above land surface and 588.63 feet above mean sea level. Elevation determined by E. I. duPont de Nemours & Company. Taps water in the Dresbach formation. Water levels affected by changes in atmospheric pressure and by earth tides. Water level recorder maintained on well from July 26 to Sept. 20, 1940.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
July 22	8:30 a.m.	13.80	Aug. 20	4:00 p.m.	13.33
26	11:50 a.m.	a15.27	23	2:30 p.m.	a13.52
29	3:30 p.m.	a13.83	27	3:45 p.m.	a12.94
31	4:00 p.m.	a13.64	29	3:50 p.m.	a13.13
Aug. 2	2:05 p.m.	a13.54	30	3:20 p.m.	a13.27
8	4:00 p.m.	a13.45	Sept. 5	10:00 a.m.	a13.52
9	2:55 p.m.	13.52	6	2:50 p.m.	a13.64
10	8:20 a.m.	13.44	12	3:20 p.m.	a13.52
14	3:40 p.m.	a13.11	13	2:15 p.m.	a13.41
15	4:00 p.m.	a13.10	20	3:00 p.m.	a13.81
16	1:30 p.m.	a13.23			

81-7E-6K1. National Biscuit Company. At east end of Iten Bldg. NW¼SE¼ sec. 6, T. 81 N., R. 7 E. Unused industrial drilled well, diameter 6 inches, reported depth 1,180 feet. Measuring point, top edge of metal manhole rim, level with concrete floor, 1.2 feet above top of ties on main line of C. & N. W. R. R. water levels believed to be affected by pumping from nearby wells. Water levels, in feet below measuring point, 1940: Aug. 10, 51.75; Aug. 21 at 8:25 a.m., 49.14; Aug. 21 at 3:25 p.m., 49.80; Oct. 31, 49.95.

Decatur County

69-25-29R1. Sam Gasset. SE¼SE¼ sec. 29, T. 69 N., R. 25 W. Domestic dug well, diameter 5 feet, depth 29.5 feet. Measuring point, top of concrete curb, 0.4 foot above concrete sidewalk and land surface. Water level, in feet below measuring point, 1940: Oct. 25, 20.30.

a Measurement made by E. I. duPont de Nemours & Company.

Emmet County

100-32-11R1. Okamanpedan State Park. SE¼SE¼ sec. 11, T. 100 N., R. 32 W. Water level, in feet below measuring point, 1940: Oct. 23, 62.85.

99-34-14B1. Owner's number 3. City of Estherville. NW¼NE¼ sec. 14, T. 99 N., 34 W. No measurements made in 1940.

99-32-10E1. C. E. Birney. SW¼NW¼ sec. 10, T. 99 N., R. 32 E. Stock well, diameter 6 inches, depth 28.3 feet. Measuring point, top of concrete tile casing, 0.7 foot above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1940: Oct. 23, 11.74; Dec. 20, 7.66.

Hamilton County

86-25-5E1. Owner's number 3. City of Stanhope. SW¼NW¼ sec. 5, T. 86 N., R. 25 W. Well deepened in 1940 from original depth of 601 feet to 2,200 feet. No measurements made in 1940 before well was deepened. Measuring point, when well was 1,825 feet deep, top of 8-inch casing 1 foot above land surface. Tapped water in St. Peter sandstone. Water level, in feet below measuring point; March 26, 1940, 83.02. Measuring point, when well was at depth 2,200 feet, top of drilling platform 2 feet above land surface. Taps water in New Richmond and Jordan sandstone. Water level in feet below measuring point, 1940: April 26, a/108.

Harrison County

81-42-31E1. Mutual Benefit Life Insurance Company. (Incorrectly shown as 81-42-31D1, NW¼NW¼ sec. 31, T. 81 N., R. 42 W. in Water Supply Paper 886) SW¼NW¼ sec. 31, T. 81 N., R. 42 W. Measurements discontinued.

80-42-11Q1. City of Woodbine. SW¼SE¼ sec. 11, T. 80 N., R. 42 W. Drilled well, diameter 12 inches, depth 91.5 feet. Measuring point, bottom edge of horizontal breather pipe into well, but all measurements referred to concrete floor of pump house at land surface. Water level measurements by M. E. Hill, Water Superintendent. Water levels, in feet below concrete floor of pump house, 1940: Aug. 18, 13.35; Dec. 12, 13.3.

80-41-20M1. Mutual Benefit Life Insurance Company. (Incorrectly shown as 80-41-20N1, SW¼SW¼ in Water-Supply Paper 886) NW¼SW¼ sec. 20, T. 80 N., R. 41 W. Water levels, in feet below measuring point, 1940: May 23, 68.61; Aug. 16, 68.80; Dec. 11, 69.15.

79-41-34N1. Mutual Benefit Life Insurance Company. SW¼SW¼ sec.34 T. 79 N., R. 41 W. Water levels in feet below measuring point, 1940: May 23, 56.35; Aug. 16, 55.55; Dec. 11, 57.18.

78-42-12Q1. Mutual Benefit Life Insurance Company. SW¼SE¼ sec. 12, T. 78 N., R. 42 W. Deepened in 1940 from 28.9 feet to 40.5 feet. No measurements in 1940 when well was 28.9 feet deep. Measuring point since May 23, 1940, top of new concrete curb, 0.9 foot above old measuring point, and 0.3 foot above land surface. Water levels, in feet below measuring point, 1940: May 23, 22.62; Aug. 16, 23.58; Dec. 11, 24.74.

78-42-11A1. Mutual Benefit Life Insurance Company. NE¼NE¼ sec. 11, T. 78 N., R. 42 W. Water levels, in feet below measuring point, 1940: May 23, 27.83; Aug. 16, 28.32; Dec. 11, 28.6.

Ida County

89-40-35D1. Owner's Number 3. City of Holstein. NW¼NW¼ sec. 35, T. 89 N., R. 40 W. No measurement made in 1940.

89-39-12L1. Keith Laundry and Cleaning Company. NW¼SW¼ sec. 12, T. 87 N., R. 39 W. No measurement made in 1940.

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a Reported by drilling contractor.

Jasper County

80-18-31C1. Union Central Life Insurance Company. NW¼NE¼ sec. 31, T. 80 N., R. 18 W. Domestic and stock well, diameter 36 inches, depth 37.5 feet. Measuring point, top of concrete curb, 1.0 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 29	25.10	Aug. 27	19.55	Nov. 7	23.54
May 14	18.82	Sept.20	23.42	Dec. 27	19.00

Johnson County

80-5-9K1. Mrs. Evelyn Snyder. NW¼SE¼ sec. 9, T. 80 N., R. 5 W. Measuring point, Aug. 7, and Sept. 14 top of casing, 0.07 foot below instrument platform. Water level recorder removed Aug. 2, 1940.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
Jan. 7	9:00 a.m.	6.13	May 5	9:00 a.m.	4.60
14	12:20 p.m.	6.22	12	9:00 a.m.	4.86
21	11:30 a.m.	6.26	19	9:00 a.m.	5.05
28	1:00 p.m.	6.28	26	7:30 a.m.	5.20
Feb. 4	11:45 a.m.	6.40	June 2	8:20 a.m.	5.41
11	11:30 a.m.	6.47	9	9:45 a.m.	5.77
18	11:00 a.m.	5.72	16	10:30 a.m.	5.86
25	1:20 p.m.	5.47	23	9:25 a.m.	4.73
Mar. 3	10:15 a.m.	4.92	30	8:00 a.m.	5.51
10	1:00 p.m.	4.29	July 6	10:15 a.m.	6.15
17	8:30 a.m.	4.44	14	9:30 a.m.	6.64
24	12:00 m.	4.46	21	6:45 a.m.	6.99
31	6:30 a.m.	4.76	28	10:10 a.m.	7.33
Apr. 7	12:00 m.	4.84	Aug. 2	2:35 p.m.	7.38
14	10:40 a.m.	4.02	7	3:15 p.m.	a 7.57
21	11:30 a.m.	3.93	Sept.14	10:10 a.m.	ab 7.36
28	8:00 a.m.	4.41			

80-5-9K2. United States Geological Survey. Located on the property of C. L. Hudler. NW¼SE¼ sec. 9, T. 80 N., R. 5 W. Observation bored well, diameter 7⅛ inches, depth 12.7 feet. Measuring point, top of instrument platform, 0.84 foot above top of casing and 2.3 feet above land surface. Water level recorder maintained on well since Aug. 7, 1940. Replaces well 80-5-9K1.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
Aug. 7	3:00 p.m.	7.74	Oct. 21	2:00 p.m.	7.74
11	8:10 a.m.	7.49	27	10:10 a.m.	7.75
18	10:00 a.m.	7.16	Nov. 3	10:50 a.m.	7.27
25	9:00 a.m.	7.45	10	8:50 a.m.	6.94
Sept. 1	8:40 a.m.	7.35	17	12:01 p.m.	7.02
8	8:00 a.m.	7.74	24	5:00 p.m.	6.48
14	9:40 a.m.	7.29	Dec. 1	9:10 a.m.	6.80
15	9:00 a.m.	7.37	6	4:00 p.m.	6.65
22	8:10 a.m.	7.29	12	4:45 p.m.	6.77
29	12:01 p.m.	7.77	16	1:50 p.m.	6.11
Oct. 6	1:50 p.m.	7.44	22	10:00 a.m.	5.52
13	9:30 a.m.	7.77	29	11:50 a.m.	5.44
20	2:00 p.m.	7.25			

79-6-10N1. Owner's number 5. State University of Iowa. SW¼SW¼ sec. 10, T. 79 N., R. 6 W.

Water level, in feet above measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
Jan. 1	11:58 a.m.	9.31	Feb. 19	10:10 a.m.	9.16
8	3:17 p.m.	9.08	26	11:35 a.m.	9.13
15	1:03 p.m.	9.16	Mar. 4	8:15 a.m.	9.18
19	3.55 p.m.	9.32	12	12:20 p.m.	9.23
22	3:30 p.m.	9.34	18	9:00 a.m.	9.50
29	1:09 p.m.	8.89	25	9.07 a.m.	9.07
Feb. 5	12:55 p.m.	8.92	Apr. 1	8:20 a.m.	9.36
12	10,40 a.m.	9.12	8	9:00 a.m.	9.63

a New measuring point.
b Measurements temporarily discontinued.

Johnson County--Continued.

79-6-10N1. Owner's number 5.-- Continued.

Water level, in feet above measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
Apr. 15	9:00 a.m.	9.84	July 29	8:10 a.m.	9.43
22	8:32 a.m.	9.52	Aug. 5	8:20 a.m.	9.59
29	9:10 a.m.	9.78	12	8:08 a.m.	9.40
May 6	9:10 a.m.	9.34	19	8:00 a.m.	9.48
13	12:45 p.m.	9.80	26	5:50 p.m.	9.84
20	9:10 a.m.	9.49	Sept. 3	8:05 a.m.	9.59
27	10:35 a.m.	9.55	9	8:10 a.m.	9.72
June 3	10:35 a.m.	9.48	16	8:25 a.m.	9.40
10	8:30 a.m.	9.54	23	9:00 a.m.	9.57
17	9:15 a.m.	9.45	30	8:30 a.m.	9.28
24	8:25 a.m.	9.74	Oct. 7	8:15 a.m.	9.56
July 1	10:35 a.m.	9.38	14	8:45 a.m.	9.73
8	9:10 a.m.	9.50	21	8:40 a.m.	9.48
15	8:10 a.m.	9.32	28	8:20 a.m.	a 9.53
22	8:10 a.m.	9.43			

Keokuk County

76-10-25D1. City of Keota. NW¼NW¼ sec. 25, T. 76 N., R. 10 W. Measurements discontinued, well destroyed.

Linn County

(Indian Creek Project of the Soil Conservation Service)

85-6-19A1. United States Geological Survey. Located on land owned by John Inobit. NE¼NE¼ sec. 19, T. 85 N., R. 6 W. Observation bored well, diameter 3 inches, depth 8.5 feet. Measuring point, top of casing 0.8 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 2	5.13	June 13	6.26	Aug. 19	6.21	Oct. 28	6.81
18	b 4.69	17	b 6.41	26	6.18	Nov. 13	5.22
May 1	b 5.1	July 1	b 5.99	Sept. 18	6.14	25	5.33
16	b 5.74	16	b 6.93	30	6.52	Dec. 9	5.15
June 1	b 5.9	Aug. 1	b 6.26	Oct. 14	6.62	23	5.82
8	b 6.20	16	b 5.98				

85-6-26D1. United States Geological Survey. Located on land owned by Victor and Mary Varzai. NW¼NW¼ sec. 26, T. 85 N., R. 6 W. Observation bored well, diameter 3 inches, depth 13.8 feet. Measuring point, top of casing, 0.3 foot above land surface and 0.60 foot above bench mark. Bench mark, top of ⅜-inch pipe 1.6 feet east of well and 0.3 foot below land surface.

Water level, in feet below measuring point, 1940

Apr. 2	6.62	June 13	5.38	Aug. 19	5.86	Oct. 28	7.49
18	b 3.66	17	b 5.49	26	5.72	Nov. 13	5.88
May 1	b 4.18	July 1	b 5.28	Sept. 18	6.26	25	5.70
16	b 4.63	16	b 6.03	30	6.98	Dec. 9	5.96
June 1	b 5.0	Aug. 1	b 6.50	Oct. 14	7.39	23	5.04
8	b 5.2	16	b 5.51	17	7.42		

85-6-29B1. Earl Balderson. NW¼NE¼ sec. 29, T. 85 N., R. 6 W. Unused drilled well, diameter 5 inches, depth 147 feet. Measuring point, top of casing, 0.9 foot above land surface.

Water level, in feet below measuring point, 1940

Mar. 5	65.20	June 1	b 64.46	Aug. 1	b 65.10	Oct. 14	65.20
15	b 65.6	8	b 64.4	16	b 65.4	28	65.25
30	bc 60.65	13	64.81	19	65.36	Nov. 13	65.85
Apr. 18	b 64.16	17	b 64.6	26	65.01	25	65.63
May 1	b 64.0	July 1	b 64.85	Sept. 16	65.12	Dec. 9	65.64
16	b 64.04	16	b 65.24	30	65.32	23	65.31

a Measurements temporarily discontinued.
b Measurements made by Soil Conservation Service.
c Measurements probably inaccurate.

Linn County--Continued.
(Indian Creek Project of the Soil Conservation Service)

84-7-13E1. Alfred Rinderknecht. SW¼NW¼ sec. 13, T. 84 N., R. 7 W. Unused dug domestic well, diameter, 30 inches, depth 22.5 feet. Measuring point, top of plank platform at copper bench mark 0.2 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 5	9.29	June 1	a 6.16	Aug. 1	a 8.30	Oct. 14	9.83
15	a 8.3	8	a 6.37	16	a 8.54	28	10.28
30	a 6.42	13	6.58	19	8.93	Nov. 13	9.96
Apr. 18	a 5.7	17	a 6.7	26	8.98	25	9.71
May 1	a 5.61	July 1	a 6.9	Sept.18	9.03	Dec. 9	9.85
16	a 5.94	16	a 7.52	30	9.52	23	9.71

84-6-20N1. United States Geological Survey. Located on land owned by H. W. Wiggins. SW¼SW¼ sec. 20, T. 84 N., R. 6 W. Observation bored well, diameter 3 inches, depth 10.8 feet to Oct. 17, 1940. Deepened on October 17, 1940 to 11.7 feet. Measuring point, top of casing, 1.0 foot above land surface and 1.21 feet above bench mark. Bench mark, top of ⅛-inch pipe, 1.2 feet southeast of well and 0.2 foot below land surface.

Water level, in feet below measuring point, 1940

Apr. 2	5.60	June 13	7.21	Aug. 19	8.38	Oct. 21	11.37
18	a 4.74	17	a 7.37	26	8.58	28	11.14
May 1	a 5.21	July 1	a 7.87	Sept.18	8.57	Nov. 13	7.98
16	a 6.73	16	a 8.27	30	8.81	25	8.20
June 1	a 6.41	Aug. 1	a 8.39	Oct. 14	8.97	Dec. 9	8.76
8	a 6.81	16	a 8.37	17	b 11.50	23	7.75

84-6-22F1. C. A. Wissler. SE¼NW¼ sec. 22, T. 84 N., R. 6 W. Unused dug well, diameter 30 inches, depth 10.8 feet to October 17, 1940. Deepened to 13.0 feet on Oct. 17, 1940. Measuring point, top of plank platform at copper bench mark 0.5 foot above land surface.

Water level, in feet below measuring point, 1940

Mar. 5	9.52	June 8	a 7.05	Aug. 16	ac 10.85	Oct. 17	b 11.16
15	a 9.0	13	7.31	19	9.96	28	11.22
30	a 7.7	17	a 7.39	28	10.20	Nov. 13	10.91
Apr. 18	a 6.52	July 1	a 7.8	Sept.18	10.40	25	10.69
May 1	a 6.31	16	a 8.61	30	10.88	Dec. 9	10.62
16	a 5.79	Aug. 1	a 9.66	Oct. 14	(d)	23	10.54
June 1	a 6.84						

Linn County
(Cedar Rapids Project)

83-7-2P1. Hollenbeck. SE¼SW¼ sec. 2, T. 83 N., R. 7 W. Unused drilled well, diameter 6 inches, depth 52.2 feet. Measuring point, July 29 to Oct. 7, 1940 top of concrete platform 0.5 foot above land surface. Beginning Oct. 21, 1940 measuring point is top of pump base, 0.04 foot above ooncrete platform. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
July 29	- p.m.	32.60	Oct. 21	3:10 p.m.	e 32.98
Aug. 12	2:40 p.m.	32.68	Nov. 4	12:40 p.m.	33.02
28	2:45 p.m.	32.75	18	2:30 p.m.	32.96
Sept. 9	2:25 p.m.	32.80	Dec. 2	2:45 p.m.	32.78
23	2:15 p.m.	32.84	23	2:00 p.m.	32.40
Oct. 7	1:35 p.m.	32.90			

a Measurement made by Soil Conservation Service.
b Well deepened.
c Measurement probably inaccurate.
d Dry.
e New measuring point.

Linn County--Continued.
(Cedar Rapids Project)

83-7-6B1. Schrimper Estate. NW¼NE¼ sec. 6, T. 83 N., R. 7 W. Domestic and stock drilled well, diameter 4 inches, depth 226 feet. Measuring point, top of casing, May 10 to June 14, 1940, 0.2 foot above land surface. Beginning July 2, 1940 measuring point is top of ⅛-inch hole in pump base, 0.05 foot above top of casing. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
May 10	- a.m.	65.97	Sept.23	1:50 p.m.	71.03
June 14	11:00 a.m.	68.42	Oct. 7	1:05 p.m.	71.37
July 2	5:15 p.m.	a 69.66	21	1:45 p.m.	71.75
15	3:10 p.m.	69.40	Nov. 4	11:15 a.m.	71.78
29	1:30 p.m.	70.28	18	2:10 p.m.	72.11
Aug. 26	11:40 a.m.	70.68	Dec. 2	2:30 p.m.	72.30
Sept. 9	11:50 a.m.	70.05	23	11:55 a.m.	72.38

83-7-16D1. City of Cedar Rapids (Shaver Park). NW¼NW¼ sec. 16, T. 83 N., R. 7 W. Drilled well, depth 126.5 feet. Measuring point, top of 9/16-inch hole in pump base, 0.5 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

June 10	- p.m.	90.00	Sept. 9	11:20 a.m.	90.76
17	1:10 p.m.	90.21	23	1:30 p.m.	90.93
July 1	2:30 p.m.	90.47	Oct. 7	12:45 p.m.	91.22
15	2:00 p.m.	90.54	21	1:25 p.m.	91.30
29	1:10 p.m.	90.45	Nov. 4	10:55 a.m.	91.35
Aug. 12	1:25 p.m.	90.46	18	1:50 p.m.	91.49
26	2:45 p.m.	90.55	Dec. 23	11:35 a.m.	91.47

83-7-16J1. City of Cedar Rapids (Daniels Park). NE¼SE¼ sec. 16, T. 83 N., R. 7 W. Drilled well. Depth 163 feet. Measuring point, top of 9/16-inch hole in pump base, 0.1 foot above conical concrete pump base and 1.4 feet above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

June 10	- p.m.	33.56	Sept.23	1:15 p.m.	34.30
17	1:35 p.m.	33.62	Oct. 7	1:20 p.m.	34.37
July 1	3:00 p.m.	33.86	21	1:10 p.m.	34.50
15	2:10 p.m.	34.20	Nov. 4	10:40 a.m.	34.44
29	1:50 p.m.	34.61	18	1:40 p.m.	34.56
Aug. 12	1:15 p.m.	34.27	Dec. 2	2:10 p.m.	34.78
26	12:01 p.m.	34.10	16	3.45 p.m.	34.42
Sept. 9	12:10 p.m.	34.25			

83-7-17L1. City of Cedar Rapids (Ellis Park). NE¼SW¼ sec. 17, T. 83 N., R. 7 W. Unused drilled well, diameter 6 inches, depth 98 feet. Measuring point, top of 3/4-inch pipe 0.6 foot above land surface.

Water level, in feet below measuring point, 1940

July 2	2:40 p.m.	20.98	Oct. 7	11:30 a.m.	21.10
15	1:20 p.m.	21.16	21	11:15 a.m.	21.06
29	4:55 p.m.	21.14	Nov. 4	10:15 a.m.	20.81
Aug. 12	11:40 a.m.	21.01	18	2:15 p.m.	20.70
26	10.20 a.m.	20.91	Dec. 2	1:45 p.m.	20.68
Sept. 9	10:50 a.m.	20.80	16	3:00 p.m.	20.62
23	12:01 p.m.	21.00			

83-7-21L1. City of Cedar Rapids. North end of Second Street, NE. NE¼SW¼ sec. 21, T. 83 N., R. 7 W. Abandoned drilled well, diameter 10 inches. Original depth 1,450 feet. Measuring point, top of coupling flange of casing extension, 2.3 feet above land surface. Until 1930 well was pumped for city supply. Originally tapped water in Jordan sandstone, but present effective depth of well uncertain, as water levels are affected by pumping of nearby well 423 feet deep, which taps water in Niagaran dolomite indicating casing leak above 423 feet. Water level recorder maintained on well since March 29, 1940.

a New measuring point.

Linn County--Continued.
(Cedar Rapids Project)

83-7-21L1. City of Cedar Rapids.--Continued.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
Mar. 27	1:45 p.m.	25.43	Aug. 5	1:05 p.m.	35.09
	4:55 p.m.	25.03	12	12:50 p.m.	32.67
29	10:17 a.m.	24.10	19	11:35 a.m.	28.52
Apr. 3	3:15 p.m.	24.52	26	10:35 a.m.	26.28
6	2:40 p.m.	21.45	Sept. 3	11:10 a.m.	26.40
8	12:35 p.m.	23.69	9	1:00 p.m.	29.55
11	10:30 a.m.	25.95	18	12:25 p.m.	30.83
15	11:29 a.m.	20.92	23	12:25 p.m.	29.16
22	11:05 a.m.	21.39	30	1:00 p.m.	28.38
29	11:40 a.m.	22.25	Oct. 7	11:30 a.m.	25.56
May 8	4:45 p.m.	25.16	14	12:45 p.m.	25.86
20	1:05 p.m.	24.04	21	11:25 a.m.	24.64
27	1:15 p.m.	24.06	28	12:50 p.m.	26.08
June 3	3:25 p.m.	33.06	Nov. 4	10:25 a.m.	24.47
10	2:00 p.m.	30.53	8	1:25 p.m.	26.36
17	11:35 a.m.	29.92	13	11:40 a.m.	25.97
24	12:25 p.m.	27.20	18	1:30 p.m.	24.59
28	3:25 p.m.	30.26	25	1:15 p.m.	25.54
July 1	1:05 p.m.	29.85	Dec. 2	1:20 p.m.	25.54
8	1:30 p.m.	31.36	9	1:00 p.m.	24.95
12	4:35 p.m.	28.62	10	3:10 p.m.	26.61
15	1:20 p.m.	33.21	16	3:15 p.m.	24.82
22	12:20 p.m.	33.43	23	10:45 a.m.	23.33
29	12:50 p.m.	34.48	30	3:30 p.m.	23.90

83-7-23G1. City of Cedar Rapids (Bever Park). SW¼NE¼ sec. 23, T. 83 N., R. 7 W. Drilled well, depth 81 feet. Measuring point, top of 9/16-inch hole in pump base, 0.15 foot above conical concrete base and 1.0 foot above land surface.

Water level in feet below measuring point, 1940

June 11	-	4.72	Sept. 23	2:35 p.m.	5.68
17	1:55 p.m.	4.77	Oct. 7	2:10 p.m.	5.57
July 1	3:30 p.m.	5.15	21	3:40 p.m.	5.34
15	12:01 p.m.	5.24	Nov. 4	12:55 p.m.	5.10
29	2:55 p.m.	5.65	18	2:40 p.m.	4.99
Aug. 12	3:10 p.m.	5.56	Dec. 2	3:00 p.m.	4.96
28	3:10 p.m.	5.44	23	2:10 p.m.	4:80
Sept. 9	3:00 p.m.	5.55			

83-7-24A1. John Zrudsky. NE¼NE¼ sec. 24, T. 83 N., R. 7 W. Stock drilled well, diameter 4 inches, depth 96 feet. Measuring point, top of casing, May 9 to June 17, 1940, 0.3 foot above land surface. Beginning July 2 top of 9/16-inch hole in pump base, 0.02 foot above top of casing. Equipped with lift pump.

Water level, in feet below measuring point, 1940

May 9	- p.m.	29.66	Sept. 9	3:20 p.m.	30.38
June 6	- p.m.	30.28	23	3:55 p.m.	30.69
17	3:25 p.m.	31.39	Oct. 7	2:25 p.m.	30.46
July 2	11:50 a.m.	a 30.45	21	3:50 p.m.	30.52
15	11:45 a.m.	31.07	Nov. 4	1:10 p.m.	30.45
29	-	30.39	18	2:50 p.m.	30.42
Aug. 12	3:30 p.m.	31.40	Dec. 2	3:15 p.m.	30.18
28	3:25 p.m.	30.40	23	2:30 p.m.	30.36

83-7-28G2. Cedar Rapids Gas Company (northwest corner of 8th Avenue SE and First Street NE, Cedar Rapids), SW¼NE¼ sec. 28, T. 83 N., R. 7 W. Unused industrial drilled well, diameter 6 inches, depth 349 feet. Measuring point, top edge of old cast iron pump base, 0.5 foot above brick floor of pump house. Water level recorder maintained on well since March 22, 1940. Water levels affected by pumping from nearby wells, particularly a group of industrial wells 1,000 to 1,500 feet distant. Highest water level observed on recorder charts was 29.45 feet on Dec. 5, 1940 and lowest was 75.64 feet on August 16, 1940. Lower water levels occurred in the period July 22 to Aug. 2, 1940 but were not recorded on charts, due to obstruction in well, which has since been removed. Maximum daily fluctuation observed from recorder charts was 18.20 feet on July 15, 1940, and maximum weekly fluctuation observed was 32.96 feet for the week ending July 13, 1940.

Linn County--Continued.
(Cedar Rapids Project)

83-7-28G2. Cedar Rapids Gas Company.--Continued.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
Mar. 21	3:10 p.m.	50.41	Aug. 12	4:25 p.m.	61.07
22	3:00 p.m.	50.15	19	11:00 a.m.	52.02
Apr. 3	4:30 p.m.	47.60	26	4:45 p.m.	53.22
9	4:10 p.m.	47.75	Sept. 3	10:40 a.m.	46.52
15	10:30 a.m.	35.40	9	1:30 p.m.	57.25
22	10:10 a.m.	33.25	16	10:15 a.m.	39.36
29	10:45 a.m.	36.08	23	3:40 p.m.	56.73
May 6	10:50 a.m.	39.99	30	1:25 p.m.	48.35
13	3:38 p.m.	49.45	Oct. 7	3:10 p.m.	45.87
20	11:18 a.m.	43.99	14	11:20 a.m.	38.20
27	11:55 a.m.	43.96	21	4:25 p.m.	40.93
June 3	2:35 p.m.	51.85	28	11:30 a.m.	41.60
10	10:30 a.m.	48.31	Nov. 4	1:50 p.m.	41.16
17	11:00 a.m.	51.16	13	11:10 a.m.	47.59
24	10:55 a.m.	52.45	18	3:25 p.m.	45.71
July 1	11:50 a.m.	52.28	25	4:00 p.m.	47.58
8	12:35 p.m.	52.10	Dec. 2	5:30 p.m.	49.27
15	10:35 a.m.	50.04	9	11:10 a.m.	40.39
22	10:05 a.m.	59.58	16	4:05 p.m.	41.40
29	4:00 p.m.	67.69	23	10:25 a.m.	36.62
Aug. 2	11:00 a.m.	59.16	30	2:55 p.m.	44.22

83-7-32G1. Floyd Felter. SW¼NE¼ sec. 32, T. 83 N., R. 7 W., northwest corner of 22nd Avenue SW and 11th Street SW, Cedar Rapids. Unused domestic drilled well, depth 282 feet. Measuring point, top of 9/16-inch hole in pump base 0.15 foot above concrete curb and 0.5 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
July 12	11:40 a.m.	82.34	Oct. 7	11:00 a.m.	82.48
29	11:45 a.m.	83.06	21	10:45 a.m.	81.74
Aug. 12	11:20 a.m.	82.50	Nov. 4	10:00 a.m.	82.08
26	9:45 a.m.	82.28	18	12:01 p.m.	81.91
Sept. 9	10:30 a.m.	82.35	Dec. 2	12:30 p.m.	81.90
23	11:45 a.m.	82.60	16	2:45 p.m.	81.26

83-7-33F1. SE¼NW¼ sec. 33, T. 83 N., R. 7 W., northwest corner of 22nd Avenue SW and K Street SW, Cedar Rapids, Iowa. Drilled domestic well, depth 107 feet. Measuring point, top of 9/16-inch hole in pump base, 0.14 foot above concrete platform and 0.7 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
July 13	12:01 p.m.	74.12	Oct. 7	11:55 a.m.	74.37
29	11:30 a.m.	74.30	21	10:30 a.m.	74.40
Aug. 12	11:10 a.m.	74.30	Nov. 4	9:45 a.m.	74.42
26	9:45 a.m.	74.30	18	11:50 a.m.	74.47
Sept. 9	10:15 a.m.	74.33	Dec. 2	12:10 p.m.	74.50
23	11:30 a.m.	74.33	16	2:30 p.m.	74.36

83-6-28B1. Louis Mikuleky. NW¼NE¼ sec. 28, T. 83 N., R. 6 W. Drilled domestic well, diameter 5 inches, reported depth 219 feet. Measuring point, painted arrow at top edge of well pit on north side, 5.00 feet above top of casing at land surface. Equipped with automatic lift pump. Water levels affected by pumping.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
May 3	1:25 p.m.	45.31	July 29	3:10 p.m.	46.55
June 6	2:50 p.m.	45.65	Aug. 12	-	46.58
17	2:30 p.m.	45.71	Sept. 9	3:55 p.m.	46.59
July 1	3:50 p.m.	46.07	23	3:20 p.m.	a 46.96
15	11:30 a.m.	46.30	Oct. 7	3:20 p.m.	a 48.50

83-6-30B1. Katz. NW¼NE¼ sec. 30, T. 83 N., R. 6 W. Unused drilled well, diameter 6 inches, depth 76.5 feet. Measuring point, top of casing, north side, 0.5 foot above land surface. Equipped with lift pump.

a Pumping.

Linn County--Continued.
(Cedar Rapids Project)

83-6-30B1. Katz.--Continued.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
May 3	- p.m.	52.14	Sept. 9	3:40 p.m.	52.76
June 6	2:35 p.m.	52.26	23	3:10 p.m.	52.71
17	2:55 p.m.	52.35	Oct. 7	2:40 p.m.	52.78
July 1	4:10 p.m.	52.49	21	4:00 p.m.	52.84
15	11:20 a.m.	52.61	Nov. 4	1:25 p.m.	52.79
29	3:20 p.m.	52.68	18	3:00 p.m.	52.74
Aug. 12	3:50 p.m.	52.68	Dec. 2	3:30 p.m.	52.86
28	3:45 p.m.	52.72	23	2:40 p.m.	52.67

Lyon County

99-44-26R1. SE¼SE¼ sec. 26, T. 99 N., R. 44 W. Unused bored well, diameter 20 inches, depth 37.7 feet. Measuring point, top of concrete tile casing 2.0 feet above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1940: Oct. 24, 11.74; Dec. 20, 11.43.

99-43-11H1. SE¼NE¼ sec. 11, T. 99 N., R. 43 W. Unused well, diameter 10 inches, depth 5.4 feet. Measuring point top of casing 1.5 feet above land surface. Water levels, in feet below measuring point, 1940: Oct. 24, 3.95; Dec. 20, 3.65.

98-48-24M1. A. C. Hanson. NW¼SW¼ sec. 24, T. 98 N., R. 48 W. Water levels, in feet below measuring point, 1940: Aug. 15, 18.40; Oct. 25, 20.57.

Madison County

76-28-2B1. Glen Newton. NW¼NE¼ sec. 2, T. 76 N., R. 28 W. Unused dug well, diameter 24 inches, depth 32 feet. Measuring point, top of plank platform 0.5 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 28	19.11	May 21	17.96	Aug. 15	18.75	Dec. 3	19.04
Apr. 16	18.22	June 19	18.51	Sept. 24	19.87		

Mahaska County

74-14-14H1. City of Fremont. SE¼NE¼ sec. 14, T. 74 N., R. 14 W. Measurements discontinued.

Marion County

77-18-34C1. Rich Launpebaugh. NE¼NW¼ sec. 34, T. 77 N., R. 18 W. No measurements made in 1940.

75-20-22 H1. Union Central Life Insurance Company. SE¼NE¼ sec. 22, T. 75 N., R. 20 W. Domestic and stock dug well, diameter 60 inches, depth 14.6 feet. Measuring point, top of brick tile curb 0.8 foot above land surface. Equipped with suction pump and siphon.

Water level, in feet below measuring point, 1940

Apr. 16	11.30	June 18	11.95	Aug. 27	9.76	Nov. 15	a 11.24
May 1	a 10.78	July 3	a 11.90	Oct. 1	a 10.48	Dec. 2	a 11.45
14	a 11.01	Aug. 1	a 12.22	15	a 10.20	16	a 11.95
June 1	a 11.07	15	a 10.13	31	a 10.71	30	a 11.25
14	a 11.22						

75-20-29K1. J. D. Cleair. NW¼SE¼ sec. 29, T. 75 N., R. 20 W. Unused dug well, diameter 30 inches, depth 21.0 feet. Measuring point, top of 1-inch board cover, 1.3 feet above land surface.

Water level, in feet below measuring point, 1940

Apr. 16	12.98	June 18	12.37	Aug. 27	10.82	Nov. 15	a 12.96
May 1	a 11.77	July 1	a 12.33	Oct. 1	a 12.09	Dec. 2	a 13.16
14	a 12.51	Aug. 1	a 11.33	15	a 12.57	16	a 13.22
June 1	a 12.79	15	a 9.55	31	a 11.84	30	a 13.24
14	a 12.48						

a Measurements made by Soil Conservation Service.

Marion County--Continued.

75-20-31C1. Miss Amanda Elliott. NE¼NW¼ sec. 31, T. 75 N., R. 20 W. Dug stock well, diameter 42 inches, depth 28 feet. Measuring point, top of plank platform 0.3 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 27	27.78	June 14	a (b)	Aug. 28	26.38	Nov. 15	a 27.38
Apr. 16	17.40	18	26.92	Oct. 1	a 26.64	Dec. 2	a 27.20
May 1	a 17.47	July 1	a 27.35	15	a 28.70	16	a 26.50
14	a 19.26	Aug. 1	a 27.63	31	a 27.71	30	a 25.89
June 1	a 21.67	15	a 27.44				

75-20-31C2. Miss Amanda Elliott. NE¼NW¼ sec. 31, T. 75 N., R. 20 W. Bored stock well, diameter 15 inches, depth 28.5 feet. Measuring point, top of plank well platform, 0.3 foot above land surface. Equipped with lift pump operated by gasoline engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 27	22.46	June 14	a 13.82	Aug. 27	14.91	Nov. 15	a 22.26
Apr. 16	19.54	18	18.34	Oct. 1	a 20.5	Dec. 2	a 18.40
May 1	a 13.59	July 1	a 23.27	15	a 26.41	16	a 23.75
14	a 13.10	Aug. 1	a 18.62	31	a 26.09	30	a 23.48
June 1	a 13.53	15	a 17.47				

74-21-26E1. Griesbaum Estate. SW¼NW¼ sec. 26, T. 76 N., R. 21 W. Unused dug well, diameter 24 inches, depth 20.7 feet. Measuring point, top of plank platform at copper bench mark, 0.8 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 16	9.85	June 18	10.37	Aug. 27	13.32	Nov. 15	a 14.79
May 1	a 7.49	July 1	a 11.10	Oct. 1	a 15.53	Dec. 2	a 14.50
14	a 8.62	Aug. 1	a 14.48	15	a 15.74	16	a 14.25
June 1	a 9.24	15	a 13.73	31	a 15.73	30	a 14.03
14	a 10.19						

74-20-2M1. NW¼SW¼ sec. 2, T. 74 N., R. 20 W. On right of way of Iowa State Highway 14. Dug well, diameter 36 inches, depth 7.7 feet. Measuring point, top of iron manhole ring, 0.3 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 16	4.79	June 18	5.19	Aug. 27	4.04	Nov. 15	a 5.16
May 1	a 4.30	July 1	a 5.85	Oct. 1	a 4.9	Dec. 2	a 5.96
14	a 4.29	Aug. 1	a 5.40	15	a 5.50	16	a 6.05
June 1	a 4.59	15	a 5.68	31	a 5.07	30	a 5.61
14	a 4.84						

74-20-16M1. C. Wendall. NW¼SW¼ sec. 16, T. 74 N., R. 20 W. Unused bored well, diameter 12 inches, depth 34.2 feet. Measuring point, top of tile casing at painted arrow, 0.2 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 16	25.78	June 18	25.82	Aug. 27	27.10	Nov. 15	a 28.90
May 1	a 24.91	July 1	a 26.00	Oct. 1	a 27.74	Dec. 2	a 29.25
14	a 25.79	Aug. 1	a 26.41	15	ac 27.07	16	a 29.96
June 1	a 25.79	15	a 26.84	31	a 28.35	30	a 30.08
14	a 25.85						

74-20-33D1. T. V. Beebout. NW¼NW¼ sec. 33, T. 74 N., R. 20 W. Unused dug well, diameter 24 inches, depth 28.7 feet. Measuring point, top of concrete curb, east side, at painted arrow, 0.2 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 16	27.59	June 18	27.34	Aug. 27	27.18	Nov. 15	a 27.11
May 1	a 27.49	July 1	a 27.32	Oct. 1	a 27.14	Dec. 2	a 27.05
14	a 27.46	Aug. 1	a 27.30	15	a 27.14	16	a 27.13
June 1	a 26.91	15	a 27.20	31	a 27.15	30	a 27.18
14	a 27.37						

a Measurements made by Soil Conservation Service.
b Dry.
c Measurements probably inaccurate.

Muscatine County

76-2-14D1. Owner's test well 4. City of Muscatine. NW¼NW¼ sec. 14, T. 76 N., R. 2 W. Water levels, in feet below measuring point, 1940: April 4, 13.48; Aug. 20, 13.87; Oct. 31, 13.89; Dec. 23, 14.32.

76-2-15A1. Owner's test well 5. City of Muscatine. NE¼NE¼ sec. 15, T. 76 N., R. 2 W. Drilled test well, diameter 2 inches. Measuring point, top of reducing nipple, 0.11 foot above top of casing, and 2.8 feet above land surface. Water levels affected by pumping from city well field. Water levels, in feet below measuring point, 1940: April 4, 11.57; Aug.20, 12.68; Oct. 31, 12.80; Dec. 23, 12.45.

Osceola County

99-41-18C1. City of Sibley. NE¼NW¼ sec. 18, T. 99 N., R. 41 W. Water levels, in feet below measuring point, 1940: Jan. 10, 14.75; Oct. 24, 17.20.

99-41-18C2. City of Sibley. NE¼NW¼ sec. 18, T. 99 N., R. 41 W. Bored well, diameter 7 inches, depth 34 feet. Measuring point top of manhole cover. Equipped with suction pump. Used partly for city supply. Water level, in feet below measuring point, 1940: Oct. 24, 19.58.

Page County

69-36-31K1. City of Clarinda. NW¼SW¼ sec. 31, T. 69 N., R. 36 W. Corner of Garfield and South Tenth Streets. Unused dug well, diameter 10 feet, depth 56 feet. Measuring point, top of 1-inch pipe, through concrete slab cover, 0.85 foot above original concrete curb and land surface. Water level recorder maintained on well since Sept. 25, 1940.

Water level, in feet below measuring point, 1940

Date	Hour	Water level	Date	Hour	Water level
May 22	4:00 p.m.	23.28	Oct. 22	9:00 a.m.	23.08
June 2	4:00 p.m.	23.30	29	9:30 a.m.	23.43
July 1	3:00 p.m.	24.25	Nov. 5	10:00 a.m.	23.80
16	5:00 p.m.	24.22	12	9:45 a.m.	23.77
Aug. 5	7:00 p.m.	22.75	19	9:10 a.m.	23.36
14	10:00 a.m.	20.80	26	9:30 a.m.	22.96
Sept. 9	9:00 a.m.	19.77	Dec. 2	10:00 a.m.	23.71
23	-	21.29	5	8:20 a.m.	23.51
25	2:35 p.m.	21.86	10	10:00 a.m.	23.56
30	1:25 p.m.	22.04	18	3:30 p.m.	23.40
Oct. 7	6:50 a.m.	22.49	26	1:30 p.m.	23.24
15	8:00 a.m.	23.09			

Palo Alto County
(Vicinity of Lost Island Lake)

97-34-29N1. SW¼SW¼ sec. 29, T. 97 N., R. 34 W. Unused well, diameter 20 inches, depth 8.0 feet. Measuring point, top of concrete tile at west side, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: Aug. 1, 4.25; Oct. 3, 6.00; Nov. 20, 2.61; Dec. 19, 2.73.

97-34-29N2. SW¼SW¼ sec. 29, T. 97 N., R. 34 W. Unused well, diameter 4 inches, depth 11.3 feet. Measuring point, top of casing, 1.5 feet above land surface. Water levels, in feet below measuring point, 1940: Aug. 1, 0.99; Oct. 2, 1.86; Nov. 20, 1.02; Dec. 19, 0.85.

97-34-30Q1. Norman Broadwell. SW¼SE¼ sec. 30, T. 97 N., R. 34 W., about 150 feet north of normal shore line of Lost Island Lake. Dug domestic well, diameter 48 inches, depth 24.6 feet. Measuring point, top of 2-inch plank platform at pump, 0.5 foot above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1940: Aug. 1, 19.37; Oct. 2, 19.96; Nov. 20, 19.52; Dec. 19, 19.33.

97-34-32P1. Lost Island State Park. SE¼SW¼ sec. 32, T. 97 N., R. 34 W., about 120 feet east of normal shore line of Lost Island Lake. Unused well, depth 46.1 feet. Measuring point, top of 9/16-inch hole in pump base, 1.3 feet above land surface. Equipped with lift pump. Water levels, in feet below measuring point, 1940: Aug. 1, 11.11; Oct. 2, 13.60; Nov. 20, 13.64; Dec. 19, 13.10.

Palo Alto County--Continued.

96-34-6J1. "Electric Park." NE¼SE¼ sec. 6, T. 96 N., R. 34 W., about 150 feet south of normal shore line of Lost Island Lake. Dug domestic well, diameter 18 inches, depth 20.3 feet. Measuring point, top of well curb, 3.1 feet above land surface. Equipped with lift pump. Water levels in feet below measuring point, 1940: Aug. 1, 5.28; Oct. 2, 5.90; Nov. 20, 5.56; Dec. 19, 5.45.

Plymouth County

91-48-19M1. Joe Tracy. NW¼SW¼ sec. 19, T. 91 N., R. 48 W. Water levels in feet below measuring point, 1940: April 18, 56.89; June 9, 56.91; July 14, 57.82; Sept. 26, 58.88.

Polk County

79-22-22A1. J. G. Reed. NE¼NE¼ sec. 22, T. 79 N., R. 22 W. Stock dug well, diameter 36 inches, depth 38.5 feet. Measuring point, top of 2-inch plank cover at southeast corner, 0.2 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 29	13.42	May 14	4.60	Sept.20	6.73	Dec. 27	5.01
Apr. 1	4.14	Aug.27	5.26	Nov. 7	6.40		

Sac County

89-38-26A1. City of Schaller, NE¼NE¼ sec. 26, T. 89 N., R. 38 W. Measurements discontinued.

89-38-26A2. City of Schaller. NE¼NE¼ sec. 26, T. 89 N., R. 38 W. Drilled well, diameter 10 inches, depth 352.5 feet. Measuring point, top of 1¼-inch slanting breather pipe, welded into casing, 0.17 foot above concrete pump base and top of casing and 1.8 feet above land surface. Equipped with 10 horsepower turbine. Taps water in Dakota sandstone. Replaces well 89-38-26A1, destroyed, which was located 10 feet north. Water level, in feet below measuring point, 1940: About Feb. 1, a218.65; Oct. 2, 221.81; Dec. 13, 222.22.

86-36-2C1. John Christian. NE¼NW¼ sec. 2, T. 86 N., R. 36 W. Unused bored well, diameter 20 inches, depth 19.5 feet. Measuring point, top of concrete tile casing at painted arrow, 0.6 foot above land surface.

Water level, in feet below measuring point, 1940

Apr. 19	4.12	July 15	b 5.55	Sept.17	b 5.00	Nov.16	b 4.80
May 15	b 3.00	30	6.34	Oct. 1	5.47	Dec.13	5.32
June 20	4.10	Aug. 15	b 5.20	15	b 6.00	16	b 5.30

86-36-2E1. Albert Kulver, Jr. SW¼NW¼ sec. 2, T. 86 N., R. 36 W., about 80 feet from normal shore line of Blackhawk Lake. Dug stock well, diameter 36 inches, depth 6.2 feet. Measuring point, top of casing, north side at painted arrow, 0.2 foot above land surface. Equipped with lift pump.

Water level, in feet below measuring point, 1940

Apr. 19	1.29	July 15	b 0.70	Sept.17	b 0.73	Nov. 16	b 0.80
May 15	b 0.75	30	0.33	Oct. 1	0.83	Dec. 13	0.85
June 20	0.50	Aug. 15	b 0.40	15	b 0.83	16	b 0.75

86-36-3H1. Blackhawk Lake Preserve. SE¼NE¼ sec. 3, T. 86 N., R. 36 W. Water level, in feet below measuring point, 1940: April 19, 49.58.

86-36-4N1. Iowa State Conservation Commission. SW¼SW¼ sec. 4, T. 86 N., R. 36 W. Unused dug well, diameter 36 inches, depth 9.5 feet. Measuring point, top of concrete tile, at painted arrow, 2.5 feet above land surface.

Water level, in feet below measuring point, 1940

Apr. 19	8.95	July 15	b 8.90	Sept.17	b 8.40	Nov. 16	b 8.50
May 15	b 8.50	30	8.95	Oct. 1	8.61	Dec. 13	8.44
June 20	8.52	Aug. 15	b 8.40	15	b 8.60	16	b 8.30

a Measurement by driller. Corrected to measuring point.
b Measurement made by Iowa State Conservation Commission.

Sioux County

95-45-5A1. City of Sioux Center. NE¼NE¼ sec. 5, T. 95 N., R. 45 W. Water level, in feet below measuring point, 1940: Aug. 15, 263.38.

94-45-17A1. City of Maurice. NE¼NE¼ sec. 17, T. 94 N., R. 45 W. No measurements made in 1940.

Story County

83-24-4Q1. Iowa State College. SW¼SE¼ sec. 4, T. 83 N., R. 24 W. Water levels affected by changes in atmospheric pressure and, until Sept. 10, 1940, by inflow of surface water during heavy rains.

Water level, in feet below measuring point, 1940.

Date	Hour	Water level	Date	Hour	Water level
Jan. 6	8:00 a.m.	46.53	July 6	9:00 a.m.	46.71
13	8:20 a.m.	46.25	13	10:10 a.m.	47.16
20	8:20 a.m.	46.35	20	7:45 a.m.	47.49
29	3:00 p.m.	46.43	27	7:45 a.m.	47.92
Feb. 3	8:30 a.m.	46.50	Aug. 1	2:20 p.m.	46.98
10	8:15 a.m.	46.17	6	5:30 p.m.	47.40
17	8:10 a.m.	46.48	12	5:10 p.m.	47.20
24	8:00 a.m.	46.47	17	10:50 a.m.	47.05
Mar. 2	9:55 a.m.	46.27	31	8:35 a.m.	45.77
8	9:20 a.m.	46.08	Sept. 7	7:40 a.m.	46.37
15	3:05 p.m.	46.06	14	7:50 a.m.	45.75
23	7:15 a.m.	46.21	21	8:00 a.m.	46.40
30	10:10 a.m.	45.76	28	7:50 a.m.	45.93
Apr. 6	7:20 a.m.	46.24	Oct. 5	8:00 a.m.	45.90
13	9:10 a.m.	46.04	12	7:45 a.m.	45.60
20	11:00 a.m.	46.06	19	11:45 a.m.	45.55
27	9:10 a.m.	46.03	26	7:50 a.m.	45.55
May 4	7:15 a.m.	45.89	Nov. 2	7:50 a.m.	45.51
7	9:50 a.m.	45.87	9	7:50 a.m.	45.57
11	11:00 a.m.	45.94	16	7:50 a.m.	45.45
18	7:00 a.m.	45.69	23	7:50 a.m.	45.47
25	9:00 a.m.	45.50	30	8:00 a.m.	45.18
June 1	9:40 a.m.	45.69	Dec. 7	8:00 a.m.	45.39
8	5:00 p.m.	46.46	14	7:50 a.m.	45.56
15	10:20 a.m.	46.25	21	8:50 a.m.	45.32
22	9:30 a.m.	46.32	28	7:45 a.m.	45.00
29	11:40 a.m.	46.58			

83-24-17R1. Agronomy Farm. SE¼SE¼ sec. 17, T. 83 N., R. 24 W. No measurements made in 1940.

83-24-20J1. Agricultural Engineering Experiment Station. NE¼SE¼ sec. 20, T. 83 N., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 16	25.43	June 14	19.77	Aug. 12	22.91	Dec. 28	18.43
May 7	20.29	July 15	21.70	Sept.24	19.07		

Warren County

76-25-8Q1. Iowa State College. SW¼SE¼ sec. 8, T. 76 N., R. 25 W. Domestic dug well, diameter 36 inches, depth 30 feet. Measuring point, top of concrete curb 0.3 foot above land surface. Equipped with lift pump. Taps water in the glacial drift. Water levels, in feet below measuring point, 1940: May 14, 14.36; Aug. 27, 15.13; Dec. 27, 17.72.

Wayne County

67-23-20Q1. L. P. Bryan. SW¼SE¼ sec. 20, T. 67 N., R. 23 W. Domestic dug well, diameter 36 inches, depth 22.5 feet. Measuring point, top of concrete slab well cover 0.25 feet above land surface. Equipped with lift pump. Taps water in the glacial drift. Water level, in feet below measuring point, 1940: Oct. 24, 12.90.

Woodbury County

89-48-23B1. Owner's Riverside Station well. City of Sioux City. NW¼NE¼ sec. 23, T. 89 N., R. 48 W. As a result of observer's tape being 0.23 feet short, water levels for Sept. 2, Oct. 2, Nov. 2 and Dec. 2, 1939 were incorrectly given in Water-Supply Paper 886. In order to avoid confusion these measurements have been corrected and are shown below together with other measurements made in 1939. Unless otherwise designated, measurements by Ed. Harbeck, Sioux City Water Works.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Aug. 16, 1939	a 6.05	June 11, 1940	6.92	June 25, 1940	6.58
Sept. 2	6.52	12	6.87	26	6.58
Oct. 2	7.10	13	6.92	27	6.62
13	a 7.41	14	6.92	28	6.67
Nov. 2	7.85	15	6.75	29	6.67
Dec. 2	7.77	16	6.67	30	6.67
Jan. 2, 1940	7.60	17	6.50	July 1	6.67
Feb. 2	8.02	18	6.58	2	6.67
Mar. 2	7.94	19	6.62	Aug. 2	7.42
Apr. 2	7.19	20	6.71	13	a 7.21
May 2	7.02	21	6.67	Sept. 2	7.08
June 2	7.35	22	6.58	Oct. 2	7.92
9	a 6.73	23	6.50	Nov. 2	8.04
10	6.92	24	6.50	Dec. 2	8.08

89-47-22B1. Owner's Lowell 4. City of Sioux City. NW¼NE¼ sec. 22, T. 89 N., R. 47 W. Water level measurements by N. L. Nelson, chief engineer, Sioux City Water Works.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	b 39.17	Apr. 2	b 37.83	July 2	b 38.83	Oct. 2	b 36.75
Feb. 2	38.75	May 2	b 36.92	Aug. 2	b 38.33	Nov. 2	36.25
Mar. 2	b 38.00	June 2	b 38.33	Sept. 6	b 38.50	Dec. 2	b 35.42

a Measurement by U. S. Geological Survey.
b Nearby wells pumping.

PAGE AND MONTGOMERY COUNTIES TARKIO CREEK AREA

By V. C. Fishel

The observation-well program in the Tarkio Creek area [1/] was continued in 1940 by the Federal Geological Survey. At the beginning of 1940, 70 wells were under observation, of which 51 were in Iowa and 19 were in Missouri. Measurements were resumed in 2 wells (11 and 51) and discontinued in 3 wells (37, 43A, and 77) during the year. Records for the wells in Missouri are given under the Missouri section in this volume but the descriptive text for the wells in Missouri is given in this section. Water-level measurements in 11 wells (1, 2, 5-7, 10, 12, and 14-17) were used in computing average water levels in 1940. The measurements were made by W. M. Mulnix of the Geological Survey.

The accompanying illustration gives the average height of the water levels above arbitrary datum planes for the period of observation and the accumulative departure from normal precipitation from 1934 to 1940 as determined at the station of the U. S. Weather Bureau at Clarinda, Iowa for 1934 and at Shenandoah, Iowa from 1935 to 1940. The normal annual precipitation at Shenandoah, Iowa is about 34 inches. The precipitation has been below normal each year since the observation-well program was started. It is believed that the water levels have also probably been below normal for the period of record.

The water levels declined gradually during the very dry spring and summer of 1934, and in September and October they were about 1 foot lower than in May. Moderately heavy rains in the fall of 1934 produced some ground-water recharge and at the end of the year the average of the water levels in the wells was nearly the same as in May, when measurements were begun. Only very little rain or snow fell during the 5 months from December 1, 1934 to April 30, 1935, and the water levels remained nearly stationary. Heavy rainfall, however, occurred in May and June 1935 and the water levels rose an average of about 4 feet by July 1. During the remainder of the growing season the precipitation was moderate, and the water levels declined an average of slightly more than 2 feet. The water levels remained nearly stationary during November and December 1935 and declined only moderately in January 1936.

1/ See Water-Supply Papers 777, 817, 840, 845, and 886.

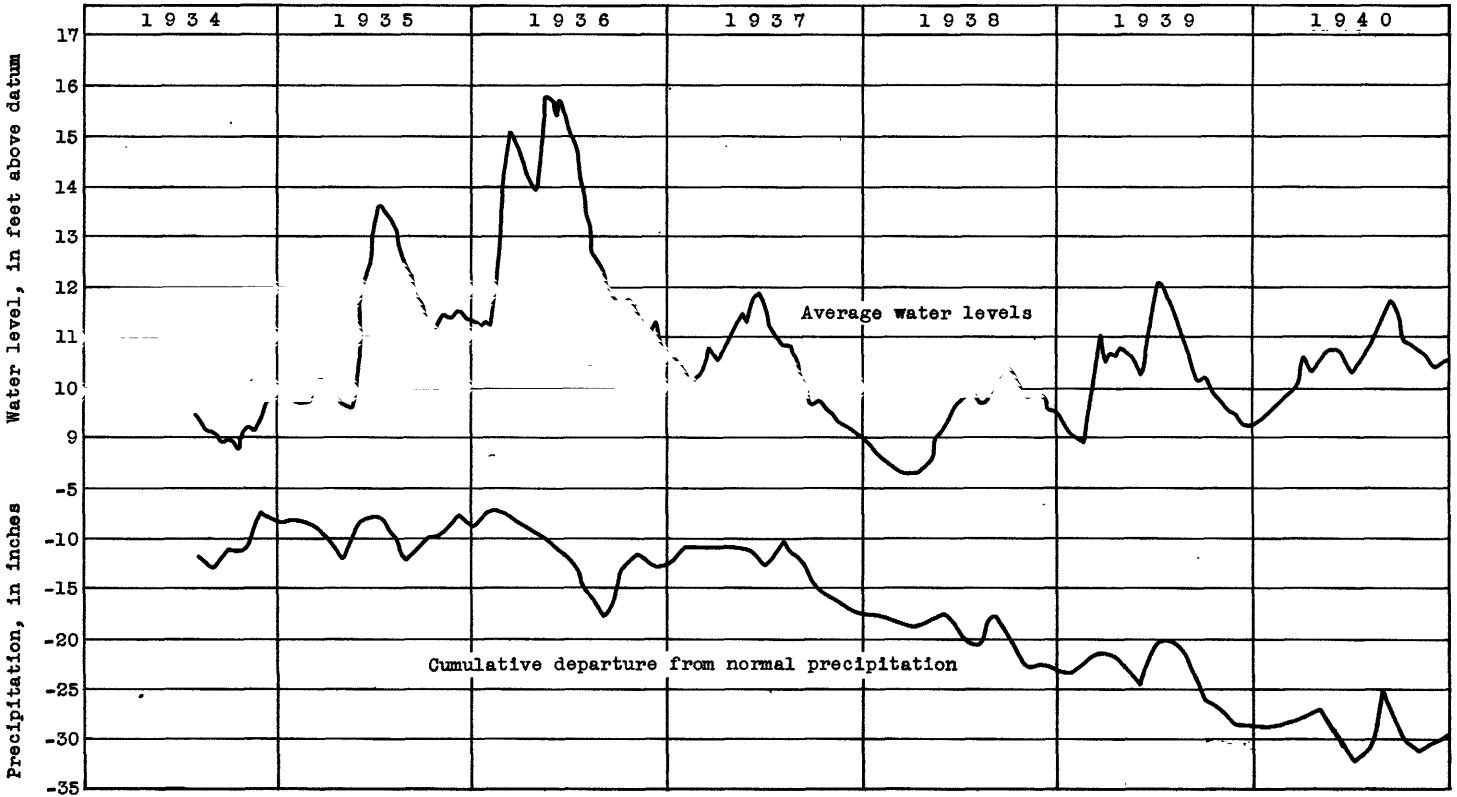

Figure 3.--Average water levels in wells in the Tarkio Creek area, Iowa-Missouri and cumulative departure from normal precipitation from January 1934 at Shenandoah, Iowa.

A thaw occurred in February 1936, during which time very few measurements were made because of bad roads. From January 28 to March 10 the water levels rose an average of nearly 4 feet. The water levels then declined until April 22, when rainfall caused them to rise sharply. On May 12 the highest average stage in the period of record was reached, 4.50 feet higher than the average stage on January 28, 1936, and nearly 6 feet higher than the average stage at the beginning of observations in the spring of 1934. The water levels then declined, with very few interruptions, for the rest of 1936. They reached an average stage on December 30, 1936 that was only about 0.6 foot higher than on January 1, 1935.

The precipitation in the area for the year 1937 was about 25 inches, which is about 8 inches below the average annual precipitation. Although the water levels rose at several times in the year, chiefly in February and May, the intermediate declines in the spring and the persistent decline in the fall and winter caused them to reach on January 1, 1938, the lowest average stage recorded since October 1934.

The water levels declined an average of 0.67 foot from January 1 to March 15, 1938, when they reached the lowest average stage at the period of observation, which extends from May 1934 to January 1941. On March 15, the water levels averaged 7.52 feet lower than in May 1936. The water levels began to rise in the latter part of March, and by the middle of July reached an average stage 1.68 feet above the stage of March 15. This rise was followed by a decline of 0.25 foot by August 2 and by another rise of 0.73 foot by September 20. The water levels then declined steadily for the rest of the year.

Water levels declined an average of 0.36 foot from January 1, 1939 to February 15, 1939. They rose 2.09 feet by March 15 and declined 0.78 foot by June 6, and then rose sharply 1.75 foot by July 5. The precipitation for the last half of 1939 was very low and the water levels declined an average of 2.83 feet from July 5 to December 19.

Bad roads prevented measurements from December 19, 1939 to March 18, 1940, during which period the water levels rose an average of 0.80 foot. Alternate rises and declines occurred during the rest of 1940 and at the end of the year the water levels were an averags of about 1.4 feet above the average stage at the end of 1939 and about 0.6 foot above the average stage at the end of 1934.

Average water levels, in feet above assumed datum planes, in 11 observation wells, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 18-19	9.98	May 6-7	10.53	June 10-11	10.54	Sept.25-26	10.82
25-26	10.53	13-14	10.65	17-18	10.49	Oct. 24-25	10.69
Apr. 8-9	10.41	20-21	10.69	24-25	10.37	Nov. 27-29	10.34
16-17	10.26	27-28	10.71	July 1-2	10.27	Dec. 30	10.59
29-30	10.43	June 3-4	10.63	Aug. 29-30	11.71		

Page County

5. John Toft.

Water level, in feet above datum, 1940

Mar. 18	7.02	Apr. 29	7.40	June 3	9.14	Aug. 29	13.30
25	7.11	May 6	7.88	10	9.05	Sept.25	12.90
Apr. 3	7.05	13	8.55	17	8.99	Oct. 24	10.34
8	7.06	20	9.00	24	8.95	Nov. 27	9.91
16	7.09	27	9.04	July 1	8.90	Dec. 30	10.28

6. T. Slickerveer.

Water level, in feet above datum, 1940

Mar. 19	8.97	May 7	9.41	June 11	10.27	Aug. 30	9.83
26	8.93	14	9.87	18	10.18	Sept.26	9.72
Apr. 9	8.92	21	10.05	25	10.02	Oct. 25	9.23
17	8.90	28	10.16	July 2	9.97	Nov. 29	9.00
30	9.17	June 4	10.23				

10. R. Palmquist.

Water level, in feet above datum, 1940

Mar. 19	10.07	May 7	10.56	June 11	10.82	Aug. 30	11.50
26	10.20	14	10.65	18	10.79	Sept.26	10.77
Apr. 9	10.34	21	10.74	25	10.85	Oct. 25	10.79
17	10.43	28	10.70	July 2	10.82	Nov. 29	10.74
30	10.54	June 4	10.77				

11. R. Palmquist. Measurements temporarily discontinued Sept. 19, 1939; measurements resumed Mar. 19, 1940.

Water level, in feet above datum, 1940

Mar. 19	12.08	May 7	12.40	June 11	10.88	Aug. 30	12.15
26	12.50	14	11.28	18	10.66	Sept.26	10.37
Apr. 9	10.31	21	11.19	25	10.67	Oct. 25	(a)
17	9.74	28	10.98	July 2	10.65	Nov. 29	(a)
30	13.11	June 4	10.94				

12. Amil Windhorst.

Water level, in feet above datum, 1940

Mar. 19	8.61	May 7	9.89	June 11	10.28	Aug. 30	13.45
26	13.87	14	10.20	18	10.57	Sept.26	11.53
Apr. 9	14.12	21	10.27	25	10.60	Oct. 25	14.21
17	14.24	28	10.32	July 2	10.57	Nov. 27	13.69
30	9.82	June 4	10.31				

13. Amil Windhorst.

Water level, in feet above datum, 1940

Mar. 19	10.58	May 7	11.22	June 11	11.00	Aug. 30	11.73
26	10.86	14	11.27	18	11.28	Sept.26	10.94
Apr. 9	11.16	21	11.19	25	11.26	Oct. 25	11.54
17	11.37	28	11.06	July 2	11.22	Nov. 29	11.38
30	11.17	June 4	11.04				

14. Floyd Hoskins.

Water level, in feet above datum, 1940

Mar. 18	13.10	Apr. 29	10.99	June 3	11.62	Aug. 29	12.10
25	13.04	May 6	11.40	10	11.29	Sept.25	11.35
Apr. 3	12.34	13	11.96	17	11.25	Oct. 24	11.71
8	11.92	20	12.01	24	10.72	Nov. 27	11.86
16	11.38	27	11.90	July 1	10.35	Dec. 30	12.93

a Well dry.

Page County--Continued.

15. Metropolitan Life Insurance Co.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 4	10.04	Apr. 29	10.34	June 3	10.17	Aug. 29	11.83
18	10.09	May 6	10.45	10	10.06	Sept.25	11.09
25	10.06	13	10.45	17	9.99	Oct. 24	10.40
Apr. 3	10.03	20	10.38	24	9.87	Nov. 27	9.31
8	10.04	27	10.30	July 1	9.78	Dec. 30	10.40
16	9.98						

16. Metropolitan Life Insurance Co. Well dry throughout 1940.

17. Albert Nordholm.

Water level, in feet above datum, 1940

Mar. 4	7.74	Apr. 29	8.58	June 3	8.54	Aug. 29	9.20
18	8.47	May 6	8.66	10	8.63	Sept.25	8.65
25	8.59	13	8.92	17	8.67	Oct. 24	8.23
Apr. 3	8.57	20	8.86	24	8.46	Nov. 27	8.08
8	8.50	27	8.80	July 1	8.26	Dec. 30	7.97
16	8.46						

38. Elsie Nordstrom.

Water level, in feet above datum, 1940

Feb. 7	68.14	Apr. 16	69.27	May 28	70.85	July 2	71.78
26	67.75	30	69.31	June 4	71.25	Aug. 30	71.93
Mar. 19	68.55	May 7	69.36	10	71.47	Sept.26	72.33
26	68.69	14	69.95	18	71.67	Oct. 24	71.93
Apr. 9	69.18	21	70.42	25	71.81	Nov. 29	71.89

39. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Mar. 19	67.23	May 7	68.22	June 10	71.33	Aug. 30	70.30
26	67.29	14	69.26	18	71.47	Sept.26	70.54
Apr. 9	68.06	21	70.05	25	71.60	Oct. 24	70.23
16	68.61	28	70.63	July 2	71.69	Nov. 27	69.97
30	68.05	June 4	71.04				

40. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	68.14	Apr. 16	66.95	May 28	69.98	July 2	71.28
26	68.05	30	66.99	June 4	70.99	Aug. 30	69.74
Mar. 19	66.56	May 7	67.09	10	71.07	Sept.26	69.49
26	66.53	14	67.54	18	71.12	Oct. 24	(a)
Apr. 9	66.84	21	68.03	25	71.26	Nov. 27	(a)

41. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	64.19	Apr. 16	67.58	May 28	70.62	July 2	70.70
26	64.10	30	67.05	June 4	70.80	Aug. 30	69.10
Mar. 19	68.11	May 7	67.40	10	70.87	Sept.26	68.77
26	68.06	14	69.29	18	70.94	Oct. 24	67.97
Apr. 9	67.61	21	70.23	25	70.77	Nov. 27	67.63

42. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Mar. 19	67.92	May 7	67.61	June 10	69.83	Aug. 30	68.45
26	67.76	14	70.31	18	69.71	Sept.26	67.68
Apr. 9	66.91	21	70.33	25	69.51	Oct. 24	66.68
16	66.96	28	70.13	July 2	69.42	Nov. 27	66.18
30	67.08	June 4	70.12				

a Well dry.

Page County--Continued.

43. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	66.03	Apr. 16	66.18	May 28	67.93	July 1	69.10
26	65.89	30	66.65	June 4	67.00	Aug. 30	67.93
Mar. 19	65.86	May 7	66.66	10	68.81	Sept.26	68.00
26	66.10	14	66.70	18	69.04	Oct. 24	67.51
Apr. 9	66.10	21	67.30	25	69.12	Nov. 27	67.19

43A. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	65.31	Apr. 16	66.31	May 21	67.26	June 18	67.97
26	65.13	30	66.57	28	67.58	25	68.35
Mar. 19	65.69	May 7	66.72	June 4	67.86	July 1	68.23
26	65.75	14	66.95	10	68.06		(a)
Apr. 9	66.22						

44. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	63.78	Apr. 16	66.08	May 28	68.91	July 2	67.82
26	63.73	30	66.28	June 4	68.71	Aug. 30	68.81
Mar. 19	68.14	May 7	67.04	10	68.43	Sept.26	66.64
26	68.27	14	69.68	18	68.27	Oct. 24	65.48
Apr. 9	66.32	21	69.38	25	67.94	Nov. 29	65.17

44A. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	62.95	Apr. 16	65.28	May 28	67.32	July 2	65.65
26	62.81	30	65.54	June 4	66.80	Aug. 30	69.47
Mar. 19	66.94	May 7	66.06	10	66.44	Sept.26	65.85
26	67.06	14	68.60	18	66.25	Oct. 24	64.14
Apr. 9	65.55	21	67.98	25	65.84	Nov. 29	63.67

45. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	61.82	Apr. 16	64.36	May 28	67.71	July 2	65.26
26	61.68	30	64.77	June 4	66.27	Aug. 30	69.07
Mar. 19	66.92	May 7	65.26	10	65.89	Sept.25	65.32
26	66.89	14	67.99	18	65.51	Oct. 24	63.60
Apr. 9	64.60	21	67.36	25	65.34	Nov. 27	63.95

46. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	57.53	Apr. 16	60.66	May 28	62.66	July 2	61.24
26	57.46	30	60.84	June 4	62.34	Aug. 30	65.22
Mar. 19	63.91	May 7	61.66	10	62.04	Sept.26	62.07
26	63.84	14	63.66	18	61.87	Oct. 24	60.32
Apr. 9	61.05	21	63.16	25	61.56	Nov. 27	58.06

47. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	52.65	Apr. 16	55.36	May 28	57.57	July 2	56.69
26	52.58	30	55.74	June 4	57.43	Aug. 30	59.16
Mar. 19	56.86	May 7	56.94	10	57.19	Sept.26	57.78
26	56.80	14	57.98	18	57.12	Oct. 24	56.42
Apr. 9	55.94	21	57.82	25	56.80	Nov. 29	56.16

48. Elsie Nordstrom. Well dry throughout 1940.

49. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	68.15	Apr. 16	68.11	May 28	68.72	July 2	69.25
26	67.92	30	68.22	June 4	68.85	Aug. 30	71.60
Mar. 19	67.90	May 7	68.28	10	69.01	Sept.26	71.37
26	67.87	14	68.41	18	69.13	Oct. 24	71.85
Apr. 9	68.06	21	68.62	25	69.37	Nov. 29	71.66

a Well destroyed.

Page County--Continued.

50. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	60.06	Apr. 16	59.92	May 28	59.77	July 2	59.48
26	59.93	30	59.97	June 4	59.92	Aug. 30	64.21
Mar. 19	60.25	May 7	60.17	10	59.97	Sept.26	63.74
26	60.21	14	60.34	18	59.62	Oct. 24	61.69
Apr. 9	60.00	21	59.50	25	59.58	Nov. 29	61.42

51. Elsie Nordstrom. Well dry throughout 1940.

52. Elsie Nordstrom. Well dry throughout 1940.

54. Elsie Nordstrom. Well dry throughout 1940.

55. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	54.96	Mar. 19	(a)	May 7	(a)	July 2	(a)
26	54.79	Apr. 9	(a)	June 4	(a)	Nov. 29	(a)

56. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	(a)	May 7	(a)	Aug. 30	53.45	Oct. 24	(a)
Mar. 19	(a)	June 4	(a)	Sept.26	53.02	Nov. 29	(a)

57. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	45.28	Apr. 16	45.35	May 28	44.59	July 1	44.71
26	45.09	30	45.46	June 4	44.33	Aug. 30	47.24
Mar. 19	45.19	May 7	45.52	10	44.23	Sept.26	46.62
26	45.24	14	45.73	18	44.20	Oct. 24	45.68
Apr. 9	45.31	21	45.04	25	44.87	Nov. 29	44.92

58. Elsie Nordstrom.

Water level, in feet above datum of well 38, 1940

Feb. 7	42.72	Apr. 16	42.47	May 28	42.12	July 2	40.96
26	42.53	30	42.67	June 4	41.93	Aug. 30	40.91
Mar. 19	42.11	May 7	42.89	10	41.98	Sept.26	40.67
26	42.23	14	43.29	18	41.95	Oct. 24	39.18
Apr. 9	42.36	21	42.41	25	41.26	Nov. 27	38.87

59. Frank Goodner.

Water level, in feet above datum of well 38, 1940

Feb. 26	36.58	Apr. 16	36.91	May 28	36.98	July 2	37.08
Mar. 19	36.82	30	36.95	June 4	36.99	Aug. 30	47.58
26	36.86	May 7	36.96	10	37.07	Sept.26	46.90
Apr. 3	36.98	14	37.00	18	37.10	Oct. 24	(a)
8	36.90	20	37.01	25	37.10	Nov. 29	(a)

69. Frank Goodner.

Water level, in feet above datum of well 38, 1940

Feb. 26	0.52	Apr. 16	3.00	May 28	5.19	July 2	3.23
Mar. 19	3.04	30	5.56	June 4	5.25	Aug. 30	5.21
26	3.17	May 7	5.44	10	4.25	Sept.26	4.32
Apr. 3	2.91	14	5.16	18	3.87	Oct. 24	3.40
8	2.95	20	5.18	25	3.52	Nov. 29	3.13

70. John Snyder.

Water level, in feet above datum, 1940

Mar. 19	14.12	Apr. 29	13.51	June 3	11.84	Aug. 30	10.59
25	13.34	May 7	12.81	10	11.06	Sept.26	9.28
Apr. 3	12.35	14	12.38	18	10.64	Oct. 24	8.93
9	12.11	20	12.11	25	9.93	Nov. 29	8.61
16	11.79	28	11.96	July 2	9.80		

a Well dry.

Page County--Continued.

71. John Snyder.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 19	10.68	Apr. 29	10.59	June 3	10.38	Aug. 30	11.18
25	10.50	May 7	10.65	10	10.27	Sept.26	10.69
Apr. 3	10.52	14	10.78	18	10.18	Oct. 24	10.39
9	10.57	20	10.65	25	10.45	Nov. 29	10.10
16	10.50	28	10.49	July 2	10.29		

74. Fred Miller.

Water level, in feet above datum, 1940

Mar. 5	4.91	Apr. 29	10.20	June 3	12.35	Aug. 29	13.32
18	7.57	May 6	10.91	10	12.41	Sept.25	12.05
25	7.45	13	11.29	17	12.44	Oct. 24	12.95
Apr. 3	9.75	20	11.83	24	12.41	Nov. 29	13.10
8	9.75	27	12.12	July 1	12.36	Dec. 30	9.78
16	9.89						

75. I. W. Runyon.

Water level, in feet above datum, 1940

Mar. 5	8.51	Apr. 29	14.18	June 3	12.30	Aug. 29	13.24
18	11.96	May 6	14.18	10	11.76	Sept.25	12.01
25	11.77	13	14.20	17	11.53	Oct. 24	10.37
Apr. 3	12.19	20	13.43	24	11.28	Nov. 27	10.28
8	12.31	27	13.69	July 1	11.19	Dec. 30	11.40
16	12.53						

76. Metropolitan Life Insurance Co.

Water level, in feet above datum, 1940

Mar. 18	10.93	Apr. 29	11.41	June 3	10.77	Aug. 29	11.26
25	10.84	May 6	11.45	10	10.66	Sept.25	10.09
Apr. 3	10.96	13	11.46	17	10.59	Oct. 24	9.99
8	10.98	20	11.32	24	10.57	Nov. 27	9.94
16	11.00	27	11.07	July 1	10.47	Dec. 30	10.76

80. Burton.

Water level, in feet above datum, 1940

Mar. 19	12.76	May 7	15.43	June 11	11.55	Aug. 30	13.86
26	12.79	14	12.22	18	11.75	Sept.26	12.70
Apr. 9	14.97	21	12.95	25	12.07	Oct. 25	11.54
17	12.37	28	13.33	July 2	11.86	Nov. 29	11.51
30	16.62	June 4	12.53				

83. Elsie Nordstrom.

Water level, in feet above datum, 1940

Feb. 26	67.37	Apr. 30	71.42	June 3	72.02	Aug. 30	70.62
Mar. 19	70.95	May 7	71.54	11	71.91	Sept.26	70.36
25	70.76	14	72.29	18	71.75	Oct. 24	70.08
Apr. 8	71.55	21	72.29	25	71.61	Nov. 29	69.92
16	72.17	28	72.17	July 2	71.53		

84. Elsie Nordstrom.

Water level, in feet above datum of well 83, 1940

Feb. 26	65.56	Apr. 30	71.74	June 3	72.17	Aug. 30	70.50
Mar. 19	71.99	May 7	72.01	11	71.98	Sept.26	70.03
25	71.77	14	73.14	18	71.74	Oct. 24	69.89
Apr. 9	71.95	21	72.80	25	71.56	Nov. 29	69.73
16	72.06	28	72.46	July 2	71.38		

85. Elsie Nordstrom.

Water level, in feet above datum of well 83, 1940

Mar. 19	73.07	May 7	72.24	June 11	72.21	Aug. 30	70.41
25	73.01	14	73.78	18	71.75	Sept.26	69.99
Apr. 9	72.31	21	73.52	25	71.60	Oct. 24	69.50
16	72.43	28	72.76	July 2	71.54	Nov. 29	69.38
30	71.88	June 3	72.46				

Page County--Continued.

86. Elsie Nordstrom.

Water level, in feet above datum of well 83, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 26	66.82	Apr. 30	72.71	June 3	72.31	Aug. 30	70.14
Mar. 19	73.74	May 7	73.04	11	72.20	Sept.26	69.58
26	73.43	14	74.10	18	71.52	Oct. 24	69.39
Apr. 9	72.28	21	73.38	25	71.28	Nov. 29	69.23
16	71.93	28	72.71	July 2	70.92		

87. Elsie Nordstrom.

Water level, in feet above datum of well 83, 1940

Feb. 26	68.24	Apr. 30	78.11	June 3	74.83	Aug. 30	71.66
Mar. 19	78.15	May 7	77.91	11	74.41	Sept.26	71.10
26	77.88	14	77.30	18	73.38	Oct. 24	70.72
Apr. 9	74.55	21	75.93	25	73.04	Nov. 29	70.43
16	74.07	28	75.08	July 2	72.70		

Montgomery County

7. E. F. Holquist.

Water level, in feet above datum, 1940

Mar. 19	10.00	May 7	13.56	June 11	13.53	Aug. 30	12.03
26	10.66	14	14.00	18	13.29	Sept.26	10.98
Apr. 9	11.53	21	14.08	25	13.12	Oct. 25	10.28
17	11.94	28	13.95	July 2	12.96	Nov. 27	9.85
30	12.30	June 4	13.83				

72. O. A. Milner.

Water level, in feet above datum, 1940

Mar. 20	15.38	May 8	16.57	June 11	15.64	Aug. 30	14.96
27	15.58	15	15.96	18	15.43	Sept.26	13.75
Apr. 9	14.58	21	16.11	26	15.68	Oct. 25	12.11
18	14.47	28	16.01	July 3	15.56	Nov. 29	12.33
30	17.29	June 4	15.93				

73. - - - .

Water level, in feet above datum, 1940

Mar. 20	13.70	May 8	12.51	June 11	12.38	Aug. 30	12.03
27	13.84	15	11.97	18	12.27	Sept.26	10.98
Apr. 9	12.18	21	12.82	26	12.58	Oct. 25	10.20
18	11.89	28	12.70	July 3	12.46	Nov. 29	10.09
30	12.69	June 4	12.59				

77. C. A. Swanson.

Water level, in feet above datum, 1940

Mar. 6	11.62	Apr. 30	19.63	May 28	15.54	June 25	16.00
19	13.68	May 7	18.21	June 4	15.38	July 2	15.93
26	13.47	14	16.19	11	15.25	Aug. 30	18.19
Apr. 9	13.14	21	15.73	18	15.16		(a)
17	12.98						

78. Mainquist.

Water level, in feet above datum, 1940

Mar. 19	10.54	May 7	11.46	June 11	9.93	Aug. 30	11.14
26	10.30	14	10.67	18	9.96	Sept.26	10.19
Apr. 9	10.00	21	10.41	25	9.96	Oct. 25	10.02
17	9.83	28	10.32	July 2	9.94	Nov. 29	9.93
30	11.92	June 4	10.12				

79. - - - .

Water level, in feet above datum, 1940

Mar. 19	15.26	May 7	17.13	June 11	12.80	Aug. 30	18.83
26	14.96	14	15.72	18	12.21	Sept.26	13.82
Apr. 9	12.60	21	15.19	25	11.90	Oct. 25	11.63
17	12.22	28	15.00	July 2	11.39	Nov. 29	10.72
30	17.98	June 4	13.72				

a Well destroyed.

Montgomery County--Continued.

81. L. G. Bergren.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 19	11.89	May 7	12.36	June 11	11.06	Aug. 30	11.20
26	11.19	14	11.59	18	10.98	Sept.26	10.71
Apr. 9	11.01	21	11.42	25	11.10	Oct. 25	10.49
17	10.92	28	11.26	July 2	11.06	Nov. 29	10.48
30	12.71	June 4	11.24				

82.

Water level, in feet above datum, 1940

Mar. 20	10.03	May 8	15.62	June 11	14.37	Aug. 30	16.79
27	11.38	15	15.18	18	14.13	Sept.26	16.11
Apr. 9	14.04	21	15.08	25	15.66	Oct. 25	13.34
18	14.18	28	14.78	July 3	15.48	Nov. 29	13.38
30	15.86	June 4	14.64				

KANSAS

INTRODUCTION

By S. W. Lohman

The Kansas section of the report on water levels and artesian pressure in the United States in 1939 [1] contained 10 chapters covering observation-well programs in 13 counties. The records for Harvey, McPherson, and Sedgwick Counties were combined in one chapter entitled "South-central Kansas", and the records for Jewell County were contained in the chapter entitled "Limestone Creek area of Soil Conservation Service".

The present section comprises 21 separate county chapters in alphabetical order and includes chapters on 8 counties added during 1940 in addition to chapters on the 13 counties covered in the previous annual volume. The 8 counties for which records are given for the first time are Barber, Clark, Comanche, Hodgeman, Kiowa, Ness, Pawnee, and Seward.

At the end of 1940 periodic measurements of water-level were being made in 486 wells. Six wells are measured 4 times a year, 357 wells are measured once a month, 110 wells are measured once a week, and 13 wells are equipped with automatic water-stage recorders. A total of 8,158 wetted-tape measurements was made during the year.

The following discussion is based upon the water-level records in 13 of the 21 counties for which records are available for 1 year or more. In 7 of these counties the precipitation in 1940 was above normal and in 6 it was below normal. Of 271 representative wells with records of more than 1 year, the water levels declined during the year in 172 wells, rose in 98 wells, and the water level in 1 well was unchanged.

The water levels in most of the observation wells in four western counties (Finney, Ford, Hamilton, and Stanton) rose during the year. The precipitation was above normal in only 2 of these counties, but it was above the average of the precipitation for the last 5 to 10 years in each of them. In 9 other counties of central and western Kansas, however, the water levels in most wells declined slightly during the year despite the fact that in 4 of the counties the precipitation was above normal.

The water levels in 243 wells whose records extend back several years were about the same at the end of 1940 as when measurements were first begun during the period from 1937 to 1939. In this period the water levels rose in 122 of the wells, declined in 120 wells, and the water level in 1 well was unchanged.

1/ Water-Supply Paper 886, pp. 138-227, 1940.

BARBER COUNTY

By J. C. Frye

An investigation of the ground-water resources of Barber County, Kansas, was started in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. A general reconnaissance of the area was made by the writer in October 1940, under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Barber County is at the eastern edge of the Plains Border section of the Great Plains province. It is drained by the Medicine Lodge River, which flows across the county from northwest to southeast, and by the Salt Fork River, which flows across the southwestern corner of the county. Most of the county is underlain by Permian rocks, but remnants of Tertiary deposits remain on some of the uplands, local Pleistocene deposits occur on intermediate levels, and Recent alluvium is found along the major valleys. Although many of the wells derive their water from the Permian rocks, locally more abundant supplies of water of better quality are obtained from the alluvium along the Medicine Lodge and Salt Fork Rivers. Only four wells in the county are pumped for irrigation.

At the end of 1940, measurements of water level were being made once a month by the wetted-tape method in 12 wells in Barber County. Seven of the wells obtain water from alluvium, four obtain water from Permian rocks, and one obtains water from Tertiary rock. The measurements in October were made by the writer; those in November and December, by Richard B. Christy. A total of 34 individual measurements of water level was made from October 17 to the end of the year.

1. D. S. Shaw. SE¼NW¼ sec. 19, T. 31 S., R.15 W. Unused drilled domestic and stock well, diameter 8 inches, depth 97 feet. Measuring point, top of 8-inch iron casing at south side, 1.0 foot above land surface. Equipped with hand pump. Water levels, in feet below measuring point, 1940: Oct. 17, 83.99; Nov. 27, 78.84; Dec. 28, 78.40.

2. Russell Lake. SW¼SW¼ sec. 14, T. 31 S., R. 14 W. Drilled irrigation well, diameter 16 inches, depth 43.5 feet. Measuring point, top of concrete curb at north side, 1.0 foot above land surface. No pump on well. Water levels, in feet below measuring point, 1940: Oct. 21, 13.90; Nov. 27, 13.39; Dec. 28, 13.35.

3. Mr. Griever. SW¼NE¼ sec. 12, T. 32 S., R. 12 W., one block north and one block east of the intersection of U. S. Highways 160 and 281, in the city of Medicine Lodge. Dug domestic well, diameter 3 feet, depth 27 feet. Measuring point, top of wooden curb at north side, 3.0 feet above land surface. Equipped with windlass and bucket. Water levels, in feet below measuring point, 1940: Oct. 21, 18.43; Nov. 27, 16.70; Dec. 28, 15.66.

4. Madge Evans. SW¼SE¼ sec. 4, T. 32 S., R. 12 W. Drilled irrigation well, diameter 16 inches, depth 42 feet. Measuring point, hole in base of turbine pump, 2.2 feet above land surface. Equipped with turbine pump and electric motor. Water levels, in feet below measuring point, 1940: Oct. 21, 18.10; Nov. 26, 18.19; Dec. 28, 17.95.

5. R. Kenney. NE¼NW¼ sec. 1, T. 33 S., R. 12 W. Dug stock well, diameter 2 feet, depth 35 feet. Measuring point, top of stone curb at north side, 1.5 feet above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 21, 30.35; Nov. 26, 30.34; Dec. 28, 30.20.

6. F. H. Boggs and Ben Barthlow. NW¼NW¼ sec. 4, T. 33 S., R. 12 W. Drilled stock well, diameter 8 inches, depth 165 feet. Measuring point, top of 8-inch iron casing at south side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water level, in feet below measuring point, 1940: Oct. 21, 39.73.

8. P. Brock. SE¼NE¼ sec. 17, T. 34 S., R. 15 W. Unused dug domestic well, diameter 3 feet, depth 22 feet. Measuring point, top of brick curb at north side, 0.5 foot above land surface. Equipped with hand lift pump. Water levels, in feet below measuring point, 1940: Oct. 22, 17.61; Nov. 26, 17.70; Dec. 28, 17.59.

9. V. D. Wells. SE¼SE¼ sec. 18, T. 34 S., R. 15 W. Unused driven domestic well, diameter 1 inch, depth 11 feet. Measuring point, top of 1-inch galvanized-iron pipe, 3.5 feet above land surface. No pump on well. Water levels, in feet below measuring point, 1940: Oct. 22, 7.26; Nov. 26, 6.38; Dec. 28, 6.00.

10. G. H. Davis. NW¼SW¼ sec. 11, T. 35 S., R. 15 W. Unused drilled stock well, diameter 5⅛ inches, depth 152 feet. Measuring point, top of 5⅛-inch galvanized-iron casing at south side, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 22, 104.35; Nov. 26, 104.18; Dec. 28, 104.06.

11. A. Achenback. NE¼SE¼ sec. 9, T. 35 S., R. 12 W. Unused drilled stock well, diameter 6 inches, depth 92 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 22, 48.72; Nov. 26, 48.44; Dec. 28, 48.19.

12. B. Mills. SW¼SW¼ sec. 34, T. 33 S., R 10 W. Unused dug stock well, diameter 3 feet, depth 25 feet. Measuring point, top of brick and concrete curb at south side, 1.5 feet above land surface. Water levels, in feet below measuring point, 1940: Oct. 22, 13.18; Nov. 26, 12.99; Dec. 28, 12.85.

13. J. A. Hrencher. SW¼SE¼ sec. 17, T. 32 S., R. 10 W., Unused dug stock well, diameter 4 feet, depth 22 feet. Measuring point, top of concrete curb at south side, 1.5 feet above land surface. Water levels, in feet below measuring point, 1940: Oct. 22, 18.49; Nov. 26, 18.16; Dec. 28, 17.83.

CLARK COUNTY

By J. C. Frye

An investigation of the ground-water resources of Clark County, Kansas, was started in 1940 by the Federal Geological Survey and the Kansas Geological Survey, in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. A general reconnaissance of the area was made in October 1940, by the writer under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Clark County is at the western edge of the Plains Border section of the Great Plains province. It is drained by the Cimarron River, which flows across the southern part of the county, and by Bluff Creek, a tributary of the Cimarron. About equal areas of Clark County are underlain by Permian, Tertiary and Pleistocene rocks, and Cretaceous rocks crop out locally in the central and eastern parts. Although most of the wells derive water from the Pleistocene formations, some of them tap water in the Permian, Cretaceous and Tertiary rocks. Most of the domestic and stock supplies and the public supplies of Ashland, Englewood, and Minneola are obtained from wells.

At the end of 1940 water-level measurements were being made once a month by the wetted-tape method in 13 wells in Clark County. The measurements in October were made by the writer; those in November and December, by Richard B. Christy. A total of 39 individual measurements of water level was made from June 28 to the end of the year.

1. Central Life Assurance Co. SE¼NW¼ sec. 17, T. 34 S., R. 25 W. Drilled stock well, diameter 6 inches, depth 39 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 10, 24.59; Nov. 19, 24.60; Dec. 29, 24.69.

2. George F. Batt. NW¼SW¼ sec. 5, T. 30 S., R. 23 W. Unused drilled domestic well, diameter 6 inches, depth 164 feet. Measuring point, top of 8-inch casing at north side, 0.5 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 12, 134.55; Nov. 19, 134.69; Dec. 29, 134.52.

3. T. L. Blair. SW¼NW¼ sec. 17, T. 30 S., R. 24 W. Unused drilled domestic and stock well, diameter 4 inches, depth 78 feet. Measuring point, notch in top of casing at south side, 0.2 foot above land surface. Equipped with hand operated lift pump. Water levels, in feet below measuring point, 1940: Oct. 12, 63.17; Nov. 19, 63.03; Dec. 29, 63.03.

4. N. B. Estes. NE¼NE¼ sec. 5, T. 31 S., R. 25 W. Unused drilled domestic well, diameter 5⅝ inches, depth 101 feet. Measuring point, top of concrete curb at west side, 0.2 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 12, 94.06; Nov. 19, 92.99; Dec. 29, 92.92.

5. Winnie Floyd. NW¼NW¼ sec. 12, T. 33 S., R. 25 W., Drilled stock well, diameter 6 inches, depth 53 feet. Measuring point, top of 6-inch galvanized-iron casing at north side, 0.5 foot above land surface. Equipped with lift pump and gasoline engine. Water levels, in feet below measuring point, 1940: Oct. 12, 29.23; Nov. 19, 29.09; Dec. 29, 29.15.

6. District School. NE¼NE¼ sec. 7, T. 35 S., R. 21 W. Unused drilled school well, diameter 6 inches, depth 36 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, level with land surface. Equipped with hand operated lift pump. Water levels, in feet below measuring point, 1940: Oct. 14, 27.58; Nov. 20, 27.41; Dec. 29, 27.24.

7. M. C. Harper. SW¼SE¼ sec. 32, T. 33 S., R. 21 W. Unused drilled stock well, diameter 6 inches, depth 61 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 1.5 feet above land surface. No pump on well. Water levels, in feet below measuring point, 1940: Oct. 14, 37.25; Nov. 20, 37.11; Dec. 29, 37.16.

8. W. H. Rogers. NE¼NE¼ sec. 7, T. 32 S., R. 21 W. Unused drilled stock well, diameter 6 inches, depth 69 feet. Measuring point, top of 6-inch galvanized-iron casing at east side, 0.5 foot above land surface. No pump on well. Water levels, in feet below measuring point, 1940: Oct. 14, 32.15; Nov. 20, 32.42; Dec. 29, 32.51.

9. F. Bailey. SW¼SW¼ sec. 34, T. 30 S., R. 21 W. Drilled stock well, diameter 6 inches, depth 31 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 2.0 feet above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 14, 13.51; Nov. 20, 13.53; Dec. 29, 13.52.

10. J. F. Folks estate. SE¼SE¼ sec. 24, T. 32 S., R. 23 W. Unused drilled stock well, diameter 6 inches, depth 21 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 1.5 feet above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 15, 17.84; Nov. 19, 17.82; Dec. 29, 17.87.

11. James O. Folks. NE¼SE¼ sec. 26, T. 33 S., R. 24 W. Unused drilled stock well, diameter 6 inches, depth 35 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 1.0 foot above land surface. Well equipped with hand operated lift pump. Water levels, in feet below measuring point, 1940: Oct. 15, 29.45; Nov. 19, 29.49; Dec. 29, 29.61.

12. Ralph Gardner. SW¼SW¼ sec. 11, T. 33 S., R. 24 W. Unused drilled domestic well, diameter 6 inches, depth 73 feet. Measuring point, top edge of pump base at west side, 0.5 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 15, 68.70; Nov. 19, 68.62; Dec. 29, 68.52.

441. W. O. Rogers. NE¼NW¼ sec. 4, T. 30 S., R. 24 W. Unused drilled domestic and stock well, diameter 5⅛ inches, depth 140 feet. Measuring point, top of 5⅛ inch galvanized-iron casing at north side, 0.7 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: June 28, 114.33; Nov. 19, 114.52; Dec. 29, 114.37.

COMANCHE COUNTY

By J. C. Frye

An investigation of the ground-water resources of Comanche County, Kansas, was started in 1940 by the Federal Geological Survey and the Kansas Geological Survey, in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. A general reconnaissance of the area was made by the writer in October 1940, under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Comanche County is in the Plains Border section of the Great Plains province. It is drained by the Salt Fork River, which flows across the central and south-central parts of the county, and by the Cimarron River and its tributary, Bluff Creek, which flow across the western and southwestern parts. Most of Comanche County is underlain by Permian and Pleistocene rocks, but Cretaceous and Tertiary rocks crop out at places. Although most of the wells derive water from the Tertiary and Pleistocene rocks, a few wells tap water in the Cretaceous and Permian rocks. Most of the domestic and stock supplies and the public supplies of Coldwater and Protection are obtained from wells. Only two wells are pumped for irrigation.

At the end of 1940, measurements of water level were being made once a month by the wetted-tape method in 8 wells in Comanche County. The measurements in October were made by the writer; those in November and December, by Richard B. Christy. A total of 24 individual measurements of water level was made from October 15 to the end of the year.

1. A. A. Carpenter. NE¼NE¼ sec. 8, T. 33 S., R. 20 W. At the southeast corner of the ruins of a foundation. Unused drilled domestic well, diameter 6 inches, depth 43 feet. Measuring point, top of concrete pump platform, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 15, 41.17; Nov. 20, 41.13; Dec. 27, 41.15.

2. Nina Clark. SW¼SW¼ sec. 27, T. 31 S., R. 30 W. Situated 100 yards northeast of school house on creek bank. Unused drilled stock well, diameter 6 inches, depth 29 feet. Measuring point, top of 6-inch galvanized-iron casing at east side, 0.2 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 15, 17.87; Nov. 20, 17.92; Dec. 27, 17.84.

3. E. Deewall. SW¼NE¼ sec. 19, T. 31 S., R. 18 W. Situated 50 yards east of half-section line and 0.35 mile south of north section line. Unused drilled stock well, diameter 6 inches, depth 97 feet. Measuring point, top of 6-inch galvanized-iron casing at west side, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 15, 85.34; Nov. 20, 85.18; Dec. 27, 84.67.

4. E. G. Thorp. SW¼SW¼ sec. 35, T. 34 S., R. 20 W. Unused drilled stock well, diameter 6 inches, depth 17 feet. Measuring point, top of 6-inch galvanized-iron casing at north side, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 16, 10.75; Nov. 27, 10.50; Dec. 28, 10.36.

6. Christopher Nickolson. NW¼NE¼ sec. 6, T. 35 S., R.18 W. Unused drilled stock well, diameter 6 inches, depth 86 feet. Measuring point, notch in top of 6-inch casing at north side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 16, 80.17; Nov. 27, 80.36; Dec. 28, 79.88.

7. W. D. Aitken. NW¼NE¼ sec. 35, T. 34 S., R. 17 W. Situated 50 yards west of bridge at side of valley. Unused drilled stock well, diameter 5 inches, depth 79 feet. Measuring point, top of 5-inch iron casing at west side, level with top of concrete curb, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 16, 51.39; Nov. 27, 40.40; Dec. 28, 55.95.

8. Christopher Beitler. NW¼NE¼ sec. 34, T. 33 S., R. 17 W. Situated in pasture 0.6 mile east of county road. Unused drilled stock well, diameter 5⅛ inches, depth 50 feet. Measuring point, top of 5⅛-inch galvanized-iron casing at west side, 1.0 foot above land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 16, 34.93; Nov. 27, 34.86; Dec. 28, 34.64.

9. H. R. Burnette. NW¼NE¼ sec. 13, T. 32 S., R. 17 W., at west edge of abandoned house. Unused drilled domestic well, diameter 5⅛ inches, depth 102 feet. Measuring point, top of 5⅛-inch galvanized-iron casing at west side, 0.2 foot above land surface. Water levels, in feet below measuring point, 1940: Oct. 17, 89.14; Nov. 27, 89.38; Dec. 28, 89.10.

FINNEY COUNTY

By B. F. Latta

The observation-well program in Finney County, Kansas (See Water-Supply Paper 886), begun in September 1939, was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health.

During the summer and fall of 1940 a detailed investigation of the geology and ground-water resources of Finney County was made by the writer under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas, and a report based on the investigation is now in preparation as a bulletin of the Kansas Geological Survey.

The water levels in about 170 wells, in addition to those in the 27 observation wells, were measured at least once during the investigation. During 1940 a total of 298 measurements of water level was made in the 27 observation wells. Measurements were discontinued in well 25 in May 1940. At the end of the year 26 wells were being measured once a month. Measurements between August 21 and November 30, 1940, were made by the writer; all other measurements were made by Richard B. Christy.

The Division of Water Resources of the Kansas State Board of Agriculture continued to maintain an automatic water-stage recorder on well 1. The records of water level for this well in 1940 have been made available by Mr. G. S. Knapp, chief engineer, and are included in this report. The recorder was serviced by K. D. McCall, assistant engineer of the Division of Water Resources.

The altitudes of the measuring points for six of the observation wells were determined by the Topographic Branch of the Federal Geological Survey, and are included in this report.

According to records of the United States Weather Bureau, the precipitation at Garden City, Finney County, in 1940 was 21.5 inches, or 1.28 inches above normal. This is the highest precipitation Finney County has received in any year since 1930, and is 7.32 inches above the annual average for the last 10 years. Of the total precipitation, 14.01 inches was received during the 4-month period from May through August.

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The water levels in most of the wells in Finney County not affected by pumping show some effect of the rainfall. Water levels in wells 7, 8, 11, 14, and 28 started to rise in May or June in response to the rainfall and, except in wells 8 and 14, continued to rise during the remainder of the year. Water levels in wells 8 and 14 declined slightly in November and December. Water levels in wells 9, 12, 24, and 26 rose sharply in response to rains in May, declined in June or July, and again rose in response to heavy rains in August. The heavy rains in May caused the water levels in wells 5, 6, and 23 to rise temporarily but in July or August the water levels started to decline and continued to decline the rest of the year. The water level in well 21 declined during the first part of the year but rose after the heavy rains in August.

Water levels in 4 wells (4, 13, 15, and 17), which are affected by pumping, rose in response to the May rains, but they started to decline in June or July in response to pumping and continued to decline until pumping had ceased in September or October when they again rose. The water level in another well affected by pumping--well 18--rose during the first half of the year but started to decline in June in response to pumping and continued to decline during the remainder of the year.

The water level in well 1 has been measured regularly since July 1936, and the record is the longest continuous record for any well in Finney County. Well 1 is a shallow well in the Arkansas Valley and the water level in it is greatly affected by pumping. The irregular downward trend of the water level in the well correlates rather closely with the cumulative departure from the normal monthly precipitation. The downward trend of the water level, however, can not be explained wholly by the cumulative deficiency in precipitation because part of the decline is probably caused by increased pumping in the valley and by the deficiency in stream flow in the last several years. The water level in the well reaches a peak each year during the pumping season, which extends from June through August, that is probably the result of recharge produced by nearby irrigation.

Fourteen of the 27 observation wells in Finney County for which the 1940 records are complete showed net rises in water level of from 0.05 foot to 0.69 foot, the average net rise being about 0.31 foot. The other 13 wells showed net declines in water level of 0.02 foot to 3.81 feet, the average net decline being about 0.78 foot. When the declines of water level in wells 3, 10, and 16 are omitted, the average net decline is reduced to about 0.37 foot.

At the end of 1940 the water levels in 14 of the wells were higher than they were at the beginning of the period of record in September 1939, and the water levels in 11 wells were lower. In the 14 wells showing net rises in water level for the entire period of record, the rises ranged from 0.02 foot to 1.52 feet, and they averaged about 0.43 foot. In the 11 wells showing net declines in water level, the declines ranged from 0.04 foot to 3.24 feet, and the average net decline was about 0.91 foot. By omitting wells 3, 16, and 19, the average net decline becomes only about 0.28 foot.

At the end of 1940 the water level in well 1 was 2.15 feet lower than it was at the beginning of record in July 1936, and the water level in well 4 was 0.3 foot lower than it was in May 1934.

The difference between the highest and lowest water levels recorded in the 27 observation wells ranged from 0.1 foot to 17.14 feet (well 3), and the average difference (omitting well 3) was about 1.15 feet.

Fluctuations of water level in observation wells in Finney County are summarized in the following table.

Highest and lowest water levels for period of record in 27 wells in Finney County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
1	a 11.12	Aug. 6, 1937	a 8.20	Dec. 21, 1940
2	109.56	Nov. 30, 1940	109.71	Oct. 26, 1939
3	44.64	Mar. 22, 1940	61.78	Aug. 21, 1940
4	34.70	July 20, 1940	36.53	Sept.20, 1939
5	23.12	June 21, 1940	23.54	Jan. 28, 1940
6		July 24, 1940		
6	17.25	June 21, 1940	19.09	Apr. 24, 1940
7	77.67	Dec. 24, 1940	78.22	June 22, 1940
8	75.92	Sept.20, 1940	76.75	June 21, 1940
9	72.86	Oct. 28, 1940	73.74	Aug. 22, 1940
10	11.83	Mar. 22, 1940	14.73	Sept.20, 1940
		Sept.20, 1940		Dec. 18, 1939
11	76.65	Oct. 28, 1940	76.75	Jan. 28, 1940
		Nov. 30, 1940		Feb. 17, 1940
12	107.67	Dec. 24, 1940	108.21	Aug. 29, 1940
13	3.77	June 21, 1940	5.63	Sept.23, 1939
14	47.10	Oct. 28, 1940	47.65	May 23, 1940
15	14.43	June 21, 1940	15.40	Sept.20, 1940
16	38.92	Oct. 26, 1940	42.29	Dec. 24, 1940
17	7.44	Apr. 24, 1940	9.81	Oct. 26, 1939
18	11.71	Sept.26, 1939	12.31	Feb. 17, 1940
19	30.62	Oct. 2, 1939	32.11	Dec. 24, 1940
20	68.02	Jan. 27, 1940	68.90	Dec. 14, 1939
				May 22, 1940
				July 24, 1940

a In feet above datum.

Highest and lowest water levels for period of record in 27 wells in Finney County--Continued.

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
21	100.32	Nov. 13, 1939	100.70	Aug. 27, 1940
22	120.14	Sept.28, 1939	120.86	Nov. 17, 1939
		Oct. 2, 1939		Dec. 18, 1939
23	44.98	July 24, 1940	45.80	Feb. 17, 1940
24	34.11	July 20, 1940	34.92	Aug. 22, 1940
26	69.95	June 21, 1940	a 72.35	Sept.30, 1939
			71.46	Aug. 21, 1940
27	76.07	Mar. 22, 1940	76.26	July 24, 1940
28	36.59	Sept.20, 1940	37.06	Apr. 24, 1940
		Oct. 28, 1940		May 23, 1940
		Dec. 24, 1940		

Net changes in water level in 1940 and net changes in water level for period of record in 27 wells in Finney County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for entire period of record
1	2.92	-0.77	b -2.15
2	.15	+ .1	+ .07
3	17.14	-3.81	-3.1
4	1.83	+ .18	c - .3
5	.42	+ .24	+ .15
6	1.84	- .08	- .74
7	.55	+ .5	+ .42
8	.83	+ .6	+ .46
9	.88	- .05	+ .13
10	2.9	-1.03	- .27
11	.1	d + .1	d + .05
12	.54	+ .34	+ .22
13	1.86	+ .19	+1.26
14	.55	+ .48	+ .37
15	.97	- .69	- .36
16	3.37	-1.65	-3.24
17	2.37	+ .69	+1.52
18	.60	+ .1	- .45
19	1.49	- .72	-1.48
20	.88	- .85	- .04
21	.38	- .02	- .07
22	.72	- .13	- .21
23	.82	d + .05	d + .02
24	.81	d + .28	d + .21
26	1.51	- .33	+ .73
27	.29	- .05	- .08
28	.47	+ .45	+ .39

a Old measuring point.
b July 17, 1936 to Dec. 31, 1940.
c May 14, 1934 to Dec. 24, 1940.
d To Nov. 30, 1940.

1. Mrs. A. M. Reid. NE¼NE¼ sec. 9, T. 24 S., R. 33 W. Water levels supplied through courtesy of the Division of Water Resources of the Kansas State Board of Agriculture.

Mean daily water level, in feet above datum, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.97	8.91	8.87	8.84	8.81	9.06	9.21	9.21	8.96	8.76	8.50	8.28
2	8.97	8.90	8.87	8.84	8.81	9.05	9.26	9.20	8.95	8.75	8.49	8.27
3	8.96	8.90	8.87	8.84	8.81	9.04	9.34	9.19	8.94	8.74	8.48	8.27
4	8.96	8.90	8.87	8.84	8.81	9.03	9.37	9.17	8.93	8.73	8.47	8.27
5	8.96	8.90	8.87	8.84	8.81	9.02	9.38	9.14	8.92	8.72	8.47	8.26
6	8.95	8.90	8.88	8.84	8.81	9.02	9.38	9.12	8.90	8.71	8.46	8.26
7	8.95	8.90	8.88	8.84	8.82	9.06	9.38	9.11	8.89	8.70	8.46	8.26
8	8.95	8.90	8.88	8.83	8.83	9.14	9.37	9.10	8.88	8.69	8.45	8.26
9	8.95	8.89	8.87	8.83	8.83	9.19	9.37	9.09	8.87	8.68	8.44	8.26
10	8.94	8.89	8.87	8.83	8.82	9.20	9.36	9.09	8.86	8.67	8.44	8.26
11	8.94	8.89	8.87	8.83	8.81	9.19	9.35	9.08	8.85	8.66	8.43	8.26
12	8.94	8.89	8.87	8.83	8.81	9.18	9.35	9.08	8.84	8.66	8.42	8.26
13	8.94	8.89	8.86	8.83	8.80	9.18	9.34	9.07	8.83	8.65	8.41	8.25
14	8.93	8.89	8.86	8.83	8.80	9.18	9.33	9.06	8.82	8.64	8.40	8.25
15	8.93	8.89	8.86	8.83	8.79	9.18	9.32	9.05	8.81	8.63	8.39	8.24
16	8.94	8.89	8.86	8.83	8.79	9.18	9.30	9.07	8.86	8.63	8.38	8.24
17	8.94	8.89	8.86	8.82	8.79	9.17	9.28	9.16	8.86	8.62	8.38	8.23
18	8.93	8.89	8.86	8.82	8.91	9.17	9.28	9.17	8.87	8.61	8.37	8.23
19	8.93	8.89	8.85	8.82	9.06	9.17	9.29	9.13	8.89	8.60	8.36	8.23
20	8.93	8.89	8.85	8.82	9.12	9.17	9.31	9.08	8.90	8.59	8.36	8.23
21	8.93	8.88	8.85	8.82	9.13	9.16	9.32	9.06	8.87	8.58	8.35	8.22
22	8.92	8.88	8.85	8.82	9.14	9.16	9.31	9.05	8.84	8.57	8.35	8.22
23	8.92	8.88	8.85	8.82	9.14	9.17	9.30	9.04	8.82	8.56	8.34	8.22
24	8.92	8.88	8.85	8.81	9.14	9.18	9.28	9.03	8.81	8.56	8.33	8.22
25	8.92	8.88	8.85	8.81	9.13	9.19	9.26	9.01	8.81	8.55	8.33	8.21
26	8.91	8.88	8.85	8.81	9.12	9.19	9.28	9.00	8.80	8.54	8.32	8.21
27	8.91	8.87	8.85	8.81	9.11	9.19	9.30	8.98	8.79	8.53	8.31	8.21
28	8.91	8.87	8.84	8.80	9.10	9.22	9.26	8.96	8.78	8.52	8.30	8.21
29	8.91	8.87	8.84	8.80	9.09	9.24	9.22	8.95	8.77	8.52	8.29	8.21
30	8.91	....	8.84	8.81	9.08	9.23	9.21	8.98	8.76	8.52	8.28	8.20
31	8.91	....	8.84	....	9.07	....	9.21	8.98	....	8.51	....	8.20

2. Maggie B. Smith. NE cor. NW¼NE¼ sec. 30, T. 26 S., R. 32 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	109.69	Apr. 24	109.62	July 24	109.68	Nov. 30	109.56
Feb. 17	109.67	May 23	109.67	Sept.20	109.57	Dec. 24	109.59
Mar. 22	109.63	June 21	109.68	Oct. 28	109.60		

3. Nora Will. SW¼SW¼ sec. 35, T. 23 S., R. 33 W.

Water level, in feet below measuring point, 1940

Jan. 28	44.88	Apr. 24	a50.30	July 20	a49.45	Oct. 28	a53.63
Feb. 17	44.76	May 23	a53.38	Aug. 21	a61.78	Nov. 30	a51.54
Mar. 22	44.64	June 21	46.62	Sept.20	a56.25	Dec. 24	48.69

4. Garden City Company. SW¼SW¼ sec. 18, T. 22 S., R. 33 W. Measuring point 2,912.5 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 29	35.38	Apr. 25	34.86	July 20	34.70	Oct. 28	35.59
Feb. 17	35.27	May 24	34.83	Aug. 21	35.49	Nov. 30	35.44
Mar. 23	35.07	June 21	34.79	Sept.20	35.67	Dec. 24	35.20

5. E. Alberta Reeves. SE¼NW¼NW¼ sec. 19, T. 21 S., R. 32 W.

Water level, in feet below measuring point, 1940

Jan. 28	23.54	Apr. 25	23.53	July 24	23.12	Oct. 28	23.30
Feb. 17	23.53	May 24	23.39	Aug. 24	23.22	Nov. 30	23.31
Mar. 22	23.52	June 21	23.12	Sept.20	23.32	Dec. 24	23.30

a Irrigation well about 200 yards east pumping.

6. T. A. Meakel. NW¼SW¼SW¼ sec. 36, T. 21 S., R. 29 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	18.80	Apr. 24	19.09	July 24	17.86	Oct. 29	18.79
Feb. 15	18.74	May 22	18.20	Aug. 27	18.44	Nov. 30	18.88
Mar. 22	18.94	June 21	17.25	Sept.20	18.64	Dec. 30	18.88

7. Marion Russell. NE¼NW¼ sec. 2, T. 26 S., R. 33 W.

Water level, in feet below measuring point, 1940

Feb. 17	78.15	May 23	78.16	Aug. 22	77.90	Nov. 30	77.78
Mar. 22	78.17	June 22	78.22	Sept.20	77.85	Dec. 24	77.67
Apr. 24	78.16	July 20	77.97	Oct. 28	77.79		

8. O. G. Reeve. SW¼NE¼SE¼ sec. 13, T. 25 S., R. 33 W.

Water level, in feet below measuring point, 1940

Jan. 28	76.68	Apr. 24	76.68	July 20	76.61	Oct. 28	75.93
Feb. 17	76.68	May 23	76.72	Aug. 22	76.18	Nov. 30	76.03
Mar. 22	76.68	June 21	76.75	Sept.20	75.92	Dec. 24	76.08

9. L. L. Jones. NW¼NE¼NW¼ sec. 2, T. 26 S., R. 34 W.

Water level, in feet below measuring point, 1940

Jan. 28	73.05	Apr. 24	73.39	July 20	73.19	Oct. 28	72.86
Feb. 17	73.16	May 23	73.19	Aug. 22	73.74	Nov. 30	72.99
Mar. 22	73.07	June 22	73.34	Sept.20	73.15	Dec. 24	73.10

10. L. R. McBeth. NW¼NE¼ sec. 9, T. 24 S., R. 33 W. Measuring point 2,866.5 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 28	11.86	Apr. 24	12.23	July 20	13.22	Oct. 28	13.88
Feb. 17	12.25	May 23	12.99	Aug. 21	14.68	Nov. 30	13.16
Mar. 22	11.83	June 21	11.89	Sept.20	14.73	Dec. 24	12.89

11. P. A. Wiens. NE¼SE¼SE¼ sec. 24, T. 22 S., R. 31 W.

Water level, in feet below measuring point, 1940

Jan. 28	76.75	Apr. 25	76.73	July 24	76.68	Oct. 28	76.65
Feb. 17	76.75	May 24	76.73	Aug. 27	76.69	Nov. 30	76.65
Mar. 22	76.72	June 21	76.72	Sept.20	76.65		

12. Nellie Handy. NW¼SE¼NE¼ sec. 3, T. 25 S., R. 31 W.

Water level, in feet below measuring point, 1940

Mar. 25	107.95	June 21	108.08	Aug. 29	108.21	Oct. 28	107.97
Apr. 24	107.93	July 24	107.91	Sept.20	108.19	Dec. 24	107.67
May 23	108.03						

13. Edwin Wehrley. NE¼SE¼SW¼ sec. 13, T. 25 S., R. 31 W.

Water level, in feet below measuring point, 1940

Jan. 27	4.56	Apr. 24	4.40	July 24	4.78	Oct. 28	4.83
Feb. 17	4.45	May 23	4.58	Aug. 29	5.42	Nov. 30	4.49
Mar. 25	4.40	June 21	3.77	Sept.20	5.58	Dec. 24	4.37

14. John A. Hunter. NE¼SE¼NE¼ sec. 4, T. 26 S., R. 32 W.

Water level, in feet below measuring point, 1940

Jan. 27	47.64	Apr. 24	47.62	July 24	47.18	Oct. 28	47.10
Feb. 17	47.60	May 23	47.65	Aug. 22	47.16	Nov. 30	47.12
Mar. 22	47.59	June 21	47.37	Sept.20	47.12	Dec. 24	47.16

15. Floyd A. Edwards. SW¼SW¼ sec. 2, T. 24 S., R. 33 W. Measuring point 2,858.6 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 28	14.53	Apr. 24	14.52	July 20	14.75	Oct. 28	15.32
Feb. 17	14.51	May 23	14.63	Aug. 21	15.24	Nov. 30	15.19
Mar. 22	14.47	June 21	14.43	Sept.20	15.40	Dec. 24	15.22

16. George L. Meeker. NW¼NE¼NE¼ sec. 6, T. 24 S., R. 34 W. Measuring point 2,970.2 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 29	40.64	Apr. 25	41.67	July 20	41.74	Oct. 28	41.26
Feb. 17	40.87	May 23	42.01	Aug. 21	41.17	Nov. 30	41.94
Mar. 22	41.30	June 21	42.27	Sept.19	40.96	Dec. 24	42.29

17. SE¼SW¼NW¼ sec. 7, T. 24 S., R. 33 W.

Water level, in feet below measuring point, 1940

Jan. 28	8.90	Apr. 24	7.44	July 20	8.12	Nov. 30	8.64
Feb. 17	8.35	May 23	7.80	Aug. 21	8.63	Dec. 24	8.21
Mar. 22	7.69	June 21	7.60	Oct. 28	8.85		

18. A. Finnup. NW¼NW¼ sec. 17, T. 24 S., R. 34 W.

Water level, in feet below measuring point, 1940

Jan. 28	12.26	Apr. 24	12.24	July 20	11.86	Oct. 28	12.09
Feb. 17	12.31	May 23	12.06	Aug. 21	11.83	Nov. 30	12.17
Mar. 22	12.24	June 22	11.82	Sept.19	11.94	Dec. 24	12.16

19. N. E. Ramsay. SE¼SE¼ sec. 10, T. 23 S., R. 34 W.

Water level, in feet below measuring point, 1940

Jan. 29	31.39	Apr. 25	31.68	July 20	31.80	Oct. 28	31.91
Feb. 17	31.46	May 24	31.55	Aug. 21	31.89	Dec. 24	32.11
Mar. 23	31.64	June 21	31.72	Sept.20	31.85		

20. C. R. Rixon. SW¼SW¼ sec. 12, T. 23 S., R. 27 W.

Water level, in feet below measuring point, 1940

Jan. 27	68.02	Apr. 24	68.86	July 24	68.90	Sept.20	68.86
Feb. 15	68.05	May 22	68.90	Aug. 27	68.89	Dec. 30	68.87
Mar. 22	68.89	June 21	68.89				

21. Lena Ramsey. NE¼NE¼ sec. 18, T. 23 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 27	100.38	Apr. 24	100.40	Aug. 27	100.70	Nov. 30	100.40
Feb. 15	100.40	July 24	100.52	Oct. 29	100.40	Dec. 30	100.40
Mar. 22	100.37						

22. Jacob Eichhorn. NW¼SW¼SW¼ sec. 18, T. 24 S., R. 31 W.

Water level, in feet below measuring point, 1940

Jan. 28	120.22	Apr. 25	120.72	July 24	120.27	Nov. 30	120.35
Feb. 17	120.25	May 23	120.18	Sept.20	120.32	Dec. 30	120.35
Mar. 25	120.23	June 21	120.28	Oct. 28	120.38		

23. J. E. Ely. SE¼SW¼SE¼ sec. 4, T. 23 S., R. 32 W.

Water level, in feet below measuring point, 1940

Feb. 17	45.80	May 24	45.64	Aug. 26	45.24	Oct. 28	45.57
Mar. 22	45.77	June 21	45.02	Sept.20	45.40	Nov. 30	45.67
Apr. 25	45.75	July 24	44.98				

24. C. N. Ingle. NE cor. NE¼ sec. 24, T. 21 S., R. 34 W. Measuring point 2,914.5 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	34.59	Apr. 25	34.75	July 20	34.11	Oct. 28	34.25
Feb. 17	34.58	May 24	34.44	Aug. 22	34.92	Nov. 30	34.31
Mar. 23	34.57	June 21	34.23	Sept.20	34.18		

25. George H. Mack. SW cor. SW¼ sec. 10, T. 24 S., R. 32 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 28	10.05	Mar. 25	10.08	May 23	9.99
Feb. 17	10.05	Apr. 25	10.03		

26. Garden City Experiment Station. SW¼NE¼SE¼ sec. 3, T. 24 S., R. 32 W. New measuring point beginning May 23, 1940, top of casing at northwest side, level with land surface, 0.89 foot below old measuring point, 2,884.8 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 28	71.29	Apr. 25	71.12	July 24	70.70	Oct. 28	71.08
Feb. 17	71.23	May 23	a70.56	Aug. 21	71.46	Nov. 30	70.69
Mar. 25	71.03	June 21	69.95	Sept.20	71.23	Dec. 30	70.73

27. Farmers and Bankers Life Insurance Company. SE¼SW¼SE¼ sec. 34, T. 26 S., R. 31 W.

Water level, in feet below measuring point, 1940

Jan. 27	76.20	Apr. 24	76.22	July 24	76.26	Oct. 28	76.14
Feb. 17	76.23	May 23	76.23	Aug. 29	76.20	Nov. 30	76.22
Mar. 22	76.07	June 21	76.25	Sept.20	76.16	Dec. 24	76.25

28. Andrew Layman. SW¼SE¼SE¼ sec. 36, T. 24 S., R. 34 W.

Water level, in feet below measuring point, 1940

Feb. 17	37.04	May 23	37.06	Aug. 22	36.64	Oct. 28	36.59
Mar. 22	37.04	June 22	36.90	Sept.20	36.59	Dec. 24	36.59
Apr. 24	37.06	July 20	36.76				

a New measuring point.

FORD COUNTY

By H. A. Waite

The observation-well program in Ford County, Kansas,[1] was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Sanitation of the Kansas State Board of Health and the Division of Water Resources of the Kansas State Board of Agriculture. The investigation in Ford County was made by the writer, under the general supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas, and a report based on the work is now in preparation as a bulletin of the Kansas Geological Survey. Eleven test holes were drilled in the county in January 1940 by a drilling rig owned by the State and Federal Surveys, making a total of 21 test holes put down in the county.

At the beginning of 1940, measurements of water levels were being made once a month in 39 wells. In August 1940 monthly observations were discontinued on 24 of the wells (4, 5, 6, 7, 9, 10, 13, 17, 25, 26, 32, 35, 43, 47, 52, 53, 60, 68A, 72, 76, 86, 89, 101, and 359), but in the future it is planned to measure the water levels in the wells once or twice each year. At the end of 1940 the water levels in 15 wells (2, 8, 11, 15, 38, 41, 48, 57, 59, 65, 79B, 79C, 96, 237, and 343) were being measured once a month. A total of 320 measurements of water level was made in 1940 by Richard B. Christy.

According to records of the United States Weather Bureau, the precipitation at Dodge City in 1940 was 25.84 inches, which is 5.30 inches above normal and almost twice the precipitation in 1939. The precipitation was above normal for the first time in 10 years and the water levels in nearly half the 39 observation wells reached their highest stages on record.

Of 15 wells for which water-level measurements are available for the entire year, 4 are on the upland north of the Arkansas Valley, 10 are in the Arkansas Valley, and 1 well is on the upland south of the valley. The water levels in 6 wells (8, 48, 59, 65, 79C, and 96), in the Arkansas Valley, rose moderately until June, when their highest stages of the year were reached, and then declined throughout the rest of the year. The water levels in 4 irrigation wells (2, 15, 57 and 79B) were affected by pumping, and the highest water levels in them occurred in March or July.

1/ See Water-Supply Papers 845 and 886.

The water levels in wells 38, 41, and 237 rose in May and June as a result of rains in April, May, and June. The highest water level of the year was reached in June in well 237 and in July in well 41. The water level in well 38 reached its highest stage in September, partly as a result of the spring rains and partly as a result of heavy rains in August, which amounted to 5.09 inches. On December 21, 1940, the water levels in 11 of the wells were from 0.02 foot to 0.95 foot higher than on January 17 to 24. The water levels in 4 of the wells showed net declines ranging from 0.11 foot to 0.65 foot in the same period. Of the 4 wells showing net declines, 3 wells (8, 65, and 79B) are in the Arkansas Valley, and the fourth well (237) is on the uplands north of the Arkansas Valley.

At the end of 1940 the water levels in 9 of the 15 wells being measured once a month were lower than at the beginning of record in October 1938, but the water levels in the other 6 wells were higher. The net declines in water level in the 9 wells during the entire period of record ranged from 0.05 foot to 1.05 feet, and the net rises in water levels in the 6 wells during the same period ranged from 0.10 foot to 0.37 foot. The difference between the highest and lowest water levels during the entire period of record in the 15 wells ranged from 0.14 foot to 4.79 feet and the average difference was about 1.57 feet.

Of the 24 wells for which records are complete only to July 1940, the water levels in 17 wells were higher in July 1940 than at the beginning of the period of record in October 1939, and in 7 wells they were lower. In the 17 wells showing net rises in water level, the rises ranged from 0.01 foot to 2.72 feet, and the average net rise was about 0.55 foot. In the 7 wells showing net declines in water level, the declines ranged from 0.03 foot to 1.21 feet, and the average net decline was about 0.33 foot. The difference between the highest and lowest recorded water levels in the 24 wells ranged from 0.07 foot to 3.97 feet, and the average difference was about 1.35 feet.

The following table summarizes the water-level fluctuations in observation wells in Ford County.

Highest and lowest water levels for period of record in 39 wells in Ford County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
2	27.35	Mar. 20, 1940	28.78	Sept. 5, 1939
4	103.62	Nov. 15, 1938	103.94	Oct. 2, 1939
		Dec. 2, 1938		
5	95.89	Jan. 3, 1939	96.70	Oct. 2, 1939
6	45.42	Nov. 1, 1938	45.88	Oct. 2, 1939
7	22.38	Mar. 31, 1939	23.57	Sept. 5, 1939
8	6.84	Mar. 31, 1939	8.97	Nov. 7, 1939
9	7.01	Mar. 31, 1939	9.71	Sept. 5, 1939
10	14.49	Aug. 19, 1939	16.41	Jan. 24, 1940
11	12.69	July 22, 1940	13.31	Jan. 24, 1940
13	85.51	Dec. 7, 1938	86.52	May 4, 1939
15	35.17	Jan. 3, 1939	36.92	Sept. 5, 1939
17	135.29	Jan. 23, 1939	135.95	July 22, 1940
25	11.14	May 27, 1939	12.38	July 22, 1940
26	83.11	Jan. 3, 1939	83.57	Apr. 19, 1940
				June 19, 1940
32	68.06	Feb. 13, 1940	68.28	Oct. 11, 1938
		Mar. 20, 1940		
35	37.14	June 19, 1940	40.80	Apr. 19, 1940
38	41.05	Sept.19, 1940	42.08	Mar. 20, 1940
				May 16, 1940
41	46.49	July 22, 1940	47.53	July 1, 1939
43	61.48	June 20, 1940	62.70	Oct. 2, 1939
47	49.43	July 22, 1940	50.50	Nov. 8, 1939
48	8.12	June 19, 1940	10.85	Oct. 2, 1939
52	2.42	Mar. 31, 1939	3.48	Aug. 9, 1939
53	4.80	Mar. 31, 1939	5.69	Sept. 5, 1939
57	8.76	Oct. 21, 1938	10.93	Oct. 2, 1939
59	17.43	Mar. 25, 1939	18.21	Sept. 5, 1939
60	4.65	June 19, 1940	8.62	Nov. 15, 1938
65	17.54	June 20, 1940	18.70	Oct. 2, 1939
68A	55.67	July 22, 1940	56.18	Feb. 14, 1940
72	33.61	Jan. 3, 1939	35.20	Nov. 8, 1939
76	27.66	Mar. 31, 1939	29.51	Nov. 8, 1939
79B	11.30	Dec. 2, 1938	16.09	Aug. 1, 1939
79C	8.97	Mar. 31, 1939	10.69	Oct. 2, 1939
86	5.73	June 19, 1940	9.34	Aug. 1, 1939
89	25.20	Mar. 31, 1939	26.11	Aug. 1, 1939
96	9.40	June 19, 1940	11.02	Sept. 5, 1939
101	8.88	June 19, 1940	9.99	Oct. 2, 1939
237	86.49	Apr. 5, 1939	86.92	Nov. 8, 1939
		Jan. 24, 1940		
343	76.68	May 15, 1939	76.82	Sept.20, 1940
				Oct. 29, 1940
359	109.15	May 19, 1939	109.22	Mar. 20, 1940
				Apr. 19, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 15 wells in Ford County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
2	1.43	+0.02	+0.10
4	.32	.....	- .19
5	.81	.....	+ .02
6	.46	.....	- .06
7	1.19	.....	+ .62
8	2.13	- .65	-1.05
9	2.70	.....	+ .28
10	1.92	.....	+1.16
11	.62	+ .42	- .11

Net changes in water level in 1940 and net changes in water level for period of record in 15 wells in Ford County--Continued

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
13	1.01	.....	+ .01
15	1.75	+ .25	+ .24
17	.66	.....	- .56
25	1.24	.....	-1.21
26	.46	.....	- .23
32	.22	.....	+ .11
35	3.66	.....	+1.04
38	1.03	+ .95	+ .32
41	1.04	+ .45	+ .19
43	1.22	.....	+ .32
47	1.07	.....	+ .37
48	2.73	+ .26	+ .37
52	1.06	.....	+ .23
53	.89	.....	- .03
57	2.17	+ .03	- .81
59	.78	+ .06	- .23
60	3.97	.....	+2.72
65	1.16	- .11	- .38
68A	.51	.....	+ .25
72	1.59	.....	+ .44
76	1.85	.....	+ .11
79B	4.79	- .57	- .78
79C	1.72	+ .29	- .26
86	3.61	.....	+ .69
89	.91	.....	+ .56
96	1.62	+ .72	+ .33
101	1.11	.....	+ .38
237	.43	- .19	- .19
343	.14	+ .07	- .05
359	.07	.....	- .06

Observation wells on the uplands north of the Arkansas Valley

10. Ed Sayre. NE¼NE¼ sec. 11, T. 25 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	16.41	Mar. 20	15.40	May 16	15.12	July 22	a14.66
Feb. 13	16.22	Apr. 19	15.31	June 19	14.69		

32. John Drewes. NW¼SW¼ sec. 24, T. 25 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	68.26	Mar. 20	68.06	May 16	68.19	July 22	b69.03
Feb. 13	68.06	Apr. 19	68.17	June 19	68.17		

35. Joseph N. Shean. NW¼SE¼ sec. 22, T. 26 S., R. 23 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	40.72	Mar. 20	40.78	May 16	40.63	July 22	37.28
Feb. 13	40.77	Apr. 19	40.80	June 19	c37.14		

38. F. Burns. SE¼NE¼ sec. 1, T. 26 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	42.06	May 16	42.08	Aug. 22	41.09	Nov. 18	41.15
Feb. 13	42.07	June 19	41.61	Sept.19	41.05	Dec. 21	41.11
Mar. 20	42.08	July 22	41.23	Oct. 29	41.12		

a Water in irrigation ditch 10 feet south of well.
b Pumped recently. c Water standing in draw northwest of well.

41. J. J. Burghardt. NW¼SW¼ sec. 11, T. 25 S., R. 21 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	47.31	Apr. 19	47.31	July 22	46.49	Oct. 29	46.79
Feb. 13	47.25	May 16	47.03	Aug. 22	46.52	Nov. 18	46.70
Mar. 20	47.27	June 19	46.59	Sept.19	46.61	Dec. 21	46.86

47. R. C. Sturgeon. NW¼NE¼ sec. 18, T. 25 S., R. 21 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 13	50.34	Apr. 19	50.41	June 19	49.61
Mar. 20	50.38	May 16	50.47	July 22	49.43

237. A. T. and S. F. Ry. NW¼NW¼ sec. 28, T. 25 S., R. 22 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	86.49	June 19	86.26	Sept.19	86.80	Nov. 18	86.68
Apr. 19	86.54	July 22	86.60	Oct. 29	86.73	Dec. 21	86.68
May 16	86.42	Aug. 22	86.82				

343. B. A. Schuette. NE¼NE¼ sec. 1, T. 26 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	76.80	Apr. 19	76.76	July 22	76.75	Oct. 29	76.82
Feb. 13	76.78	May 16	76.77	Aug. 22	76.77	Nov. 18	76.76
Mar. 20	76.75	June 19	76.74	Sept.20	76.82	Dec. 21	76.73

359. W. C. Gould. NW¼NE¼ sec. 6, T. 26 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	109.17	Mar. 20	109.22	May 16	109.20	July 22	109.21
Feb. 13	109.21	Apr. 19	109.22	June 19	109.20		

Observation wells in the Arkansas Valley

2. L. A. Lamb. SW¼SW¼ sec. 4, T. 28 S., R. 22 W.

Water level, in feet below measuring point, 1940

Feb. 13	28.41	May 16	28.16	Aug. 22	28.07	Nov. 18	28.39
Mar. 20	27.35	June 19	27.90	Sept.19	28.28	Dec. 21	28.39
Apr. 19	28.28	July 22	28.72	Oct. 29	28.41		

8. F. H. Diehl. NW¼NW¼ sec. 34, T. 26 S., R. 25 W.

Water level, in feet below measuring point, 1940

Jan. 17	7.59	Apr. 19	7.09	July 22	a7.53	Nov. 18	8.40
Feb. 13	7.41	June 19	6.85	Oct. 29	8.47	Dec. 21	8.24
Mar. 20	7.02						

9. Albert Miller. SW¼SW¼ sec. 16, T. 26 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	7.62	Mar. 20	7.25	June 19	7.07
Feb. 13	7.29	Apr. 19	7.38		

a Pumped just prior to measurement.

11. Geo. W. Molitor. SW¼NW¼ sec. 36, T. 21 S., R. 21 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	13.31	Apr. 19	13.06	July 22	12.69	Oct. 29	12.81
Feb. 13	13.30	May 16	13.16	Aug. 22	12.72	Nov. 18	12.84
Mar. 20	13.18	June 19	12.76	Sept.19	12.72	Dec. 21	12.89

25. Judge Karl Miller. NW¼SW¼ sec. 2, T. 27 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 24	12.15	Mar. 20	11.85	July 22	12.38
Feb. 13	12.01	June 19	a11.91		

43. Ralph Williams. NW¼NE¼ sec. 10, T. 27 S., R. 25 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 14	62.48	Apr. 19	62.37	June 20	61.48
Mar. 20	62.39	May 16	62.12	July 22	61.90

48. G. D. Cochran. NE¼SE¼ sec. 16, T. 27 S., R. 23 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	10.05	Apr. 19	10.02	July 22	9.35	Oct. 29	9.91
Feb. 13	9.89	May 16	9.45	Aug. 22	9.46	Nov. 18	9.88
Mar. 20	9.77	June 19	8.12	Sept.19	9.82	Dec. 21	9.79

52. Dwight Zink. SW¼SW¼ sec. 29, T. 26 S., R. 25 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 13	2.79	Apr. 19	3.0	July 22	3.11
Mar. 20	2.82	June 19	2.46		

53. Chas. Staples. SE¼NE¼ sec. 30, T. 26 S., R. 25 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	5.17	Mar. 20	4.87	July 22	b5.37
Feb. 13	5.10	Apr. 19	5.13		

57. Andrew Bogner. NW¼SE¼ sec. 22, T. 26 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	9.60	Apr. 19	9.32	Aug. 22	9.37	Nov. 18	9.57
Feb. 13	9.43	June 19	9.89	Sept.20	9.55	Dec. 21	9.57
Mar. 20	9.12	July 22	9.07	Oct. 29	9.63		

59. Ward Byers Estate. NE¼NE¼ sec. 21, T. 26 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	17.95	Apr. 19	17.82	July 22	17.75	Oct. 29	18.03
Feb. 13	17.90	May 16	17.82	Aug. 22	17.88	Nov. 18	17.92
Mar. 20	17.77	June 19	17.36	Sept.20	18.17	Dec. 21	17.89

a New measuring point.
b Pumped prior to measurement.

60. Maurice H. Thompson. NW¼SW¼ sec. 21, T. 26 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	7.32	Mar. 20	5.85	May 16	6.65
Feb. 13	6.92	Apr. 19	6.80	June 19	4.65

65. John N. Clark. SW¼SW¼ sec. 33, T. 26 S., R. 25 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	18.26	Apr. 19	18.04	Aug. 22	18.47	Nov. 18	18.34
Feb. 14	18.17	May 16	18.07	Oct. 29	18.53	Dec. 21	18.37
Mar. 20	17.91	June 20	17.54				

68A. Mrs. R. E. Pennington. NE¼NE¼ sec. 1, T. 27 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	56.15	Mar. 20	56.13	May 16	56.06	July 22	55.67
Feb. 14	56.18	Apr. 19	56.07	June 19	55.82		

72. H. Wilkinson. SW¼NW¼ sec. 32, T. 26 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	34.88	Mar. 20	34.58	May 16	34.46	July 22	a35.31
Feb. 13	34.66	Apr. 19	34.65	June 19	34.09		

76. William R. Cook. NE¼SE¼ sec. 32, T. 26 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 24	28.75	Mar. 20	28.60	May 16	28.64
Feb. 13	28.80	Apr. 19	28.74		

79B. O. N. Nevins. SW¼SW¼ sec. 23, T. 26 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	12.30	Apr. 19	13.15	July 22	13.59	Oct. 29	12.93
Feb. 13	13.03	May 16	13.01	Aug. 22	13.78	Nov. 18	12.86
Mar. 20	12.99	June 19	12.93	Sept.19	14.98	Dec. 21	12.87

79C. O. N. Nevins. SW¼SW¼ sec. 23, T. 26 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	10.07	Apr. 19	9.87	July 22	9.50	Oct. 29	9.96
Feb. 13	9.92	May 16	9.68	Aug. 22	9.85	Nov. 18	9.87
Mar. 20	9.84	June 19	9.31	Sept.19	9.98	Dec. 21	9.78

86. G. D. Cochran. SE¼NE¼ sec. 23, T. 27 S., R. 23 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	8.45	Mar. 20	8.24	May 16	7.53	July 22	7.16
Feb. 13	8.29	Apr. 19	8.34	June 19	5.73		

89. E. V. Melia. SE¼NW¼ sec. 11, T. 28 S., R. 22 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	26.00	Mar. 20	25.67	May 16	25.55	July 22	25.29
Feb. 13	25.78	Apr. 19	25.82	June 19	25.22		

a Water from priming tank leaking into well.

96. Henry Hattrup. SE¼NE¼ sec. 23, T. 26 S., R. 21 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	10.85	Apr. 19	10.78	July 22	9.72	Oct. 29	10.10
Feb. 13	10.80	May 16	10.23	Aug. 22	9.87	Nov. 18	10.20
Mar. 20	10.77	June 19	9.40	Sept.20	10.02	Dec. 21	10.13

101. Warner Jochems. NE¼SE¼ sec. 2, T. 27 S., R. 21 W.

Water level, in feet below measuring point, 1940

Jan. 24	9.91	Mar. 20	9.72	May 16	9.49	July 22	9.21
Feb. 13	9.86	Apr. 19	9.73	June 19	8.88		

Observation wells on the uplands south of the Arkansas Valley

4. John E. Wagner. SE¼NE¼ sec. 7, T. 27 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 17	103.88	Mar. 20	103.87	May 16	103.82	July 22	103.87
Feb. 13	103.85	Apr. 19	103.89	June 19	103.85		

5. W. S. Johnson. SW¼SE¼ sec. 6, T.27 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 13	96.04	Apr. 19	96.07	June 19	96.05
Mar. 20	96.04	May 16	96.05	July 22	95.99

6. Joseph Lutz. NE¼SW¼ sec. 15, T. 29 S., R. 26 W.

Water level, in feet below measuring point, 1940

Feb. 14	45.64	Apr. 20	45.62	June 20	45.51
Mar. 20	45.68	May 17	45.58		

7. W. A. Long. SE¼NE¼ sec. 35, T. 29 S., R. 26 W.

Water level, in feet below measuring point, 1940

Mar. 20	22.73	May 17	22.78	July 22	22.51
Apr. 20	22.76	June 20	22.58		

13. Ira Paulin. SW¼NW¼ sec. 9, T. 28 S., R. 23 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	85.68	Mar. 20	85.66	May 16	85.76	July 22	85.56
Feb. 13	85.66	Apr. 19	85.67	June 19	85.64		

15. George Lutz. SW¼NW¼ sec. 24, T. 29 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 25	35.48	Apr. 20	35.30	July 22	35.63	Oct. 29	35.39
Feb. 14	35.39	May 17	35.32	Aug. 22	35.59	Nov. 18	35.25
Mar. 20	35.29	June 20	35.35	Sept.19	35.49	Dec. 21	35.23

17. E. B. Spahr. NW¼SW¼ sec. 17, T. 29 S., R. 24 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 14	135.63	Apr. 19	135.84	June 20	135.84
Mar. 20	135.78	May 17	135.90	July 22	135.95

26. M. L. Gilliom. NE¼NW¼ sec. 25, T. 28 S., R. 21 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 13	83.55	Apr. 19	83.57	June 19	83.57
Mar. 20	83.52	May 16	83.55	July 22	83.55

GRAY COUNTY

By B. F. Latta

The observation-well program in Gray County, Kansas,(see Water-Supply Paper 886),begun in October 1939, was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health.

During the fall of 1940 a detailed investigation of the geology and ground-water resources of Gray County was made by the writer under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas, and a report based on this work is now in preparation as a bulletin of the Kansas Geological Survey.

The water levels in about 90 wells, in addition to the 26 observation wells, were measured at least once during the investigation. During 1940 a total of 278 measurements of water-level was made in the 26 observation wells. Measurements were discontinued in well 25 in February 1940, and in well 15 in October 1940. At the end of the year 24 wells were being measured once a month. Measurements between August 27 and December 4, 1940, were made by the writer, all others were made by Richard B. Christy.

The precipitation in Gray County in 1940, as recorded by the United States Weather Bureau, was 22.59 inches, or 1.16 inches above normal. This is the highest precipitation that Gray County has received in any year since 1928, and is considerably above the annual average for the last 13 years. The fluctuation of water level in only a few of the observation wells (7, 11, 18, 26, and 28), which are not affected by pumping, show a correlation with the precipitation. Water levels in 6 wells (1, 4, 8, 19, 20, and 29), which are affected by pumping, rose until June and then started to decline in response to pumping. The water levels in the wells again began to rise in the fall after pumping had ceased.

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Eleven of the 22 observation wells in Gray County for which the 1940 records are complete showed net rises in water level of 0.06 foot to 2.65 feet, the average net rise being about 0.67 foot. The other 11 wells showed net declines in water level of 0.06 foot to 0.38 foot, the average net decline being about 0.13 foot.

Two wells (26 and 27) showed unusually large rises in water level in 1940 due to local recharge. The net rise of water level in well 26 was 2.37 feet and in well 27 it was 2.65 feet. In the wells showing net rises in water level in 1940, excluding wells 26 and 27, the average net rise was only 0.26 foot.

At the end of 1940 the water levels in 18 of the wells were higher than at the beginning of the period of record in October 1939, and the water levels in 4 wells were lower. In the 18 wells showing net rises in water level for the entire period of record, the rises ranged from 0.04 foot to 2.47 feet, and the average net rise was about 0.57 foot. In the 4 wells showing net declines in water level, the declines ranged from 0.2 foot to 0.9 foot, and the average net decline was about 0.41 foot. The difference between the highest and lowest recorded water levels in 22 wells ranged from 0.13 foot to 2.92 feet and the average was about 0.97 foot.

Water level fluctuations in observation wells in Gray County are summarized in the following table.

Highest and lowest water levels for period of record in 22 wells in Gray County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
1	6.75	June 21, 1940	8.56	Oct. 8, 1940
3	164.70	Nov. 13, 1939	165.24	Aug. 29, 1940
4	17.24	May 22, 1940	18.75	Aug. 29, 1940
6	88.12	Dec. 30, 1940	88.37	Oct. 8, 1940
7	77.98	Oct. 8, 1940	78.70	May 22, 1940
8	8.54	May 22, 1940	10.70	Oct. 7, 1939
9	90.76	Jan. 27, 1940	90.93	May 22, 1940
11	59.55	July 23, 1940	59.83	Mar. 21, 1940 May 22, 1940
12	133.65	Nov. 13, 1939	134.24	Oct. 10, 1939
14	45.98	Jan. 26, 1940	46.49	Nov. 13, 1939
16	138.33	Dec. 14, 1939 Mar. 22, 1940	139.03	Oct. 12, 1939
17	85.02	Oct. 12, 1939 Oct. 18, 1939	85.32	Dec. 4, 1940
18	49.22	Dec. 29, 1940	50.05	Aug. 29, 1940
19	14.22	May 22, 1940	15.02	Aug. 29, 1940
20	20.72	June 21, 1940	22.03	Nov. 4, 1940

Highest and lowest water levels for period of record in 22 wells in Gray County--Continued

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
21	89.78	Nov. 17, 1939	89.91	Dec. 4, 1940
22	126.93	Oct. 18, 1939	127.09	Mar. 21, 1940
		Nov. 13, 1939		
		Dec. 29, 1940		
23	111.31	Mar. 22, 1940	113.28	Nov. 4, 1940
24	76.43	Oct. 18, 1939	76.91	June 20, 1940
26	110.90	Oct. 8, 1940	113.72	Dec. 14, 1939
27	57.92	Mar. 21, 1940	60.84	Feb. 15, 1940
		Dec. 4, 1940		
28	82.11	May 22, 1940	82.60	Dec. 14, 1939
				Jan. 26, 1940
				July 23, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 22 wells in Gray County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
1	1.81	-0.07	+0.53
3	.54	+ .08	+ .3
4	1.51	- .14	+ .63
6	.25	+ .12	+ .07
7	.72	+ .51	+ .41
8	2.16	+ .41	+1.22
9	.17	- .06	+ .06
11	.28	+ .2	+ .06
12	.59	- .13	+ .43
14	.51	- .38	- .2
16	.7	- .06	+ .63
17	.3	- .15	- .26
18	.83	+ .6	+ .57
19	.8	- .12	+ .31
20	1.31	- .1	+ .08
21	.31	+ .06	+ .04
22	.16	+ .16	+ .08
23	1.97	- .14	- .9
24	.48	- .07	- .3
26	2.82	+2.37	+2.15
27	2.92	+2.65	+2.47
28	.49	+ .25	+ .21

1. G. A. Hard. NW¼SE¼ sec. 20, T. 25 S., R. 29 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	7.74	Apr. 24	7.42	July 24	7.89	Nov. 4	8.40
Feb. 15	7.54	May 22	7.42	Aug. 29	8.40	Dec. 4	8.05
Mar. 22	7.43	June 21	6.75	Oct. 8	8.56	30	7.81

3. N. A. Mans. NE¼SW¼NW¼ sec. 7, T. 28 S., R. 27 W.

Water level, in feet below measuring point, 1940

Feb. 15	164.81	May 22	164.82	Aug. 29	165.24	Dec. 4	165.09
Mar. 21	164.89	June 20	164.71	Oct. 8	164.91	29	164.73
Apr. 24	164.72	July 23	164.72	Nov. 8	164.77		

4. F. Luther. NW¼SW¼NE¼ sec. 10, T. 26 S., R. 28 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	17.60	Apr. 24	17.73	Aug. 29	18.75	Dec. 4	17.89
Feb. 15	17.57	May 22	17.24	Oct. 8	18.08	30	17.74
Mar. 21	17.72	June 20	17.27	Nov. 4	18.05		

6. S. Dirks. SE¼NE¼NE¼ sec. 5, T. 28 S., R. 29 W.

Water level, in feet below measuring point, 1940

Feb. 15	88.24	May 22	88.25	Aug. 29	88.25	Dec. 4	88.15
Mar. 22	88.24	June 21	88.26	Oct. 8	88.37	30	88.12
Apr. 24	88.21	July 23	88.26	Nov. 4	88.16		

7. P. Brientenbach et al. SE¼SW¼SE¼ sec. 36, T. 26 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 26	78.58	Apr. 24	78.60	July 23	78.01	Nov. 4	78.01
Feb. 15	78.56	May 22	78.70	Aug. 29	77.99	Dec. 4	78.09
Mar. 22	78.61	June 21	78.36	Oct. 8	77.98	30	78.07

8. NW¼NE¼SE¼ sec. 11, T. 26 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 27	9.89	Apr. 24	9.58	July 23	9.88	Nov. 4	10.04
Feb. 15	9.82	May 22	8.54	Aug. 27	10.00	Dec. 4	9.15
Mar. 21	9.58	June 20	8.56	Oct. 8	9.50	30	9.48

9. L. Naftziger. NE¼SE¼NE¼ sec. 24, T. 24 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 27	90.76	May 22	90.93	Aug. 29	90.85	Dec. 5	90.84
Mar. 22	90.84	June 21	90.90	Oct. 8	90.86	30	90.82
Apr. 24	90.90	July 23	90.87	Nov. 5	90.86		

11. J. D. Wetmore. NE¼NE¼ sec. 35, T. 29 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 26	59.78	May 22	59.83	Aug. 29	59.63	Dec. 4	59.60
Feb. 15	59.78	June 20	59.65	Oct. 8	59.56	29	59.58
Mar. 21	59.83	July 23	59.55	Nov. 4	59.60		

12. Mary Hill. SE¼SE¼SE¼ sec. 26, T. 28 S., R. 27 W.

Water level, in feet below measuring point, 1940

Jan. 26	133.68	Apr. 20	133.75	July 23	133.73	Nov. 4	133.79
Feb. 15	133.77	May 22	133.74	Aug. 29	133.80	Dec. 4	133.79
Mar. 21	133.79	June 20	133.75	Oct. 8	133.77	29	133.81

13. G. Bowser. SW¼NW¼NW¼ sec. 24, T. 24 S., R. 28 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Mar. 22	77.99	July 23	77.79	Oct. 8	77.78
May 22	77.92	Aug. 27	77.74	Nov. 5	77.78

14. Sarah Marney. SE cor. SW¼SE¼ sec. 25, T. 29 S., R. 27 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	45.98	Apr. 20	46.15	July 23	46.13	Nov. 4	46.36
Feb. 15	46.22	May 22	46.17	Aug. 29	46.20	Dec. 4	46.37
Mar. 21	46.10	June 20	46.05	Oct. 8	46.32	29	46.36

15. N. C. Diven. Center NW¼SW¼ sec. 17, T. 25 S., R. 30 W. New measuring point beginning Aug. 29, 1940, top of casing at south side, 0.3 foot above land surface, 0.47 foot below old measuring point.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	36.45	Apr. 24	36.62	June 21	36.40	Aug. 29	a36.19
Feb. 15	36.49	May 22	36.57	July 24	36.42	Oct. 8	36.07
Mar. 22	36.54						

16. Ed Wallace. NE cor. NW¼ sec. 19, T. 29 S., R. 30 W.

Water level, in feet below measuring point, 1940

Jan. 26	138.34	Apr. 24	138.35	July 23	138.36	Nov. 4	138.37
Feb. 15	138.39	May 22	138.38	Aug. 29	138.37	Dec. 4	138.36
Mar. 22	138.33	June 21	138.38	Oct. 8	138.36	30	138.40

17. V. E. Yeager. NE cor. NW¼NE¼ sec. 31, T. 28 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 26	85.13	Apr. 24	85.16	July 23	85.20	Dec. 4	85.32
Feb. 15	85.12	May 22	85.21	Aug. 29	85.20	30	85.28
Mar. 22	85.17	June 21	85.20	Nov. 4	85.25		

18. W. H. Mace. SE¼NE¼ sec. 25, T. 29 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 26	49.82	Apr. 24	49.76	July 23	49.87	Nov. 4	49.65
Feb. 15	49.74	May 22	49.52	Aug. 29	50.05	Dec. 4	49.66
Mar. 21	49.78	June 21	49.59	Oct. 8	49.69	29	49.22

19. M. E. Kraushaar. NW¼NW¼ sec. 35, T. 25 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 27	14.44	Apr. 24	14.27	July 24	14.79	Nov. 4	14.87
Feb. 15	14.31	May 22	14.22	Aug. 29	15.02	Dec. 4	14.71
Mar. 22	14.32	June 21	14.26	Oct. 8	15.01	30	14.56

20. R. and E. Fischer. SE¼SW¼NE¼ sec. 23, T. 25 S., R. 30 W.

Water level, in feet below measuring point, 1940

Jan. 27	21.72	Apr. 24	21.46	Aug. 29	21.82	Dec. 4	21.91
Feb. 15	21.62	June 21	20.72	Oct. 8	22.02	30	21.88
Mar. 22	21.51	July 24	21.44	Nov. 4	22.03		

21. C. M. Davis. NW¼SW¼ sec. 7, T. 26 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 27	89.85	Apr. 24	89.79	July 24	89.86	Nov. 4	89.86
Feb. 15	89.80	May 22	89.89	Aug. 29	89.86	Dec. 4	89.91
Mar. 22	89.80	June 21	89.88	Oct. 8	89.81	30	89.79

22. C. Salem. SW¼SE¼SE¼ sec. 15, T. 27 S., R. 27 W.

Water level, in feet below measuring point, 1940

Mar. 21	127.09	June 20	127.03	Oct. 8	126.98	Dec. 4	127.01
Apr. 24	126.97	July 23	127.01	Nov. 4	126.99	29	126.93
May 22	126.99	Aug. 29	127.06				

23. Fry. NW¼SE¼ sec. 24, T. 28 S., R. 29 W., in Montezuma.

Water level, in feet below measuring point, 1940

Jan. 26	112.75	Apr. 24	111.35	July 23	112.56	Nov. 4	113.28
Feb. 15	111.34	May 22	111.47	Aug. 29	112.04	Dec. 4	111.65
Mar. 22	111.31	June 21	113.05	Oct. 8	112.78	30	112.89

a New measuring point.

24. J. W. Herb. NW¼NE¼ sec. 3, T. 27 S., R. 27 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	76.72	Apr. 24	76.70	July 23	76.85	Nov. 4	76.45
Feb. 15	76.46	May 22	76.79	Aug. 29	76.79	Dec. 4	76.79
Mar. 21	76.58	June 20	76.91	Oct. 8	76.46		

25. Charles Sturevant. SE¼NW¼SW¼ sec. 10, T. 26 S., R. 27 W. Measurements discontinued after Feb. 1940. Water levels, in feet below measuring point, 1940: Jan.27, 36.28; Feb. 15, 36.02.

26. Arthur Adams. NE¼SE¼ sec. 2, T. 26 S., R. 27 W.

Water level, in feet below measuring point, 1940

Feb. 15	113.58	May 18	112.59	Aug. 29	111.18	Dec. 5	111.11
Mar. 20	113.37	June 19	111.23	Oct. 8	110.90	30	111.21
Apr. 19	112.84	July 22	111.24	Nov. 5	111.10		

27. H. E. Hettrick. NW¼SE¼NW¼ sec. 36, T. 26 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 27	60.76	Apr. 24	57.92	July 23	59.78	Nov. 4	59.18
Feb. 15	60.84	May 22	58.40	Aug. 29	59.43	Dec. 4	57.92
Mar. 21	58.72	June 20	60.15	Oct. 8	59.08	29	58.11

28. W. H. McLaughton. SE¼SE¼ sec. 14, T. 27 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 26	82.60	Apr. 24	82.54	July 23	82.60	Nov. 4	82.47
Feb. 15	82.55	May 22	82.11	Aug. 29	82.40	Dec. 4	82.33
Mar. 22	82.52	June 21	82.55	Oct. 8	82.46	30	82.35

29. A. F. Hohner. SE¼NW¼ sec. 2, T. 28 S., R. 30 W.

Water level, in feet below measuring point, 1940

Mar. 22	110.95	May 22	110.94	Oct. 8	112.50	Dec. 4	111.17
Apr. 24	110.89	June 21	110.77	Nov. 4	111.37	30	111.01

HAMILTON COUNTY

By T. G. McLaughlin

The observation-well program in Hamilton County, Kansas, (see Water-Supply Paper 886) was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. The program is under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. Field work on the geology and ground-water resources of Hamilton County was completed during the fall of 1940. The altitude of the measuring point of well 8 was determined with an alidade and plane table by F. S. Bradshaw and is given for the first time in this report.

Measurements of water levels were made in 21 observation wells each month in 1940; a total of 207 individual measurements was made during the year. All measurements during the first 7 months of the year and those during December were made by Richard B. Christy; the rest were made by the writer.

According to records of the United States Weather Bureau the precipitation in Hamilton County in 1940 was 13.60 inches, which is 4.07 inches below normal but 0.08 inch above the average for the 10-year period from 1931 to 1940. Most of the precipitation--8.58 inches--occurred from the first of May through August. It is difficult to make any correlations between the water-level fluctuations and the precipitation because the period of record for the observation wells in Hamilton County is relatively short. In a few wells (1, 3, 4, and 5) in the Arkansas Valley, however, the water levels fluctuate more nearly in accordance with the precipitation. The water levels in these wells rose after the heavy rains in May and in August. The water levels in 7 wells (3, 4, 5, 6, 12, 19 and 27) reached their highest stage of the year during the summer months when the precipitation was the greatest.

Of the 18 observation wells in Hamilton County for which records are most complete, the water levels in 11 wells (4, 5, 6, 7, 8, 9, 13, 16, 17, 27 and 28) were higher at the close of 1940 than at the beginning of the year and in 7 wells (1, 2, 3, 12, 19, 20 and 22) the water levels were lower. Over the entire period of record there was a rise in water level in 11 wells (4, 5, 6, 7, 8, 9, 13, 16, 22, 27, and 28) and a decline in 7 wells (1, 2, 3, 12, 17, 19 and 20).

For the year 1940 the rise in water levels in the 11 wells ranged from 0.01 foot to 1.10 feet and averaged 0.39 foot. The decline ranged from 0.22 foot to 2.58 feet and averaged 0.62 foot. For the entire period of record the rises in water level ranged from 0.01 foot to 1.14 feet and averaged 0.31 foot and the declines in water level ranged from 0.12 foot to 0.59 foot and averaged about 0.32 foot. The difference between the highest and lowest water levels in the 18 wells averaged 1.25 feet, the minimum being 0.22 foot and the maximum, 5.05 feet. Water-level fluctuations are summarized in the following table.

Highest and lowest water levels for period of record in 18 wells in Hamilton County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
1	25.77	Nov. 16, 1939	26.93	May 15, 1940
2	27.09	Feb. 20, 1940	28.14	Nov. 22, 1940
3	13.51	June 17, 1940	14.92	Nov. 16, 1939
4	16.88	June 22, 1940	21.67	Dec. 19, 1939
5	15.70	June 22, 1940	17.88	Nov. 16, 1939
6	53.51	June 22, 1940	55.04	Nov. 16, 1939
7	45.46	Dec. 23, 1940	46.00	Nov. 27, 1940
8	147.18	Dec. 23, 1940	147.66	Oct. 10, 1939
9	190.18	Dec. 23, 1940	190.60	Oct. 10, 1939
12	144.03	May 15, 1940	144.37	Dec. 23, 1940
13	57.01	Dec. 23, 1940	57.52	June 17, 1940
16	85.03	Dec. 23, 1940	85.83	Feb. 19, 1940
17	44.26	Sept.30, 1939	44.48	May 15, 1940 July 18, 1940
19	128.97	May 15, 1940	129.23	Feb. 19, 1940
20	33.41	Sept.19, 1940	34.09	Dec. 23, 1940
22	111.32	Apr. 22, 1940	116.37	July 17, 1940
27	171.21	June 22, 1940	171.78	Nov. 16, 1939
28	221.48	Apr. 20, 1940	221.95	Mar. 14, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 18 wells in Hamilton County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
1	1.16	-0.43	-0.59
2	1.05	- .42	- .43
3	1.41	- .22	- .47
4	4.79	+ .20	+ .06
5	2.18	+ .56	+ .45
6	1.53	+1.10	+1.14
7	.54	+ .39	+ .31
8	.48	+ .22	+ .04
9	.42	+ .26	+ .14
12	.34	- .27	- .25
13	.51	+ .40	+ .23
16	.80	+ .70	+ .79
17	.22	+ .01	- .13
19	.26	- .22	- .12
20	.68	- .41	- .24
22	5.05	-2.58	+ .01
27	.57	+ .19	+ .01
28	.47	+ .26	+ .25

1. R. E. Bray, Jr. NE¼NE¼ sec. 32, T. 23 S., R. 41 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	26.31	Mar. 15	26.47	May 15	26.93	Dec. 23	26.74
Feb. 20	26.23	Apr. 22	25.92	June 17	25.89		

2. R. Holdren. NW¼NW¼ sec. 23, T. 23 S., R. 43 W.

Water level, in feet below measuring point, 1940

Jan. 30	27.22	Apr. 22	27.14	June 17	27.40	Nov. 22	28.14
Feb. 20	27.09	May 15	27.11	Oct. 21	27.84	Dec. 23	27.64
Mar. 15	27.30						

3. B. Rees. SW¼NW¼ sec. 8, T. 24 S., R. 40 W.

Water level, in feet below measuring point, 1940

Jan. 30	14.67	Apr. 22	13.89	July 17	13.86	Oct. 21	14.21
Feb. 19	14.48	May 15	13.98	Aug. 21	14.09	Nov. 21	14.39
Mar. 14	14.34	June 17	13.51	Sept.19	14.42	Dec. 23	14.89

4. Continental Life Insurance Co. NW cor. SE¼ sec. 14, T. 24 S., R. 40 W.

Water level, in feet below measuring point, 1940

Jan. 30	21.23	Apr. 23	17.55	July 18	18.23	Oct. 21	20.57
Feb. 19	21.16	May 15	18.35	Aug. 21	19.41	Nov. 21	20.83
Mar. 14	20.45	June 22	16.88	Sept.19	20.10	Dec. 23	21.03

5. W. A. Dunn. SE¼NE¼ sec. 20, T. 24 S., R. 39 W.

Water level, in feet below measuring point, 1940

Jan. 30	17.42	Apr. 23	16.28	July 18	16.34	Oct. 22	16.39
Feb. 19	17.17	May 15	16.17	Aug. 21	15.81	Dec. 23	16.86
Mar. 14	16.72	June 22	15.70	Sept.19	16.85		

6. Belle Heinlen. SW¼SE¼ sec. 24, T. 24 S., R. 39 W.

Water level, in feet below measuring point, 1940

Jan. 30	54.70	Apr. 23	53.71	July 18	53.89	Oct. 21	53.86
Feb. 19	54.28	May 15	53.73	Aug. 21	53.58	Nov. 21	53.79
Mar. 14	53.67	June 22	53.51	Sept.19	53.76	Dec. 23	53.60

7. I. E. Martin. NW¼SW¼ sec. 16, T. 23 S., R. 40 W.

Water level, in feet below measuring point, 1940

Feb. 19	45.85	May 15	45.69	Aug. 26	45.56	Nov. 27	46.00
Mar. 14	45.82	June 17	45.66	Sept.19	45.55	Dec. 23	45.46
Apr. 22	45.81	July 17	45.61	Oct. 21	45.47		

8. R. D. Woodman. SW¼NW¼ sec. 21, T. 22 S., R. 40 W. Measuring point 3,513.8 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 19	147.40	May 15	147.43	Aug. 26	147.34	Nov. 26	147.57
Mar. 14	147.49	June 17	147.35	Sept.19	147.45	Dec. 23	147.18
Apr. 22	147.32	July 17	147.30	Oct. 21	147.26		

9. Inez Dikeman. SE cor. sec. 21, T. 21 S., R. 40 W.

Water level, in feet below measuring point, 1940

Feb. 19	190.44	May 15	190.24	Aug. 26	190.31	Oct. 21	190.22
Mar. 14	190.46	June 17	190.28	Sept.19	190.33	Dec. 23	190.18
Apr. 22	190.36	July 17	190.24				

11. M. Williamson. NE¼NW¼ sec. 18, T 26 S., R. 40 W. Water levels, in feet below measuring point, 1940: Feb. 20, 115.88; Mar. 14, 115.84; Apr. 23, 115.33.

12. I. E. Martin. NE cor. SW¼ sec. 2, T. 22 S., R. 41 W. Measuring point 3,621.9 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 20	144.10	May 15	144.03	Aug. 21	144.15	Oct. 21	144.22
Mar. 14	144.14	June 17	144.18	Sept.19	144.24	Dec. 23	144.37
Apr. 22	144.18	July 18	144.14				

13. Carl Lewis. SE¼SW¼ sec. 13, T. 21 S., R. 42 W.

Water level, in feet below measuring point, 1940

Feb. 20	57.41	May 15	57.49	Aug. 21	57.49	Oct. 21	57.18
Mar. 14	57.44	June 17	57.52	Sept.19	57.32	Dec. 23	57.01
Apr. 22	57.45	July 17	57.46				

16. Chas. H. Miller. SE¼SW¼ sec. 22, T. 25 S., R. 39 W.

Water level, in feet below measuring point, 1940

Jan. 30	85.73	Apr. 23	85.77	July 18	85.69	Oct. 21	85.70
Feb. 19	85.83	May 15	85.68	Aug. 26	85.74	Nov. 27	85.76
Mar. 14	85.80	June 22	85.63	Sept.18	85.80	Dec. 23	85.03

17. Thos. A. Wells. NW¼NW¼ sec. 11, T. 25 S., R. 39 W.

Water level, in feet below measuring point, 1940

Feb. 19	44.40	May 15	44.48	Aug. 26	44.29	Nov. 21	44.34
Mar. 14	44.45	June 22	44.43	Sept.18	44.29	Dec. 23	44.39
Apr. 23	44.44	July 18	44.48	Oct. 21	44.30		

19. W. E. Bereman. NE¼NW¼NE¼ sec. 26, T. 26 S., R. 39 W.

Water level, in feet below measuring point, 1940

Feb. 19	129.33	May 15	128.97	Aug. 26	127.17	Nov. 23	129.19
Mar. 14	129.03	June 22	129.02	Sept.18	129.18	Dec. 23	129.01
Apr. 23	129.11	July 18	129.01	Oct. 21	129.09		

20. Alpha H. Bennett. SW¼SW¼ sec. 2, T. 24 S., R. 43 W.

Water level, in feet below measuring point, 1940

Jan. 30	33.68	Apr. 22	34.04	July 17	34.07	Oct. 21	34.04
Feb. 20	33.97	May 15	34.04	Aug. 26	33.82	Nov. 22	34.06
Mar. 15	34.04	June 17	34.00	Sept.19	33.41	Dec. 23	34.09

22. T. J. Crist. NW¼SW¼ sec. 26, T. 24 S., R. 43 W.

Water level, in feet below measuring point, 1940

Jan. 30	113.58	Apr. 22	111.32	July 17	116.37	Oct. 21	116.00
Feb. 20	113.78	May 15	112.70	Aug. 26	114.91	Nov. 22	115.95
Mar. 15	114.63	June 17	115.13	Sept.19	114.91	Dec. 23	116.16

24. Eugene Scherick. NE¼NW¼ sec. 5, T. 26 S., R. 42 W. Water levels, in feet below measuring point, 1940: Jan. 30, 59.44; Feb. 20, 59.38; Mar. 15, 59.40; Apr. 22, 59.62.

26. J. C. Kitch. NW¼NW¼ sec. 23, T. 26 S., R. 42 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 30	64.51	Mar. 15	64.52	May 15	64.49
Feb. 20	64.49	Apr. 22	64.52	June 17	64.57

27. B. M. Rupert. SE¼SE¼ sec. 24, T. 25 S., R. 40 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 19	171.48	May 15	171.39	Aug. 26	171.38	Oct. 21	171.39
Mar. 14	171.38	June 22	171.21	Sept.18	171.45	Dec. 23	171.29
Apr. 23	171.44	July 18	171.37				

28. A. S. and E. J. Gilliam. SE¼SE¼ sec. 13, T. 22 S., R. 39 W.

Water level, in feet below measuring point, 1940

Feb. 19	221.78	May 15	221.73	Aug. 27	221.65	Nov. 27	221.70
Mar. 14	221.95	June 22	221.54	Sept.17	221.68	Dec. 23	221.52
Apr. 20	221.48	July 18	221.64	Oct. 22	221.73		

HARVEY COUNTY

By S. W. Lohman, G. H. von Hein, and C. C. Williams

The observation-well program in south-central Kansas[1], including Harvey County, was continued in 1940 by the Federal and State Geological Surveys, in cooperation with the city of Wichita, the Division of Sanitation of the Kansas State Board of Health, and the Division of Water Resources of the Kansas State Board of Agriculture.

In 1940 a preliminary report was published on the geology and ground-water resources of the "Equus Beds" area[2], including Harvey County, and a detailed report on the same area is in preparation. In September 1940 the new well field of the city of Wichita in Harvey County was put into operation. The descriptions and water levels of the 25 supply wells and of 50 nearby observation wells are given for the first time in this report.

At the end of 1939, 119 wells in Harvey County were under observation, but records for only 44 of the wells were given in Water-Supply Paper 886. Fifteen of the 44 wells were observed once a month, 26 were observed once a week, and 3 were equipped with automatic water-stage recorders. During 1940, 2 wells (718, 823), which were observed once a month, were discontinued and weekly water-level measurements were begun in well 1,174, which is described for the first time in this report. At the end of the year, 118 wells were under observation, including 13 wells observed once a month, 102 wells observed once a week, and 3 wells equipped with recorders. A total of 4,391 wetted-tape measurements was made in 1940. Mr. von Hein

1/ See Water-Supply Papers 840, 845, and 886.
2/ Lohman, Stanley W., and Frye, John C., Geology and ground-water resources of the "Equus Beds" area in south-central Kansas: Economic Geology, vol. 35, no. 7, pp. 839-866, November 1940.

made all water-level measurements, serviced the recorders, and prepared the field descriptions of the 76 new wells described for the first time in this report. The well descriptions and water-level measurements given in this report were compiled by Charles C. Williams.

According to records of the United States Weather Bureau, the precipitation at Newton in 1940 was 35.63 inches, or 3.93 inches above normal; and at Sedgwick it was 29.55 inches, or only 0.08 inch above normal. Most of the observation wells in Harvey County lie near or west of Sedgwick, however, where the precipitation was not appreciably above normal. The water levels in 20 of the 25 wells not affected by nearby pumping declined during the year by amounts ranging from 0.04 foot to 0.79 foot. In 5 of the 25 wells, however, the water levels rose 0.02 foot to 0.72 foot during the year.

Ninety-three of the wells, including the 75 new municipal wells, are pumped or are affected by pumping, and the water levels in most of the wells declined during the year by amounts ranging from 0.27 foot to 3 or 4 feet. In a few of the pumped wells, however, the water levels declined as much as 9 to 13 feet, but these wells were pumped heavily at the close of the year and were not pumped at the beginning of the year.

The water levels in 6 of the 25 wells not affected by pumping stood higher at the end of 1940 than at the beginning of the period of record in 1937, 1938, or 1939, by amounts ranging from 0.28 foot to 1.73 feet. The water levels in 19 of the wells, however, declined during the same period by amounts ranging from 0.01 foot to 3.61 feet. The 93 wells affected by pumping during 1940 were not so affected prior to 1940 or were not observed prior to 1939.

Water-level fluctuations in observation wells in Harvey County are summarized in the following tables.

Highest and lowest water levels for period of record in 25 wells in Harvey County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, unaffected by nearby pumping, in feet below measuring point	Date
72	23.60	July 4, 1938	25.85	Oct. 7, 1937
136	12.30	July 2, 1940	14.65	Apr. 1, 1938
294	39.75	Aug. 20, 1938	43.92	Apr. 3,4,5, 1938
325	12.85	Apr. 30, 1939	14.21	June 4, 1939
701	38.06	Dec. 5, 1939	44.73	Nov. 2, 1938
718	14.07	Apr. 30, 1939	15.57	Oct. 3, 1940
817	15.06	May 24, 1940	17.92	Oct. 25, 1940
824	16.79	Sept. 7, 1938	20.76	Nov. 5, 1940
831	20.30	June 4, 1940	21.54	Nov. 5, 1940
832	19.18	Sept. 8, 1938	20.85	Nov. 5, 1940
833	9.51	June 4, 1940	11.49	Nov. 5, 1940
852	16.06	Sept. 6, 1939	17.66	Nov. 5, 1940
853	9.12	May 24, 1940	11.48	Nov. 15, 1940 Dec. 20, 1940
854	12.57	May 24, 1940	15.37	Nov. 1, 1940
875	3.54	May 24, 1940	7.74	Oct. 25, 1940
876	28.86	Dec. 22, 1939	30.53	Nov. 8, 1940
877	16.51	June 7, 8, 1940	17.57	Mar. 18, 1939
880	5.43	May 13, 1940	8.10	Nov. 19, 1940
881	5.54	May 13, 1940	8.02	Nov. 11, 1940
888	.53	May 10, 1940	9.65	Oct. 27, 1939
889	3.87	May 24, 1940	8.79	Nov. 29, 1940
890	5.67	Mar. 31, 1939	7.37	Nov. 5, 1940
891	3.31	July 5, 1939	4.83	Oct. 3, 1940
892	4.03	July 5, 1939	5.72	Oct. 3, 1940
893	4.24	June 4, 1940	5.67	Nov. 5, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 25 wells in Harvey County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
72	2.15	+0.10	+1.17
136	2.35	- .20	+1.36
294	4.17	- .69	+ .75
325	1.36	- .03	- .11
701	6.67	- .68	+1.73
718	....	.....	-1.25
817	2.86	- .02	-1.19
824	3.97	- .71	-3.61
831	1.24	+ .07	-1.49
832	1.67	+ .02	-1.45
833	1.98	- .66	-1.54
852	1.60	- .16	-1.28
853	2.36	- .61	-1.23
854	2.80	+ .02	-1.94
875	4.20	- .08	- .91
876	1.67	- .33	-1.60
877	1.06	- .26	- .01
880	2.67	- .57	- .25
881	2.48	- .63	- .45
888	9.12	+ .72	-2.07
889	4.92	- .79	-2.98
890	1.70	- .75	-1.47
891	1.52	- .07	+ .35
892	1.69	- .04	+ .28
893	1.43	- .30	- .39

Highest and lowest water levels for period of record in 93 wells in Harvey County that are pumped or are affected by pumping

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, unaffected by nearby pumping, in feet below measuring point	Date
506	14.30	May 11, 1940	19.16	Oct. 24-25, Nov. 4-5, 1940
507	7.06	May 24, 1940	14.21	Nov. 22, 1940
821	13.03	Aug. 21, 1939	14.98	Dec. 30, 1940
839	10.62	Aug. 21, 1939	16.33	Dec. 23, 1940
872	18.15	Mar. 11, 1939	23.34	Oct. 7, 1940
873	18.11	Mar. 11, 1939	23.40	Oct. 7, 1940
874	20.54	May 27, 1940	37.34	Sept. 24, 1940
878	16.55	June 3, 1940	19.16	Dec. 30, 1940
879	18.02	May 27, 1940 June 3, 1940	21.62	Dec. 24, 1940
883	14.05	Aug. 21, 1939	19.57	Dec. 9, 1940
884	13.94	Aug. 21, 1939	19.53	Dec. 9, 1940
885	13.82	Aug. 21, 1939	20.65	Dec. 9, 1940
886	3.14	Aug. 21, 1939	9.38	Sept. 16, 1940
887	3.52	May 27, 1940	10.39	Sept. 16, 1940
894	12.66	May 27, 1940	17.17	Dec. 24, 1940
895	12.74	May 27, 1940	18.25	Nov. 19, 1940
899	14.81	June 10, 1940	15.77	Oct. 21, 1940
1112	18.60	June 3, 1940	19.69	Nov. 4, 1940
M1	20.56	Apr. 13, 1939	29.90	Nov. 19, 1940
M1a	18.17	June 3, 1940	26.17	Nov. 4, 1940
M1b	16.64	June 3, 1940	25.02	Nov. 19, 1940
M2	20.33	May 4, 1939	42.48	Sept. 9, 1940
M2a	18.54	June 3, 1940	41.60	Sept. 9, 1940
M2b	20.75	May 27, 1940	32.24	Sept. 9, 1940
M3	25.20	May 8, 1939	40.31	Nov. 19, 1940
M3a	20.83	May 27, 1940	35.48	Nov. 19, 1940
M3b	24.13	May 27, 1940	39.59	Nov. 19, 1940
M4	25.12	May 27, 1940	42.66	Nov. 19, 1940
M4a	23.67	May 27, 1940	38.94	Nov. 19, 1940
M4b	24.71	May 27, 1940	38.98	Nov. 19, 1940
M5	22.33	May 16, 1939	40.01	Oct. 14, 1940
M5a	18.59	June 3, 1940	23.55	Oct. 14, 1940
M5b	18.82	May 27, 1940	23.61	Oct. 7, 1940
M6	21.05	May 27, 1940	28.93	Sept. 9, 1940
M6a	19.63	June 3, 1940	23.70	Nov. 19, 1940
M6b	19.46	June 3, 1940	23.51	Nov. 19, 1940
M7	13.03	June 13, 1939	18.10	Oct. 21, 1940
M7a	12.10	Aug. 21, 1939	16.51	Dec. 9, 1940
M7b	12.04	Aug. 21, 1939	16.52	Dec. 9, 1940
M8	17.93	May 27, 1940	24.68	Oct. 14, 1940
M8a	15.62	June 3, 1940	19.36	Nov. 19, 1940
M8b	14.30	June 3, 1940	18.10	Nov. 19, 1940
M9	12.82	May 27, 1940	18.55	Dec. 24, 1940
M9a	11.30	May 27, 1940	16.69	Dec. 24, 1940
M9b	10.22	May 27, 1940	15.65	Dec. 24, 1940
M10	14.05	May 27, 1940	20.17	Dec. 9, 1940
M10a	12.04	May 27, 1940	17.32	Dec. 9, 1940
M10b	11.24	May 27, 1940	16.30	Dec. 9, 1940
M11	9.11	May 27, 1940	14.83	Dec. 24, 1940
M11a	7.38	May 27, 1940	13.19	Dec. 24, 1940
M11b	8.47	May 27, 1940	14.23	Dec. 24, 1940
M12	13.41	Aug. 21, 1939	20.45	Dec. 24, 1940
M12a	11.73	May 27, 1940	18.54	Dec. 2, 1940
M12b	12.40	Aug. 21, 1939 May 27, 1940	19.23	Dec. 2, 1940
M13	10.27	Aug. 21, 1939	15.79	Dec. 9, 1940
M13a	8.69	May 27, 1940	13.77	Dec. 9, 1940
M13b	8.43	May 27, 1940	13.85	Dec. 9, 1940
M14	11.07	May 27, 1940	17.42	Dec. 9, 1940
M14a	9.11	Apr. 4, 1939	15.59	Nov. 4, 1940

Highest and lowest water levels for period of record in 93 wells in Harvey County that are pumped or are affected by pumping--Continued.

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, unaffected by nearby pumping, in feet below measuring point	Date
M14b	8.96	May 13, 27, June 3, 1940	15.19	Nov. 4, 1940
M15	14.92	Apr. 17, 1939	23.09	Dec. 23, 1940
M15a	13.19	May 27, 1940	21.12	Dec. 23, 1940
M15b	14.25	May 27, 1940	22.39	Dec. 23, 1940
M16	12.71	Aug. 21, 1939	19.13	Dec. 23, 1940
M16a	11.93	Aug. 21, 1939	17.97	Dec. 23, 1940
M16b	11.52	May 27, 1940	15.64	Dec. 23, 1940
M17	8.58	Aug. 21, 1939	12.36	Oct. 21, 1940
M17a	6.26	Aug. 21, 1939	10.10	Nov. 19, 1940
M17b	6.01	Aug. 21, 1939	9.89	Dec. 9, 1940
M18	12.00	Aug. 21, 1939	16.37	Nov. 11, 1940
M18a	11.32	Aug. 21, 1939	15.61	Nov. 11, 1940
M18b	10.58	Aug. 21, 1939	14.83	Nov. 11, 1940
M19	12.82	Aug. 21, 1939	17.33	Dec. 23, 1940
M19a	13.81	Aug. 21, 1939	18.44	Dec. 23, 1940
M19b	12.47	Aug. 21, 1939	17.18	Dec. 23, 1940
M20	11.74	May 27, 1940	18.66	Dec. 9, 1940
M20a	10.08	May 27, 1940	16.16	Dec. 9, 1940
M20b	9.21	May 27, 1940	15.20	Dec. 9, 1940
M21	10.32	Aug. 21, 1939	15.39	Nov. 11, 1940
M21a	9.30	Aug. 21, 1939	14.25	Nov. 11, 1940
M21b	8.88	Aug. 21, 1939	13.79	Nov. 11, 1940
M22	11.20	Aug. 21, 1939	17.17	Nov. 4, 1940
M22a	9.29	Aug. 21, 1939	15.30	Nov. 4, 1940
M22b	10.18	Aug. 21, 1939	16.20	Nov. 4, 1940
M23	9.85	Aug. 21, 1939	19.03	Dec. 23, 1940
M23a	9.17	Aug. 21, 1939	16.20	Dec. 23, 1940
M23b	8.60	Aug. 21, 1939	15.37	Dec. 23, 1940
M24	10.71	Aug. 21, 1939	15.77	Dec. 16, 1940
M24a	9.88	Aug. 21, 1939	14.84	Dec. 16, 1940
M24b	12.17	Aug. 28, 1939	16.80	Dec. 16, 1940
M25	7.54	Aug. 21, 1939	12.69	Dec. 31, 1940
M25a	6.11	Aug. 21, 1939	11.51	Dec. 31, 1940
M25b	7.69	Aug. 21, 1939	12.99	Dec. 31, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 93 wells in Harvey County that are pumped or are affected by pumping

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
506	4.86	-0.77	-1.30
507	7.15	-3.87	-3.97
821	1.95	-1.40	-1.72
839	5.71	-2.48	-3.29
872	5.19	-3.04	-3.68
873	5.29	-3.12	-3.76
874	16.80	-6.48	-6.12
878	2.61	-1.85	-2.38
879	3.60	-2.75	-3.17
883	5.52	-2.92	-2.94
884	5.59	-2.90	-2.92
885	6.83	-2.77	-2.76
886	6.24	-4.15	-4.17
887	6.87	-4.63	-4.67
894	4.51	-3.29	-2.77
895	5.51	-3.54	-3.44
899	.96	- .24	- .27
1112	1.09	- .22	- .41

Net changes in water level in 1940 and net changes in water level for period of record in 93 wells in Harvey County that are pumped or are affected by pumping--Continued

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
M1	9.34	-6.59	-8.18
M1a	8.00	-5.86	-6.45
M1b	8.38	-6.18	-6.77
M2	22.15	-13.53	-18.34
M2a	23.06	-8.09	-8.95
M2b	11.49	-9.55	-9.61
M3	15.11	-9.30	-11.00
M3a	14.65	-9.06	-7.22
M3b	15.46	-9.29	-6.62
M4	17.54	-10.21	-11.18
M4a	15.27	-9.52	-7.85
M4b	14.27	-8.92	-8.87
M5	17.68	-4.90	-8.00
M5a	4.96	-2.93	-3.19
M5b	4.89	-2.90	-3.02
M6	7.88	-2.75	- .39
M6a	4.07	-3.15	-3.14
M6b	4.05	-3.07	-3.04
M7	5.07	-3.28	-3.51
M7a	4.41	-3.21	-4.54
M7b	4.48	-3.27	-4.57
M8	6.75	-3.42	-2.00
M8a	3.74	-2.94	-2.75
M8b	3.80	-2.93	-2.71
M9	5.73	-4.87	-5.05
M9a	5.39	-4.47	-4.50
M9b	5.43	-4.48	-4.38
M10	6.12	-4.71	-4.35
M10a	5.28	-4.32	-4.56
M10b	5.06	-4.12	-4.35
M11	5.72	-4.75	-5.16
M11a	5.81	-4.83	-4.52
M11b	5.76	-4.74	-4.36
M12	7.04	-5.90	-5.30
M12a	6.81	-5.66	-6.04
M12b	6.83	-5.57	-4.91
M13	5.52	-4.03	-3.61
M13a	5.08	-3.87	-3.48
M13b	5.42	-4.18	-3.72
M14	6.35	-4.46	-3.72
M14a	6.48	-4.42	-5.60
M14b	6.23	-4.51	-5.53
M15	8.17	-7.35	-8.17
M15a	7.93	-7.18	-7.24
M15b	8.14	-7.39	-7.44
M16	6.42	-5.46	-5.58
M16a	6.04	-5.05	-5.11
M16b	4.12	-3.42	-3.36
M17	3.78	-2.74	-2.97
M17a	3.84	-2.39	-2.01
M17b	3.88	-2.44	-2.21
M18	4.37	-2.38	-2.96
M18a	4.29	-2.33	-2.71
M18b	4.25	-2.23	-2.60
M19	4.51	-2.75	-3.26
M19a	4.63	-2.79	-2.34
M19b	4.71	-2.75	-2.34
M20	6.92	-4.53	-4.11
M20a	6.08	-4.65	-4.14
M20b	4.57	-4.57	-4.07
M21	5.07	-2.63	-2.46

Net changes in water level in 1940 and net changes in water level for period of record in 93 wells in Harvey County that are pumped or are affected by pumping--Continued

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
M21a	4.95	-2.58	-2.37
M21b	4.91	-2.55	-2.27
M22	5.97	-2.84	-2.37
M22a	6.01	-2.77	-2.38
M22b	6.02	-2.82	-2.44
M23	9.18	-2.83	-2.11
M23a	7.03	-2.83	-2.23
M23b	6.77	-2.84	-2.30
M24	5.06	-2.89	-2.17
M24a	4.96	-2.84	-2.02
M24b	4.63	-2.77	-2.18
M25	5.15	-2.50	-2.18
M25a	5.40	-2.60	-2.34
M25b	5.30	-2.69	-2.33

72. Anna Hertzler. SW¼NE¼SE¼ sec. 16, T. 22 S., R. 1 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 2	24.78	May 3	24.37	Aug. 1	25.45	Nov. 5	25.20
Mar. 2	24.64	June 7	24.17	Sept. 3	25.37	Dec. 3	24.68
Apr. 5	24.60	July 3	24.69	Oct. 3	25.09		

136. Ada M. Day. NW¼NW¼NW¼ sec. 19, T. 23 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	12.76	Apr. 3	12.95	July 2	12.30	Oct. 3	12.70
Feb. 1	12.92	May 2	12.83	Aug. 1	12.41	Nov. 5	12.94
Mar. 11	12.92	June 4	12.38	Sept. 3	12.61	Dec. 3	12.96

294. Owner, J. B. Schmidt; lessee, Hollow Oil Co. SE¼NW¼ sec. 17, T. 22 S., R. 3 W.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42.21	42.37	42.09	41.86	41.76	40.78	41.16	42.01	42.41	42.62	42.90	42.91
2	42.22	42.39	42.07	41.86	41.75	40.78	41.19	42.02	42.40	42.60	42.91	42.93
3	42.23	42.39	42.03	41.88	41.74	40.79	41.22	42.04	42.43	42.60	42.91	42.94
4	42.23	42.38	42.02	41.91	41.71	40.79	41.26	42.04	42.44	42.61	42.90	42.94
5	42.25	42.36	42.01	41.95	41.69	40.80	41.30	42.08	42.40	42.63	42.93	42.92
6	.....	42.35	41.99	41.97	41.67	40.82	41.31	42.12	42.38	42.67	42.95	42.92
7	.....	42.34	41.96	41.96	41.67	40.82	41.32	42.12	42.38	42.69	42.96	42.92
8	.....	42.32	41.95	41.94	41.67	40.82	41.34	42.11	42.38	42.69	42.97	42.92
9	.....	42.32	41.93	41.95	41.67	40.83	41.36	42.06	42.36	42.68	42.96	42.92
10	.....	42.32	41.90	41.94	41.58	40.84	41.38	42.05	42.37	42.71	42.92	42.93
11	.....	42.32	41.90	41.96	41.43	40.85	41.41	42.06	42.38	42.74	42.91	42.94
12	.....	42.32	41.88	41.98	41.35	40.86	41.44	42.08	42.39	42.75	42.97	42.95
13	.....	42.33	41.89	41.98	41.25	40.87	41.48	42.10	42.39	42.76	43.00	42.99
14	.....	42.33	41.89	41.98	41.17	40.88	41.50	42.11	42.40	42.78	43.01	43.00
15	.....	42.32	41.89	41.96	41.15	40.89	41.52	42.11	42.42	42.80	43.00	43.00
16	.....	42.31	41.89	41.92	41.15	40.90	41.54	42.13	.....	42.80	42.98	42.96
17	.....	42.32	41.88	41.91	41.14	40.91	41.56	42.15	.....	42.82	42.96	42.96
18	.....	42.32	41.86	41.89	41.10	40.92	41.59	42.20	.....	42.82	42.97	42.96
19	.....	42.31	41.86	41.90	41.03	40.93	41.63	42.23	.....	42.82	42.99	42.95
20	.....	42.30	41.86	41.91	40.94	40.94	41.68	42.23	42.53	42.83	43.01	42.95
21	.....	42.30	41.86	41.91	40.86	40.95	41.71	42.23	42.55	42.83	42.99	42.96
22	.....	42.31	41.86	41.90	40.84	40.96	41.74	42.22	42.56	42.85	42.99	42.96
23	.....	42.29	41.86	41.87	40.84	40.97	41.75	42.25	42.55	42.86	43.02	42.94

294. Owner, J. B. Schmidt; lessee, Hollow Oil Co.--Continued.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	.....	.....	41.88	41.88	40.82	40.99	41.76	42.27	42.53	42.87	43.03	42.93
25	.....	.....	41.89	41.87	40.79	41.01	41.77	42.27	42.58	42.89	43.03	42.89
26	42.36	.....	41.89	41.87	40.78	41.02	41.79	42.27	42.59	42.90	42.97	42.88
27	42.36	.....	41.87	41.87	40.77	41.03	41.82	42.29	42.59	42.90	42.93	42.89
28	42.36	.....	41.85	41.85	40.77	41.06	41.85	42.32	42.59	42.88	42.93	.....
29	42.36	.....	41.85	41.81	40.77	41.11	41.90	42.37	42.61	42.89	42.89	.....
30	42.36	.....	41.86	41.78	40.78	41.13	41.95	42.40	42.62	42.90	42.87	42.90
31	42.36	.....	41.86	.....	40.78	.....	41.97	42.41	.....	42.89	.....	42.90

325. A. L. Gouldener. SW cor. SE¼ sec. 19, T. 23 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	14.03	Apr. 3	13.94	July 2	13.68	Oct. 3	13.90
Feb. 1	14.08	May 2	13.90	Aug. 1	13.74	Nov. 25	14.00
Mar. 11	13.93	June 4	13.65	Sept. 3	13.81	Dec. 3	14.08

506. Owner of well, city of Wichita; owner of property, W. G. Backhaus. NW¼NE¼ sec. 28, T. 23 S., R. 2 W.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18.22	18.15	17.70	17.87	17.38	16.19	17.73	18.90	18.69	18.78	19.13	18.75
2	18.22	18.15	17.65	17.93	17.34	16.27	17.71	18.91	18.73	18.83	19.14	18.75
3	18.21	18.14	17.63	18.19	17.32	16.33	17.78	18.92	18.79	18.87	19.14	18.75
4	18.20	18.09	17.62	18.28	17.34	16.43	17.90	18.73	18.80	18.90	19.16	18.75
5	18.20	18.09	17.61	18.33	17.41	16.50	17.89	18.74	18.25	18.90	19.16	18.76
6	.....	18.09	17.63	18.33	17.46	16.53	17.91	18.91	17.96	18.91	19.12	18.79
7	.....	18.08	17.67	18.07	17.50	16.59	17.88	18.97	17.96	18.91	19.06	18.81
8	.....	18.10	17.68	18.30	17.36	16.64	17.91	19.00	18.02	18.88	19.01	18.83
9	.....	18.10	17.64	18.36	15.50	16.66	18.08	18.70	18.19	18.86	18.97	18.87
10	.....	18.08	17.64	18.40	14.56	16.70	18.16	18.50	18.26	18.87	18.95	18.89
11	.....	18.05	17.65	18.34	14.30	16.71	18.23	18.36	18.29	18.87	19.01	18.88
12	.....	18.05	17.70	18.21	14.63	16.63	18.28	18.38	18.31	18.89	19.03	18.87
13	.....	18.05	17.74	18.34	14.96	16.68	18.29	18.40	18.34	18.95	19.03	18.87
14	.....	18.02	17.74	18.30	15.30	16.76	18.30	18.56	18.37	18.99	19.06	18.87
15	.....	18.00	17.74	18.36	15.52	16.83	18.29	18.72	18.40	18.99	19.07	18.85
16	.....	18.02	17.74	18.41	15.68	16.89	18.35	18.68	18.41	18.97	19.09	18.96
17	.....	17.99	17.75	18.32	15.75	16.94	18.45	18.59	18.45	18.96	19.09	18.98
18	.....	17.97	17.79	18.04	15.65	16.99	18.52	18.43	18.74	18.97	19.09	19.00
19	.....	18.00	17.79	17.81	14.88	17.04	18.58	18.62	18.76	19.01	19.09	19.02
20	.....	18.02	17.81	17.61	14.46	17.08	18.58	18.65	18.73	19.06	19.10	19.03
21	.....	18.02	17.83	17.54	14.71	17.11	18.51	18.57	18.87	19.10	19.05	19.03
22	.....	18.02	17.83	17.57	14.92	17.13	18.55	18.50	18.83	19.13	19.06	19.00
23	.....	18.00	17.85	17.62	15.10	17.20	18.68	18.50	18.85	19.15	19.06	18.98
24	.....	17.98	17.87	17.62	15.27	17.26	18.74	18.50	18.80	19.16	19.05	18.97
25	.....	17.97	17.86	17.62	15.45	17.50	18.74	18.50	18.82	19.16	19.00	18.99
26	18.15	17.91	17.83	17.62	15.58	17.62	18.44	18.53	18.75	19.15	18.88	19.02
27	18.14	17.89	17.82	17.62	15.72	17.71	18.37	18.75	18.69	19.10	18.87	19.02
28	18.13	17.84	17.85	17.51	15.84	17.66	18.31	18.88	18.71	19.05	18.82	.....
29	18.13	17.80	17.88	17.41	15.94	17.58	18.55	18.83	18.73	19.07	18.77	.....
30	18.13	.....	17.88	17.40	16.02	17.55	18.68	18.68	18.73	19.09	18.75	19.00
31	18.13	.....	17.87	.....	16.12	.....	18.83	18.64	.....	19.11	.....	18.99

507. Owner of well, city of Wichita; owner of property, W. G. Backhaus. NW¼NE¼ sec. 28, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	10.33	Apr. 26	9.75	July 19	10.10	Oct. 11	12.23
Feb. 2	10.36	May 3	9.48	26	10.23	18	12.94
9	10.29	10	7.62	Aug. 2	10.43	25	13.97
16	10.19	17	8.44	9	10.45	Nov. 1	13.72
23	10.14	24	7.06	16	10.45	8	12.78
Mar. 1	9.71	31	8.63	23	10.49	15	14.01
8	9.85	June 7	8.96	30	10.60	22	14.21
15	9.93	14	9.08	Sept. 6	11.90	29	12.70
22	10.02	21	9.39	13	12.05	Dec. 6	13.08
29	10.02	28	9.79	20	12.43	13	13.05
Apr. 5	10.15	July 5	9.79	27	11.91	20	14.09
12	10.21	12	10.05	Oct. 4	13.17	30	14.20
19	9.71						

701. Arkansas Valley Interurban Railway Co., NE cor. NW¼ sec. 3, T. 23 S., R. 1 W.

Water level, in feet below measuring point, 1940

Jan. 2	38.08	Apr. 3	39.43	July 2	41.98	Oct. 3	40.51
Feb. 1	38.14	May 2	40.17	Aug. 1	42.38	Nov. 5	39.70
Mar. 11	38.62	June 4	42.13	Sept. 5	41.29	Dec. 3	38.76

718. G. R. Hess. SW¼SW¼ sec. 15, T. 24 S., R. 3 W. Well removed in Nov. 1940, observations discontinued.

Water level, in feet below measuring point, 1940

Jan. 2	14.92	Apr. 3	14.36	July 3	14.64	Sept. 6	15.40
Feb. 1	14.93	May 2	14.22	Aug. 1	15.07	Oct. 3	15.57
Mar. 11	14.42	June 4	14.18				

817. City of Wichita. NW cor. NW¼ sec. 1, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 26	17.21	Apr. 26	16.36	July 19	17.57	Oct. 11	17.86
Feb. 2	17.26	May 3	16.17	26	17.72	18	17.90
9	17.27	10	15.12	Aug. 2	17.86	25	17.92
16	16.94	17	15.42	9	17.71	Nov. 1	17.81
23	16.81	24	15.06	16	17.83	8	17.73
Mar. 1	16.59	31	15.63	23	17.79	15	17.66
8	16.57	June 7	16.07	30	17.85	22	17.53
15	16.77	14	16.31	Sept. 6	17.27	29	17.33
22	16.68	21	16.41	13	17.42	Dec. 6	17.30
29	16.73	28	16.95	20	17.67	13	17.40
Apr. 5	16.83	July 5	17.08	27	17.69	20	17.36
12	17.04	12	17.40	Oct. 4	17.76	30	17.23
19	16.30						

821. City of Wichita. NW cor. NW¼ sec. 6, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	13.58	May 27	13.05	Aug. 5	13.33	Oct. 14	14.18
Feb. 13	13.60	June 3	13.05	12	13.36	21	14.25
26	13.47	10	13.06	19	13.40	28	14.36
Mar. 6	13.38	17	13.07	26	13.40	Nov. 4	14.45
18	13.42	24	13.10	Sept. 3	13.54	11	14.53
25	13.43	July 1	13.11	9	13.60	19	14.62
Apr. 2	13.42	8	13.10	16	13.69	Dec. 2	14.78
15	13.38	15	13.17	23	13.81	9	14.79
29	13.36	22	13.22	30	13.93	24	14.91
May 6	13.36	29	13.26	Oct. 7	14.07	30	14.98
13	13.11						

823. City of Wichita. NE cor. NE¼, sec. 29, T. 24 S., R. 1 W. Well removed in Apr. 1940, observations discontinued. Water levels, in feet below measuring point, 1940: Jan. 2, 22.79; Feb. 1, 22.76; Mar. 11, 22.49; Apr. 3, 22.76.

824. City of Wichita. SE cor. sec. 22, T. 24 S., R. 1 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	19.69	Apr. 3	19.24	July 3	19.06	Oct. 3	20.31
Feb. 1	19.58	May 2	19.14	Aug. 1	19.92	Nov. 5	20.76
Mar. 11	19.80	June 4	18.06	Sept. 5	20.14	Dec. 3	20.40

831. City of Wichita. NE cor. sec. 19, T. 24 S., R. 1 W.

Water level, in feet below measuring point, 1940

Jan. 2	21.41	May 2	21.07	Aug. 1	21.34	Nov. 5	21.54
Mar. 11	21.19	June 4	20.30	Sept. 5	21.11	Dec. 3	21.34
Apr. 3	21.48	July 2	20.90	Oct. 3	21.29		

832. City of Wichita. NE cor. sec. 19, T. 24 S., R. 1 W.

Water level, in feet below measuring point, 1940

Jan. 2	20.65	May 2	20.23	Aug. 1	20.72	Nov. 5	20.85
Mar. 11	20.35	June 4	19.77	Sept. 5	20.07	Dec. 3	20.63
Apr. 3	20.75	July 2	20.26	Oct. 3	20.62		

833. City of Wichita. SW cor. sec. 19, T. 24 S., R. 1 W.

Water level, in feet below measuring point, 1940

Jan. 2	10.64	Apr. 3	10.58	July 2	10.00	Oct. 3	11.00
Feb. 1	10.75	May 2	9.86	Aug. 1	10.58	Nov. 5	11.49
Mar. 11	10.26	June 4	9.51	Sept. 5	10.38	Dec. 3	11.30

839. City of Wichita. NE cor. sec. 35, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	13.80	May 27	12.58	Aug. 12	13.91	Oct. 21	15.48
Feb. 12	13.85	June 3	12.70	19	14.05	28	15.68
26	13.57	10	12.67	26	14.08	Nov. 4	15.66
Mar. 6	13.45	17	12.67	Sept. 5	14.17	11	15.65
18	13.65	24	12.78	9	14.20	19	15.73
25	13.72	July 1	13.01	16	14.50	Dec. 2	16.06
Apr. 1	13.64	8	13.16	23	14.72	9	16.10
15	13.66	15	13.36	30	14.97	16	16.20
22	13.41	22	13.54	Oct. 7	15.10	23	16.33
May 6	13.28	29	13.73	14	15.23	30	16.28
13	12.82	Aug. 5	13.89				

852. City of Wichita. NW cor. sec. 29, T. 24 S., R. 1 W.

Water level, in feet below measuring point, 1940

Jan. 2	17.27	Apr. 3	17.33	July 2	16.76	Oct. 3	17.32
Feb. 1	17.33	May 2	16.79	Aug. 1	17.20	Nov. 5	17.66
Mar. 11	17.05	June 4	16.34	Sept. 5	17.05	Dec. 3	17.43

853. City of Wichita. NW cor. sec. 13, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 26	10.76	Apr. 26	10.41	July 19	10.68	Oct. 11	11.30
Feb. 2	10.96	May 3	10.35	26	10.74	18	11.34
9	11.05	10	9.35	Aug. 2	10.89	25	11.40
16	10.94	17	9.60	9	10.89	Nov. 1	11.42
26	10.74	24	9.12	16	10.95	8	11.47
Mar. 1	10.60	31	9.59	23	11.02	15	11.48
8	10.66	June 7	9.84	30	11.11	22	11.42
15	10.73	14	10.00	Sept. 6	10.87	29	11.27
22	10.82	21	10.15	13	10.93	Dec. 6	11.31
29	10.85	28	10.32	20	11.11	13	11.46
Apr. 5	11.00	July 5	10.45	27	11.15	20	11.48
12	11.03	12	10.59	Oct. 4	11.20	30	11.37
19	10.41						

854. City of Wichita. SW cor. sec. 23, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	15.10	Apr. 26	14.49	July 19	14.56	Oct. 11	15.27
Feb. 2	15.15	May 3	14.36	26	14.71	18	15.24
9	15.04	10	13.05	Aug. 2	14.89	25	15.34
16	14.99	17	13.46	9	14.94	Nov. 1	15.37
23	14.84	24	12.57	16	15.01	8	15.34
Mar. 1	14.59	31	13.11	23	15.10	15	15.34
8	14.65	June 7	13.34	30	15.21	22	15.31
15	14.62	14	13.51	Sept. 6	14.88	29	15.13
22	14.70	21	13.76	13	14.90	Dec. 6	15.10
29	14.75	28	14.10	20	15.09	13	15.24
Apr. 5	14.89	July 5	14.20	27	15.09	20	15.23
12	14.86	12	14.44	Oct. 4	15.18	30	15.08
19	14.45						

872. Owner of well, city of Wichita; owner of property, D. C. Buller. SE cor. sec. 31, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	18.84	May 20	18.19	Aug. 5	18.90	Oct. 14	23.14
Feb. 12	18.86	27	18.17	12	18.87	21	21.93
26	18.70	June 3	18.18	19	18.96	28	21.80
Mar. 6	18.64	10	18.24	26	18.92	Nov. 4	21.45
18	18.67	17	18.27	Sept. 3	20.36	11	21.55
25	18.68	24	18.34	9	20.15	19	22.14
Apr. 1	18.58	July 1	18.40	16	19.20	Dec. 2	21.50
15	18.55	8	18.45	24	23.14	9	21.68
29	18.53	15	18.66	30	20.89	16	21.84
May 6	18.55	22	18.74	Oct. 7	23.34	23	21.88
13	18.36	29	18.77				

873. Owner of well, city of Wichita; owner of property, D. C. Buller. SE cor. sec. 31, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	18.78	May 20	18.22	Aug. 5	18.86	Oct. 14	23.14
Feb. 12	18.81	27	18.12	12	18.82	21	21.91
26	18.64	June 3	18.12	19	18.91	28	21.75
Mar. 6	18.56	10	18.17	26	18.88	Nov. 4	21.45
18	18.61	17	18.22	Sept. 3	20.34	11	21.48
25	18.64	24	18.28	9	22.12	19	22.12
Apr. 1	18.54	July 1	18.35	16	19.17	Dec. 2	21.47
15	18.49	8	18.40	24	23.21	9	21.67
29	18.48	15	18.62	30	20.84	16	21.83
May 6	18.50	22	18.69	Oct. 7	23.40	23	21.90
13	18.30	29	18.73				

874. Owner of well, city of Wichita; owner of property, D. C. Buller. SE cor. sec. 31, T. 23 S., R. 2 W.

Water level, in feet above measuring point, 1940

Jan. 29	21.32	May 20	20.57	Aug. 5	21.51	Oct. 14	a 36.25
Feb. 12	21.33	27	20.54	12	21.38	21	a 28.06
26	21.17	June 3	20.57	19	21.49	28	a 26.43
Mar. 6	21.10	10	20.65	26	21.46	Nov. 4	26.47
18	21.13	17	20.72	Sept. 3	a 26.90	11	26.08
25	21.18	24	20.79	9	a 32.77	19	a 32.04
Apr. 1	21.08	July 1	20.88	16	23.97	Dec. 2	25.78
15	21.05	8	20.95	24	a 37.34	9	26.67
29	20.98	15	21.45	30	24.85	16	27.86
May 6	21.02	22	21.23	Oct. 7	a 35.73	23	27.89
13	20.78	29	21.23				

a Nearby well pumping.

875. Owner of well, city of Wichita; owner of property, A. B. Hanely. SE cor. SE¼ sec. 17, T. 23 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	7.15	Apr. 26	6.02	July 19	5.93	Oct. 11	7.58
Feb. 2	7.30	May 3	5.65	26	6.17	18	7.54
9	7.16	10	4.39	Aug. 2	6.63	25	7.74
16	7.12	17	4.61	9	6.52	Nov. 1	7.73
23	6.54	24	3.54	16	6.76	8	7.56
Mar. 1	6.33	31	4.12	23	6.94	15	7.51
8	6.37	June 7	4.35	30	7.13	22	7.58
15	6.22	14	4.40	Sept. 6	7.01	29	7.37
22	6.31	21	4.77	13	7.04	Dec. 6	7.31
29	6.41	28	5.38	20	7.37	13	7.53
Apr. 5	6.59	July 5	5.31	27	7.24	20	7.45
12	6.45	12	5.76	Oct. 4	7.44	30	7.23
19	6.06						

876. Owner of well, city of Wichita; owner of property, A. B. Hanely. SE cor. SE¼ sec. 17, T. 23 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 26	28.86	Apr. 26	28.64	July 19	28.36	Oct. 11	28.93
Feb. 2	28.89	May 3	28.64	26	28.42	18	29.01
9	28.88	10	28.45	Aug. 2	28.50	25	29.06
16	28.88	17	28.36	9	28.57	Nov. 1	29.07
23	28.85	24	28.13	16	28.60	8	30.53
Mar. 1	28.86	31	28.06	23	28.65	15	29.17
8	28.85	June 7	28.05	30	28.66	22	29.03
15	28.81	14	28.05	Sept. 6	28.66	29	29.02
22	28.79	21	27.84	13	28.71	Dec. 6	29.11
29	28.78	28	28.17	20	28.78	13	29.16
Apr. 5	28.78	July 5	28.24	27	28.85	20	29.20
12	28.69	12	28.30	Oct. 4	28.88	30	29.19
19	28.66						

877. Owner of well, city of Wichita; owner of property, A. B. Hanely. SE cor. SE¼ sec. 17, T. 23 S., R. 3 W.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.21	17.36	17.35	17.24	17.14	16.55	16.56	16.75	16.93	17.11	17.28	17.41
2	17.22	17.37	17.32	17.24	17.14	16.55	16.56	16.77	16.94	17.10	17.28	17.43
3	17.22	17.35	17.31	17.28	17.12	16.54	16.58	16.77	16.96	17.09	17.28	17.43
4	17.22	17.30	17.34	17.31	17.11	16.53	16.59	16.78	16.95	17.10	17.29	17.41
5	17.22	17.31	17.33	17.33	17.08	16.54	16.60	16.80	16.93	17.11	17.32	17.41
6	.....	17.31	17.31	17.30	17.10	16.54	16.59	16.82	16.94	17.15	17.32	17.40
7	.....	17.31	17.30	17.23	17.10	16.51	16.58	16.81	16.95	17.15	17.31	17.42
8	.....	17.36	17.30	17.25	17.09	16.51	16.58	16.81	16.96	17.14	17.30	17.42
9	.....	17.38	17.29	17.26	16.98	16.53	16.59	16.80	16.97	17.14	17.28	17.41
10	.....	17.37	17.28	17.27	16.95	16.53	16.60	16.81	16.99	17.16	17.26	17.43
11	.....	17.34	17.27	17.32	16.92	16.53	16.62	16.82	17.00	17.18	17.33	17.43
12	.....	17.38	17.28	17.32	16.89	16.53	16.65	16.82	17.00	17.17	17.35	17.45
13	.....	17.38	17.30	17.28	16.86	16.53	16.65	16.82	17.00	17.17	17.35	17.46
14	.....	17.38	17.30	17.26	16.85	16.53	16.63	16.81	17.00	17.20	17.36	17.46
15	.....	17.35	17.30	17.23	16.85	16.53	16.63	16.84	17.01	17.22	17.35	17.43
16	.....	17.40	17.28	17.23	16.85	16.53	16.63	16.85	17.02	17.20	17.31	17.46
17	.....	17.38	17.25	17.22	16.83	16.53	16.64	16.84	17.03	17.21	17.31	17.46
18	.....	17.35	17.29	17.23	16.68	16.55	16.65	16.88	17.05	17.20	17.31	17.46
19	.....	17.38	17.28	17.23	16.68	16.55	16.66	16.88	17.05	17.21	17.33	17.46
20	.....	17.40	17.28	17.23	16.64	16.58	16.65	16.88	17.06	17.22	17.34	17.47
21	.....	17.42	17.28	17.23	16.63	16.57	16.67	16.88	17.06	17.22	17.31	17.47
22	.....	17.42	17.28	17.21	16.63	16.55	16.67	16.87	17.06	17.23	17.35	17.46
23	.....	17.41	17.29	17.22	16.62	16.53	16.67	16.89	17.06	17.24	17.38	17.45
24	.....	.....	17.30	17.22	16.60	16.54	16.67	16.89	17.07	17.24	17.38	17.44

877. Owner of well, city of Wichita--Continued.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
25	.....	.....	17.30	17.21	16.58	16.54	16.67	16.89	17.11	17.25	17.38	17.43
26	17.34	17.35	17.27	17.19	16.58	16.54	16.68	16.89	17.11	17.25	17.35	17.47
27	17.33	17.37	17.25	17.19	16.58	16.55	16.69	16.87	17.09	17.25	17.37	17.47
28	17.32	17.38	17.24	17.18	16.57	16.58	16.71	16.89	17.10	17.24	17.37	.....
29	17.32	17.37	17.26	17.14	16.57	16.58	16.73	16.93	17.11	17.27	17.35	.....
30	17.34	.....	17.26	17.13	16.57	16.58	16.74	16.94	17.11	17.27	17.40	17.48
31	17.34	.....	17.25	.....	16.55	.....	16.74	16.94	.....	17.27	.....	17.47

878. Owner of well, city of Wichita; owner of property, C. Cadwell. SE cor. sec. 1, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	17.31	May 27	16.57	Aug. 5	17.45	Oct. 14	18.48
Feb. 13	17.31	June 3	16.55	12	17.43	21	18.59
26	16.99	10	16.69	19	17.49	28	18.62
Mar. 6	16.93	17	16.77	26	17.50	Nov. 4	18.73
18	17.08	24	16.83	Sept. 3	17.69	11	18.79
25	16.99	July 1	16.90	9	17.82	19	18.85
Apr. 2	16.99	8	16.99	16	17.96	Dec. 2	18.93
15	16.88	15	17.11	23	18.10	9	19.00
May 6	16.86	22	17.25	30	18.26	24	19.12
13	16.65	29	17.32	Oct. 7	18.36	30	19.16

879. Owner of well, city of Wichita; owner of property, C. Cadwell. SE cor. sec. 1, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 29	18.80	May 27	18.02	Aug. 5	18.82	Oct. 14	20.71
Feb. 13	18.79	June 3	18.02	12	18.90	21	20.92
26	18.53	10	18.12	19	19.02	28	21.06
Mar. 6	18.43	17	18.18	26	18.88	Nov. 4	21.04
18	18.49	24	18.26	Sept. 3	19.49	11	21.22
25	18.50	July 1	18.36	9	20.07	19	21.18
Apr. 2	18.45	8	18.43	16	18.97	Dec. 2	21.20
15	18.38	15	18.57	23	20.18	9	21.22
May 6	18.38	22	18.72	30	20.33	24	21.62
13	18.15	29	18.80	Oct. 7	20.56	30	21.55

880. Owner of well, city of Wichita; owner of property, Peter Miller. SE cor. sec. 11, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 29	7.03	June 3	5.94	Aug. 12	7.49	Oct. 21	8.02
Feb. 13	6.76	10	6.22	19	7.54	28	8.05
Mar. 6	6.13	17	6.35	26	7.64	Nov. 4	8.05
18	6.23	24	6.53	Sept. 3	7.72	11	8.09
25	6.22	July 1	6.71	9	7.68	19	8.10
Apr. 2	6.31	8	6.88	16	7.79	Dec. 2	7.77
15	6.25	15	7.07	23	7.87	9	7.76
May 6	5.93	22	7.15	30	7.91	24	7.71
13	5.43	29	7.27	Oct. 7	7.96	30	7.60
27	5.67	Aug. 5	7.41	14	7.97		

881. Owner of well, city of Wichita; owner of property, Peter Miller. SE cor. sec. 11, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 29	6.95	June 3	5.95	Aug. 12	7.42	Oct. 21	7.94
Feb. 13	6.71	10	6.18	19	7.47	28	7.96
Mar. 6	6.16	17	6.32	26	7.57	Nov. 4	7.95
18	6.19	24	6.53	Sept. 3	7.65	11	8.02
25	6.20	July 1	6.71	9	7.64	19	8.00
Apr. 2	6.21	8	6.84	16	7.70	Dec. 2	7.72
15	6.18	15	7.00	23	7.76	9	7.69
May 6	5.96	22	7.04	30	7.81	24	7.63
13	5.54	29	7.28	Oct. 7	7.86	30	7.57
27	5.69	Aug. 5	7.41	14	7.92		

883. Owner of well, city of Wichita; owner of property, Maggie Holle. NW cor. sec. 26, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	15.85	May 13	15.18	July 29	15.96	Oct. 7	18.71
Feb. 12	15.93	27	14.89	Aug. 5	16.09	14	17.82
26	15.62	June 3	14.96	12	16.05	21	17.85
Mar. 6	15.50	10	15.09	19	16.19	28	18.01
18	15.82	17	15.13	26	16.15	Nov. 4	17.89
25	15.75	24	15.04	Sept. 5	16.96	11	18.02
Apr. 1	15.68	July 1	15.25	9	17.90	19	19.30
15	15.66	8	15.39	16	17.02	Dec. 2	17.96
22	15.52	15	15.64	23	17.32	9	19.57
May 6	15.48	22	15.83	30	17.91	23	18.77

884. Owner of well, city of Wichita; owner of property, Maggie Holle. NW cor. sec. 26, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	15.78	May 13	15.07	July 29	15.88	Oct. 7	18.72
Feb. 12	15.84	27	14.84	Aug. 5	15.99	14	17.73
26	15.54	June 3	14.87	12	15.96	21	17.75
Mar. 6	15.41	10	15.00	19	16.09	28	17.93
18	15.63	17	15.05	26	16.06	Nov. 4	17.80
25	15.67	24	14.96	Sept. 5	16.88	11	17.95
Apr. 1	15.59	July 1	15.17	9	17.85	19	19.29
15	15.57	8	15.30	16	16.93	Dec. 2	17.87
22	15.43	15	15.56	24	17.24	9	19.53
May 6	15.41	22	15.78	30	17.82	23	18.68

885. Owner of well, city of Wichita; owner of property, Maggie Holle. NW cor. sec. 26, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	15.65	May 13	14.96	July 29	15.74	Oct. 7	19.60
Feb. 12	15.72	27	14.72	Aug. 5	15.85	14	17.69
26	15.43	June 3	14.74	12	15.88	21	17.59
Mar. 1	15.30	10	14.89	19	15.98	28	17.90
18	15.51	17	14.92	26	15.94	Nov. 4	17.66
25	15.54	24	14.84	Sept. 5	16.83	11	17.83
Apr. 1	15.48	July 1	15.03	9	18.27	19	20.34
15	15.44	8	15.18	16	16.79	Dec. 2	17.71
22	15.30	15	15.44	25	17.06	9	20.65
May 6	15.27	22	15.61	30	17.74	23	18.42

886. Owner of well, city of Wichita; owner of property, F. H. Haiber. NE cor. NW¼ sec. 16, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	4.27	June 3	3.67	Aug. 12	4.71	Oct. 14	8.06
Feb. 13	4.21	10	3.87	19	4.73	21	7.97
Mar. 6	3.74	17	3.92	26	4.79	28	7.70
18	3.87	24	4.02	Sept. 5	5.57	Nov. 4	7.97
25	3.92	July 1	4.12	9	6.38	11	8.14
Apr. 1	3.95	8	4.23	16	9.38	19	8.84
15	3.98	15	4.21	24	7.68	Dec. 2	8.52
May 6	3.85	22	4.52	30	8.14	9	9.24
13	3.66	29	4.62	Oct. 7	9.05	24	8.42
27	3.44	Aug. 5	4.74				

887. Owner of well, city of Wichita; owner of property, F. H. Haiber. NE cor. NW¼ sec. 16, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	4.32	June 3	3.71	Aug. 12	4.73	Oct. 14	8.61
Feb. 13	4.13	10	3.91	19	4.79	21	8.49
Mar. 6	3.84	17	3.94	26	4.83	28	8.12
18	3.96	24	4.04	Sept. 5	5.90	Nov. 4	8.55
25	4.01	July 1	4.15	9	6.61	11	8.68
Apr. 1	4.03	8	4.29	16	10.39	19	9.14
15	4.00	15	4.31	24	8.30	Dec. 2	9.01
May 6	3.88	22	4.57	30	8.83	9	9.99
13	3.68	29	4.67	Oct. 7	9.99	24	8.95
27	3.52	Aug. 5	4.80				

888. Owner of well, city of Wichita; owner of property, C. K. Ellis. NW cor. sec. 17, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 26	8.52	Apr. 26	6.36	July 19	6.44	Oct. 11	8.34
Feb. 2	8.53	May 3	4.17	26	7.00	18	8.56
9	8.47	10	.53	Aug. 2	7.75	25	8.76
16	8.44	17	1.23	9	7.72	Nov. 1	8.69
Mar. 1	8.03	24	.78	16	7.91	8	8.56
8	8.06	31	1.90	23	8.19	15	8.46
15	7.96	June 7	2.04	30	8.42	22	8.42
22	7.96	14	2.85	Sept. 6	5.09	29	7.98
29	7.96	21	3.50	13	6.71	Dec. 6	7.94
Apr. 5	8.02	28	4.39	20	7.58	13	8.08
12	7.89	July 5	4.94	27	7.74	20	8.09
19	7.61	12	5.86	Oct. 4	8.10	30	7.80

889. Owner of well, city of Wichita; owner of property, C. K. Ellis. NW cor. sec. 17, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 26	7.59	Apr. 26	6.73	July 19	6.21	Oct. 11	7.97
Feb. 2	7.58	May 3	5.96	26	6.53	18	8.27
9	7.55	10	4.47	Aug. 2	6.77	25	8.54
16	7.49	17	4.26	9	6.86	Nov. 1	8.43
Mar. 1	7.24	24	3.87	16	6.97	8	8.36
8	7.12	31	4.27	23	7.14	15	8.51
15	7.05	June 7	4.57	30	7.29	22	8.72
22	7.07	14	4.78	Sept. 6	7.23	29	8.79
29	7.04	21	5.14	13	7.40	Dec. 6	8.65
Apr. 5	7.14	28	5.45	20	7.61	13	8.74
12	7.12	July 5	5.70	27	7.55	20	8.67
19	6.79	12	6.02	Oct. 4	7.79	30	8.38

890. Owner of well, city of Wichita; owner of property, J. F. Jorgenson. NE cor. SE¼SE¼ sec. 21, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 2	6.39	Apr. 4	5.98	July 3	6.51	Oct. 3	7.33
Feb. 1	6.41	May 2	5.71	Aug. 1	7.17	Nov. 5	7.37
Mar. 11	5.92	June 4	6.04	Sept. 6	7.23	Dec. 3	7.14

891. Owner of well, city of Wichita; owner of property, Arthur McMurry. SE cor. sec. 31, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 2	4.16	Apr. 4	3.79	July 3	3.99	Oct. 3	4.83
Feb. 6	3.90	May 2	3.42	Aug. 1	4.69	Nov. 5	4.78
Mar. 11	3.48	June 4	3.75	Sept. 6	4.78	Dec. 3	4.23

892. Owner of well, city of Wichita; owner of property Arthur McMurry. SE cor. sec. 31, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	5.12	Apr. 3	4.72	July 3	4.86	Oct. 3	5.72
Feb. 6	4.87	May 2	4.32	Aug. 1	5.36	Nov. 5	5.71
Mar. 11	4.52	June 4	4.61	Sept. 6	5.63	Dec. 3	5.16

893. Owner of well, city of Wichita; owner of property Arthur McMurry. SE cor. sec. 31, T. 24 S., R. 3 W.

Water level, in feet below measuring point, 1940

Jan. 2	5.04	Apr. 3	4.60	July 3	4.48	Oct. 3	5.58
Feb. 6	4.80	May 2	4.44	Aug. 1	4.91	Nov. 5	5.67
Mar. 11	4.74	June 4	4.24	Sept. 6	5.41	Dec. 3	5.34

894. Owner of well, city of Wichita; owner of property, H. A. Lawrence. NE cor. sec. 18, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	13.78	June 3	12.78	Aug. 12	14.12	Oct. 21	16.58
Feb. 13	13.68	10	12.96	19	14.24	28	16.80
Mar. 6	13.16	17	13.11	26	14.27	Nov. 4	16.62
18	13.28	24	13.24	Sept. 5	14.74	11	16.58
25	13.28	July 1	13.39	9	15.41	19	17.03
Apr. 1	13.33	8	13.51	16	15.57	Dec. 2	16.88
15	13.19	15	13.64	24	15.77	9	17.00
May 6	13.10	22	13.88	30	15.75	24	17.17
13	12.80	29	14.02	Oct. 7	15.96	30	17.07
27	12.66	Aug. 5	14.19	14	16.06		

895. Owner of well, city of Wichita; owner of property, H. A. Lawrence. NE cor. sec. 18, T. 24 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	13.80	June 3	12.87	Aug. 12	14.16	Oct. 21	17.83
Feb. 13	13.71	10	13.07	19	14.28	28	17.81
Mar. 6	13.22	17	13.16	26	14.30	Nov. 4	16.98
18	13.39	24	13.32	Sept. 5	14.97	11	16.92
25	13.38	July 1	13.45	9	16.02	19	18.25
Apr. 1	13.23	8	13.56	16	16.08	Dec. 2	17.56
15	13.28	15	13.75	24	16.30	9	17.84
May 6	13.20	22	13.93	30	16.16	24	17.51
13	12.91	29	14.07	Oct. 7	16.43	30	17.34
27	12.74	Aug. 5	14.22	14	16.48		

899. L. U. Becker. SE¼SE¼ sec. 30, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Jan. 29	15.35	June 3	14.87	Aug. 12	15.58	Oct. 14	15.76
Feb. 12	15.34	10	14.81	19	15.54	21	15.77
Mar. 6	15.27	17	14.95	26	15.57	28	15.74
18	15.27	24	15.04	Sept. 3	15.62	Nov. 4	15.74
25	15.27	July 1	15.16	9	15.58	11	15.44
Apr. 1	15.25	8	15.23	16	15.59	19	15.70
15	15.25	15	15.30	24	15.62	Dec. 2	15.51
May 6	15.25	22	15.38	30	15.65	9	15.63
13	15.07	29	15.47	Oct. 7	15.72	24	15.59
27	14.86	Aug. 5	15.56				

1112. Owner, M. H. Miller; tenant, A. C. Unruh. NW cor. NE¼ sec. 31, T. 23 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	19.39	June 3	18.60	Aug. 12	19.40	Oct. 14	19.64
Feb. 12	19.38	10	18.71	19	19.45	21	19.62
Mar. 6	19.28	17	18.75	26	19.45	28	19.68
18	19.18	24	18.85	Sept. 3	19.53	Nov. 4	19.69
25	19.16	July 1	18.95	9	19.50	11	19.66
Apr. 1	19.15	8	19.02	16	19.51	19	19.65
15	19.17	15	19.11	24	19.52	Dec. 2	19.62
May 6	19.14	22	19.18	30	19.56	9	19.59
13	18.91	29	19.24	Oct. 7	19.59	24	19.61
27	18.65	Aug. 5	19.38				

1174. City of Wichita. SW cor. sec. 32, T. 24 S., R. 1 W. On right of way of township road. Driven observation well, diameter 1¼ inches, depth 30.5 feet. Measuring point, top of pipe, 1.5 feet above land surface, 1.51 feet above bench mark, 1,377.01 feet above sea level. Bench mark 10L, established Sept. 22, 1938, top of square nut on brace rod at west side of corner fence post, 3 feet south of well, level with land surface, 1,375.51 feet above sea level. Water levels, in feet below measuring point, 1940: Dec. 19, 10.28; Dec. 24, 10.15; Dec. 30, 10.28.

New public supply wells of the city of Wichita

The 25 pumped wells differ in depth, yield, and draw-down, but are of the same diameter and construction, and the descriptions of the measuring points at each of these wells are identical except for the height of the measuring point above the land surface and above sea level. The same is true of the 50 observation wells, 2 of which are situated near each pumped well. Accordingly, the descriptions common to all wells are given below, and only the descriptions peculiar to each well are given in the detailed descriptions that follow.

Well numbers. The field numbers of the 25 pumped wells are M1, M2, and so on. The field numbers of the 50 observation wells correspond to those of the pumped wells with the addition of letters a and b, there being 2 observation wells near each pumped well. Thus wells M1a and M1b are near well M1, and so on.

Ownership. All wells are owned by the city of Wichita.

Location. The locations of all wells are given within the section and township; in addition, the distance and direction of the observation wells are given with reference to the nearest pumped well.

Construction. The 25 pumped wells were drilled to a minimum diameter at the bottom of 30 inches, are equipped with screens and casing that have an inside diameter of 18 inches, and are gravel packed. Each well is pumped by an individual electrically driven turbine pump. Each of the pumps in wells M4, M19, and M22 has a capacity of 500 gallons a minute; those in the other 22 wells are rated at 1,000 gallons a minute. Each of the 50 observation wells was first drilled to nearly its full depth by the hydraulic-rotary method, then a 1¼-inch farm well point 3 feet long attached to lengths of 1¼-inch galvanized-iron pipe was driven several feet below the bottom of the hole. The wells are protected by ventilated screw-caps when not being measured.

Measuring point. The measuring point of each well is the top of the casing.

Bench marks. The bench mark at each of the 25 pumped wells is a brass plug that protrudes an eighth of an inch above the surface of the concrete floor in each well house. Each bench mark has been tied in with nearby bench marks of the United States Coast and Geodetic Survey and the United States Geological Survey by Black and Veatch, consulting engineers.

M1. NW cor. sec. 29, T. 23 S., R. 2 W. Depth 221.8 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.04 feet above bench mark, 1,433.28 feet above sea level. Bench mark 1,432.24 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 13, 1939	20.56	Nov. 21, 1939	22.00	July 22, 1940	21.83
May 1	22.75	27	22.05	29	21.93
June 12	22.14	Dec. 4	22.03	Aug. 5	22.18
19	22.45	11	22.01	12	22.07
July 3	21.87	18	22.03	19	22.52
10	21.87	27	22.05	26	22.30
17	22.22	Jan. 29, 1940	22.15	Sept. 3	a 66.98
24	21.72	Feb. 12	22.15	9	a 70.58
31	21.85	Mar. 6	21.96	16	25.69
Aug. 7	21.90	18	21.95	18	25.14
21	21.52	25	21.96	24	24.44
28	21.42	Apr. 2	21.91	30	24.57
Sept. 5	21.46	15	21.89	Oct. 7	25.26
11	21.53	May 6	21.69	14	a 63.47
18	21.68	13	21.28	21	27.79
25	21.74	27	20.82	28	28.17
Oct. 2	21.79	June 3	20.86	Nov. 4	26.27
9	21.86	10	20.92	11	27.79
16	21.91	17	20.99	19	29.90
23	21.91	24	21.09	Dec. 2	a 71.27
30	22.01	July 1	21.21	9	a 67.29
Nov. 6	22.35	8	21.30	23	28.74
13	22.00	15	21.72		

a Pumping.

M1a. NW cor. sec. 29, T. 23 S., R. 2 W. One hundred feet southwest of well M1. Depth 71.0 feet. Measuring point, 0.7 foot above land surface, 0.39 foot below bench mark, 1,431.85 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 13, 1939	18.86	Oct. 30, 1939	19.32	July 1, 1940	18.45
May 1	18.98	Nov. 6	19.35	8	18.56
8	20.52	13	19.32	15	18.98
15	20.94	21	19.32	22	19.08
22	19.79	27	19.39	29	19.15
29	20.03	Dec. 4	19.33	Aug. 5	19.39
June 5	19.66	11	19.34	12	19.29
12	19.49	18	19.35	19	19.43
19	19.46	27	19.36	26	19.44
July 3	19.26	Jan. 29, 1940	19.45	Sept. 3	a 29.54
10	19.27	Feb. 12	19.44	9	a 31.77
17	19.27	26	20.32	16	22.48
24	19.11	Mar. 6	19.25	24	21.58
31	19.23	18	19.23	30	21.63
Aug. 7	19.25	25	19.15	Oct. 7	25.26
21	18.94	Apr. 2	19.11	14	a 27.19
28	18.81	15	19.10	21	24.60
Sept. 5	18.82	May 6	18.94	28	24.41
11	18.90	13	18.61	Nov. 4	22.96
18	19.05	27	18.18	11	24.18
25	19.06	June 3	18.17	19	26.17
Oct. 2	19.10	10	18.20	Dec. 2	a 36.45
9	19.22	17	18.28	9	a 29.99
16	19.23	24	18.36	23	25.31
23	19.22				

M1b. NW cor. sec. 29, T. 23 S., R. 2 W. Five hundred and ninety-two feet southwest of well M1. Depth 69.0 feet. Measuring point, 0.7 foot above land surface, 1.87 feet below bench mark, 1,430.37 feet above sea level.

Water level, in feet below measuring point, 1939-40

Apr. 13, 1939	17.28	Oct. 30, 1939	17.37	July 1, 1940	16.94
May 1	17.40	Nov. 6	17.75	8	17.05
8	19.04	13	17.75	15	17.45
15	19.51	21	17.76	22	17.66
22	18.29	27	17.82	29	17.72
29	18.50	Dec. 4	17.77	Aug. 5	17.90
June 5	18.12	11	17.76	12	17.80
12	17.98	18	17.79	19	17.90
19	17.91	27	17.81	26	17.92
July 3	17.72	Jan. 29, 1940	17.87	Sept. 3	a 26.79
10	17.74	Feb. 12	17.88	9	a 29.13
17	17.76	26	17.78	16	21.10
24	17.58	Mar. 6	17.70	24	20.14
31	17.70	18	17.68	30	20.23
Aug. 7	17.71	25	17.67	Oct. 7	23.88
21	17.36	Apr. 2	17.62	14	a 24.62
28	17.26	15	17.62	21	23.74
Sept. 5	17.30	May 6	17.40	28	23.60
11	17.33	13	17.07	Nov. 4	21.62
18	17.47	27	16.84	11	22.94
25	17.53	June 3	16.64	19	25.02
Oct. 2	17.57	10	16.68	Dec. 2	a 33.31
9	17.66	17	16.76	9	a 27.38
16	17.69	24	16.84	23	24.05
23	17.67				

M2. NW¼SW¼ sec. 29, T. 23 S., R. 2 W. Depth 234.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.02 foot above bench mark, 1,431.34 feet above sea level. Bench mark 1,430.32 feet above sea level.

a Well M1 pumping.

M2.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 4, 1939	20.33	Dec. 11, 1939	25.41	July 29, 1940	26.21
15	29.58	18	25.40	Aug. 5	26.61
July 17	26.25	27	25.39	12	26.36
31	25.81	Jan. 29, 1940	25.14	19	26.51
Aug. 7	25.82	Feb. 12	25.00	26	26.55
21	25.24	Mar. 6	24.53	Sept. 3	a 95.42
28	25.17	18	24.44	9	42.48
Sept. 5	25.23	25	24.41	16	a 89.64
11	25.31	Apr. 2	24.33	18	a 90.23
18	25.45	15	24.27	24	31.06
25	25.48	May 6	24.00	30	31.55
Oct. 2	25.56	13	23.54	Oct. 7	32.56
9	25.60	27	23.16	14	36.70
16	25.62	June 3	23.27	21	36.75
23	25.68	10	23.38	28	33.02
30	25.65	17	23.49	Nov. 4	38.17
Nov. 6	25.58	24	23.58	11	a 93.71
13	25.53	July 1	23.75	19	a 91.46
21	25.50	8	23.86	Dec. 2	34.70
27	25.53	15	26.02	9	38.11
Dec. 4	25.45	22	26.53	23	38.67

M2a. NW¼SW¼ sec. 29, T. 23 S., R. 2 W. One hundred feet southwest of well M2. Depth 67.0 feet. Measuring point, 0.7 foot above land surface, 0.03 foot above bench mark, 1,430.35 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 4, 1939	19.03	Nov. 6, 1939	19.93	July 8, 1940	18.96
15	23.03	13	19.88	15	19.65
22	20.77	21	19.89	22	19.83
29	21.15	27	19.83	29	19.73
June 5	20.54	Dec. 4	19.87	Aug. 5	20.05
12	20.33	11	19.85	12	19.94
19	20.22	18	19.88	19	19.99
July 3	19.98	27	19.89	26	19.98
10	20.04	Jan. 29, 1940	19.89	Sept. 3	b 31.11
17	20.03	Feb. 12	19.85	9	41.60
31	19.92	Mar. 6	19.64	16	b 28.34
Aug. 7	19.94	18	19.57	24	22.86
21	19.55	25	19.61	30	22.79
28	19.44	Apr. 2	19.54	Oct. 7	25.83
Sept. 5	19.49	15	19.51	14	26.86
11	19.55	May 6	19.31	21	26.33
18	19.67	13	18.93	28	25.69
25	19.73	27	18.54	Nov. 4	25.79
Oct. 2	19.75	June 3	18.54	11	b 29.58
9	19.81	10	18.60	19	b 32.13
16	19.83	17	18.78	Dec. 2	31.77
23	19.76	24	18.77	9	29.28
30	19.90	July 1	18.88	23	27.98

M2b. NW¼SW¼ sec. 29, T 23 S., R. 2 W. Five hundred feet southwest of well M2. Depth 68.5 feet. Measuring point, 0.5 foot above land surface, 0.29 foot above bench mark, 1,430.61 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 4, 1939	21.78	June 19, 1939	21.80	Aug. 21, 1939	21.17
15	25.68	July 3	21.63	28	21.08
22	22.49	10	21.65	Sept. 5	21.16
29	22.83	17	21.65	11	21.23
June 5	22.05	31	21.56	18	21.39
12	21.82	Aug. 7	21.59	25	21.45

a Pumping.
b Well 2 pumping.

M2b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Oct. 2, 1939	21.50	Mar. 25, 1940	21.69	Aug. 19	21.94
9	21.59	Apr. 2	21.64	26	21.98
16	21.56	15	21.64	Sept. 3	a 30.52
23	21.61	May 6	21.47	9	32.24
30	21.71	13	21.14	16	a 26.24
Nov. 6	21.72	27	20.75	24	25.12
13	21.69	June 3	20.76	30	25.49
21	21.71	10	20.83	Oct. 7	27.94
27	21.81	17	20.90	14	32.10
Dec. 4	21.73	24	20.98	21	29.25
11	21.72	July 1	21.11	28	27.36
18	21.78	8	21.22	Nov. 4	28.27
27	21.80	15	21.61	11	a 29.67
Jan. 29, 1940	21.84	22	22.17	19	a 33.85
Feb. 12	21.89	29	21.65	Dec. 2	30.27
Mar. 6	21.66	Aug. 5	22.26	9	30.82
18	21.65	12	21.87	23	31.39

M3. SE¼SE¼SW¼ sec. 29, T. 23 S., R. 2 W. Depth 237.8 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.01 feet above bench mark, 1,428.30 feet above sea level. Bench mark 1,427.29 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 8, 1939	25.20	Nov. 21, 1939	26.73	July 22, 1940	27.37
15	30.70	27	26.80	29	26.81
June 12	27.38	Dec. 4	26.74	Aug. 5	27.13
19	27.55	11	26.76	12	27.33
July 3	26.80	18	26.77	19	27.43
10	26.91	27	26.78	26	27.50
17	26.84	Jan. 30, 1940	26.90	Sept. 3	b 67.41
24	26.67	Feb. 12	26.92	9	39.10
31	26.66	Mar. 6	26.71	16	32.25
Aug. 7	26.68	18	26.77	18	34.33
21	26.04	25	26.83	24	32.67
28	26.05	Apr. 2	26.81	30	b 68.61
Sept. 5	26.18	15	26.87	Oct. 7	33.17
11	26.28	May 6	26.57	14	36.86
18	26.46	13	26.06	21	b 73.84
25	26.55	27	25.80	28	b 67.63
Oct. 2	26.60	June 3	26.10	Nov. 4	39.00
9	26.65	10	26.15	11	35.55
16	26.76	17	26.26	19	40.31
23	26.70	24	26.40	Dec. 2	32.45
30	26.78	July 1	26.58	9	36.20
Nov. 6	26.75	8	26.70	23	b 69.76
13	26.74	15	27.18		

M3a. SE¼SE¼SW¼ sec. 29, T. 23 S., R. 2 W. One hundred feet southwest of M3. Depth 66.0 feet. Measuring point, 0.9 foot above land surface, 0.97 foot below bench mark, 1,426.32 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 8, 1939	24.00	July 24, 1939	21.72	Oct. 9, 1939	21.91
15	26.78	31	21.79	16	21.96
22	23.19	Aug. 7	21.79	23	21.96
29	23.50	21	21.29	30	22.06
June 5	22.53	28	21.25	Nov. 6	22.05
12	22.23	Sept. 5	21.35	13	22.06
19	22.14	11	21.46	21	22.04
July 3	21.84	18	21.60	27	22.12
10	21.89	25	21.71	Dec. 4	22.06
17	21.87	Oct. 2	21.76	11	22.07

a Well M2 pumping.
b Pumping.

M3a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Dec. 18, 1939	22.08	June 17, 1940	21.14	Sept. 16, 1940	26.36
27	22.09	24	21.25	24	27.78
Jan. 30, 1940	22.16	July 1	21.39	30	a 28.79
Feb. 12	22.17	8	21.49	Oct. 7	28.16
Mar. 6	21.83	15	22.01	14	33.09
18	21.88	22	22.13	21	a 34.67
25	21.86	29	21.94	28	a 29.36
Apr. 2	21.81	Aug. 5	22.41	Nov. 4	32.30
15	21.84	12	22.10	11	29.57
May 6	21.62	19	22.10	19	35.48
13	21.19	26	22.12	Dec. 2	27.69
27	20.83	Sept. 3	a 33.83	9	31.22
June 3	20.94	9	33.41	23	a 33.73
10	21.06				

M3b. SE¼SE¼SW¼ sec. 29, T. 23 S., R. 2 W. Five hundred feet southwest of well M3. Depth 97.0 feet. Measuring point, 1.0 foot above land surface, 0.07 foot above bench mark, 1,427.36 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 8, 1939	28.00	Nov. 6, 1939	25.16	July 8, 1940	24.79
15	30.01	13	25.18	15	25.21
22	26.46	21	25.17	22	25.42
29	26.58	27	25.75	29	25.18
June 5	25.56	Dec. 4	25.20	Aug. 5	25.70
12	25.28	11	25.21	12	25.36
19	25.20	18	25.23	19	25.42
July 3	24.95	27	25.24	26	25.40
10	24.98	Jan. 30, 1940	25.33	Sept. 3	a 37.09
17	24.99	Feb. 12	25.32	9	36.70
24	24.82	Mar. 6	25.10	16	29.78
31	24.88	18	25.10	24	32.01
Aug. 7	24.91	25	25.14	30	a 32.39
21	24.42	Apr. 2	25.11	Oct. 7	31.60
28	24.38	15	25.11	14	37.02
Sept. 5	24.48	May 6	24.92	21	a 37.87
11	24.61	13	24.47	28	a 32.89
18	24.78	27	24.13	Nov. 4	35.41
25	24.89	June 3	24.22	11	33.14
Oct. 2	24.94	10	24.32	19	39.59
9	25.04	17	24.44	Dec. 2	30.90
16	25.09	24	24.56	9	34.62
23	25.08	July 1	24.69	23	a 37.41
30	25.18				

M4. SE cor. sec. 30, T. 23 S., R. 2 W. Depth 234.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of the pump base, 1.02 feet above bench mark, 1,432.71 feet above sea level. Bench mark 1,431.69 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 4, 1939	25.18	Sept. 5, 1939	25.68	Dec. 4, 1939	26.02
22	28.40	11	25.47	11	26.03
June 12	25.52	18	25.72	18	26.05
19	26.72	25	25.78	27	26.06
July 3	26.48	Oct. 2	25.76	Jan. 29, 1940	26.15
10	26.15	9	25.90	Feb. 12	26.18
17	26.47	16	25.93	Mar. 6	25.97
24	25.92	23	26.27	18	25.98
31	25.99	30	26.03	25	26.04
Aug. 7	25.99	Nov. 6	26.01	Apr. 2	25.98
21	25.53	21	25.99	15	25.96
28	25.44	27	26.07	May 6	25.86

a Well M3 pumping.

M4.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 13, 1940	25.54	Aug. 5, 1940	28.73	Oct. 7, 1940	33.04
27	25.12	12	26.53	14	a 71.06
June 3	25.22	19	26.54	21	35.43
10	25.31	26	26.50	28	31.94
17	25.41	Sept. 3	36.50	Nov. 4	34.26
24	25.49	9	37.62	11	33.35
July 1	25.61	16	31.56	19	42.66
8	25.61	18	35.03	Dec. 2	32.40
15	26.23	24	34.13	9	36.36
22	a 52.64	30	31.20	23	a 70.66
29	26.33				

M4a. SE cor. sec. 30, T. 23 S., R. 2 W. One hundred feet west-southwest of well M4. Depth 69.0 feet. Measuring point, 0.8 foot above land surface, 0.31 foot above bench mark, 1,432.0 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 14, 1939	26.40	Nov. 6, 1939	24.56	July 8, 1940	24.20
May 22	25.81	13	24.58	15	24.44
29	25.94	21	24.56	22	b 25.61
June 5	24.99	27	24.65	29	24.55
12	24.75	Dec. 4	24.58	Aug. 5	25.41
19	24.70	11	24.58	12	24.78
July 3	24.49	18	24.60	19	24.83
10	24.52	27	24.61	26	24.81
17	24.50	Jan. 29, 1940	24.73	Sept. 3	33.56
24	24.33	Feb. 12	24.69	9	35.06
31	24.40	Mar. 6	24.49	16	29.09
Aug. 7	24.41	18	24.54	24	31.03
21	23.99	25	24.58	30	29.13
28	23.92	Apr. 2	24.53	Oct. 7	31.01
Sept. 5	23.99	15	24.54	14	b 38.47
11	24.07	May 6	24.38	21	33.15
18	24.19	13	24.03	28	30.30
25	24.31	27	23.67	Nov. 4	32.04
Oct. 2	24.35	June 3	23.73	11	32.79
9	24.44	10	23.77	19	38.94
16	24.47	17	23.87	Dec. 2	31.18
23	24.48	24	23.97	9	34.25
30	24.57	July 1	24.09	23	b 36.43

M4b. SE cor. sec. 30, T. 23 S., R. 2 W. Four hundred and sixty-two feet west-southwest of well M4. Depth 69.0 feet. Measuring point, 0.8 foot above land surface, 1.87 feet above bench mark, 1,433.56 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 8, 1939	25.82	Aug. 7, 1939	25.44	Oct. 30, 1939	25.60
May 22	26.71	21	25.02	Nov. 6	25.60
29	26.85	28	24.95	13	25.62
June 5	25.88	Sept. 5	25.01	21	25.60
12	25.78	11	25.12	27	25.69
19	25.69	18	25.26	Dec. 4	25.62
July 3	25.50	25	25.33	11	25.62
10	25.55	Oct. 2	25.39	18	25.62
17	25.52	9	25.48	27	25.63
24	25.35	16	25.54	Jan. 29, 1940	25.77
31	25.44	23	25.52	Feb. 12	25.77

a Pumping.
b Well M4 pumping.

M4b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Mar. 6, 1940	25.54	July 1, 1940	25.11	Sept. 24, 1940	31.64
18	25.48	8	25.21	30	29.87
25	25.60	15	25.47	Oct. 7	31.79
Apr. 2	25.56	22	a 26.46	14	a 38.41
15	25.55	29	25.56	21	33.67
May 6	25.40	Aug. 5	26.36	28	31.01
13	25.06	12	25.74	Nov. 4	32.61
27	24.71	19	25.85	11	33.33
June 3	24.74	26	25.86	19	38.98
10	24.82	Sept. 3	34.04	Dec. 2	31.96
17	24.90	9	35.47	9	34.69
24	24.99	16	29.79	23	a 36.47

M5. NW¼SW¼ sec. 32, T. 23 S., R. 2 W. Depth 237.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.02 feet above bench mark, 1,432.98 feet above sea level. Bench mark 1,431.96 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 16, 1939	22.33	Nov. 21, 1939	25.17	July 22, 1940	25.50
29	26.23	27	25.26	29	25.72
June 5	25.50	Dec. 4	25.23	Aug. 5	25.82
12	25.40	11	25.23	12	25.32
19	25.64	18	25.26	19	25.28
July 3	25.05	27	25.27	26	25.20
10	25.11	Jan. 29, 1940	25.43	Sept. 3	33.05
17	25.26	Feb. 12	25.48	9	34.53
24	24.86	Mar. 6	25.27	16	29.08
31	24.91	18	25.34	18	32.01
Aug. 7	24.82	25	25.34	24	b 73.40
21	24.54	Apr. 2	25.30	30	29.73
28	24.51	15	25.27	Oct. 7	31.52
Sept. 5	24.59	May 6	25.16	14	40.01
11	24.68	13	24.88	21	33.08
18	24.84	27	24.58	28	29.19
Oct. 2	24.93	June 3	24.63	Nov. 4	29.95
9	25.03	10	24.72	11	28.89
16	25.07	17	24.79	19	b 89.93
23	25.07	24	24.89	Dec. 2	28.22
30	25.21	July 1	24.96	9	33.52
Nov. 6	25.16	8	25.03	23	30.33
13	25.28	15	25.22		

M5a. NW¼SW¼ sec. 32, T. 23 S., R. 2 W. One hundred feet south-southwest of well M5. Depth 70.80 feet. Measuring point, 0.80 foot above land surface, 0.19 foot below bench mark, 1,431.77 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 16, 1939	19.16	Sept. 5, 1939	18.98	Dec. 11, 1939	19.30
29	19.78	11	18.98	18	19.32
June 5	19.63	18	19.12	27	19.33
12	19.48	25	19.15	Jan. 29, 1940	19.42
19	19.56	Oct. 2	19.18	Feb. 12	19.44
July 3	19.42	9	19.26	Mar. 6	19.18
10	19.54	16	19.07	18	19.23
17	19.54	23	19.24	25	19.20
24	19.39	30	19.31	Apr. 2	19.13
31	19.35	Nov. 6	19.31	15	19.09
Aug. 7	19.32	21	19.34	May 6	19.02
21	19.01	27	19.44	13	18.83
28	18.97	Dec. 4	19.32	27	18.65

a Well M4 pumping.
b Pumping.

M5a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 3, 1940	18.59	Aug. 12, 1940	19.40	Oct. 14, 1940	23.55
10	18.71	19	19.42	21	22.33
17	18.71	26	19.37	28	21.99
24	18.73	Sept. 3	21.25	Nov. 4	21.82
July 1	18.81	9	22.91	11	21.84
8	18.90	16	20.74	19	a 23.17
15	19.39	24	a 24.03	Dec. 2	21.84
22	19.34	30	21.23	9	22.16
29	19.37	Oct. 7	23.49	23	22.35
Aug. 5	19.45				

M5b. NW¼SW¼ sec. 32, T. 23 S., R. 2 W. Five hundred feet south-southwest of well M1. Depth 59.0 feet. Measuring point, 1.0 foot above land surface, 0.60 foot above bench mark, 1,432.56 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 16, 1939	19.45	Nov. 13, 1939	19.50	July 15, 1940	19.38
29	20.01	21	19.46	22	19.47
June 5	19.76	27	19.55	29	19.48
12	19.75	Dec. 4	19.47	Aug. 5	19.59
19	19.76	11	19.48	12	19.55
July 3	19.62	18	19.48	19	19.63
10	19.77	27	19.49	26	19.57
17	19.72	Jan. 29, 1940	19.57	Sept. 3	21.15
24	19.60	Feb. 12	19.58	9	23.00
31	19.58	Mar. 6	19.35	16	20.89
Aug. 7	19.51	18	19.39	24	a 23.71
21	19.19	25	19.41	30	21.38
28	19.16	Apr. 2	19.31	Oct. 7	23.61
Sept. 5	19.19	15	19.27	14	23.42
11	19.20	May 6	19.26	21	22.43
18	19.32	13	19.06	28	22.16
25	19.32	27	18.82	Nov. 4	21.98
Oct. 2	19.34	June 3	18.86	11	22.00
9	19.45	10	18.98	19	a 23.14
16	19.46	17	18.96	Dec. 2	22.05
23	19.41	24	19.02	9	22.34
30	19.50	July 1	19.07	23	22.47
Nov. 6	19.46	8	19.12		

M6. SW cor. sec. 32, T. 23 S., R. 2 W. Depth 257.3 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.07 feet above bench mark, 1,433.35 feet above sea level. Bench mark 1,432.28 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 26, 1939	24.19	Oct. 2, 1939	21.57	Mar. 18, 1940	21.67
June 5	22.11	9	21.71	25	21.66
12	22.12	16	21.68	Apr. 1	21.59
19	22.39	23	21.66	15	21.55
July 3	21.91	30	21.79	29	21.52
10	22.06	Nov. 6	21.72	May 6	21.54
17	22.03	13	21.77	13	21.31
24	21.87	21	21.72	20	21.11
31	21.82	27	21.82	27	21.05
Aug. 7	21.77	Dec. 4	21.73	June 3	21.12
21	21.43	11	21.74	10	21.18
28	21.37	18	21.75	17	21.22
Sept. 5	21.41	27	21.76	24	21.29
11	21.45	Jan. 29, 1940	21.83	July 1	21.38
18	21.58	Feb. 12	21.77	8	21.42
25	21.58	Mar. 6	21.57	15	21.79

a Well M5 pumping.

M6.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 22, 1940	21.68	Sept. 16, 1940	23.64	Nov. 4, 1940	24.50
29	21.71	18	25.94	11	24.70
Aug. 5	21.87	24	a 55.85	19	25.34
12	21.79	30	24.50	Dec. 2	24.00
19	21.94	Oct. 7	a 63.05	9	24.63
26	21.92	14	a 63.06	16	24.54
Sept. 3	25.42	21	26.61	23	24.58
9	28.93	28	24.95		

M6a. SW cor. sec. 32, T. 23 S., R. 2 W. One hundred feet north-northwest of well M6. Depth 51.0 feet. Measuring point, 1.0 foot above land surface, 0.70 foot above bench mark, 1,432.98 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 26, 1939	20.28	Dec. 4, 1939	20.21	July 15, 1940	20.15
June 5	20.67	11	20.25	22	20.22
12	20.64	18	20.20	29	20.25
19	20.64	27	20.18	Aug. 5	20.36
July 3	20.44	Jan. 29, 1940	20.27	12	20.34
10	20.63	Feb. 12	20.34	19	20.38
17	20.55	26	20.15	26	20.39
24	20.46	Mar. 6	20.11	Sept. 3	21.87
31	20.40	18	20.13	9	23.63
Aug. 7	20.31	25	20.15	16	21.68
21	19.99	Apr. 1	20.03	24	b 24.81
28	19.93	15	19.98	30	22.35
Sept. 5	19.98	29	19.98	Oct. 7	b 25.02
11	20.00	May 6	20.03	14	b 24.72
18	20.10	13	19.81	21	23.42
25	20.08	20	19.64	28	23.25
Oct. 2	20.11	27	19.66	Nov. 4	22.94
9	20.21	June 3	19.63	11	23.00
16	20.20	10	19.71	19	23.70
23	20.22	17	19.72	Dec. 2	22.98
30	20.34	24	19.81	9	23.19
Nov. 6	20.28	July 1	19.88	16	23.36
21	20.18	8	19.91	23	23.42
27	20.27				

M6b. SW cor. sec. 32, T. 23 S., R. 2 W. Five hundred feet north-northwest of well M6. Depth 51.0 feet. Measuring point, 1.0 foot above land surface, 0.78 foot above bench mark, 1,433.06 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 26, 1939	20.15	Oct. 16, 1939	20.01	Apr. 15, 1940	19.86
June 5	20.44	23	19.98	29	19.83
12	20.43	30	20.09	May 6	19.83
19	20.42	Nov. 6	20.03	13	19.65
July 3	20.26	13	20.08	20	19.58
10	20.40	21	20.05	27	19.48
17	20.36	27	20.12	June 3	19.46
24	20.25	Dec. 4	20.05	10	19.50
31	20.18	11	20.04	17	19.53
Aug. 7	20.13	18	20.04	24	19.60
21	19.80	27	20.05	July 1	19.67
28	19.75	Jan. 29, 1940	20.12	8	19.72
Sept. 5	19.78	Feb. 12	20.17	15	19.94
11	19.80	26	19.74	22	19.99
18	19.92	Mar. 6	19.92	29	20.05
25	19.92	18	19.96	Aug. 5	20.19
Oct. 2	19.93	25	19.96	12	20.16
9	20.04	Apr. 1	19.88	19	20.24

a Pumping.
b Well M6 pumping.

M6b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Aug. 26, 1940	20.20	Oct. 7, 1940	a 24.66	Nov. 19, 1940	23.51
Sept. 3	21.66	14	a 24.47	Dec. 2	22.79
9	23.34	21	23.17	9	23.00
16	21.49	28	23.02	16	23.10
24	a 24.43	Nov. 4	22.73	23	23.19
30	22.13	11	22.78		

M7. NW cor. SW¼ sec. 16, T. 24 S., R. 2 W. Depth 122.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.47 feet above bench mark, 1,415.10 feet above sea level. Bench mark 1,413.63 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 24, 1939	14.26	Dec. 4, 1939	14.60	July 29, 1940	15.01
June 13	13.03	11	14.48	Aug. 5	15.15
20	15.39	18	14.53	12	15.05
July 3	13.83	27	14.56	19	15.11
11	14.34	Jan. 30, 1940	14.49	26	15.21
18	14.60	Feb. 13	14.31	Sept. 5	15.44
31	14.00	Mar. 6	13.92	9	15.79
Aug. 7	14.24	18	14.06	16	b 24.60
21	13.28	25	14.07	18	16.50
28	13.67	Apr. 2	14.14	24	16.42
Sept. 5	13.99	15	14.15	30	16.33
11	14.17	May 6	14.04	Oct. 7	b 24.66
18	14.35	13	13.84	14	16.97
25	14.44	27	13.68	21	18.10
Oct. 2	14.46	June 3	14.02	28	17.38
9	14.55	10	14.09	Nov. 4	17.02
16	14.60	17	14.20	11	b 25.24
23	14.57	24	14.31	19	b 25.04
30	14.63	July 1	14.45	Dec. 2	17.50
Nov. 13	14.54	8	14.56	9	17.77
20	14.53	15	15.11	24	b 23.13
27	14.55	22	14.88		

M7a. NW cor. SW¼ sec. 16, T. 24 S., R. 2 W. One hundred feet north-northwest of well M7. Depth 51.0 feet. Measuring point, 0.9 foot above land surface, 0.27 foot above bench mark, 1,413.90 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 24, 1939	12.97	Oct. 30, 1939	13.47	July 8, 1940	13.35
May 1	13.31	Nov. 13	13.37	15	15.60
8	13.48	20	13.34	22	13.64
15	13.49	27	13.25	29	13.76
22	13.55	Dec. 4	13.33	Aug. 5	13.90
29	13.58	11	13.30	12	13.80
June 5	13.69	18	13.35	19	13.82
13	13.80	27	13.39	26	13.97
20	14.09	Jan. 30, 1940	13.30	Sept. 5	14.17
July 3	12.58	Feb. 13	13.12	9	14.58
11	13.14	Mar. 6	12.74	16	c 18.20
18	13.30	18	12.89	24	15.17
31	12.72	25	12.90	30	15.10
Aug. 7	13.04	Apr. 2	12.90	Oct. 7	c 18.32
21	12.10	15	12.93	14	15.73
28	12.48	May 6	12.86	21	15.95
Sept. 5	12.80	13	12.66	28	16.12
11	12.98	27	12.44	Nov. 4	15.74
18	13.16	June 3	12.70	11	c 18.80
25	12.99	10	12.88	19	c 18.98
Oct. 2	13.25	17	13.01	Dec. 2	16.24
9	13.35	24	13.11	9	16.51
16	13.30	July 1	13.25	24	c 18.16
23	13.41				

a Well M6 pumping. b Pumping.
c Well M7 pumping.

M7b. NW cor. SW¼ sec. 16, T. 24 S., R. 2 W. Five hundred feet north-northwest of well M7, in SW cor. NW¼ sec. 16, T. 24 S., R. 2 W. Depth 51.0 feet. Measuring point 0.8 foot above land surface, 0.47 foot above bench mark, 1,414.10 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 24, 1939	12.95	Oct. 30, 1939	13.37	July 8, 1940	13.29
May 1	13.22	Nov. 13	13.29	15	14.23
8	13.46	20	13.28	22	13.57
15	13.37	27	13.29	29	13.70
22	13.48	Dec. 4	13.24	Aug. 5	13.82
29	13.55	11	13.21	12	13.77
June 5	13.66	18	13.26	19	13.81
13	13.74	27	13.30	26	13.91
20	14.20	Jan. 30, 1940	13.25	Sept. 5	14.13
July 3	12.59	Feb. 13	13.05	9	14.59
11	13.14	Mar. 6	12.65	16	a 16.89
18	13.25	18	12.80	24	15.21
31	12.77	25	12.83	30	15.11
Aug. 7	12.92	Apr. 2	12.87	Oct. 7	a 16.96
21	12.04	15	12.87	14	15.75
28	12.41	May 6	12.78	21	15.96
Sept. 5	12.68	13	12.55	28	16.12
11	12.87	27	12.36	Nov. 4	15.79
18	13.02	June 3	12.60	11	a 17.43
25	13.17	10	12.77	19	a 17.72
Oct. 2	13.19	17	12.90	Dec. 2	16.33
9	13.30	24	13.02	9	16.52
16	13.32	July 1	13.18	24	a 17.15
23	13.32				

M8. SE cor. NE¼ sec. 6, T. 24 S., R. 2 W. Depth 257.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 0.90 foot above bench mark, 1,430.16 feet above sea level. Bench mark 1,429.26 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 30, 1939	20.12	Nov. 27, 1939	18.70	July 15, 1940	b 20.27
June 13	19.55	Dec. 4	18.61	22	18.69
20	19.17	11	18.61	29	18.72
July 3	18.98	18	18.58	Aug. 5	18.83
11	19.13	27	18.56	12	18.81
18	19.04	Jan. 30, 1940	18.70	19	18.97
25	18.91	Feb. 12	18.70	26	18.92
31	18.77	Mar. 6	18.39	Sept. 9	22.05
Aug. 7	18.71	18	18.47	16	20.41
21	18.31	25	18.48	18	b 35.70
28	18.28	Apr. 1	18.37	24	b 70.81
Sept. 5	18.34	15	18.34	30	21.14
11	18.58	22	18.34	Oct. 7	22.77
18	18.53	May 6	18.47	14	24.68
25	18.52	13	18.12	21	b 58.03
Oct. 2	18.51	27	17.93	28	b 64.79
9	18.64	June 3	17.96	Nov. 4	22.05
16	18.60	10	18.06	11	22.07
23	18.58	17	18.10	19	22.59
30	18.70	24	18.19	Dec. 2	21.94
Nov. 6	18.62	July 1	18.27	9	22.12
13	18.67	8	18.32	23	b 79.61
21	18.58				

a Well M7 pumping.
b Pumping.

M8a. SE cor. NE¼ sec. 6, T. 24 S., R. 2 W. One hundred feet north-northeast of well M8. Depth 50.9 feet. Measuring point, 0.9 foot above land surface, 1.05 feet below bench mark, 1,428.21 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 30, 1939	16.57	Nov. 27, 1939	16.37	July 15, 1940	16.24
June 13	16.79	Dec. 4	16.29	22	16.29
20	16.79	11	16.27	29	16.32
July 3	16.62	18	16.28	Aug. 5	16.44
11	16.82	27	16.27	12	16.44
18	16.70	Jan. 30, 1940	16.38	19	16.55
25	16.64	Feb. 12	16.38	26	16.50
31	16.48	Mar. 6	16.08	Sept. 3	17.45
Aug. 7	16.42	18	16.13	9	17.97
21	16.04	25	16.14	16	17.83
28	15.99	Apr. 1	16.02	24	a 18.31
Sept. 5	16.04	15	15.99	30	18.58
11	16.06	22	16.05	Oct. 7	18.93
18	16.20	May 6	15.99	14	19.18
25	16.19	13	15.78	21	a 19.47
Oct. 2	16.20	27	15.63	28	a 19.62
9	16.04	June 3	15.62	Nov. 4	19.27
16	16.34	10	15.72	11	19.33
23	16.28	17	15.73	19	19.36
30	16.41	24	15.80	Dec. 2	19.26
Nov. 6	16.35	July 1	15.92	9	19.32
13	16.38	8	15.98	23	a 19.74
21	16.22				

M8b. SE cor. NE¼ sec. 6, T. 24 S., R. 2 W. Five hundred feet north-northeast of well M8. Depth 54.0 feet. Measuring point, 1.0 foot above land surface, 2.28 feet above bench mark, 1,426.98 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 30, 1939	15.28	Nov. 27, 1939	15.04	July 15, 1940	14.90
June 13	15.46	Dec. 4	14.95	22	14.98
20	15.38	11	14.94	29	15.01
July 3	15.21	18	14.96	Aug. 5	15.12
11	15.43	27	14.97	12	15.10
18	15.36	Jan. 30, 1940	15.06	19	15.22
25	15.26	Feb. 12	15.04	26	15.18
31	15.10	Mar. 6	14.75	Sept. 3	16.19
Aug. 7	15.07	18	14.80	9	16.82
21	14.67	25	14.78	16	16.50
28	14.63	Apr. 1	14.69	24	a 16.99
Sept. 5	14.67	15	14.66	30	17.30
11	14.71	22	14.71	Oct. 7	17.80
18	14.80	May 6	14.69	14	17.98
25	14.84	13	14.44	21	a 18.21
Oct. 2	14.83	27	14.31	28	a 18.33
9	14.90	June 3	14.30	Nov. 4	17.97
16	14.68	10	14.38	11	18.02
23	14.88	17	14.45	19	18.10
30	15.00	24	14.54	Dec. 2	17.90
Nov. 6	14.96	July 1	14.58	9	17.99
13	15.00	8	14.66	23	a 18.37
21	14.89				

M9. NW cor. sec. 8, T. 24 S., R. 2 W. Depth 248.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 1.02 feet above bench mark, 1,423.45 feet above sea level. Bench mark 1,422.43 feet above sea level.

a Well M8 pumping.

M9.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 5, 1939	13.50	Nov. 27, 1939	13.68	July 22, 1940	13.77
13	15.16	Dec. 4	13.58	29	13.87
20	14.03	11	13.54	Aug. 5	14.02
July 3	14.48	18	13.58	12	13.95
11	14.67	27	13.60	19	14.07
18	14.11	Jan. 30, 1940	13.68	26	14.06
25	13.93	Feb. 13	13.64	Sept. 5	a 43.54
31	13.70	Mar. 6	13.21	9	15.99
Aug. 7	13.66	18	13.33	16	15.75
21	13.13	25	13.31	18	a 42.06
28	13.14	Apr. 2	13.24	24	16.39
Sept. 5	13.27	15	13.49	30	16.23
11	13.34	May 6	13.17	Oct. 7	16.82
18	13.53	13	12.95	14	16.62
25	13.51	27	12.82	21	17.14
Oct. 2	13.51	June 3	12.86	28	17.23
9	13.71	10	13.03	Nov. 4	a 39.58
16	13.65	17	13.09	11	a 45.57
23	13.68	24	13.21	19	17.37
30	13.73	July 1	13.31	Dec. 2	17.77
Nov. 13	13.65	8	13.41	9	17.81
20	13.61	15	a 39.40	24	18.55

M9a. NW cor. sec. 8, T. 24 S., R. 2 W. One hundred feet south-southwest of well M9. Depth 50.9 feet. Measuring point, 0.9 foot above land surface, 0.35 foot below bench mark, 1,422.08 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 5, 1939	12.19	Nov. 27, 1939	12.17	July 22, 1940	12.26
13	13.37	Dec. 4	12.10	29	12.37
20	12.80	11	12.07	Aug. 5	12.48
July 3	12.62	18	12.12	12	12.42
11	12.99	27	12.16	19	12.51
18	12.68	Jan. 30, 1940	12.22	26	12.53
25	12.46	Feb. 13	12.17	Sept. 5	b 14.54
31	12.29	Mar. 6	11.77	9	14.11
Aug. 7	12.19	18	11.87	16	14.15
21	11.65	25	11.80	24	14.56
28	11.69	Apr. 2	11.72	30	14.59
Sept. 5	11.80	15	11.71	Oct. 7	14.87
11	11.89	May 6	11.70	14	14.90
18	12.03	13	11.41	21	15.21
25	12.05	27	11.30	28	15.36
Oct. 2	12.03	June 3	11.32	Nov. 4	b 15.88
9	12.21	10	11.45	11	b 16.50
16	12.15	17	11.54	19	15.67
23	12.09	24	11.65	Dec. 2	15.85
30	12.23	July 1	11.80	9	15.90
Nov. 13	12.14	8	11.87	24	16.69
20	12.08	15	b 12.85		

M9b. NW cor. sec. 8, T. 24 S., R. 2 W. Five hundred feet south-southwest of well M9. Depth 51.1 feet. Measuring point, 1.1 feet above land surface, 1.51 feet below bench mark, 1,420.92 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 5, 1939	11.27	Aug. 7, 1939	11.18	Oct. 9, 1939	11.19
13	12.46	21	10.61	16	11.15
20	11.80	28	10.66	23	11.06
July 3	11.66	Sept. 5	10.78	30	11.25
11	11.98	11	10.82	Nov. 13	11.13
18	11.67	18	11.00	20	11.09
25	11.42	25	11.01	27	11.17
31	11.24	Oct. 2	11.02	Dec. 4	11.04

a Pumping. b Well M9 pumping.

M9b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Dec. 11, 1939	10.99	June 10, 1940	10.42	Sept. 16, 1940	13.10
18	11.09	17	10.50	24	13.52
27	11.12	24	10.53	30	13.53
Jan. 30, 1940	11.17	July 1	10.74	Oct. 7	13.77
Feb. 13	11.09	8	10.84	14	13.82
Mar. 6	11.70	15	a 11.70	21	14.13
18	10.75	22	11.23	28	14.33
25	10.77	29	11.34	Nov. 4	a 14.59
Apr. 2	10.70	Aug. 5	11.42	11	a 15.03
15	10.63	12	11.38	19	14.61
May 6	11.61	19	11.49	Dec. 2	14.79
13	10.35	26	11.48	9	14.90
27	10.22	Sept. 5	a 13.03	24	15.65
June 3	10.27	9	13.10		

M10. NE cor. NW¼ sec. 8, T. 24 S., R. 2 W. Depth 259.3 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 0.99 foot above bench mark, 1,422.83 feet above sea level. Bench mark 1,421.84 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 3, 1939	15.82	Dec. 11, 1939	15.13	July 29, 1940	15.07
July 11	16.78	18	15.12	Aug. 5	15.40
18	15.61	27	15.11	12	15.31
25	15.39	Jan. 30, 1940	15.46	19	15.44
31	15.17	Feb. 12	15.07	26	15.40
Aug. 7	15.13	Mar. 6	14.60	Sept. 5	17.31
21	14.79	18	14.72	9	17.63
28	14.62	25	14.71	16	18.19
Sept. 5	14.78	Apr. 1	14.62	18	b 60.83
11	14.87	15	14.55	23	b 43.71
18	15.06	22	14.49	30	18.70
25	15.07	May 6	14.50	Oct. 7	b 54.84
Oct. 2	15.07	13	14.23	14	19.06
9	15.18	27	14.05	21	19.17
16	15.23	June 3	14.17	28	18.90
23	15.16	10	14.27	Nov. 4	18.51
30	15.29	17	14.36	11	19.24
Nov. 6	15.19	24	14.48	19	19.04
13	15.23	July 1	14.58	Dec. 2	b 59.68
21	15.12	8	14.67	9	20.17
27	15.25	15	14.82	23	b 61.74
Dec. 4	15.13	22	15.17		

M10a. NE cor. NW¼ sec. 8, T. 24 S., R. 2 W. One hundred feet west-northwest of well M10. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.33 foot below bench mark, 1,421.51 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 16, 1939	12.76	Oct. 2, 1939	12.84	Dec. 27, 1939	12.88
July 11	14.34	9	13.01	Jan. 30, 1940	13.00
18	13.40	16	12.98	Feb. 12,	12.95
25	13.20	23	12.96	Mar. 6	12.52
31	13.00	30	13.09	18	12.63
Aug. 7	12.91	Nov. 6	13.00	25	12.63
21	12.40	13	13.01	Apr. 1	12.52
28	12.41	21	12.94	15	12.48
Sept. 5	12.58	27	13.06	22	12.43
11	12.66	Dec. 4	12.90	May 6	12.47
18	12.85	11	12.93	13	12.17
25	12.86	18	12.90	27	12.04

a Well M9 pumping.
b Pumping.

M10a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 3, 1940	12.09	Aug. 12, 1940	13.23	Oct. 14, 1940	16.23
10	12.24	19	13.37	21	16.43
17	12.32	26	13.35	28	16.35
24	12.47	Sept. 5	15.67	Nov. 4	16.33
July 1	12.57	9	15.07	11	16.70
8	12.64	16	15.33	19	16.81
15	12.79	23	a 18.11	Dec. 2	a 20.30
22	13.01	30	15.85	9	17.32
29	13.13	Oct. 7	a 18.65	23	a 20.41
Aug. 5	13.30				

M10b. NE cor. NW¼ sec. 8, T. 24 S., R. 2 W. Five hundred feet west-northwest of well M10. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.23 foot below bench mark, 1,421.61 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 16, 1939	11.95	Dec. 11, 1939	12.12	July 29, 1940	12.43
July 11	13.42	18	12.07	Aug. 5	12.57
18	12.77	27	12.03	12	12.45
25	12.60	Jan. 30, 1940	12.18	19	12.57
31	12.36	Feb. 12	12.15	26	12.55
Aug. 7	12.29	Mar. 6	11.70	Sept. 5	14.22
21	11.77	18	11.83	9	14.29
28	11.79	25	11.81	16	14.44
Sept. 5	11.94	Apr. 1	11.72	23	a 15.76
11	11.98	15	11.64	30	15.02
18	12.17	22	11.67	Oct. 7	a 15.85
25	12.15	May 6	11.68	14	15.35
Oct. 2	12.13	13	11.38	21	15.55
9	12.27	27	11.24	28	15.50
16	12.24	June 3	11.28	Nov. 4	15.54
23	12.17	10	11.42	11	15.88
30	12.28	17	11.52	19	15.84
Nov. 6	12.19	24	11.65	Dec. 2	a 17.21
13	12.24	July 1	11.75	9	16.30
21	12.15	8	11.84	23	a 17.35
27	12.24	15	12.00		
Dec. 4	12.13	22	12.32		

M11. SW cor. NW¼ sec. 8, T. 24 S., R. 2 W. Depth 227.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of pump base, 1.03 feet above bench mark, 1,418.78 feet above sea level. Bench mark 1,417.75 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 10, 1939	9.67	Oct. 30, 1939	10.15	June 3, 1940	9.17
20	11.09	Nov. 13	10.05	10	9.34
July 3	10.40	20	10.01	17	9.44
11	11.35	27	10.07	24	9.58
18	10.52	Dec. 4	10.18	July 1	9.70
25	10.34	11	9.94	8	9.81
31	10.04	18	10.00	15	10.33
Aug. 7	9.99	27	10.05	22	10.19
21	9.38	Jan. 30, 1940	10.08	29	10.32
28	9.44	Feb. 13	10.01	Aug. 5	10.45
Sept. 5	9.58	Mar. 6	9.55	12	10.38
11	9.68	18	9.67	19	10.49
18	9.91	25	9.68	26	10.50
25	9.90	Apr. 2	9.60	Sept. 5	11.68
Oct. 2	9.92	15	9.53	9	b 33.41
9	10.08	May 6	9.51	16	12.29
16	10.05	13	9.23	18	b 32.42
23	9.99	27	9.11	24	12.63

a Well M10 pumping. b Pumping.

M11.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Sept.30, 1940	12.56	Oct. 28, 1940	a 29.07	Dec. 2, 1940	14.11
Oct. 7	12.83	Nov. 4	13.10	9	a 33.57
14	12.86	11	13.86	24	14.83
21	a 28.86	19	13.94		

M11a. SW cor. NW¼ sec. 8, T. 24 S., R. 2 W. One hundred feet north-northwest of well M11. Depth 51.0 feet. Measuring point, 1.0 foot above land surface, 0.55 foot below bench mark, 1,417.20 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 10, 1939	8.67	Dec. 4, 1939	8.29	July 22, 1940	8.48
20	9.19	11	8.25	29	8.59
July 3	8.65	18	8.31	Aug. 5	8.70
11	9.35	27	8.34	12	8.64
18	8.87	Jan. 30, 1940	8.36	19	8.74
25	8.67	Feb. 13	8.32	26	8.80
31	88.38	Mar. 6	7.87	Sept. 5	9.68
Aug. 7	8.33	18	7.97	9	b 12.87
21	7.71	25	7.91	16	10.48
28	7.80	Apr. 2	7.81	24	10.77
Sept. 5	7.91	15	7.82	30	10.75
11	8.03	May 6	7.79	Oct. 7	10.89
18	8.22	13	7.50	14	11.00
25	8.22	27	7.38	21	b 12.64
Oct. 2	8.21	June 3	7.43	28	b 13.17
9	8.36	10	7.63	Nov. 4	12.37
16	8.31	17	7.73	11	11.89
23	8.29	24	7.86	19	11.94
30	8.48	July 1	7.99	Dec. 2	12.08
Nov. 13	8.36	8	8.10	9	b 13.46
20	8.23	15	8.48	24	13.19
27	8.34				

M11b. SW cor. NW¼ sec. 8, T. 24 S., R. 2 W. Five hundred feet north-northwest of well M11. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.84 foot above bench mark, 1,418.59 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 10, 1939	9.87	Dec. 4, 1939	9.37	July 22, 1940	9.55
20	10.23	11	9.31	29	9.68
July 3	9.78	18	9.40	Aug. 5	9.82
11	10.37	27	9.44	12	9.72
18	9.98	Jan. 30, 1940	9.49	19	9.85
25	9.80	Feb. 13	9.37	26	9.85
31	9.50	Mar. 6	8.96	Sept. 5	9.85
Aug. 7	9.43	18	9.06	9	b 12.11
21	8.56	25	8.93	16	11.57
28	8.85	Apr. 2	8.97	24	11.80
Sept. 5	9.04	15	8.92	30	11.78
11	9.15	May 6	8.89	Oct. 7	11.98
18	9.33	13	8.60	14	12.10
25	9.33	27	8.47	21	b 12.77
Oct. 2	9.33	June 3	8.53	28	b 12.32
9	9.50	10	8.49	Nov. 4	13.34
16	9.48	17	8.78	11	13.01
23	9.39	24	8.91	19	12.98
30	9.56	July 1	9.07	Dec. 2	13.14
Nov. 13	9.43	8	9.17	9	b 13.50
20	9.39	15	9.47	24	14.23
27	9.46				

a Pumping.
b Well M11 pumping.

M12. NW¼SW¼ sec. 9, T. 24 S., R. 2 W. Depth 236.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of pump base, 0.98 foot above bench mark, 1,416.35 feet above sea level. Bench mark 1,415.37 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 26, 1939	15.15	Dec. 18, 1939	14.47	Aug. 5, 1940	14.98
July 3	15.15	27	14.49	12	14.89
11	16.57	Jan. 30, 1940	14.55	19	15.00
18	14.55	Feb. 13	14.50	26	15.01
31	14.20	Mar. 6	14.16	Sept. 5	16.22
Aug. 7	14.24	18	14.21	9	17.57
21	13.41	25	14.27	16	a 45.28
28	13.65	Apr. 2	14.22	18	18.83
Sept. 5	13.92	15	14.22	24	19.30
11	14.05	May 6	14.11	30	a 48.27
18	14.25	13	13.88	Oct. 7	a 48.54
25	14.31	27	13.68	14	19.92
Oct. 2	14.33	June 3	13.63	21	19.82
9	14.45	10	14.00	28	18.79
23	14.45	17	14.08	Nov. 4	a 41.62
30	14.56	24	14.17	11	19.05
Nov. 13	14.52	July 1	14.31	19	20.04
20	14.66	8	14.40	Dec. 2	20.42
27	14.55	15	14.58	9	a 47.97
Dec. 4	14.48	22	14.73	24	20.45
11	14.45	29	14.82		

M12a. NW¼SW¼ sec. 9, T. 24 S., R. 2 W. One hundred feet south-southwest of well M12. Depth 69.0 feet. Measuring point, 1.0 foot above land surface, 0.33 foot below bench mark, 1,415.04 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 26, 1939	13.25	Dec. 11, 1939	12.51	July 29, 1940	12.86
July 3	13.29	18	12.54	Aug. 5	12.98
11	14.87	27	12.56	12	12.98
18	12.78	Jan. 30, 1940	12.63	19	13.06
31	12.39	Feb. 13	12.57	26	13.08
Aug. 7	12.34	Mar. 6	12.24	Sept. 5	14.20
21	11.74	18	12.29	9	15.64
28	11.84	25	12.34	16	b 23.68
Sept. 5	11.99	Apr. 2	12.32	24	17.60
11	12.15	15	12.28	30	b 22.10
18	12.32	May 6	12.17	Oct. 7	b 23.20
25	12.36	13	11.94	14	17.77
Oct. 2	12.45	27	11.73	21	17.74
9	12.57	June 3	11.90	28	16.83
16	12.50	10	12.02	Nov. 4	b 19.53
23	12.52	17	12.13	11	16.88
30	12.67	24	12.24	19	17.23
Nov. 13	12.60	July 1	12.33	Dec. 2	18.54
20	12.53	8	12.44	9	b 23.88
27	12.66	15	12.60	24	18.29
Dec. 4	12.54	22	12.77		

M12b. NW¼SW¼ sec. 9, T. 24 S., R. 2 W. Five hundred feet south-southwest of well M12. Depth 68.7 feet. Measuring point, 0.7 foot above land surface, 0.51 foot above bench mark, 1,415.88 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 26, 1939	13.93	Aug. 28, 1939	12.48	Oct. 16, 1939	13.23
July 3	13.91	Sept. 5	12.67	23	13.21
11	15.44	11	12.80	30	13.32
18	13.43	18	13.00	Nov. 13	13.25
31	13.03	25	13.08	20	13.24
Aug. 7	13.07	Oct. 2	13.08	27	13.29
21	12.40	9	13.23	Dec. 4	13.21

a Pumping b Well M12 pumping.

M12b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Dec. 11, 1939	13.19	June 10, 1940	12.64	Sept. 16, 1940	a 23.67
18	13.20	17	12.75	24	18.17
27	13.21	24	12.87	30	a 22.18
Jan. 30, 1940	13.27	July 1	13.01	Oct. 7	a 23.25
Feb. 13	13.19	8	13.11	14	18.34
Mar. 6	12.87	15	13.29	21	18.37
18	12.90	22	13.43	28	17.43
25	12.98	29	13.51	Nov. 4	a 19.89
Apr. 2	12.95	Aug. 5	13.67	11	17.50
15	12.91	12	13.58	19	18.89
May 6	12.82	19	13.66	Dec. 2	19.23
13	12.58	26	13.72	9	a 24.03
27	12.40	Sept. 5	14.86	24	18.84
June 3	12.51	9	16.22		

M13. NW¼NE¼ sec. 17, T. 24 S., R. 2 W. Depth 244.8 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of pump base, 0.98 foot above bench mark, 1,415.90 feet above sea level. Bench mark 1,414.92 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 16, 1939	11.73	Dec. 18, 1939	11.27	Aug. 5, 1940	11.84
July 3	11.23	27	11.29	12	11.74
11	12.68	Jan. 30, 1940	11.31	19	11.80
18	11.55	Feb. 13	11.20	26	11.87
31	11.10	Mar. 6	10.76	Sept. 5	12.45
Aug. 7	11.13	18	10.83	9	13.30
21	10.27	25	10.87	16	14.62
28	10.48	Apr. 2	10.84	18	b 35.43
Sept. 5	10.73	15	10.81	24	14.28
11	10.86	May 6	10.72	30	14.28
18	11.09	13	10.45	Oct. 7	14.70
25	11.13	27	10.33	14	14.44
Oct. 2	11.15	June 3	10.48	21	b 26.94
9	11.31	10	10.68	28	b 38.12
23	11.28	17	10.77	Nov. 4	14.68
30	11.39	24	10.91	11	14.56
Nov. 13	11.32	July 1	11.05	19	b 38.44
20	11.28	8	11.14	Dec. 2	15.67
27	11.34	15	11.30	9	15.79
Dec. 4	11.27	22	11.53	24	15.34
11	11.24	29	11.68		

M13a. NW¼NE¼ sec. 17, T. 24 S., R. 2 W. One hundred feet east-northeast of well M13. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.33 foot below bench mark, 1,414.59 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 16, 1939	10.11	Oct. 30, 1939	9.96	May 13, 1940	8.71
July 3	9.75	Nov. 13	9.76	27	8.69
11	10.45	20	9.72	June 3	8.80
18	10.06	27	9.77	10	8.97
31	9.64	Dec. 4	9.70	17	9.09
Aug. 7	9.25	11	9.66	24	9.22
21	8.89	18	9.70	July 1	9.37
28	8.98	27	9.72	8	9.46
Sept. 5	9.21	Jan. 30, 1940	9.72	15	9.63
11	9.35	Feb. 13	9.61	22	9.90
18	9.56	Mar. 6	9.16	29	10.03
25	9.60	18	9.24	Aug. 5	10.28
Oct. 2	9.62	25	9.27	12	10.17
9	9.75	Apr. 2	9.21	19	10.27
16	9.74	15	9.20	26	10.27
23	9.72	May 6	9.08	Sept. 5	10.74

a Well M12 pumping. b Pumping.

M13a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Sept. 9, 1940	11.31	Oct. 14, 1940	12.47	Nov. 19, 1940	a 14.95
16	12.11	21	a 14.07	Dec. 2	13.75
24	12.22	28	a 14.09	9	13.77
30	12.21	Nov. 4	12.93	24	13.59
Oct. 7	12.44	11	12.93		

M13b. NW¼NE¼ sec. 17, T. 24 S., R. 2 W. Five hundred feet east-northeast of well M13. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.30 foot below bench mark, 1,414.62 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 16, 1939	9.96	Dec. 11, 1939	9.41	July 29, 1940	9.89
July 3	9.68	18	9.50	Aug. 5	10.09
11	10.18	27	9.54	12	9.97
18	9.99	Jan. 30, 1940	9.50	19	10.05
31	9.50	Feb. 13	9.40	26	10.02
Aug. 7	9.43	Mar. 6	8.95	Sept. 5	10.61
21	8.75	18	8.97	9	11.13
28	8.80	25	9.02	16	11.91
Sept. 5	9.02	Apr. 2	8.99	24	12.14
11	9.15	15	8.94	30	12.11
18	9.32	May 6	8.82	Oct. 7	12.25
25	9.38	13	8.55	14	12.40
Oct. 2	9.40	27	8.43	21	a 13.04
9	9.55	June 3	8.54	28	a 13.23
16	9.55	10	8.70	Nov. 4	12.94
23	9.50	17	8.80	11	12.86
30	9.63	24	8.90	19	a 13.83
Nov. 13	9.55	July 1	9.11	Dec. 2	13.67
20	9.51	8	9.21	9	13.85
27	9.57	15	9.40	24	13.68
Dec. 4	9.48	22	9.69		

M14. NW cor. sec. 16, T. 24 S., R. 2 W. Depth 102.20 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 0.98 foot above bench mark, 1,415.78 feet above sea level. Bench mark 1,414.80 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 13, 1939	12.94	Dec. 4, 1939	12.23	July 22, 1940	12.62
20	13.78	11	12.17	29	12.79
July 3	12.37	18	12.23	Aug. 5	13.05
11	12.98	27	12.27	12	12.83
18	12.71	Jan. 30, 1940	12.20	19	12.89
31	12.25	Feb. 13	12.08	26	12.91
Aug. 7	12.26	Mar. 6	11.65	Sept. 5	13.83
21	11.49	18	11.72	9	b 33.78
28	11.63	25	11.70	16	b 35.15
Sept. 5	11.84	Apr. 2	11.67	24	15.73
11	11.96	15	11.64	30	15.72
18	12.17	May 6	11.46	Oct. 7	16.00
25	12.20	13	11.18	14	b 24.71
Oct. 2	12.21	27	11.07	21	16.07
9	12.34	June 3	11.18	28	15.92
16	12.36	10	11.37	Nov. 4	17.31
23	12.31	17	11.45	11	16.14
30	12.41	24	11.55	19	16.86
Nov. 13	12.30	July 1	11.68	Dec. 2	b 33.94
20	12.27	8	11.68	9	17.42
27	12.31	15	11.95	24	16.66

a Well M13 pumping. b Pumping.

M14a. NW cor. sec. 16, T. 24 S., R. 2 W. One hundred feet north-northwest of well M14. Depth 50.0 feet. Measuring point, 0.8 foot above land surface, 0.33 foot below bench mark, 1,414.47 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 4, 1939	9.11	Oct. 23, 1939	10.34	July 8, 1940	9.82
24	10.41	30	10.48	15	10.04
May 1	10.38	Nov. 13	10.36	22	10.66
8	10.50	20	10.33	29	10.80
15	10.49	27	10.40	Aug. 5	11.99
22	10.51	Dec. 4	10.28	12	10.86
29	10.60	11	10.23	19	10.91
June 5	10.67	18	10.33	26	10.90
13	10.91	27	10.38	Sept. 5	11.89
20	11.58	Jan. 30, 1940	10.29	9	a 20.03
July 3	10.53	Feb. 13	10.15	16	a 22.26
11	11.02	Mar. 6	9.66	24	13.76
18	10.83	18	9.72	30	13.55
31	10.40	25	9.72	Oct. 7	13.72
Aug. 7	10.36	Apr. 2	9.72	14	a 18.63
21	9.60	15	9.67	21	13.92
28	9.73	May 6	9.56	28	13.82
Sept. 5	9.92	13	9.21	Nov. 4	15.59
11	10.03	27	9.13	11	14.11
18	10.26	June 3	9.20	19	14.73
25	10.25	10	9.43	Dec. 2	a 23.02
Oct. 2	10.27	17	9.52	9	15.36
9	10.42	24	9.60	24	14.71
16	10.41	July 1	9.73		

M14b. NW cor. sec. 16, T. 24 S., R. 2 W. Five hundred feet north-northwest of well M14, in SW cor. sec. 9, T. 24 S., R. 2 W. Depth 57.0 feet. Measuring point, 0.8 foot above land surface, 0.23 foot below bench mark, 1,414.57 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 4, 1939	8.98	Oct. 23, 1939	10.05	July 8, 1940	9.60
24	10.09	30	10.19	15	9.79
May 1	10.10	Nov. 13	10.07	22	10.38
8	10.18	20	10.06	29	10.52
15	10.17	27	10.10	Aug. 5	10.79
22	10.19	Dec. 4	9.98	12	10.54
29	10.29	11	9.92	19	10.62
June 5	10.39	18	10.02	26	10.60
13	10.60	27	10.09	Sept. 5	11.59
20	11.19	Jan. 30, 1940	10.00	9	a 15.31
July 3	10.32	Feb. 13	9.85	16	a 17.61
11	10.77	Mar. 6	9.40	24	13.46
18	10.61	18	9.47	30	13.23
31	10.13	25	9.45	Oct. 7	13.28
Aug. 7	10.10	Apr. 2	9.51	14	a 15.75
21	9.34	15	9.41	21	13.58
28	9.46	May 6	9.25	28	13.50
Sept. 5	9.61	13	8.96	Nov. 4	15.19
11	9.75	27	8.96	11	13.82
18	10.00	June 3	8.96	19	14.39
25	9.97	10	9.18	Dec. 2	a 19.32
Oct. 2	10.00	17	9.26	9	15.06
9	10.11	24	9.36	24	14.51
16	10.15	July 1	9.52		

a Well M14 pumping.

M15. SE cor. NE¼ sec. 9, T. 23 S., R. 2 W. Depth 192.60 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 1.01 feet above bench mark, 1,410.46 feet above sea level. Bench mark 1,409.45 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1939	14.92	Nov. 27, 1939	15.74	July 22, 1940	15.92
24	15.79	Dec. 4	15.70	29	15.88
June 12	16.04	11	15.70	Aug. 5	16.03
19	16.34	18	15.70	12	16.03
July 3	15.53	27	15.69	19	16.09
10	15.60	Jan. 29, 1940	15.74	26	16.11
17	15.64	Feb. 12	15.72	Sept. 5	17.96
24	15.57	Mar. 6	15.48	9	17.79
31	15.49	18	15.54	16	21.48
Aug. 7	15.53	25	15.58	18	18.34
21	15.03	Apr. 1	15.55	23	a 23.13
28	15.09	15	15.56	30	a 39.43
Sept. 5	15.24	22	15.44	Oct. 7	21.77
11	15.33	May 6	15.44	14	20.51
18	15.51	13	15.22	21	20.73
25	15.56	27	14.99	28	20.04
Oct. 2	15.58	June 3	15.14	Nov. 4	a 29.47
9	15.68	10	15.25	11	a 37.92
16	15.70	17	15.32	19	18.89
30	15.77	24	15.38	Dec. 2	18.73
Nov. 6	15.72	July 1	15.49	9	a 38.76
13	15.73	8	15.58	23	23.09
21	15.67	15	15.74		

M15a. SE cor. NE¼ sec. 9, T. 23 S., R. 2 W. One hundred feet north-northeast of well M15. Depth 66.7 feet. Measuring point, 0.7 foot above land surface, 0.65 foot below bench mark, 1,408.80 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1939	13.88	Oct. 23, 1939	13.88	July 1, 1940	13.69
24	14.05	30	13.93	8	13.76
May 1	14.36	Nov. 6	13.91	15	13.87
8	14.43	13	13.91	22	13.95
15	14.31	21	13.87	29	14.03
22	14.15	27	13.93	Aug. 5	14.17
29	14.22	Dec. 4	13.91	12	14.20
June 5	14.16	11	13.96	19	14.24
12	14.16	18	13.97	26	14.26
19	14.15	27	13.98	Sept. 5	15.95
July 3	13.68	Jan. 30, 1940	13.94	9	16.07
10	13.77	Feb. 12	13.92	16	19.38
17	13.79	Mar. 6	13.69	23	b 24.26
24	13.73	18	13.72	30	b 24.32
31	13.65	25	13.77	Oct. 7	19.73
Aug. 7	13.70	Apr. 1	13.74	14	18.53
21	13.20	15	13.75	21	18.76
28	13.24	22	13.62	28	18.15
Sept. 5	13.40	May 6	13.62	Nov. 4	b 20.13
11	13.53	13	13.41	11	b 24.11
18	13.67	27	13.19	19	17.09
25	13.74	June 3	13.33	Dec. 2	16.93
Oct. 2	13.76	10	13.43	9	b 24.67
9	13.87	17	13.48	23	21.12
16	13.87	24	13.57		

a Pumping.
b Well M15 pumping.

M15b. SE cor. NE¼ sec. 9, T. 23 S., R. 2 W. Five hundred feet north-northeast of well M15. Depth 61.80 feet. Measuring point, 0.8 foot above land surface, 0.29 foot above bench mark, 1,409.74 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 17, 1939	14.95	Oct. 23, 1939	14.98	July 1, 1940	14.75
24	15.13	30	15.05	8	14.86
May 1	15.46	Nov. 6	15.01	15	14.93
8	15.58	13	15.02	22	15.00
15	15.42	21	14.98	29	15.13
22	15.25	27	15.06	Aug. 5	15.28
29	15.35	Dec. 4	15.00	12	15.27
June 5	15.30	11	15.04	19	15.33
12	15.29	18	14.98	26	15.33
19	15.28	27	14.93	Sept. 5	17.04
July 3	14.83	Jan. 30, 1940	15.00	9	17.09
10	14.90	Feb. 12	15.02	16	20.52
17	14.95	Mar. 6	14.74	23	a 24.90
24	14.86	18	14.81	30	a 23.96
31	14.77	25	14.85	Oct. 7	20.87
Aug. 7	14.80	Apr. 1	14.82	14	19.67
21	14.30	15	14.81	21	19.85
28	14.33	22	14.69	28	19.26
Sept. 5	14.49	May 6	14.68	Nov. 4	a 20.31
11	14.62	13	14.47	11	a 23.86
18	14.77	27	14.85	19	18.24
25	14.83	June 3	14.39	Dec. 2	18.00
Oct. 2	14.87	10	14.46	9	a 24.33
9	14.95	17	14.57	23	22.39
16	15.01	24	14.62		

M16. SE cor. sec. 9, T. 23 S., R. 2 W. Depth 193.4 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 0.96 foot above bench mark, 1,408.53 feet above sea level. Bench mark 1,407.57 feet above sea level.

Water level, in feet below measuring point, 1939-40

Apr. 27, 1939	13.55	Nov. 13, 1939	13.66	July 15, 1940	13.68
May 1	13.84	21	13.61	22	14.19
8	14.99	27	13.68	29	13.90
15	13.86	Dec. 4	13.62	Aug. 5	14.03
22	13.80	11	13.61	12	14.02
June 12	14.02	18	13.61	19	14.08
19	14.30	27	13.60	26	14.11
July 3	13.21	Jan. 30, 1940	13.67	Sept. 5	b 38.27
10	13.42	Feb. 12	13.61	9	15.83
17	13.54	Mar. 6	13.28	16	b 43.31
24	13.60	18	13.39	18	15.91
31	13.20	25	13.43	23	b 36.60
Aug. 7	13.42	Apr. 1	13.42	30	18.34
21	12.71	15	13.41	Oct. 7	b 42.69
28	12.90	22	13.18	14	b 38.43
Sept. 5	13.14	May 6	13.24	21	b 24.60
11	13.30	13	13.05	28	b 36.91
18	13.46	27	12.87	Nov. 4	b 33.23
25	13.53	June 3	13.08	11	18.59
Oct. 2	13.56	10	13.18	19	16.47
9	13.67	17	13.29	Dec. 2	16.98
16	13.65	24	13.32	9	18.84
23	13.65	July 1	13.45	23	19.13
30	13.71	8	13.54		

a Well M15 pumping.
b Pumping.

M16a. SE cor. sec. 9, T. 23 S., R. 2 W. One hundred feet north-northeast of well M16. Depth 57.0 feet. Measuring point, 1.0 foot above land surface, 0.48 foot above bench mark, 1,408.05 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 27, 1939	12.86	Oct. 30, 1939	12.94	July 8, 1940	12.78
May 1	13.20	Nov. 6	12.92	15	12.90
8	14.01	13	12.91	22	12.99
15	13.21	21	12.87	29	13.14
22	13.12	27	12.94	Aug. 5	13.25
29	13.22	Dec. 4	12.88	12	13.23
June 5	13.24	11	12.90	19	13.33
12	13.25	18	12.88	26	13.33
19	13.28	27	12.87	Sept. 5	a 20.08
July 3	12.43	Jan. 30, 1940	12.92	9	14.44
10	12.67	Feb. 12	12.86	16	a 23.57
17	12.78	Mar. 6	12.52	23	a 22.33
24	12.76	18	12.60	30	17.17
31	12.53	25	12.64	Oct. 7	a 23.08
Aug. 7	12.66	Apr. 1	12.64	14	a 21.01
21	11.93	15	12.64	21	a 19.84
28	12.16	22	12.42	28	a 20.69
Sept. 5	12.38	May 6	12.47	Nov. 4	a 20.63
11	12.53	13	12.26	11	17.56
18	12.70	27	12.12	19	15.73
25	12.80	June 3	12.33	Dec. 2	15.15
Oct. 2	12.80	10	12.43	9	17.90
9	12.92	17	12.54	23	17.97
16	12.93	24	12.58		
23	12.90	July 1	12.71		

M16b. SE cor. sec. 9, T. 23 S., R. 2 W. Five hundred feet north-northeast of well M16. Depth 56.0 feet. Measuring point, 0.5 foot above land surface, 0.07 foot above bench mark, 1,407.64 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 27, 1939	12.28	Oct. 30, 1939	11.85	July 1, 1940	12.07
May 1	12.65	Nov. 6	12.28	8	12.11
8	12.70	13	12.29	15	12.27
15	12.48	21	12.22	22	12.39
22	12.48	27	12.29	29	12.49
29	12.56	Dec. 4	12.23	Aug. 5	12.61
June 5	12.57	11	12.20	12	12.63
12	12.62	18	12.19	19	12.62
19	12.67	27	12.18	26	12.67
July 3	12.00	Jan. 30, 1940	12.22	Sept. 5	a 13.79
10	12.18	Feb. 12	12.21	9	13.32
17	12.29	Mar. 6	11.89	16	a 15.28
24	12.28	18	11.98	23	a 15.95
31	12.02	25	11.99	30	14.80
Aug. 7	12.02	Apr. 1	11.96	Oct. 7	a 15.64
21	11.57	15	11.95	14	a 15.12
28	11.69	22	11.79	21	a 15.34
Sept. 5	11.87	May 6	11.91	28	a 15.13
11	11.98	13	11.66	Nov. 4	a 15.33
18	12.16	27	11.52	11	15.33
25	12.20	June 3	11.65	19	14.59
Oct. 2	12.23	10	11.76	Dec. 2	14.62
9	12.34	17	11.88	9	15.51
16	12.37	24	11.95	23	15.64
23	12.29				

a Well M16 pumping.

M17. NE¼SE¼ sec. 16, T. 24 S., R. 2 W. Depth 185.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of the pump base, 0.97 foot above bench mark, 1,403.98 feet above sea level. Bench mark 1,403.01 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 8, 1939	9.30	Nov. 13, 1939	9.60	July 15, 1940	9.70
15	9.84	21	9.54	22	10.83
22	9.83	27	9.59	29	9.97
29	9.88	Dec. 4	9.52	Aug. 5	10.10
June 12	10.05	11	9.55	12	10.07
19	10.35	18	9.53	19	10.09
July 3	8.85	27	9.51	26	10.05
10	9.22	Jan. 29, 1940	9.53	Sept. 5	10.67
17	9.49	Feb. 12	9.44	9	10.61
24	9.49	Mar. 6	9.08	16	10.76
31	9.12	18	9.21	18	11.07
Aug. 7	9.38	25	9.28	23	a 30.70
21	8.58	Apr. 1	9.31	30	11.64
28	8.78	15	9.30	Oct. 7	12.31
Sept. 5	9.09	22	8.98	14	12.20
11	9.28	May 6	9.03	21	12.36
18	9.48	13	8.88	28	12.16
25	9.56	27	8.98	Nov. 4	12.26
Oct. 2	9.60	June 3	9.17	11	a 34.13
9	9.67	10	9.20	19	12.25
16	9.65	17	9.30	Dec. 2	a 33.03
23	9.63	24	9.32	9	12.43
30	9.66	July 1	9.47	23	12.27
Nov. 6	9.60	8	9.55		

M17a. NE¼SE¼ sec. 16, T. 24 S., R. 2 W. One hundred feet east-northeast of well M17. Depth 51.0 feet. Measuring point, 0.6 foot above land surface, 1.38 feet below bench mark, 1,401.63 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 8, 1939	7.77	Nov. 6, 1939	7.52	July 8, 1940	7.49
15	7.89	13	7.50	15	7.61
22	7.83	21	7.46	22	7.88
29	7.88	27	7.50	29	7.85
June 5	7.89	Dec. 4	7.45	Aug. 5	7.93
12	8.12	11	7.55	12	7.95
19	7.92	18	7.50	19	7.69
July 3	6.68	27	7.47	26	8.06
10	7.10	Jan. 29, 1940	7.39	Sept. 5	8.29
17	7.26	Feb. 12	7.41	9	8.36
24	7.42	Mar. 6	6.95	16	8.81
31	6.97	18	7.09	23	b 10.80
Aug. 7	7.24	25	7.31	30	9.26
21	6.26	Apr. 1	7.30	Oct. 7	9.53
28	6.67	15	7.22	14	9.75
Sept. 5	7.01	22	6.85	21	9.83
11	7.18	May 6	7.01	28	9.65
18	7.40	13	6.73	Nov. 4	9.71
25	7.55	27	6.93	11	b 11.39
Oct. 2	7.54	June 3	7.13	19	10.10
9	7.59	10	7.15	Dec. 2	b 11.77
16	7.58	17	7.21	9	10.06
23	7.56	24	7.25	23	9.78
30	7.58	July 1	7.40		

a Pumping.
b Well M17 pumping.

M17b. NE¼SE¼ sec. 16, T. 24 S., R. 2 W. Five hundred feet east-northeast of well M17. Depth 51.0 feet. Measuring point, 2.0 feet above land surface, 1.64 feet below bench mark, 1,401.37 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 8, 1939	7.38	Nov. 6, 1939	7.26	July 8, 1940	7.23
15	7.51	13	7.23	15	7.33
22	7.49	21	7.19	22	7.50
29	7.54	27	7.24	29	7.62
June 5	7.60	Dec. 4	7.20	Aug. 5	7.71
12	7.63	11	7.20	12	7.68
19	7.68	18	7.18	19	7.71
July 3	6.40	27	7.17	26	7.83
10	6.80	Jan. 29, 1940	7.15	Sept. 5	8.03
17	7.07	Feb. 12	7.09	9	8.15
24	7.12	Mar. 6	6.70	16	8.67
31	6.72	18	6.82	23	a 9.84
Aug. 7	6.93	25	6.92	30	9.03
21	6.01	Apr. 1	6.91	Oct. 7	9.41
28	6.40	15	6.97	14	9.56
Sept. 5	6.78	22	6.57	21	9.64
11	6.95	May 6	6.71	28	9.52
18	7.14	13	6.48	Nov. 4	9.58
25	7.25	27	6.58	11	a 10.48
Oct. 2	7.27	June 3	6.81	19	9.88
9	7.34	10	6.83	Dec. 2	a 10.80
16	7.27	17	6.92	9	9.89
23	7.30	24	6.95	23	9.59
30	7.30	July 1	7.14		

M18. SE¼SW¼ sec. 22, T. 24 S., R. 2 W. Depth 156.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of pump base, 0.98 foot above bench mark, 1,401.92 feet above sea level. Bench mark 1,400.94 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Aug. 3, 1939	12.87	Feb. 12, 1940	13.45	Aug. 5, 1940	13.97
21	12.00	26	13.23	12	14.01
28	12.11	Mar. 6	13.05	19	14.08
Sept. 5	12.34	18	13.17	26	14.07
11	12.55	25	13.21	Sept. 5	15.43
18	12.74	Apr. 1	13.17	9	14.76
25	12.86	15	13.18	16	14.85
Oct. 2	12.95	22	13.04	18	b 43.15
9	13.13	May 6	12.96	23	15.07
16	13.17	13	12.74	30	b 41.03
23	13.16	27	12.51	Oct. 7	15.71
30	13.27	June 3	12.63	14	b 42.05
Nov. 6	13.24	10	12.79	21	15.75
13	13.29	17	12.88	28	b 39.63
21	13.25	24	12.73	Nov. 4	15.96
27	13.34	July 1	12.95	11	16.37
Dec. 4	13.30	8	13.04	19	16.20
11	13.27	15	b 33.87	Dec. 2	15.77
18	13.30	22	13.67	9	15.95
27	13.29	29	14.07	23	15.83
Jan. 29, 1940	13.45				

a Well M17 pumping.
b Pumping.

M18a. SE¼SW¼ sec. 22, T. 24 S., R. 2 W. One hundred feet west-southwest of well M18. Depth 71.7 feet. Measuring point, 1.7 feet above land surface, 0.50 foot above bench mark, 1,401.44 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Aug. 3, 1939	12.34	Jan. 29, 1940	12.72	July 29, 1940	13.33
21	11.32	Feb. 12	12.73	Aug. 5	13.24
28	11.38	26	12.52	12	13.30
Sept. 5	11.65	Mar. 6	12.32	19	13.36
11	11.80	18	12.40	26	13.36
18	12.03	25	12.48	Sept. 5	14.65
25	12.15	Apr. 1	12.44	9	14.03
Oct. 2	12.22	15	12.43	16	13.97
9	12.44	22	12.31	23	14.32
16	12.41	May 6	12.21	30	a 28.36
23	12.43	13	12.00	Oct. 7	14.91
30	12.53	27	11.80	14	a 28.94
Nov. 6	12.49	June 3	11.86	21	15.01
13	12.57	10	12.03	28	a 28.02
21	12.55	17	12.09	Nov. 4	15.22
27	12.60	24	12.08	11	15.61
Dec. 4	12.55	July 1	12.22	19	15.42
11	12.63	8	12.33	Dec. 2	15.00
18	12.59	15	a 23.21	9	15.14
27	12.57	22	12.90	23	15.05

M18b. SE¼SW¼ sec. 22, T. 24 S., R. 2 W. Five hundred feet west-southwest of well M18. Depth 63.2 feet. Measuring point, 1.2 feet above land surface, 0.39 foot above bench mark, 1,401.33 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Aug. 3, 1939	11.73	Jan. 29, 1940	12.10	July 29, 1940	12.59
21	10.58	Feb. 12	12.12	Aug. 5	12.54
28	10.66	26	11.90	12	12.58
Sept. 5	10.94	Mar. 6	11.71	19	12.69
11	11.13	18	11.78	26	12.68
18	11.35	25	11.87	Sept. 5	13.89
25	11.50	Apr. 1	11.82	9	13.27
Oct. 2	11.59	15	11.85	16	12.39
9	11.76	22	11.73	23	13.60
16	11.83	May 6	11.60	30	a 21.20
23	11.81	13	11.42	Oct. 7	14.16
30	11.89	27	11.13	14	a 21.47
Nov. 6	11.87	June 3	11.25	21	14.25
13	11.90	10	11.40	28	a 21.32
21	11.91	17	11.49	Nov. 4	14.48
27	12.02	24	11.48	11	14.83
Dec. 4	11.94	July 1	11.63	19	14.63
11	11.95	8	11.73	Dec. 2	14.30
18	11.91	15	a 17.04	9	14.39
27	11.88	22	12.23	23	14.33

M19. NE cor. sec. 27, T. 24 S., R. 2 W. Depth 145.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 1.01 feet above bench mark, 1,398.36 feet above sea level. Bench mark 1,397.35 feet above sea level.

a Well M18 pumping.

M19.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 6, 1939	14.07	Dec. 4, 1939	14.41	July 22, 1940	14.49
19	15.55	11	14.45	29	14.61
July 3	13.78	18	14.42	Aug. 5	14.74
10	14.14	27	14.41	12	14.73
17	14.21	Jan. 29, 1940	14.58	19	14.87
24	14.31	Feb. 12	14.71	26	14.84
31	14.17	26	14.42	Sept. 5	15.89
Aug. 7	14.49	Mar. 6	14.29	9	18.98
21	12.82	18	14.48	16	15.70
28	13.01	25	14.53	18	a 36.75
Sept. 5	13.29	Apr. 1	14.45	23	15.97
11	13.44	15	14.42	30	16.82
18	13.71	22	14.30	Oct. 7	a 33.66
25	13.72	May 6	14.26	14	16.88
Oct. 2	13.89	13	13.94	21	16.52
9	14.15	27	13.69	28	17.14
16	14.20	June 3	13.66	Nov. 4	15.96
23	14.16	10	13.77	11	16.91
30	14.35	17	13.83	19	a 34.57
Nov. 6	14.29	24	13.75	Dec. 2	16.73
13	14.41	July 1	13.93	9	a 36.03
21	14.34	8	14.07	23	17.33
27	14.47	15	14.35		

M19a. NE cor. sec. 27, T. 24 S., R. 2 W. One hundred feet west-northwest of well M19. Depth 59.7 feet. Measuring point, 0.7 foot above land surface, 1.75 feet above bench mark, 1,399.10 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 6, 1939	16.10	Dec. 4, 1939	15.38	July 15, 1940	15.39
19	16.24	11	15.41	22	15.47
July 3	14.76	18	15.46	29	15.69
10	15.02	27	15.44	Aug. 5	15.81
17	15.18	Jan. 29, 1940	15.65	12	15.78
24	15.30	Feb. 12	15.71	19	15.99
31	15.27	26	15.43	26	15.93
Aug. 7	15.46	Mar. 6	15.29	Sept. 5	16.79
21	13.81	18	15.46	9	17.98
28	13.99	25	15.51	16	16.74
Sept. 5	14.24	Apr. 1	15.48	23	17.02
11	14.43	15	15.43	30	17.72
18	14.69	22	15.32	Oct. 7	b 20.23
25	14.80	May 6	15.29	14	17.67
Oct. 2	14.83	13	14.88	21	17.56
9	15.15	27	14.69	28	17.86
16	15.20	June 3	14.71	Nov. 4	17.63
23	15.14	10	14.90	11	17.80
30	15.35	17	14.89	19	b 20.94
Nov. 6	15.28	24	14.80	Dec. 2	17.70
13	15.38	July 1	15.02	9	b 21.20
21	15.32	8	15.15	23	18.44
27	15.47				

M19b. NE cor. sec. 27, T. 24 S., R. 2 W. Five hundred feet west-northwest of well M19. Depth 51.0 feet. Measuring point, 1.0 foot above land surface, 1.48 feet above bench mark, 1,398.83 feet above sea level.

a Pumping.
b Well M19 pumping.

M19b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 6, 1939	14.84	Dec. 4, 1939	14.20	July 15, 1940	14.27
19	15.10	11	14.23	22	14.40
July 3	13.48	18	14.20	29	14.53
10	13.90	27	14.18	Aug. 5	14.66
17	13.99	Jan. 29, 1940	14.43	12	14.64
24	14.12	Feb. 12	14.52	19	14.76
31	13.97	26	14.15	26	14.70
Aug. 7	14.33	Mar. 6	14.05	Sept. 5	15.76
21	12.47	18	14.27	9	16.24
28	12.74	25	14.29	16	15.64
Sept. 5	13.05	Apr. 1	14.23	23	15.94
11	13.24	15	14.17	30	16.78
18	13.50	22	14.06	Oct. 7	a 17.00
25	13.62	May 6	14.04	14	16.80
Oct. 2	13.63	13	13.70	21	16.54
9	13.93	27	13.49	28	16.98
16	13.98	June 3	13.51	Nov. 4	16.65
23	13.94	10	13.66	11	16.86
30	14.13	17	13.75	19	a 17.71
Nov. 6	14.09	24	13.62	Dec. 2	16.59
13	14.18	July 1	13.82	9	17.54
21	14.12	8	13.94	23	17.18
27	14.28				

M20. NW¼SE¼ sec. 8, T. 24 S., R. 2 W. Depth 248.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 0.99 foot above bench mark, 1,419.29 feet above sea level. Bench mark 1,418.30 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 10, 1939	13.23	Dec. 27, 1939	12.78	Aug. 5, 1940	13.25
18	12.27	Jan. 30, 1940	12.81	12	13.14
Aug. 7	12.71	Feb. 13	12.71	19	13.26
21	12.09	Mar. 6	12.31	26	13.27
28	12.13	18	12.35	Sept. 5	14.28
Sept. 5	12.34	25	12.37	9	15.14
11	12.42	Apr. 2	12.28	16	16.46
18	12.65	15	12.22	18	16.71
25	12.65	May 6	12.19	24	b 35.12
Oct. 2	12.68	13	11.91	30	16.54
9	12.83	27	11.74	Oct. 7	17.04
16	12.81	June 3	11.84	14	16.40
23	12.88	10	12.01	21	b 40.24
30	12.93	17	12.10	28	16.91
Nov. 13	12.84	24	12.21	Nov. 4	16.63
20	12.78	July 1	12.34	11	16.54
27	12.87	8	12.44	19	b 41.85
Dec. 4	12.77	15	12.91	Dec. 2	b 41.59
11	12.73	22	12.96	9	18.66
18	12.76	29	13.18	30	17.34

M20a. NW¼SE¼ sec. 8, T. 24 S., R. 2 W. One hundred feet south-southwest of well M20. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.10 foot below bench mark, 1,418.20 feet above sea level.

a Well M19 pumping.
b Pumping.

M20a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 10, 1939	11.64	Jan. 30, 1940	11.13	Aug. 5, 1940	11.57
18	11.82	Feb. 13	11.03	12	11.44
Aug. 7	11.14	Mar. 6	10.63	19	11.60
21	10.52	18	10.69	26	11.57
28	10.54	25	10.67	Sept. 5	12.36
Sept. 5	10.71	Apr. 2	10.64	9	12.96
11	10.81	15	10.57	16	13.58
18	11.00	May 6	10.50	24	a 15.54
25	11.02	13	11.20	30	13.12
Oct. 2	11.00	27	10.08	Oct. 7	14.30
9	11.20	June 3	10.14	14	14.34
16	11.14	10	10.32	21	a 15.09
23	11.15	17	10.42	28	14.66
30	11.26	24	10.56	Nov. 4	14.66
Nov. 13	11.18	July 1	10.66	11	14.71
20	11.15	8	10.79	19	a 15.81
Dec. 4	11.11	15	11.14	Dec. 2	a 16.47
11	11.06	22	11.29	9	16.16
18	11.11	29	11.45	30	15.78
27	11.14				

M20b. NW¼SE¼ sec. 8, T. 24 S., R. 2 W. Five hundred feet south-southwest of M20. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 1.06 feet below bench mark, 1,417.24 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 10, 1939	10.78	Dec. 27, 1939	10.24	Aug. 5, 1940	10.71
18	10.91	Jan. 30, 1940	10.28	12	10.59
Aug. 7	10.27	Feb. 13	10.19	19	10.75
21	9.63	Mar. 6	9.77	26	10.72
28	9.61	18	9.80	Sept. 5	11.40
Sept. 5	9.80	25	9.77	9	11.96
11	9.91	Apr. 2	9.73	16	12.59
18	10.13	15	9.66	24	a 13.22
25	10.10	May 6	9.64	30	13.16
Oct. 2	10.15	13	9.32	Oct. 7	13.31
9	10.30	27	9.21	14	13.39
16	10.29	June 3	9.26	21	a 13.82
23	10.25	10	9.48	28	13.73
30	10.39	17	9.55	Nov. 4	13.78
Nov. 13	10.30	24	9.69	11	13.78
20	10.25	July 1	9.81	19	a 14.58
27	10.32	8	9.89	Dec. 2	a 15.18
Dec. 4	10.23	15	10.20	9	15.20
11	10.18	22	10.38	30	14.85
18	10.22	29	10.53		

M21. SW cor. sec. 26, T. 24 S., R. 2 W. Depth 79.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 1.01 feet above bench mark, 1,393.97 feet above sea level. Bench mark 1,392.96 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 3, 1939	12.55	July 17, 1939	11.87	Sept. 18, 1939	11.24
8	12.83	24	12.00	25	11.30
15	12.68	31	11.89	Oct. 2	11.40
22	12.83	Aug. 7	12.01	9	11.69
June 12	13.04	21	10.32	16	11.74
19	13.24	28	10.52	23	11.67
July 3	11.49	Sept. 5	10.80	Nov. 6	11.86
10	11.49	11	10.93	13	12.00

a Well M20 pumping.

M21.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Nov. 21, 1939	11.94	May 20, 1940	11.27	Sept. 9, 1940	a 25.32
27	12.11	27	11.41	16	a 28.78
Dec. 4	12.03	June 3	11.45	18	14.07
11	12.08	10	11.33	23	14.55
18	12.07	17	11.32	30	a 26.87
27	12.06	24	11.32	Oct. 7	15.00
Jan. 29, 1940	12.38	July 1	11.48	14	14.60
Feb. 12	12.48	8	11.62	21	a 26.25
Mar. 6	12.22	15	11.82	28	a 28.23
18	12.35	22	12.00	Nov. 4	a 28.37
25	12.41	29	12.20	11	15.39
Apr. 1	12.32	Aug. 5	12.31	19	15.23
15	12.25	12	12.36	Dec. 2	14.98
22	12.13	19	12.51	9	15.31
May 6	12.05	26	12.48	16	15.22
13	11.68	Sept. 5	a 26.49	23	15.01

M21a. SW cor. sec. 26, T. 24 S., R. 2 W. One hundred feet north-northwest of well M21. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.13 foot above bench mark, 1,393.09 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 3, 1939	11.48	Nov. 6, 1939	10.80	July 8, 1940	10.50
8	11.78	13	10.95	15	10.77
15	11.64	21	10.85	22	10.93
22	11.87	27	11.03	29	11.06
29	11.87	Dec. 4	10.96	Aug. 5	11.23
June 5	11.89	11	10.97	12	11.27
12	11.96	18	10.98	19	11.40
19	11.92	27	10.97	26	11.40
July 3	10.45	Jan. 29, 1940	11.27	Sept. 5	b 17.85
10	10.76	Feb. 12	11.37	9	b 16.90
17	10.85	Mar. 6	11.12	16	b 19.15
24	10.98	18	11.24	23	13.44
31	10.86	25	11.32	30	b 19.29
Aug. 7	10.02	Apr. 1	11.20	Oct. 7	13.88
21	9.30	15	11.15	14	13.48
28	9.48	22	11.05	21	b 18.29
Sept. 5	9.75	May 6	10.97	28	b 19.16
11	9.91	13	10.61	Nov. 4	b 19.73
18	10.20	20	10.18	11	14.25
25	10.27	27	10.27	19	14.11
Oct. 2	10.36	June 3	10.32	Dec. 2	13.87
9	10.62	10	10.23	9	14.14
16	10.67	17	10.22	16	14.07
23	10.61	24	10.21	23	13.85
30	10.80	July 1	10.37		

M21b. SW cor. sec. 26, T. 24 S., R. 2 W. Five hundred feet north-northwest of well M21. Depth 50.8 feet. Measuring point, 0.8 foot above land surface, 0.12 foot below bench mark, 1,392.84 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 3, 1939	11.19	Aug. 7, 1939	10.59	Nov. 13, 1939	10.51
8	11.48	21	8.88	21	10.49
15	11.34	28	9.06	27	10.65
22	11.44	Sept. 5	9.31	Dec. 4	10.56
29	11.44	11	9.48	11	10.60
June 5	11.47	18	9.77	18	10.53
12	11.57	25	9.83	27	10.50
19	11.47	Oct. 2	9.91	Jan. 29, 1940	10.91
July 3	10.07	9	10.23	Feb. 12	10.98
10	10.36	16	10.32	Mar. 6	10.70
17	10.43	23	10.21	18	10.84
24	10.53	30	10.45	25	10.88
31	10.43	Nov. 6	10.39	Apr. 1	10.76

a Pumping.

b Well M21 pumping.

M21b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Apr. 15, 1940	10.74	July 15, 1940	10.36	Oct. 7, 1940	13.46
22	10.63	22	10.49	14	13.09
May 6	10.53	29	10.63	21	a 15.86
13	10.18	Apr. 5	10.78	28	a 16.55
20	9.97	12	10.84	Nov. 4	a 17.33
27	9.82	19	11.01	11	13.79
June 3	9.88	26	10.98	19	13.69
10	9.80	Sept. 5	a 15.20	Dec. 2	13.43
17	9.79	9	a 14.32	9	13.67
24	9.80	16	a 16.18	16	13.62
July 1	9.93	23	13.00	23	13.46
8	10.08	30	a 16.59		

M22. SW cor. SE¼ sec. 26, T. 24 S., R. 2 W. Depth 81.6 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in side of the pump base, 0.99 foot above bench mark, 1,393.59 feet above sea level. Bench mark 1,392.60 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 16, 1939	14.34	Dec. 4, 1939	13.51	July 29, 1940	13.61
June 12	14.47	11	13.57	Aug. 5	13.76
19	14.66	18	13.55	12	13.83
July 3	12.62	27	13.53	19	13.99
10	13.10	Jan. 29, 1940	13.87	26	13.99
17	13.23	Feb. 12	13.99	Sept. 5	15.37
24	13.40	Mar. 6	13.69	9	b 26.95
31	13.22	18	13.86	16	15.99
Aug. 7	13.39	25	13.90	18	15.30
21	11.20	Apr. 1	13.82	23	b 31.88
28	11.63	15	13.77	30	b 33.50
Sept. 5	12.05	22	13.63	Oct. 7	b 30.89
11	12.24	May 6	13.53	14	16.00
18	12.59	13	13.08	21	16.28
25	12.71	27	12.81	28	16.78
Oct. 2	12.80	June 3	12.94	Nov. 4	17.17
9	13.12	10	12.77	11	b 32.97
16	13.10	17	12.80	19	16.60
23	13.13	24	12.83	Dec. 2	16.73
Nov. 6	13.30	July 1	13.01	9	b 35.85
13	13.46	8	13.15	16	17.13
21	13.42	15	13.23	23	16.71
27	13.59	22	13.43		

M22a. SW cor. SE¼ sec. 26, T. 24 S., R. 2 W. One hundred feet west-southwest of well M22. Depth 51.0 feet. Measuring point, 0.8 foot above land surface, 0.84 foot below bench mark, 1,391.76 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 16, 1939	12.35	Sept. 11, 1939	10.33	Dec. 18, 1939	11.65
29	12.40	18	10.67	27	11.64
June 5	12.45	25	10.78	Jan. 29, 1940	11.96
12	12.50	Oct. 2	10.85	Feb. 12	12.06
19	12.45	9	11.18	Mar. 6	11.75
July 3	10.68	16	11.13	18	11.93
10	11.15	23	11.16	25	11.95
17	11.31	30	11.43	Apr. 1	11.86
24	11.48	Nov. 6	11.34	15	11.82
31	11.30	13	11.50	22	11.69
Aug. 7	11.47	21	11.50	May 6	11.54
21	9.29	27	11.63	13	11.12
28	9.72	Dec. 4	11.54	27	10.85
Sept. 5	10.01	11	11.58	June 3	10.91

a Well M21 pumping. b Pumping.

M22a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 10, 1940	10.76	Aug. 19, 1940	12.01	Oct. 21, 1940	14.40
17	10.80	26	11.99	28	14.82
24	10.85	Sept. 5	13.47	Nov. 4	15.30
July 1	11.01	9	a 20.25	11	a 20.75
8	11.14	16	14.07	19	14.64
15	11.26	23	a 19.17	Dec. 2	14.73
22	11.46	30	a 20.96	9	a 20.98
29	11.64	Oct. 7	a 19.94	16	15.16
Aug. 5	11.77	14	14.02	23	14.73
12	11.80				

M22b. SW cor. SE¼ sec. 26, T. 24 S., R. 2 W. Five hundred feet west-southwest of well M22, along east-west road, in SE¼SW¼ sec. 26, T. 24 S., R. 2 W. Depth 50.0 feet. Measuring point, 0.9 foot above land surface, 0.24 foot above bench mark, 1,392.84 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 16, 1939	13.02	Nov. 21, 1939	12.21	July 15, 1940	12.03
29	13.19	27	12.39	22	12.21
June 5	13.24	Dec. 4	12.29	29	12.38
12	13.27	11	12.34	Aug. 5	12.54
19	13.18	18	12.32	12	12.58
July 3	11.48	27	12.31	19	12.75
10	11.96	Jan. 29, 1940	12.64	26	12.74
17	12.10	Feb. 12	12.75	Sept. 5	14.32
24	12.25	Mar. 6	12.45	9	a 16.20
31	12.08	18	12.64	16	14.98
Aug. 7	12.24	25	12.66	23	a 15.49
21	10.18	Apr. 1	12.56	30	a 17.53
28	10.51	15	12.50	Oct. 7	a 17.01
Sept. 5	10.91	22	12.38	14	14.83
11	11.11	May 6	12.29	21	15.24
18	11.42	13	11.83	28	15.70
25	11.53	27	11.54	Nov. 4	16.20
Oct. 2	11.61	June 3	11.63	11	a 17.53
9	11.92	10	11.47	19	15.45
16	12.03	17	11.50	Dec. 2	15.52
23	11.93	24	11.51	9	a 17.96
30	12.17	July 1	11.67	16	15.97
Nov. 6	12.10	8	11.83	23	15.46
13	12.25				

M23. SE cor. NE¼ sec. 35, T. 24 S., R. 2 W. Depth 204.5 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 0.99 foot above bench mark, 1,388.59 feet above sea level. Bench mark 1,387.60 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 29, 1939	13.51	Oct. 2, 1939	11.76	Mar. 6, 1940	12.44
June 5	13.48	9	12.04	18	12.63
12	13.46	16	12.03	25	12.73
19	13.58	23	12.10	Apr. 1	12.66
July 3	11.31	30	12.30	15	12.66
10	11.94	Nov. 6	12.25	22	12.36
17	12.17	13	12.37	May 6	12.28
24	12.36	20	12.36	13	11.92
31	12.05	27	12.50	27	11.35
Aug. 7	12.28	Dec. 4	12.45	June 3	11.84
21	9.85	11	12.49	10	11.73
28	10.39	18	12.58	17	11.73
Sept. 5	10.88	27	12.56	24	11.87
11	11.13	Jan. 29, 1940	12.79	July 1	12.06
18	11.50	Feb. 12	12.81	8	12.21
25	11.66	26	12.53	15	12.42

a Well M22 pumping.

M23.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 22, 1940	12.55	Sept. 16, 1940	13.65	Nov. 4, 1940	15.04
29	12.74	18	13.77	11	14.71
Aug. 5	12.53	23	a 43.34	19	15.40
12	12.93	30	14.33	Dec. 2	a 41.04
19	13.08	Oct. 7	14.76	9	15.70
26	13.13	14	14.77	16	a 41.08
Sept. 5	a 37.93	21	a 36.23	23	19.03
9	a 39.48	28	15.46	31	15.62

M23a. SE cor. NE¼ sec. 35, T. 24 S., R. 2 W. One hundred feet north-northeast of well M23. Depth 50.9 feet. Measuring point, 0.9 foot above land surface, 0.57 foot above bench mark, 1,388.17 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 29, 1939	12.79	Nov. 27, 1939	11.87	July 22, 1940	11.95
June 5	12.93	Dec. 4	11.81	29	12.14
12	12.82	11	11.85	Aug. 5	12.25
19	12.72	18	11.82	12	12.32
July 3	10.60	27	11.80	19	12.50
10	10.53	Jan. 29, 1940	12.19	26	12.49
17	11.50	Feb. 12	12.21	Sept. 5	b 15.38
24	11.74	26	11.91	9	b 14.89
31	11.42	Mar. 6	11.81	16	13.02
Aug. 7	11.65	18	12.05	23	b 16.28
21	9.17	25	12.11	30	13.70
28	9.74	Apr. 1	12.05	Oct. 7	13.88
Sept. 5	10.23	15	12.04	14	14.14
11	10.49	22	11.74	21	b 16.97
18	10.83	May 6	11.62	28	14.73
25	11.02	13	11.27	Nov. 4	14.48
Oct. 2	11.13	27	11.07	11	14.15
9	11.40	June 3	11.17	19	14.52
16	11.40	10	11.07	Dec. 2	b 17.48
23	11.48	17	11.11	9	14.82
30	11.67	24	11.22	16	b 17.52
Nov. 6	11.60	July 1	11.44	23	16.20
13	11.73	8	11.57	31	15.02
20	11.74	15	11.79		

M23b. SE cor. NE¼ sec. 35, T. 24 S., R. 2 W. Five hundred feet north-northeast of well M23. Depth 51.1 feet. Measuring point, 1.1 feet above land surface, 0.07 foot above bench mark, 1,387.67 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 29, 1939	12.26	Oct. 2, 1939	10.72	Mar. 6, 1940	11.38
June 5	12.48	9	11.00	18	11.62
12	12.39	16	11.01	25	11.66
19	12.26	23	11.06	Apr. 1	11.60
July 3	10.05	30	11.27	15	11.60
10	10.82	Nov. 6	11.21	22	11.31
17	11.07	13	11.34	May 6	11.20
24	11.30	20	11.35	13	10.84
31	10.96	27	11.48	27	10.64
Aug. 7	11.18	Dec. 4	11.41	June 3	10.76
21	8.60	11	11.46	10	10.65
28	9.27	18	11.42	17	10.69
Sept. 5	9.75	27	11.39	24	10.80
11	10.06	Jan. 29, 1940	11.72	July 1	10.97
18	10.44	Feb. 12	11.79	8	11.14
25	10.61	26	11.47	15	11.35

a Pumping.

b Well M23 pumping.

M23b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 22, 1940	11.51	Sept. 16, 1940	12.59	Nov. 11, 1940	13.72
29	11.70	23	a 14.41	19	14.02
Aug. 5	11.88	30	13.25	Dec. 2	a 15.77
12	11.91	Oct. 7	13.43	9	14.36
19	12.07	14	13.62	16	a 15.77
26	12.10	21	a 15.26	23	15.37
Sept. 5	a 13.58	28	14.18	31	14.56
9	a 13.21	Nov. 4	13.97		

M24. SE cor. sec. 35, T. 24 S., R. 2 W. Depth 97.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 1.0 foot above bench mark, 1,389.88 feet above sea level. Bench mark 1,388.88 feet above sea level.

Water level, in feet below measuring point, 1939-40

June 1, 1939	13.21	Dec. 4, 1939	12.10	July 29, 1940	12.35
12	13.28	11	12.15	Aug. 5	12.48
19	13.45	18	12.17	12	12.53
July 3	12.18	27	12.16	19	12.66
10	12.25	Jan. 29, 1940	12.49	26	12.72
17	12.29	Feb. 12	12.53	Sept. 5	b 31.79
24	13.41	26	12.43	9	b 34.99
31	12.24	Mar. 6	12.36	16	13.33
Aug. 7	12.31	18	12.47	18	13.54
21	10.71	25	12.53	23	13.61
28	10.77	Apr. 1	12.50	30	14.23
Sept. 5	10.95	15	12.50	Oct. 7	14.54
11	11.07	22	12.36	14	b 35.26
18	11.39	May 6	12.25	21	15.36
25	11.41	13	12.11	28	14.95
Oct. 2	11.50	27	11.90	Nov. 4	b 32.59
9	11.67	June 3	11.93	11	14.84
16	11.73	10	11.39	19	14.87
23	11.78	17	11.65	Dec. 2	14.94
30	11.89	24	11.72	9	b 31.11
Nov. 6	11.92	July 1	11.74	16	15.77
13	12.01	8	11.96	23	15.38
20	12.06	15	12.06	31	b 33.34
27	12.10	22	12.20		

M24a. SE cor. sec. 35, T. 24 S., R. 2 W. One hundred feet west-southwest of well M24. Depth 54.0 feet. Measuring point, 1.0 foot above surface, 0.26 foot above bench mark, 1,389.14 feet above land surface.

Water level, in feet below measuring point, 1939-40

June 1, 1939	12.43	Oct. 2, 1939	10.61	Feb. 26, 1940	11.56
12	12.40	9	10.80	Mar. 6	11.49
19	12.31	16	10.83	18	11.59
July 3	11.31	23	10.89	25	11.62
10	11.42	30	11.02	Apr. 1	11.60
17	11.46	Nov. 6	11.05	15	11.64
24	11.55	13	11.10	22	11.52
31	11.39	20	11.16	May 6	11.36
Aug. 7	11.44	27	11.23	13	11.27
21	9.88	Dec. 4	11.22	27	11.05
28	9.91	11	11.25	June 3	11.05
Sept. 5	10.03	18	11.30	10	10.73
11	10.21	27	11.28	17	10.79
18	10.40	Jan. 29, 1940	11.61	24	10.86
25	10.54	Feb. 12	11.66	July 1	10.96

a Well M23 pumping. b Pumping.

M24a.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 8, 1940	11.06	Sept. 9, 1940	a 17.26	Nov. 4, 1940	a 19.26
15	11.09	16	12.44	11	13.95
22	11.31	23	12.69	19	13.97
29	11.46	30	13.35	Dec. 2	14.03
Aug. 5	11.60	Oct. 7	13.62	9	a 18.34
12	11.67	14	a 19.44	16	14.84
19	11.81	21	14.45	23	14.45
26	11.81	28	14.05	31	a 19.19
Sept. 5	a 16.97				

M24b. SE cor. sec. 35, T. 24 S., R. 2 W. Five hundred feet west-southwest of well M24. Depth 51.0 feet. Measuring point, 1.0 foot above land surface, 2.92 feet above bench mark, 1,391.81 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
June 1, 1939	14.30	Dec. 4, 1939	13.36	July 22, 1940	13.41
12	14.52	11	13.37	29	13.54
19	14.38	18	13.40	Aug. 5	13.68
July 3	13.59	27	13.38	12	13.71
10	13.54	Jan. 29, 1940	13.71	19	13.85
17	13.61	Feb. 12	13.76	26	13.92
24	13.64	26	13.71	Sept. 5	a 15.21
31	12.52	Mar. 6	13.64	9	a 15.16
Aug. 7	13.59	18	13.70	16	14.54
21	12.24	25	13.75	23	14.70
28	12.17	Apr. 1	13.72	30	15.36
Sept. 5	12.26	15	13.74	Oct. 7	15.62
11	12.35	22	13.65	14	a 17.38
18	12.53	May 6	13.51	21	16.39
25	12.66	13	13.43	28	16.12
Oct. 2	12.74	27	13.20	Nov. 4	a 17.77
9	12.94	June 3	13.20	11	16.12
16	12.91	10	13.03	19	16.00
23	13.03	17	12.95	Dec. 2	16.02
30	13.12	24	12.96	9	a 16.74
Nov. 6	13.17	July 1	13.06	16	16.80
13	13.21	8	13.15	23	16.48
20	13.28	15	13.31	31	a 17.60
27	13.35				

M25. SW¼SE¼ sec. 36, T. 24 S., R. 2 W. Depth 189.0 feet. Measuring point, 2.0 feet above land surface, 0.87 foot below bottom of hole in the side of the pump base, 1.01 feet above bench mark, 1,383.83 feet above sea level. Bench mark 1,382.82 feet above sea level.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
May 22, 1939	10.51	Oct. 2, 1939	9.22	Mar. 6, 1940	9.84
June 12	10.84	9	9.82	18	10.04
19	10.95	16	9.46	25	10.15
July 3	9.06	23	9.54	Apr. 1	10.12
10	9.55	30	9.72	15	10.10
17	9.76	Nov. 6	9.68	22	9.69
24	9.94	13	9.80	May 6	9.67
31	9.64	20	9.79	13	9.40
Aug. 7	9.83	27	9.91	27	9.11
21	7.54	Dec. 4	9.87	June 3	9.37
28	8.02	11	9.91	10	9.09
Sept. 5	8.46	18	9.90	17	9.10
11	8.67	27	9.89	24	9.44
18	8.98	Jan. 29, 1940	10.19	July 1	9.62
25	9.13	Feb. 12	10.21	8	9.75

a Well M24 pumping.

M25.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 15, 1940	9.93	Sept.16, 1940	11.00	Nov. 4, 1940	12.07
22	10.07	18	10.89	11	11.79
29	10.24	23	10.60	19	a 34.47
Aug. 5	10.40	30	11.48	Dec. 2	12.46
12	10.40	Oct. 7	a 30.24	9	a 33.31
19	10.56	14	11.94	16	12.54
26	10.58	21	12.56	23	a 33.05
Sept. 5	10.86	28	12.16	31	12.69
9	10.60				

M25a. SW¼SE¼ sec. 36, T. 24 S., R. 2 W. One hundred feet southwest of well M25. Depth 50.0 feet. Measuring point, 0.8 foot above land surface, 0.03 foot above bench mark, 1,382.85 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 22, 1939	9.17	Nov. 27, 1939	8.60	July 22, 1940	8.73
June 5	9.66	Dec. 4	8.56	29	8.93
12	9.55	11	8.62	Aug. 5	9.02
19	9.41	18	8.59	12	9.12
July 3	7.71	27	8.57	19	9.23
10	8.25	Jan. 29, 1940	8.91	26	9.22
17	8.50	Feb. 12	8.93	Sept. 5	9.50
24	8.66	Mar. 6	8.55	9	9.29
31	8.35	18	8.66	16	9.64
Aug. 7	8.54	25	8.84	23	10.15
21	6.11	Apr. 1	8.83	30	10.23
28	6.69	15	8.76	Oct. 7	b 12.20
Sept. 5	7.13	22	8.41	14	10.72
11	7.30	May 6	8.38	21	11.05
18	7.68	13	8.12	28	10.92
25	7.80	27	7.94	Nov. 4	10.89
Oct. 2	7.90	June 3	8.10	11	10.60
9	8.12	10	7.73	19	b 13.38
16	8.15	17	7.97	Dec. 2	11.09
23	8.17	24	8.12	9	b 13.07
30	8.36	July 1	8.34	16	11.27
Nov. 6	8.36	8	8.43	23	b 12.24
13	8.50	15	8.59	31	11.51
20	8.46				

M25b. SW¼SE¼ sec. 36,T. 24 S., R. 2 W. Five hundred feet southwest of M25 in the NE¼NW¼ sec. 1, T. 25 S., R. 2 W., along east-west road. Depth 51.0 feet. Measuring point, 0.8 foot above land surface, 1.69 feet above bench mark, 1,384.51 feet above sea level.

Water level, in feet below measuring point, 1939-40

May 22, 1939	10.60	Oct. 9, 1939	9.55	Apr. 1, 1940	10.20
June 5	11.09	16	9.54	15	10.18
12	10.92	23	9.61	22	9.84
19	10.79	30	9.78	May 6	9.78
July 3	9.22	Nov. 6	9.74	13	9.55
10	9.73	13	9.87	27	9.36
17	9.91	20	9.86	June 3	9.27
24	10.06	27	10.01	10	9.13
31	9.74	Dec. 4	9.94	17	9.37
Aug. 7	9.91	11	9.99	24	9.53
21	7.69	18	9.99	July 1	9.72
28	8.14	27	9.98	8	9.80
Sept. 5	8.55	Jan. 29, 1940	10.30	15	10.03
11	8.75	Feb. 12	10.30	22	10.15
18	9.07	Mar. 6	9.95	29	10.31
25	9.20	18	10.18	Aug. 5	10.49
Oct. 2	9.28	25	10.25	12	10.50

a Pumping. b Well M25 pumping.

M25b.--Continued.

Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Aug. 19, 1940	10.64	Oct. 7, 1940	a 13.16	Nov. 19, 1940	a 14.21
26	10.65	14	12.21	Dec. 2	12.50
Sept. 5	10.89	21	12.49	9	a 14.11
9	10.69	28	12.29	16	12.64
16	10.98	Nov. 4	12.33	23	a 13.29
23	11.50	11	11.98	31	12.99
30	11.58				

HODGEMAN COUNTY

By H. A. Waite

According to a survey made by Kenneth D. McCall and Milburn H. Davison of the Division of Water Resources, Kansas State Board of Agriculture, approximately 16,845 acres of land in the Pawnee River Basin were under irrigation in 1939. Of the land under irrigation, 8,701 acres were irrigated with water pumped from wells, 6,052 acres were irrigated with water pumped from streams, and 2,092 acres were irrigated with water pumped from wells and streams. There were 134 irrigation wells, 95 stream pumping plants, and 30 small dams in operation in 1939. Because of the increase in land irrigated with water pumped from wells in the last several years, it was deemed advisable to start a program of water-level measurements in wells in order to determine the influence of the increased withdrawals on ground-water levels in the basin. An observation-well program was begun in the Pawnee River Basin in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Sanitation of the Kansas State Board of Health, and the Division of Water Resources of the Kansas State Board of Agriculture. This work was done under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. In August 1940, 8 wells, including 3 wells in Hodgeman County, 2 wells in Ness County, and 3 wells in Pawnee County, were selected for monthly observation by Richard B. Christy and the writer.

A total of 13 wetted-tape measurements were made in Hodgeman County during 1940 by Richard B. Christy. Descriptions and records of water level for the 3 observation wells in Hodgeman County follow.

a Well M25 pumping.

3. W. J. Fox. SW¼NW¼ sec. 12, T. 21 S., R. 22 W. Dug and drilled irrigation well, diameter 20 inches, depth 75.6 feet. Measuring point, top of round concrete curb, 5 feet in diameter, southeast side at painted orange mark, 1.0 foot above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 28	35.69	Oct. 29	35.03	Dec. 26	34.71
Sept.20	35.77	Nov. 28	35.09		

4. William Macey. SW¼SW¼ sec. 13, T. 22 S., R. 22 W. Dug and drilled irrigation well, diameter 20 inches, depth 50.3 feet. Measuring point, top of channel-iron sill upon which pumphead rests, north side at painted orange mark, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Aug. 28, 28.03; Sept. 20, 28.19; Nov. 28, 28.47; Dec. 26, 28.13.

5. Roy Klein. NW¼NE¼ sec. 36, T. 21 S., R. 21 W. Drilled irrigation well, diameter 18 inches, depth 97 feet. Measuring point, top of 18-inch casing, north side at painted orange mark, 0.8 foot above land surface. Water levels, in feet below measuring point, 1940: Aug. 27, 32.83; Oct. 29, 33.88; Nov. 28, 33.43; Dec. 26, 33.18.

JEWELL COUNTY

By H. A. Waite and C. R. Curtis

The observation-well program in the Limestone Creek area, Jewell County, Kansas,[1/] was continued in 1940 by the Federal and State Geological Surveys in cooperation with the Soil Conservation Service, the Division of Sanitation of the State Board of Health and the Division of Water Resources of the State Board of Agriculture, under the general supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. Water-level measurements were being made in 39 wells at the beginning of the year. Measurements on well 64, a community well, were discontinued during the year after the well was sealed. At the end of the year 38 wells were under observation; about 491 individual wetted-tape measurements were made during 1940. Measurements were made about once a month in most of the wells. The measurements through June 10 were made by W. H. Hardin. As a result of a reduction in the staff of the Soil Conservation Service at Mankato, the observation-well program in Jewell County lapsed temporarily after June 10. Measurements were resumed in August by Charles R. Curtis and from September through the rest of the year were made by a local observer, John H. Diamond.

1/ See Water-Supply Papers 777, 817, 840, 845, and 886.

According to records of the United States Weather Bureau, the precipitation at Burr Oak, situated several miles north of the northern boundary of the Limestone Creek area, was 23.01 inches or 1.96 inches below normal. The water levels in 31 of the 38 wells under observation at the end of the year showed net declines for the period January 3 to December 23 ranging from 0.41 foot to 12.31 feet; the water levels in 4 wells showed net rises for the same period ranging from 0.13 to 0.67 foot. The greatest net decline in water level, 12.31 feet, occurred in well 34, one of the wells adjacent to the Kindler Pond. Water-level fluctuations in 1940 and during the period of record are summarized in the following table.

Highest and lowest water levels for period of record in 39 wells in Jewell County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
4	18.66	Oct. 12, 1938	5.88	Apr. 2, 1936
6	12.43	Mar. 19, 1934	7.77	Oct. 13, 1937
8	56.86	Sept. 7, 1938	8.02	Aug. 23, 1934
12	14.20	Nov. 8, 1935	7.91	June 8, 1938
14	15.16	June 16, 1937	8.79	Mar. 20, 1934
18	15.11	Mar. 26, 1936	9.51	May 2, 1935
22	14.17	June 19, 1936	9.48	Aug. 10, 1934
25	13.55	Feb. 11, 1937	9.15	Mar. 2, 1935
30	13.70	May 15, 1936	7.20	Sept.20, 1940
34	99.98	Sept.13, 1935	77.44	Aug. 19, 1940
34A	104.35	June 28, 1935	91.68	Mar. 2, 1935
34B	105.31	June 24, 1938	88.09	Mar. 2, 1935
34C	107.14	June 28, 1935	93.57	Sept.20, 1940
40	10.41	June 22, 1938	9.30	Mar. 6, 1937
41	14.04	May 28, 1936	8.71	Apr. 3, 1940
42	15.62	June 21, 1935	9.76	May 11, 1935
43	19.90	June 20, 1935	8.81	Sept.20, 1934
44	20.91	May 2, 1940	8.43	May 9, 1935
45	15.53	May 21, 1936	6.64	Dec. 21, 1940
46	22.12	July 20, 1938	8.82	Aug. 30, 1934
47	19.58	June 22, 1938	9.48	May 9, 1935
48	15.18	Feb. 13, 1936	8.87	Oct. 25, 1934
49	30.66	June 28, 1939	3.07	Nov. 24, 1934 Nov. 28, 1934
50	20.75	May 15, 1940	9.97	Dec. 6, 1934 Dec. 13, 1934
51	101.58	Mar. 16, 1939	84.75	Sept.26, 1934
52	104.98	Mar. 20, 1936	94.76	May 3, 1935
53	107.83	Sept.13, 1935	94.89	May 3, 1935
54	110.10	Sept.13, 1935	93.81	Oct. 23, 1940
55	109.93	Sept. 6, 1935	95.28	May 3, 1935
56	107.19	Sept.20, 1935	95.46	May 3, 1935
57	103.30	Dec. 13, 1935	95.53	May 3, 1935
61	87.98	Feb. 7, 1940	83.17	Sept.27, 1935
62	87.46	Sept.13, 1935	83.10	May 3, 1935
63	95.03	Apr. 5, 1939	87.96	July 15, 1935
64	17.51	June 14, 1939	10.42	Jan. 19, 1938
65	13.95	May 19, 1937	4.04	Aug. 20, 1940
66	13.20	June 16, 1937	6.06	Oct. 23, 1940
67	13.22	June 16, 1937	4.56	Dec. 2, 1940
69	13.34	June 13, 1937	5.82	Aug. 20, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 39 wells in Jewell County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
4	12.78	-2.12	+2.62
6	4.66	- .41	-3.71
8	48.84	-6.30	+8.27
12	6.29	-2.08	-2.07
14	6.37	+ .55	+1.91
18	5.60	-1.14	-2.07
22	4.69	- .93	+ .51
25	4.40	- .67	-1.05
30	6.50	-1.45	-5.30
34	22.54	-12.31	-4.44
34A	12.67	-4.42	+8.10
34B	17.22	-2.50	+4.27
34C	13.57	-3.61	- .25
40	1.11	+ .13	- .10
41	5.33	.....	-1.07
42	5.86	-1.52	-1.02
43	11.09	-2.26	- .52
44	12.48	-1.59	+ .99
45	8.89	-1.59	-4.37
46	13.30	+ .26	+8.36
47	10.10	-1.82	+ .12
48	6.31	+ .67	+1.81
49	27.59	-4.56	+8.46
50	10.78	-1.29	+2.20
51	16.83	- .51	+11.26
52	10.22	-1.95	+4.35
53	12.94	-1.36	+1.69
54	16.29	-1.51	+2.03
55	14.65	- .72	+2.57
56	11.73	.....	+3.35
57	7.77	.....	+2.70
61	4.81	- .78	+2.56
62	4.36	- .43	- .17
63	7.07	- .78	+1.32
64	7.09	.....	- .89
65	9.91	-1.20	-2.76
66	7.14	-2.42	-4.90
67	8.66	- .75	-6.04
69	7.52	- .88	-2.57

Most of the observation wells in Jewell County have been measured since 1934 but wells 64, 65, 66, 67, and 69 were added to the program in 1937. Of the 34 wells under observation since 1934 the water levels in 21 wells showed net rises for the period of record ranging from 0.12 foot to 11.26 feet and averaging 3.78 feet, and the water levels in 13 wells showed net declines ranging from 0.10 foot to 5.30 feet and averaging 2.01 feet. The water levels in the 5 wells having shorter records showed net declines from January 7, 1937, to December 23, 1940, ranging from 0.89 foot to 6.04 feet and averaging 3.43 feet.

The average of the water levels in 12 wells (6, 12, 18, 22, 25, 30, 40, 41, 42, 45, 48, and 50), in 1940, are given in the following table.

Average of the water levels in 12 observation wells in Jewell County, Kansas, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 3	a 10.97	May 2	11.11	Oct. 23-24	a 9.90
Feb. 7	b 11.24	15	a 11.61	Nov. 30-	
Mar. 14	11.01	June 10	a 11.48	Dec. 2	a 10.29
Apr. 3	10.98	Aug. 19-20	a 10.45	Dec. 23	a 10.03
18	11.06	Sept.20	a 10.09		

The relation between the average water levels and the cumulative departure from normal monthly precipitation for the period from August 1934 to January 1, 1941, is shown in the accompanying illustration.

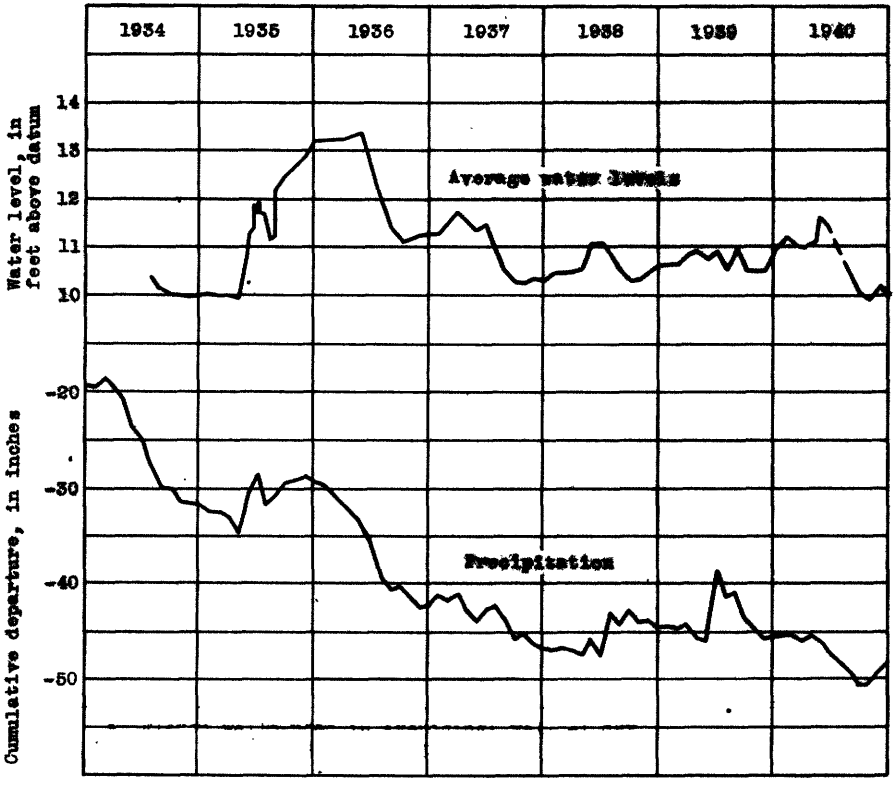

Figure 4.--Graphs showing average water levels in wells and cumulative departure from normal precipitation in Jewell County, Kansas.

On December 23, 1940, the average water level was 0.94 foot lower than on January 3, 1940, and only 0.03 foot higher than on January 1, 1935. During the latter part of October 1940 the average water level was only about 0.07 foot higher than the lowest average water level for the entire period of record, which occurred in October 1934.

The average water levels in 1940 rose 0.27 foot from January 3 to February 7 in response to above-normal precipitation in January, after which it declined until about April 3. As a result of above-normal precipitation in March and April, which totaled 5.10 inches, the average water level started to rise after April 3, reaching the highest stage of the year on May 15--0.64 foot above the average water level on January 3, 1940, and 1.61 feet higher than on January 1, 1935. The average water level declined steadily from May 15 until about October 23 when the lowest stage of the year was recorded. On October 23 the average water level was 1.71 feet lower than the highest stage on May 15, and was 1.07 feet lower than on January 3. The precipitation from May through September was 5.57 inches. The average water level rose slightly at the end of November following above-normal precipitation during that month and then declined slightly during December.

Water level, in feet above arbitrary datum, 1940

Date	4	6	8	12	14	18	25
Jan. 3	15.57	9.13	27.48	12.57	10.15	10.98	10.00
Feb. 7	15.38	9.36	27.12	12.25	10.14	10.48	.....
Mar. 14	15.50	9.36	27.61	11.89	10.12	10.51	9.78
Apr. 3	15.27	9.29	23.48	11.71	10.11	10.56	9.88
18	14.86	9.28	23.39	11.68	10.14	10.58	9.78
May 2	14.64	9.24	22.97	11.60	10.18	10.55	9.72
15	14.52	9.19	22.73	11.61	10.19	10.52	9.69
June 10	12.51	9.10	22.64	11.50	10.20	10.46	9.49
Aug. 19-20	14.11	8.85	21.91	11.00	10.28	9.96	9.22
Sept.20	14.39	8.75	21.59	10.54	10.46	9.83	9.37
Oct. 23-24	13.84	8.69	21.17	10.38	10.56	9.79	9.36
Nov. 30-Dec.2	13.39	8.64	(a)	11.06	10.53	9.80	9.23
Dec. 21-23	13.45	8.72	21.18	10.49	10.70	9.84	9.33

Water level, in feet above arbitrary datum, 1940

Date	40	41	42	43	44	45	46	47
Jan. 3	10.03	(a)	11.49	13.46	18.04	8.23	17.89	13.28
Feb. 7	10.27	(a)	11.50	13.18	19.30	7.99	17.83	12.92
Mar. 14	10.06	9.84	11.47	12.85	20.38	8.07	19.51	13.04
Apr. 3	10.22	8.71	11.44	12.76	20.63	8.13	19.01	13.11
18	10.17	9.64	11.37	12.29	20.78	8.17	18.66	12.79
May 2	10.11	9.77	11.36	12.60	20.91	8.22	18.52	12.68
15	10.16	(a)	11.61	12.54	20.71	8.24	18.37	12.66
June 10	10.14	....	11.43	12.42	19.97	8.03	18.18	12.48
Aug. 19-20	9.95	....	10.51	11.84	17.31	7.34	17.41	11.93
Sept.20	9.97	....	10.40	11.59	16.01	7.02	17.14	11.65
Oct. 23-24	9.95	....	10.01	11.43	14.86	6.80	17.27	11.46
Nov. 30-Dec. 2	9.96	....	10.14	11.18	16.49	6.67	18.18	11.61
Dec. 21-23	10.16	....	9.97	11.20	16.45	6.64	18.15	11.46

a Well dry.

Water level, in feet above arbitrary datum, 1940

Date	48	49	50	64a/	65a/	66	67	69a/
Jan. 3	11.35	26.77	14.32	12.02	9.94	9.02	6.21	9.46
Feb. 7	11.67	26.35	14.99	11.83	9.09	7.93	7.79	9.53
Mar. 14	12.38	25.01	15.60	13.79	11.10	7.82	7.75	9.41
Apr. 3	12.54	26.06	15.97	13.79	8.86	7.97	7.84	9.47
18	12.55	25.89	16.21	13.34	10.85	7.88	7.84	9.27
May 2	12.61	25.79	16.40	13.12	11.16	7.89	7.79	9.42
15	12.52	25.63	20.75	13.02	10.78	7.88	7.67	9.62
June 10	12.40	25.64	20.73	13.12	9.85	7.75	7.50	9.72
Aug. 19-20	12.17	23.25	16.28	11.45	4.04	6.43	6.31	5.82
Sept.20	11.87	21.63	14.87	10.61	4.92	6.20	5.49	7.79
Oct. 23-24	11.75	21.69	13.81	(b)	4.90	6.06	5.31	7.81
Nov. 30-Dec. 2	12.04	21.99	15.33	(b)	8.70	6.30	4.56	8.09
Dec. 21-23	12.02	22.21	13.03	(b)	8.74	6.60	5.46	8.58

Water level, in feet above arbitrary datum, 1940

Date	22	30	34c/	34Ac/	34Bc/	34Cc/	Pond staff gage c/
Jan. 3	12.58	9.99	92.63	96.32	96.03	97.94	15.40
Feb. 7	12.67	.....	92.24	96.36	95.99	.....	15.40
Mar. 14	12.63	10.64	91.23	96.47	96.78	97.93	16.10
Apr. 3	12.52	10.79	92.01	98.03	98.95	97.94	16.00
18	12.51	10.79	92.49	97.06	97.32	97.11	15.80
May 2	12.53	11.19	92.36	96.42	96.38	96.61	15.60
15	12.48	11.01	d91.22	96.03	95.76	96.29	15.20
June 10	12.22	10.79	d89.87	95.42	94.83	95.95	15.00
Aug. 19-20	12.09	7.58	d77.44	100.69	92.26	95.10	(e)
Sept.20	11.16	7.20	d78.22	93.59	91.45	93.57	(e)
Oct. 23-24	11.14	7.26	d81.47	93.30	91.44	93.58	(e)
Nov. 30-Dec. 2	11.95	8.39	d78.34	100.72	94.28	94.72	14.90
Dec. 21-23	11.65	8.54	d80.32	100.74	93.53	94.33	14.60

Water level in wells near Beeler Pond, in feet, 1940
(Assumed height of zero level on pond staff gage, 100.00 feet)

Date	57	56	55	Pond staff gage	54	53	52
Jan. 3	.....	(f)	99.79	104.90	99.64	98.86	102.49
Feb. 7	.....	(f)	.....	105.80	.....	.....	103.24
Mar. 14	99.27	(f)	101.04	106.20	101.06	100.35	102.49
Apr. 3	99.86	(f)	101.37	105.90	101.72	100.92	103.24
18	99.91	(f)	101.18	105.70	101.52	100.65	103.29
May 2	99.86	(f)	101.23	105.50	101.00	100.46	103.10
15	99.82	(f)	100.52	105.70	100.58	100.08	102.70
June 10	99.55	(f)	99.72	105.20	99.96	99.44	.....
Aug. 20	98.83	(f)	99.00	(e)	(f)	98.25	.....
Sept.20	98.78	(f)	98.79	(e)	(f)	97.18	102.23
Oct. 23	98.77	(f)	98.72	(e)	93.81	97.18	102.22
Dec. 2	98.47	99.48	98.75	103.80	97.69	97.59	100.51
23	98.73	99.73	99.07	103.50	98.13	97.50	100.54

a Community well; used considerably.
b Sealed.
c Kindler Pond wells; water levels in feet above datum; assumed height of zero level on pond staff gage, 100.00 feet.
d Well pumped.
e Well dry.
f Well clogged.

Water level in wells near Beeler Pond, in feet, 1940

Date	51	61	62	63
Jan. 3	96.52	87.76	85.28	91.26
Feb. 7	96.23	87.98	85.30	91.33
Mar. 14	99.86	87.26	85.25	91.87
Apr. 3	98.60	87.50	85.36	92.83
18	98.12	87.27	85.39	93.07
May 2	97.74	87.24	85.44	93.15
15	97.27	87.11	85.46	93.08
June 10	96.72	87.08	85.57	92.74
Aug. 20	95.87	87.06	85.19	90.55
Sept.20	95.68	87.32	85.07	90.41
Oct. 23	95.85	87.47	85.11	90.39
Dec. 2	96.56	86.94	84.96	90.44
23	96.01	86.98	84.85	90.48

KEARNY COUNTY

By T. G. McLaughlin

The observation-well program in Kearny County (see Water-Supply Paper 886) was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. The program is under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. Field work on the geology and ground-water resources of this county was resumed in August 1940 and was completed in the early part of October 1940. The altitudes of the measuring points of 5 observation wells (14, 15, 16, 21 and 22) in Kearny County were determined in 1940 with an alidade and plane table by Pierson C. Lyon and F. S. Bradshaw, and are given in this report for the first time.

The water levels in 23 observation wells were measured once a month in 1940; a total of 238 individual measurements was made. All measurements during the first seven months of the year and during December were made by Richard B. Christy; the rest were made by the writer.

The precipitation in Kearny County in 1940 was 17.92 inches, which is 2.07 inches above normal and 4.56 inches above the average for the 10-year period from 1931 to 1940. This was the heaviest precipitation in Kearny County since 1930. As a result, the water levels in many wells rose during 1940; particularly after the heavy rains in May and August. The water levels in several deep wells on the uplands, however, declined steadily throughout the year.

There was a net decline in water level during 1940 in 11 of the 20 wells in Kearny County for which records are most complete, and a rise in water level in 9 wells. During the period of record there was a net decline in water level in 10 wells and a net rise in 10 wells.

The average rise in 9 wells (6, 7, 13, 15, 17, 18, 19, 22, and 23) in 1940 was 0.36 foot, and the rises ranged from 0.04 foot to 0.83 foot. The average net decline in 11 wells (1, 2, 3, 4, 9, 11, 12, 14, 16, 26 and 28) in 1940 was 0.75 foot and the net declines ranged from 0.10 foot to 2.14 feet.

For the period of record the net rise in 10 wells (3, 4, 6, 7, 13, 15, 17, 18, 19, and 28) ranged from 0.01 foot to 1.11 feet and averaged 0.38 foot. The net decline in 10 wells (1, 2, 9, 11, 12, 14, 16, 22, 23, and 26) ranged from 0.03 foot to 2.94 feet and averaged 0.73 foot. The difference between the highest and lowest water level in the 20 wells ranged from 0.16 foot to 2.94 feet and averaged 1.2 feet. Water-level fluctuations are summarized in the following table.

Highest and lowest water levels for period of record in 20 wells in Kearny County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
1	11.33	Mar. 25, 1940	12.81	July 20, 1940
2	57.54	Mar. 25, 1940	59.94	Sept.20, 1940
3	92.34	Dec. 20, 1939	94.63	Oct. 16, 1939
4	106.81	Jan. 28, 1940	107.01	Nov. 27, 1940
6	154.55	Dec. 20, 1939 June 22, 1940	155.16	Nov. 23, 1940
7	52.97	June 22, 1940	53.87	Oct. 16, 1939
9	26.52	Oct. 17, 1940	29.46	Dec. 24, 1940
11	14.68	Oct. 17, 1939	15.75	Dec. 23, 1940
12	13.82	Apr. 25, 1940	15.46	Nov. 21, 1940
13	5.71	June 22, 1940	8.53	Dec. 20, 1939
14	226.98	Oct. 25, 1939	227.76	Nov. 27, 1940
15	71.05	Aug. 22, 1940	71.87	Sept.20, 1940
16	45.75	Apr. 20, 1939	47.38	Dec. 23, 1940
17	89.97	Aug. 22, 1940	91.99	May 23, 1940
18	72.17	Mar. 25, 1940	72.33	Sept.17, 1940
19	130.58	Dec. 23, 1940	131.30	Nov. 23, 1940
22	182.72	June 22, 1940	182.99	Sept.17, 1940
23	174.63	Oct. 24, 1939	175.15	Nov. 23, 1940
26	86.30	Oct. 24, 1940	86.84	Sept.18, 1940
28	124.16	Jan. 28, 1940	124.35	Feb. 19, 1940 Oct. 22, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 20 wells in Kearny County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
1	1.48	-0.47	-0.05
2	2.40	-1.17	- .28
3	2.29	-1.39	+ .51
4	.20	- .15	+ .01
6	.61	+ .08	+ .31
7	.90	+ .32	+ .88
9	2.94	-2.14	-2.94
11	1.07	- .57	-1.07
12	1.64	- .56	- .49
13	2.82	+ .83	+1.11
14	.78	- .35	- .44
15	.82	+ .25	+ .26
16	1.63	-1.20	-1.60
17	2.02	+ .78	+ .40
18	.16	+ .04	+ .05
19	.72	+ .47	+ .29
22	.27	+ .10	- .05
23	.52	+ .38	- .03
26	.54	- .16	- .39
28	.19	- .10	+ .01

1. R. T. Beaty. NW¼NE¼ sec. 34, T. 24 S., R. 36 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 19	11.41	May 23	11.38	Sept.18	11.80	Nov. 21	11.93
Mar. 25	11.33	July 20	12.81	Oct. 22	11.89	Dec. 24	11.88
Apr. 25	11.48	Aug. 22	11.63				

2. C. E. Worthen. SE¼SE¼ sec. 16, T. 24 S., R. 36 W.

Water level, in feet below measuring point, 1940

Jan. 28	57.76	Apr. 25	58.48	July 20	59.49	Oct. 22	59.01
Feb. 19	58.01	May 23	58.43	Aug. 28	59.42	Nov. 21	59.04
Mar. 25	57.54	June 22	58.53	Sept.20	59.94	Dec. 23	58.83

3. E. G. Worthen. SW¼NW¼ sec. 10, T. 23 S., R. 36 W.

Water level, in feet below measuring point, 1940

Jan. 28	92.73	Apr. 25	94.02	July 20	94.01	Oct. 22	94.14
Feb. 19	94.20	May 23	94.06	Aug. 22	94.21	Dec. 23	94.12
Mar. 25	94.02	June 22	93.94	Sept.18	94.00		

4. C. W. Walker. NW¼SW¼ sec. 11, T. 21 S., R. 37 W.

Water level, in feet below measuring point, 1940

Jan. 28	106.81	Apr. 25	106.95	July 20	106.95	Oct. 22	106.98
Feb. 19	106.96	May 23	106.94	Aug. 22	106.96	Nov. 27	107.01
Mar. 25	106.95	June 22	106.94	Sept.18	107.00	Dec. 23	106.96

6. Meta Kettler. NW¼NW¼ sec. 26, T. 24 S., R. 37 W.

Water level, in feet below measuring point, 1940

Jan. 28	154.65	Apr. 25	154.66	July 20	154.67	Oct. 22	154.81
Feb. 19	154.76	May 23	154.78	Aug. 21	154.71	Nov. 23	155.16
Mar. 25	154.64	June 22	154.55	Sept.20	154.65	Dec. 23	154.57

7. C. H. Browne. NW¼SW¼ sec. 8, T. 25 S., R. 37 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 19	53.31	May 23	53.02	Aug. 26	53.29	Nov. 21	53.39
Mar. 25	53.09	June 22	52.97	Sept.17	53.33	Dec. 23	52.99
Apr. 25	53.03	July 20	53.31	Oct. 22	53.48		

9. R. Bentrup. NW¼NW¼ sec. 2, T. 24 S., R. 35 W.

Water level, in feet below measuring point, 1940

Jan. 28	27.32	Apr. 25	27.66	July 20	28.41	Oct. 22	29.13
Feb. 17	27.29	May 23	27.90	Aug. 22	28.87	Nov. 27	29.43
Mar. 25	27.44	June 22	28.12	Sept.20	28.91	Dec. 24	29.46

10. Phoenix Joint State Land Bank. NE¼NE¼ sec. 13, T. 24 S., R. 35 W.

Water level, in feet below measuring point, 1940

Jan. 28	6.39	Mar. 22	6.12	May 23	5.96	July 20	6.09
Feb. 17	6.74	Apr. 25	6.18	June 22	5.93	Aug. 22	6.02

11. P. J. Fichter. SW¼SW¼ sec. 11, T. 25 S., R. 36 W.

Water level, in feet below measuring point, 1940

Mar. 25	15.18	June 22	15.38	Sept.20	15.39	Nov. 21	15.68
Apr. 25	15.23	July 20	15.50	Oct. 22	15.50	Dec. 23	15.75
May 23	15.32	Aug. 22	15.30				

12. J. E. Beymer. SE¼SW¼ sec. 22, T. 21 S., R. 35 W.

Water level, in feet below measuring point, 1940

Jan. 28	14.55	Apr. 25	13.82	July 20	15.02	Nov. 21	15.46
Feb. 17	14.62	May 23	13.95	Aug. 22	14.42	Dec. 24	15.11
Mar. 25	14.00	June 22	13.91	Sept.20	14.94		

13. D. S. Nicholson. NW¼NW¼ sec. 15, T. 25 S., R. 37 W.

Water level, in feet below measuring point, 1940

Feb. 19	7.88	May 23	6.17	Aug. 26	7.42	Nov. 21	8.37
Mar. 25	5.98	June 22	5.71	Sept.17	7.72	Dec. 23	7.05
Apr. 25	6.35	July 20	7.07	Oct. 22	8.09		

14. W. H. Ploeger. SW¼SW¼ sec. 32, T. 22 S., R. 38 W. Measuring point 3,390.5 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 19	227.21	May 23	227.28	Sept.17	227.56	Nov. 27	227.76
Mar. 14	227.51	June 22	227.11	Oct. 22	227.67	Dec. 23	227.56
Apr. 25	227.09	July 18	227.16				

15. Joseph McNellis. SW¼SW¼ sec. 36, T. 22 S., R. 35 W. Measuring point 3,005.48 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 28	71.72	Apr. 25	71.72	July 20	71.40	Oct. 22	71.70
Feb. 17	71.77	May 23	71.85	Aug. 22	71.05	Nov. 27	71.55
Mar. 25	71.77	June 22	71.72	Sept.20	71.87	Dec. 23	71.47

16. C. B. Campbell. SE¼SE¼ sec. 15, T. 23 S., R. 35 W. Measuring point 3,017.46 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 28	46.18	Apr. 25	46.54	July 20	46.90	Oct. 22	47.18
Feb. 17	46.37	May 23	46.70	Aug. 22	46.91	Nov. 27	47.33
Mar. 25	46.46	June 22	46.70	Sept.20	47.08	Dec. 23	47.38

17. A. G. Campbell. NE¼NW¼ sec. 15, T. 21 S., R. 35 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 19	91.86	May 23	91.99	Aug. 22	89.97	Nov. 27	90.28
Mar. 25	91.87	June 22	90.99	Sept.18	90.16	Dec. 24	91.08
Apr. 25	91.96	July 20	90.06	Oct. 22	90.14		

18. G. M. Cook. SW¼SE¼ sec. 28, T. 24 S., R. 38 W.

Water level, in feet below measuring point, 1940

Feb. 19	72.29	May 23	72.23	Aug. 21	72.26	Oct. 22	72.23
Mar. 25	72.17	June 22	72.18	Sept.17	72.33	Dec. 23	72.25
Apr. 25	72.28	July 20	72.22				

19. E. M. Beymer. NE¼NW¼ sec. 8, T. 26 S., R. 38 W.

Water level, in feet below measuring point, 1940

Feb. 19	131.05	May 23	131.11	Aug. 24	130.97	Nov. 23	131.30
Mar. 25	130.99	June 22	130.88	Sept.18	131.00	Dec. 23	130.58
Apr. 25	130.86	July 20	130.95	Oct. 21	130.99		

21. B. P. Aubun. SE¼SE¼ sec. 19, T. 21 S., R. 38 W. Measuring point, 3,410.8 feet above sea level. Water levels, in feet below measuring point, 1940: Feb. 19, 156.35; Mar. 14, 156.32; Apr. 25, 156.20; May 23, 156.18.

22. J. A. Denslow. NE¼SE¼ sec. 6, T. 22 S., R. 38 W. Measuring point, 3,391.4 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 19	182.95	May 23	182.84	Aug. 27	182.95	Nov. 27	182.89
Mar. 14	182.94	June 22	182.72	Sept.17	182.99	Dec. 23	182.85
Apr. 25	182.89	July 18	182.89	Oct. 22	182.98		

23. James Coghill. NW¼NW¼ sec. 18, T. 26 S., R. 37 W.

Water level, in feet below measuring point, 1940

Feb. 19	175.04	May 23	175.00	Aug. 24	174.94	Nov. 23	175.15
Mar. 25	174.96	June 22	174.82	Sept.18	174.92	Dec. 23	174.66
Apr. 25	174.81	July 20	174.86	Oct. 21	174.96		

25. NW¼NW¼ sec. 5, T. 27 S., R. 36 W. Water levels, in feet below measuring point, 1940: Mar. 25, 124.03; Apr. 25, 124.05; May 23, 124.06.

26. Anna Davidson. SE¼SE¼ sec. 22, T. 26 S., R. 37 W.

Water level, in feet below measuring point, 1940

Feb. 19	86.53	May 23	86.71	Aug. 24	86.81	Nov. 23	86.63
Mar. 25	86.59	June 22	86.71	Sept.18	86.84	Dec. 24	86.69
Apr. 25	86.64	July 20	86.78	Oct. 21	86.83		

28. Harry Tate. NW¼NW¼ sec. 26, T. 22 S., R. 37 W.

Water level, in feet below measuring point, 1940

Jan. 28	124.16	Apr. 25	124.30	July 20	124.28	Oct. 22	124.35
Feb. 19	124.35	May 23	124.30	Aug. 22	124.31	Nov. 27	124.34
Mar. 25	124.30	June 22	124.28	Sept.18	124.33	Dec. 23	124.26

KIOWA COUNTY

By J. C. Frye

An investigation of the ground-water resources of Kiowa County, Kansas, was started in 1940 by the Federal Geological Survey and the Kansas Geological Survey, in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. A general reconnaissance of the area was made by the writer in October 1940, under the direction of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas.

Kiowa County is in the Plains Border section of the Great Plains province. It is drained by Rattlesnake Creek, a tributary to the Arkansas River, which flows across the northern part of the county, and by the Medicine Lodge River, which flows across the southeastern part of the county. Most of Kiowa County is underlain by Tertiary and Pleistocene formations, but in the southeastern part Cretaceous and Permian rocks crop out. Although most of the wells derive water from the Tertiary and Pleistocene formations, a few obtain water from the Cretaceous and Permian rocks. Most of the domestic and stock supplies and the public supplies of Greensburg and Haviland are obtained from wells. Only four wells in the county are pumped for irrigation.

Of special interest is the old public supply well of the city of Greensburg, completed in 1888, and advertised as the "largest hand-dug well in the world". It is 32 feet in diameter and 109 feet deep, is walled with cut blocks of stone, and has a reported yield of 70 gallons a minute. It is dug into the Kingsdown silt of Pleistocene age. The well has a roof at the top and is equipped with a staircase by means of which visitors, for an admission of 25 cents, may descend 90 feet to the water level.

At the end of 1940, measurements of water-level were being made once a month by the wetted-tape method in 7 wells in Kiowa County. Measurements in October were made by the writer; those in November and December, by Richard B. Christy. A total of 20 individual measurements of water level were made from October 19 to the end of the year.

3. E. M. Pyle. NW¼NE¼ sec. 8, T. 29 S., R. 16 W., 0.35 mile west and 0.1 mile south of section corner. Unused drilled well originally used to supply water for drilling oil well, diameter 9 inches, depth 126 feet. Measuring point, top of 9-inch iron casing at north side, 1.2 feet above land surface. No pump on well. Water levels, in feet below measuring point, 1940: Oct. 19, 68.99; Dec. 27, 68.89.

4. H. E. Davis. SE¼NE¼ sec. 4, T. 28 S., R. 16 W. Drilled domestic and irrigation well, diameter 6 inches, depth 120 feet. Measuring point, top of 6-inch galvanized-iron casing at south side, 1.0 foot above land surface. Equipped with lift pump and gasoline engine. Water levels, in feet below measuring point, 1940: Oct. 26, 76.52; Nov. 29, 76.48; Dec. 27, 76.45.

5. L. W. Grimes. NW¼NW¼ sec. 34, T. 27 S., R. 17 W. Drilled irrigation well, diameter 19 inches, depth 87.5 feet. Measuring point, hole in pump base at east side, 0.2 foot above land surface. Equipped with turbine pump. Water levels, in feet below measuring point, 1940: Oct. 23, 41.23; Nov. 29, 44.00; Dec. 27, 41.32.

6. Mrs. J. A. Crowe. NW¼SW¼ sec. 16, T. 28 S., R. 18 W., northwest corner of the city of Greensburg. Drilled domestic well, diameter 6 inches, depth 100 feet. Measuring point, top edge of concrete curb of pump pit at west side, level with land surface. Equipped with lift pump and windmill. Water levels, in feet below measuring point, 1940: Oct. 23, 84.83; Nov. 29, 84.87; Dec. 27, 84.63.

7. A. C. Weaver. SW¼NW¼ sec. 23, T. 27 S., R. 18 W. Drilled irrigation well, diameter 19 inches, depth 80 feet. Measuring point, top edge of man hole in concrete well cover at west side, 2.0 feet above land surface. Equipped with turbine pump. Water levels, in feet below measuring point, 1940: Oct. 23, 34.25; Nov. 29, 34.38; Dec. 27, 34.38.

8. E. E. Miller. SW¼SE¼ sec. 18, T. 27 S., R. 18 W. Unused drilled irrigation well, diameter 16 inches, depth 75 feet. Measuring point, top edge of concrete curb at south side, 1.0 foot above land surface. No pump on well. Water levels, in feet below measuring point, 1940: Oct. 23, 26.96; Nov. 29, 27.20; Dec. 27, 27.31.

10. J. E. Ely. SW¼NW¼ sec. 23, T. 30 S., R. 18 W., 50 yards east of road in field. Unused drilled stock well, diameter 6 inches, depth 154 feet. Measuring point, notch in top of galvanized-iron casing at south side, 0.5 foot above land surface. Equipped with hand-operated lift pump which is not in serviceable condition. Water levels, in feet below measuring point, 1940: Oct. 24, 107.27; Nov. 29, 106.91; Dec. 27, 107.00.

MCPHERSON COUNTY

By S. W. Lohman and G. H. von Hein

The observation-well program in south-central Kansas[1/], including McPherson County, was continued in 1940 by the Federal and State Geological Surveys in cooperation with the city of Wichita, the Division of Sanitation of the Kansas State Board of Health and the Division of Water Resources of the Kansas State Board of Agriculture.

In 1940 a preliminary report on the geology and ground-water resources of the "Equus Beds" area[2/], including McPherson County, was published, and a detailed report on the same area is in preparation.

1/ See Water-Supply Papers 840, 845, and 886.
2/ Lohman, Stanley W. and Frye, John C., Geology and ground-water resources of the "Equus Beds" area in south-central Kansas: Econ. Geol., pp. 839-866, Nov. 1940.

Of the 10 wells under observation in McPherson County in 1940, water-level measurements were made 4 times in 6 wells, once a month in 3 wells, and once a week in 1 well. A total of 99 wetted-tape measurements were made during the year by G. H. von Hein.

According to records of the United States Weather Bureau the precipitation at McPherson in 1940 was 24.76 inches--5.08 inches below normal. As a result, the water levels in most of the wells declined somewhat during the year. The water levels in 2 wells (309 and 310), however, rose slightly during the year.

The water levels in 7 of the 10 wells stood higher at the end of 1940 than at the beginning of the period of record in 1937, by amounts ranging from 0.42 foot to 9.29 feet. Well 310, which showed the greatest rise in water level--9.29 feet--is a deep well in shale and the water level in the well has risen each year since measurements were begun in 1937.

The water levels in 3 of the 10 wells stood lower at the end of 1940 than at the beginning of the period of record by amounts ranging from 0.62 foot to 5.58 feet. Well 262, which showed the greatest decline in water level--5.58 feet--, is pumped each day for stock use and hence the decline probably is chiefly the result of pumping.

Water-level fluctuations in observation wells in McPherson County are summarized in the following table.

Highest and lowest water levels for period of record in 10 wells in McPherson County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
19	69.40	Aug. 11, 1939	70.78	Oct. 3, 1940 Nov. 5, 1940
243	82.49	Sept. 2, 1938	83.49	Oct. 28, 1937
249	33.81	July 4, 1938	a 40.13	Apr. 2, 1940
250	41.38	Oct. 3, 1940	a 46.67	July 29, 1938
252	5.58	June 3, 1938	12.80	Oct. 3, 1940
260	24.21	July 4, 1938	29.35	Nov. 4, 1937 Dec. 4, 1937
262	28.68	Sept. 2, 1938	b 41.35	Nov. 2, 1938
309	33.55	Sept.10, 1938	40.29	Mar. 26, 1938
310	10.10	Dec. 3, 1940	19.39	Nov. 4, 1937
311	10.14	July 4, 1938	14.26	Dec. 31, 1939

a Measured after well was pumped.
b Measured while pumping.

Net changes in water level in 1940 and net changes in water level for period of record in 10 wells in McPherson County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
19	1.38	-0.23	-0.62
243	1.00	a - .07	+ .55
249	6.32	.....	+2.39
250	5.29	.....	+2.12
252	7.22	a -5.51	-1.85
260	5.14	a - .35	+ .42
262	12.67	a - .78	-5.58
309	6.74	+ .23	+3.68
310	9.29	+ .55	+9.29
311	4.12	-1.75	+ .50

19. Scott Montgomery. NW¼NE¼ sec. 29, T. 19 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 2	70.38	May 3	70.19	Aug. 1	70.59	Nov. 5	70.78
Mar. 2	70.33	June 7	70.18	Sept. 3	70.67	Dec. 3	70.71
Apr. 5	70.23	July 3	70.29	Oct. 3	70.78		

243. Emma Bergstrom. SE¼SW¼SE¼ sec. 5, T. 19 S., R. 3 W. Water levels, in feet below measuring point, 1940: Apr. 2, 82.87; July 3, 82.96; Oct. 3, 82.94.

249. Prudential Life Insurance Co. SE cor. sec. 5, T. 18 S., R. 3 W. Water levels, in feet below measuring point, 1940: Apr. 2, 40.13 (measured after well was pumped); July 3, 35.04; Oct. 3, 35.30.

250. John Weed (?). NE¼NE¼SE¼ sec. 30, T. 19 S., R. 4 W. Water levels, in feet below measuring point, 1940: Apr. 2, 42.19 (measured after well was pumped); July 3, 41.49; Oct. 3, 41.38.

252. David Mills. SE cor. sec. 14, T. 19 S., R. 5 W. Water levels, in feet below measuring point, 1940: Apr. 2, 7.29; July 3, 9.21; Oct. 3, 12.80.

260. C. Welch. SE cor. sec. 33, T. 17 S., R. 4 W. Water levels, in feet below measuring point, 1940: Apr. 2, 28.58; July 3, 28.56; Oct. 3, 28.93.

262. P. A. Olson. NE¼NW¼NE¼ sec. 1, T. 18 S., R. 5 W. Water levels, in feet below measuring point, 1940 (measured while pumping) Apr. 2, 35.88; July 3, 31.25; Oct. 3, 36.66.

309. Mrs. Ida Tuxhorn. SW¼SW¼ sec. 9, T. 21 S., R. 4 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	36.98	Apr. 26	36.96	July 19	34.66	Oct. 11	35.59
Feb. 2	37.15	May 3	36.66	26	34.63	18	35.56
9	36.98	10	36.46	Aug. 2	34.95	25	35.68
16	37.05	17	35.86	9	35.04	Nov. 1	35.88
Mar. 1	36.77	24	35.14	16	35.00	8	35.88
8	37.04	31	34.90	23	35.17	15	36.09
15	36.97	June 7	34.65	30	35.35	22	36.06
22	36.97	14	34.48	Sept. 6	35.37	29	35.93
29	36.88	21	34.47	13	35.18	Dec. 6	35.82
Apr. 5	36.97	28	34.61	20	35.38	13	36.31
12	37.41	July 5	34.66	27	35.34	20	36.24
19	37.04	12	34.78	Oct. 4	35.30	30	36.06

a To October 3.

310. City of Moundridge. SW¼NE¼SW¼ sec. 23, T. 21 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 2	10.65	May 3	10.25	Aug. 1	10.42	Nov. 5	10.27
Mar. 2	10.41	June 7	10.24	Sept. 3	10.32	Dec. 3	10.10
Apr. 5	10.39	July 3	10.30	Oct. 3	10.21		

311. City of Moundridge. SW¼NE¼SW¼ sec. 23, T. 21 S., R. 2 W.

Water level, in feet below measuring point, 1940

Feb. 2	11.15	May 3	12.56	Aug. 1	13.30	Nov. 5	12.45
Mar. 2	13.20	June 7	11.89	Sept. 3	14.01	Dec. 3	12.90
Apr. 5	12.90	July 3	12.48	Oct. 3	13.43		

MEADE COUNTY

By J. C. Frye

The observation-well program in Meade County, Kansas, (see Water-Supply Paper 886) was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in ccoperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health.

Field work in the county was resumed in July 1940 by the writer, under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. In 1940 a geologic map of the county was prepared, and the inventory of private wells in the county was completed. In 1939 and 1940 the depth to water level or artesian pressure was measured in about 95 percent of the 354 wells visited. During 1940 the portable drilling machine owned by the Federal and State Geological Surveys put down 21 test holes in the county, in 5 of which water-level measurements were made. This work was done by Ellis D. Gordon, driller, Perry McNally, sampler, and Laurence Buck, helper.

During the year two additional irrigation wells were constructed in the county, one on the high plains west of the artesian basin and the other at the eastern side of the basin. In 1940 a total of 10 wells was pumped for irrigation, and in addition, water from flowing artesian wells was used for irrigation.

A preliminary report on the water supply of the Meade artesian basin was prepared by the writer in 1940 and is now in press as bulletin 35 of the Kansas Geological Survey. In 1940 the water levels in 27 wells were measured once a month and an automatic water-stage recorder was operated on 1 well. A total of 332 wetted-tape measurements was made in 1940. All monthly measurements during August and September were made by the writer; all other monthly measurements were made by Richard B. Christy. The automatic water-stage recorder on well 234 was serviced weekly by Christopher Sobba.

A summary of fluctuations of water levels in the 28 observation wells in the county is given in the following table.

Highest and lowest water levels for period of record in 28 wells in Meade County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
2	20.84	June 20, 1940	22.18	Sept.29, 1939
3	29.27	July 15, 1939	30.68	Aug. 17, 1940
10	14.55	Apr. 20, 1940	19.91	Aug. 3, 1939
11	10.40	July 17, 1939	14.56	Sept.20, 1940
16	13.38	July 18, 1939	16.90	Oct. 28, 1940
23	10.90	June 20, 1940	12.32	Oct. 29, 1940
27	19.99	Dec. 21, 1940	20.54	Oct. 29, 1939
33	38.14	Feb. 14, 1940	38.42	Nov. 14, 1940
34	147.35	Feb. 14, 1940	151.19	Oct. 29, 1939
36	157.09	Feb. 14, 1940	160.46	Sept.20, 1940
37	34.31	July 20, 1939	41.72	Sept.29, 1939
40	130.40	Feb. 14, 1940	133.11	Sept.14, 1940
41	157.83	Sept.30, 1939	158.30	Nov. 9, 1939
42	133.13	Feb. 14, 1940	133.57	Aug. 19, 1940
45	3.88	June 20, 1940	4.90	Aug. 31, 1939
47	43.69	Jan. 26, 1940	44.39	July 22, 1939
55	85.47	Sept.30, 1939	86.52	Sept.20, 1940
57	169.94	Aug. 2, 1939	172.90	Nov. 13, 1940
59	119.18	July 25, 1939	123.45	Jan. 26, 1940
61	61.12	Dec. 21, 1940	61.37	May 17, 1940
62	26.18	Dec. 21, 1940	26.66	Aug. 17, 1940
73	33.18	Nov. 9, 1939	34.55	Aug. 19, 1940
76	27.70	Sept. 1, 1939	36.58	Dec. 19, 1940
77	65.31	June 20, 1940	66.03	Sept.20, 1940
88	42.38	June 20, 1940	44.71	Sept.20, 1940
101	87.38	Nov. 9, 1939	88.47	Nov. 14, 1940
234	14.33	Apr. 15, 1940	15.72	Aug. 31, 1939
304	218.81	Nov. 9, 1939	220.13	Sept. 4, 1939

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Net changes in water level in 1940 and net changes in water level for period of record in 28 wells in Meade County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
2	1.34	-0.21	-0.01
3	1.41	- .01	- .74
10	5.36	- .08	+3.97
11	4.16	- .19	-2.41
16	3.52	-1.66	-3.52
23	1.42	- .33	+ .31
27	.55	+ .49	+ .55
33	.28	- .16	- .13
34	3.84	+ .36	+ .06
36	2.37	- .92	+ .19
37	7.41	-2.31	- .02
40	2.71	- .38	- .07
41	.47	- .08	- .12
42	.44	- .05	- .08
45	1.02	+ .10	- .39
47	.70	- .12	+ .80
55	1.05	+ .02	- .07
57	2.96	-2.25	-2.70
59	4.27	+2.37	-1.90
61	.25	+ .07	+ .04
62	.48	+ .30	+ .43
73	1.37	- .14	- .09
76	8.88	-2.03	-5.11
77	.72	- .27	± .00
88	2.33	- .55	+ .61
101	1.09	+ .13	+ .04
234	1.39	+ .07	+ .98
304	1.32	+ .18	+ .24

The water levels in 18 wells showed net declines in 1940 ranging from 0.01 foot to 2.31 feet and averaging 0.65 foot; and the water levels in 10 wells showed net rises ranging from 0.02 foot to 2.37 feet and averaging 0.41 foot. There was an average net decline in water level of 0.27 foot in the 28 wells. For the period of record, 15 wells showed net declines in water level ranging from 0.01 foot to 5.11 feet and averaging 1.90 feet; 12 wells showed net rises in water level ranging from 0.04 foot to 3.97 feet and averaging 0.69 feet; and the water level in 1 well was unchanged. There was an average net decline in water level of 0.29 foot in the 28 wells. The greatest fluctuation in water level in the period of record--8.88 feet--occurred in well 76, and the smallest fluctuation--0.25 foot--occurred in well 61. The average fluctuation in water level in the 28 wells was 2.26 feet.

The precipitation at Plains was 2.06 inches below normal in 1940, which, however, was 2.94 inches more than the average annual precipitation during the last 10 years and 6.79 inches more than in 1939. Of the 18.30 inches of precipitation in 1940, 80 percent occurred in the 6-month period from April through September, which may account for the slight rise of water level in some of the wells during the early winter.

2. William A. Ellson. NW¼SW¼ sec. 5, T. 30 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	21.20	Apr. 20	20.96	July 23	21.57	Nov. 19	21.48
Feb. 14	21.12	May 17	20.89	Aug. 17	21.70	Dec. 21	21.41
Mar. 21	20.97	June 20	20.84	Oct. 29	21.57		

3. H. L. Salmon. NW¼SE¼ sec. 4, T. 30 S., R. 27 W.

Water level, in feet below measuring point, 1940

Feb. 14	30.00	May 22	29.77	Aug. 17	30.68	Nov. 19	30.09
Mar. 21	30.00	June 20	29.69	Sept.20	30.05	Dec. 20	30.01
Apr. 20	29.94	July 23	29.70	Oct. 28	30.05		

10. Fred Borchers. SW¼NW¼ sec. 29, T. 33 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 25	15.11	Apr. 20	14.55	July 23	15.94	Oct. 28	15.53
Feb. 14	14.98	May 17	14.77	Aug. 19	15.76	Nov. 14	15.43
Mar. 10	14.92	June 20	14.92	Sept.20	15.93	Dec. 19	15.19

11. J. E. Lutz. NW¼SW¼ sec. 4, T. 30 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 25	12.62	Apr. 20	12.46	Aug. 17	13.38	Nov. 19	12.93
Feb. 14	12.47	May 17	12.53	Sept.20	14.56	Dec. 21	12.81
Mar. 21	12.46	June 20	12.48	Oct. 29	12.99		

16. B. A. Cordes. SW¼SW¼ sec. 25, T. 33 S., R. 29 W.

Water level, in feet below measuring point, 1940

Jan. 25	15.24	Apr. 20	14.90	July 23	15.86	Sept.20	16.80
Feb. 14	15.05	May 17	15.09	Aug. 19	16.34	Oct. 28	16.90
Mar. 21	14.99	June 20	15.45				

23. L. L. Ming. SE¼SE¼ sec. 18, T. 30 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 25	10.87	Apr. 20	11.14	July 23	11.06	Oct. 29	12.19
Feb. 14	10.96	May 17	11.06	Aug. 17	11.49	Nov. 19	12.31
Mar. 21	11.00	June 20	10.90	Sept.20	12.31	Dec. 21	11.20

27. Ira C. Rees. SW¼NW¼ sec. 9, T. 30 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 25	20.48	Apr. 20	20.43	July 22	20.40	Oct. 29	20.53
Feb. 14	20.44	May 17	20.41	Aug. 17	20.51	Nov. 19	20.53
Mar. 21	20.42	June 20	20.39	Sept.20	20.53	Dec. 21	19.99

33. H. L. Woodruff. NE¼NW¼ sec. 34, T. 33 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 25	38.26	May 17	38.22	Sept.12	38.42	Nov. 14	38.42
Feb. 14	38.14	July 23	38.20	Oct. 28	38.38	Dec. 19	38.42
Mar. 21	38.25	Aug. 19	38.27				

34. District School. SE¼SE¼ sec. 17, T. 33 S., R. 27 W.

Water level, in feet below measuring point, 1940

Jan. 25	147.78	Apr. 20	147.70	July 23	147.58	Nov. 14	148.18
Feb. 14	147.35	May 17	147.36	Aug. 19	147.91	Dec. 19	147.42
Mar. 21	147.55	June 20	147.67	Sept.20	147.81		

36. Tony Steinke. NW¼NE¼ sec. 24, T. 32 S., R. 27 W.

Water level, in feet below measuring point, 1940

Jan. 25	157.70	Apr. 20	157.56	July 23	157.32	Oct. 28	159.08
Feb. 14	157.09	May 17	157.15	Aug. 19	159.14	Nov. 14	158.62
Mar. 21	157.23	June 20	157.42	Sept.20	160.46		

37. J. H. Clay. SE¼SE¼ sec. 11, T. 33 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	35.02	Apr. 20	35.03	June 20	35.20	Aug. 19	35.53
Mar. 21	35.00	May 17	35.28	July 23	35.98	Nov. 14	37.33

40. J. A. and D. F. Collingwood. SE¼SE¼ sec. 30, T. 31 S., R. 29 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	130.48	Apr. 20	130.61	July 23	130.68	Oct. 28	130.78
Feb. 14	130.40	May 22	130.81	Aug. 19	133.95	Nov. 14	130.73
Mar. 21	130.52	June 20	130.63	Sept.14	133.11	Dec. 20	130.86

41. D. L. Shrammer. NW¼NW¼ sec. 20, T. 30 S., R. 30 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	158.16	May 22	158.15	Aug. 19	158.23	Nov. 14	158.14
Mar. 21	158.22	June 20	158.14	Sept.14	158.26	Dec. 20	158.24
Apr. 20	158.09	July 23	158.14	Oct. 28	158.24		

42. H. Jenkinson. SW¼SW¼ sec. 23, T. 30 S., R. 29 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	133.46	Apr. 20	133.34	July 23	133.39	Oct. 28	133.38
Feb. 14	133.13	May 22	133.37	Aug. 19	133.57	Nov. 14	133.49
Mar. 21	133.40	June 20	133.34	Sept.14	133.43	Dec. 20	133.51

45. Joseph Rocke. SE¼NE¼ sec. 31, T. 30 S., R. 27 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	4.66	Apr. 20	4.07	July 23	4.15	Oct. 28	4.18
Feb. 14	4.52	May 22	3.92	Aug. 19	4.48	Nov. 19	4.40
Mar. 21	4.25	June 20	3.88	Sept.20	4.37	Dec. 20	4.56

47. C. A. Harner. SE¼SE¼ sec. 18, T. 30 S., R. 27 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	43.69	Mar. 21	43.88	Sept.20	43.90	Nov. 19	43.81
Feb. 14	43.80	Aug. 19	44.16	Oct. 28	43.78	Dec. 20	43.81

55. C. W. Farris. SE¼SE¼ sec. 15, T. 30 S., R. 28 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	86.46	May 22	86.49	Aug. 19	86.49	Nov. 19	86.44
Mar. 21	86.50	June 20	86.47	Sept.20	86.52	Dec. 20	86.44
Apr. 20	86.44	July 23	86.39	Oct. 28	86.42		

57. Plains State Bank. SW¼SE¼ sec. 18, T. 33 S., R. 30 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	170.45	Apr. 20	170.60	July 23	172.62	Oct. 28	172.66
Feb. 14	170.36	May 17	172.34	Aug. 19	172.73	Nov. 13	172.90
Mar. 21	170.48	June 20	172.34	Sept.20	172.74	Dec. 19	172.68

59. R. R. Singley. NE¼NE¼ sec. 20, T. 33 S., R. 29 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	123.45	Apr. 20	121.96	July 23	121.28	Nov. 13	121.16
Feb. 14	121.56	May 17	121.88	Aug. 19	120.57	Dec. 19	121.08
Mar. 21	121.76	June 20	121.49	Oct. 28	121.09		

61. John Meyer. NW¼NW¼ sec. 26, T. 31 S., R. 27 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	61.19	Apr. 20	61.14	July 23	61.16	Oct. 29	61.16
Feb. 14	61.12	May 17	61.37	Aug. 17	61.21	Nov. 19	61.19
Mar. 21	61.19	June 20	61.16	Sept.20	61.20	Dec. 21	61.12

62. H. L. Salmon. NE¼NE¼ sec. 7, T. 31 S., R. 26 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	26.48	Apr. 20	26.46	July 23	26.37	Oct. 29	26.29
Feb. 14	26.33	May 17	26.23	Aug. 17	26.66	Nov. 19	26.25
Mar. 21	26.46	June 20	26.34	Sept.20	26.34	Dec. 21	26.18

73. A. M. and O. M. Eubank. SE¼NE¼ sec. 11, T. 34 S., R. 28 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	33.45	Apr. 20	33.44	Aug. 19	34.55	Nov. 14	34.32
Feb. 14	33.44	June 20	33.27	Sept.12	33.61	Dec. 19	33.59
Mar. 21	33.44	July 23	33.33				

76. R. L. L. Barnstable. NE¼NE¼ sec. 3, T. 34 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 25	34.55	Apr. 20	35.42	July 23	32.68	Oct. 28	36.16
Feb. 14	34.82	May 17	35.48	Aug. 19	34.61	Nov. 14	36.39
Mar. 21	35.17	June 20	32.06	Sept.12	35.37	Dec. 19	36.58

77. J. W. Wood. SE¼NE¼ sec. 4, T. 32 S., R. 28 W.

Water level, in feet below measuring point, 1940

Feb. 14	65.45	May 22	65.40	Aug. 19	65.98	Nov. 14	65.87
Mar. 21	65.55	June 20	65.31	Sept.20	66.03	Dec. 20	65.72
Apr. 20	65.56	July 23	65.76	Oct. 28	65.84		

88. H. V. Gulick. SE¼SE¼ sec. 14, T. 31 S., R. 28 W.

Water level, in feet below measuring point, 1940

Jan. 26	43.40	Apr. 20	42.84	July 23	43.37	Oct. 28	44.70
Feb. 14	43.26	May 22	42.55	Aug. 19	44.20	Nov. 19	44.36
Mar. 21	43.00	June 20	42.38	Sept.20	44.71	Dec. 20	43.95

101. West and Higenbotham. NE¼NE¼ sec. 29, T. 34 S., R. 26 W.

Water level, in feet below measuring point, 1940

Jan. 25	88.01	Apr. 20	87.97	July 23	87.91	Oct. 28	87.64
Feb. 14	87.63	May 17	87.60	Aug. 19	88.21	Nov. 14	88.47
Mar. 21	87.77	June 20	87.94	Sept.12	87.85	Dec. 19	87.88

234. Christopher Sobba. NW¼NE¼ sec. 23, T. 30 S., R. 27 W.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.81	14.89	14.85	14.83	.....	14.77	.....	.....	14.82	14.72	14.99	.....
2	14.81	14.89	14.88	14.82	.....	14.78	.....	.....	14.80	14.70	14.99	.....
3	14.79	14.86	14.90	14.86	.....	14.75	.....	.....	14.80	14.69	14.98	.....
4	14.81	14.82	14.91	.....	.....	14.76	14.93	.....	14.80	14.70	15.00	.....
5	14.80	14.84	14.89	.....	.....	14.78	14.82	.....	14.79	14.71	15.02	.....
6	14.79	14.84	14.88	.....	.....	14.77	14.88	.....	14.77	14.76	.....	14.74
7	14.80	14.82	14.88	.....	.....	14.77	14.88	.....	14.78	14.76	.....	14.75
8	14.80	14.87	14.89	.....	.....	14.77	14.86	.....	14.77	14.71	.....	14.73
9	14.79	14.88	14.85	.....	.....	14.79	14.85	15.10	14.76	14.70	.....	14.73
10	14.78	14.86	14.85	14.98	.....	14.80	14.85	15.04	14.77	14.73	.....	14.75
11	14.80	14.86	14.83	14.64	.....	14.80	14.85	14.98	14.76	14.74	.....	14.75
12	14.80	14.89	14.88	14.58	.....	14.79	14.85	14.93	14.75	14.73	15.16	14.75
13	14.78	14.89	14.89	14.46	.....	14.78	14.89	14.88	14.72	14.73	15.08	14.75
14	14.82	14.87	14.89	14.42	.....	14.78	14.87	14.85	14.73	14.78	15.00	14.76
15	14.85	14.84	14.87	14.33	.....	14.78	.....	.....	14.73	14.78	14.94	14.73
16	14.82	14.89	14.85	14.43	.....	14.78	.....	14.83	14.73	14.75	14.86	14.77
17	14.82	14.91	14.85	14.54	.....	14.79	.....	14.83	14.74	14.77	14.84	14.77
18	14.83	14.89	14.87	14.65	.....	14.80	14.98	14.85	14.76	14.76	14.80	14.73
19	14.88	14.90	14.85	14.73	.....	14.82	14.94	14.84	14.78	14.79	14.80	14.76
20	14.88	14.90	14.85	14.80	.....	14.82	.....	.....	14.79	14.79	14.80	14.75
21	14.88	14.91	14.86	14.78	.....	14.82	.....	.....	14.81	14.78	14.73	14.75
22	14.88	14.91	14.86	14.77	.....	14.82	.....	.....	14.81	14.77	14.76	14.73
23	14.87	14.87	14.87	14.80	.....	14.85	.....	.....	14.79	14.78	14.77	14.71
24	14.88	14.91	14.88	14.80	.....	14.86	.....	15.01	14.80	14.77	14.77	14.69
25	14.89	14.92	14.87	14.78	.....	14.85	.....	14.96	14.82	14.77	14.74	14.71
26	14.88	14.86	14.83	14.79	.....	.....	.....	14.93	14.79	14.78	14.73	14.75
27	14.85	14.87	14.81	.....	.....	14.85	.....	14.89	14.75	14.79	14.75	14.75
28	14.85	14.88	14.83	.....	.....	14.90	.....	14.88	14.74	14.85	14.72	14.75
29	14.85	14.88	14.84	.....	.....	.....	.....	14.89	14.75	14.89	.....	14.75
30	14.86	.....	14.85	.....	.....	.....	.....	14.89	14.75	14.92	.....	14.74
31	14.85	.....	14.84	.....	14.77	.....	.....	14.85	.....	14.98	.....	14.74

304. A. W. Adams. NW¼SE¼ sec. 27, T. 34 S., R. 30 W. Water levels, in feet below measuring point, 1940: Feb. 14, 220.07; May 17, 219.89.

MORTON COUNTY

By T. G. McLaughlin

The observation-well program in Morton County, Kansas (See Water-Supply Paper 886), was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. The program is under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. A report on the geology and ground-water resources of Morton County was written in 1940 and will be published as a bulletin of the Kansas Geological Survey. In 1940 the altitudes of the measuring points for several of the observation wells were determined with an alidade and plane table by John B. LaDuex and are given in this report for the first time.

Measurements of water level were made once a month in 19 observation wells during the first 7 months of 1940 but only in 6 wells (22, 54, 65, 93, 114 and 117) after August 1, 1940. A total of 137 measurements was made during the year. Measurements in the first 7 months of 1940 and those in December 1940 were made by Richard B. Christy; all other measurements were made by the writer.

The precipitation in Morton County in 1940 was about normal for the first time in nearly 10 years. Owing to the fact that the depth to water level in the observation wells ranges from 50 feet to more than 200 feet and that the period of record is relatively short, there appears to be no apparent correlation between the fluctuations of water level and the precipitation.

Of the 6 wells in Morton County under observation at the end of the year, the water levels in 2 wells were higher at the end of the year than at the beginning of the year, the water levels in 3 wells were lower, and the water level in 1 well was unchanged.

Of the 13 observation wells (8, 11, 21, 28, 42, 69, 74, 77, 87, 97, 104, 105 and 127) observed only through July 1940 the water levels in 9 wells were higher in July 1940 than at the time the first measurements were made in July 1939, and the water levels in 4 of the wells were lower. The net rises ranged from 0.08 to 0.52 foot and averaged about 0.20 foot. The net declines ranged from 0.02 foot to 1.92 feet and averaged about 0.57 foot. The difference between the highest and lowest water levels ranged from 0.11 foot to 2.05 feet and averaged 0.47 foot. Water-level fluctuations are summarized in the following tables.

Highest and lowest water levels for period of record in 6 wells in Morton County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
22	74.46	Aug. 21, 1940	75.24	Oct. 27, 1939
54	76.27	July 18, 1940	76.90	July 25, 1939
65	53.55	Aug. 24, 1939	54.12	Nov. 12, 1940
93	159.57	Dec. 18, 1940	160.14	Oct. 27, 1939
114	226.62	Aug. 25, 1939	226.89	Dec. 16, 1939
				Apr. 23, 1940
				Nov. 13, 1940
117	167.11	Nov. 14, 1939	167.39	July 26, 1939
		Oct. 26, 1940		

Net changes in water level in 1940 and net changes in water level for period of record in 6 wells in Morton County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
22	0.78	-0.22	-0.34
54	.63	+ .01	+ .50
65	.57	- .24	- .45
93	.57	+ .35	+ .37
114	.27	.....	+ .04
117	.28	- .06	+ .05

Highest and lowest water levels for period of record in 13 wells in Morton County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
8	152.07	July 18, 1940	152.52	Oct. 27, 1939
11	110.88	June 18, 1940	111.76	Feb. 1, 1940
21	70.05	Dec. 15, 1939	70.18	Oct. 27, 1939
28	138.88	May 14, 1940	139.04	Oct. 27, 1939
42	68.76	Apr. 23, 1940	68.87	July 25, 1939
		May 14, 1940		
		June 18, 1940		
69	67.48	Aug. 24, 1939	67.67	Feb. 1, 1940
74	87.70	July 17, 1940	88.01	July 25, 1939
77	147.42	July 25, 1939	147.87	Oct. 27, 1939

Highest and lowest water levels for period of record in 13 wells in Morton County--Continued.

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
87	129.47	June 16, 1940	129.68	July 25, 1939
97	113.76	Oct. 26, 1939 July 18, 1940	113.98	July 26, 1939
104	90.03	Oct. 26, 1939	90.19	Feb. 1, 1940 July 18, 1940
105	198.06	May 14, 1940	198.86	July 25, 1939
127	210.98	Sept.25, 1939	213.03	June 18, 1940 July 18, 1940

Net changes in water level for period of record in 13 wells in Morton County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, for period of record
8	0.45	+0.24
11	.88	+ .52
21	.13	+ .05
28	.16	+ .08
42	.11	+ .10
69	.19	- .02
74	.31	+ .31
77	.45	- .28
87	.21	+ .19
97	.22	+ .22
104	.16	- .06
105	.80	+ .12
127	2.05	-1.92

8. C. M. Crocker. NE¼NW¼ sec. 15, T. 31 S., R. 40 W. Measuring point 3,289.0 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 21	152.14	Apr. 23	152.16	June 18	152.09
Mar. 15	152.09	May 14	152.11	July 18	152.07

11. Mrs. Leo Everett. SE¼SW¼ sec. 9, T. 31 S., R. 41 W. Measuring point 3,400.9 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 1	111.76	Mar. 23	111.21	June 18	110.88
21	111.34	Apr. 23	111.19	July 18	111.06

21. John W. Bitner. SE¼NE¼ sec. 3, T. 31 S., R. 43 W. Measuring point 3,589.6 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 1	70.07	Mar. 23	70.13	May 14	70.11	July 17	70.06
21	70.10	Apr. 22	70.09	June 18	70.12		

22. E. A. Wilcox. SE¼SE¼ sec. 14, T. 31 S., R. 43 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 1	74.87	Apr. 22	74.77	July 17	74.50	Oct. 25	74.51
21	74.88	May 14	74.88	Aug. 21	74.46	Nov. 12	75.04
Mar. 23	74.97	June 18	74.68	Sept.18	74.63	Dec. 18	75.09

28. G. L. Hayward. SW¼SE¼ sec. 2, T. 32 S., R. 40 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 21	138.91	Apr. 23	138.91	June 18	138.89
Mar. 15	138.89	May 14	138.88	July 18	138.89

42. Lucy Hobbs. NW¼NW¼ sec. 13, T. 32 S., R. 42 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 1	68.82	Mar. 23	68.79	May 14	68.76	July 17	68.77
21	68.79	Apr. 23	68.76	June 18	68.76		

54. V. W. Dickinson. SW¼SW¼ sec. 13, T. 33 S., R. 40 W.

Water level, in feet below measuring point, 1940

Feb. 21	76.41	May 14	76.33	Aug. 21	76.31	Nov. 13	76.39
Mar. 15	76.36	June 18	76.40	Sept.18	76.35	Dec. 18	76.40
Apr. 23	76.35	July 18	76.27	Oct. 26	76.41		

65. John Hentschel. SE¼NE¼ sec. 8, T. 33 S., R. 42 W.

Water level, in feet below measuring point, 1940

Feb. 1	53.80	Apr. 22	53.94	July 17	53.96	Oct. 25	54.03
21	53.89	May 14	54.04	Aug. 21	53.99	Nov. 12	54.12
Mar. 23	53.88	June 18	53.96	Sept.18	53.85	Dec. 18	54.04

69. George B. Pate. SE¼SE¼ sec. 32, T. 33 S., R. 42 W. Measuring point 3,493.5 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 1	67.67	Mar. 25	67.59	May 14	67.63	July 18	67.53
21	67.62	Apr. 22	67.61	June 18	67.56		

74. Thomas A. Ball. NE¼NE¼ sec. 17, T. 33 S., R. 43 W. Measuring point 3,629.3 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 1	87.88	Mar. 23	87.79	May 14	87.79	July 17	87.70
21	87.83	Apr. 22	87.78	June 18	87.74		

77. Ethyl B. Weber. SW¼NW¼ sec. 7, T. 34 S., R. 39 W. Water levels, in feet below measuring point, 1940: Feb. 21, 147.63; Mar. 15, 147.57; Apr. 23, 147.70.

87. G. L. Hayward. SE¼SE¼ sec. 1, T. 34 S., R. 41 W. Measuring point 3,369.7 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 21	129.54	Apr. 23	129.53	June 16	129.47
Mar. 15	129.53	May 14	129.50	July 18	129.49

93. Ira Webb. NE¼SE¼ sec. 28, T. 34 S., R. 41 W. Measuring point 3,435.7 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 21	159.92	May 14	159.84	Aug. 21	159.59	Nov. 13	159.96
Mar. 15	159.79	June 18	159.82	Sept.18	159.67	Dec. 18	159.57
Apr. 23	159.97	July 18	159.79	Oct. 26	159.71		

97. W. B. Cushman. SE¼SE¼ sec. 22, T. 34 S., R. 42 W. Measuring point 3,502.0 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 1	113.84	Mar. 23	113.83	May 14	113.82	July 18	113.76
21	113.88	Apr. 22	113.77	June 18	113.77		

104. Wm. Dulahahn. NE¼SE¼ sec. 35, T. 34 S., R. 43 W.

Water level, in feet below measuring point, 1940

Feb. 1	90.19	Mar. 23	90.09	May 14	90.15	July 18	90.19
21	90.14	Apr. 22	90.10	June 18	90.17		

105. S. J. Willits. NW¼NW¼ sec. 5, T. 35 S., R. 39 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 21	198.58	Apr. 23	198.54	June 18	198.46
Mar. 15	198.51	May 14	198.06	July 18	198.74

114. J. L. Kniffen. SE¼SE¼ sec. 13, T. 35 S., R. 41 W. Measuring point 3,452.5 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 21	226.84	May 14	226.84	Aug. 21	226.71	Nov. 13	226.89
Mar. 15	226.80	June 18	226.84	Sept.18	226.80	Dec. 26	226.84
Apr. 23	226.89	July 18	226.87	Oct. 26	226.88		

117. W. C. Washburn. SW¼SW¼ sec. 4, T. 35 S., R. 42 W.

Water level, in feet below measuring point, 1940

Feb. 1	167.28	Mar. 23	167.21	May 14	167.27	Oct. 26	167.11
21	167.19	Apr. 22	167.21	June 18	167.17	Nov. 12	167.34

127. J. M. Hardwick. NE¼NE¼ sec. 21, T. 35 S., R. 43 W. Measuring point 3,687.2 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 1	211.09	Mar. 23	211.09	May 14	212.16	July 18	213.03
21	211.35	Apr. 22	211.67	June 18	213.03		

NESS COUNTY

By H. A. Waite

An observation-well program was begun in Ness County in 1940, as a part of a larger program in the Pawnee River Basin. The larger program covers parts of Hodgeman, Ness and Pawnee Counties and is described in the chapter on Hodgeman County. At the end of 1940, measurements of water level were being made once a month in 2 wells in Ness County; a total of 8 measurements were made during the year by Richard B. Christy. Descriptions and records of water level for the 2 wells in Ness County follow.

1. J. E. Ficken. SE¼SW¼ sec. 32, T. 20 S., R. 23 W. Dug and drilled irrigation well, diameter 19 inches, depth 70.4 feet. Measuring point, top of I-beam sill under base of pumphead, east side at painted orange mark, 2.0 feet above land surface. Water levels, in feet below measuring point, 1940: Aug. 27, 36.91; Oct. 29, 36.43; Nov. 25, 36.25; Dec. 26, 36.02.

2. C. L. Whitley. SW cor. sec. 20, T. 20 S., R. 22 W. Dug and drilled irrigation well, diameter 20 inches, depth 58 feet. Measuring point, top of round concrete curb, south side at painted orange mark, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: Sept. 20, 25.90; Oct. 29, 25.85; Nov. 25, 25.58; Dec. 26, 25.71.

PAWNEE COUNTY

By H. A. Waite

An observation-well program was begun in Pawnee County in 1940, as a part of a larger program embracing parts of Hodgeman, Ness and Pawnee Counties. The program is described in the chapter on Hodgeman County. At the end of 1940, measurements of water level were being made once a month in 3 wells in Pawnee County; a total of 10 measurements was made during the year by Richard B. Christy. Descriptions and records of water level for the 3 observation wells in Pawnee County follow.

6. Frank Elmore. SW cor. sec. 27, T. 21 S., R. 19 W. Dug and drilled irrigation well, diameter 24 inches, depth 60 feet. Measuring point, top of lath strip on flat circular wooden cover over pit, at painted orange mark, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Aug. 28, 24.59; Nov. 28, 25.02; Dec. 26, 24.83.

7. Ralph Lupfer. NE¼NE¼ sec. 18, T. 22 S., R. 17 W. Drilled irrigation well, diameter 19 inches, depth 123.5 feet. Measuring point, top of 20-inch galvanized-iron casing, southwest side at painted orange arrow, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: Nov. 29, 28.00; Dec. 26, 27.98.

8. F. B. Reed. NW¼NW¼ sec. 6, T. 22 S., R. 16 W. Drilled irrigation well, diameter 19 inches, depth 33.5 feet. Measuring point, top of round concrete block curb, 5 feet in diameter, south side at painted orange mark, 1.5 feet above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 28	19.29	Oct. 29	17.07	Dec. 26	16.76
Sept.20	19.82	Nov. 29	16.85		

SCOTT COUNTY

By H. A. Waite

The observation-well program in Scott County, Kansas (see Water-Supply Paper 886), was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Sanitation of the Kansas State Board of Health and the Division of Water Resources of the Kansas State Board of Agriculture. The program is under the general supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. Field work in Scott County was completed in December 1940 and a report is now in preparation as a bulletin of the Kansas Geological Survey. Altitudes of the measuring points of about 225 wells including 31 observation wells, were established in 1940 by instrumental levels. The altitudes of the measuring points of the 31 observation wells are included in this report for the first time. Sixteen test holes were drilled in the county in December 1940 and January 1941 by a drilling rig owned by the State and Federal Surveys and operated by Ellis D. Gordon, driller, Perry McNally, sampler, and Laurence P. Buck, helper.

At the beginning of 1940, measurements of water level were being made in 31 wells including 2 wells (32 and 33) equipped with 8-day automatic water-stage recorders maintained by the State and Federal Surveys, 2 wells (1 and 2) equipped with continuous automatic water-stage recorders maintained by the Division of Water Resources, and 27 wells observed monthly by the State and Federal Surveys. In March 1940, monthly observations were discontinued in wells 24 and 45 after they were equipped with pumps. In May 1940, measurements of water level were begun in wells 54 and 55, and in August well 1A was constructed and equipped with a continuous automatic water-stage recorder, as described below. At the end of 1940, water-level measurements were being made in 32 wells. A total of 290 wetted-tape measurements was made in 1940. All monthly water-level measurements were made by Richard B. Christy, except for those in October, which were made by the writer. The recorders on wells 32 and 33 were serviced each week by J. R. Haverfield, and those on wells 1, 1A, and 2 were serviced by K. D. McCall of the Division of Water Resources.

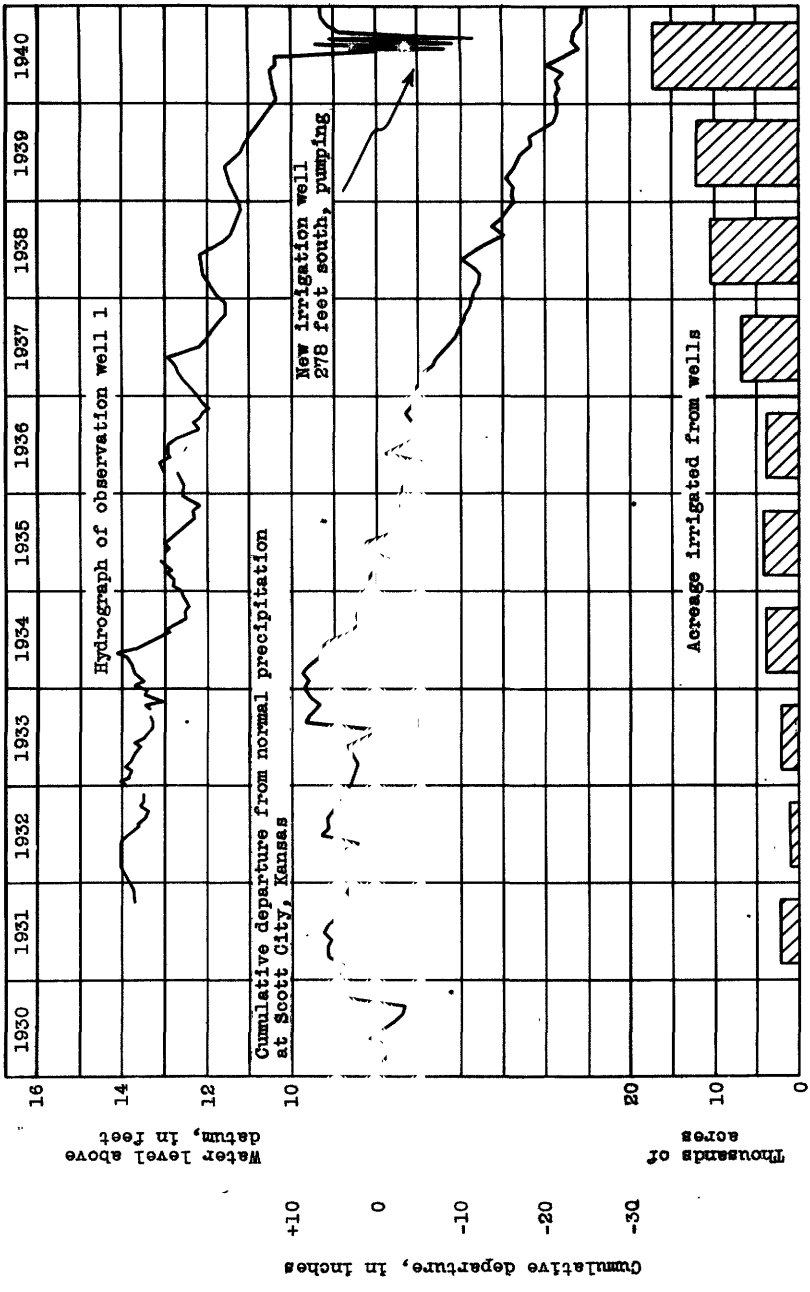

Figure 5.--Graphs showing fluctuations of water level in well 1, cumulative departure from normal precipitation, and acreage irrigated from wells in Scott County, Kansas.

In the spring of 1940 an irrigation well was drilled 278 feet south of observation well 1. Because the pumping of this well affects the water level in well 1, as is shown in the accompanying illustration, a new observation well (1A) was constructed in August 1940 by the Division of Water Resources about 1 mile east and 0.3 mile north of well 1. The description and complete water-level records of wells 1A, 54, and 55 are included in this report.

A survey of the irrigated acreage in the shallow-water basin made in 1940 by K. D. McCall and the writer indicates that 17,164 acres were irrigated from wells. At the end of the year there were 90 irrigation wells in the county.

According to the records of the United States Weather Bureau, the precipitation at Scott City in 1940 was 16.88 inches, which is 2.97 inches below normal. The water levels in 24 of the 28 wells having complete records showed net declines during the year ranging from 0.02 foot to 2.71 feet. The greatest declines occurred in wells in the shallow-water basin as a result of below normal precipitation and heavy pumping for irrigation. The water levels in 15 of 16 wells in this part of the county had net declines for the year ranging from 0.72 foot to 2.71 feet and averaging 1.52 feet. The difference between the highest and lowest water levels in the 16 wells during the period of record ranged from 0.36 foot to 9.35 feet and the average difference was about 3.80 feet.

The water levels in 5 wells (5, 8, 32, 33, and 42) in the shallow-water basin, declined steadily throughout the year. None of the 5 wells was pumped during 1940, but all of them are near other wells that are pumped. The water levels in 5 other wells (6, 9, 13, 19, and 23) in the basin rose slightly during the period from January through April, after which they declined during the rest of the year. At least a part of the winter and spring rises represents recovery from the effects of heavy pumping in the latter part of 1939.

The following discussion is based on the water-level records for wells 1 and 2, which have the longest complete records of water level in the county. The water levels in wells 1 and 2 had net declines of 1.15 and 1.37 feet, respectively, from January 1 to December 31, 1940. As is shown in figure 1, the water level in well 1 was affected considerably

during the last part of 1940 by the pumping of a new irrigation well. The difference between the highest and lowest water levels during the period of record was 8.46 feet in well 1 and 3.97 feet in well 2. The record for well 1 extends back to 1931 and the record for well 2 extends back to 1934. The net decline in water level during the period of record amounted to 4.43 feet in well 1 and 3.43 feet in well 2. Thus there have been average annual declines in water level of 0.55 foot in well 1 and 0.57 foot in well 2. As is shown in figure 1, there appears to be a definite correlation between the general downward trend of the water level in well 1 and the downward trend in the curve showing the cumulative departure from normal precipitation, indicating that the decline in water level may be at least in part the result of the mounting deficiency in precipitation. On the other hand, the acreage irrigated from wells has increased each year during the period of record and, therefore, the decline in water level may be partly the result of the increasing use of ground water for irrigation.

The following table summarizes the fluctuations of water level in observation wells in Scott County.

Highest and lowest water levels for period of record in 28 wells in Scott County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, unaffected by nearby pumping, in feet below measuring point	Date
1	a 14.12	May 14, 16, 1934	a 5.66	Sept.13, 1940
1A	a 7.06	Aug. 16, 17, 18, 1940	a 6.30	Nov. 6 to Dec. 7, 1940
2	a 13.85	Apr. 25, 1939	a 9.88	Dec. 20-24, 1940
3	68.94	May 30, 1934	72.16	Oct. 26, 1940
4	91.44	May 20, June 24, 1940	92.05	Nov. 16, 1940
5	39.79	May 30, 1934	45.72	Dec. 31, 1940
6	71.00	Apr. 13, 1936	80.35	Sept.21, 1940
8	49.42	Sept. 8, 1939	52.75	Dec. 31, 1940
9	48.07	Sept. 8, 1939	51.47	Nov. 15, 1940
13	51.56	Sept. 9, 1939	54.77	Oct. 25, 1940
17	34.19	Feb. 22, 1939	35.11	Oct. 25, 1940
19	46.38	Apr. 18, 1940	49.60	Aug. 26, 1940
23	43.35	Apr. 18, 1940	47.15	Oct. 25, 1940
24	35.12	Mar. 19, 1940	36.22	Dec. 11, 1939
27	58.39	Sept.18, 1939	59.20	Dec. 31, 1940
32	37.79	Sept.20, 21, 22, 1939	39.29	Dec. 21-31, 1940
33	73.23	Sept.25, 26, 27, 1939	75.05	Dec. 30, 31, 1940
34	83.90	Sept.22, 1939	83.98	Mar. 19, 1940
35	117.59	Jan. 15, 1940	117.83	Nov. 6, 1939 Nov. 16, 1940

a Water level, in feet above datum.

Highest and lowest water levels for period of record in 28 wells in Scott County--Continued.

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, unaffected by nearby pumping, in feet below measuring point	Date
36	126.14	Sept.22, 1939	126.32	May 20, 1940 Nov. 16, 1940
37	97.78	Sept.22, 1939	98.87	Sept.21, 1940
38	72.24	Apr. 18, 1940 Feb. 22, 1940	72.87	Dec. 31, 1940
39	69.22	June 24, 1940 Sept.21, 1940	69.32	Dec. 31, 1940
40	111.12	Sept.30, 1939	111.30	Apr. 18, 1940
41	131.16	Aug. 27, 1940	131.81	Nov. 15, 1940
42	53.02	Sept.23, 1939	58.75	Nov. 15, 1940
44	68.36	Mar. 19, 1940	69.20	Oct. 25, 1940
45	21.12	Jan. 16, 1940 Mar. 19, 1940	21.53	Sept.27, 1939
47	32.50	Sept.28, 1939	35.15	Oct. 25, 1940
48	32.41	June 24, 1940	32.77	Nov. 15, 1940
49	34.91	Oct. 25, 1940	35.05	Feb. 22, 1940
50	98.19	Nov. 15, 1940	98.48	Jan. 16, 1940 Apr. 18, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 28 wells in Scott County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
1	8.46	-1.15	-4.43
1A	.76	.....	.....
2	3.97	-1.37	-3.43
3	3.22	- .72	-2.06
4	.61	- .24	+ .12
5	5.93	-2.00	-5.93
6	9.35	-2.06	-4.29
8	3.33	-2.71	-3.33
9	3.40	-1.60	-2.75
13	3.21	a -1.73	-2.59
17	.92	- .91	- .74
19	3.22	b -1.22	- .02
23	3.80	- .87	-1.34
24	1.10	.....	.....
27	.81	b - .45	- .81
32	1.50	-1.16	-1.50
33	1.82	-1.32	-1.82
34	.08	+ .03	- .03
35	.24	- .22	- .11
36	.18	- .02	- .17
37	1.09	a - .53	- .88
38	.63	- .47	- .54
39	.10	- .09	- .09
40	.18	- .15	- .13
41	.65	+ .56	+ .54
42	5.73	b -2.08	-3.76
44	.84	a - .54	- .03
45	.41	.....	.....
47	2.65	b -1.96	-2.38
48	.36	+ .07	- .07
49	.14	.....	.....
50	.29	+ .28	+ .24

a Period Mar. 19 to Dec. 31, 1940.
b Period Feb. 22 to Dec. 31, 1940.

1. Mrs. Rosine Smith. NW cor. sec. 9, T. 20 S., R. 33 W.

Mean daily water level, in feet above datum, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.41	10.35	10.40	.....	10.48	10.32	10.35	6.73	8.87	8.80	9.13	9.18
2	10.41	10.35	10.42	.....	10.48	10.32	10.34	6.44	8.92	8.82	9.14	9.19
3	10.40	10.36	10.41	.....	10.48	10.29	10.34	6.28	8.95	8.84	9.15	9.21
4	10.39	10.35	10.40	.....	10.48	10.29	10.34	7.03	9.02	8.85	9.14	9.21
5	10.39	10.36	10.40	.....	10.49	10.31	10.34	7.99	9.05	8.88	9.10	9.21
6	10.39	10.36	10.40	.....	10.48	10.33	10.31	8.35	8.36	8.89	9.14	9.21
7	10.38	10.36	10.40	.....	10.47	10.33	10.30	8.60	7.51	....	9.14	9.20
8	10.38	10.36	10.40	.....	10.46	10.35	10.32	8.78	7.55	....	9.16	9.21
9	10.38	10.36	10.41	.....	10.46	10.34	10.28	8.91	7.74	8.95	9.16	9.22
10	10.38	10.36	10.41	.....	10.46	10.34	10.27	9.02	6.98	8.96	9.16	9.20
11	10.38	10.37	10.42	.....	10.45	10.34	10.27	9.10	6.32	8.98	....	9.22
12	10.38	10.36	10.42	.....	10.45	10.34	10.27	9.16	5.92	9.00	....	9.21
13	10.37	10.36	10.41	.....	10.45	10.35	10.28	9.24	5.66	9.02	....	9.21
14	10.37	10.37	10.42	.....	10.45	10.35	10.27	9.29	5.99	9.00	....	9.22
15	10.37	10.36	10.42	10.43	10.45	10.35	10.27	9.34	6.98	9.03	....	9.24
16	10.37	10.36	10.42	10.43	10.45	10.35	10.27	8.95	7.50	9.05	....	9.23
17	10.37	10.37	10.42	10.44	10.44	10.35	10.27	7.63	7.62	9.05	....	9.23
18	10.37	10.37	10.42	10.43	10.44	10.35	10.27	7.83	7.92	9.06	....	9.25
19	10.37	10.37	10.43	10.44	10.42	10.35	10.28	8.04	8.07	9.07	....	9.24
20	10.36	10.38	10.42	10.44	10.41	10.36	10.28	6.89	8.19	9.08	....	9.23
21	10.36	10.38	10.42	10.44	10.40	10.36	10.27	6.37	8.29	9.09	....	9.24
22	10.36	10.39	10.42	10.43	10.39	10.37	10.04	6.09	8.38	9.09	....	9.25
23	10.35	10.39	10.42	10.44	10.40	10.37	9.79	6.94	8.48	9.09	....	9.26
24	10.35	10.39	10.42	10.45	10.39	10.36	9.79	7.67	8.52	9.10	....	9.26
25	10.35	10.40	10.43	10.45	10.39	10.35	8.78	8.03	8.56	9.11	....	9.26
26	10.35	10.41	10.43	10.45	10.39	10.35	8.21	8.26	8.62	9.12	....	9.23
27	10.35	10.39	.....	10.47	10.39	10.35	7.96	8.42	8.66	9.14	....	9.25
28	10.34	10.39	.....	10.46	10.39	10.34	8.43	8.55	8.70	9.13	....	9.26
29	10.34	10.39	.....	10.46	10.38	10.34	8.54	8.65	8.73	9.13	9.21	9.26
30	10.35	.....	.....	10.46	10.38	10.35	7.56	8.73	8.78	9.13	9.20	9.27
31	10.35	.....	.....	.....	10.38	.....	7.08	8.81	....	9.13	....	9.26

1A. Division of Water Resources, Kansas State Board of Agriculture. NW¼SW¼ sec. 3, T. 20 S., R. 33 W. Drilled observation well, diameter 7 inches, depth 69 feet. Measuring point, top of 7-inch galvanized-iron casing, south side at painted orange mark, 0.8 foot above land surface, 61.28 feet above arbitrary datum, 2,965.39 feet above sea level. Water level Aug. 16, 1940, 54.22 feet below measuring point, 7.06 feet above datum. Friez continuous automatic water-stage recorder maintained on well since Aug. 16, 1940. Water-level measurements supplied through courtesy of the Division of Water Resources.

Mean daily water level, in feet above datum, 1940
(from recorder charts)

Day	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	7.04	6.54	6.31	6.30
2	.....	7.03	6.52	6.31	6.30
3	.....	7.03	6.50	6.31	6.30
4	.....	7.03	6.48	6.31	6.30
5	.....	7.03	6.46	6.31	6.30
6	.....	7.02	6.44	6.30	6.30
7	.....	7.02	6.43	6.30	6.30
8	.....	7.01	6.42	6.30	6.31
9	.....	7.00	6.41	6.30	6.31
10	.....	6.98	6.40	6.30	6.31
11	.....	6.96	6.40	6.30	6.31
12	.....	6.94	6.39	6.30	6.31
13	.....	6.92	6.38	6.30	6.31
14	.....	6.90	6.38	6.30	6.31
15	.....	6.89	6.38	6.30	6.31
16	7.06	6.87	6.37	6.30	6.31
17	7.06	6.85	6.36	6.30	6.32
18	7.06	6.83	6.36	6.30	6.32
19	7.05	6.80	6.36	6.30	6.32

1A.--Continued.

Mean daily water level, in feet above datum, 1940
(from recorder charts)

Day	Aug.	Sept.	Oct.	Nov.	Dec.
20	7.05	6.78	6.35	6.30	6.32
21	7.05	6.76	6.35	6.30	6.32
22	7.05	6.74	6.34	6.30	6.33
23	7.05	6.72	6.34	6.30	6.33
24	7.04	6.69	6.33	6.30	6.33
25	7.04	6.67	6.33	6.30	6.33
26	7.04	6.64	6.33	6.30	6.33
27	7.04	6.62	6.32	6.30	6.34
28	7.04	6.60	6.32	6.30	6.34
29	7.04	6.58	6.32	6.30	6.34
30	7.04	6.56	6.32	6.30	6.34
31	7.04	....	6.31	....	6.34

2. E. E. Coffin. NE¼SE¼ sec. 25, T. 18 S., R. 33 W.

Mean daily water level, in feet above datum, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.29	11.49	11.62	11.80	11.95	11.52	11.38	11.18	10.85	10.58	10.26	9.96
2	11.29	11.50	11.63	11.81	11.95	11.52	11.37	11.17	10.83	10.57	10.24	9.95
3	11.30	11.50	11.64	11.81	11.95	11.51	11.37	11.16	10.82	10.57	10.23	9.95
4	11.30	11.50	11.64	11.82	11.95	11.50	11.38	11.15	10.81	10.56	10.22	9.94
5	11.31	11.50	11.65	11.82	11.94	11.49	11.38	11.14	10.79	10.56	10.21	9.94
6	11.32	11.51	11.66	11.83	11.93	11.48	11.38	11.14	10.78	10.55	10.20	9.94
7	11.33	11.51	11.67	11.84	11.92	11.48	11.37	11.13	10.77	10.55	10.19	9.93
8	11.33	11.52	11.67	11.84	11.90	11.47	11.37	11.12	10.76	10.53	10.18	9.93
9	11.34	11.53	11.68	11.84	11.87	11.46	11.37	11.11	10.75	10.52	10.17	9.92
10	11.35	11.53	11.68	11.85	11.84	11.46	11.35	11.09	10.74	10.51	10.16	9.92
11	11.36	11.54	11.69	11.85	11.82	11.46	11.35	11.08	10.73	10.50	10.15	9.91
12	11.37	11.54	11.70	11.86	11.80	11.45	11.34	11.07	10.72	10.50	.....	9.91
13	11.37	11.55	11.71	11.86	11.78	11.44	11.34	11.06	10.72	10.49	.....	9.91
14	11.38	11.55	11.71	11.87	11.76	11.44	11.33	11.05	10.71	10.48	.....	9.90
15	11.38	11.56	11.72	11.87	11.74	11.43	11.33	11.04	10.69	10.47	.....	9.90
16	11.40	11.57	11.72	11.88	11.72	11.43	11.33	11.03	10.68	10.46	.....	9.89
17	11.40	11.57	11.72	11.88	11.70	11.43	11.32	11.02	10.67	10.45	.....	9.89
18	11.41	11.57	11.73	11.88	11.68	11.43	11.30	11.00	10.67	10.44	.....	9.89
19	11.41	11.58	11.74	11.89	11.67	11.42	11.29	10.99	10.66	10.42	.....	9.89
20	11.42	11.58	11.74	11.89	11.66	11.42	11.28	10.98	10.65	10.41	.....	9.88
21	11.43	11.58	11.75	11.90	11.65	11.42	11.27	10.97	10.64	10.40	.....	9.88
22	11.43	11.58	11.75	11.90	11.64	11.42	11.27	10.95	10.63	10.39	.....	9.88
23	11.44	11.58	11.76	11.92	11.63	11.42	11.26	10.94	10.62	10.38	.....	9.88
24	11.44	11.59	11.76	11.92	11.60	11.41	11.25	10.93	10.61	10.37	.....	9.88
25	11.45	11.60	11.77	11.92	11.59	11.41	11.23	10.92	10.61	10.36	.....	9.89
26	11.45	11.60	11.77	11.93	11.58	11.40	11.23	10.91	10.60	10.35	.....	9.90
27	11.46	11.60	11.77	11.93	11.57	11.39	11.22	10.89	10.60	10.33	.....	9.90
28	11.46	11.61	11.78	11.93	11.56	11.38	11.21	10.88	10.60	10.32	.....	9.91
29	11.47	11.61	11.78	11.93	11.55	11.39	11.20	10.87	10.59	10.30	9.97	9.91
30	11.48	.....	11.79	11.94	11.54	11.38	11.20	10.86	10.58	10.28	9.96	9.91
31	11.49	.....	11.79	.....	11.53	.....	11.19	10.86	.....	10.27	.....	9.92

3. Claude Hughes. SW¼SW¼ sec. 21, T. 18 S., R. 33 W. Measuring point 3,021.29 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	70.28	Mar. 19	69.97	May 20	71.72	Nov. 16	71.43
Feb. 22	70.08	Apr. 18	69.86	Oct. 26	72.16	Dec. 31	71.00

4. W. N. Robinson. SE¼NW¼ sec. 31, T. 18 S., R. 34 W. Turbine pump pulled for repairs in Sept. 1940, and was reinstalled 1.17 feet lower than its original setting. New measuring point after Sept. 1940, top of ½-inch hole in pumphead base, at painted orange mark, 1.17 feet below old measuring point, 0.5 foot above land surface, 3,165.7 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	91.48	Apr. 18	91.48	July 25	91.45	Nov. 16	90.88
Feb. 23	91.48	May 20	91.44	Aug. 26	91.48	Dec. 31	90.55
Mar. 19	91.46	June 24	91.44	Sept.21	a90.47		

5. Mrs. Rosine Smith. SW¼NW¼ sec. 25, T. 19 S., R. 33 W. Measuring point 2,956.95 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 16	43.72	Apr. 18	44.29	July 25	44.66	Oct. 25	45.41
Feb. 22	44.02	May 20	44.42	Aug. 26	45.06	Nov. 15	45.30
Mar. 19	44.17	June 24	44.49	Sept.21	45.34	Dec. 31	45.72

6. American Life Insurance Co. NW¼SW¼ sec. 29, T. 19 S., R. 33 W. Measuring point 2,993.6 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 16	77.43	Apr. 18	76.88	Sept.21	80.35	Nov. 15	80.13
Feb. 22	77.20	May 20	77.06	Oct. 25	79.48	Dec. 31	79.49
Mar. 19	77.06	June 24	76.97				

8. Mrs. Rosine Smith. NW¼NW¼ sec. 35, T. 19 S., R. 33 W. Measuring point 2,962.90 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 16	50.04	Apr. 18	51.10	July 24	51.51	Oct. 25	52.17
Feb. 22	50.80	May 20	51.23	Aug. 26	51.71	Nov. 15	52.38
Mar. 19	51.00	June 24	51.39	Sept.21	51.88	Dec. 31	52.75

9. Mrs. Rosine Smith. SW¼SW¼ sec. 35, T. 19 S., R. 33 W. Measuring point 2,959.3 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 16	49.22	Apr. 18	48.94	July 24	50.36	Oct. 25	50.97
Feb. 22	49.10	May 20	49.54	Aug. 26	51.02	Nov. 15	51.47
Mar. 19	49.02	June 24	49.40	Sept.21	b52.17	Dec. 31	50.82

13. Mrs. Rosine Smith. SW¼SW¼ sec. 2, T. 20 S., R. 33 W. Measuring point 2,960.3 feet above sea level.

Water level, in feet below measuring point, 1940

Mar. 19	52.42	June 24	53.15	Sept.21	d57.49	Nov. 15	d55.93
Apr. 18	53.14	July 24	53.42	Oct. 25	54.77	Dec. 31	54.15
May 20	c55.08	Aug. 26	c56.87				

17. H. E. Trout. NE¼NW¼ sec. 30, T. 19 S., R. 32 W. New turbine pump installed in June 1940. New measuring point after June 1940, bottom edge of rectangular opening in the side of pumphead, at painted orange mark, 1.3 feet above old measuring point, 0.8 foot above land surface, 2,949.4 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 22	34.19	Apr. 18	34.31	Oct. 25	a36.41	Dec. 31	36.40
Mar. 19	34.24	May 20	34.86	Nov. 16	36.30		

a New measuring point.

b Irrigation well 300 yards south pumping.

c Irrigation well 200 yards southeast pumping.

d Nearby irrigation wells pumping.

19. J. Dyer. SE¼NE¼ sec. 12, T. 18 S., R. 33 W. Measuring point 2,964.32 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	46.89	Mar. 19	46.49	May 20	47.42	Nov. 16	48.42
Feb. 12	46.74	Apr. 18	46.38	Aug. 26	49.60	Dec. 31	48.11

23. SE¼SE¼ sec. 24, T. 18 S., R. 33 W. Measuring point 2,961.31 feet abcve sea level.

Water level, in feet below measuring point, 1940

Jan. 16	44.46	Apr. 18	43.35	July 25	45.42	Oct. 25	47.15
Feb. 22	44.06	May 20	44.95	Aug. 26	46.72	Nov. 16	46.72
Mar. 19	43.45	June 24	44.84	Sept.21	46.05	Dec. 31	45.33

24. Elvin Deng. SW¼SW¼ sec. 30, T. 18 S., R. 32 W. Measurements discontinued after pump was installed in Mar. 1940. Water levels, in feet below measuring point, 1940: Jan. 16, 35.36; Feb. 22, 35.24; Mar. 19, 35.12.

27. Anson Mark. NE¼NW¼ sec. 15, T. 18 S., R. 33 W. Measuring point 2,992.74 feet above sea level.

Water level, in feet below measuring point, 1940

Feb. 22	58.75	May 20	58.79	Aug. 26	58.94	Nov. 16	59.13
Mar. 19	58.78	June 24	58.83	Sept.21	58.99	Dec. 31	59.20
Apr. 18	58.77	July 25	58.88	Oct. 26	59.08		

32. E. J. Roark. NW¼SE¼ sec. 25, T. 19 S., R. 33 W. Measuring point 2,950.23 feet above sea level.

Lowest daily water level, in feet below measuring point, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	38.13	38.22	38.29	38.33	38.40	38.50	38.52	38.64	38.97	.....	39.25	39.25
2	38.12	38.22	38.29	38.34	38.40	38.50	38.52	38.65	38.98	.....	39.25	39.25
3	38.13	38.22	38.29	38.34	38.40	38.50	38.52	38.65	38.99	.....	39.25	39.25
4	38.13	38.23	38.29	38.34	38.40	38.50	38.51	38.66	39.01	.....	39.25	39.25
5	38.13	38.23	38.29	38.34	38.41	38.50	38.52	38.67	39.02	39.24	39.25	39.25
6	38.13	38.23	38.30	38.34	38.41	38.51	38.51	38.68	39.03	39.24	39.35	39.26
7	38.14	38.23	38.30	38.35	38.42	38.50	38.51	38.69	39.04	39.24	39.25	39.26
8	38.14	38.24	38.30	38.35	38.43	38.50	38.51	38.70	39.05	39.24	39.25	39.26
9	38.14	38.25	38.30	38.35	38.43	38.51	38.51	38.70	39.07	39.23	39.25	39.26
10	38.14	38.25	38.30	38.35	38.44	38.51	38.51	38.71	39.08	39.24	39.25	39.26
11	38.15	38.26	38.31	38.36	38.44	38.51	38.51	38.72	39.09	39.24	39.26	39.26
12	38.15	38.26	38.31	38.36	38.45	38.50	38.51	38.73	39.10	39.23	39.25	39.26
13	38.15	38.26	38.31	38.36	38.46	38.50	38.51	38.75	39.11	39.23	39.25	39.27
14	.....	38.26	38.31	38.36	38.46	38.50	38.51	38.76	39.12	39.23	39.25	39.27
15	.....	38.26	38.31	38.36	38.46	38.50	38.52	38.78	39.13	39.23	39.25	39.27
16	.....	38.26	38.31	38.37	38.47	38.50	38.52	38.79	39.14	39.24	39.25	39.27
17	.....	38.26	38.31	38.37	38.47	38.50	38.52	38.80	39.15	39.24	39.25	39.27
18	.....	38.26	38.32	38.37	38.48	38.50	38.52	38.82	39.16	39.24	39.25	39.28
19	.....	38.27	38.32	38.38	38.48	38.50	38.52	38.83	39.17	39.24	39.25	39.28
20	38.18	38.27	38.32	38.38	38.48	38.50	38.52	38.85	39.18	39.24	39.25	39.28
21	38.18	38.28	38.32	38.38	38.49	38.51	38.53	38.86	39.19	39.24	39.25	39.29
22	38.18	38.27	38.32	38.39	38.49	38.51	38.54	38.87	39.20	39.24	39.25	39.29
23	38.19	38.28	38.32	38.39	38.49	38.51	38.55	38.89	39.21	39.24	39.25	39.29
24	38.19	38.28	38.32	38.39	38.49	38.51	38.57	38.90	39.23	39.24	39.25	39.29
25	38.19	38.28	38.32	38.39	38.49	38.50	38.58	38.91	39.23	39.24	39.25	39.29
26	38.19	38.28	38.32	38.39	38.49	38.49	38.59	38.92	39.24	39.25	39.25	39.29
27	38.19	38.29	38.32	38.39	38.50	38.49	38.60	38.92	.....	39.25	39.25	39.29
28	38.19	38.29	38.33	38.39	38.50	38.50	38.61	38.93	.....	39.25	39.25	39.29
29	38.20	38.29	38.33	38.39	38.50	38.50	38.62	38.94	.....	39.25	39.25	39.29
30	38.20	.....	38.33	38.39	38.50	38.51	38.62	38.95	.....	39.25	39.25	39.29
31	38.21	.....	38.33	.....	38.50	.....	38.63	38.96	.....	39.25	.....	39.29

33. American Life Insurance Co. NE¼SW¼ sec. 31, T. 19 S., R. 33 W. Measuring point 2,999.46 feet above sea level.

Lowest daily water level, in feet below measuring point, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	73.73	73.87	73.98	74.09	74.19	74.28	74.37	74.44	74.54	.....	74.80	74.94
2	73.73	73.87	74.00	74.09	74.19	74.28	74.37	74.44	74.54	.....	74.80	74.95
3	73.74	73.88	74.01	74.10	74.19	74.28	74.37	74.45	74.55	.....	74.80	74.95
4	73.75	73.88	74.01	74.10	74.20	74.28	74.37	74.45	74.55	.....	74.82	74.96
5	73.75	73.89	74.01	74.10	74.20	74.28	74.37	74.46	74.55	74.67	74.82	74.96
6	73.75	73.89	74.02	74.10	74.20	74.29	74.37	74.46	74.55	74.68	74.83	74.97
7	73.76	73.89	74.02	74.11	74.21	74.30	74.37	74.47	74.55	74.68	74.83	74.97
8	73.76	73.90	74.02	74.11	74.22	74.31	74.37	74.48	74.56	74.68	74.83	74.97
9	73.77	73.90	74.03	74.11	74.22	74.31	74.38	74.48	74.56	74.69	74.84	74.98
10	73.77	73.91	74.03	74.12	74.22	74.31	74.38	74.48	74.57	74.69	74.85	74.98
11	73.78	73.92	74.04	74.13	74.22	74.32	74.39	74.49	74.57	74.70	74.86	74.98
12	73.78	73.92	74.04	74.13	74.22	74.32	74.39	74.49	74.57	74.70	74.86	74.99
13	73.79	73.92	74.05	74.13	74.23	74.32	74.39	74.49	74.58	74.70	74.87	74.99
14	73.79	73.93	74.05	74.13	74.24	74.32	74.39	74.50	74.58	74.71	74.87	75.00
15	.....	73.94	74.05	74.13	74.24	74.32	74.39	74.50	74.59	74.72	74.87	75.00
16	.....	73.94	74.05	74.14	74.24	74.32	74.40	74.51	74.59	74.72	74.87	75.01
17	.....	73.94	74.06	74.14	74.25	74.33	74.40	74.51	74.59	74.73	74.87	75.01
18	.....	73.95	74.06	74.15	74.25	74.33	74.40	74.51	74.60	74.73	74.88	75.02
19	.....	73.95	74.06	74.15	74.25	74.33	74.40	74.51	74.60	74.73	74.88	75.02
20	73.82	73.95	74.06	74.15	74.26	74.33	74.40	74.51	74.61	74.74	74.88	75.02
21	73.82	73.96	74.07	74.16	74.26	74.33	74.41	74.51	74.61	74.74	74.89	75.03
22	73.82	73.96	74.07	74.16	74.26	74.34	74.41	74.51	74.61	74.75	74.89	75.03
23	73.83	73.97	74.08	74.16	74.27	74.35	74.41	74.52	74.62	74.75	74.90	75.03
24	73.83	73.97	74.08	74.16	74.27	74.35	74.41	74.51	74.63	74.76	74.90	75.04
25	73.84	73.97	74.08	74.17	74.27	74.35	74.42	74.51	74.64	74.76	74.91	75.04
26	73.84	73.98	74.08	74.17	74.27	74.35	74.42	74.52	74.64	74.76	74.92	75.04
27	73.85	73.98	74.08	74.18	74.28	74.35	74.42	74.52	74.64	74.77	74.92	75.04
28	73.85	73.98	74.09	74.18	74.28	74.35	74.43	74.52	74.65	74.78	74.93	75.04
29	73.85	73.98	74.09	74.18	74.28	74.36	74.43	74.53	.....	74.78	74.93	75.04
30	73.86	.....	74.09	74.19	74.28	74.36	74.44	74.53	.....	74.79	74.94	75.05
31	73.86	.....	74.09	.....	74.28	.....	74.44	74.54	.....	74.80	.....	75.05

34. H. M. A. Hess et al. SW¼SW¼ sec. 19, T. 18 S., R. 34 W. Measuring point 3,158.06 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	83.96	Apr. 18	83.93	July 25	83.91	Oct. 25	83.92
Feb. 23	83.98	May 20	83.95	Aug. 26	83.94	Nov. 15	83.93
Mar. 19	83.98	June 24	83.92	Sept.21	83.94	Dec. 31	83.93

35. Mrs. Lily Miller. SE¼SE¼ sec. 18, T. 16 S., R. 34 W. Measuring point 3,158.89 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 15	117.59	Apr. 18	117.80	July 25	117.78	Oct. 25	117.78
Feb. 23	117.82	May 20	117.78	Aug. 26	117.79	Nov. 16	117.83
Mar. 19	117.75	June 24	117.76	Sept.21	117.80	Dec. 31	117.81

36. Henry S. Mix. SE¼NE¼ sec. 11, T. 16 S., R. 34 W. Measuring point 3,109.25 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 15	126.29	Apr. 18	126.27	July 25	126.19	Oct. 25	126.27
Feb. 23	126.27	May 20	126.32	Aug. 26	126.28	Nov. 16	126.32
Mar. 19	126.29	June 24	126.19	Sept.21	126.24	Dec. 31	126.31

37. Joseph Hickey estate. NE¼SW¼ sec. 16, T. 17 S., R. 33 W. Measuring point 3,038.98 feet above sea level.

Water level, in feet below measuring point, 1940

Mar. 19	98.13	June 24	98.62	Sept.21	98.87	Nov. 16	98.60
Apr. 18	98.38	July 25	98.69	Oct. 25	98.27	Dec. 31	98.66
May 20	98.61						

38. Brandt. NE¼SE¼ sec. 24, T. 17 S., R. 33 W. Measuring point 2,987.63 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	72.40	Apr. 18	72.24	July 25	72.53	Oct. 25	72.52
Feb. 12	72.85	May 20	72.51	Aug. 26	72.50	Nov. 16	72.55
Mar. 19	72.42	June 24	72.49	Sept.21	72.53	Dec. 31	72.87

39. Henry F. Poos estate. NE¼NE¼ sec. 26, T. 18 S., R. 31 W. Measuring point 2,916.77 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	69.23	Apr. 18	69.24	July 25	69.25	Oct. 25	69.23
Feb. 22	69.22	May 20	69.23	Aug. 26	69.23	Nov. 15	69.24
Mar. 19	69.24	June 24	69.22	Sept.21	69.22	Dec. 31	69.32

40. Michael McLaughlin. SW¼NW¼ sec. 2, T. 17 S., R. 31 W. Measuring point 2,913.49 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	111.13	Apr. 18	111.30	July 25	111.26	Oct. 25	111.19
Feb. 22	111.19	May 20	111.27	Aug. 27	111.29	Nov. 15	111.18
Mar. 19	111.29	June 24	111.27	Sept.21	111.29	Dec. 31	111.28

41. Almada King. NW¼NW¼ sec. 12, T. 17 S., R. 32 W. Measuring point 2,982.42 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	131.78	Apr. 18	131.79	July 25	131.78	Oct. 25	131.78
Feb. 22	131.75	May 20	131.58	Aug. 27	a131.16	Nov. 15	131.80
Mar. 12	131.76	June 24	131.78	Sept.21	131.81	Dec. 31	131.22

42. Mrs. Rosine Smith. SW¼NW¼ sec. 26, T. 19 S., R. 33 W. Measuring point 2,966.26 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 22	54.70	May 20	55.02	Aug. 26	55.53	Nov. 15	58.75
Mar. 19	54.80	June 24	55.22	Sept.21	55.79	Dec. 31	56.78
Apr. 18	54.98	July 24	55.26	Oct. 25	56.14		

44. Melchior Lang. SW¼NE¼ sec. 2, T. 20 S., R. 34 W. Measuring point 3,013.75 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 19	68.36	June 24	68.69	Sept.21	69.12	Nov. 15	69.13
Apr. 18	68.38	July 24	68.80	Oct. 25	69.20	Dec. 31	68.90
May 20	68.52	Aug. 26	69.06				

45. M. E. Halley. SW¼SW¼ sec. 7, T. 19 S., R. 32 W. Measurements discontinued after pump and pump jack were installed in Mar. 1940. Measuring point, 2,936.03 feet above sea level. Water levels, in feet below measuring point, 1940: Jan. 16, 21.12; Feb. 22, 21.13; Mar. 19, 21.12.

47. V. M. Harris (Federal Land Bank, Wichita, Kansas.) SE¼NW¼ sec. 29, T. 18 S., R. 32 W. Measuring point 2,949.5 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 22	32.92	May 20	33.18	Aug. 26	34.27	Nov. 16	b41.59
Mar. 19	32.97	June 24	32.62	Sept.21	b41.30	Dec. 31	34.88
Apr. 18	32.99	July 25	b33.64	Oct. 25	35.15		

48. P. Roark. NE¼NE¼ sec. 25, T. 20 S., R. 33 W. Measuring point 2,929.09 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	32.66	Apr. 18	32.72	July 24	32.50	Oct. 25	32.75
Feb. 22	32.68	May 20	32.71	Aug. 26	32.67	Nov. 15	32.77
Mar. 19	32.69	June 24	32.41	Sept.21	32.74	Dec. 31	32.59

a Surface water entered well.
b New irrigation well 30 feet south pumping.

49. Geo. M. Crofton. SE¼NE¼ sec. 22, T. 20 S., R. 31 W. Measuring point, 2,875.20 feet above sea level. Water levels, in feet below measuring point, 1940: Jan. 12, 35.02; Feb. 22, 35.05; Oct. 25, 34.91; Nov. 15, 34.96.

50. F. M. Houstin. SW¼SE¼ sec. 28, T. 19 S., R. 32 W. Measuring point 3,010.36 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	98.48	Apr. 18	98.48	July 25	98.42	Oct. 25	98.30
Feb. 22	98.42	May 20	98.44	Aug. 26	98.39	Nov. 15	98.19
Mar. 19	98.44	June 24	98.43	Sept.21	98.36	Dec. 31	98.20

54. B. B. Harkness. SE cor. sec. 10, T. 20 S., R. 31 W. Unused drilled well, diameter 8 inches, depth 44 feet. Measuring point, top of casing, north side at painted orange mark, 0.55 foot above land surface, 2,876.64 feet above sea level.

Water level, in feet below measuring point, 1940

May 20	38.59	July 25	38.57	Sept.21	38.56	Nov. 15	38.44
June 24	38.59	Aug. 26	38.56	Oct. 25	38.44	Dec. 31	38.39

55. J. U. Hushaw. NW cor. sec. 7, T. 19 S., R. 32 W. Drilled stock well equipped with pump and windmill, diameter 6 inches, depth 33 feet. Measuring point, top of casing, west side at painted orange mark, 0.4 foot above land surface, 2,936.9 feet above sea level.

Water level, in feet below measuring point, 1940

May 20	17.73	Aug. 26	17.98	Oct. 25	18.46	Dec. 31	18.69
July 25	18.05	Sept.21	18.14	Nov. 16	18.69		

SEDGWICK COUNTY

By S. W. Lohman, G. H. von Hein, and C. C. Williams

The observation-well program in south-central Kansas [1/], including Sedgwick County, was continued in 1940 by the Federal and State Geological Surveys, in cooperation with the city of Wichita, the Division of Sanitation of the Kansas State Board of Health and the Division of Water Resources of the Kansas State Board of Agriculture.

In 1940 a preliminary report was published on the geology and ground-water resources of the "Equus Beds" area, including Harvey County, and a detailed report on the same area is in preparation. In September 1940, pumping was discontinued in the old well field of the Wichita Water Company at Wichita, and the new well field of the city of Wichita in Harvey County was put into operation.

At the beginning of 1940, 29 wells in Sedgwick County were under observation. During the year weekly observations were begun in well 840 and monthly observations were begun in well 870. At the end of the year 31 wells were under observation, including 21 wells observed once a month, 7 wells observed once a week, and 3 wells equipped with automatic water-stage recorders. A total of 734 wetted-tape measurements was made in 1940.

1/ See Water-Supply Papers 840, 845, and 886.

Mr. G. H. von Hein made all measurements of water level and serviced the recorders. The well descriptions and water-level measurements given in this report were compiled by Charles C. Williams.

According to records of the United States Weather Bureau, the precipitation at Wichita in 1940 was 36.77 inches, which is 6.61 inches above normal. In spite of the above-normal precipitation, the water levels in 21 of the 29 wells not affected by pumping declined during the year by amounts ranging from 0.07 foot to 1.12 feet. The water levels in 8 of the wells, however, rose 0.08 foot to 1.12 feet during the year. The water level in well 26 rose 8.17 feet during the year because of the fact that pumping in an adjacent well field was discontinued after September 1940. The water level in well 307 declined 2.18 feet during the year owing partly to pumping in a nearby well field beginning in September 1940.

During the period of record from 1937 or 1938 through 1940, the water levels in 23 of the 29 wells not affected by pumping declined 0.23 foot to 2.57 feet, but the water levels in 6 wells rose 0.01 foot to 1.24 feet.

The fluctuations of water level in observation wells in Sedgwick County are summarized in the following table.

Highest and lowest water levels for period of record in 31 wells in Sedgwick County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
11	60.01	Oct. 3, 1939	61.84	July 4, 1938
12	19.84	Sept.25, 26, 27-30, 1938	21.98	Apr. 1, 2, 8, 9, 11, 12, 1938
26	15.66	June 28, 1938	26.18	Jan. 29, 1940
28	17.24	July 4, 1938	20.78	Feb. 1, 1938
307	12.59	June 15, 1940	15.65	Apr. 1, 1938
800	18.76	Aug. 27, 1938	20.69	Apr. 3, 1940
802	4.78	Sept. 6, 1940	7.71	Nov. 2, 1939
804	2.69	Aug. 16, 1938	4.78	Dec. 5, 1939
805	6.41	Aug. 17, 1938	8.98	Dec. 3, 1940
806	16.89	Sept. 6, 1939	18.11	Nov. 5, 1940
807	22.02	Nov. 2, 1939	24.03	Dec. 3, 1940
808	21.04	Nov. 2, 1938	24.44	Aug. 19, 1938
809	14.98	Oct. 29, 1938	18.19	Dec. 3, 1940
810	11.82	July 1, 1939	14.68	Aug. 30, 1940
811	7.83	Sept.24, 1938	9.96	Nov. 22, 1940
812	11.57	Nov. 5, 1938	13.41	Nov. 15, 22, 1940
813	17.17	Dec. 2, 1938	18.31	Nov. 5, 1940
814	16.64	Dec. 2, 1938	18.11	Dec. 3, 1940
815	14.40	Sept. 1, 1939	15.44	Dec. 13, 20, 1940

Highest and lowest water levels for period of record in 31 wells in Sedgwick County--Continued.

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
816	11.27	Aug. 18, 1939	13.48	Apr. 15, 1939
825	13.86	Apr. 30, 1939	15.53	Nov. 5, 1940
826	12.26	Sept. 7, 1938	14.01	Nov. 4, 1940
830	26.12	Sept. 9, 1938	30.62	Oct. 3, 1940
834	10.99	July 5, 1939	13.20	Oct. 3, 1940
838	25.79	Sept. 6, 1939	27.91	Nov. 5, 1940
840	11.23	May 24, 1940	13.67	Nov. 22, 1940
842	6.21	June 4, 1940	8.57	Nov. 5, 1940
845	15.00	Sept. 6, 1940	16.95	Apr. 3, 1940
846	17.08	Nov. 11, 1938	18.35	Apr. 3, 1940
847	17.15	Nov. 11, 1938	18.59	Apr. 3, 1940
870	8.12	July 3, 1940	10.80	Nov. 5, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 31 wells in Sedgwick County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
11	1.83	-0.44	+0.01
12	2.14	- .40	+ .26
26	10.52	a+8.17	a+3.37
28	3.54	+ .54	+ .78
307	3.06	b-2.18	b-2.24
800	1.93	- .07	-1.61
802	2.93	+ .68	-1.50
804	2.09	+1.12	- .74
805	2.57	-1.12	-2.57
806	1.22	- .47	- .23
807	2.01	- .75	- .74
808	3.40	- .41	+ .08
809	3.21	- .35	-1.93
810	2.86	+ .08	-2.12
811	2.13	+ .12	+1.24
812	1.84	- .36	-1.11
813	1.14	- .41	- .50
814	1.47	- .60	-1.28
815	1.04	- .39	- .73
816	2.21	- .97	-1.15
825	1.67	- .67	-1.19
826	1.75	- .34	-1.54
830	4.50	- .74	-4.32
834	2.21	- .37	-1.00
838	2.12	-1.06	-1.49
840	2.44	- .46	- .92
842	2.36	- .35	- .62
845	1.95	+ .38	+ .35
846	1.27	+ .47	- .72
847	1.44	+ .14	-1.26
870	2.68	- .38	-1.44

11. J. H. Heim. SE cor. sec. 22, T. 26 S., R. 3 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	60.29	Apr. 3	60.43	July 3	60.35	Oct. 3	60.56
Feb. 1	60.34	May 2	60.35	Aug. 1	60.32	Nov. 5	60.68
Mar. 11	60.37	June 4	60.36	Sept. 6	60.43	Dec. 3	60.73

a Recovery resulting from cessation of pumping in nearby well field.
b Drawdown resulting from pumping in nearby well field.

12. Dr. A. D. Updegraph. NW¼SE¼ sec. 26, T. 25 S., R. 1 W.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.94	21.06	21.07	21.13	21.07	20.63	20.83	21.06	21.19	21.05	21.26	21.32
2	20.94	21.07	21.07	21.12	21.06	20.63	20.84	21.06	21.20	21.06	21.26	21.31
3	20.93	21.05	21.09	21.15	21.05	20.64	20.85	21.07	21.20	21.06	21.26	21.31
4	20.95	21.03	21.08	21.16	21.04	20.66	20.86	21.10	21.21	21.08	21.27	21.29
5	20.94	21.04	21.08	21.18	21.04	20.67	20.88	21.09	21.20	21.09	21.28	21.29
6	.....	21.04	21.04	21.15	21.05	20.67	20.88	21.10	21.16	21.11	21.28	21.28
7	.....	21.04	21.05	21.15	21.05	20.67	20.88	21.10	21.12	21.12	21.29	21.29
8	.....	21.07	21.06	21.18	21.06	20.66	20.88	21.11	21.09	21.10	21.27	21.28
9	.....	21.07	21.04	21.18	21.06	20.68	20.89	21.11	21.05	21.12	21.26	21.29
10	.....	21.06	21.06	21.18	21.01	20.69	20.90	21.11	21.05	21.13	21.26	21.31
11	.....	21.06	21.04	21.20	20.97	20.69	20.90	21.11	21.04	21.15	21.29	21.30
12	.....	21.08	21.07	21.20	20.91	20.69	20.90	21.11	21.02	21.14	21.30	21.32
13	.....	21.09	21.08	21.16	20.88	20.70	20.91	21.11	20.99	21.15	21.30	21.32
14	.....	21.08	21.08	21.14	20.85	20.71	20.91	21.11	20.99	21.17	21.30	21.33
15	.....	21.07	21.06	21.15	20.83	20.71	20.92	21.12	20.99	21.18	21.29	21.32
16	.....	21.09	21.06	21.16	20.81	20.72	20.93	21.13	20.99	21.17	21.28	21.33
17	.....	21.08	21.05	21.20	20.79	20.73	20.94	21.14	20.99	21.19	21.29	21.34
18	.....	21.07	21.09	21.20	20.77	20.73	20.95	21.15	20.99	21.18	21.28	21.32
19	.....	21.08	21.08	21.16	20.76	20.74	20.95	21.15	21.00	21.20	21.31	21.33
20	.....	21.09	21.10	21.15	20.73	20.75	20.96	21.15	21.01	21.21	21.31	21.33
21	.....	21.10	21.11	21.12	20.69	20.75	20.97	21.14	21.03	21.21	21.30	21.33
22	.....	21.11	21.11	21.09	20.68	20.76	20.98	21.15	21.01	21.22	21.33	21.32
23	.....	21.08	21.13	21.10	20.66	20.77	20.98	21.15	21.00	21.22	21.33	21.32
24	.....	.....	21.13	21.10	20.63	20.78	20.99	21.15	21.03	21.22	21.33	21.30
25	.....	.....	21.13	21.08	20.63	20.78	20.99	21.15	21.05	21.23	21.32	21.32
26	21.04	21.05	21.11	21.08	20.63	20.79	21.00	21.15	21.04	21.24	21.33	21.34
27	21.02	21.09	21.09	21.08	20.63	20.81	21.01	21.16	21.03	21.23	21.34	21.33
28	21.02	21.10	21.13	21.06	20.63	20.82	21.02	21.17	21.05	21.25	21.31	.....
29	21.04	21.09	21.13	21.06	20.63	20.83	21.03	21.18	21.06	21.26	21.29	.....
30	21.04	.....	21.13	21.07	20.63	20.81	21.04	21.19	21.06	21.25	21.31	21.35
31	21.03	.....	21.12	.....	20.63	.....	21.05	21.19	.....	21.26	.....	21.34

26. Wichita Water Co. SW¼ sec. 18, T. 27 S., R. 1 W.

Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	24.19	26.10	24.88	24.74	23.69	21.56	23.00	25.60	22.44	16.35	16.45	16.16
2	24.59	26.03	24.86	24.72	23.67	21.57	23.02	25.61	21.23	16.33	16.45	16.13
3	24.84	25.96	24.84	24.72	23.66	21.73	22.64	25.63	20.42	16.34	16.44	16.13
4	24.96	25.83	24.79	24.84	23.69	22.08	22.64	24.88	19.76	16.42	16.48	16.13
5	25.05	25.79	24.70	24.88	23.69	22.36	21.53	24.38	19.08	16.44	16.50	16.13
6	25.08	25.70	24.70	24.83	23.68	22.46	22.02	24.32	18.54	16.46	16.48	16.13
7	25.00	25.66	24.70	24.83	23.71	22.30	22.06	24.18	18.22	16.46	16.40	16.14
8	24.98	25.63	24.63	24.48	23.72	22.20	21.89	24.16	17.92	16.41	16.34	16.12
9	25.20	25.58	24.60	24.52	23.58	22.16	21.83	24.01	17.72	16.44	16.30	16.15
10	25.32	25.54	24.60	24.59	23.56	21.30	21.96	23.99	17.52	16.46	16.30	16.17
11	25.40	25.50	24.26	24.62	23.46	21.40	22.28	23.89	17.28	16.46	16.36	16.15
12	25.45	25.29	24.38	24.63	23.28	20.90	22.46	23.63	16.95	16.45	16.38	16.17
13	.....	25.27	.....	24.65	22.27	20.04	22.49	23.86	16.78	16.46	16.40	16.18
14	.....	25.24	.....	24.65	22.27	20.08	22.59	23.97	16.72	16.51	16.42	16.22
15	.....	25.19	24.66	24.63	22.25	20.38	22.71	23.97	16.70	16.50	16.40	16.22
16	.....	25.15	24.66	24.59	22.32	20.52	22.96	23.92	16.67	16.48	16.36	16.29
17	.....	25.12	24.64	24.60	22.38	20.80	23.11	23.86	16.65	16.50	16.35	16.30
18	.....	25.11	24.30	24.46	22.37	21.34	23.49	23.86	16.63	16.48	16.30	16.26
19	.....	24.90	24.48	24.46	21.92	21.17	23.80	22.80	16.60	16.46	16.30	16.25
20	.....	25.01	24.54	24.42	21.63	21.29	23.89	23.57	16.55	16.46	16.29	16.24
21	.....	25.04	24.58	24.35	21.62	21.55	23.70	23.77	16.57	16.47	16.23	16.21
22	25.60	25.02	24.57	24.00	21.46	21.66	23.75	23.89	16.56	16.47	16.23	16.15
23	25.72	24.96	24.58	24.05	21.28	21.66	23.91	23.98	16.56	16.47	16.24	16.11
24	25.79	25.01	24.59	24.02	20.88	21.72	24.28	24.05	16.60	16.46	16.23	16.08
25	25.80	25.02	24.18	24.08	20.88	22.04	24.62	24.08	16.56	16.46	16.21	16.07
26	25.98	24.97	24.40	24.08	20.64	22.33	24.82	24.14	16.52	16.47	16.17	16.09
27	26.14	24.94	24.52	23.90	20.85	22.53	25.02	24.16	16.53	16.45	16.15	16.07
28	26.16	24.94	24.58	23.68	21.02	22.64	25.13	24.16	16.44	16.47	16.11	.....
29	26.18	24.92	24.58	23.55	21.26	22.80	25.20	24.14	16.42	16.49	16.10	.....
30	26.14	.....	24.68	23.69	21.32	22.91	25.36	24.07	16.40	16.46	16.15	16.01
31	26.14	.....	24.74	.....	21.41	.....	25.48	24.07	.....	16.45	.....	16.02

28. Ada M. Davis et al. NE¼NW¼NE¼ sec. 1, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	19.75	Apr. 3	19.18	July 2	18.78	Oct. 3	19.88
Feb. 1	19.70	May 2	18.69	Aug. 1	19.73	Nov. 5	19.83
Mar. 11	19.02	June 4	17.86	Sept. 3	20.06	Dec. 3	19.21

307. J. R. Clark. NW¼NW¼SW¼ sec. 1, T. 25 S., R. 2 W.
Lowest daily water level, in feet below measuring point, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.10	13.27	13.13	13.31	13.15	12.90	12.83	13.33	13.66	14.12	14.92	14.92
2	13.10	13.28	13.17	13.30	13.13	12.90	12.84	13.35	13.68	14.16	14.94	14.92
3	13.08	13.25	13.19	13.35	13.11	12.90	12.86	13.36	13.69	14.20	14.96	14.92
4	13.11	13.21	13.20	13.38	13.10	12.94	12.88	13.37	13.68	14.26	14.97	14.96
5	13.11	13.23	13.19	13.40	13.13	12.96	12.88	13.39	13.65	14.28	14.96	14.97
6	.....	13.24	13.17	13.37	13.14	12.97	12.89	13.39	13.67	14.29	14.95	14.98
7	.....	13.23	13.20	13.33	13.15	12.97	12.91	13.39	13.67	14.30	14.94	14.99
8	.....	13.28	13.21	13.36	13.16	12.98	12.93	13.39	13.67	14.32	14.93	14.99
9	.....	13.28	13.20	13.36	13.14	13.00	12.95	13.38	13.76	14.42	14.91	15.03
10	.....	13.26	13.21	13.38	13.10	12.99	12.96	13.38	13.79	14.45	14.90	15.05
11	.....	13.24	13.20	13.41	13.10	12.76	12.99	13.38	13.77	14.47	14.92	15.07
12	.....	13.28	13.25	13.41	13.09	12.66	13.02	13.40	13.79	14.51	14.92	15.11
13	.....	13.28	13.26	13.36	13.09	12.62	13.02	13.42	13.80	14.52	14.94	15.15
14	.....	13.27	13.27	13.34	13.12	12.60	13.03	13.45	13.80	14.59	14.94	15.16
15	.....	13.26	13.25	13.33	13.13	12.59	13.05	13.44	13.80	14.64	14.92	15.15
16	.....	13.29	13.24	13.35	13.12	12.60	13.06	13.44	13.86	14.67	14.95	15.14
17	.....	13.28	13.23	13.37	13.10	12.62	13.08	13.45	13.89	14.71	14.96	15.15
18	.....	13.27	13.27	13.34	13.05	12.61	13.11	13.46	13.87	14.74	14.96	15.15
19	.....	13.30	13.27	13.25	12.98	12.61	13.13	13.46	13.90	14.73	14.98	15.15
20	.....	13.31	13.27	13.23	12.90	12.62	13.14	13.47	13.93	14.71	14.99	15.17
21	.....	13.31	13.28	13.21	12.88	12.63	13.16	13.47	13.95	14.71	14.98	15.17
22	.....	13.33	13.29	13.18	12.88	12.63	13.17	13.49	13.94	14.72	14.99	15.16
23	.....	13.29	13.31	13.22	12.88	12.67	13.18	13.51	13.98	14.79	15.00	15.16
24	.....	.....	13.33	13.22	12.86	12.67	13.19	13.51	14.04	14.78	14.98	15.17
25	.....	.....	13.32	13.20	12.87	12.67	13.21	13.52	14.10	14.76	14.97	15.18
26	13.24	13.19	13.29	13.21	12.87	12.68	13.23	13.53	14.15	14.77	14.93	15.20
27	.....	13.21	13.26	13.20	12.88	12.73	13.24	13.54	14.13	14.77	14.93	15.19
28	.....	13.19	13.30	13.17	12.88	12.79	13.27	13.55	14.14	14.77	14.90	.....
29	13.24	13.18	13.32	13.15	12.89	12.80	13.29	13.57	14.15	14.77	14.88	.....
30	13.25	.....	13.31	13.15	12.89	12.81	13.30	13.59	14.13	14.82	14.91	15.25
31	13.24	.....	13.31	.....	12.89	.....	13.32	13.60	.....	14.86	.....	15.28

800. City of Wichita. SW cor. sec. 33, T. 26 S., R. 1 E.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	20.30	Apr. 3	20.69	July 2	19.63	Oct. 3	20.02
Feb. 2	20.45	May 2	20.62	Aug. 1	19.86	Nov. 5	20.27
Mar. 11	20.58	June 4	19.78	Sept. 5	20.01	Dec. 3	20.37

802. City of Wichita. NW cor. sec. 1, T. 27 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	7.66	May 2	6.17	Aug. 1	7.24	Nov. 5	7.54
Mar. 11	7.11	June 4	5.98	Sept. 6	4.78	Dec. 3	6.98
Apr. 3	7.35	July 3	6.50	Oct. 3	7.11		

804. City of Wichita. SE cor. sec. 16, T. 26 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	4.55	Apr. 3	4.06	July 3	3.43	Oct. 3	3.85
Feb. 2	4.60	May 2	3.24	Aug. 1	4.46	Nov. 5	4.18
Mar. 11	3.91	June 4	3.14	Sept. 6	3.44	Dec. 3	3.43

805. City of Wichita. NW cor. NE¼ sec. 19, T. 26 S., R. 1 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	7.86	Apr. 3	7.70	July 3	7.75	Oct. 3	7.70
Feb. 1	7.82	May 2	7.08	Aug. 1	8.61	Nov. 5	7.99
Mar. 11	7.43	June 4	7.20	Sept. 6	7.18	Dec. 3	8.98

806. City of Wichita. NW cor. SW¼ sec. 15, T. 26 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	17.56	Apr. 3	17.64	July 3	17.30	Oct. 3	17.96
Feb. 6	17.58	May 2	17.38	Aug. 1	17.72	Nov. 5	18.11
Mar. 11	17.50	June 4	17.11	Sept. 6	17.86	Dec. 3	18.03

807. City of Wichita. NW cor. sec. 10, T. 26 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	23.28	Apr. 3	23.38	July 3	22.93	Oct. 3	23.80
Feb. 6	23.44	May 2	23.30	Aug. 1	23.28	Nov. 5	24.01
Mar. 11	23.34	June 4	22.82	Sept. 6	23.65	Dec. 3	24.03

808. City of Wichita. SW cor. NW¼ sec. 18, T. 26 S., R. 2 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	23.95	Apr. 3	24.02	July 3	23.76	Oct. 3	24.18
Feb. 1	23.99	May 2	23.93	Aug. 1	23.93	Nov. 5	24.34
Mar. 11	23.96	June 4	23.75	Sept. 6	24.11	Dec. 3	24.36

809. City of Wichita. NW cor. sec. 21, T. 26 S., R. 1 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	17.84	Apr. 3	18.15	July 2	16.68	Oct. 3	17.81
Feb. 2	18.04	May 2	17.75	Aug. 1	17.31	Nov. 5	18.12
Mar. 11	18.00	June 4	16.70	Sept. 5	17.72	Dec. 3	18.19

810. City of Wichita. NE cor. SE¼ sec. 35, T. 25 S., R. 1 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	14.40	Apr. 26	14.08	July 19	14.40	Oct. 11	14.59
Feb. 2	14.40	May 3	14.01	26	14.50	18	14.44
9	14.42	10	13.38	Aug. 2	14.61	25	14.51
16	14.39	17	13.30	9	14.66	Nov. 1	14.55
23	14.30	24	13.10	16	14.63	8	14.57
Mar. 1	14.24	31	13.44	23	14.64	15	14.56
8	14.18	June 7	13.64	30	14.68	22	14.54
15	14.21	14	13.75	Sept. 6	13.68	29	14.28
22	14.28	21	13.87	13	13.83	Dec. 6	14.27
29	14.36	28	14.05	20	14.09	13	14.33
Apr. 5	14.42	July 5	14.17	27	14.20	20	14.37
12	14.44	12	14.30	Oct. 4	14.30	30	14.32
19	14.13						

811. City of Wichita. SE cor. sec. 33, T. 25 S., R. 1 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	9.83	Apr. 26	9.61	July 19	9.59	Oct. 11	9.69
Feb. 2	9.84	May 3	9.56	26	9.65	18	9.78
9	9.84	10	9.34	Aug. 2	9.78	25	9.82
16	9.77	17	9.35	9	9.82	Nov. 1	9.87
26	9.70	24	9.20	16	9.83	8	9.91
Mar. 1	9.66	31	9.20	23	9.88	15	9.94
8	9.67	June 7	9.24	30	9.84	22	9.96
15	9.70	14	9.26	Sept. 6	9.32	29	9.71
22	9.72	21	9.28	13	9.34	Dec. 6	9.68
29	9.71	28	9.34	20	9.45	13	9.72
Apr. 5	9.77	July 5	9.43	27	9.52	20	9.70
12	9.79	12	9.51	Oct. 4	9.61	30	9.71
19	9.62						

812. City of Wichita. NW cor. sec. 27, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	13.02	Apr. 26	13.06	July 19	12.97	Oct. 11	13.29
Feb. 2	13.05	May 3	9.56	26	13.02	18	13.31
9	13.08	10	12.80	Aug. 2	13.09	25	13.35
16	13.08	17	12.80	9	13.12	Nov. 1	13.38
26	13.00	24	12.47	16	13.16	8	13.40
Mar. 1	12.98	31	12.60	23	13.19	15	13.41
8	13.04	June 7	12.63	30	13.24	22	13.41
15	13.06	14	12.62	Sept. 6	13.14	29	13.29
22	13.11	21	12.70	13	13.12	Dec. 6	13.29
29	13.15	28	12.78	20	13.21	13	13.35
Apr. 5	13.19	July 5	12.83	27	13.19	20	13.39
12	13.20	12	12.91	Oct. 4	13.25	30	13.38
19	13.04						

813. City of Wichita. SW¼SW¼ sec. 24, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Jan. 2	17.89	Apr. 3	18.10	July 2	17.97	Oct. 3	18.17
Feb. 2	17.96	May 2	18.02	Aug. 1	18.11	Nov. 5	18.31
Mar. 11	17.99	June 4	17.78	Sept. 5	18.21	Dec. 3	18.30

814. City of Wichita. SE cor. sec. 14, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Jan. 2	17.51	Apr. 3	17.81	July 2	17.59	Oct. 3	17.90
Feb. 2	17.64	May 2	17.80	Aug. 1	17.79	Nov. 5	18.03
Mar. 11	17.68	June 4	17.47	Sept. 5	17.92	Dec. 3	18.11

815. City of Wichita. NE cor. sec. 17, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	15.05	Apr. 26	15.17	July 19	14.85	Oct. 11	15.23
Feb. 2	15.08	May 3	15.13	26	14.89	18	15.25
9	15.07	10	15.09	Aug. 2	14.94	25	15.27
16	15.10	17	14.96	9	14.99	Nov. 1	15.33
26	15.07	24	14.83	16	15.03	8	15.36
Mar. 1	15.05	31	14.80	23	15.07	15	15.37
8	15.09	June 7	14.75	30	15.08	22	15.34
15	15.12	14	14.73	Sept. 6	15.10	29	15.39
22	15.14	21	14.72	13	15.11	Dec. 6	15.39
29	15.15	28	14.74	20	15.15	13	15.42
Apr. 5	15.17	July 5	14.78	27	15.16	20	15.44
12	15.18	12	14.80	Oct. 4	15.19	30	15.44
19	15.18						

816. City of Wichita. SW cor. sec. 7, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	12.44	Apr. 26	12.53	July 19	12.33	Oct. 11	13.07
Feb. 2	12.48	May 3	12.48	26	12.42	18	13.09
9	12.52	10	12.34	Aug. 2	12.62	25	13.13
16	12.54	17	12.27	9	12.61	Nov. 1	13.19
26	12.47	24	11.84	16	12.67	8	13.20
Mar. 1	12.43	31	11.91	23	12.73	15	13.22
8	12.48	June 7	11.97	30	12.80	22	13.25
15	12.47	14	11.91	Sept. 6	12.79	29	13.25
22	12.55	21	11.90	13	12.84	Dec. 6	13.27
29	12.55	28	12.02	20	12.92	13	13.35
Apr. 5	12.62	July 5	12.12	27	12.93	20	13.37
12	12.62	12	12.24	Oct. 4	12.98	30	13.41
19	12.53						

825. City of Wichita. NE cor. sec. 3, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	14.72	Apr. 3	14.31	July 2	14.46	Oct. 3	15.36
Feb. 1	14.73	May 2	14.16	Aug. 1	14.98	Nov. 5	15.53
Mar. 11	14.33	June 4	14.01	Sept. 5	15.26	Dec. 3	15.39

826. City of Wichita. NE cor. sec. 5, T. 25 S., R. 1 W.
Water level, in feet below measuring point, 1940

Jan. 29	13.46	June 3	12.97	Aug. 12	13.80	Oct. 21	13.98
Feb. 12	13.46	10	13.04	19	13.83	28	14.00
Mar. 6	13.20	17	13.14	26	13.95	Nov. 4	14.01
18	13.37	24	13.27	Sept. 5	13.54	11	13.99
25	13.45	July 1	13.43	9	13.49	19	13.98
Apr. 1	13.54	8	13.50	16	13.63	Dec. 2	13.72
15	13.52	15	13.65	23	13.76	9	13.78
22	13.20	22	13.71	30	13.81	16	13.83
May 6	13.26	29	13.82	Oct. 7	13.89	23	13.83
13	12.74	Aug. 5	13.91	14	13.93	31	13.80
27	12.76						

830. City of Wichita. SW cor. sec. 30, T. 25 S., R. 2 W.
Water level, in feet below measuring point, 1940

Jan. 2	29.70	Apr. 3	29.51	July 3	29.40	Oct. 3	30.62
Feb. 1	29.70	May 2	29.34	Aug. 1	30.23	Nov. 5	30.82
Mar. 11	29.31	June 4	28.99	Sept. 6	30.39	Dec. 3	30.44

834. City of Wichita. SW cor. sec. 9, T. 25 S., R. 3 W.
Water level, in feet below measuring point, 1940

Jan. 2	12.43	Apr. 3	12.19	July 3	12.15	Oct. 3	13.20
Feb. 1	12.27	May 2	11.96	Aug. 1	12.78	Nov. 5	13.19
Mar. 11	11.97	June 4	11.79	Sept. 6	13.01	Dec. 3	12.80

838. City of Wichita. NE cor. NW¼ sec. 33, T. 25 S., R. 3 W.
Water level, in feet below measuring point, 1940

Jan. 2	26.79	Apr. 3	26.99	July 3	26.70	Oct. 3	27.67
Feb. 6	26.90	May 2	27.00	Aug. 1	27.13	Nov. 5	27.91
Mar. 11	26.86	June 4	26.39	Sept. 6	27.47	Dec. 3	27.85

840. Owner of property, C. A. Berger; owner of well, city of Wichita. NE cor. sec. 9, T. 25 S., R. 2 W. Drilled test well, total depth 233 feet, with one 1¼-inch observation well extending to a depth of 61 feet. Measuring point, top of pipe, 5.9 feet above land surface, 6.12 feet above bench mark, 1,401.54 feet above sea level. Bench mark 26A, top of railroad spike in corner fence post, NW cor. sec. 10, T. 25 S., R. 2 W., 1,395.42 feet above sea level.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Sept.26, 1938	12.42	May 24, 1940	11.23	Sept.13, 1940	13.06
Jan. 26, 1940	12.88	31	11.39	20	13.24
Feb. 2	12.92	June 7	11.63	27	13.30
9	12.84	14	11.41	Oct. 4	13.32
16	12.76	21	11.56	11	13.40
Mar. 1	12.38	28	11.74	18	13.44
8	12.33	July 5	11.86	25	13.51
15	12.33	12	12.07	Nov. 1	13.55
22	12.33	19	12.26	8	13.60
29	12.36	26	12.46	15	13.63
Apr. 5	12.45	Aug. 2	12.72	22	13.67
12	12.45	9	12.75	29	13.47
19	12.21	16	13.00	Dec. 6	13.35
26	12.08	23	13.09	13	13.37
May 3	12.06	30	13.19	20	13.41
10	11.99	Sept. 6	13.01	30	13.34
17	12.03				

842. City of Wichita. NW cor. sec. 16, T. 25 S., R. 2 W.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	7.82	Apr. 3	7.17	July 3	6.64	Oct. 3	8.38
Feb. 6	7.79	May 2	6.67	Aug. 1	7.63	Nov. 5	8.57
Mar. 11	7.02	June 4	6.21	Sept. 6	8.15	Dec. 3	8.17

845. City of Wichita. SW¼SW¼ sec. 5, T. 27 S., R. 1 E.
Water level, in feet below measuring point, 1940

Jan. 2	16.80	Apr. 3	16.95	July 3	15.46	Oct. 3	15.47
Feb. 1	16.78	May 2	16.11	Aug. 1	15.80	Nov. 5	15.55
Mar. 11	16.62	June 4	15.32	Sept. 6	15.00	Dec. 3	15.42

846. City of Wichita. SW¼SE¼ sec. 6, T. 27 S., R. 1 E.
Water level, in feet below measuring point, 1940

Jan. 2	18.27	Apr. 3	18.35	July 3	17.51	Oct. 3	17.82
Feb. 1	18.33	May 2	17.75	Aug. 1	17.72	Nov. 5	18.00
Mar. 11	17.98	June 4	17.27	Sept. 6	17.66	Dec. 2	17.80

847. City of Wichita. SW cor. SE¼ sec. 6, T. 27 S., R. 1 E.
Water level, in feet below measuring point, 1940

Jan. 2	18.55	Apr. 3	18.59	July 3	17.72	Oct. 3	18.36
Feb. 1	18.49	May 2	18.18	Aug. 1	18.12	Nov. 5	18.57
Mar. 11	18.30	June 4	17.42	Sept. 6	18.10	Dec. 3	18.41

870. W. Williams. NW¼NE¼ sec. 18, T. 25 S., R. 2 W. Near feed lot 200 feet south of section-line road and 115 feet west of driveway. Unused driven stock well, diameter 1½ inches, depth 19.0 feet. Measuring point, edge of hole in top of pump base, 2.5 feet above land surface. Top half of pitcher pump is missing.
Water level, in feet below measuring point, 1939-40

Date	Water level	Date	Water level	Date	Water level
Mar. 31, 1939	8.93	Nov. 2, 1939	9.91	June 4, 1940	8.66
Apr. 30	9.08	Dec. 5	9.95	July 3	8.12
June 4	9.82	Jan. 2, 1940	9.99	Aug. 1	10.10
July 5	8.31	Feb. 6	9.94	Sept. 6	10.47
Aug. 1	9.45	Mar. 11	9.26	Oct. 3	10.68
Sept. 6	8.92	Apr. 3	9.41	Nov. 5	10.80
Oct. 3	9.62	May 2	8.91	Dec. 3	10.37

SEWARD COUNTY

By Frank Byrne

An investigation of the geology and ground-water resources of Seward County, Kansas, was undertaken during the summer of 1940 by the Federal and the Kansas Geological Surveys in cooperation with the Division of Sanitation, Kansas State Board of Health, and the Division of Water Resources, Kansas State Board of Agriculture. The work was done by the writer under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. Chemical analyses of 20 samples of well water were made by R. H. Hess, chemist of the Division of Sanitation of the Kansas State Board of Health.

Seward is a sparsely populated county in the southwestern part of the State, and is bordered on the south by the State of Oklahoma. It lies in the High Plains section of the Great Plains province. The plains surface is trenched by the valley of the only important stream in the county, the Cimarron River. Considerable parts of the gently undulating upland plain are obscured beneath the generally low and smoothly rounded Quaternary sand dunes. Immediately underlying the upland plain is a thin series of unconsolidated sands and clays, presumably of Pleistocene and early Recent age, that thickens markedly in the marginal areas of the Cimarron Valley. These deposits supply water to some of the wells immediately adjacent to the river in the northern half of the county. The gravels, sands, silts, clays, and mortar beds of the Ogallala, the next oldest formation, are well exposed only along the south side of the Cimarron Valley. The Ogallala supplies water to most of the upland wells. The oldest formation exposed in the county is the Laverne, which crops out along the Cimarron Valley just west of the eastern boundary of Seward County. The Laverne is probably early Pliocene in age and comprises sandstone, shale, chalk, and limestone that underlie the Ogallala with an angular unconformity. The Dakota group, which is underlain by Permian redbeds, has been identified in some of the deeper wells and might supply water to a very few of the deepest water wells. Well 8 which is an experimental irrigation well drilled on the upland near Liberal in 1937, was abandoned in 1939. A second irrigation well was put down in 1940 on the floodplain of the Cimarron River on the Harlow farm near the northern boundary of the county.

The water levels in 167 wells were measured at least once during the course of the investigation. Eleven of the wells were selected for monthly measurements of water level. All measurements after September 1 were made by Richard B. Christy; the rest were made by the writer. A total of 56 measurements in the 11 wells was made during the year. The altitude of the measuring point for well 155 was determined instrumentally by Pierson C. Lyon. The field numbers of the wells are given in the following descriptions.

8. Liberal Deep Well Company. NW¼NE¼ sec. 32, T. 34 S., R. 33 W. Unused drilled irrigation well, diameter 15 inches, reported depth 350 feet. Measuring point, top of air vent on pump base, south side, 0.4 foot above land surface. Equipped with turbine pump, operated by natural gas engine (not connected at present).

Water level, in feet below measuring point, 1937-40

Date	Water level	Date	Water level	Date	Water level
Nov. 20, 1937	a123	Sept.19, 1940	124.07	Nov. 13, 1940	123.17
Aug. 15, 1940	124.02	Oct. 26	123.50	Dec. 19	122.75
27	124.00				

15. R. H. Hitch. SE¼SW¼ sec. 21, T. 32 S., R. 33 W. Drilled domestic and stock well, diameter 5 inches, depth 53 feet. Measuring point, lowest point on top of galvanized-iron casing, west side, 1.3 feet above land surface. Equipped with windmill and lift pump. Water levels, in feet below measuring point, 1940: July 10, 18.02; Aug. 26, 18.20; Dec. 18, 17.46.

52. Federal Farm Mortgage. NW¼NW¼ sec. 22, T. 34 S., R. 32 W. Unused drilled well, diameter 5 inches, depth 213 feet. Measuring point, top of first pipe union above wooden clamp, northeast side, 1.2 feet above land surface.

Water level, in feet below measuring point, 1940

July 22	208.97	Sept.19	208.14	Nov. 13	208.23
Aug. 26	208.08	Oct. 26	208.01	Dec. 12	209.04

60. Lee Swan. NW¼NE¼ sec. 21, T. 33 S., R. 33 W. Drilled domestic and stock well, diameter 5 inches, reported depth 202 feet. Measuring point, top of 5-inch galvanized-iron casing, west side, 0.2 foot above land surface. Equipped with windmill and lift pump. Water levels, in feet below measuring point, 1940: July 23, 182.40; Aug. 26, 182.40; Sept. 19, 182.48; Dec. 19, 182.55.

66. Federal Land Bank. NW¼SW¼ sec. 35, T. 34 S., R. 31 W. Drilled domestic and stock well, diameter 5 inches, depth 221 feet. Measuring point, top of sheet metal cover, north-northeast side, 1.1 feet above land surface. Equipped with windmill and lift pump. Water levels, in feet below measuring point, 1940: July 24, 217.45; Aug. 26, 217.27; Sept. 19, 217.56; Nov. 13, 218.04.

106. Kansas City Life Insurance Company. SW¼SW¼ sec. 8, T. 32 S., R. 34 W. Unused drilled well, diameter 5 inches, depth 212 feet. Measuring point, high point on top of galvanized-iron casing, west-southwest side, 0.9 foot above land surface.

Water level, in feet below measuring point, 1940

Aug. 1	209.04	Sept.18	209.07	Nov. 13	209.16
26	208.98	Oct. 26	209.03	Dec. 18	208.95

108. C. D. Day. NE¼SE¼ sec. 6, T. 31 S., R. 34 W. Drilled domestic and stock well, diameter 5 inches, depth 114 feet. Measuring point, top of cover next to pipe, northwest side, 1.0 foot above land surface. Equipped with windmill and lift pump. Water levels, in feet below measuring point, 1940: Aug. 1, 111.33; Aug. 26, 111.12; Dec. 18, 111.74.

122. Mrs. Flora Atwell. NE¼SE¼ sec. 9, T. 33 S., R. 31 W. Unused drilled domestic and stock well, diameter 5 inches, depth 213 feet. Measuring point, top of 5-inch galvanized-iron casing, west side, 2.0 feet above land surface. Equipped with windmill and lift pump (not serviceable).

Water level, in feet below measuring point, 1940

Aug. 5	205.63	Sept.19	205.49	Nov. 13	205.49
26	205.50	Oct. 26	205.33	Dec. 19	205.44

a Measured by S. L. Schoff, U. S. Geological Survey.

155. Fred Collingwood. SE¼SE¼ sec. 11, T. 31 S., R. 31 W. Unused drilled domestic and stock well, diameter 5 inches, depth 161 feet. Measuring point, low point in top of 5-inch galvanized-iron casing, north side, 0.4 foot above land surface, 2,805.8 feet above sea level. Equipped with windmill and lift pump.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 14	157.55	Sept.19	157.60	Nov. 13	157.53
27	157.61	Oct. 26	157.63	Dec. 18	157.48

159. Liberal Gas Company. NW¼NE¼ sec. 3, T. 35 S., R. 34 W. Unused drilled well to supply drilling water for gas well, diameter 12 inches, depth 162.5 feet. Measuring point, low point of notch in top of 12-inch wrought-iron casing, northwest side, 1.7 feet above land surface.

Water level, in feet below measuring point, 1940

Aug. 15	97.08	Sept.18	97.23	Nov. 13	97.23
26	97.10	Oct. 26	97.21	Dec. 19	97.25

165. Griffith and Baughman. SE¼SW¼ sec. 14, T. 31 S., R. 33 W. Abandoned drilled well, diameter 5 inches, depth 180 feet. Measuring point, top of 5-inch wrought-iron casing, south side, 0.5 foot above land surface.

Water level, in feet below measuring point, 1940

Aug. 17	168.11	Sept.19	168.07	Nov. 13	168.08
26	168.01	Oct. 26	168.03	Dec. 18	168.28

STANTON COUNTY

By B. F. Latta

The observation-well program in Stanton County, Kansas (see Water-Supply Paper 886), was continued in 1940 by the Federal Geological Survey and the Kansas Geological Survey in cooperation with the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Sanitation of the Kansas State Board of Health. The program is under the supervision of S. W. Lohman, Federal geologist in charge of ground-water investigations in Kansas. A report on the geology and ground-water resources of Stanton County was written during the early part of 1940 and will be published as a bulletin of the Kansas Geological Survey. The field investigation on which this report is based was made during the summer of 1939. The altitudes of the measuring points for several of the observation wells were determined with an alidade and plane table by Delmar Branson and Everett Johnson during the winter of 1939-40 and are given in this report for the first time.

Monthly water-level measurements were discontinued in August 1940 in 12 wells (4, 29, 35, 48, 54, 57, 62, 84, 117, 124, 128, 141) of the 17 original observation wells, but in the future it is planned to measure the water levels in these 12 wells once or twice each year. At the end of 1940 water levels were being measured once a month in 5 wells (13, 47, 68, 93, 146). A total of 139 water-level measurements was made in 1940, all of which were made by Richard B. Christy.

The precipitation in Stanton County in 1940, as recorded by the United States Weather Bureau, was 12.61 inches, which is 4.46 inches below normal. The precipitation in 1940 was, however, the second heaviest since 1934 and was exceeded only in 1938. The annual deficiencies in precipitation from 1934 to 1940 ranged from 3 inches to 8.42 inches.

Of the total annual precipitation of 12.61 inches, 9.4 inches was received during the 5-month period from April through August. Although the water levels in 2 relatively shallow wells (13 and 146) declined during the first 5 months of the year, they began to rise in June in response to the recharge furnished by the rains in May. The water levels in the other 3 observation wells (47, 68, and 93) are deeper and the water levels in them did not respond to the rains.

The water levels in 4 of the 5 observation wells in Stanton County that were being measured at the close of the year were higher at the end of 1940 than at the beginning of 1940, and the water level was lower in 1 well. In the 4 wells that showed net rises in water level, the rises ranged from 0.04 foot to 0.34 foot. Well 47 showed a net decline in water level of 0.02 foot. At the end of 1940 the water levels in 2 of the wells were higher than at the beginning of the record in July or August 1939, but the water levels in 2 other wells were lower and the water level in 1 well was unchanged. The difference between the highest and lowest recorded water levels in the 5 wells ranged from 0.1 foot to 0.54 foot and the average was about 0.3 foot.

Of the 12 observation wells for which records are complete only to July 1940, the water levels in 8 wells were higher at the end of the period of record than at the beginning of record in July 1939, and the water levels in 4 wells were lower. In the 8 wells showing net rises in water level, the rises ranged from 0.06 foot to 0.64 foot, and the average net rise was about 0.28 foot.

In the 4 wells showing net declines in water level, the declines ranged from 0.06 foot to 0.33 foot, and the average net decline was about 0.14 foot. The difference between the highest and lowest recorded water levels in these 12 wells ranged from 0.12 foot to 0.9 foot, and the average difference was about 0.28 foot.

The following tables summarize the fluctuations of water level in observation wells in Stanton County.

Highest and lowest water levels for period of record in 5 wells in Stanton County

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
13	52.33	July 25, 1939 Sept.18, 1940	52.83	Apr. 23, 1940
47	70.88	Apr. 23, 1940	70.98	Nov. 12, 1940
68	137.49	Dec. 18, 1940	138.03	Aug. 8, 1939
93	176.26	July 18, 1940	176.60	Oct. 9, 1939
146	46.67	July 17, 1940	46.80	Apr. 22, 1940 May 14, 1940 June 18, 1940

Net changes in water level in 1940 and net changes in water level for period of record in 5 wells in Stanton County

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, 1940	Net rise (+) or net decline (-) in feet, for period of record
13	0.5	+0.1	-0.22
47	.1	- .02	- .03
68	.54	+ .34	+ .49
93	.34	+ .07	+ .09
146	.13	+ .04	.00

Highest and lowest water levels in 12 wells in Stanton County to July 1940

Well	Highest recorded water level, in feet below measuring point	Date	Lowest recorded water level, in feet below measuring point	Date
4	55.77	July 18, 1940	55.92	July 25, 1939 Aug. 8, 1939
29	100.33	July 24, 1939 Sept. 8, 1939	100.45	Feb. 21, 1940
35	178.80	July 17, 1940	179.12	Oct. 9, 1939
48	78.25	Aug. 8, 1939	78.38	July 18, 1940
54	102.44	Sept. 8, 1939	102.68	July 18, 1940
57	150.01	July 18, 1940	150.91	Jan. 31, 1940
62	139.89	June 17, 1940 July 18, 1940	140.73	Aug. 8, 1939
84	60.43	Aug. 8, 1939	60.77	July 18, 1940
117	63.68	May 14, 1940	63.95	Aug. 8, 1939
124	138.70	Dec. 16, 1939	138.85	Oct. 9, 1939
128	182.21	Dec. 15, 1939	182.48	Feb. 20, 1940
141	152.80	July 17, 1940	153.15	Sept. 8, 1939 Feb. 21, 1940

Net changes in water level in 12 wells in Stanton County to July 1940

Well	Difference between highest and lowest water levels, in feet	Net rise (+) or net decline (-) in feet, for period of record
4	0.15	+0.15
29	.12	- .1
35	.32	+ .26
48	.13	- .06
54	.24	- .06
57	.9	+ .54
62	.16	+ .64
84	.34	- .33
117	.27	+ .06
124	.15	+ .1
128	.27	+ .23
141	.35	+ .25

4. G. L. Warner. SE¼SE¼ sec. 17, T. 27 S., R. 39 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 31	55.81	Mar. 15	55.79	July 18	55.77
Feb. 20	55.81	June 18	55.79		

13. L. Y. Carrithers. NE¼SE¼ sec. 21, T. 27 S., R. 40 W. Measuring point 3,236.2 feet above sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 31	52.65	Apr. 23	52.83	July 18	52.52	Oct. 25	52.39
Feb. 20	52.67	May 15	52.82	Aug. 21	52.52	Nov. 12	52.51
Mar. 15	52.72	June 18	52.82	Sept.18	52.33	Dec. 18	52.55

29. W. Ward. SE¼NE¼ sec. 12, T. 27 S., R. 42 W.

Water level, in feet below measuring point, 1940

Jan. 31	100.43	Mar. 15	100.44	May 15	100.44	July 17	100.43
Feb. 21	100.45	Apr. 22	100.44	June 17	100.44		

35. H. S. Weir. NE¼SE¼ sec. 26, T. 27 S., R. 43 W. Measuring point 3,542.9 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	178.84	Mar. 15	178.92	May 15	178.94	July 17	178.80
Feb. 21	179.04	Apr. 22	178.99	June 17	178.89		

47. Southwestern College. NW¼NE¼ sec. 35, T. 28 S., R. 39 W.

Water level, in feet below measuring point, 1940

Jan. 31	70.92	Apr. 23	70.88	Aug. 21	70.94	Nov. 12	70.98
Feb. 20	70.91	June 18	70.91	Sept.18	70.94	Dec. 18	70.94
Mar. 15	70.92	July 18	70.89	Oct. 25	70.95		

48. J. Snyder. SE¼NE¼ sec. 13, T. 28 S., R. 40 W.

Water level, in feet below measuring point, 1940

Jan. 31	78.28	Mar. 15	78.30	May 15	78.27	July 18	78.38
Feb. 20	78.30	Apr. 23	78.30	June 18	78.28		

54. L. R. Smith. NW¼NE¼ sec. 36, T. 28 S., R. 40 W.

Water level, in feet below measuring point, 1940

Jan. 31	102.48	Mar. 15	102.52	May 14	102.52	July 18	102.68
Feb. 20	102.53	Apr. 23	102.52	June 18	102.49		

57. J. Wilson. NW¼NE¼ sec. 13, T. 28 S., R. 41 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 31	150.91	Mar. 15	150.17	May 15	150.12	July 18	150.01
Feb. 21	150.30	Apr. 23	150.25	June 18	150.06		

62. H. Bearman. SW¼SW¼ sec. 29, T. 28 S., R. 41 W.

Water level, in feet below measuring point, 1940

Jan. 31	140.26	Mar. 15	140.18	May 14	140.30	July 18	139.89
Feb. 21	140.44	Apr. 23	140.18	June 17	139.89		

68. C. D. Wartman. SW¼SW¼ sec. 29, T. 28 S., R. 42 W. Measuring point 3,544.6 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	137.83	Apr. 22	137.73	July 17	137.60	Oct. 25	137.53
Feb. 21	137.90	May 14	137.73	Aug. 21	137.59	Nov. 12	137.71
Mar. 15	137.83	June 17	137.64	Sept.18	137.59	Dec. 18	137.49

84. J. C. Jones. NW¼SW¼ sec. 23, T. 29 S., R. 39 W. Measuring point 3,168.4 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	60.66	Mar. 15	60.67	May 14	60.72	July 18	60.77
Feb. 20	60.67	Apr. 23	60.66	June 18	60.69		

93. J. Plummer. Cent. NE¼ sec. 11, T. 29 S., R. 41 W. Measuring point 3,349.7 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	176.43	Apr. 23	176.36	July 18	176.26	Oct. 25	176.27
Feb. 20	176.42	May 15	176.31	Aug. 21	176.28	Nov. 12	176.47
Mar. 15	176.38	June 18	176.37	Sept.18	176.29	Dec. 18	176.36

117. Z. B. Nicholas. NE¼NW¼ sec. 14, T. 30 S., R. 39 W. Measuring point 3,171.6 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	63.92	Mar. 15	63.90	May 14	63.68	July 18	63.85
Feb. 20	63.92	Apr. 23	63.90	June 18	63.87		

124. F. H. Staker. SE¼SE¼ sec. 3, T. 30 S., R. 40 W. Measuring point 3,283.9 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	138.79	Mar. 15	138.73	May 14	138.79	July 18	138.73
Feb. 20	138.76	Apr. 23	138.78	June 18	138.78		

128. A. J. Doughty. SW¼SE¼ sec. 8, T. 30 S., R. 41 W. Measuring point 3,406.8 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	182.23	Mar. 15	182.42	May 14	182.36	July 18	182.24
Feb. 20	182.48	Apr. 23	182.47	June 18	182.33		

141. C. F. Wendf. SE¼SW¼ sec. 2, T. 30 S., R. 43 W. Measuring point 3,644.2 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	152.84	Mar. 15	153.04	May 14	153.09	July 17	152.80
Feb. 21	153.15	Apr. 22	152.89	June 18	152.97		

146. C. M. Harrison. SW¼SE¼ sec. 27, T. 30 S., R. 43 W. New measuring point beginning Oct. 25, 1940, top of casing at east side, level with land surface, 0.5 foot below old measuring point, 3,614.7 feet above sea level.

Water level, in feet below measuring point, 1940

Jan. 31	46.77	Apr. 22	46.80	July 17	46.67	Oct. 25	a46.26
Feb. 21	46.79	May 14	46.80	Aug. 21	46.71	Nov. 12	46.25
Mar. 15	46.78	June 18	46.80	Sept.18	46.69	Dec. 18	46.23

a New measuring point.

MINNESOTA

CLAY COUNTY

By A. C. Byers

Periodic measurements of the water levels in four wells in Minnesota were begun in July 1940 by the Federal Geological Survey in cooperation with the North Dakota Geological Survey and the City of Fargo, N. Dak. The purpose and scope of the investigation is described in the North Dakota section of this volume. The wells are all within 6 miles of Moorhead, Clay County, Minnesota. Observations were taken about once a week; a total of about 90 measurements, all by the wetted tape method, were made, by L. K. Wenzel, W. C. Rasmussen, Frank Taplin, and A. C. Byers.

The measurements are given in this report in feet above assumed datum planes. The datum for each well was computed from the average of the water levels on July 11, 1940 in wells 12, 28 and 67 in Cass County, North Dakota.

All the wells are drilled wells, and although no logs are available, it is probable that all end in the glacial till. All are artesian wells.

The water supply for the city of Moorhead is obtained from two artesian well fields of three wells each. The pumpage from these wells, together with the pumpage from three wells at the Fairmont Creamery and two small wells at the Moorhead Laundry, produce the chief withdrawals in the area. Small quantities of water are, of course, also withdrawn from numerous farm and domestic wells.

The records as yet are too meagre to allow interpretation. The water level in well 3 fluctuates irregularly due to the pumping of a near-by well to supply the clubhouse at the municipal golf course. The water level in the well shows a rising trend and for the period of record it had a net rise of 1.98 feet. On the other hand, the water level in well 5 shows a downward trend and during the last half of 1940 had a net decline of 0.68 foot. The fluctuations of water level in well 7 are small and may be caused by the pumping of nearby farm wells. There was a net decline in water level in the well of 0.13 foot. The water level in well 8 rose sharply from July 19 to July 31, but then declined slowly and rather smoothly until November 23 when another sharp rise began. This rise was followed by a decline from December 7 to December 14 and on December 28 the water level was 0.16 foot higher than on July 19.

3. City of Moorhead. NW¼SW¼ sec. 32, T. 140 N., R. 48 W. In well house at rear of municipal golf course clubhouse. Unused drilled well, diameter 3 inches, depth 131.0 feet below measuring point. Measuring point, top of concrete pump base, 1.4 feet above land surface and 133.57 feet above assumed datum. Water level July 17, 1940, 37.84 feet below measuring point. Water level affected by pumping of nearby well.

Water level, in feet above assumed datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 17	95.73	Aug. 24	96.73	Oct. 12	96.48	Nov. 23	97.57
19	95.57	31	97.05	19	97.24	30	97.90
24	97.04	Sept. 7	97.13	26	97.59	Dec. 7	97.17
31	95.71	14	97.09	Nov. 2	96.52	14	97.74
Aug. 3	96.47	21	96.24	9	97.59	21	96.39
10	95.74	28	94.78	16	97.74	28	97.71
17	96.78	Oct. 5	97.18				

5. Wm. Bailey. NE¼NE¼ sec. 18, T. 139 N., R. 48 W. In rear of 1203 8th St. So., Moorhead, Minn. Unused drilled well, diameter 3 inches, depth 132.8 feet below measuring point. Measuring point, top of casing, 0.6 foot above land surface and 129.98 feet above assumed datum. Water level July 17, 1940, 34.25 feet below measuring point.

Water level, in feet above assumed datum, 1940

July 17	95.73	Aug. 24	95.26	Oct. 12	94.90	Nov. 23	95.25
19	95.70	31	95.13	19	95.01	30	95.15
24	95.62	Sept. 7	95.06	26	94.98	Dec. 7	95.13
31	95.60	14	95.03	Nov. 2	95.00	14	95.13
Aug. 3	95.54	21	94.96	9	96.07	21	95.07
10	95.45	28	94.91	16	95.14	28	95.05
17	95.38	Oct. 5	94.87				

7. Andrew Gunderson. SE¼SE¼ sec. 23, T. 140 N., R. 48 W. Used drilled stock well, diameter 3 inches. Measuring point, top of casing, 1.1 feet above land surface and 138.10 feet above assumed datum. Water level July 19, 1940, 42.37 feet below measuring point. Equipped with lift pump and pump jack. Used during threshing season.

Water level, in feet above assumed datum, 1940

July 19	95.73	Aug. 10	95.43	Nov. 9	95.34	Dec. 7	95.51
24	95.51	Oct. 19	95.27	16	95.70	14	95.52
31	95.46	26	95.25	23	95.29	21	95.59
Aug. 3	95.69	Nov. 2	95.56	30	95.60	28	95.60

8. NW¼SW¼ sec. 4, T. 140 N., R. 48 W. Unused drilled well, diameter 3 inches. Measuring point, top of casing, 0.9 foot above land surface and 116.88 feet above assumed datum. Water level July 19, 1940, 21.15 feet below measuring point. Equipped with windmill.

Water level, in feet above assumed datum, 1940

July 19	95.73	Aug. 31	96.00	Oct. 12	95.78	Nov. 23	95.73
24	95.99	Sept. 7	95.91	19	95.78	30	96.14
31	96.22	14	95.87	26	95.78	Dec. 7	96.26
Aug. 3	96.10	21	95.82	Nov. 2	95.83	14	95.77
10	96.00	28	95.80	9	95.81	21	95.84
17	95.97	Oct. 5	95.81	16	95.85	28	95.89
24	95.99						

MISSOURI

ATCHISON COUNTY

TARKIO CREEK AREA

By V. C. Fishel

The observation-well program in the Tarkio Creek Area in Atchison County, Missouri (see Iowa-Missouri sections in Water-Supply Papers 777, 817, 840, 845, and 886) was continued in 1940 by the Federal Geological Survey. At the beginning of 1940, 19 wells were under observation. Well 37 was discontinued in July leaving 18 wells under observation at the end of the year. The descriptive text for the wells is included in the Iowa section of this volume. The measurements were made by W. M. Mulnix of the Geological Survey.

1. W. R. Marshal.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 18	9.59	Apr. 29	10.82	June 3	9.91	July 1	9.70
25	9.13	May 6	9.93	10	9.79	Oct. 24	10.71
Apr. 3	8.93	13	9.65	17	9.79	Nov. 27	10.61
8	10.34	20	9.34	24	9.77	Dec. 30	10.56
16	9.31	27	10.06				

2. H. W. Klutas.

Water level, in feet above datum, 1940

Mar. 18	11.80	Apr. 29	11.61	June 3	11.45	July 1	10.98
25	11.77	May 6	11.67	10	11.31	Oct. 24	10.96
Apr. 3	11.55	13	11.58	17	11.19	Nov. 27	10.39
8	11.45	20	11.63	24	11.08	Dec. 30	11.05
16	11.40	27	11.60				

20.

Water level, in feet above datum, 1940

Mar. 4	14.45	Apr. 29	16.05	June 3	12.55	Aug. 29	13.32
18	23.10	May 6	13.72	10	12.07	Sept. 25	10.68
23	22.86	13	13.53	17	11.73	Oct. 24	9.33
Apr. 3	16.03	20	14.07	24	11.75	Nov. 27	9.14
8	15.31	27	13.11	July 1	11.30	Dec. 30	11.23
16	13.74						

21.

Water level, in feet above datum, 1940

Mar. 4	9.88	Apr. 29	9.50	June 3	8.40	Aug. 29	10.14
18	9.51	May 6	9.58	10	8.25	Sept. 25	9.49
25	9.43	13	8.51	17	8.13	Oct. 24	8.79
Apr. 3	8.88	20	8.96	24	8.16	Nov. 27	8.75
8	9.32	27	8.58	July 1	8.19	Dec. 30	8.13
16	8.46						

22. J. A. McAllister.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 4	11.49	Apr. 29	11.73	June 3	11.20	Aug. 29	11.45
18	12.22	May 6	11.39	10	10.98	Sept.25	10.40
25	12.30	13	11.34	17	10.77	Oct. 24	9.99
Apr. 3	11.41	20	11.71	24	10.73	Nov. 27	9.82
8	11.24	27	11.44	July 1	10.66	Dec. 30	10.62
16	11.14						

24.

Water level, in feet above datum, 1940

Mar. 4	8.20	Apr. 29	8.95	June 3	9.37	Aug. 29	9.76
18	8.31	May 6	9.01	10	9.38	Sept.25	9.83
25	8.33	13	9.01	17	9.44	Oct. 24	9.20
Apr. 3	8.34	20	9.28	24	9.51	Nov. 27	9.12
8	8.46	27	9.39	July 1	9.58	Dec. 30	9.56
16	8.49						

25. Edwin Rolf.

Water level, in feet above datum of well 1, 1940

Mar. 4	31.07	Apr. 29	32.32	June 3	32.45	Aug. 29	32.41
18	32.44	May 6	32.53	10	32.08	Sept.25	32.24
25	32.38	13	32.15	17	31.77	Oct. 24	30.15
Apr. 3	31.96	20	32.70	24	31.66	Nov. 27	30.08
8	31.84	27	32.71	July 1	31.71	Dec. 30	30.14
16	31.69						

26. Edwin Rolf. Well dry throughout 1940.

27. Edwin Rolf.

Water level, in feet above datum of well 1, 1940

Mar. 4	29.16	Apr. 29	29.72	June 3	30.24	Aug. 29	30.62
18	30.34	May 6	29.66	10	30.11	Sept.25	29.81
25	30.53	13	29.80	17	29.95	Oct. 24	28.99
Apr. 3	30.26	20	29.90	24	29.92	Nov. 27	28.90
8	30.21	27	30.57	July 1	29.84	Dec. 30	29.13
16	29.74						

28. Edwin Rolf.

Water level, in feet above datum of well 1, 1940

Mar. 4	47.80	Apr. 29	50.11	June 3	52.45	Aug. 29	51.47
18	51.06	May 5	50.08	10	52.07	Sept.25	50.94
25	51.30	13	52.13	17	51.59	Oct. 24	49.70
Apr. 3	50.83	20	52.26	24	51.19	Nov. 27	49.50
8	50.54	27	52.97	July 1	50.89	Dec. 30	48.33
16	50.18						

29. Edwin Rolf.

Water level, in feet above datum of well 1, 1940

Mar. 4	33.22	Apr. 29	33.00	June 3	33.32	Aug. 29	34.46
18	33.28	May 5	33.12	10	33.01	Sept.25	32.19
25	33.35	13	33.31	17	32.78	Oct. 24	31.56
Apr. 3	33.16	20	33.36	24	32.57	Nov. 27	31.17
8	33.06	27	33.48	July 1	32.49	Dec. 30	32.05
16	32.94						

30. W. F. Marshall.

Water level, in feet above datum of well 1, 1940

Mar. 4	16.95	Apr. 29	17.54	June 3	17.42	Aug. 29	20.45
18	18.07	May 6	17.50	10	16.99	Sept.25	17.54
25	18.05	13	17.03	17	16.88	Oct. 24	16.84
Apr. 3	17.07	20	17.75	24	16.70	Nov. 27	16.69
8	17.08	27	18.07	July 1	16.54	Dec. 30	15.67
16	16.68						

31. W. F. Marshall.

Water level, in feet above datum of well 1, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 4	8.80	Apr. 29	9.13	June 3	9.51	Aug. 29	10.36
18	9.03	May 6	9.15	10	9.45	Sept.25	10.44
25	9.12	13	9.26	17	9.41	Oct. 24	10.19
Apr. 3	9.13	20	9.27	24	9.40	Nov. 27	10.21
8	9.10	27	9.51	July 1	9.34	Dec. 30	9.60
16	9.10						

32. W. F. Marshall.

Water level, in feet above datum of well 1, 1940

Mar. 4	3.72	Apr. 16	2.09	May 27	3.24	July 1	1.59
18	4.50	29	7.22	June 3	2.56	Aug. 29	6.99
25	4.55	May 6	3.33	10	2.26	Sept.25	3.82
Apr. 3	2.28	13	2.55	17	2.15	Oct. 24	3.07
8	2.15	20	3.80	24	1.90	Dec. 30	3.42

33. W. F. Marshall.

Water level, in feet above or below datum of well 1, 1940

Mar. 4	1.11	Apr. 29	-1.69	June 3	-2.02	Aug. 29	+2.26
18	-1.06	May 6	-1.92	10	-2.10	Sept.25	-1.31
25	-1.43	13	-2.05	17	-2.12	Oct. 24	-1.64
Apr. 3	-1.91	20	-1.90	24	-2.12	Nov. 27	- .30
8	-1.92	27	-1.71	July 1	-2.15	Dec. 30	-1.42
16	-2.07						

34. W. F. Marshall.

Water level, in feet above datum of well 1, 1940

Mar. 4	6.13	Apr. 29	9.18	June 3	6.62	Aug. 29	8.39
18	6.67	May 6	6.66	10	5.99	Sept.25	6.40
25	6.82	13	6.46	17	5.76	Oct. 24	5.77
Apr. 3	5.18	20	6.72	24	5.50	Nov. 27	5.73
8	5.63	27	7.68	July 1	5.26	Dec. 30	7.17
16	5.88						

35. W. F. Marshall.

Water level, in feet above datum of well 1, 1940

Mar. 4	53.26	Apr. 29	54.82	June 3	52.81	Aug. 29	51.77
18	54.91	May 6	54.56	10	52.14	Sept.25	49.89
25	55.00	13	53.19	17	52.00	Oct. 24	49.45
Apr. 3	52.96	20	53.98	24	51.20	Nov. 27	49.42
8	53.90	27	53.79	July 1	50.98	Dec. 30	50.82
16	52.98						

36. George Rolf.

Water level, in feet above datum of well 1, 1940

Mar. 4	86.49	Apr. 29	86.78	June 3	87.06	Aug. 29	87.38
18	86.52	May 6	86.70	10	87.13	Sept.25	86.46
25	86.54	13	86.86	17	87.15	Oct. 24	87.27
Apr. 3	86.60	20	86.92	24	87.21	Nov. 27	87.24
8	86.66	27	87.00	July 1	87.27	Dec. 30	87.03
16	86.71						

37.

Water level, in feet above datum of well 1, 1940

Mar. 4	85.59	Apr. 8	86.24	May 13	85.21	June 10	84.53
18	87.18	16	85.62	20	85.28	17	84.47
25	87.15	29	85.76	27	85.23	24	84.22
Apr. 3	86.62	May 6	85.80	June 3	84.86	July 1	a 84.05

a Measurements discontinued.

NEBRASKA

By L. K. Wenzel

The State-wide program of water-level measurements in wells was continued in 1940 by the Federal Geological Survey in cooperation with the Conservation and Survey Division of the University of Nebraska.

Measurements of water levels made in 445 observation wells are given on the following pages. Included in this group are 50 wells in Hall and Merrick Counties that are being observed through informal cooperation with the Grand Island Water Department; 8 wells in Garden County that are being observed through informal cooperation with the Fish and Wildlife Service, United States Department of the Interior; and 46 wells in Keith and Lincoln Counties that are being observed through informal cooperation with the Central Nebraska Public Power and Irrigation District. Measurements in 21 of the wells in Richardson County were made in 1940 in connection with a detailed investigation of the geology and ground-water resources of that county by the Federal Geological Survey in cooperation with the Conservation and Survey Division of the University of Nebraska. Daily tape measurements, furnished by the Nebraska Department of Roads and Irrigation, are given for well 85 in Morrill County. A total of about 4,350 individual measurements of water level, most of them made in 1940, are given on the following pages.

The precipitation in Nebraska in 1940 was 17.35 inches, 5.13 inches below average, and as a result, the water levels in most of the observation wells declined in the year. The following table summarizes the water-level fluctuations in key wells throughout the State:

Cumulative change in water levels, in feet, in selected observation wells in Nebraska, 1934-40

	1935	1936	1937	1938	1939	1940
Northeast	-0.31	-0.69	-0.25	+0.07	-0.43	-0.44
Southeast	+ .66	- .20	- .56	- .25	- .76	-1.12
North-central	+ .10	- .14	- .50	- .47	- .32	- .64
South-central	+ .27	- .16	- .18	- .18	- .16	- .14
Northwest	+ .46	+ .06	- .22	+ .14	- .20	- .38
Southwest	+ .04	+ .01	- .14	+ .03	- .14	- .29
Entire State	+ .24	- .22	- .34	- .16	- .38	- .56

The records from 1934 through 1939 are based on 167 wells; in 1940 some of the wells went dry, were destroyed, or otherwise were rendered unfit for measurement and the record for the year is based on 133 wells.

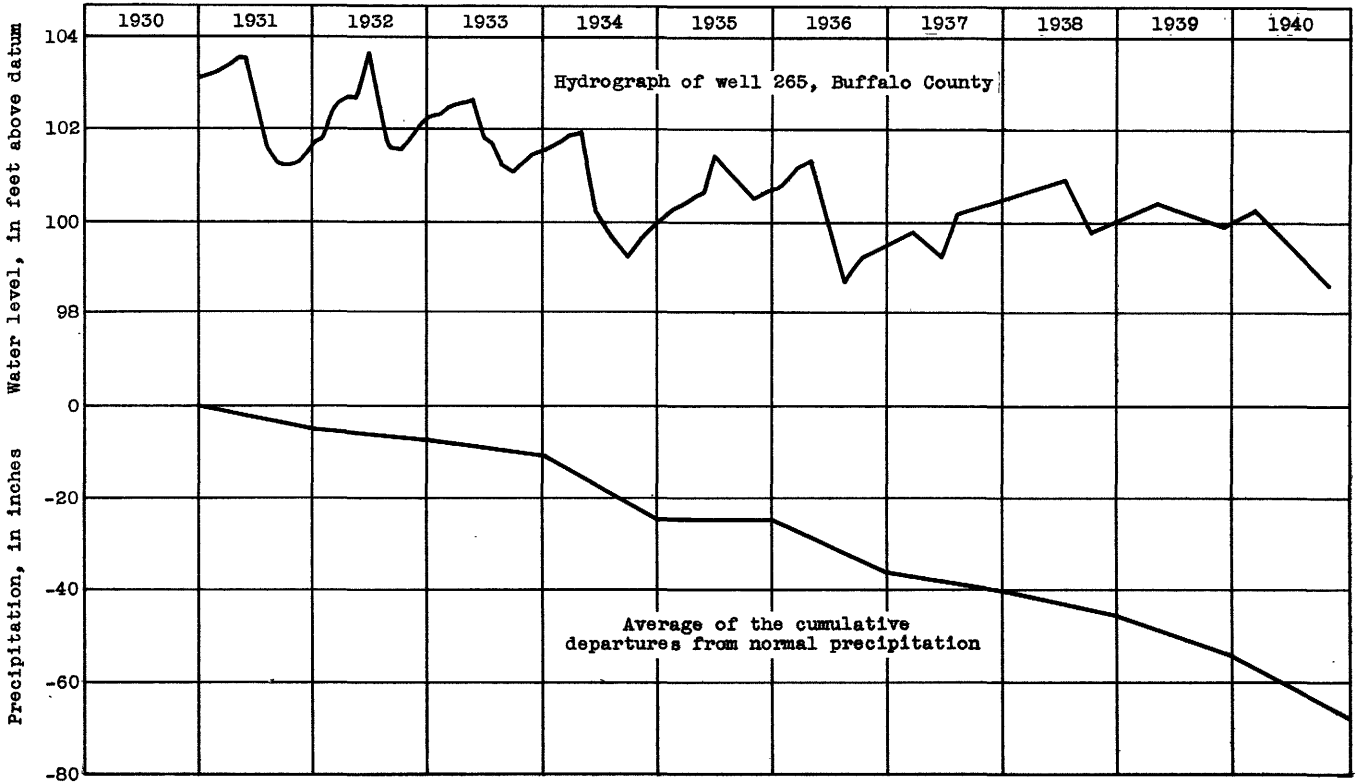

Figure 6.--Hydrograph of well 265, in Buffalo County, Nebr., and the average of the cumulative departures from normal precipitation at Grand Island and Kearney, Nebr.

The table shows that in 1940 the averages of the water levels in the observation wells declined in 5 sections of the state and rose in 1 section. There was an average net decline of 0.18 foot in the 133 wells. At the end of 1940, the averages of the water levels in all sections of the state were lower than at the end of 1934; in south-central Nebraska the average decline in the 6-year period was only 0.14 foot, but in southeast Nebraska it was 1.12 feet. For the entire state the average net decline in the 6 years was 0.56 foot. If it is assumed that the average net decline of 0.18 foot recorded in the 133 key wells in 1940 represents the average net fluctuation of the water table over the state and that the specific yield of the formations in which the water occurs in Nebraska averages 15 percent - that is, that each cubic foot of material will yield or store 0.15 cubic foot of water, then the records indicate a net decrease in ground-water storage in 1940 of about 1,300,000 acre-feet. On the same basis, the decrease in ground-water storage in the 6-year period ending with 1940 may be computed to be about 4,100,000 acre-feet. The precipitation in Nebraska during the 6-year period was about 24.4 inches below average - a deficiency equivalent to about 100,000,000 acre-feet of water. Since 1934 the decrease in ground-water storage has, therefore, been only slightly more than 4 percent of the deficiency in the precipitation.

During 1940, the water levels in 64 of the 133 key observation wells reached new low stages and the water levels in 17 of the wells reached new high stages.

The accompanying illustration shows the fluctuations of water level in well 265, in Buffalo County, and the average of the cumulative departures from normal precipitation at Grand Island and Kearney from 1931 to 1940, inclusive. Well 265 is an irrigation well in the central Platte Valley about midway between Grand Island and Kearney. The fluctuations of water level in the well are typical of those in wells in the central part of the valley. The illustration shows that there has been a general downward trend of the water level in the well during the 10-year period of record. The precipitation in the area has been below normal in each of the 10 years and it is believed that this deficiency has been the chief cause of the lowering of the water level, although the pumping of wells

for irrigation in the valley may have also contributed to the decline. The first 4 years of record are based on measurements made once a week or once a month but the last part of the record is based on measurements made only a few times a year. The seasonal fluctuations of water level during the last 6 years of record are, therefore, not as apparent as they are during the first 4 years. The water level in well 265 was 102.62 feet above datum (about 17 feet below the land surface) on October 29, 1930 and 98.70 feet above datum on October 27, 1940. The net decline in water level in the 10 years thus was 3.92 feet. During this period the average of the precipitation at Grand Island and Kearney was about 68 inches below normal - nearly 3 year's normal precipitation.

A report[1/] on ground-water conditions in the vicinity of Grand Island was published during the year as Water-Supply Paper 836-E. Water levels in wells in the vicinity of Grand Island continued to decline in 1940, partly as a result of the expansion of the cone of depression caused by pumping in the area and partly as the result of deficient precipitation, which was 15.15 inches below normal. The normal annual precipitation at Grand Island is 27.06 inches. The average of the water levels in 41 wells in the vicinity of Grand Island was 98.28 feet above datum near the end of 1940. At the end of 1935 the average of the water levels in the same wells was 101.95 feet above datum. An average decline in water levels of 3.67 feet has thus occurred in the 5-year period. The water levels in most of the wells are affected by pumping for municipal, industrial, or irrigation supply, but the water levels in some of the wells are not so affected. In general, the water levels in the wells not affected by pumping had only small declines. All wells, however, showed declines in water level in the 5-year period; the smallest decline was 0.80 foot in well GI200, the largest decline was 8.36 feet in well GI228.

The observation wells, which are listed alphabetically by county and numerically within each county, have numbers that correspond to those given in Water-Supply Papers 817, 840, 845, and 886. This report gives complete descriptions for only those wells whose records appear for the first time. For most wells the water levels are expressed in feet above an assumed datum, which is 100 feet below the water level on January 1,

1/ Wenzel, L. K., Local overdevelopment of ground-water supplies with special reference to conditions at Grand Island, Nebraska: U. S. Geolog. Survey Water-Supply Paper 836-E, pp. 233-281, 1940.

1935. The height of the measuring point above datum for wells that have been established since January 1, 1935, has been interpolated from the average water level in a group of similar wells on a selected date. The water levels are directly comparable even though the measuring point has been changed, because the record is given as a height above a datum that has been referred to one or more bench marks near the well.

Adams County

193. No measurements made in 1940.

448. Water levels, in feet above datum, 1940: Apr. 11, 97.41; Aug. 1, 97.58; Nov. 13, 97.35.

Antelope County

111. No measurements made in 1940. Well dry, Mar. 27.

202. Water levels, in feet above datum, 1940: Mar. 27, 100.12; July 18, 99.19; Oct. 30, 99.43.

Arthur County

250.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	a 99.31	Apr. 5	98.82	July 24	a 98.70	Nov. 7	98.46
Feb. 1	a 99.33	29	a 98.85	Aug. 28	a 98.61	28	a 98.45
28	a 99.00	May 23	a 98.85	Sept.30	a 98.51	Dec. 31	a 98.44
Mar. 27	a 98.85	June 26	a 98.77	Nov. 1	a 98.47		

251. Water levels, in feet above datum, 1940: Apr. 5, 99.57; July 26, 98.06.

Banner County

238. Water levels, in feet above datum, 1940: Apr. 6, 101.03; July 28, 100.28; Nov. 8, 102.09.

354. Water level, in feet above datum, 1940: Apr. 6, 100.64.

Blaine County

210. Water levels, in feet above datum, 1940: Apr. 2, 99.31; July 23, 98.03; Nov. 4, 98.46.

211. Water levels, in feet above datum, 1940: Apr. 2, 100.30; July 23, 99.97; Nov. 4, 99.23.

237. Water levels, in feet above datum, 1940: Apr. 2, 98.87; July 23, 98.58; Nov. 4, 98.82.

a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Blaine County--Continued.

433. Water levels, in feet above datum, 1940: Apr. 2, 99.96; July 23, 98.76; Nov. 4, 99.30.

434. Water levels, in feet above datum, 1940: Apr. 2, 99.51; July 23, 98.98; Nov. 4, 99.11.

Boone County

200. Water levels, in feet above datum, 1940: Mar. 23, 100.42; July 13, 100.26; Oct. 26, 99.43.

201. Water levels, in feet above datum, 1940: Mar. 23, 100.26; July 13, 99.42; Oct. 26, 99.57.

207. Water levels, in feet above datum, 1940: Mar. 23, 100.32; July 13, 100.35; Oct. 26, 99.93.

425. Water level, in feet above datum, 1940: Mar. 23, 101.98; July 13, dry; Oct. 26, dry.

426. Water levels, in feet above datum, 1940: Mar. 23, 100.26; July 13, 100.02; Oct. 26, 99.73.

Box Butte County

Measurements discontinued in following wells: 1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, and 17.

129. Water levels, in feet above datum, 1940: Apr. 1, 99.60; July 22, 99.59; Nov. 2, 99.55.

338. Water level, in feet above datum, 1940: Mar. 30, 99.94.

378. Water levels, in feet above datum, 1940: Mar. 30, 99.74; July 20, 98.11; Nov. 1, 99.05.

Boyd County

74. Water levels, in feet above datum, 1940: Mar. 28, 100.06; July 18, 98.87; Oct. 31, 98.64.

75. Water levels, in feet above datum, 1940: Mar. 28, 99.89; July 18, 98.58; Oct. 31, 97.73.

209. Water levels, in feet above datum, 1940: Mar. 28, 100.82; July 18, 99.47; Oct. 30, 98.72.

Brown County

243. Water levels, in feet above datum, 1940: Mar. 29, 100.03; July 19, 98.52.

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Buffalo County

52. No measurements made in 1940.

232. Water levels, in feet above datum, 1940: Mar. 26, 101.11; July 16, 100.43.

262. Water level, in feet above datum, 1940: Mar. 25, 99.20

263. Water levels, in feet above datum, 1940: Mar. 25, 100.32; July 15, 98.77; Oct. 27, 97.97.

264. Water level, in feet above datum, 1940: Mar. 25, 98.67.

265. Water levels, in feet above datum, 1940: Mar. 25, 100.27; Oct. 27, 98.70.

267. Water levels, in feet above datum, 1940: Mar. 25, 99.56; Oct. 27, 97.64.

268. Water levels, in feet above datum, 1940: Mar. 25, 100.32; Oct. 27, 97.07.

269. Water level, in feet above datum, 1940: Mar. 25, 99.69.

270. Water levels, in feet above datum, 1940: Mar. 25, 98.53; July 15, 97.65; Oct. 27, 99.33.

272. Water levels, in feet above datum, 1940: Mar. 25, 98.73; July 15, 98.12; Oct. 27, 97.48.

273. No measurements made in 1940.

274. Water levels, in feet above datum, 1940: Mar. 25, 101.72; July 15, 99.93.

278. Water levels, in feet above datum, 1940: Mar. 25, 102.79; July 16, 101.79; Oct. 27, 100.18.

279. Water levels, in feet above datum, 1940: Mar. 25, 99.67; July 16, 97.82; Oct. 27, 97.19.

Burt County

63. Water levels, in feet above datum, 1940: Mar. 21, 98.99; July 11, 102.04; Oct. 23, 99.35.

64. Measuring point changed; altitude of new point not determined.

402. Water levels, in feet above datum, 1940: Mar. 21, 97.52; July 11, 99.45; Oct. 23, 97.64.

Butler County

170. Water level, in feet above datum, 1940: Mar. 19, 96.65.

Cass County

16. Water levels, in feet above datum, 1940: Mar. 19, 98.04; July 5, 97.80; Oct. 15, 97.46.

17. Measurements discontinued.

18. Water level, in feet above datum, 1940: Mar. 20, 98.45.

Cedar County

65. Univ. of Nebr. NE¼SW¼ sec. 4, T. 28 N., R. 3 E., about 60 feet west of old well 65. Unused bored well, diameter 1 inch, depth 20.5 feet. Measuring point, top of pipe, 0.8 foot above land surface and 111.21 feet above datum of old well 65. Water level July 12, 1940, 6.58 feet below measuring point. Water level, in feet above datum, 1940: July 12, 104.63; Oct. 25, 102.44.

66. Water levels, in feet above datum, 1940: Mar. 22, 100.16; July 12, 99.52; Oct. 25, 99.36.

369. Water levels, in feet above datum, 1940: Mar. 22, 101.00; July 12, 101.47; Oct. 25, 100.67.

Chase County

152. Water levels, in feet above datum, 1940: Apr. 8, 98.63; July 29, 98.24; Nov. 11, 98.29.

153. Water levels, in feet above datum, 1940: Apr. 8, 100.34; July 29, 99.82; Nov. 11, 99.95.

Cherry County

115. Water levels, in feet above datum, 1940: Mar. 29, 98.29; July 19, 98.30; Oct. 31, 98.05.

116. Water levels, in feet above datum, 1940: Mar. 29, 100.01; July 19, 98.94; Oct. 31, 98.54.

118. Water levels, in feet above datum, 1940: Mar. 29, 98.41; July 19, 98.25; Oct. 31, 98.10.

256. Water levels, in feet above datum, 1940: Mar. 29, 98.00; July 19, 97.98; Oct. 31, 97.47.

257. Water levels, in feet above datum, 1940: Mar. 29, 99.62; July 19, 98.54; Oct. 31, 98.46.

312. Water levels, in feet above datum, 1940: Apr. 2, 98.24; July 22, 97.54; Nov. 4, 98.28.

399. Water levels, in feet above datum, 1940: Mar. 29, 100.57; July 19, 99.92; Oct. 31, 100.04.

431. Water levels, in feet above datum, 1940: Mar. 29, 99.37; July 19, 98.64; Oct. 31, 98.61.

Cheyenne County

86. No measurements made in 1937.

87. Water levels, in feet above datum, 1940: Apr. 6, 100.16; July 28, 100.36; Nov. 9, 100.49.

90. Water levels, in feet above datum, 1940: Apr. 6, 99.65; July 28, 98.55; Nov. 9, 99.54.

91. Water levels, in feet above datum, 1940: Apr. 6, 99.57; Nov. 9, 98.75.

Cheyenne County--Continued.

92. Water level, in feet above datum, 1940: Apr. 6, 100.55.

444. Water level, in feet above datum, 1940: Apr. 6, 98.77

Clay County

391. Measurements discontinued.

Colfax County

37. Water levels, in feet above datum, 1940: Mar. 21, 101.11; Oct. 22, 99.33.

38. Water levels, in feet above datum, 1940: Mar. 21, 101;41; July 11, 101.15; Oct. 22, 100.42.

332. Water levels, in feet above datum, 1940: Mar. 21, 95.41; July 11, 98.96; Oct. 23, 97.01.

343. Water level, in feet above datum, 1940: Mar. 21, 101.98.

Cuming County

61. Water levels, in feet above datum, 1940: Mar. 21, 99.04; July 11, 100.49; Oct. 23, 98.31.

69. Water levels, in feet above datum, 1940: Mar. 21, 98.19; July 11, 98.70; Oct. 23, 97.82.

Custer County

53. Water levels, in feet above datum, 1940: Mar. 26, 100.13; July 16, 99.00; Oct. 28, 99.29.

195. Water levels, in feet above datum, 1940: Mar. 26, 98.93; July 16, 98.48; Oct. 28, 98.19.

196. Water levels, in feet above datum, 1940: Apr. 2, 98.63; July 23, 97.71; Nov. 4, 96.87.

219. Water levels, in feet above datum, 1940: Apr. 3, 100.96; July 23, 99.41; Nov. 4, 99.75.

220. Water levels, in feet above datum, 1940: Apr. 3, 100.34; July 23, 99.07.

325. Water levels, in feet above datum, 1940: Mar. 26, 99.86; July 16, 99.20; Oct. 28, 98.47.

435. Water levels, in feet above datum, 1940: Apr. 3, 99.65; July 23, 98.81; Nov. 4, 99.43.

436. Water levels, in feet above datum, 1940: Apr. 3, 99.96; July 23, 99.08; Nov. 4, 99.21.

Dakota County

104. Water levels, in feet above datum, 1940: Mar. 22, 98.84; July 12, 99.40.

453. Water levels, in feet above datum, 1940: Mar. 22, 98.07; July 12, 100.27; Oct. 25, 100.15.

Dawes County

123. Water levels, in feet above datum, 1940: Mar. 30, 101.25; July 20, 101.36; Nov. 1, 100.40.

315. Water levels, in feet above datum, 1940: Mar. 30, 118.30; July 20, 119.98; Nov. 1, 118.73.

396. Water levels, in feet above datum, 1940: Mar. 30, 100.35; July 20, 100.29; Nov. 1, 100.16.

Dawson County

99. Water levels, in feet above datum, 1940: Apr. 3, 99.69; July 25, 98.89; Nov. 6, 99.32.

280. Water levels, in feet above datum, 1940: June 10, 101.29; Dec. 4, 99.87.

283. Water levels, in feet above datum, 1940: Apr. 3, 100.56; July 24, 98.48; Nov. 5, 99.50.

284. Water levels, in feet above datum, 1940: Apr. 3, 100.76; July 24, 98.37; Nov. 5, 98.92.

285. Water levels, in feet above datum, 1940: July 24, 97.76; Nov. 5, 99.11.

286. Water levels, in feet above datum, 1940: Apr. 3, 99.96; July 24, 98.30; Nov. 5, 98.66.

287. Water levels, in feet above datum, 1940: Apr. 3, 99.58; July 24, 96.60; Nov. 5, 97.19.

288. Water levels, in feet above datum, 1940: Apr. 3, 99.42; July 24, 96.00; Nov. 5, 97.38.

289. Water levels, in feet above datum, 1940: Apr. 3, 99.62; July 24, 98.04; Nov. 5, 98.15.

290. Water levels, in feet above datum, 1940: Apr. 3, 99.80; Nov. 5, a/ 101.64.

291. Water levels, in feet above datum, 1940: Apr. 3, 99.99; Nov. 5, a/ 100.96.

292. Water levels, in feet above datum, 1940: Apr. 3, 100.05; July 24, 99.44; Nov. 5, a/ 99.04.

293. Water levels, in feet above datum, 1940: July 24, 98.13; Nov. 5, 98.03.

294. Water levels, in feet above datum, 1940: Apr. 3, 100.58; July 24, 98.82; Nov. 15, 99.27.

295. Water levels, in feet above datum, 1940: Apr. 3, 100.43; July 24, 99.25; Nov. 5, 99.55.

296. Water levels, in feet above datum, 1940: July 26, 98.88; Nov. 5, 99.21

297. Water levels, in feet above datum, 1940: Apr. 3, 101.10; July 24, 100.11; Nov. 5, 100.97.

298. Water levels, in feet above datum, 1940: Apr. 3, 101.20; July 24, 100.31; Nov. 5, 99.70.

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a/ Water in nearby ditch.

Dawson County--Continued.

299. Water levels, in feet above datum, 1940: Apr. 3, 100.60; July 24, 99.11; Nov. 5, 99.24.

300. Water levels, in feet above datum, 1940: Apr. 3, 100.32; Nov. 5, 99.26.

301.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	a 99.62	Apr. 4	a 99.22	July 24	97.07	Nov. 2	a 97.12
29	a 99.63	May 2	a 99.00	27	a 97.00	5	97.87
Mar. 5	a 99.78	29	a 98.39	Aug. 29	a 96.49	29	a 98.94
Apr. 3	99.31	July 2	a 97.58	Sept.30	a 96.28	Dec. 30	a 98.91

302.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	a 99.74	Apr. 4	a 99.38	July 24	97.28	Nov. 2	a 97.18
29	a 99.86	May 2	a 99.17	27	a 97.22	5	97.54
Mar. 5	a100.20	29	a 98.50	Aug. 29	a 96.69	29	a 99.07
Apr. 3	99.42	July 2	a 97.81	Sept.30	a 96.55	Dec. 30	a 99.19

303.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	a100.17	Apr. 4	a100.02	July 24	97.94	Nov. 2	a 97.58
29	a100.37	May 2	a 99.88	27	a 97.89	5	97.64
Mar. 5	a101.11	29	a 99.21	Aug. 29	a 97.34	29	a 99.51
Apr. 3	100.07	July 2	a 98.59	Sept.30	a 97.24	Dec. 30	a 99.73

304.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	a100.38	Apr. 4	a100.13	July 24	98.06	Nov. 2	a 97.40
29	a100.57	May 2	a100.01	27	a 98.04	5	97.54
Mar. 5	a100.81	29	a 99.60	Aug. 29	a 97.44	29	a 99.79
Apr. 3	100.15	July 2	a 98.88	Sept.30	a 97.33	Dec. 30	a 99.63

305.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	a100.15	Apr. 3	100.46	Sept.30	a 97.95	Nov. 29	a 98.59
29	a100.46	4	a100.43	Nov. 2	a 97.94	Dec. 30	a 99.14
Mar. 5	a100.85	July 2	a 98.81				

306.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	a 99.25	Apr. 4	a 99.37	July 24	93.71	Nov. 2	a 94.06
29	a 99.36	May 2	a 99.13	27	a 95.11	5	95.74
Mar. 5	a 99.45	29	a 99.93	Aug. 29	a 96.91	29	a 97.11
Apr. 3	99.37	July 2	a 97.70	Sept.30	a 95.39	Dec. 30	a 97.43

308. Water levels, in feet above datum, 1940: Apr. 3, 102.21; Nov. 5, 99.33.

309. Water levels, in feet above datum, 1940: Apr. 3, 101.83; Nov. 6, 101.97.

310. Water level, in feet above datum, 1940: Apr. 3, 100.41.

311. Water levels, in feet above datum, 1940: Apr. 3, 102.43; July 25, 102.25; Nov. 6, 102.57.

314. Water level, in feet above datum, 1940: Apr. 3, 100.74.

317. Water levels, in feet above datum, 1940: Apr. 3, 101.16; July 24, 100.04; Nov. 5, 100.21.

a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Dawson County--Continued.

318.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	a100.41	May 29	a100.13	July 29	a 99.53	Nov. 4	a 99.17
Mar. 4	a100.63	July 1	a 99.85	Aug. 30	a 99.20	5	99.17
Apr. 4	a100.61	24	99.54	Oct. 1	a 99.02	Dec. 2	99.48
May 2	a100.56						

319. Water levels, in feet above datum, 1940: Apr. 3, 100.82; July 24, 99.86; Nov. 5, 99.26.

Deuel County

94. Water level, in feet above datum, 1940: Apr. 6, 100.16.

130. Water levels, in feet above datum, 1940: Apr. 6, 99.87; July 28, 100.16; Nov. 9, 100.39.

Dixon County

107. No measurements made in 1940.

333. Water levels, in feet above datum, 1940: Mar. 22, 101.09; July 12, 102.32; Oct. 25, 100.92.

340. Water levels, in feet above datum, 1940: Mar. 22, 98.49; July 12, 99.46; Nov. 7, dry.

Dodge County

29. Water level, in feet above datum, 1940: Mar. 20, 100.49.

31. Water levels, in feet above datum, 1940: Mar. 20, 100.76; July 9, 102.96; Oct. 18, 100.79.

34. Water levels, in feet above datum, 1940: Mar. 21, 100.69; July 10, 98.38; Oct. 22, 98.50.

35. Measurements discontinued.

401. Water levels, in feet above datum, 1940: Mar. 20, 100.68; July 9, 101.32; Oct. 18, 98.75.

420. Water levels, in feet above datum, 1940: Mar. 21, 101.07; July 10, 99.83; Oct. 22, 99.11.

Douglas County

24. Water levels, in feet above datum, 1940: Mar. 20, 101.24; July 9, 100.21; Oct. 18, 99.74.

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a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Dundy County

177. Water levels, in feet above datum, 1940: Apr. 8, 99.44; July 30, 98.72; Nov. 11, 98.97.

361. Water levels, in feet above datum, 1940: Apr. 8, 100.70; July 29, 99.89; Nov. 11, 100.39.

380. Water levels, in feet above datum, 1940: Apr. 8, 100.09; July 29, 98.95; Nov. 11, 99.16.

381. Measurements discontinued.

445. Water levels, in feet above datum, 1940: Apr. 8, 100.84; July 29, 100.24; Nov. 11, 100.06.

Fillmore County

174. Water level, in feet above datum, 1940: Apr. 11, 98.49.

191. Water levels, in feet above datum, 1940: Apr. 11, 98.85; Aug. 2, 98.44; Nov. 14, 98.21.

192. No measurements made in 1940.

Franklin County

Measurements discontinued in the following wells: 10, 11, 14, and 15.

156. Water levels, in feet above datum, 1940: Apr. 10, 99.98; Aug. 1, 99.19.

221. Water levels, in feet above datum, 1940: Apr. 10, 98.96; Aug. 1, 98.72.

224. Water levels, in feet above datum, 1940: Apr. 10, 100.08; Aug. 1, 99.61.

Frontier County

135. Water level, in feet above datum, 1940: Apr. 9, 99.08.

136. Water levels, in feet above datum, 1940: Apr. 9, 99.59; July 30, 99.16.

Furnas County

145. Water levels, in feet above datum, 1940: Apr. 9, 99.71; July 31, 99.13; Nov. 12, 99.11.

147. Water levels, in feet above datum, 1940: Apr. 9, 99.55; July 31, 99.38; Nov. 12, 99.24.

148. Water levels, in feet above datum, 1940: Apr. 9, 100.22; July 31, 99.88; Nov. 12, 99.83.

149. Water level, in feet above datum, 1940: July 31, 99.33.

180. Water levels, in feet above datum, 1940: Apr. 9, 99.28; July 31, 99.09; Nov. 12, 98.88.

Furnas County--Continued.

387. Water levels, in feet above datum, 1940: Apr. 9, 99.47; July 31, 99.29; Nov. 12, 99.08.

388. Water levels, in feet above datum, 1940: Apr. 9, 99.52; July 31, 100.12; Nov. 12, 99.39.

395. Water levels, in feet above datum, 1940: Apr. 9, 99.79; July 31, 99.29; Nov. 12, 99.18.

Gage County

199. Water levels, in feet above datum, 1940: Apr. 12, 97.04; July 6, 96.73; Oct. 17, 96.28.

230. Water levels, in feet above datum, 1940: Apr. 12, 99.66; Aug. 3, 101.23; Nov. 15, 101.34.

231. Water levels, in feet above datum, 1940: Apr. 12, 99.49; Aug. 5, 99.40; Oct. 16, 99.40.

Garden County

3. Well dry throughout 1940.

4. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,000, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 5	799.75	May 9	799.92	July 24	798.87	Sept.25	798.24
15	799.74	18	799.59	30	798.69	Oct. 7	798.62
22	799.79	28	799.37	Aug. 8	798.54	17	798.62
28	799.79	June 6	799.51	15	798.43	26	798.62
Apr. 2	799.81	13	799.29	23	798.43	30	798.66
12	799.86	20	799.04	30	798.29	Dec. 6	798.83
21	800.19	27	798.99	Sept. 7	798.59	19	798.74
26	800.11	July 5	798.91	14	798.44	26	799.09
May 3	800.24	11	798.77	20	798.36	30	799.09

5. Crescent Lake Migratory Bird Refuge. Northwest of Smith Lake. Unused driven observation well, diameter 1½ inches, depth 19 feet. Measuring point, top of pipe, 2.3 feet above land surface and 3,844.08 feet above sea level. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,800, 1933-40

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1933	38.00	June 2, 1934	37.18	Sept. 8, 1934	36.03
16	38.29	10	36.90	23	36.18
Jan. 19, 1934	38.67	16	36.99	30	36.15
28	38.75	23	36.99	Oct. 7	36.40
Feb. 11	38.83	July 1	36.63	14	38.00
Mar. 1	39.13	8	36.40	21	38.24
12	38.75	14	36.18	27	36.71
25	38.84	21	36.02	Nov. 11	36.70
Apr. 19	38.30	29	35.14	18	36.71
May 4	38.94	Aug. 5	36.03	26	36.99
13	38.26	12	36.17	Dec. 17	37.18
19	37.70	26	35.98	28	36.93
27	37.09	Sept. 2	36.02	Jan. 4, 1935	37.39

Garden County--Continued.

5. Crescent Lake Migratory Bird Refuge--Continued.

Date	Water level	Date	Water level	Date	Water level
Jan. 11, 1935	37.53	Nov. 23, 1937	36.38	May 29, 1939	37.78
21	37.55	Dec. 3	36.42	June 11	37.74
30	37.84	10	36.45	26	38.38
Feb. 6	37.96	17	36.53	July 12	36.34
21	38.17	24	36.60	20	36.08
Mar. 5	38.25	31	36.66	28	35.96
16	38.17	Jan. 7, 1938	36.72	Aug. 12	35.74
28	38.39	13	36.81	21	35.56
Apr. 17	38.34	20	36.90	30	35.53
May 2	38.79	28	36.90	Sept. 6	35.53
23	39.39	Feb. 4	37.02	14	35.52
June 6	39.32	11	37.11	22	35.83
20	38.71	18	37.26	29	35.84
July 3	37.77	26	37.38	Oct. 6	36.08
16	37.06	Mar. 3	37.46	18	36.10
24	37.72	11	37.55	28	36.13
Aug. 2	37.01	18	37.80	Nov. 10	36.29
9	36.61	25	37.03	17	36.48
19	36.33	Apr. 2	37.55	30	36.58
26	36.13	11	38.04	Dec. 14	36.67
Sept. 4	36.40	18	38.58	22	36.68
11	36.46	25	38.12	Mar. 6, 1940	38.08
18	36.37	May 2	38.76	15	37.94
25	36.36	11	38.27	22	37.94
Oct. 4	36.49	16	38.16	27	37.91
16	36.63	25	38.92	Apr. 2	37.88
24	36.71	June 6	38.13	13	38.03
Nov. 1	36.82	13	37.73	20	38.21
9	37.05	20	37.35	30	38.34
Dec. 3	37.16	28	37.36	May 4	37.96
18	37.34	July 12	37.33	11	37.53
Jan. 2, 1936	37.59	18	37.12	18	37.42
14	37.86	25	36.75	28	36.93
22	37.93	Aug. 1	36.51	June 7	37.11
Feb. 4	37.27	8	36.40	14	36.68
24	38.51	15	36.28	21	36.18
Mar. 7	38.74	23	36.24	27	36.10
17	38.81	Sept. 7	36.48	July 6	35.98
Apr. 20	38.50	13	36.76	12	35.85
July 22	35.74	19	36.80	24	35.52
Oct. 20	36.15	26	36.48	31	35.37
Nov. 19	37.67	Oct. 3	36.40	Aug. 9	35.22
Feb. 8, 1937	37.66	10	36.36	16	35.10
Mar. 30	38.27	19	36.29	21	35.08
May 7	37.84	25	36.46	30	35.25
28	37.14	Nov. 3	37.10	Sept. 6	35.25
June 17	37.10	Dec. 6	37.21	14	35.30
July 6	36.30	13	37.20	20	35.44
14	36.09	20	37.35	26	35.53
Aug. 19	35.67	28	37.39	Oct. 8	35.53
Sept. 17	35.77	Mar. 9, 1939	38.71	17	35.59
27	36.90	14	38.70	26	35.68
Oct. 9	36.95	23	38.65	30	35.68
14	36.96	Apr. 5	38.65	Dec. 6	36.08
23	36.18	27	38.58	19	36.12
28	36.29	May 4	38.08	28	36.23
Nov. 5	36.34	12	37.88	31	36.23
11	36.39				

Garden County--Continued.

12. Crescent Lake Migratory Bird Refuge. Northwest corner of refuge. Unused driven observation well, diameter 1½ inches, depth 10 feet. Measuring point, top of pipe, 0.8 foot above land surface and 3,851.77 feet above sea level. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,800 feet, 1934-40

Date	Water level	Date	Water level	Date	Water level
Aug. 5, 1934	45.82	June 17, 1937	45.49	Mar. 14, 1939	45.77
12	45.80	July 6	45.20	23	45.79
26	45.72	14	45.10	Apr. 5	45.91
Sept. 2	45.73	Aug. 19	44.78	27	45.99
8	45.72	Sept. 17	44.85	May 4	45.99
23	45.67	27	44.65	29	45.96
30	45.61	Oct. 8	44.51	June 6	46.23
Oct. 7	45.71	14	44.51	11	46.03
14	45.63	23	44.68	26	45.77
21	45.75	28	44.70	July 12	45.47
27	44.87	Nov. 5	44.72	20	45.30
Nov. 11	44.82	11	44.82	28	45.17
18	44.83	23	44.83	Aug. 12	44.91
26	45.83	Dec. 3	44.79	21	44.91
Dec. 17	45.87	10	44.69	30	44.80
28	45.33	17	44.69	Sept. 6	44.75
Jan. 4, 1935	45.92	24	44.72	14	44.62
11	45.90	31	44.74	22	44.67
21	45.85	Jan. 7, 1938	44.76	29	44.59
30	45.98	13	44.68	Oct. 6	44.67
Feb. 6	46.01	20	44.80	18	44.87
21	45.95	28	44.82	28	44.85
Mar. 5	46.09	Feb. 4	44.81	Nov. 10	44.77
16	46.07	11	44.80	17	44.77
28	46.06	18	44.89	30	44.79
Apr. 17	46.36	26	44.87	Dec. 14	44.82
May 2	46.77	Mar. 3	44.90	21	44.82
23	47.27	11	44.92	Mar. 6, 1940	45.17
June 6	47.57	18	44.99	15	45.17
20	47.64	25	44.97	22	45.29
July 3	47.33	Apr. 2	45.11	27	45.37
16	47.07	11	45.13	Apr. 2	45.37
24	47.72	18	45.34	13	45.32
Aug. 2	47.32	25	45.39	20	45.35
9	47.00	May 2	45.99	30	45.39
19	46.74	11	45.95	May 4	45.41
26	46.58	16	45.92	11	45.41
Sept. 4	46.59	23	46.10	18	45.27
11	46.55	June 6	46.00	28	45.12
18	46.39	13	46.11	June 7	45.08
25	46.36	20	45.99	14	44.97
Oct. 4	46.35	28	46.00	21	44.87
16	46.36	July 12	46.05	27	44.79
24	46.32	18	45.97	July 6	44.79
Nov. 1	46.30	25	45.79	12	44.67
19	46.35	Aug. 1	45.77	24	44.57
Dec. 3	46.33	8	45.64	31	44.47
18	46.34	15	45.52	Aug. 9	44.47
Jan. 2, 1936	46.45	23	45.52	16	44.41
12	46.48	Sept. 7	45.31	21	44.45
22	46.47	13	45.34	30	44.27
Feb. 4	46.38	19	45.29	Sept. 6	44.27
24	46.41	28	45.24	14	44.27
Mar. 7	46.52	Oct. 3	45.19	20	44.29
17	46.56	10	45.15	26	44.27
Apr. 20	46.77	19	45.09	Oct. 8	44.32
May 5	46.83	25	45.46	17	44.32
July 22	45.58	Nov. 30	43.15	26	44.47
Oct. 20	45.19	Dec. 6	45.12	30	44.52
Feb. 17, 1937	45.46	13	45.17	Dec. 7	44.67
Mar. 30	45.66	20	45.32	19	44.72
Apr. 22	45.77	28	45.21	28	44.72
May 28	45.57	Mar. 9, 1939	45.65	31	44.79

Garden County--Continued.

17. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,800, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 6	27.53	May 11	27.35	July 24	26.53	Sept.26	26.46
15	27.53	17	27.27	31	26.51	Oct. 8	26.53
22	27.55	28	27.08	Aug. 9	26.51	17	26.68
27	27.53	June 7	27.15	16	26.47	26	26.73
Apr. 2	27.53	14	26.98	21	26.43	30	26.73
13	27.53	21	26.87	30	26.40	Dec. 7	26.98
20	27.58	27	26.80	Sept. 6	26.40	19	27.08
30	27.48	July 6	26.73	14	26.44	28	27.13
May 4	27.52	12	26.67	20	26.40	31	27.13

19. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,800, 1940

Mar. 6	9.55	May 10	9.46	July 24	7.71	Sept.26	7.96
15	9.66	17	9.43	31	7.73	Oct. 8	8.11
22	9.66	28	9.33	Aug. 9	7.75	17	8.34
27	9.75	June 7	9.28	16	7.66	26	8.34
Apr. 2	9.65	14	9.13	21	7.67	30	8.34
13	9.76	20	8.56	30	7.78	Dec. 7	8.61
20	9.81	27	8.39	Sept. 6	7.78	19	8.66
30	9.94	July 6	8.17	14	7.89	28	8.85
May 4	9.75	12	8.06	20	7.91	31	8.81

21. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,700, 1940

Mar. 6	91.94	May 10	92.39	July 24	91.14	Sept.26	90.87
15	92.09	16	92.34	31	91.05	Oct. 8	91.11
22	92.12	28	92.21	Aug. 9	90.99	17	91.13
27	92.15	June 7	92.19	16	90.89	26	91.19
Apr. 2	92.19	13	92.01	21	90.89	30	91.29
13	92.23	21	91.73	30	90.84	Dec. 7	91.36
20	92.41	27	91.57	Sept. 6	90.84	19	91.45
30	92.34	July 6	91.45	14	90.90	28	91.56
May 4	92.39	12	91.34	20	90.84	31	91.59

25. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Water level, in feet above sea level minus 3,800, 1940

Mar. 5	23.28	May 10	23.26	July 19	22.99	Sept.26	22.79
15	23.29	18	23.23	30	22.94	Oct. 8	22.77
22	23.29	28	23.18	Aug. 8	22.92	14	22.74
28	23.29	June 6	23.19	15	22.92	24	22.79
Apr. 2	23.28	14	23.16	21	22.86	30	22.84
12	23.29	20	23.02	30	22.86	Dec. 7	23.16
20	23.31	28	23.16	Sept. 6	22.84	19	23.14
26	23.26	July 5	23.16	13	22.84	28	23.26
May 3	23.28	11	23.02	20	22.82	31	23.29

27. Crescent Lake Migratory Bird Refuge. West of Island Lake. Unused driven observation well, diameter 1½ inches. Measuring point, top of pipe, 2.5 feet above land surface and 3,800.69 feet above sea level. Measurements supplied through courtesy of Fish and Wildlife Service, U. S. Dept. of the Interior.

Garden County--Continued.

27. Crescent Lake Migratory Bird Refuge--Continued.

Water level, in feet above sea level less 3,700, 1934-40

Date	Water level	Date	Water level	Date	Water level
Aug. 5, 1934	93.13	June 18, 1937	91.34	Mar. 14, 1939	90.69
12	92.99	July 7	90.86	23	90.66
26	93.15	Aug. 20	90.63	Apr. 3	90.70
Sept. 2	92.65	Sept. 18	90.63	26	90.72
8	92.93	28	90.54	May 4	90.77
23	92.79	Oct. 8	90.73	12	90.79
30	92.76	14	90.74	28	90.89
Oct. 7	93.07	23	90.45	June 7	90.76
14	93.65	28	90.39	12	90.86
21	93.89	Nov. 5	90.45	26	90.59
27	92.63	11	90.39	July 11	90.91
Nov. 11	92.55	23	90.29	20	90.86
18	92.55	Dec. 3	90.31	30	90.69
26	92.52	11	90.22	Aug. 10	90.64
Dec. 17	92.43	16	90.19	21	90.61
28	92.43	24	90.17	31	90.52
Jan. 4, 1935	92.43	30	90.19	Sept. 6	90.47
11	92.43	Jan. 6, 1938	90.16	15	90.45
21	92.39	13	90.15	22	90.41
30	92.34	20	90.15	30	90.35
Feb. 6	92.38	29	90.19	Oct. 6	90.31
21	92.36	Feb. 3	90.16	18	90.27
Mar. 5	92.32	10	90.16	28	90.24
16	92.32	17	90.19	Nov. 13	90.19
28	92.31	24	90.16	18	90.19
Apr. 17	92.33	Mar. 3	90.19	Dec. 15	90.15
May 2	92.63	10	90.19	22	90.19
23	92.64	17	90.24	Mar. 5, 1940	90.22
June 6	92.75	24	90.19	13	90.30
20	93.15	Apr. 1	90.19	23	90.28
July 3	93.10	12	90.21	27	90.26
16	92.97	19	90.29	Apr. 3	90.28
24	92.89	May 3	90.67	12	90.28
Aug. 2	92.80	11	90.74	21	90.28
9	92.70	17	90.59	30	90.28
19	92.61	25	90.74	May 3	90.34
26	92.53	June 7	91.81	10	90.30
Sept. 4	92.44	14	91.85	18	90.22
11	92.40	21	91.86	28	90.18
18	92.35	30	91.89	June 6	90.32
25	92.29	July 11	92.16	14	90.24
Oct. 4	92.25	19	91.16	20	90.18
16	92.18	27	90.99	28	90.14
25	92.15	Aug. 2	90.95	July 5	90.12
Nov. 1	92.11	10	90.87	22	90.04
19	92.06	18	90.81	24	89.98
Dec. 3	92.04	24	90.74	30	90.00
18	91.97	Sept. 7	90.65	Aug. 8	89.84
Jan. 2, 1936	92.02	14	90.63	15	89.88
14	91.96	21	90.69	23	89.68
22	91.95	28	90.39	30	89.70
Feb. 4	92.01	Oct. 3	90.59	Sept. 6	89.70
24	92.05	12	90.56	14	89.68
Mar. 7	91.99	18	90.53	19	89.68
17	91.98	26	90.49	26	89.64
Apr. 20	92.02	Nov. 10	90.47	Oct. 7	90.68
May 5	92.05	16	90.45	17	90.72
July 22	91.76	30	90.39	26	90.78
Oct. 4	91.18	Dec. 5	90.42	30	90.78
Nov. 18	91.07	13	90.40	Dec. 6	90.88
Jan. 16, 1937	90.95	19	90.41	19	90.90
Feb. 15	90.96	27	90.56	26	90.96
Mar. 31	91.04	Mar. 9, 1939	90.66	30	91.08
May 31	90.99				

Garden County--Continued.

96.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 29	a100.92	May 24	a100.66	July 26	99.65	Oct. 31	a100.22
Apr. 1	a100.75	June 27	a 99.96	Aug. 29	a 99.48	Nov. 7	100.32
5	100.66	July 25	a 99.53	Oct. 1	a 99.78	29	a100.43
30	a100.85						

218. Water levels, in feet above datum, 1940: Apr. 5, 99.37; July 26, 98.08; Nov. 7, 100.14.

326. Water levels, in feet above datum, 1940: Apr. 5, 94.45; July 26, 93.56; Nov. 7, 94.01.

Garfield County

55. Water levels, in feet above datum, 1940: Mar. 26, 103.98; July 17, 104.38; Oct. 28, 105.49.

Gosper County

182. No measurements made in 1940.

183. Water levels, in feet above datum, 1940: Apr. 9, 100.57; July 31, 100.39.

307.

Water level, in feet above datum, 1940

Jan. 29	a 97.86	May 2	a 97.36	July 27	a 96.38	Nov. 5	95.33
Mar. 5	a 97.57	29	a 97.29	Aug. 29	a 95.82	29	a 95.46
Apr. 3	97.31	July 2	a 96.81	Sept.30	a 95.58	Dec. 30	a 95.38
4	a 97.47	24	96.48	Nov. 2	a 95.36		

447. Water levels, in feet above datum, 1940: Apr. 9, 101.78; July 31, 103.44.

Grant County

215. Water levels, in feet above datum, 1940: Apr. 2, 99.17; July 22, 98.01; Nov. 4, 98.15.

216. Water levels, in feet above datum, 1940: Apr. 2, 99.05; July 22, 98.71; Nov. 4, 99.54.

Greeley County

206. Water levels, in feet above datum, 1940: Mar. 27, 100.19; July 17, 98.94; Oct. 29, 99.97.

347. Water levels, in feet above datum, 1940: Mar. 27, 98.65; July 17, 98.81; Oct. 29, 98.18.

423. Water levels, in feet above datum, 1940: Mar. 27, 100.54; July 17, 99.30; Oct. 29, 99.40.

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a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Hall County

244. Water level, in feet above datum, 1940: Mar. 23, 101.61.

245.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level
Mar. 23	99.38	July 14	100.61	Nov. 2	a 98.80
Apr. 9	a 99.12	Oct. 27	98.58	Dec. 24	a 98.77

246. Water levels, in feet above datum, 1940: Mar. 25, 99.66; Oct. 27, 98.74.

247. Water level, in feet above datum, 1940: Mar. 25, 98.32.

249. Water levels, in feet above datum, 1940: Mar. 25, 98.36; July 14, 101.86; Oct. 27, 99.80.

258. Water levels, in feet above datum, 1940: Mar. 25, 98.22; Oct. 27, 97.17.

259. Water levels, in feet above datum, 1940: Mar. 25, 100.47; July 15, 99.97; Oct. 27, 99.05.

260. Water levels, in feet above datum, 1940: Mar. 25, 99.61; July 15, 99.32; Oct. 27, 98.92.

261. Water level, in feet above datum, 1940: Mar. 25, 99.00.

GI 202. Water level, in feet above datum, 1940: Dec. 24, a/ 99.45.

GI 203. Water levels, in feet above datum, 1940: Apr. 9, a/ 100.45; June 25, a/ 100.24; Sept. 24, a/ 99.70; Dec. 24, a/ 99.40.

GI 204. Water levels, in feet above datum, 1940: Apr. 9, a/ 99.57; June 25, a/ 99.45; Sept. 24, a/ 99.17; Dec. 24, a/ 98.82.

GI 206. Water levels, in feet above datum, 1940: Apr. 9, a/ 99.86; June 25, a/ 99.55; Sept. 24, a/ 99.00; Dec. 24, a/ 99.10.

GI 207. Water levels, in feet above datum, 1940: Feb. 27, a/ 98.20; June 1, a/ 97.85; July 27, a/ 97.30; Nov. 2, a/ 97.02.

GI 208.

Water level, in feet above datum, 1940

Feb. 27	a 99.30	June 1	a 98.80	Nov. 2	a 97.62
Apr. 9	a 99.00	July 27	a 98.15		

GI 209. Water levels, in feet above datum, 1940: Feb. 27, a/ 101.20; Apr. 9, a/ 101.07; June 1, a/ 100.75; July 27, a/ dry.

GI 210.

Water level, in feet above datum, 1940

Feb. 27	a 98.55	June 1	a 95.95	Nov. 2	a 96.56
Apr. 9	a 98.50	July 27	(b)		

GI 211. Water levels, in feet above datum, 1940: Feb. 27, a/ 98.62; Apr. 9, a/ 98.55; June 1, a/ 98.07; July 27, a/ dry.

GI 212.

Water level, in feet above datum, 1940

Feb. 27	a 98.85	June 1	a 98.05	Nov. 2	a 97.20
Apr. 9	a 98.80	July 27	a 96.80		

GI 214. Water levels, in feet above datum, 1940: Feb. 27, a/ 96.20; Apr. 9, a/ 96.05; June 1, a/ 95.30; July 27, a/ 94.30.

a Measurement supplied through courtesy of Grand Island Water Department.

b Well dry.

Hall County--Continued.

GI 215. Water levels, in feet above datum, 1940: Feb. 27, a/ 98.45; Apr. 9, a/ 98.35; June 1, a/ 97.60.

GI 216.

Water level, in feet above datum, 1940					
Date	Water level	Date	Water level	Date	Water level
Feb. 27	a 98.52	June 1	a 98.02	Nov. 2	a 96.72
Apr. 9	a 98.42	July 27	a 97.07		

GI 217.

Water level, in feet above datum, 1940					
Mar. 20	a 98.15	June 25	a 97.15	Dec. 24	a 97.10
Apr. 9	a 97.75	Sept.24	a 97.30		

GI 218.

Water level, in feet above datum, 1940					
Mar. 20	a 99.10	June 25	a 98.77	Dec. 24	a 98.10
Apr. 9	a 99.10	Sept.24	a 98.74		

GI 219.

Water level, in feet above datum, 1940					
Feb. 20	a101.32	June 25	a101.62	Dec. 24	a100.92
Apr. 9	a101.47	Sept.24	a100.62		

GI 220.

Water level, in feet above datum, 1940					
Feb. 20	a100.35	June 25	a100.07	Dec. 24	a 99.35
Apr. 9	a100.28	Sept.24	a 99.35		

GI 221. Water levels, in feet above datum, 1940: Mar. 20, a/ 97.85; Dec. 24, a/ 97.45.

GI 222. Water levels, in feet above datum, 1940: Mar. 20, a/ 99.15; June 25, a/ 97.95; Sept. 24, a/ 98.15; Dec. 24, a/ 97.45.

GI 223. Water levels, in feet above datum, 1940: June 1, a/ 98.82; July 27, a/ 98.52; Nov. 2, a/ 97.97.

GI 224. Water levels, in feet above datum, 1940: Apr. 9, a/ 99.40; June 1, a/ 99.25; July 27, a/ 99.00.

GI 225. Water levels, in feet above datum, 1940: Apr. 9, a/ 100.05; June 25, a/ 99.81; Sept. 24, a/ 99.25; Dec. 24, a/ 98.95.

GI 226. Water levels, in feet above datum, 1940: Apr. 9, a/ 96.07; June 1, a/ 95.15; July 27, a/ 94.45; Nov. 2, a/ 94.50.

GI 227.

Water level, in feet above datum, 1940					
Feb. 27	a 98.57	June 1	a 98.02	Nov. 2	a 97.10
Apr. 9	a 98.38	July 27	a 97.57		

GI 228. Water levels, in feet above datum, 1940: July 27, a/ 93.35; Nov. 2, a/ 93.59.

GI 229. Water levels, in feet above datum, 1940: Apr. 9, a/ 99.32; June 1, a/ 99.02; July 27, a/ 98.62; Nov. 2, a/ 98.32.

GI 230.

Water level, in feet above datum, 1940					
Feb. 27	a100.07	June 1	a 99.52	Nov. 2	a 98.48
Apr. 9	a100.04	July 27	a 99.12		

a Measurement supplied through courtesy of Grand Island Water Department.

Hall County--Continued.

GI 231. Water levels, in feet above datum, 1940: Apr. 9, a/ 98.26; June 1, a/ 98.05; July 27, a/ 97.55; Nov. 2, a/ 97.16.

GI 232. Water levels, in feet above datum, 1940: Feb. 27, a/ 98.57; Apr. 9, a/ 98.47; June 1, a/ 97.89; July 27, a/ dry.

GI 233. Water levels, in feet above datum, 1940: Apr. 9, a/ 99.35; June 1, a/ 98.55; July 27, a/ 98.10; Nov. 2, a/ 97.65.

GI 234. Water levels, in feet above datum, 1940: Feb. 27, a/ 106.25; Apr. 9, a/ 100.55; June 1, a/ 99.35; July 27, a/ dry.

GI 236.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 27	a100.00	June 1	a100.05	Nov. 2	a 98.43
Apr. 9	a100.27	July 27	a 99.70		

GI 237.

Water level, in feet above datum, 1940

Feb. 27	a 99.42	June 1	a 98.92	Nov. 2	a 97.98
Apr. 9	a 99.37	July 27	a 98.07		

GI 238.

Water level, in feet above datum, 1940

Feb. 27	a 99.40	June 1	a 98.30	Nov. 2	a 98.10
Apr. 9	a 99.40	July 27	(b)		

GI 239. Water levels, in feet above datum, 1940: Feb. 20, a/ 99.73; Apr. 9, 99.58; June 25, a/ 99.28; Sept. 24, a/ 99.20.

GI 240

Water level, in feet above datum, 1940

Feb. 20	a100.83	June 25	a100.99	Dec. 24	a 99.93
Apr. 9	a100.99	Sept.24	a100.86		

GI 241. Water levels, in feet above datum, 1940: Feb. 20, a/ 99.87; Apr. 9, a/ 99.95; June 25, a/ 99.86; Sept. 24, a/ 99.05.

GI 242. Water levels, in feet above datum, 1940: June 25, a/ 99.90; Sept. 24, a/ 99.40; Dec. 24, a/ 97.40.

GI 243. No measurements made in 1940.

GI 244.

Water level, in feet above datum, 1940

Feb. 20	a100.52	June 25	a100.62	Dec. 24	a 99.62
Apr. 9	a100.62	Sept.24	a 99.91		

GI 246.

Water level, in feet above datum, 1940

Feb. 20	a100.62	June 25	a100.87	Dec. 24	a 99.87
Apr. 9	a100.82	Sept.24	a100.27		

GI 247. Water levels, in feet above datum, 1940: Apr. 8, a/ 101.93; June 25, a/ 100.16; Sept. 24, a/ 100.23; Dec. 24, a/ 100.08.

GI 248

Water level, in feet above datum, 1940

Feb. 20	a101.20	June 25	a101.50	Dec. 24	a100.30
Apr. 9	a101.70	Sept.24	a100.67		

a Measurement supplied through courtesy of Grand Island Water Department.
b Well dry.

Hall County--Continued.

GI 249.

Water level, in feet above datum, 1940					
Date	Water level	Date	Water level	Date	Water level
Feb. 20	a101.35	June 25	a101.55	Dec. 24	a100.60
Apr. 9	a101.70	Sept.24	a100.75		

GI 250.

Water level, in feet above datum, 1940					
Feb. 20	a101.75	June 25	a101.45	Dec. 24	a100.25
Apr. 9	a102.05	Sept.24	a100.34		

GI 251.

Water level, in feet above datum, 1940					
Mar. 20	a 99.05	June 25	a 98.75	Dec. 24	a 98.10
Apr. 9	a 98.82	Sept.24	a 98.40		

GI 252.

Water level, in feet above datum, 1940					
Mar. 20	a 99.60	June 25	a 98.22	Dec. 24	a 97.60
Apr. 9	a 98.34	Sept.24	a 98.07		

GI 253.

Water level, in feet above datum, 1940					
Feb. 20	a 98.55	June 25	a 98.21	Dec. 24	97.45
Apr. 9	a 98.41	Sept.24	a 97.85		

GI 254.

Water level, in feet above datum, 1940					
Feb. 20	a 97.80	June 25	a 97.70	Dec. 24	a 96.95
Apr. 9	a 97.75	Sept.24	a 97.50		

GI 255. No measurements made in 1940.

Hamilton County

158. Measuring point destroyed.

159. Water level, in feet above datum, 1940: Apr. 11, 98.78.

160. Water levels, in feet above datum, 1940: Apr. 11, 98.20; Aug. 2, 97.67.

173. Water level, in feet above datum, 1940: Apr. 11, 100.68.

330. Water levels, in feet above datum, 1940: Apr. 11, 99.13; Nov. 14, 97.50.

Harlan County

155. Water level, in feet above datum, 1940: Apr. 10, 101.03.

222. Water levels, in feet above datum, 1940: Apr. 10, 99.79; July 31, 100.05; Nov. 13, 101.68.

329. Water levels, in feet above datum, 1940: Apr. 10, 99.56; July 31, 98.65; Nov. 13, 99.52.

389. Water levels, in feet above datum, 1940: Apr. 10, 99.76; July 31, 99.70.

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a Measurement supplied through courtesy of Grand Island Water Department.

Hayes County

141. Water levels, in feet above datum, 1940: Apr. 9, 99.39; July 30, 99.26.

142. Water levels, in feet above datum, 1940: Apr. 9, 100.97; July 30, 100.93.

446. Water levels, in feet above datum, 1940: Apr. 8, 100.09; July 29, 100.53; Nov. 11, 99.92.

Hitchcock County

140. Water levels, in feet above datum, 1940: Apr. 9, 98.79; July 30, 98.55.

178. Water levels, in feet above datum, 1940: Apr. 8, 100.73; Nov. 11, 100.02.

362. Water levels, in feet above datum, 1940: Apr. 8, 100.44; July 29, 100.80.

Holt County

112. Water level, in feet above datum, 1940: Mar. 28, 99.19.

113. Water levels, in feet above datum, 1940: Mar. 28, 99.90; July 19, 99.11.

203. Water levels, in feet above datum, 1940: Mar. 27, 100.23; July 18, 99.11; Oct. 30, 99.38.

373. Water levels, in feet above datum, 1940: Mar. 28, 101.07; July 19, 100.23; Oct. 31, 99.67.

374. Water levels, in feet above datum, 1940: Mar. 28, 99.72; July 19, 98.55; Oct. 31, 98.14.

424. Water levels, in feet above datum, 1940: Mar. 27, 100.66; July 18, 99.97; Oct. 30, 98.37.

428. Water levels, in feet above datum, 1940: Mar. 27, 97.52; July 17, 97.67; Oct. 30, 97.38.

Hooker County

214. Water levels, in feet above datum, 1940: Apr. 2, 93.94; July 22, 93.75; Nov. 4, 93.48.

Howard County

46. Water levels, in feet above datum, 1940: Mar. 27, 100.59; July 17, 99.95; Oct. 29, 99.41.

51. Water levels, in feet above datum, 1940: Mar. 23, 98.50; July 14, 98.47; Oct. 26, 97.87.

59. Water levels, in feet above datum, 1940: July 17, 99.34; Oct. 29, 98.95.

Howard County--Continued.

98. Water levels, in feet above datum, 1940: Mar. 26, 100.48; July 16, 99.01; Oct. 28, 97.91.

346. Water levels, in feet above datum, 1940: Mar. 27, 101.77; July 17, 98.89; Oct. 29, 99.79.

Jefferson County

226. Water levels, in feet above datum, 1940: Apr. 12, 100.04; Aug. 3, 99.94; Nov. 15, 100.69.

227. Water level, in feet above datum, 1940: Apr. 12, 100.04.

228. Water levels, in feet above datum, 1940: Apr. 12, 98.38; Aug. 3, 99.31; Nov. 15, 99.42.

229. Water levels, in feet above datum, 1940: Apr. 12, 99.26; Aug. 3, 99.01; Nov. 15, 99.52.

Johnson County

2. Water levels, in feet above datum, 1940: Apr. 12, 98.81; July 6, 98.75; Oct. 17, 98.61.

3. Water level, in feet above datum, 1940: Apr. 12, 97.10.

Kearney County

181. Water levels, in feet above datum, 1940: Apr. 10, 100.29; Aug. 1, 99.42; Nov. 13, 99.34.

266. Water levels, in feet above datum, 1940: Mar. 25, 100.86; July 15, 100.02; Oct. 27, 99.34.

Keith County

93.

Water levels, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	a100.74	May 27	a101.28	Aug. 30	a100.74	Nov. 6	100.58
31	a101.04	June 28	a101.46	Sept.27	a100.60	Dec. 2	100.64
Mar. 5	a101.36	July 26	101.09	Oct. 30	a100.57	30	100.82
Apr. 2	a101.51						

255. Water levels, in feet above datum, 1940; Apr. 5, 99.01; July 26, 98.18; Nov. 7, 98.59.

348. Water level, in feet above datum, 1940: Apr. 4, 102.72.

349. Measurements discontinued.

350.

Water level, in feet above datum, 1940

May 27	a100.46	Aug. 30	a 99.77	Oct. 30	a 99.56	Dec. 2	a 99.70
June 28	a100.44	Sept.27	a 99.59	Nov. 17	99.47	30	a 99.83
July 26	99.16						

a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Keith County--Continued.

351.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 4	99.42	Aug. 30	a 99.17	Oct. 30	a 99.09	Dec. 2	a 99.07
June 28	a 99.42	Sept.27	a 99.07	Nov. 7	99.37	30	a 99.10
July 26	99.24						

352. Water levels, in feet above datum, 1940: Jan. 3, a/ 99.78; Feb. 1, a/ 100.16; Feb. 28, a/ 100.76; Mar. 27, a/ 100.87. Well destroyed; measurements discontinued.

355. Measurements discontinued.

356. Measurements discontinued.

357. Measurements discontinued.

358. Water levels, in feet above datum, 1940: Apr. 6, 98.10; July 29, 98.05; Nov. 9, 97.98.

360. Water levels, in feet above datum, 1940: Apr. 8, 100.01; July 29, 99.77.

N4. Central Nebraska Public Power and Irrigation District. NE¼NE¼ sec. 20, T. 15 N., R. 38 W. Bored observation well, diameter 4 inches, depth 19 feet. Measuring point, top of casing, 3,303.19 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
June 24, 1936	17.70	Aug. 4	18.10	June 29, 1939	18.53
26	17.30	Sept. 8	18.14	July 31	18.37
30	17.70	Nov. 2	18.32	Aug. 30	18.60
July 3	17.70	Dec. 2	18.15	Sept.29	18.50
7	17.70	30	18.19	Oct. 28	18.50
16	17.50	Jan. 31, 1938	18.18	Nov. 29	19.30
30	17.80	Feb. 28	18.25	Jan. 3, 1940	(b)
Aug. 13	17.20	Mar. 31	18.24	Feb. 1	18.82
28	17.79	May 4	18.24	28	18.70
Sept.14	17.74	31	18.28	Mar. 27	18.71
Oct. 1	17.81	June 30	18.28	Apr. 29	18.73
16	17.82	Aug. 30	18.32	May 23	18.75
Nov. 4	17.81	Sept.29	18.35	June 26	18.76
30	17.85	Oct. 31	18.38	July 24	18.83
Jan. 4, 1937	17.89	Nov. 29	18.40	Aug. 28	18.82
Feb. 3	17.93	Dec. 29	18.43	Sept.30	18.87
Mar. 2	17.96	Jan. 30, 1939	18.45	Nov. 1	18.86
Apr. 1	17.98	Feb. 27	18.46	28	18.88
May 4	18.32	Apr. 3	18.48	Dec. 31	18.90
June 2	18.03	May 1	18.50		
July 8	18.05	31	18.52		

N5. Central Nebraska Public Power and Irrigation District. NW¼ sec. 16, T. 15 N., R. 38 W. Bored observation well, diameter 4 inches, depth 10 feet. Measuring point, top of casing, 3,345.48 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

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a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

b Well dry.

Keith County--Continued.

N5. Central Nebraska Public Power and Irrigation District--Continued.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
June 24, 1936	7.60	July 8	8.27	May 31, 1939	8.63
26	7.60	Aug. 4	8.34	June 29	8.68
30	7.60	Sept. 8	8.31	July 31	8.95
July 3	7.70	Nov. 2	8.32	Aug. 30	9.12
7	7.70	Dec. 1	8.35	Sept.29	9.00
16	7.90	30	8.36	Oct. 28	9.60
30	7.80	Jan. 31, 1938	8.40	Nov. 29	(a)
Aug. 13	7.80	Feb. 28	8.25	Jan. 3, 1940	(a)
28	7.94	Mar. 31	8.46	Feb. 1	9.48
Sept.14	7.94	May 4	8.49	28	9.09
Oct. 1	7.84	31	7.16	Mar. 27	9.12
16	7.80	June 30	8.03	Apr. 29	9.15
Nov. 4	7.78	Aug. 30	8.35	May 23	9.18
30	7.82	Sept.29	8.29	June 26	9.23
Jan. 4, 1937	7.82	Oct. 31	8.44	July 24	9.42
Feb. 3	7.87	Nov. 29	8.50	Aug. 28	9.61
Mar. 2	7.91	Dec. 29	8.52	Sept.30	9.56
Apr. 1	7.95	Jan. 30, 1939	8.57	Nov. 1	9.50
May 4	7.99	Apr. 3	8.58	28	9.52
June 2	8.02	May 1	8.62	Dec. 31	9.55

N6. Central Nebraska Public Power and Irrigation District. SE¼ sec. 4, T. 15 N., R. 38 W. Bored observation well, diameter 5 inches, depth 8.2 feet. Measuring point, top of casing, 3,362.08 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
June 24, 1936	4.15	Aug. 4, 1937	4.28	May 31, 1939	4.68
26	4.20	Sept. 8	3.39	June 29	4.93
30	4.25	Nov. 2	4.62	July 31	5.24
July 3	4.25	Dec. 1	4.64	Aug. 30	5.29
7	4.30	30	4.66	Sept.29	5.17
16	4.30	Jan. 31, 1938	4.70	Oct. 28	5.17
30	4.40	Feb. 28	4.73	Nov. 29	5.16
Aug. 13	4.40	Mar. 31	4.73	Jan. 3, 1940	5.22
28	4.39	May 4	4.40	Feb. 1	5.24
Sept.14	4.35	31	(b)	28	5.25
Oct. 1	4.24	June 30	1.78	Mar. 27	5.28
16	4.19	Aug. 30	3.62	Apr. 29	5.30
Nov. 4	4.18	Sept.29	3.85	May 23	5.30
30	4.18	Oct. 31	4.28	June 26	4.86
Jan. 4, 1937	4.18	Nov. 29	4.44	July 24	5.44
Feb. 3	4.25	Dec. 29	4.59	Aug. 28	5.44
Mar. 2	4.20	Jan. 30, 1939	4.67	Sept.30	5.68
Apr. 1	4.12	Feb. 27	4.75	Nov. 1	5.59
May 4	4.34	Apr. 3	4.30	28	5.59
June 2	4.40	May 1	4.69	Dec. 31	5.57
July 8	4.76				

N7. Central Nebraska Public Power and Irrigation District. NW¼ sec. 34, T. 16 N., R. 38 W. Bored observation well, diameter 4 inches, depth 12 feet. Measuring point, top of casing, 3,392.34 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
June 24, 1936	9.10	Aug. 13, 1936	9.10	Jan. 4, 1937	9.51
26	9.00	28	9.25	Mar. 2	9.50
30	9.05	Sept.14	9.37	Apr. 1	9.56
July 3	9.05	Oct. 1	9.44	May 4	9.58
7	9.10	16	9.47	June 2	9.63
16	9.10	Nov. 4	9.48	July 8	9.83
30	9.20	30	9.54	Nov. 2, 1937	9.91

a Dry.
b Well flooded.

Keith County--Continued.

N7. Central Nebraska Public Power and Irrigation District--Continued.
Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Dec. 1, 1937	9.99	Jan. 30, 1939	9.88	Feb. 1, 1940	10.53
Jan. 31, 1938	9.97	Feb. 27	9.92	28	10.55
Feb. 28	9.98	Apr. 3	9.90	Mar. 27	10.57
Mar. 31	9.98	May 1	9.86	Apr. 29	10.60
May 4	9.98	31	9.92	May 23	10.63
31	a 5.54	June 29	9.95	June 26	10.62
June 30	7.66	July 31	10.05	July 24	10.72
Aug. 30	8.09	Aug. 30	10.14	Aug. 28	10.83
Sept.29	8.75	Sept.29	10.23	Sept.30	10.88
Oct. 31	9.86	Oct. 28	10.30	Nov. 1	10.87
Nov. 29	9.86	Nov. 29	10.35	28	10.89
Dec. 29	9.84	Jan. 3, 1940	10.40	Dec. 31	10.89

N9. Central Nebraska Public Power and Irrigation District. SE¼NE¼ sec. 28, 16 N., R. 38 W. Bored observation well, diameter 5 inches, depth 19.8 feet. Measuring point, top of casing, 3,438.12 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Jan. 24, 1936	12.80	Sept. 8, 1937	13.59	June 29, 1939	13.61
26	12.80	Nov. 3	13.38	July 31	14.02
30	12.90	Dec. 1	13.32	Aug. 30	14.15
July 3	12.90	30	13.22	Sept.29	14.08
7	13.00	Jan. 31, 1938	13.15	Oct. 28	13.94
16	13.10	Feb. 28	13.11	Nov. 29	13.85
30	13.30	Mar. 31	13.10	Jan. 3, 1940	13.72
Aug. 13	13.30	May 4	13.09	Feb. 1	13.70
28	13.35	31	13.02	28	13.62
Sept.14	13.30	June 30	13.03	Mar. 27	13.60
Oct. 1	13.34	Aug. 30	13.49	Apr. 29	13.59
16	13.30	Sept.29	13.36	May 23	13.76
Nov. 4	13.23	Oct. 31	13.40	June 26	14.08
30	13.15	Nov. 29	13.32	July 24	14.42
Mar. 2, 1937	12.86	Dec. 29	13.26	Aug. 28	14.46
Apr. 1	12.78	Jan. 30, 1939	13.18	Sept.30	14.39
May 4	12.89	Feb. 27	13.15	Nov. 1	14.23
June 2	13.00	Apr. 3	13.09	28	14.11
July 8	13.32	May 1	13.10	Dec. 31	14.00
Aug. 4	13.55	31	13.30		

N11. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	15.98	Apr. 29	16.14	July 24	16.30	Nov. 1	16.39
Feb. 1	16.05	May 23	16.20	Aug. 28	16.31	28	16.38
28	16.07	June 26	16.23	Sept.30	16.35	Dec. 31	16.46
Mar. 27	16.07						

N18. Central Nebraska Public Power and Irrigation District. SE¼ sec. 21, T. 15 N., R. 38 W. Bored and driven observation well, diameter 1¼ inches, depth 37 feet. Measuring point, top of pipe, 3,228.30 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

a Well flooded.

Keith County--Continued.

N18. Central Nebraska Public Power and Irrigation District-Continued.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
July 3, 1936	32.45	Nov. 2, 1937	33.10	June 29, 1939	34.07
7	32.40	Dec. 1	33.14	July 31	33.95
16	32.50	30	33.09	Aug. 30	34.22
30	32.50	Jan. 31, 1938	33.14	Sept.29	34.30
Aug. 18	32.50	Feb. 28	33.18	Oct. 28	34.10
28	32.35	Mar. 31	33.39	Nov. 29	34.12
Sept.14	32.30	May 4	33.58	Jan. 3, 1940	34.05
Oct. 1	32.46	31	33.30	Feb. 1	33.88
16	32.48	June 30	33.48	28	34.47
Nov. 4	32.54	Aug. 3	33.44	Mar. 27	34.60
30	32.54	Sept.29	33.40	Apr. 29	34.68
Jan. 4, 1937	32.59	Oct. 31	33.88	May 23	34.71
Feb. 3	32.67	Nov. 29	33.74	June 26	34.77
Mar. 2	32.70	Dec. 29	33.61	July 24	34.84
Apr. 1	32.74	Jan. 30, 1939	33.93	Aug. 28	34.96
May 4	32.80	Feb. 27	33.69	Sept.30	35.02
June 2	32.86	Apr. 3	33.92	Nov. 1	35.07
July 8	32.82	May 1	34.10	28	35.09
Aug. 3	32.86	31	34.37	Dec. 31	34.87
Sept. 7	33.06				

N25. Central Nebraska Public Power and Irrigation District. NW¼ sec. 5, T. 15 N., R. 39 W. Bored observation well, diameter 4 inches, depth 36.8 feet. Measuring point, top of casing, 3,408.33 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
July 30, 1936	34.80	Dec. 31, 1937	35.13	Aug. 1, 1939	35.80
Aug. 13	34.80	Feb. 1, 1938	35.22	31	35.87
28	34.89	Mar. 1	35.23	Sept.30	35.85
Sept.14	34.90	Apr. 1	35.15	Oct. 30	35.88
Oct. 1	34.93	May 5	27.66	Dec. 1	35.95
16	34.93	June 1	a 23.70	Jan. 4, 1940	35.94
Nov. 30	35.08	July 1	26.72	Feb. 2	35.97
Dec. 31	34.91	Aug. 31	32.84	29	35.98
Feb. 2, 1937	34.92	Sept.30	33.82	Apr. 1	36.02
Mar. 2	35.07	Nov. 1	35.44	30	36.04
Apr. 2	35.10	30	35.50	May 24	36.02
May 4	35.21	Dec. 30	35.55	June 27	36.09
June 1	35.75	Jan. 30, 1939	35.57	July 25	36.12
July 8	35.26	Feb. 28	35.39	Aug. 29	36.16
Aug. 4	31.84	Apr. 4	35.66	Oct. 1	36.19
Sept. 7	33.99	May 2	35.70	31	36.23
Nov. 3	35.22	June 1	35.71	Nov. 29	36.24
Dec. 2	35.03	30	35.75		

N35. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 27	7.17	Apr. 30	7.17	June 27	7.17	Oct. 31	7.64
Apr. 1	7.15	May 24	7.01	July 25	7.57		

N37. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	15.93	Apr. 1	10.74	June 27	15.91	Oct. 1	18.70
Feb. 2	15.17	30	10.65	July 25	18.46	31	16.97
29	12.66	May 24	11.59	Aug. 29	18.56	Nov. 29	16.54

a Well flooded.

Keith County--Continued.

N41. Central Nebraska Public Power and Irrigation District. SE¼ sec. 24, T. 15 N., R. 39 W. Drilled observation well, diameter 1¼ inches, depth 226 feet. Measuring point, top of pipe, 3,282.61 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Oct. 1, 1936	73.84	May 4, 1938	80.32	Nov. 29, 1939	82.61
16	74.05	31	80.54	Jan. 3, 1940	82.68
Nov. 30	75.40	June 30	80.64	Feb. 1	82.74
Jan. 4, 1937	75.84	Aug. 30	81.24	28	82.80
Feb. 2	76.38	Sept.30	81.28	Mar. 27	82.85
Mar. 2	76.82	Oct. 31	81.35	Apr. 29	82.87
Apr. 1	77.27	Nov. 29	81.40	May 23	82.86
May 4	77.73	Dec. 29	81.62	June 26	82.86
June 2	78.12	Jan. 30, 1939	81.68	July 14	82.88
July 8	78.50	Feb. 27	81.85	Aug. 28	82.99
Aug. 4	78.80	Apr. 3	81.95	Sept.30	82.95
Sept. 8	79.12	May 1	82.05	Nov. 1	83.02
Nov. 2	79.62	31	82.12	28	83.13
Dec. 1	79.62	June 29	82.20	Dec. 31	83.18
30	79.82	July 31	82.29		
Feb. 1, 1938	79.30	Aug. 30	82.35		
Mar. 1	80.09	Sept.29	82.44		
31	80.20	Oct. 28	82.52		

N42. Central Nebraska Public Power and Irrigation District. NE¼ sec. 28, T. 15 N., R. 38 W. Drilled observation well, diameter 2 inches, depth 261 feet. Measuring point, top of pipe, 3,262.28 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1936	94.02	May 4, 1938	94.50	Sept.29, 1939	94.82
Nov. 30	94.10	31	94.52	Oct. 28	94.88
Jan. 4, 1937	94.05	June 30	94.56	Nov. 29	94.91
Mar. 2	81.75	Aug. 30	94.59	Jan. 3, 1940	94.94
Apr. 1	88.84	Sept.30	94.57	Feb. 1	94.95
May 4	92.48	Oct. 31	94.61	28	95.00
June 2	93.78	Nov. 29	94.60	Mar. 27	95.03
July 8	94.19	Dec. 29	94.67	Apr. 29	95.05
Aug. 3	94.26	Jan. 30, 1939	94.64	May 23	95.08
Sept. 7	93.82	Feb. 27	94.68	June 26	95.10
Nov. 2	94.42	Apr. 3	94.70	July 24	95.04
Dec. 1	94.44	May 1	94.71	Aug. 28	95.18
30	94.43	31	94.72	Sept.30	95.23
Jan. 31, 1938	94.20	June 29	94.74	Nov. 1	95.26
Feb. 28	94.47	July 31	94.80	28	95.27
Mar. 31	94.38	Aug. 30	94.80		

S10. Central Nebraska Public Power and Irrigation District. SW¼ sec. 3, T. 14 N., R. 38 W. Drilled observation well, depth 48 feet. Measuring point, top of casing, 3,153.50 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
June 16, 1936	21.00	Aug. 1, 1936	21.80	Feb. 1, 1937	21.09
17	21.20	14	21.85	Mar. 2	20.75
18	21.30	28	21.90	Apr. 1	21.00
19	21.20	Sept.15	22.05	May 3	21.44
22	21.30	Oct. 2	21.95	July 7	22.24
26	21.35	17	21.71	Aug. 2	22.68
30	21.40	Nov. 6	21.91	Sept. 7	23.76
July 3	21.50	30	21.50	Nov. 2	25.61
7	21.50	Jan. 4, 1937	21.32	Dec. 1	24.32

Keith County--Continued.

S10. Central Nebraska Public Power and Irrigation District-Continued.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Dec. 30, 1937	24.05	Jan. 30, 1939	21.19	Apr. 29, 1940	22.88
Jan. 31, 1938	24.24	Feb. 27	21.10	June 26	21.35
Feb. 28	24.19	Apr. 3	21.24	July 24	21.91
Mar. 31	24.36	May 1	21.42	Aug. 29	22.09
May 4	23.65	31	21.70	Sept.30	22.50
31	22.13	June 29	21.85	Nov. 1	22.68
June 30	21.14	July 31	22.28	28	21.94
Aug. 30	21.57	Aug. 30	22.55	Dec. 31	21.95
Sept.29	21.41	Sept.29	22.33		
Oct. 31	21.86	Oct. 28	22.00		
Nov. 29	23.64	Feb. 28, 1940	23.38		
Dec. 29	21.65	Mar. 27	23.58		

S16. Central Nebraska Public Power and Irrigation District. SE¼ sec. 10, T. 14 N., R. 38 W. Drilled observation well, diameter 1¼ inches, depth 240 feet. Measuring point, top of pipe, 3,363.63 feet above sea level. Measurements furnished through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1937-40

Feb. 1, 1937	188.95	May 31, 1938	188.70	Sept.29, 1939	188.58
Mar. 1	187.82	June 30	188.46	Oct. 28	188.70
Apr. 2	188.78	Aug. 30	188.51	Nov. 29	188.44
May 3	189.75	Sept.29	188.61	Feb. 1, 1940	188.94
June 1	188.95	Oct. 31	188.30	28	188.60
July 7	188.79	Nov. 29	188.45	Mar. 27	188.21
Aug. 3	188.85	Dec. 29	188.79	Apr. 29	188.56
Sept. 8	188.82	Jan. 30, 1939	188.56	May 23	188.62
Nov. 3	189.05	Feb. 28	188.62	June 26	188.49
Dec. 1	188.86	Apr. 3	188.68	July 24	188.47
30	188.33	May 1	188.69	Aug. 28	188.57
Jan. 31, 1938	188.68	31	188.42	Sept.30	188.70
Feb. 28	188.66	June 29	188.83	Nov. 1	188.77
Mar. 31	188.90	July 31	188.47	28	188.51
May 4	188.52	Aug. 30	188.66	Dec. 31	188.66

S18. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	162.70	Apr. 29	162.62	July 24	162.67	Nov. 1	162.89
Feb. 1	162.89	May 23	162.89	Aug. 28	162.68	28	162.51
28	162.74	June 26	162.50	Oct. 1	162.59	Dec. 31	162.63
Mar. 27	162.47						

S19. Central Nebraska Public Power and Irrigation District. SW¼NE¼ sec. 7, T. 14 N., R. 38 W. Drilled observation well, diameter 1¼ inches, depth 283 feet. Measuring point, top of pipe, 3,360.47 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Dec. 31, 1936	167.84	Aug. 4, 1937	167.67	Mar. 31, 1938	167.96
Feb. 1, 1937	167.97	Sept. 7	167.80	May 4	167.78
Mar. 1	167.76	Nov. 2	168.05	31	167.90
Apr. 2	167.50	Dec. 1	167.01	June 30	167.74
May 4	167.45	30	167.56	Aug. 30	167.68
June 2	167.89	Jan. 31, 1938	167.70	Sept.29	167.76
July 7	167.69	Feb. 28	166.85	Oct. 31	167.60

Keith County--Continued.

S19. Central Nebraska Public Power and Irrigation District-Continued.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1938	167.74	Aug. 30, 1939	167.92	May 23, 1940	167.98
Dec. 29	167.97	Sept.29	167.86	June 26	167.96
Jan. 30, 1939	167.82	Oct. 28	167.86	July 24	167.88
Feb. 27	167.91	Nov. 29	167.80	Aug. 29	167.90
Apr. 3	167.78	Jan. 3, 1940	168.00	Sept.30	167.93
May 1	167.83	Feb. 1	168.05	Nov. 1	168.00
31	167.80	28	168.14	28	167.78
June 29	167.65	Mar. 27	167.74	Dec. 31	167.98
July 31	167.80	Apr. 29	168.03		

S20. Central Nebraska Public Power and Irrigation District. SW¼SW¼ sec. 2, T. 14 N., R. 39 W. Drilled observation well, depth 229 feet. Measuring point, top of pipe, 3,380.71 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1937-40

Feb. 1, 1937	183.35	July 1, 1938	182.95	Oct. 30, 1939	183.29
Mar. 1	183.05	Aug. 31	183.02	Dec. 1	182.90
Apr. 2	183.72	Sept.30	183.04	Jan. 3, 1940	183.08
May 3	183.23	Nov. 1	182.58	Feb. 1	183.32
June 1	183.25	30	182.90	29	183.08
July 7	183.04	Dec. 30	183.10	Apr. 1	183.07
Aug. 3	183.22	Jan. 31, 1939	182.66	29	183.05
Sept. 8	183.12	Feb. 28	183.15	May 24	182.99
Nov. 3	183.02	Apr. 4	183.04	June 27	182.99
Dec. 1	183.10	May 1	183.09	July 25	182.92
30	182.47	June 1	183.03	Aug. 29	183.36
Jan. 31, 1938	183.05	30	183.10	Oct. 1	182.95
Feb. 28	182.84	Aug. 1	182.98	31	183.24
Mar. 31	183.22	31	183.13	Nov. 29	182.98
May 4	182.90	Sept.29	183.02	Dec. 31	183.50
June 1	183.10				

S21. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	105.40	Apr. 1	105.44	June 27	105.61	Oct. 1	105.40
Feb. 2	105.55	30	105.68	July 25	106.00	31	105.57
29	105.46	May 24	105.37	Aug. 29	105.68	Nov. 29	105.40

S22. Central Nebraska Public Power and Irrigation District. NW¼ sec. 31, T. 15 N., R. 39 W. Drilled observation well, diameter 1¼ inches, depth 217 feet. Measuring point, top of pipe, 3,320.56 feet above sea level. Measurrments supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Dec. 31, 1936	107.21	Dec. 2, 1937	107.31	Nov. 1, 1938	107.31
Feb. 1, 1937	107.65	30	107.06	30	107.48
Mar. 1	107.30	Feb. 1, 1938	107.25	Dec. 30	107.53
Apr. 2	107.06	Mar. 1	107.42	Jan. 31, 1939	107.15
May 3	107.38	Apr. 1	107.60	Feb. 28	107.60
June 1	107.41	May 5	107.45	Apr. 4	107.36
July 7	107.40	June 1	107.54	May 2	107.43
Aug. 3	107.47	July 1	107.45	June 1	107.42
Sept. 8	107.37	Aug. 31	107.59	30	107.36
Nov. 3	107.35	Sept.30	107.55	Aug. 1	107.59

Keith County--Continued.

S22. Central Nebraska Public Power and Irrigation District-Continued.
Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Aug. 31, 1939	107.49	Feb. 29, 1940	107.63	July 25, 1940	107.69
Sept.30	107.68	Apr. 1	107.48	Aug. 29	107.86
Oct. 30	107.60	30	107.91	Oct. 1	107.70
Dec. 1	107.76	May 24	107.61	31	107.79
Jan. 4, 1940	107.74	June 27	107.80	Nov. 29	107.62

S 23. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.
Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	113.30	Apr. 30	113.63	July 25	113.49	Oct. 31	113.58
Feb. 29	113.23	May 24	113.40	Aug. 29	113.63	Nov. 29	113.41
Apr. 1	113.25	June 27	113.51	Oct. 1	113.50		

S24. Central Nebraska Public Power and Irrigation District. NW¼ sec. 20, T. 15 N., R. 40 W. Drilled observation well, diameter 1¼ inches, depth 144 feet. Measuring point, top of pipe, 3,391.72 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.
Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Nov. 30, 1936	59.17	May 5, 1938	59.30	Aug. 31, 1939	59.32
Dec. 31	59.36	June 1	59.14	Sept.30	59.85
Feb. 1, 1937	59.59	July 1	58.83	Dec. 1	59.48
Mar. 1	59.67	Aug. 31	58.65	Jan. 4, 1940	59.42
Apr. 2	59.36	Sept.30	58.83	Feb. 2	59.48
May 3	59.87	Nov. 1	58.22	29	59.50
June 1	59.56	30	58.95	Apr. 1	59.50
July 7	58.79	Dec. 30	58.24	30	60.08
Aug. 3	58.42	Jan. 31, 1939	58.95	May 24	59.76
Sept. 8	58.50	Feb. 28	59.57	June 27	59.84
Nov. 3	58.82	Apr. 4	59.51	July 25	59.91
Dec. 2	58.72	May 1	59.74	Aug. 29	60.31
31	58.95	June 1	59.42	Oct. 1	60.31
Feb. 1, 1938	58.89	30	59.15	31	60.46
Mar. 1	58.93	Aug. 1	59.23	Nov. 29	60.20
Apr. 1	59.70				

S26. Central Nebraska Public Power and Irrigation District. NE¼NW¼ sec. 3, T. 13 N., R. 38 W. Bored observation well, diameter 5 inches, depth 19 feet. Measuring point, top of casing, 3,199.68 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.
Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1936	16.53	June 1, 1938	14.78	Nov. 8, 1939	16.99
Jan. 4, 1937	15.87	July 2	15.60	Dec. 2	16.87
Feb. 2	14.80	Sept. 1	17.14	Jan. 7, 1940	16.10
Mar. 4	15.15	Oct. 3	15.40	31	16.12
Apr. 1	15.37	Nov. 2	15.90	Mar. 5	15.90
May 5	16.08	Dec. 1	15.95	Apr. 2	15.91
June 3	16.44	31	15.33	May 1	16.19
July 6	16.97	Feb. 2, 1939	14.92	27	16.47
Aug. 2	17.22	Mar. 1	14.55	June 28	16.67
Nov. 2	17.00	Apr. 5	14.36	July 26	17.39
Dec. 3	16.79	May 3	14.81	Aug. 30	17.03
31	16.09	June 2	15.70	Sept.27	17.40
Feb. 2, 1938	15.97	July 1	16.40	Oct. 30	17.14
Mar. 2	14.90	Sept. 1	17.28	Nov. 29	16.82
Apr. 2	16.12	30	17.33	Dec. 30	16.59
May 6	15.72				

Keith County--Continued.

327. Central Nebraska Public Power and Irrigation District. NE¼NE¼ sec. 5, T. 13 N., R. 37 W. Bored observation well, diameter 5 inches, depth 17 feet. Measuring point, top of casing, 3,158.28 feet above sea level. Measurements furnished through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Dec. 2, 1936	13.66	June 2, 1938	12.80	Oct. 4, 1939	14.00
Jan. 4, 1937	13.37	July 2	12.77	Dec. 4	13.93
Feb. 2	12.78	Sept. 1	13.32	Jan. 5, 1940	13.73
Mar. 3	12.40	Oct. 3	12.36	31	13.44
Apr. 1	12.87	Nov. 4	13.08	Mar. 5	13.05
May 5	13.44	Dec. 1	13.05	Apr. 2	13.10
June 3	13.58	31	12.58	May 1	13.60
July 6	13.77	Feb. 2, 1939	11.77	27	13.80
Aug. 2	13.72	Mar. 1	11.40	June 28	13.84
Nov. 2	13.62	Apr. 5	11.15	July 26	13.89
Dec. 3	13.44	May 4	11.52	Aug. 30	14.06
31	13.19	June 3	12.66	Sept.27	14.17
Feb. 2, 1938	13.16	July 6	13.28	Oct. 30	13.97
Mar. 2	12.81	Aug. 2	14.65	Nov. 29	13.74
Apr. 2	13.38	Sept. 1	13.62	Dec. 30	13.63
May 6	13.22				

331. Ellen Kelly. SW¼NW¼ sec. 4, T. 14 N., R. 39 W. Unused drilled well, diameter 2½ inches, depth 200 feet. Measuring point, top of pipe. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1937-40

May 3, 1937	93.40	Nov. 30, 1938	94.05	Jan. 3, 1940	94.79
June 2	93.27	Dec. 30	94.30	Feb. 2	95.05
Nov. 3	93.43	Jan. 31, 1939	93.99	29	94.86
Dec. 2	93.38	Feb. 28	94.36	Apr. 1	94.90
30	93.25	Apr. 4	94.32	30	94.87
Jan. 31, 1938	93.61	May 2	94.46	May 24	94.93
Feb. 28	93.66	June 1	94.32	June 27	94.98
Apr. 1	93.90	29	94.50	July 25	95.03
May 4	93.70	Aug. 1	94.52	Aug. 29	95.36
June 1	94.02	31	94.65	Oct. 1	95.11
July 1	93.86	Sept.30	94.82	31	95.33
Aug. 31	94.03	Oct. 30	94.82	Nov. 29	95.20
Nov. 1	93.78	Dec. 1	94.68		

332. Ellen Kelly. T. 14 N., R. 39 W. Abandoned stock well, depth 80.5 feet. Measuring point, top of pipe. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1937-40

May 3, 1937	58.57	Aug. 31, 1938	58.83	Oct. 30, 1939	59.00
June 1	58.58	Sept.30	58.85	Dec. 1	58.98
July 7	58.59	Nov. 1	58.73	Jan. 3, 1940	59.00
Aug. 3	58.66	30	58.80	Feb. 2	59.02
Sept. 8	58.69	Dec. 30	58.85	29	58.95
Nov. 3	58.70	Jan. 31, 1939	58.65	Apr. 1	58.92
Dec. 2	58.73	Feb. 28	58.78	30	58.98
30	58.63	Apr. 4	58.55	May 24	58.91
Jan. 31, 1938	58.70	May 2	58.74	June 27	58.97
Feb. 28	58.69	June 1	58.75	July 25	59.06
Apr. 1	58.73	30	58.79	Aug. 29	59.15
May 4	58.67	Aug. 1	58.88	Oct. 1	59.13
June 1	58.80	31	58.90	31	59.18
July 1	58.76	Sept.30	59.00	Nov. 29	59.13

Keith County--Continued.

S35. M. Robohm. NE¼SE¼ sec. 36, T. 14 N., R. 38 W. Abandoned drilled stock well, diameter 3 inches. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Dec. 3, 1938	166.70	Aug. 30, 1939	166.88	May 23, 1940	167.90
29	167.15	Sept.29	166.75	June 26	166.95
Jan. 30, 1939	166.62	Oct. 31	167.26	July 24	166.87
Feb. 27	166.92	Nov. 29	166.83	Aug. 28	166.99
Apr. 7	166.85	Jan. 5, 1940	167.10	Sept.30	167.25
May 31	166.55	Feb. 3	166.98	Nov. 1	167.17
June 29	167.05	Mar. 1	167.10	28	167.12
July 31	166.70	Apr. 29	166.89		

Keyapaha County

76. Measurements discontinued.

375. Water levels, in feet above datum, 1940: Mar. 29, 101.01; July 19, 99.07; Oct. 31, 98.92.

Kimball County

88. Water levels, in feet above datum, 1940: Apr. 6, 99.83; July 28, 99.41; Nov. 9, 99.43.

89. Water levels, in feet above datum, 1940: Apr. 6, 100.17; July 28, 100.08; Nov. 9, 100.11.

327. Water levels, in feet above datum, 1940: Apr. 6, 99.10; July 28, 99.71; Nov. 9, 98.77.

344. No measurements made in 1940.

394. Measurements discontinued.

Knox County

67. Water levels, in feet above datum, 1940: Mar. 22, 100.27; July 12, 99.33; Oct. 25, dry.

71. Water levels, in feet above datum, 1940: Mar. 28, 99.86; July 18, 98.95; Oct. 30, 98.66.

335. Water levels, in feet above datum, 1940: Mar. 28, 98.87; July 18, 97.69; Oct. 30, 96.96.

336. Water levels, in feet above datum, 1940: Mar. 28, 101.56; July 18, 100.08; Oct. 30, 99.94.

370. Water levels, in feet above datum, 1940: Mar. 22, 99.32; July 12, 99.22; Oct. 25, 97.27.

429. Water levels, in feet above datum, 1940: Mar. 28, 99.17; July 18, 97.96; Oct. 30, 97.65.

Lancaster County

1. Water level, in feet above datum, 1940: July 6, 98.16.

13. Water levels, in feet above datum, 1940: Mar. 19, 98.46; July 8, 98.22; Oct. 16, 97.89.

14. Water levels, in feet above datum, 1940: Mar. 19, 99.77; July 5, 98.79; Oct. 15, 97.91.

366. Water levels, in feet above datum, 1940: Apr. 13,101.76; July 8, 101.41; Oct. 17, 101.31.

367. Water levels, in feet above datum, 1940: Mar. 19, 101.46; Aug. 5, 100.94.

Lincoln County

131. Water level, in feet above datum, 1940: Mar. 6, 101.06.

133. No measurements made in 1940.

134. Water levels, in feet above datum, 1940: Apr. 9, 100.81; July 30, 100.68.

143. Water levels, in feet above datum, 1940: Apr. 9, 101.14; July 30, 100.99.

144. Water levels, in feet above datum, 1940: Apr. 9, 99.76; July 30, 99.71.

241.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 2	a100.61	July 2	a 99.29	Aug. 20	a 98.46	Nov. 6	a 99.33
Apr. 3	100.08	25	98.81	Sept.30	a 98.74	30	a 99.42
May 1	a100.19	27	a 98.90	Nov. 2	a 99.32	Dec. 31	a 99.53
29	a 99.49						

242.

Water level, in feet above datum, 1940

Mar. 2	a101.14	May 1	a101.55	July 25	100.33	Oct. 1	a100.11
Apr. 2	a101.43	28	a100.82	29	a100.67	Nov. 4	a101.02
4	101.45	July 1	a100.62	Aug. 29	99.46	6	100.91
						30	101.41

252. Water levels, in feet above datum, 1940: Apr. 4, 99.38; July 25, 99.21; Nov. 6, 99.08.

253. Water levels, in feet above datum, 1940: Apr. 4, 99.68; July 25, 98.52; Nov. 6, 99.49.

383. Water level, in feet above datum, 1940: Apr. 4, 103.33.

384. Water levels, in feet above datum, 1940: Apr. 4, 100.61; July 25, 99.65; Nov. 6, 100.58.

385. Water levels, in feet above datum, 1940: Apr. 9, 99.61; July 30, 99.49.

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a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Lincoln County--Continued.

405.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 2	a 99.45	Apr. 4	99.60	July 26	99.12	Oct. 30	a 99.42
Feb. 3	a 99.73	May 1	a 99.99	Aug. 30	a 98.55	Nov. 6	99.50
Mar. 1	a100.08	27	a100.56	Sept.27	a 98.96	Dec. 2	99.33
Apr. 2	a 99.73	June 28	a 99.65				

406. Water levels, in feet above datum, 1940: Apr. 4, 99.82; July 26, 99.34; Nov. 6, 99.39.

E26. Central Nebraska Public Power and Irrigation District. NE¼NE¼ sec. 27, T. 14 N., R. 33 W. Bored observation well, diameter 2 inches, depth 16 feet. Measuring point, top of casing, 0.5 foot above land surface. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Sept. 1, 1938	9.78	July 6, 1939	9.97	May 4, 1940	11.12
Oct. 3	9.62	Aug. 2	10.40	27	10.65
Nov. 4	10.18	Sept. 1	10.44	June 28	10.39
Dec. 3	10.41	Oct. 4	10.66	July 26	10.53
31	10.53	Nov. 6	10.91	Aug. 30	10.96
Feb. 4, 1939	10.35	Dec. 4	11.11	Sept.27	10.78
Mar. 1	10.25	Jan. 2, 1940	11.17	Oct. 30	11.01
Apr. 7	10.10	Feb. 3	11.14	Dec. 2	11.19
May 3	10.10	Mar. 5	10.87	30	11.27
June 2	9.94	Apr. 2	10.91		

E27. Central Nebraska Public Power and Irrigation District. NE¼SW¼ sec. 29, T. 14 N., R. 33 W. Bored observation well, diameter 2 inches, depth 16 feet. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Sept. 1, 1938	10.76	July 6, 1939	9.94	May 4, 1940	10.76
Oct. 3	10.00	Aug. 2	10.74	27	10.02
Nov. 4	10.23	Sept. 1	10.41	June 28	10.10
Dec. 3	10.27	Oct. 4	10.36	July 26	10.80
31	10.35	Nov. 6	10.54	Aug. 30	11.51
Feb. 4, 1939	10.22	Dec. 4	10.58	Sept.27	11.38
Mar. 1	10.22	Jan. 2, 1940	10.68	Oct. 30	10.94
Apr. 7	9.93	31	10.69	Dec. 2	10.77
May 3	9.93	Mar. 5	10.60	30	10.77
June 2	9.96	Apr. 2	10.59		

E38. Central Nebraska Public Power and Irrigation District. NE¼SE¼ sec. 32, T. 13 N., R. 34 W. Bored observation well, diameter 2 feet, depth 18 feet. Measuring point, top of casing, 0.8 foot above land surface. Measurments supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Oct. 3, 1938	12.80	Aug. 2, 1939	13.35	May 4, 1940	13.09
Nov. 4	12.85	Sept. 1	13.59	27	13.23
Dec. 3	12.78	Oct. 4	13.80	June 28	13.40
31	12.75	Nov. 6	13.68	July 26	13.72
Feb. 5, 1939	12.40	Dec. 4	13.53	Aug. 30	13.96
Mar. 1	12.27	Jan. 2, 1940	13.40	Sept.27	14.17
Apr. 7	11.96	31	13.25	Oct. 30	14.11
May 3	12.19	Mar. 5	13.03	Dec. 2	13.81
June 3	12.64	Apr. 2	12.95	30	13.58
July 6	12.82				

a Measurement supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Lincoln County--Continued.

JS-1. Central Nebraska Public Power and Irrigation District. NW¼SW¼ sec. 35, T. 12 N., R. 27 W. Bored observation well, diameter 2 inches, depth 45 feet. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Aug. 12, 1938	34.08	June 5, 1939	38.52	Mar. 2, 1940	38.61
Sept. 1	33.91	July 5	38.74	Apr. 3	37.68
Oct. 1	34.03	Aug. 3	38.97	May 3	37.20
Nov. 1	34.74	Sept. 5	39.12	28	37.04
Dec. 2	35.47	Oct. 2	39.26	July 1	36.73
Jan. 3, 1939	36.12	Nov. 1	39.30	29	36.65
Feb. 3	36.21	Dec. 4	39.13	Aug. 30	36.66
Mar. 2	37.12	Jan. 5, 1940	39.02	Oct. 1	36.58
Apr. 6	37.73	30	38.97	Nov. 4	36.58
May 5	38.20				

JS-2. Central Nebraska Public Power and Irrigation District. NW¼NW¼ sec. 35, T. 12 N., R. 27 W. Bored observation well, diameter 2 feet, depth 32 feet. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Aug. 12, 1938	22.65	June 5, 1939	26.33	Apr. 3, 1940	25.78
Sept. 1	22.70	July 5	26.55	May 3	25.03
Oct. 1	22.58	Aug. 3	26.76	28	24.88
Nov. 1	23.15	Sept. 5	26.97	July 1	24.56
Dec. 2	23.73	Oct. 2	27.16	29	24.58
Jan. 3, 1939	24.34	Nov. 1	27.26	Aug. 30	24.75
Feb. 3	24.45	Dec. 4	27.09	Oct. 1	24.70
Mar. 2	25.06	Jan. 5, 1940	26.91	Nov. 4	24.62
Apr. 6	25.69	30	26.82	Dec. 2	24.29
May 5	26.00	Mar. 2	26.64		

JS-3. Central Nebraska Public Power and Irrigation District. NE¼SE¼ sec. 35, T. 12 N., R. 27 W. Bored observation well, diameter 2 inches, depth 44 feet. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Aug. 12, 1938	32.11	June 5, 1939	33.26	Apr. 5, 1940	32.67
Sept. 1	32.44	July 5	33.33	May 3	31.75
Oct. 1	31.72	Aug. 3	33.81	28	32.82
Nov. 1	30.92	Sept. 5	33.96	July 1	31.69
Dec. 2	32.22	Oct. 2	34.06	29	32.36
Jan. 4, 1939	32.58	Nov. 1	33.90	Aug. 30	32.16
Feb. 3	32.73	Dec. 6	33.50	Oct. 1	31.89
Mar. 2	32.95	Jan. 6, 1940	33.34	Nov. 4	31.64
Apr. 6	32.95	30	33.19	Dec. 2	31.32
May 5	33.06	Mar. 2	32.82		

JS-4. Central Nebraska Public Power and Irrigation District. NE¼NE¼ sec. 35, T. 12 N., R. 27 W. Bored observation well, diameter 2 inches, depth 35 feet. Measuring point, top of pipe. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Aug. 12, 1938	21.90	June 5, 1939	22.80	Apr. 5, 1940	22.02
Sept. 1	22.17	July 5	22.72	May 3	21.25
Oct. 1	21.36	Aug. 3	23.37	28	22.16
Nov. 1	20.64	Sept. 5	23.50	July 1	21.10
Dec. 2	21.76	Oct. 2	23.60	29	21.76
Jan. 4, 1939	22.15	Nov. 1	23.42	Aug. 30	21.74
Feb. 3	22.24	Dec. 6	22.93	Oct. 1	21.48
Mar. 2	22.42	Jan. 6, 1940	22.75	Nov. 4	21.20
Apr. 6	22.35	30	22.63	Dec. 2	20.85
May 5	22.50	Mar. 2	22.30		

Lincoln County--Continued.

U12. Central Nebraska Public Power and Irrigation District. SE¼SE¼ sec. 13, T. 13 N., R. 30 W. Bored observation well, diameter 4 inches, depth 24 feet. Measuring point, top of casing, 2,785.54 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1936	17.00	Jan. 1, 1938	16.96	July 5, 1939	17.13
28	17.69	Feb. 2	16.67	Oct. 2	17.36
Oct. 2	17.85	Mar. 2	16.37	Nov. 1	17.00
21	17.75	Apr. 2	15.55	Dec. 4	16.44
Nov. 3	17.55	May 6	15.07	Jan. 5, 1940	16.07
4	17.54	June 2	14.82	30	15.72
Dec. 2	17.29	July 2	15.50	Mar. 2	15.17
Jan. 2, 1937	16.94	Sept. 1	16.95	Apr. 2	14.64
Feb. 2	16.68	Oct. 3	16.00	May 1	14.41
Mar. 3	16.46	Nov. 3	16.07	28	15.02
Apr. 3	15.72	Dec. 1	15.43	July 1	15.43
May 5	15.49	Jan. 3, 1939	14.95	29	17.08
June 3	16.41	Feb. 2	14.43	Aug. 29	17.26
July 6	17.08	Mar. 2	14.15	Oct. 1	16.97
Aug. 2	17.88	Apr. 6	13.80	Nov. 4	16.39
Nov. 1	17.74	May 4	13.86	30	15.95
Dec. 3	17.26	June 3	14.47		

U14. Central Nebraska Public Power and Irrigation District. NW¼NW¼ sec. 20, T. 13 N., R. 29 W. Bored observation well, diameter 4 inches, depth 18 feet. Measuring point, top of casing, 2,771.31 feet above sea level. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1936-40

Date	Water level	Date	Water level	Date	Water level
Aug. 15, 1936	12.10	Jan. 1, 1938	11.21	Aug. 3, 1939	11.45
28	12.25	Feb. 2	10.94	Sept. 5	11.70
Sept. 15	12.50	Mar. 2	10.70	Oct. 2	11.66
Oct. 2	12.39	Apr. 2	10.18	Nov. 1	11.45
21	12.20	May 6	9.80	Dec. 4	10.97
Nov. 3	11.90	June 2	9.53	Jan. 5, 1940	10.76
4	11.95	July 2	10.15	30	10.62
Dec. 2	11.56	Sept. 1	11.37	Mar. 2	10.06
Jan. 2, 1937	11.29	Oct. 3	10.46	Apr. 2	9.32
Feb. 2	11.32	Nov. 3	10.36	May 1	9.61
Mar. 3	10.80	Dec. 2	10.22	28	10.24
Apr. 3	10.38	Jan. 3, 1939	9.70	July 1	9.46
May 5	10.28	Feb. 2	9.44	29	10.97
June 3	11.18	Mar. 2	9.26	Aug. 29	11.33
July 6	11.55	Apr. 6	9.20	Oct. 1	11.28
Aug. 2	11.91	May 4	9.81	Nov. 4	10.93
Nov. 1	11.95	June 3	10.02	30	10.49
Dec. 3	11.50	July 5	10.45		

U21. A. E. Wheeler. NW¼NE¼ sec. 35, T. 13 N., R. 29 W. Abandoned drilled domestic and stock well, diameter 5 inches, depth about 36 feet. Measuring point, top of casing, 1.0 foot above land surface. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	15.19	Aug. 3, 1939	15.50	May 1, 1940	14.08
Dec. 2	14.90	Sept. 5	15.25	28	14.62
Jan. 3, 1939	14.80	Oct. 2	14.94	July 1	14.74
Feb. 3	14.73	Nov. 1	14.90	29	15.20
Mar. 2	14.46	Dec. 4	14.87	Aug. 29	15.60
Apr. 6	14.39	Jan. 5, 1940	14.92	Oct. 1	15.61
May 4	14.33	30	14.82	Nov. 4	15.20
June 3	14.87	Mar. 2	14.59	30	14.78
July 5	15.09	Apr. 2	14.39		

Lincoln County--Continued.

U22. Central Nebraska Public Power and Irrigation District. SW¼SW¼ sec. 31, T. 13 N., R. 28 W. Bored observation well, diameter 2 inches, depth 20 feet. Measuring point, top of casing, 0.9 foot above land surface. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	10.90	Aug. 3, 1939	11.74	May 1, 1940	9.60
Dec. 2	10.82	Sept. 5	11.08	28	9.96
Jan. 3, 1939	10.72	Oct. 2	10.20	July 1	10.07
Feb. 3	10.58	Nov. 1	10.40	29	11.00
Mar. 2	10.45	Dec. 4	10.42	Aug. 29	11.53
Apr. 6	10.19	Jan. 5, 1940	10.48	Oct. 1	11.44
May 4	10.30	30	10.49	Nov. 4	10.94
June 3	10.71	Mar. 2	10.36	30	10.58
July 5	10.97	Apr. 3	10.16		

U32. Central Nebraska Public Power and Irrigation District. NE¼NW¼ sec. 15, T. 12 N., R. 28 W. Bored observation well, diameter 2 inches, depth 22.5 feet. Measuring point, top of casing, 0.9 foot above land surface. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Nov. 3, 1938	16.43	Aug. 3, 1939	16.62	May 1, 1940	16.78
Dec. 2	16.16	Sept. 5	17.27	28	17.04
Jan. 3, 1939	16.07	Oct. 2	17.63	July 1	17.30
Feb. 3	16.17	Nov. 1	17.44	29	17.32
Mar. 2	15.55	Dec. 4	16.93	Aug. 30	17.74
Apr. 6	15.57	Jan. 5, 1940	16.84	Oct. 1	17.75
May 4	15.88	30	16.54	Nov. 4	16.84
June 3	16.60	Mar. 2	16.50	Dec. 2	16.78
July 5	16.60	Apr. 3	16.79		

U33. Central Nebraska Public Power and Irrigation District. SE¼SE¼ sec. 14, T. 12 N., R. 28 W. Bored observation well, diameter 2 inches, depth 46 feet. Measuring point, top of casing, 1.0 foot above land surface. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Nov. 3, 1938	37.82	Aug. 3, 1939	37.80	May 1, 1940	37.95
Dec. 2	37.20	Sept. 5	38.04	28	38.08
Jan. 3, 1939	37.65	Oct. 2	38.30	July 1	38.11
Feb. 3	37.55	Nov. 1	38.33	29	38.25
Mar. 2	37.34	Dec. 4	38.23	Aug. 30	38.37
Apr. 6	37.18	Jan. 5, 1940	38.15	Oct. 1	38.43
May 4	37.22	30	38.08	Nov. 4	38.12
June 3	37.50	Mar. 2	37.93	Dec. 2	37.95
July 5	37.65	Apr. 3	37.95		

U34. Central Nebraska Public Power and Irrigation District. SE¼SE¼ sec. 20, T. 12 N., R. 27 W. Bored observation well, diameter 2 inches, depth 31 feet. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Nov. 3, 1938	17.52	Aug. 3, 1939	17.71	May 1, 1940	18.34
Dec. 2	16.52	Sept. 5	18.35	28	18.64
Jan. 3, 1939	17.10	Oct. 2	18.57	July 1	18.71
Feb. 3	17.35	Nov. 1	18.55	29	18.63
Mar. 2	16.84	Dec. 4	18.29	Aug. 30	18.91
Apr. 6	16.95	Jan. 5, 1940	18.35	Oct. 1	18.98
May 4	17.24	30	18.40	Nov. 4	18.43
June 5	17.77	Mar. 2	18.15	Dec. 2	18.44
July 5	17.78	Apr. 3	18.38		

Lincoln County--Continued.

U35. Central Nebraska Public Power and Irrigation District. NE¼SE¼ sec. 28, T. 12 N., R. 27 W. Bored observation well, diameter 2 inches, depth 18 feet. Measuring point, top of casing, 1.0 foot above land surface. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	9.15	Aug. 3, 1939	10.80	May 1, 1940	11.17
Dec. 2	9.21	Sept. 5	11.22	28	11.26
Jan. 3, 1939	9.33	Oct. 2	11.53	July 1	10.83
Feb. 3	9.36	Nov. 1	11.65	29	10.73
Mar. 2	9.32	Dec. 4	11.44	Aug. 30	11.45
Apr. 6	9.48	Jan. 5, 1940	11.43	Oct. 1	11.57
May 4	9.72	30	11.41	Nov. 4	11.08
June 5	10.17	Mar. 2	11.38	Dec. 2	10.89
July 5	10.34	Apr. 3	11.32		

U38. Dr. Schneider. SW¼SE¼ sec. 26, T. 12 N., R. 27 W. Drilled irrigation well. Measuring point, top of casing, 0.1 foot above land surface. Equipped with turbine pump. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	11.53	Aug. 3, 1939	(a)	May 3, 1940	(a)
Dec. 2	12.09	Sept. 5	14.02	28	12.60
Jan. 4, 1939	12.41	Oct. 2	14.17	July 1	12.10
Feb. 3	12.43	Nov. 1	13.96	29	(a)
Mar. 2	12.59	Dec. 6	13.63	Aug. 30	12.59
Apr. 6	12.64	Jan. 6, 1940	13.44	Oct. 1	12.34
May 5	12.78	30	13.32	Nov. 4	12.14
June 5	13.26	Mar. 2	13.05	Dec. 2	11.82
July 5	13.28	Apr. 5	12.75		

U40. Central Nebraska Public Power and Irrigation District. NW¼NW¼ sec. 16, T. 11 N., R. 26 W. Bored observation well, diameter 2 inches, depth 35 feet. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	21.30	Aug. 3, 1939	21.03	May 3, 1940	21.38
Dec. 2	21.14	Sept. 5	21.55	28	21.15
Jan. 4, 1939	21.49	Oct. 2	22.12	July 1	21.25
Feb. 3	21.76	Nov. 1	21.12	29	21.34
Mar. 2	21.94	Jan. 6, 1940	21.26	Aug. 30	21.45
Apr. 6	22.12	30	21.52	Oct. 1	21.91
May 5	21.60	Mar. 2	21.85	Nov. 4	21.50
June 5	21.36	Apr. 5	22.10	Dec. 2	21.29
July 5	21.04				

U42. Sheldon. SW¼SW¼ sec. 15, T. 11 N., R. 26 W. Drilled irrigation well, diameter 10 inches. Measuring point, top of I beam, which is 0.6 foot below top of casing. Equipped with centrifugal pump. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	18.84	Aug. 3, 1939	(a)	May 3, 1940	18.70
Dec. 2	19.57	Sept. 5	20.72	28	18.65
Jan. 4, 1939	20.44	Oct. 2	22.18	July 1	19.22
Feb. 3	20.83	Nov. 1	19.55	29	(a)
Mar. 2	21.12	Dec. 6	19.20	Aug. 30	20.81
Apr. 6	21.13	Jan. 6, 1940	20.15	Oct. 1	21.53
May 5	20.35	30	20.62	Nov. 4	19.36
June 5	18.96	Mar. 4	21.13	Dec. 2	19.45
July 5	18.14	Apr. 5	(a)		

a Pumping

Lincoln County--Continued.

U43. SE¼SE¼ sec. 22, T. 11 N., R. 26 W. Abandoned stock well. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	41.95	Aug. 3, 1939	41.76	May 3, 1940	41.90
Dec. 2	41.43	Sept. 5	42.10	28	41.56
Jan. 4, 1939	41.38	Oct. 2	42.44	July 1	41.40
Feb. 3	41.50	Nov. 1	42.24	29	41.60
Mar. 2	41.64	Dec. 6	41.54	Aug. 30	41.74
Apr. 6	41.89	Jan. 6, 1940	41.36	Oct. 1	41.87
May 5	41.70	30	41.50	Nov. 4	41.70
June 5	41.56	Mar. 4	41.71	Dec. 2	41.53
July 5	41.50	Apr. 5	42.00		

U50. Dr. Schneider. SW¼SE¼ sec. 26, T. 12 N., R. 27 W. 300 feet west of well U38. Abandoned drilled irrigation well, diameter 8 inches. Measuring point, top of casing. Measurements supplied through courtesy of Central Nebraska Public Power and Irrigation District.

Water level, in feet below measuring point, 1938-40

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1938	10.85	Aug. 3, 1939	13.20	May 3, 1940	11.73
Dec. 2	11.40	Sept. 5	13.40	28	11.96
Jan. 4, 1939	11.77	Oct. 2	13.32	July 1	11.52
Feb. 3	11.85	Nov. 1	13.54	29	11.76
Mar. 2	12.00	Dec. 6	13.14	Aug. 30	12.03
Apr. 6	12.05	Jan. 6, 1940	12.92	Oct. 1	11.95
May 5	12.25	30	12.82	Nov. 4	11.55
June 5	12.65	Mar. 2	12.57	Dec. 2	11.22
July 5	12.70	Apr. 5	12.20		

Logan County

404. Water level, in feet above datum, 1940: Apr. 2, 99.15; Nov. 4, 98.54.

Loup County

234. Water levels, in feet above datum, 1940: Mar. 26, 98.89; July 16, 98.55.

345. Water levels, in feet above datum, 1940: Mar. 26, 100.41; July 16, 99.27; Oct. 28, 99.81.

422. Water level, in feet above datum, 1940: Mar. 26, 100.02; July 16, 102.57; Oct. 28, 105.22.

McPherson County

254. Water levels, in feet above datum, 1940: Apr. 4, 99.66; July 25, 99.56; Nov. 6, 99.38.

Madison County

108. Water levels, in feet above datum, 1940: Mar. 27, 100.02; July 18, 99.34; Oct. 30, 99.98.

Madison County--Continued.

109. Water levels, in feet above datum, 1940: July 18, 98.80; Oct. 30, 99.81.

110. Water levels, in feet above datum, 1940: Mar. 23, 99.89; July 13, 100.26; Oct. 26, 99.51.

334. Water levels, in feet above datum, 1940: July 13, 106.93; Oct. 26, 99.81.

Merrick County

42. Water levels, in feet above datum, 1940: Mar. 23, 101.52; July 13, 100.85; Oct. 26, 99.71.

48. Water levels, in feet above datum, 1940: Mar. 23, 100.09; July 14, 99.11; Oct. 26, 98.33.

49. Water levels, in feet above datum, 1940: Mar. 23, 100.02; July 14, 99.80; Oct. 26, 99.72.

50. Water levels, in feet above datum, 1940: Mar. 23, 100.04; July 14, 99.56; Oct. 26, 99.72.

GI200. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level
Feb. 20	101.60	June 25	102.04	Dec. 24	101.15
Apr. 9	101.85	Sept.24	101.90		

GI201. Measurements supplied through courtesy of Grand Island Water Department.

Water level, in feet above datum, 1940

Feb. 20	103.37	June 25	101.49	Dec. 24	100.22
Apr. 9	102.09	Sept.24	101.07		

Morrill County

84. Water levels, in feet above datum, 1940: Apr. 5, 100.85; July 26, 100.70; Nov. 7, 100.78.

85. Measurements supplied through courtesy of Nebraska Department of Roads and Irrigation.

Water level, in feet above datum, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	100.00	100.15	100.20	99.99	100.07	99.40
2	100.00	100.16	100.31	99.96	100.07	99.34
3	100.00	100.18	100.33	99.95	100.03	99.28
4	100.00	100.18	100.34	99.93	99.99	99.32
5	100.00	100.21	100.33	99.93	99.95	99.43
6	99.99	100.25	100.30	99.92	99.91	99.48
7	99.99	100.26	100.28	99.92	99.88	99.53
8	99.99	100.27	100.26	99.93	99.85	99.56
9	100.00	100.27	100.22	99.93	99.83	99.58
10	100.02	100.26	100.20	99.91	99.81	99.61
11	100.03	100.25	100.17	99.92	99.78	99.60
12	100.06	100.27	100.14	99.95	99.75	99.67
13	100.08	100.27	100.12	99.96	99.73	99.53
14	100.10	100.26	100.11	99.95	99.70	99.48
15	100.12	100.23	100.14	99.93	99.68	99.50

Morrill County--Continued.

85. -- Continued.

Water level, in feet above datum, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June
16	100.13	100.20	100.15	99.95	99.66	99.49
17	100.13	100.18	100.11	100.06	99.64	99.47
18	100.10	100.19	100.10	100.11	99.62	99.45
19	100.08	100.16	100.08	100.10	99.61	99.43
20	100.02	100.15	100.07	100.07	99.59	99.42
21	99.99	100.13	100.05	100.05	99.57	99.39
22	99.98	100.13	100.03	100.02	99.56	99.37
23	99.98	100.10	100.02	99.99	99.55	99.37
24	99.98	100.09	100.00	99.97	99.55	99.36
25	99.97	100.09	100.00	99.94	99.55	99.34
26	99.99	100.08	99.98	99.92	99.54	99.32
27	99.98	100.08	99.98	99.90	99.49	99.29
28	99.98	100.10	100.02	99.93	99.48	99.26
29	100.00	100.13	100.03	99.98	99.46	99.24
30	100.08	.....	100.02	100.04	99.44	99.21
31	100.12	.....	100.00	.....	99.43	.....

Water level, in feet above datum, 1940

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	99.22	98.92	98.82	99.82	99.93	100.06
2	99.27	98.91	98.81	99.87	99.94	100.05
3	99.28	98.89	98.82	99.91	99.94	100.07
4	99.26	98.88	98.81	99.92	.....	100.04
5	99.23	98.86	98.86	99.93	99.93	100.06
6	99.20	98.85	98.87	99.98	99.93	100.04
7	99.17	98.84	98.86	100.03	99.94	100.05
8	99.15	98.82	98.86	100.05	99.94	100.06
9	99.12	98.82	98.89	100.03	99.95	100.04
10	99.10	98.81	98.93	100.03	99.94	100.05
11	99.09	98.80	98.96	100.02	.....	100.03
12	99.08	98.78	98.97	100.02	99.95	100.02
13	99.07	98.78	98.99	100.02	99.95	100.01
14	99.11	98.77	99.01	100.00	99.95	100.01
15	99.14	98.75	99.03	100.02	99.99	100.01
16	99.15	98.73	99.06	100.00	100.04	99.98
17	99.15	98.73	99.08	100.00	100.07	99.99
18	99.13	98.73	99.09	99.99	100.11	99.99
19	99.09	98.74	99.12	99.98	100.12	99.99
20	99.07	98.73	99.31	99.98	100.14	100.02
21	99.06	98.73	99.40	99.98	100.14	100.03
22	99.04	98.78	99.44	99.97	100.12	100.04
23	99.02	99.79	99.48	99.96	100.10	100.04
24	99.01	99.80	99.53	99.95	100.10	100.05
25	99.01	98.82	99.59	99.95	100.10	100.06
26	98.97	98.82	99.63	99.96	100.09	100.07
27	98.96	98.83	99.65	99.95	100.09	100.08
28	98.94	98.82	99.66	99.94	100.09	100.08
29	98.94	98.82	99.68	99.94	100.10	100.08
30	98.93	98.82	99.71	99.93	100.06	100.08
31	98.92	98.82	.....	99.93	.....	100.06

97. Water levels, in feet above datum, 1940: Apr. 5, 99.67; July 26, 99.06; Nov. 7, 99.11.

Nance County

43. Water levels, in feet above datum, 1940: Mar. 23, 101.19; July 13, 100.57; Oct. 26, 100.29.

44. No measurements made in 1940.

Nance County--Continued.

45. No measurements made in 1940.

371. Water levels, in feet above datum, 1940: Mar. 23, 98.55; July 13, 98.53; Oct. 26, 98.41.

Nemaha County

11. Water levels, in feet above datum, 1940: Apr. 13, 99.01; July 6, 98.25; Oct. 17, 101.50.

Nuckolls County

6. Measurements discontinued.

7. Measurements discontinued.

164. Water level, in feet above datum, 1940: Apr. 12, 99.04.

165. Water levels, in feet above datum, 1940: Apr. 12, 95.01; Aug. 3, 95.94; Nov. 15, 95.92.

393. Water levels, in feet above datum, 1940: Apr. 11, 98.64; Aug. 2, 98.44.

407. Water levels, in feet above datum, 1940: Apr. 12, 99.15; Aug. 3, 99.39; Nov. 15, 98.93.

Otoe County

8. Water levels, in feet above datum, 1940: July 6, 99.29; Oct. 17, 100.04.

9. Water levels, in feet above datum, 1940: Apr. 13, 99.82; July 6, 98.52; Oct. 17, 98.77.

10. Water levels, in feet above datum, 1940: Apr. 13, 97.67; July 6, 97.31; Oct. 17, 97.11.

Pawnee County

4. Water levels, in feet above datum, 1940: Apr. 12, 102.79; July 4, 102.03; Oct. 17, 99.96.

Perkins County

151. Water levels, in feet above datum, 1940: Apr. 8, 101.94; July 29, 101.65.

364. Measurements discontinued.

Phelps County

157. Water levels, in feet above datum, 1940: Apr. 10, 98.97; Aug. 1, 97.79.

184. Measurements discontinued.

Phelps County--Continued.

275. Water levels, in feet above datum, 1940: Mar. 25, 100.37; July 16, 99.62; Oct. 27, 98.50.

276. Water levels, in feet above datum, 1940: Mar. 25, 99.33; Oct. 27, 98.52.

277. Water level, in feet above datum, 1940: Mar. 25, 100.44.

Pierce County

68. Measurements discontinued.

70. Water levels, in feet above datum, 1940: Mar. 28, 100.55; July 18, 99.43; Oct. 30, 98.55.

Platte County

39. Water levels, in feet above datum, 1940: Mar. 21, 101.89; July 11, 102.62; Oct. 23, 102.00.

40. Water levels, in feet above datum, 1940: Mar. 21, 100.79; July 11, 100.81.

41. Water levels, in feet above datum, 1940: Mar. 21, 100.22; Oct. 23, 99.34.

339. Measurements discontinued.

342. Water levels, in feet above datum, 1940: Mar. 21, 99.44; Oct. 23, 97.65.

368. Water levels, in feet above datum, 1940: Mar. 21, 102.31; July 11, 104.98; Oct. 23, dry.

Redwillow County

137. Water levels, in feet above datum, 1940: Apr. 9, 99.96; Nov. 12, 99.83.

139. Water levels, in feet above datum, 1940: Apr. 8, 99.40; July 30, 98.66; Nov. 12, 98.61.

150. Measurements discontinued.

179. Water levels, in feet above datum, 1940: Apr. 8, 99.59; July 30, 99.29.

328. Measurements discontinued.

Richardson County

1. Fred Metzner. SE¼SE¼ sec. 29, T. 1 N., R. 17 E. Unused dug domestic well, diameter 30 inches, depth 52.4 feet. Measuring point, wooden platform, west edge of hole where plank is missing, 0.5 foot above land surface and 146.08 feet above datum. Equipped with force pump and windmill, both out of repair. Water level Aug. 19, 1940, 47.36 feet below measuring point.

Richardson County--Continued.

1. Fred Metzner--Continued.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 17	98.96	Aug. 13	98.81	Sept. 9	99.18	Oct. 7	98.59
22	98.91	19	98.72	16	98.91	15	98.53
29	98.91	27	99.11	23	99.07	21	98.52
Aug. 5	98.81	Sept. 3	99.76	30	98.64	29	98.48

2. Approximately center of sec. 16, T. 1 N., R. 16 E. Unused drilled well, diameter 10 inches, depth 39.5 feet. Measuring point, northeast edge of steel casing, 2 feet above land surface and 113.61 feet above assumed datum. Water level Aug. 19, 1940, 14.89 feet below measuring point.

Water level, in feet above datum, 1940

July 17	98.79	Aug. 13	98.81	Sept. 9	100.05	Oct. 7	99.16
22	98.65	19	98.72	16	99.98	15	98.85
29	98.60	27	99.39	23	99.72	21	98.91
Aug. 5	98.53	Sept. 3	99.87	30	99.35	29	98.66

3. Clarence Schatz. SE¼SE¼ sec. 36, T. 2 N., R. 15 E. Unused drilled domestic well, diameter 15 inches, depth 34 feet. Measuring point, east edge of pump base, 2 feet above land surface and 128.54 feet above assumed datum. Equipped with force pump. Water level Aug. 19, 1940, 29.82 feet below measuring point.

Water level, in feet above datum, 1940

July 17	98.82	Aug. 13	98.74	Sept. 9	98.68	Oct. 7	98.65
22	98.82	19	98.72	16	98.71	15	98.63
29	98.79	28	98.71	23	98.83	21	98.60
Aug. 5	98.75	Sept. 3	98.69	30	98.72	29	98.61

4. Mrs. Della Goolsley. SE¼SE¼ sec. 10, T. 3 N., R. 16 E. Unused drilled domestic well, diameter 6 (?) inches, depth 31.6 feet. Measuring point, east side of north half of pump base, 0.5 foot above land surface and 113.21 feet above assumed datum. Equipped with force pump. Water level Aug. 19, 1940, 14.49 feet below measuring point.

Water level, in feet above datum, 1940

July 17	98.45	Aug. 13	99.02	Sept. 9	99.38	Oct. 7	97.35
22	98.04	19	98.72	16	98.70	15	97.07
29	97.61	28	99.43	23	98.95	21	96.91
Aug. 5	97.52	Sept. 3	98.66	30	99.00	29	96.77

5.

Water levels, in feet above datum, 1940

Apr. 13	101.28	Sept. 3	99.43	Sept.23	100.45	Oct. 15	99.53
July 6	100.00	9	99.85	30	99.82	21	99.52
Aug. 19	99.50	16	100.27	Oct. 7	99.64	29	98.53
27	99.59						

6. Will Yoesel. NE¼SW¼ sec. 3, T. 1 N., R. 17 E. Used stock well, diameter 4 (?) inches, depth 100+ feet. Measuring point, north side of pump base, 1 foot above land surface and 168.50 feet above assumed datum. Equipped with force pump and windmill. Water level Aug. 19, 1940, 69.78 feet below measuring point.

Water level, in feet above datum, 1940

July 18	a 80.95	Aug. 5	99.23	Aug. 19	98.72	Aug. 28	99.05
22	99.31	13	97.78				

7. University of Nebraska. Old well caved in and was not measured in 1939. New well put down about 850 feet southwest of site of old, in NW¼NW¼ sec. 16, T. 1 N., R. 17 E. Driven well, diameter 1 inch, depth 40 feet. Measuring point, top of pipe, 1.7 feet above land surface and 119.65 feet above assumed datum. Water level Aug. 19, 1940, 19.97 feet below measuring point.

a Pumped recently

Richardson County--Continued.

7. University of Nebraska--Continued.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 3	100.14	Aug. 13	99.85	Sept. 9	101.40	Oct. 7	100.05
July 6	99.36	19	99.68	16	101.03	15	99.73
22	100.48	27	100.81	23	100.85	21	99.63
29	100.09	Sept. 3	101.81	30	100.33	29	99.53
Aug. 5	99.75						

8. F. W. Burgett. SE¼SE¼ sec. 19 (May be SW¼SW¼ sec. 20) T. 1 N., R. 14 E. Unused domestic and stock well, diameter 4 inches, depth 46 feet. Measuring point, west side of pump base, 0.5 foot above land surface and 134.05 feet above assumed datum. Equipped with force pump and windmill. Water level Aug. 19, 1940, 35.33 feet below measuring point.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 19	99.02	Aug. 13	98.82	Sept. 9	99.23	Oct. 7	98.67
22	99.00	19	98.72	16	99.07	15	98.58
24	98.92	26	98.82	23	98.96	21	98.65
Aug. 5	98.83	Sept. 3	99.00	30	98.72	29	98.58

9. Fowle Realty Company. SW¼SE¼ sec. 19, T. 1 N., R. 16 E. Dug stock well, diameter about 48 inches, depth 16 feet. Measuring point north edge of concrete curb, 1 foot above land surface and 107.34 feet above assumed datum. Preparations made for equipping well with siphon. Water level Aug. 19, 1940, 8.62 feet below measuring point.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 19	98.65	Aug. 13	98.84	Sept. 9	98.49	Oct. 7	98.16
22	98.68	19	98.72	16	98.48	15	98.33
29	98.65	26	98.64	23	98.35	21	98.21
Aug. 5	98.64	Sept. 3	98.67	30	98.27	a 29	93.53

10. Ben Stalder. NW¼NW¼ sec. 27, T. 1 N., R. 15 E. Unused drilled domestic well, diameter 12 inches, depth 23 feet. Measuring point, west side top of casing, 0.5 foot above land surface and 118.37 feet above assumed datum. Equipped with force pump. Water level Aug. 19, 1940, 19.65 feet below measuring point.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 19	100.11	Aug. 13	98.82	Sept. 9	102.46	Oct. 7	100.78
22	99.88	19	98.72	16	102.00	15	100.50
29	99.34	26	98.80	23	101.45	21	100.56
Aug. 5	98.84	Sept. 3	101.45	30	101.04	29	100.39

11. George Riden. NE¼SE¼ sec. 32, T. 1 N., R. 15 E. Unused drilled well, diameter 4 inches, depth 74 feet. Measuring point, west side top of casing, 0.7 foot above land surface and 158.41 feet above assumed datum. Water level Aug. 19, 1940, 59.69 feet below measuring point.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 19	98.93	Aug. 13	98.81	Sept. 9	99.01	Oct. 7	99.03
22	98.84	19	98.72	16	99.19	15	98.89
29	98.81	26	99.06	23	99.24	21	98.92
Aug. 5	98.73	Sept. 3	98.82	30	99.08	29	98.83

12. E. J. Ahearn. NE¼NW¼ sec. 24, T. 3 N., R. 15 E. Dug stock well, diameter 15 inches, depth 31.3 feet. Measuring point, north side top of tile casing, 1.4 feet above land surface and 111.31 feet above assumed datum. Equipped with force pump. Water level Aug. 19, 1940, 12.59 feet below measuring point.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 25	99.18	Aug. 19	98.72	Sept.16	99.09	Oct. 15	99.02
29	99.09	28	99.09	23	99.28	21	98.71
Aug. 5	b 98.85	Sept. 3	98.84	30	98.87	29	98.82
13	99.06	9	98.93	Oct. 7	99.09		

a Siphon operating continuously
b Pump installed; small amounts pumped hereafter.

Richardson County--Continued.

13. Warren Gergens. SE¼SE¼ sec. 23, T. 3 N., R. 13 E. Unused drilled domestic and stock well, diameter 6 inches, depth 14.5 feet. Measuring point, north side top of galvanized casing, 0.5 foot above land surface and 108.97 feet above assumed datum. Equipped with force pump. Water level, Aug. 19, 1940, 10.25 feet below measuring point.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 25	99.10	Aug. 19	98.72	Sept.16	98.78	Oct. 15	98.37
29	99.02	27	100.92	23	98.81	21	98.29
Aug. 5	98.93	Sept. 3	99.19	30	98.66	29	98.30
13	98.92	9	98.97	Oct. 7	98.55		

14. L. Heineman. NW¼SE¼ sec. 16, T. 2 N., R. 15 E. Unused dug domestic well, diameter 12 inches, depth 34.5 feet. Measuring point, east side pump base, 1 foot above land surface and 122.72 feet above assumed datum. Equipped with force pump. Water level Aug. 19, 1940, 24.00 feet below measuring point.

Water level, in feet above datum, 1940

July 25	98.92	Aug. 19	98.72	Sept.23	99.12	Oct. 15	98.62
29	98.85	27	99.32	30	98.89	21	98.63
Aug. 5	98.78	Sept. 9	99.32	Oct. 7	98.71	29	98.56
13	98.76	16	99.12				

15. Mrs. Marthe Remmers. NW¼NW¼ sec. 29, T. 3 N., R. 17 E. Unused drilled domestic and stock well, diameter 6 inches, depth 27.5 feet. Measuring point, east side of hole in wooden platform under pump base, 0.2 foot above land surface and 124.39 feet above assumed datum. Equipped with force pump. Water level Aug. 19, 1940, 25.67 feet below measuring point.

Water level, in feet above datum, 1940

July 18	98.75	Aug. 13	98.73	Sept. 9	98.67	Oct. 7	98.57
22	98.67	19	98.72	16	98.64	15	98.56
29	98.69	28	98.65	23	98.45	21	98.55
Aug. 5	98.67	Sept. 3	98.66	30	98.55	29	98.58

408.

Water level, in feet above datum, 1940

Apr. 13	100.52	Aug. 19	98.06	Sept.23	100.62	Oct. 15	99.27
July 6	98.99	Sept. 9	101.59	30	100.08	21	99.08
Aug. 13	98.21	16	101.18	Oct. 7	99.70	29	98.76

410. University of Nebraska. SE¼SW¼ sec. 4, T. 2 N., R. 13 E. Bored well, diameter 3 inches, depth 18.8 feet. Measuring point, painted arrow on south side top of casing, 2.55 feet above land surface and 112.60 feet above assumed datum. Water level Aug. 19, 1940, 13.88 feet below measuring point.

Water level, in feet above datum, 1936-40

Date	Water level	Date	Water level	Date	Water level
Oct. 12, 1936	101.96	Apr. 12, 1940	100.06	Sept. 9, 1940	103.82
Mar. 18, 1937	100.96	July 6	100.23	16	102.01
June 2	101.30	22	99.52	23	101.30
Aug. 3	100.16	29	99.27	30	100.71
Oct. 6	99.64	Aug. 5	99.03	Oct. 7	100.38
July 6, 1938	99.82	13	98.86	15	99.98
Oct. 10	99.70	19	98.72	21	99.90
May 27, 1939	100.42	27	101.94	29	99.72
Nov. 14	99.16	Sept. 3	103.80		

Richardson County--Continued.

416.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 13	101.47	Aug. 27	a112.85	Sept.23	100.39	Oct. 15	99.49
July 6	98.81	Sept. 3	106.58	30	100.19	21	98.86
Aug. 13	98.89	9	101.20	Oct. 7	99.96	29	98.51
19	98.67	16	100.78				

417. University of Nebraska. NW¼NW¼ sec. 19, T. 1 N., R. 16 E. Bored well, diameter 3 inches, depth 14.3 feet. Measuring point, south side top of casing, 1.8 feet above land surface and 110.60 feet above assumed datum. Water level Aug. 19, 1940, 11.88 feet below measuring point.

Water level, in feet above datum, 1936-40

Date	Water level	Date	Water level	Date	Water level
Oct. 13, 1936	102.98	Aug. 19, 1940	98.72	Oct. 7, 1940	100.60
Mar. 18, 1937	102.44	Sept. 9	104.35	15	100.31
May 11, 1940	100.42	16	102.44	21	100.20
Aug. 5	98.97	23	101.34	29	99.94
13	98.84	30	100.87		

418. Old well partly caved. New well bored 3 or 4 feet north of old on June 6, 1940. Measuring point, top of pipe, 2 feet above land surface, 117.40 feet above assumed datum, 1.45 feet above measuring point of old well.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 4	98.74	Aug. 13	100.42	Sept. 9	100.91	Oct. 7	99.86
July 6	99.70	19	100.46	16	100.09	15	99.80
29	99.45	28	b108.07	23	99.97	21	99.83
Aug. 5	101.48	Sept. 3	102.37	30	99.90	29	100.03

419.

Water level, in feet above datum, 1940

Apr. 13	99.22	Aug. 13	97.58	Sept. 9	101.04	Oct. 7	98.53
July 6	98.69	19	97.43	16	99.46	15	98.32
22	97.97	28	101.39	23	99.00	21	98.31
29	97.62	Sept. 3	100.04	30	98.70	29	98.16
Aug. 5	97.56						

Rock County

117. Water levels, in feet above datum, 1940: Mar. 29, 101.37; July 19, 100.31; Oct. 31, 100.07.

198. Water levels, in feet above datum, 1940: July 19, 99.71; Oct. 31, 99.86.

Saline County

194. Water levels, in feet above datum, 1940: Apr. 12, 102.70; Aug. 5, 101.21; Oct. 16, 99.23.

341. Water levels, in feet above datum, 1940: Apr. 12, 96.98; Aug. 5, 96.84; Oct. 16, 96.71.

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a Surface water from roadside ditch drained into well on night of August 26.

b Nemaha River, flowing nearby, in flood.

Sarpy County

26. Replaced by new well.

27. Water levels, in feet above datum, 1940: Mar. 20, 101.92; July 9, 100.85; Oct. 18, 100.05.

323. Water levels, in feet above datum, 1940: Mar. 20, 95.99; July 9, 95.95; Oct. 18, 92.86.

Saunders County

19. Water levels, in feet above datum, 1940: Mar. 19, 100.31; July 5, 100.11; Oct. 15, 99.52.

21. Water levels, in feet above datum, 1940: Mar. 19, 100.08; July 5, 100.78; Oct. 15, 99.80.

22. Water levels, in feet above datum, 1940: Mar. 19, 104.81; July 5, 99.13; Oct. 15, 97.07.

331. Water levels, in feet above datum, 1940: Mar. 19, 100.15; July 5, 98.11; Oct. 15, 94.54.

Scotts Bluff County

Measurements discontinued on following wells: 1, 2, 4, 6, 7A, 7B, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 31, 32, 43, 50, 76, 166, 196, 259, 310, 353, 398, and 437.

240. Water level, in feet above datum, 1940: Apr. 5, 97.11.

438. Water levels, in feet above datum, 1940: Apr. 5, 100.09; July 27, 102.24; Nov. 8, 100.74.

439. Water levels, in feet above datum, 1940: Apr. 5, 100.23; July 27, 100.87; Nov. 8, 100.97.

440. Water levels, in feet above datum, 1940: Apr. 5, 100.22; July 27, 99.92; Nov. 8, 99.77.

441. Water levels, in feet above datum, 1940: Apr. 5, 100.15; July 27, 101.92; Nov. 8, 100.83.

442. Water levels, in feet above datum, 1940: Apr. 5, 100.58; July 27, 102.25; Nov. 8, 100.50.

Seward County

171. Water levels, in feet above datum, 1940: Apr. 12, 99.96; Oct. 16, 98.63.

172. Water levels, in feet above datum, 1940: Apr. 12, 100.64; Aug. 5, 99.61; Oct. 16, 99.97.

Sheridan County

82. Replaced by new well.

120. Water levels, in feet above datum, 1940: July 20, 99.12; Nov. 1, 98.89.

217. Water levels, in feet above datum, 1940: Apr. 2, 98.56; July 22, 97.64; Nov. 4, 97.38.

376. Water levels, in feet above datum, 1940: Mar. 29, 100.59; July 20, 99.10; Nov. 1, 99.14.

379. Water levels, in feet above datum, 1940: Apr. 2, 99.87; July 22, 98.58; Nov. 4, 99.26.

432. Water levels, in feet above datum, 1940: Mar. 29, 101.69; July 20, 99.76; Nov. 1, 99.58.

Sherman County

58. Water levels, in feet above datum, 1940: Mar. 26, 100.87; July 16, 99.75; Oct. 28, 100.56.

Sioux County

1. Measurements discontinued.

2. Measurements discontinued.

81. Water levels, in feet above datum, 1940: Mar. 30, 99.55; July 20, 99.50; Nov. 1, 99.64.

125. Water levels, in feet above datum, 1940: Mar. 30, 98.81; July 20, a/ 97.90.

239. Measurements discontinued.

377. Water levels, in feet above datum, 1940: Mar. 30, 100.82; July 20, 100.11; Nov. 1, 100.62.

Stanton County

208. Water level, in feet above datum, 1940: Mar. 23, 99.75.

421. Water level, in feet above datum, 1940: Mar. 23, 100.95; July 12, 101.57.

Thayer County

166. Water levels, in feet above datum, 1940: Apr. 12, 99.43; Aug. 3, 99.36; Nov. 15, 99.37.

187. Water levels, in feet above datum, 1940: Apr. 11, 99.04; Aug. 2, 98.76; Nov. 14, 98.20.

452. Water levels, in feet above datum, 1940: Apr. 11, 97.71; Aug. 2, 98.80; Nov. 14, 96.67.

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a Recently pumped.

Thomas County

212. Water levels, in feet above datum, 1940: Apr. 2, 99.92; July 23, 99.52; Nov. 4, 99.78.

213. Water levels, in feet above datum, 1940: Apr. 2, 100.10; July 23, 99.66; Nov. 4, 100.00.

Thurston County

60. Water levels, in feet above datum, 1940: July 12, 101.20; Oct. 25, 98.80.

102. Well dry Mar. 22, 1940.

103. Water levels, in feet above datum, 1940: Mar. 22, 98.81; July 12, dry.

Valley County

54. Water levels, in feet above datum, 1940: Mar. 26, 102.29; July 16, 101.44; Oct. 28, 101.97.

56. Water levels, in feet above datum, 1940: Mar. 26, 101.49; July 17, 102.79; Oct. 29, 102.91.

57. Water level, in feet above datum, 1940: July 17, 104.82.

Washington County

32. Water levels, in feet above datum, 1940: Mar. 20, 103.20; July 9, 102.16; Oct. 18, 100.08.

33. Water levels, in feet above datum, 1940: Mar. 20, 98.05; July 9, 97.70; Oct. 18, 97.35.

Wayne County

100. Water levels, in feet above datum, 1940: Mar. 23, 99.21; July 12, 99.87; Oct. 26, 99.13.

Webster County

Measurements discontinued in the following wells: 1, 2, 3, 4, 5, 9, 12, and 13.

161. Water levels, in feet above datum, 1940: Apr. 11, 98.24; Aug. 1, 98.02; Nov. 13, 98.64.

162. No measurements made in 1940.

163. Water level, in feet above datum, 1940: Apr. 10, 99.71

Wheeler County

204. Water levels, in feet above datum, 1940: Mar. 27, 100.39; July 18, 99.18; Oct. 30, 98.95.

205. Water levels, in feet above datum, 1940: Mar. 27, 99.85; July 17, 98.72; Oct. 29, 99.55.

York County

167. Water levels, in feet above datum, 1940: Apr. 11, 99.58; Aug. 2, 99.19.

225. Water levels, in feet above datum, 1940: Apr. 11, 100.49; Aug. 2, 99.93.

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NORTH DAKOTA

STATE-WIDE PROJECT

By W. C. Rasmussen

The program of water-level measurements in wells in North Dakota[1/] was continued in 1940 by the Federal Geological Survey in cooperation with the North Dakota Geological Survey. No wells were dropped from the program and 96 new wells were added. At the end of the year water levels in 176 wells were under observation.

Water levels in 64 of the wells were measured weekly by 38 local observers employed for the project. Water levels in 20 wells were measured weekly and the water levels in 12 wells were measured occasionally through the courtesy of city, State, and Federal agencies. The remaining 80 wells were measured once, twice or a few times, but all were established for semi-annual measurement in the future. About 4,000 individual measurements of water level were made in 1940. Six automatic water-stage recorders were operated on wells during the year.

A ground-water investigation of the area in the vicinity of Fargo was begun in 1940 by the Federal Survey in cooperation with the North Dakota Geological Survey and the city of Fargo. A discussion of this project is given on subsequent pages under the heading of Cass County. A reconnaissance of possible well-irrigation areas in several counties and a detailed ground-water survey of the area south of Oakes, Dickey County, were made during the year by the Federal Geological Survey in cooperation with the State Geological Survey. A Work Projects Administration Survey of the wells in 52 of the 53 counties of the State was completed, and the tables and summary data made available to the public in the North Dakota Geological Survey Library, University of North Dakota, Grand Forks.

The following table gives average monthly water levels from September 1937 to December 1940, based on the records of 10 to 42 wells scattered over the State. In general, the average water levels in corresponding months during subsequent years show decreases in average water levels from previous years. The average water level was 100.05 feet above the datum planes in December 1937, 99.54 feet in December 1938, 99.31 feet in December 1939, and 98.92 feet in December 1940. Records for 25 wells were used to compute average water levels for 1940. Water levels in 5 of the

1/ See Geological Survey Water-Supply Papers 840, 845 and 886.

wells stood higher at the end of the year than at the beginning; in 20 wells they stood lower. The precipitation in North Dakota in 1939 as reported by the United States Weather Bureau was 3 percent above normal. Records have not been collected for a sufficient period to make detailed interpretation possible.

Average monthly water levels, in feet above assumed datum planes, in observation wells in North Dakota, 1937-40

Year	Jan.	Feb.	Mar.	Apr.	May	June
1937	.....	.....	.....	.....	.....	.....
1938	99.97	99.93	100.12	100.41	100.68	100.35
1939	99.49	99.38	99.38	99.95	99.98	100.07
1940	99.24	99.14	99.13	99.16	99.43	99.52

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.
1937	.....	.....	100.30	100.19	100.13	100.05
1938	99.99	99.61	99.59	99.44	99.51	99.54
1939	99.89	99.62	99.41	99.37	99.34	99.31
1940	99.34	99.24	99.07	98.96	98.95	98.92

Records for 176 observation wells are included in this report. The wells are listed alphabetically by county name and numerically within each county. Observation wells have been established in every county in the State and periodic measurements are being made of wells in every county except Grand Forks, where two previous observation wells have gone dry. Complete descriptions are given for only those wells whose descriptions are not included in Water-Supply Papers 840, 845, or 886. Except where otherwise noted, the water level in each well is expressed in feet above an assumed datum 100 feet below the water level in that well on January 1, 1938, or nearest date of measurement. The height of the measuring point above the datum for wells that have been established since January 1, 1938, has been interpolated on a later date from the average water level in a group of selected wells. The depth to water level below the measuring point for any measurement may be computed by subtracting the height of the water level above the datum from the altitude of the measuring point. Water levels for any one well are directly comparable, even though the measuring point may be changed, because the record is given in height above a datum that has been referred to one or more bench marks near the well.

Adams County

1. Mrs. Halvorsen. SW¼SW¼ sec. 14, T. 130 N., R. 97 W. Drilled domestic well, diameter 4 inches, depth 77 feet. Measuring point, hole in pump base at east side, 2.0 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 18, 53.50.

Barnes County

97. H. H. Wilkins. NW¼SW¼ sec. 5, T. 138 N., R. 57 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.31	Apr. 13	99.29	July 6	99.14	Oct. 5	98.89
13	99.35	20	99.16	13	99.13	12	98.86
20	99.33	27	99.25	20	99.04	19	98.88
27	99.29	May 4	99.25	27	99.04	26	98.86
Feb. 3	99.36	11	99.21	Aug. 3	99.01	Nov. 2	98.87
10	99.43	18	99.19	10	99.00	9	98.85
17	99.15	25	99.21	17	99.01	16	98.91
24	99.22	June 1	99.18	24	99.11	23	98.69
Mar. 2	99.24	5	99.12	31	98.89	30	98.74
9	99.28	8	99.14	Sept. 7	98.79	Dec. 7	98.73
16	99.33	15	99.15	14	98.91	14	98.78
23	99.18	22	99.11	21	98.89	21	98.77
30	99.26	29	99.02	28	98.80	28	98.79
Apr. 6	99.24						

98. H. H. Wilkins. NW¼SW¼ sec. 5, T. 138 N., R. 57 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	103.21	Apr. 13	103.51	July 6	103.30	Oct. 5	103.12
13	102.90	20	103.46	13	103.28	12	103.08
20	103.48	27	103.44	20	103.31	19	103.09
27	103.02	May 4	103.45	27	103.31	26	103.02
Feb. 3	103.09	11	103.37	Aug. 3	103.33	Nov. 2	103.03
10	103.20	18	103.45	10	103.34	9	103.01
17	103.15	25	103.46	17	103.32	16	102.97
24	103.19	June 1	103.41	24	103.27	23	102.92
Mar. 2	103.28	5	103.42	31	103.19	30	102.90
9	103.30	8	103.41	Sept. 7	103.15	Dec. 7	102.90
16	103.33	15	103.40	14	103.12	14	102.81
23	103.29	22	103.35	21	103.19	21	102.79
30	103.38	29	103.32	28	103.06	28	102.76
Apr. 6	103.78						

Benson County

111. H. Biltingsrud. NE¼SE¼ sec. 36, T. 156 N., R. 69 W. Bored well, diameter 36 inches, depth 29.0 feet. Measuring point, hole in platform on south side of pump base, 0.3 foot above land surface. Bench mark, established May 16, 1940, chiseled cross in pink granite erratic in southeast corner of granary foundation, 30 feet north of well, and 0.57 foot below measuring point. Well pumped occasionally for water for tractors. Water levels, in feet below measuring point, 1940: May 16, 20.70; Nov. 3, 20.72.

Billings County

88. Roosevelt National Park. SW¼SE¼ sec. 32, T. 140 N., R. 100 W. New measuring point, top of new well platform, 1.10 feet above old measuring point, 127.77 feet above datum, and 1.4 feet above surface. New measuring point established Oct. 18, 1939, but it was assumed only 1.00 foot higher than old measuring point so subsequent measurements in 1939, listed in Water-Supply Paper 886, are 0.10 foot too low.

Water level, in feet above datum, 1940

Jan. 6	99.78	Apr. 13	99.74	July 7	99.88	Oct. 5	99.65
13	99.78	20	99.74	14	99.86	12	99.65
20	99.78	27	99.81	20	99.85	19	99.65
27	99.77	May 4	99.77	27	99.85	26	99.65

Billings County--Continued.

88. Roosevelt National Park.--Continued.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 3	99.76	May 11	99.89	Aug. 4	99.77	Nov. 2	99.65
10	99.76	18	99.92	10	99.76	9	99.65
17	99.76	25	99.92	17	99.75	16	99.65
24	99.75	29	99.94	24	99.73	23	99.65
Mar. 2	99.74	June 1	100.00	31	99.72	30	99.65
9	99.73	8	99.93	Sept. 7	99.69	Dec. 7	99.65
16	99.73	15	99.92	14	99.68	14	99.63
23	99.73	22	99.92	21	99.67	21	99.63
30	99.73	29	99.88	28	99.66	28	99.62
Apr. 6	99.74						

Bottineau County

60. Federal Land Bank. SE¼NE¼ sec. 23, T. 160 N., R. 76 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.72	Apr. 13	99.67	July 6	99.66	Oct. 5	99.64
13	99.72	20	99.67	13	99.66	12	99.65
20	99.71	27	99.67	20	99.66	19	99.65
27	99.71	May 4	99.66	27	99.66	26	99.65
Feb. 3	99.71	11	99.66	Aug. 3	99.65	Nov. 2	99.65
10	99.70	16	99.68	10	99.65	9	99.63
17	99.70	18	99.66	19	99.65	16	99.63
24	99.70	25	99.65	24	99.65	23	99.62
Mar. 2	99.69	June 1	99.65	31	99.65	30	99.62
9	99.69	8	99.65	Sept. 7	99.65	Dec. 7	99.61
16	99.68	15	99.65	14	99.64	14	99.61
23	99.68	22	99.65	21	99.64	21	99.61
30	99.67	29	99.65	28	99.64	28	99.60
Apr. 6	99.67						

112. Frank Churchill. SE¼SE¼ sec. 25, T. 161 N., R. 78 W. Unused bored well, diameter 18 inches, depth 60 feet. Measuring point, arrow on well platform, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: May 17, 24.21; Nov. 11, 24.07.

Bowman County

83. City of Bowman. NE¼SW¼ sec. 11, T. 131 N., R. 102 W. Fire dug well, diameter 16 feet, depth 49.1 feet. Measuring point, top of curb at manhole, about 1 foot above land surface. Bench marks same as for well 84. Water level June 17, 1938, 26.58 feet below measuring point.

Water level, in feet above datum, 1938-40

Date	Water level	Date	Water level	Date	Water level
June 17, 1938	96.92	Sept. 10, 1938	99.67	June 10, 1939	100.17
Aug. 13	97.90	17	99.65	17	101.74
20	99.73	May 20, 1939	99.75	24	101.66
27	99.57	27	99.84	July 1	101.67
Sept. 3	99.62	June 3	99.83	May 29, 1940	101.82

Bowman County--Continued.

84. City of Bowman. NE¼SW¼ sec. 11, T. 131 N., R. 102 W. Unused bored well, diameter 8 inches, depth 68.5 feet. Measuring point, top of casing, 1.2 feet above land surface, and 124.09 feet above datum. Bench mark 1, nail in washer, 1.9 feet above land surface, on west side of telephone pole, which is on east side of alley 66 feet south-southeast of north pumphouse, 165 feet east-southeast of well 84 and 125.20 feet above datum. Bench mark 2, nail in washer, 1.0 foot above land surface on west side of telephone pole on east side of alley, 126 feet south of bench mark 1, 42 feet northeast of northeast corner of south pumphouse, and 129.73 feet above datum. Bench mark 3, chiseled cross on east corner of northeast concrete base for stand pipe, 91 feet west of bench mark 2 and 135.28 feet above datum. Well 84 is influenced by the occasional pumping of well 83, in north pumphouse for fire protection. Water level, June 17, 1938, 24.42 feet below measuring point. Observer, George Larsen, Bowman.

Water level, in feet above datum, 1938-40

Date	Water level	Date	Water level	Date	Water level
June 17, 1938	99.67	Feb. 24, 1940	101.36	July 20, 1940	101.59
18	99.85	Mar. 2	101.33	27	101.55
25	99.82	9	101.33	Aug. 3	101.51
July 2	99.85	16	101.32	10	101.59
9	100.39	23	101.35	17	101.60
16	99.94	30	101.41	24	102.17
23	100.90	Apr. 6	101.61	31	102.09
30	100.91	13	101.63	Sept. 7	102.17
Aug. 13	99.83	20	101.59	14	102.09
20	100.36	27	101.63	21	100.63
27	100.36	May 11	101.69	28	101.63
Sept. 3	100.38	18	101.72	Oct. 5	101.67
10	100.38	25	101.76	12	101.84
17	100.38	29	101.88	19	101.93
May 20, 1939	101.40	June 1	101.77	26	101.01
27	100.58	8	a 101.26	Nov. 2	101.21
June 3	100.57	15	101.76	9	101.35
10	100.58	22	101.77	16	101.46
17	101.77	29	101.84	23	101.42
24	101.75	July 6	101.87	30	101.44
July 1	101.77	13	a 101.26	Dec. 7	101.43
Feb. 17, 1940	101.34				

85. City of Bowman. NE¼SW¼ sec. 11, T. 131 N., R. 102 W. Unused drilled well, diameter 8 inches, reported depth 500 feet. Measuring point, top of casing, in pumphouse level with floor, 9.5 feet below land surface and 126.80 feet above datum. Bench marks same as for well 84. Well 85 is 20 feet west of a deep 1,000 foot well that is pumped for city supply. Water level, June 17, 1938, 26.61 feet below measuring point. Observer, George Larsen, Bowman.

Water level, in feet above datum, 1938-40

June 17, 1938	100.19	June 10, 1939	101.54	May 25, 1940	101.66
18	100.19	17	101.71	29	101.66
25	100.14	24	101.71	June 1	101.64
July 2	100.30	July 1	101.72	8	101.59
9	100.42	Feb. 17, 1940	101.40	15	101.62
16	100.72	24	101.47	22	101.62
23	100.69	Mar. 2	101.48	29	101.66
30	100.80	9	101.47	July 6	101.02
Aug. 13	100.63	16	101.43	13	101.42
20	100.53	23	101.42	20	101.41
27	100.70	30	101.62	27	100.94
Sept. 3	100.69	Apr. 6	101.64	Aug. 3	100.92
10	100.70	13	101.72	10	101.02
17	99.85	20	101.69	17	101.00
May 20, 1939	101.52	27	101.67	24	101.11
27	101.52	May 11	101.58	31	101.17
June 3	101.51	18	101.62	Sept. 7	101.15

a Well 83 recently pumped.

Bowman County--Continued.

85. City of Bowman.--Continued.

Water level, in feet above datum, 1938-40

Date	Water level	Date	Water level	Date	Water level
Sept.14, 1940	101.17	Oct. 19, 1940	101.21	Nov. 16, 1940	101.33
21	101.16	26	101.21	23	101.24
28	101.12	Nov. 2	101.23	30	101.22
Oct. 5	101.07	9	101.19	Dec. 7	101.23
12	101.20				

Burke County

66. Mrs. P. M. Peterson. SE¼SE¼ sec. 5, T. 162 N., R. 89 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	100.09	Apr. 6	100.23	June 29	100.41	Oct. 5	100.17
13	100.08	13	100.27	July 6	100.34	12	100.13
20	100.08	20	100.26	13	100.30	19	100.13
27	100.12	27	100.28	20	100.28	26	100.12
Feb. 3	100.11	May 4	100.24	27	100.34	Nov. 2	100.13
10	100.13	11	100.42	Aug. 3	100.41	9	100.20
17	100.13	18	100.63	10	100.37	16	100.13
24	100.12	23	100.62	17	100.38	23	100.13
Mar. 2	100.13	25	100.62	24	100.36	30	100.13
9	100.17	June 1	100.56	Sept. 7	100.25	Dec. 7	100.09
16	100.17	8	100.56	14	100.23	14	100.15
23	100.17	15	100.56	21	100.20	21	100.16
30	100.21	22	100.49	28	100.17	28	100.17

115. Fish and Wildlife Service, U. S. Dept. of the Interior. SE¼SW¼ sec. 21, T. 160 N., R. 91 W. Unused jetted well, diameter 2 inches, depth 90 feet. Measuring point, top of casing, 1.9 feet above land surface, about 2,360 feet above mean sea level and 158.48 feet above datum. Bench mark, cross on limestone boulder 18 feet north of well, and 157.24 feet above datum. Water level, May 22, 1940, 58.76 feet below measuring point. Observer, Eric B. Lawson, custodian, Lostwood Migratory Bird Refuge.

Water level, in feet above datum, 1940

May 22	99.72	July 27	99.81	Sept.21	99.69	Nov. 2	99.60
25	99.85	Aug. 3	99.71	28	99.69	16	99.58
June 15	99.86	10	99.70	Oct. 5	99.66	23	99.51
22	99.94	17	99.74	12	99.63	30	99.55
29	99.84	24	99.74	19	99.63	Dec. 14	99.65
July 6	99.83	Sept.14	99.78	26	99.61	28	99.69
13	99.86						

116. Fish and Wildlife Service, U. S. Dept. of the Interior. SE¼SE¼ sec. 4, T. 159 N., R. 91 W. Unused jetted well, diameter 2 inches, depth 200 feet. Measuring point, top of casing, 1.8 feet above land surface, about 2,305 feet above sea level, and 178.87 feet above datum. Bench mark, cross in granite boulder, 33 feet south of well and 177.30 feet above datum. Water level, May 22, 1940, 79.15 feet below measuring point. Observer, Eric B. Lawson, custodian, Lostwood Migratory Bird Refuge.

Water level, in feet above datum, 1940

May 22	99.72	July 27	99.60	Sept.21	99.38	Nov. 2	99.24
25	99.88	Aug. 3	99.74	28	99.37	16	99.33
June 15	99.85	10	99.58	Oct. 5	99.37	23	99.21
22	99.77	17	99.51	12	99.38	30	99.23
29	99.72	24	99.48	19	99.35	Dec. 14	99.26
July 6	99.67	Sept.14	99.41	26	99.35	28	99.38
13	99.64						

Burleigh County

1. Celia DeLong. SW¼SW¼ sec. 25, T. 141 N., R. 80 W. Used domestic well, 36 inches square, depth 18.8 feet. Measuring point, bored hole in wood platform at painted arrow, 0.2 foot above land surface. Water level, in feet below measuring point, 1940: Nov. 21, 15.92.

Cass County

Fargo area

By A. C. Byers

In June 1940 the city of Fargo, the North Dakota Geological Survey and the Federal Geological Survey began a cooperative investigation of an area comprising about 50 square miles in the vicinity of Fargo for the purpose of determining the supply of ground water available to the city. As a part of the investigation 17 wells were selected for periodic observation and the water levels in them were measured at least once a week from July through December. Included in the group of observation wells are Cass County wells 12, 28, 57, 58, and 67, in which measurements of water level have been made since 1937 as a part of the State-wide program of observation wells in North Dakota. Automatic water-stage recorders were in operation on 5 of the observation wells at the end of 1940; a total of about 800 individual measurements of water level were made in the wells during the year.

The Fargo area lies entirely within the Red River Valley, a physiographic division the area and boundaries of which correspond approximately to those of the ancient glacial Lake Agassiz. A deposit of fine silt containing streaks of sand extends from the land surface to a depth of about 100 feet. Below the silt wells encounter in succession glacial drift, Cretaceous formations, and Pre-Cambrian granite. The formations underlying the silt are known in the area only from well logs, and the character, distribution, and thickness are not well established.

Only very meager supplies of water, or none at all, are obtained by wells from the lake silt. A few wells in the area derive sufficient water for domestic purposes from streaks of sand in the silt, but most wells are drilled through the silt to the underlying glacial drift. The drift consists chiefly of clay and silt, but in places it contains sand, gravel and boulders. Wells that tap the sand and gravel generally yield considerable water, but those that draw chiefly from the till yield only very small supplies. Much of the sand and gravel apparently occurs in pockets

in the drift that are only indirectly connected. The city well at Fargo apparently taps a pocket of sand and gravel and wells at Moorhead, Minn., and at West Fargo, N. Dak., may also tap such pockets or they may obtain water from more extensive deposits of sand and gravel in buried valleys.

The water in the silt is believed to be unconfined, but the water in the drift is under artesian pressure and rises in wells to within 20 to 40 feet of the land surface. All the observation wells, except wells 43, 109, and 122, definitely tap artesian water in the glacial drift. Wells 43, 109, and 122 are relatively shallow and do not penetrate through the lake silt. They obtain water from thin streaks of fine sand in the silt. Well 122 is probably a water-table well, well 109 is probably artesian; the character of well 43 is doubtful, but it is probably a water-table well.

The water levels in most of the observation wells have not been observed for a sufficient period to permit interpretation. The water levels in wells 12, 28, 57, 58, and 67, however, have been measured periodically since late in 1937 and show that the artesian head, at least in the vicinities of the wells, has declined considerably since measurements were begun. At the end of 1940, the water levels in wells 12 and 28 were 10.03 feet and 9.99 feet lower and the water level in well 67 was 2.51 feet lower than in 1937. The water levels in wells 12 and 28 are directly affected by the pumping of the well that is used to augment the municipal supply of Fargo, but well 67 is not so affected and the water level in it is believed to represent more truly the regional artesian head of the area. The water level in well 58 is affected by the pumping of well 57 for stockyard use and at the end of 1940 the water level in well 58 was 15.25 feet lower than in 1937. In 1940, the water levels in wells 12, 28, and 67 declined 0.62 foot, 0.60 foot, and 0.52 foot respectively, and the water level in well 58 declined 6.09 feet.

In the following tables all water levels are reported in feet above assumed datum planes. The datum for each well previously included in the State-wide program was established by arbitrarily assigning an elevation of 100 feet to the last water-level measurement of 1937 or the first water-level measurement of 1938. For the new wells in the Fargo area, all wells except 43, 109, 122, 124, and 127, have been given an assumed

datum by computing the average elevation of the water levels in wells 12, 28, and 67 on July 11, 1940, and assigning that stage to the first reading of each new well. The water levels in wells 124 and 127, which were established later in the year and which are affected by the seasonal pumping of well 14, were assigned the same elevation as well 28 on the date the water level was first measured. The water levels in wells 43, 109, and 122, were assigned a datum computed from the stage of the water level in well 8.

1. H. Benson. SW¼NE¼ sec. 12, T. 139 N., R. 49 W. In north section of double garage at 201 Sixteenth St. So., Fargo, N. Dak. Unused drilled well, diameter 4 inches, depth 175 feet below land surface. Measuring point, top of casing, 0.72 foot above land surface and 122.52 feet above datum. Water level, July 3, 1940, 26.46 feet below measuring point. Equipped with lift pump.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 3	96.06	July 22	95.47	Sept. 9	94.14	Oct. 26	94.74
8	96.25	24	95.41	10	94.55	Nov. 2	94.86
9	95.62	26	95.50	11	94.62	9	95.15
10	95.71	29	95.49	12	94.67	16	95.02
11	95.73	31	95.52	13	94.67	23	95.04
12	95.68	Aug. 3	94.74	14	94.68	30	95.11
13	95.74	10	94.22	21	94.55	Dec. 7	95.17
15	95.75	17	94.27	28	94.56	14	95.16
17	95.91	24	94.26	Oct. 5	94.62	21	95.22
18	95.81	31	94.27	12	94.62	28	95.33
20	95.61	Sept. 7	94.14	19	94.69		

3. The Pierce Co. SW¼SW¼ sec. 6, T. 139 N., R. 48 W. In basement storage room, 1019 First Ave. No., Fargo, N. Dak. Unused drilled well, diameter 6 inches, depth 404 feet below land surface. Measuring point, top edge of coupling on top of casing, about 5 feet below land surface and 118.79 feet above datum. Automatic water-stage recorder installed Sept. 26, 1940. Water level affected by pumping of well 14. Water level, July 3, 1940, 23.01 feet below measuring point.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

July	3	a	95.78	Aug.	31	a	91.19	Oct.	7	91.42	Oct. 28	92.58
	8	a	95.75	Sept.	7	a	90.76		8	91.49	29	92.65
	9	a	95.74		14	a	90.39		9	91.55	30	92.69
	10	a	95.74		16	ac	90.30		10	91.63	31	92.71
	11	ab	95.73		17	a	90.26		11	91.68	Nov. 1	92.77
	12	a	95.70		18	a	90.23		12	91.76	2	92.82
	13	a	95.69		19	a	90.23		13	91.79	3	92.87
	15	a	95.62		20	a	90.20		14	91.85	4	92.90
	16	a	95.51		21	a	90.24		15	91.90	5	92.94
	17	a	95.45		25	a	90.52		16	91.97	6	92.94
	18	a	95.38		26	a	90.55		17	92.03	7	92.96
	20	a	95.12		27		90.64		18	92.07	8	92.99
	22	a	94.85		28		90.74		19	92.15	9	93.04
	24	a	94.58		29		90.81		20	92.21	12	a 93.20
	26	a	94.30		30		90.86		21	92.26	16	a 93.31
	29	a	93.97	Oct.	1		90.95		22	92.32	17	93.32
	31	a	93.74		2		91.04		23	92.37	18	93.33
Aug.	3	a	93.44		3		91.13		24	92.40	19	93.37
	10	a	92.75		4		91.23		25	92.44	20	93.39
	17	a	92.12		5		91.35		26	92.49	21	93.40
	24	a	91.90		6		91.38		27	92.52	22	93.44

a Tape measurement.
b Pumping of well 14 begun.
c Pumping of well 14 stopped Sept. 15.

Cass County--Continued.

3. The Pierce Co.--Continued.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov. 23	93.44	Dec. 3	93.65	Dec. 13	93.82	Dec. 23	94.03
24	93.44	4	93.68	14	93.82	24	94.08
25	93.45	5	93.74	15	93.83	25	94.14
26	93.49	6	93.76	16	93.87	26	94.17
27	93.53	7	93.82	17	93.91	27	94.17
28	93.55	8	93.82	18	93.91	28	94.19
29	93.60	9	93.83	19	93.94	29	94.21
30	93.64	10	93.86	20	93.98	30	94.21
Dec. 1	93.65	11	93.85	21	93.99	31	94.21
2	93.65	12	93.84	22	94.02		

4. City of Fargo. SW¼NE¼ sec. 7, T. 139 N., R. 48 W. In Island Park. Unused drilled well, diameter 10 inches, depth 228 feet below measuring point. Measuring point, top edge of coupling on top of casing, 2.8 feet above land surface and 135.60 feet above datum. Automatic water stage recorder installed Aug. 2, 1940. Water level, July 3, 1940, 39.48 feet below measuring point. Water level affected by changes in atmospheric pressure.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	95.12	95.02	95.30	95.36
2	.....	.....	95.14	95.04	95.30	95.34
3	a 96.12	95.09	95.11	95.07	95.30	95.34
4	.....	95.06	95.10	95.12	95.31	95.40
5	.....	95.05	95.09	95.11	95.28	95.39
6	.....	95.05	95.08	95.09	95.27	95.43
7	.....	95.08	95.03	95.09	95.27	95.42
8	a 95.91	95.04	95.02	95.10	95.28	95.43
9	a 95.78	95.01	95.03	95.12	95.30	95.42
10	a 95.70	94.92	95.02	95.12	95.32	95.40
11	a 95.73	94.89	95.03	95.13	95.33	95.37
12	a 95.65	94.85	95.04	95.14	95.28	95.32
13	a 95.70	94.82	95.06	95.14	95.25	.....
14	.....	94.79	95.04	95.15	95.25	a 95.32
15	a 95.68	.....	95.05	95.15	95.28	95.33
16	a 95.67	.....	95.07	95.17	95.37	95.33
17	a 95.74	a 94.77	95.10	95.15	95.37	95.33
18	a 95.80	94.77	95.10	95.16	95.36	95.35
19	.....	94.78	95.06	95.20	95.34	95.39
20	a 95.66	94.83	95.01	95.21	95.33	95.37
21	.....	94.86	94.99	95.20	95.36	95.38
22	a 95.54	94.85	94.99	95.22	95.31	95.38
23	.....	94.91	95.01	95.21	95.31	95.40
24	a 95.42	94.91	94.95	95.22	95.30	95.44
25	.....	94.99	94.94	95.23	95.31	95.42
26	a 95.26	95.02	94.97	95.22	95.34	95.40
27	.....	95.04	95.02	95.23	95.33	95.40
28	.....	95.06	95.00	95.26	95.34	95.34
29	a 95.19	95.10	94.98	95.27	95.38	95.45
30	.....	95.11	94.99	95.27	95.37	95.43
31	a 95.15	95.10	.....	95.27	.....	95.43

a Tape measurement.

Cass County--Continued.

5. Gardner Hotel. SE¼SW¼ sec. 6, T. 139 N., R. 48 W. In basement of hotel building at First Ave. No. and Roberts St., Fargo, N. Dak. Bored and drilled well, diameter 18 inches and 6 inches, depth 382 feet below land surface. Measuring point, edge of 2 by12-inch plank over well, 117.01 feet above datum. Automatic water-stage recorder installed Sept. 28, 1940. Water level affected by pumping well 14. Water level, July 5, 1940, 21.27 feet below measuring point.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 5	a 95.74	Oct. 1	91.37	Oct. 28	92.16	Dec. 2	93.30
8	a 95.74	2	91.37	29	92.20	3	93.32
9	a 95.75	3	91.38	30	92.24	4	93.35
11	ab 95.73	4	91.44	31	92.28	5	93.38
12	a 95.73	5	91.45	Nov. 1	92.31	6	93.40
13	a 95.71	6	91.45	2	92.36	7	93.44
15	a 95.71	7	91.46	3	92.39	8	93.46
18	a 95.68	8	91.48	4	92.42	9	93.49
20	a 95.61	9	91.50	5	92.47	10	93.52
22	a 95.56	10	91.53	9	a 92.65	11	93.53
24	a 95.46	11	91.55	10	92.66	12	93.55
26	a 95.36	12	91.57	16	a 92.86	13	93.57
29	a 95.34	13	91.61	17	92.87	14	93.58
31	a 95.22	14	91.64	18	92.90	15	93.61
Aug. 3	a 95.39	15	91.67	19	92.94	16	93.63
10	a 94.82	16	91.70	20	92.97	17	93.65
17	a 93.85	17	91.73	21	93.00	18	93.67
24	a 93.37	18	91.76	22	93.03	19	93.69
31	a 92.83	19	91.79	23	93.06	20	93.72
Sept. 7	a 92.30	20	91.81	24	93.09	21	93.73
14	a 91.86	21	91.85	25	93.12	22	93.77
18	ac 91.62	22	91.91	26	93.15	23	93.78
19	a 91.61	23	91.95	27	93.17	24	93.80
20	a 91.55	24	91.99	28	93.20	25	93.83
21	a 91.49	25	92.03	29	93.23	26	93.84
28	a 91.38	26	92.06	30	93.26	27	93.86
29	91.38	27	92.12	Dec. 1	93.28	28	93.88
30	91.37						

6. Merchants National Bank & Trust Co. NE¼SW¼ sec. 12, T. 139 N., R. 49 W. Behind barn at 801 Seventeenth St. So., Fargo, N. Dak. Used drilled domestic well, diameter 8 inches, depth 141.9 feet below measuring point. Measuring point, top of concrete plug, 1.8 feet above land surface and 133.94 feet above datum. Water level July 8, 1940, 40.52 feet below measuring point. Equipped with lift pump.

Water level, in feet above datum, 1940

July 8	d 93.42	July 24	d 94.44	Sept.14	94.39	Oct. 26	95.18
9	d 95.14	26	96.28	21	91.48	Nov. 2	99.19
10	96.67	29	d 93.21	24	95.20	9	96.62
11	d 95.73	31	92.70	25	97.25	16	d 86.26
12	d 94.84	Aug. 3	92.78	26	94.71	23	91.21
13	d 92.83	10	94.96	27	93.53	30	99.64
15	d 94.69	17	94.02	28	92.49	Dec. 7	d 94.93
17	99.82	24	d 95.58	Oct. 5	93.33	14	d 97.54
18	d 95.18	31	96.77	12	93.99	21	d 91.47
20	d 92.17	Sept. 7	d 93.69	19	91.37	28	95.74
22	94.70						

a Tape measurement. b Pumping of well 14 begun.
c Pumping well 14 stopped Sept. 15. d Recently pumped.

Cass County--Continued.

8. Arthur D. South Estate. SE¼SE¼ sec. 14, T. 140 N., R. 52 W. Observer, Ardelle M. South.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	98.96	Apr. 6	98.92	June 29	99.01	Sept.28	99.19
13	98.99	13	98.92	July 6	99.01	Oct. 5	99.19
20	98.95	21	98.92	13	98.99	12	99.19
27	98.92	27	98.95	20	99.08	19	99.19
Feb. 3	98.92	May 4	98.94	27	99.10	26	99.19
10	98.92	11	98.94	Aug. 3	99.15	Nov. 2	99.21
17	98.90	18	98.98	10	99.17	9	99.21
24	98.92	25	98.98	17	99.18	16	99.56
Mar. 2	98.88	June 1	98.96	24	99.24	23	99.56
10	98.85	6	98.98	31	99.28	30	99.57
16	98.92	8	99.01	Sept. 7	99.21	Dec. 7	99.52
23	98.93	15	99.01	14	99.19	14	99.52
30	98.93	22	99.01	21	99.18	21	99.52

10. Arthur D. South Estate. SE¼SE¼ sec. 14, T. 140 N., R. 52 W. Observer, Ardelle M. South.

Water level, in feet above datum, 1940

Jan. 6	98.72	Apr. 6	98.87	June 29	98.82	Sept.28	98.19
13	98.72	13	98.87	July 6	98.74	Oct. 5	98.17
20	98.72	21	98.89	13	98.38	12	98.06
27	98.71	27	98.99	20	98.39	19	98.12
Feb. 3	98.73	May 4	98.97	27	98.39	26	98.13
10	98.72	11	98.97	Aug. 3	98.44	Nov. 2	98.13
17	98.75	18	99.01	10	98.46	9	98.16
24	98.73	25	98.99	17	98.46	16	98.58
Mar. 2	98.74	June 1	99.02	24	98.45	23	98.58
10	98.73	6	98.98	31	98.45	30	98.63
16	98.76	8	98.99	Sept. 7	98.38	Dec. 7	98.57
23	98.78	15	98.89	14	98.34	14	98.57
30	98.81	22	98.87	21	98.24	21	98.57

12. City of Fargo. SW¼SW¼ sec. 1, T. 139 N., R. 49 W.

Water level, in feet above datum, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	94.60	.....	68.33	.....	78.38	.....	.....
2	.....	.....	93.10	.....	.....	.....	.....	67.84	.....	78.87	86.22	.....
3	.....	92.80	.....	.....	.....	.....	.....	67.58	80.04	79.35	.....	.....
4	.....	.....	.....	.....	94.33	.....	.....	.....	79.89	79.82	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	67.10	79.73	80.17	.....	.....
6	90.97	.....	.....	93.97	.....	.....	94.68	66.69	79.53	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	66.45	79.44	80.85	.....	89.00
8	.....	.....	.....	.....	.....	94.68	94.62	66.22	.....	81.16	.....	.....
9	.....	.....	93.30	.....	.....	.....	94.62	65.54	78.99	81.52	86.99	.....
10	.....	92.52	.....	.....	.....	.....	94.63	65.19	78.88	81.79	.....	.....
11	.....	.....	.....	.....	94.38	.....	a94.58	.....	78.75	82.09	.....	.....
12	.....	.....	.....	.....	.....	.....	90.62	64.68	78.63	82.36	.....	.....
13	91.34	.....	.....	94.07	.....	.....	86.50	64.13	78.52	.....	.....	.....
14	.....	.....	.....	.....	.....	.....	.....	63.90	78.40	82.88	.....	89.27
15	.....	.....	.....	.....	.....	94.65	81.91	63.64	(b)	83.12	.....	.....
16	.....	.....	93.51	.....	.....	.....	80.15	63.35	78.10	83.38	87.66	.....
17	.....	92.61	.....	.....	.....	.....	78.49	63.11	62.36	83.56	.....	.....
18	.....	.....	.....	.....	94.53	.....	77.09	.....	65.15	83.81	.....	.....
19	.....	.....	.....	.....	.....	.....	76.20	62.72	67.43	84.00	.....	.....
20	92.61	.....	.....	94.12	.....	.....	76.23	62.50	69.01	.....	.....	.....
21	.....	.....	.....	.....	.....	.....	.....	62.37	70.36	84.38	.....	89.64
22	.....	.....	.....	.....	.....	94.71	73.97	62.04	.....	84.57	.....	.....
23	.....	.....	93.58	.....	.....	.....	72.78	62.53	72.74	84.71	88.09	.....
24	.....	92.82	.....	.....	.....	.....	72.17	61.71	73.67	84.88	.....	.....

a Pumping of well 14 begun.
b Pumping of well 14 stopped.

Cass County--Continued.

12. City of Fargo.--Continued.

Water level, in feet above datum, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
25	.....	.....	.....	.....	94.56	.....	71.43	.....	74.50	85.04	.....	.....
26	.....	.....	.....	.....	.....	.....	70.90	61.41	75.32	85.19	.....	.....
27	91.93	.....	.....	94.22	.....	.....	70.40	61.20	76.07	.....	.....	.....
28	.....	.....	.....	.....	.....	.....	.....	61.02	76.68	85.52	.....	89.97
29	.....	.....	.....	.....	.....	94.68	69.46	60.90	.....	.....	.....	.....
30	.....	.....	93.88	.....	.....	.....	69.03	60.71	77.83	.....	88.59	.....
31	.....	.....	.....	.....	.....	.....	68.61	60.52	.....	.....	.....	.....

14. City of Fargo. NW¼SW¼ sec. 1, T. 139 N., R. 49 W. Pumped for city supply. No measurements made in 1940.

17. David Bossart. NE¼NE¼ sec. 2, T. 139 N., R. 49 W. In rear of 1014 Twenty-seventh St. No., Fargo, N. Dak. Used drilled domestic well, diameter 3 inches, depth 140 feet below land surface. Measuring point, top of casing 0.7 foot above land surface and 125.90 feet above datum. Water level July 8, 1940, 30.29 feet below measuring point. Water level affected by pumping of well 14. Equipped with lift pump.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 8	95.61	July 17	87.41	Oct. 19	82.95	Nov. 30	86.75
9	91.83	18	a 78.23	26	84.63	Dec. 7	88.71
11	a 95.73	20	77.69	Nov. 2	87.15	14	88.00
12	92.11	Sept. 28	79.22	9	87.92	21	88.74
15	84.15	Oct. 5	82.20	16	89.14	28	92.06
16	80.23	12	83.25	23	88.68		

28. City of Fargo. NW¼SW¼ sec. 1, T. 139 N., R. 49 W.

Water level, in feet above datum, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	.....	.....	94.63	.....	68.32	.....	78.39	.....	.....
2	.....	.....	93.11	.....	.....	.....	.....	67.90	.....	78.88	86.21	.....
3	.....	92.22	.....	.....	.....	.....	.....	67.62	60.01	79.37	.....	.....
4	.....	.....	.....	.....	94.37	.....	.....	.....	59.90	79.84	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	67.09	59.80	80.15	.....	.....
6	90.94	.....	.....	94.00	.....	.....	94.71	66.67	59.55	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	66.51	59.37	80.84	.....	89.01
8	.....	.....	.....	.....	.....	94.72	95.61	66.19	.....	81.17	.....	.....
9	.....	.....	93.31	.....	.....	.....	95.62	65.64	58.99	81.52	87.01	.....
10	.....	92.53	.....	.....	.....	.....	95.64	65.17	58.86	81.80	.....	.....
11	.....	.....	.....	.....	94.41	.....	b95.61	.....	58.74	82.10	.....	.....
12	.....	.....	.....	.....	.....	.....	90.66	64.61	58.62	82.35	.....	.....
13	91.36	.....	.....	94.11	.....	.....	86.57	64.11	58.48	.....	.....	.....
14	.....	.....	.....	.....	.....	.....	.....	63.82	58.37	82.89	.....	89.29
15	.....	.....	.....	.....	.....	94.69	81.87	63.59	(c)	83.12	.....	.....
16	.....	.....	93.52	.....	.....	.....	80.22	63.31	58.12	83.39	87.67	.....
17	.....	92.61	.....	.....	.....	.....	78.50	63.10	62.37	83.55	.....	.....
18	.....	.....	.....	.....	94.56	.....	77.12	.....	65.13	83.81	.....	.....
19	.....	.....	.....	.....	.....	.....	76.24	62.71	67.43	84.00	.....	.....
20	91.63	.....	.....	94.16	.....	.....	76.25	62.49	69.01	.....	.....	.....
21	.....	.....	.....	.....	.....	.....	.....	62.36	70.35	84.37	.....	89.65
22	.....	.....	.....	.....	.....	94.72	74.02	62.01	.....	84.57	.....	.....
23	.....	.....	93.60	.....	.....	.....	72.79	62.08	72.75	84.71	88.08	.....
24	.....	92.83	.....	.....	.....	.....	72.21	61.56	73.65	84.89	.....	.....
25	.....	.....	.....	.....	94.59	.....	71.44	.....	74.49	85.05	.....	.....
26	.....	.....	.....	.....	.....	.....	70.94	61.38	75.32	85.19	.....	.....
27	91.94	.....	.....	94.26	.....	.....	70.41	61.18	76.10	.....	.....	.....
28	.....	.....	.....	.....	.....	.....	.....	61.03	76.72	85.53	.....	90.01
29	.....	.....	.....	.....	.....	94.70	69.49	60.87	.....	.....	.....	.....
30	.....	.....	93.90	.....	.....	.....	69.00	60.66	77.84	.....	88.64	.....
31	.....	.....	.....	.....	.....	.....	68.65	60.48	.....	.....	.....	.....

a Recently pumped.
b Pumping of well 14 begun.
c Pumping of well 14 stopped.

Cass County--Continued.

29. Arthur D. South Estate. SE¼SE¼ sec. 14, T. 140 N., R. 52 W. Observer, Ardelle M. South.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	100.29	Apr. 6	101.00	June 29	100.92	Sept.28	99.44
13	100.73	13	98.96	July 6	99.20	Oct. 5	98.69
20	100.17	21	100.75	13	99.89	12	99.34
27	100.16	27	100.73	20	98.97	19	99.01
Feb. 3	99.64	May 4	99.85	27	100.14	26	99.23
10	100.00	11	100.93	Aug. 3	100.56	Nov. 2	99.00
17	99.97	18	100.65	10	100.45	9	99.19
24	100.09	25	99.81	17	100.37	16	98.71
Mar. 2	99.73	June 1	100.84	24	100.32	23	98.67
10	100.26	6	100.87	31	100.12	30	99.71
16	100.00	8	100.67	Sept. 7	100.16	Dec. 7	99.83
23	99.89	15	101.00	14	100.03	14	99.77
30	100.69	22	100.90	21	98.13	21	99.82

43. North Dakota State College. NE¼SW¼ sec. 35, T. 140 N., R. 49 W. Unused bored well, diameter 36 inches, depth 70.3 feet below measuring point. Measuring point, top of 2 by 12-inch board cover, 1.0 foot above land surface and 107.87 feet above datum. Water level, July 16, 1940, 8.85 feet below measuring point. Equipped with windmill.

Water level, in feet above datum, 1940

July 16	99.02	Aug. 10	99.36	Sept.28	98.99	Nov. 16	99.52
18	99.13	17	99.26	Oct. 5	98.94	23	99.69
22	99.04	24	99.21	12	98.93	30	99.87
24	99.00	31	99.18	19	99.00	Dec. 7	99.94
26	98.95	Sept. 7	99.07	26	99.04	14	99.97
29	98.86	14	98.98	Nov. 2	99.21	21	100.00
31	98.81	21	98.98	9	99.27	28	100.06
Aug. 3	98.91						

56. Union Stockyards. No measurements made in 1940.

57. Union Stockyards. NW¼NE¼ sec. 6, T. 139 N., R. 49 W. New measuring point, bottom edge of pump base at north side, 17.5 feet below land surface and 106.63 feet above datum.

Water level, in feet above datum, 1940

July 17	88.53	Aug. 17	89.17	Oct. 5	85.16	Nov. 23	83.48
19	a 79.67	24	89.65	12	a 76.45	30	84.07
24	88.10	31	88.68	19	82.63	Dec. 7	83.83
27	81.42	Sept. 7	a 80.17	26	a 75.83	14	83.14
31	a 81.16	14	a 79.71	Nov. 2	83.22	21	84.11
Aug. 3	a 81.26	21	87.10	9	81.45	28	a 77.18
10	a 81.91	28	a 77.95	16	a 76.21		

58. Union Stockyards. SE¼NE¼ sec. 6, T. 139 N., R 49 W. Automatic water-stage recorder installed Sept. 26, 1940. Water levels affected by pumping of well 57.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

Jan. 1	b 90.84	Aug. 31	b 88.73	Oct. 5	84.52	Oct. 17	83.22
8	b 91.25	Sept. 7	b 88.59	6	85.22	18	83.13
July 13	b 89.25	14	b 88.26	7	84.70	19	83.31
17	b 88.85	21	b 88.25	8	84.25	20	83.99
19	b 89.23	27	85.32	9	84.04	21	83.39
24	b 88.50	28	85.02	10	83.75	22	82.90
27	b 88.32	29	85.76	11	83.27	23	82.93
31	b 89.70	30	84.81	12	83.77	24	82.96
Aug. 3	b 89.55	Oct. 1	84.49	13	84.51	25	82.76
10	b 90.19	2	84.45	14	83.91	26	82.93
17	b 89.18	3	84.49	15	83.65	27	83.93
24	b 89.81	4	84.47	16	83.62	28	83.29

a Pump operating in well. b Tape measurement.

Cass County--Continued.

58. Union Stockyards.--Continued.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 29	83.01	Nov. 12	83.22	Nov. 26	82.94	Dec. 10	83.37
30	82.84	13	83.13	27	83.17	11	83.20
31	82.87	14	82.82	28	83.20	12	83.18
Nov. 1	82.84	15	82.67	29	83.01	13	83.30
2	82.85	16	82.53	30	83.10	14	83.46
3	83.57	17	83.34	Dec. 1	83.69	15	83.54
4	82.97	18	82.82	2	83.05	16	83.28
5	82.72	19	82.47	3	82.81	17	82.97
6	82.71	20	82.59	4	82.70	18	83.00
7	82.41	21	83.61	5	82.49	19	83.05
8	82.39	22	83.05	6	82.59	20	82.99
9	82.82	23	82.88	7	82.71	28	a 84.75
10	83.49	24	83.75	8	84.05	29	85.02
11	83.31	25	83.17	9	83.55		

67. City of Fargo. NW¼NE¼ sec. 18, T. 139 N., R. 48 W. Measuring point to June 29, 1940, top of casing, 10.24 feet above land surface and 140.25 feet above datum; after June 29, 1940, top of casing flush with land surface and 130.21 feet above datum. Automatic water-stage recorder installed Aug. 5, 1940. Water level, July 7, 1940, 32.47 feet below measuring point.

Lowest daily water level, in feet above datum, 1940
(from recorder charts)

Day	Jan.	Mar.	Apr.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	a98.16	.....	.....	.....	.....	97.06	96.75	97.13	97.29
2	.....	.....	.....	.....	.....	.....	97.04	96.77	97.13	97.28
3	.....	.....	.....	.....	.....	.....	97.01	96.80	97.13	97.28
4	.....	.....	.....	.....	.....	.....	97.00	96.87	97.15	97.36
5	.....	.....	.....	.....	.....	.....	96.96	96.81	97.12	97.36
6	.....	.....	.....	a98.18	.....	97.43	96.95	96.79	97.12	97.40
7	.....	.....	.....	.....	.....	97.41	96.90	96.83	97.13	97.39
8	.....	.....	.....	.....	.....	97.36	96.89	96.82	97.15	97.40
9	.....	.....	.....	.....	.....	97.35	96.90	96.85	97.19	97.39
10	.....	.....	.....	.....	a97.74	97.28	96.88	96.84	97.23	97.36
11	.....	.....	.....	.....	a97.71	97.25	96.89	96.86	97.25	97.35
12	.....	.....	.....	.....	a97.67	97.23	96.90	96.86	97.21	97.30
13	.....	.....	.....	.....	a97.70	97.21	96.86	96.86	97.18	97.30
14	.....	.....	.....	.....	.....	97.21	96.86	96.90	97.18	97.34
15	.....	.....	.....	.....	a97.66	97.20	96.86	96.90	97.24	97.37
16	.....	.....	.....	.....	a97.66	97.13	96.86	96.92	97.29	97.37
17	.....	.....	.....	.....	a97.82	97.12	96.83	96.91	97.27	97.37
18	.....	.....	.....	.....	a97.77	97.10	96.83	96.94	97.27	97.41
19	.....	.....	.....	.....	.....	97.10	96.79	96.97	97.23	97.45
20	.....	.....	.....	.....	a97.68	97.11	96.75	96.96	97.23	97.43
21	.....	.....	.....	.....	.....	97.08	96.71	96.96	97.27	97.45
22	.....	.....	.....	.....	a97.65	97.06	96.71	96.97	97.28	.....
23	.....	.....	.....	.....	.....	97.05	96.74	96.97	97.22	.....
24	.....	.....	.....	.....	a97.60	97.10	96.69	96.98	97.22	97.50
25	.....	.....	.....	.....	.....	97.11	96.68	96.99	97.22	97.45
26	.....	.....	.....	.....	a97.52	97.11	96.72	97.00	97.27	97.43
27	a98.06	.....	a98.26	.....	a97.50	97.10	96.78	97.00	97.26	97.43
28	.....	.....	.....	.....	.....	97.10	96.72	97.04	97.27	97.49
29	.....	.....	.....	a97.91	a97.51	97.10	96.71	97.08	97.33	97.47
30	.....	a98.41	.....	.....	.....	97.09	96.72	97.08	97.30	97.46
31	.....	.....	.....	.....	a97.49	97.06	.....	97.08	.....	97.45

a Tape measurement.

Cass County--Continued.

73. Sam Chessley. NE¼SE¼ sec. 24, T. 139 N., R. 49 W. Used drilled domestic well, diameter 3 inches. Measuring point, top of casing at north side, 0.5 foot above land surface and 128.52 feet above datum. Water level, July 23, 1940, 32.79 feet below measuring point. Equipped with windmill.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 23	95.73	Oct. 12	94.82	Nov. 9	95.13	Dec. 7	95.14
Sept.21	94.88	19	94.87	16	95.14	14	95.18
28	94.86	26	94.94	23	95.04	21	95.28
Oct. 5	94.87	Nov. 2	95.01	30	95.16	28	95.23

109. Elmer Sukat. NE¼NW¼ sec. 8, T. 139 N., R. 49 W. Unused drilled well, diameter 3⅛ inches, depth 86.6 feet below measuring point. Measuring point, top of casing, 0.7 foot above land surface and 130.15 feet above datum. Water level, July 27, 1940, 31.05 feet below measuring point. Equipped with lift pump.

Water level, in feet above datum, 1940

July 27	99.10	Sept. 7	102.91	Sept.28	103.25	Nov. 16	98.45
31	100.15	14	103.48	Oct. 5	94.75	23	97.91
Aug. 3	102.71	21	103.51	12	96.75	30	97.61
10	102.78	24	103.28	19	96.20	Dec. 7	97.34
17	101.29	25	103.30	26	97.93	14	97.31
24	101.39	26	103.45	Nov. 2	97.85	21	97.24
31	101.98	27	103.30	9	99.29	28	97.18

122. Leonard Hobbs. NE¼NE¼ sec. 2, T. 139 N., R. 49 W. Unused dug well, diameter 42 inches, depth 21.8 feet below measuring point. Measuring point, top of 2 by 8-inch plank at west side, 0.5 foot above land surface and 116.70 feet above datum. Water level, July 31, 1940, 17.56 feet below measuring point. Equipped with lift pump.

Water level, in feet above datum, 1940

July 31	99.14	Sept. 7	99.51	Oct. 19	99.18	Nov. 30	99.47
Aug. 4	99.51	14	99.40	26	99.18	Dec. 7	99.43
10	99.86	21	99.30	Nov. 2	99.29	14	99.30
17	99.80	28	99.23	9	99.34	21	99.35
24	99.66	Oct. 5	99.20	16	99.50	28	99.37
31	99.62	12	99.16	23	99.45		

124. H. R. Kollman. SE¼NE¼ sec. 2, T. 139 N., R. 49 W. In rear of 2723 Seventh Ave. No., Fargo, N. Dak. Unused drilled well, diameter 5⅛ inches, depth 117.4 feet below measuring point. Measuring point, top of casing, 2 feet above land surface and 120.42 feet above datum. Water level, Oct. 8, 1940, 38.62 feet below measuring point. Water levels affected by pumping of well 14.

Water level, in feet above datum, 1940

Oct. 8	81.80	Nov. 2	84.45	Nov. 23	85.66	Dec. 14	86.71
12	82.30	9	84.89	30	86.09	21	86.94
19	83.15	16	85.35	Dec. 7	86.46	28	87.39
26	83.83						

127. City of Fargo. NW¼SE¼ sec. 2, T. 139 N., R. 49 W. Unused drilled observation well, diameter 1⅛ inches, depth 156.2 feet below measuring point. Measuring point, top edge of coupling on top of casing, 1.3 feet above land surface and 110.26 feet above datum. Water level, Oct. 30, 1940, 24.39 feet below measuring point.

Water level, in feet above datum, 1940

Oct. 30	85.87	Nov. 16	90.86	Dec. 7	91.22	Dec. 21	91.09
Nov. 2	86.20	23	91.07	14	91.10	28	91.09
9	88.59	30	91.90				

Cavalier County

43. City of Langdon. SE¼SW¼ sec. 14, T. 161 N., R. 60 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	105.00	Apr. 13	104.29	July 6	106.15	Oct. 5	106.73
13	104.98	20	105.50	13	106.19	12	106.77
20	105.04	27	105.65	20	106.25	19	106.81
27	105.14	May 4	105.69	27	106.29	26	106.83
Feb. 3	105.15	11	105.73	Aug. 3	106.33	Nov. 2	106.87
10	105.27	15	105.77	10	106.37	9	106.91
17	105.23	18	105.77	17	106.39	16	106.98
24	105.02	25	105.81	24	106.48	23	106.98
Mar. 2	105.06	June 1	105.89	31	106.50	30	106.98
9	105.13	8	105.94	Sept. 7	106.52	Dec. 7	107.02
16	105.10	15	105.98	14	106.56	14	107.02
23	105.14	22	106.04	21	106.60	21	107.10
30	105.19	29	106.08	28	106.64	28	107.06
Apr. 6	105.25						

44. City of Langdon. SW¼SE¼ sec. 14, T. 161 N., R. 60 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	112.91	Apr. 13	110.08	July 6	128.12	Oct. 5	127.96
13	112.75	20	119.41	13	127.91	12	127.54
20	112.68	27	122.00	20	127.87	19	127.64
27	112.75	May 4	130.06	27	127.12	26	127.68
Feb. 3	112.68	11	125.75	Aug. 3	127.75	Nov. 2	127.83
10	112.83	15	132.53	10	127.91	9	127.87
17	111.70	18	129.00	17	127.79	16	127.98
24	111.75	25	130.02	24	127.75	23	127.91
Mar. 2	111.40	June 1	127.29	31	127.77	30	128.00
9	111.08	8	128.62	Sept. 7	127.70	Dec. 7	128.12
16	110.41	15	128.58	14	127.66	14	128.02
23	109.85	22	128.39	21	127.50	21	128.12
30	110.25	29	128.29	28	127.56	28	128.00
Apr. 6	110.22						

45. City of Langdon. SW¼NE¼ sec. 23, T. 161 N., R. 60 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	127.27	Apr. 13	125.56	July 6	133.75	Oct. 5	125.33
13	127.11	20	134.13	13	133.29	12	130.32
20	126.92	27	136.84	20	132.88	19	132.34
27	126.82	May 4	136.63	27	132.29	26	132.21
Feb. 3	126.69	11	136.50	Aug. 3	133.90	Nov. 2	132.11
10	126.59	15	130.90	10	125.00	9	131.94
17	126.44	18	136.59	17	127.92	16	131.84
24	126.29	25	136.40	24	128.34	23	131.65
Mar. 2	126.19	June 1	136.13	31	127.34	30	131.48
9	126.03	8	136.02	Sept. 7	126.42	Dec. 7	131.32
16	125.77	15	135.81	14	125.34	14	131.17
23	125.56	22	135.56	21	124.32	21	131.00
30	125.46	29	135.34	28	124.63	28	130.88
Apr. 6	125.44						

46. Cavalier County Fair Association. NE¼SE¼ sec. 14, T. 161 N., R. 60 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	98.46	Apr. 13	96.96	July 6	99.90	Oct. 5	99.12
13	98.42	20	96.87	13	95.10	12	98.71
20	98.27	27	96.98	20	102.96	19	98.77
27	98.25	May 4	97.56	27	99.98	26	98.85
Feb. 3	98.06	11	98.27	Aug. 3	100.32	Nov. 2	98.81
10	97.98	15	98.41	10	100.58	9	98.75
17	97.73	18	98.67	17	100.35	16	98.75
24	97.62	25	98.96	24	100.23	23	98.51
Mar. 2	97.52	June 1	99.29	31	99.98	30	98.60
9	97.42	8	99.50	Sept. 7	99.85	Dec. 7	98.42
16	97.33	15	99.71	14	99.58	14	98.25
23	97.14	22	99.85	21	99.15	21	98.19
30	97.10	29	99.79	28	99.17	28	98.10
Apr. 6	97.02						

Dickey County

72A. State of North Dakota. NE¼ sec. 36, T. 131 N., R. 64 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.86	Apr. 13	100.01	July 6	99.75	Oct. 5	99.65
13	99.82	20	100.00	13	99.82	12	99.67
20	99.82	27	100.04	20	99.75	19	99.68
27	99.86	May 4	100.02	27	99.71	26	99.71
Feb. 3	99.88	11	100.01	Aug. 3	99.73	Nov. 2	99.68
10	99.88	18	100.00	10	99.73	9	99.69
17	99.86	25	99.96	17	99.72	16	99.70
24	99.84	June 1	99.87	24	99.72	23	99.69
Mar. 2	99.84	3	99.87	31	99.71	30	99.67
9	99.88	8	99.90	Sept. 7	99.71	Dec. 7	99.71
16	99.90	15	99.82	14	99.78	14	99.69
23	99.86	22	99.73	21	99.69	21	99.69
30	100.02	29	99.80	28	99.65	28	99.73
Apr. 5	99.98						

92. S. A. Reko. NE¼NW¼ sec. 27, T. 131 N., R. 60 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.66	Apr. 13	99.62	July 7	99.47	Oct. 6	99.25
13	99.67	20	99.64	14	99.49	13	99.24
20	99.66	27	99.72	21	99.37	20	99.26
27	99.66	May 4	99.70	28	99.41	27	99.28
Feb. 3	99.66	11	99.66	Aug. 4	99.37	Nov. 3	99.26
10	99.70	18	99.62	11	99.35	10	99.26
17	99.62	25	99.62	18	99.31	17	99.31
24	99.62	June 1	99.64	25	99.35	24	99.25
Mar. 2	99.64	2	99.61	Sept. 1	99.31	Dec. 1	99.25
9	99.61	9	99.60	8	99.26	10	99.33
16	99.70	16	99.56	15	99.29	15	99.26
23	99.53	23	99.58	22	99.25	22	99.30
30	99.83	30	99.56	29	99.24	29	99.35
Apr. 6	99.66						

93. D. C. Botts. NW¼NW¼ sec. 7, T. 129 N., R. 59 W. Used domestic drilled well, diameter 4 inches and 1¼ inches, depth 97 feet. Measuring point, top of 1¼-inch pipe, 2.5 feet above land surface. Water level, in feet below measuring point, 1940: Aug. 21, 2.53.

95. Standard Oil Co. NE¼NE¼ sec. 29, T. 131 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 22.0 feet. Measuring point, joint in pitcher pump, 3.8 feet above land surface. Water level, in feet below measuring point, 1940: Aug. 22, 20.07.

98. Albert M. Schmit. NE¼NE¼ sec. 20, T. 131 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 38.0 feet. Measuring point, top of casing, in basement, about 7 feet below land surface. Water level, in feet below measuring point, 1940: Aug. 23, 21.92.

99. Eugene E. Eaton. NW¼NW¼ sec. 27, T. 131 N., R. 59 W. Used garden driven well, diameter 1¼ inches, depth 14.0 feet. Measuring point, top of casing in pit, 4.8 feet below land surface. Water level, in feet below measuring point, 1940: Aug. 30, 6.81.

100. Paul Roney. SE¼NE¼ sec. 21, T. 131 N., R. 59 W. Unused driven well, diameter 1¼ inches, depth 25.9 feet. Measuring point, top of casing, 3.2 feet above land surface. Water level, in feet below measuring point, 1940: Aug. 31, 22.58.

Dickey County--Continued.

101. D. C. Botts. NE¼NW¼ sec. 7, T. 129 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 17.9 feet. Measuring point, joint in pitcher pump, 1.0 foot above land surface and 113.38 feet above datum. Bench mark 1, nail in washer in southwest corner of frame house about 30 feet north-northwest of well and 117.34 feet above datum. Bench mark 2, nail in washer in northeast corner of barn, about 30 feet southwest of well and 117.34 feet above datum. Water level Sept. 2, 1940, 14.05 feet below measuring point. Observer, Eina E. Holmstrom, Ludden.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 2	99.33	Oct. 5	99.55	Nov. 9	99.60	Dec. 7	99.67
7	99.36	12	99.56	16	99.60	14	99.61
14	99.46	19	99.57	23	99.58	21	99.61
21	99.49	26	99.58	30	99.59	28	99.62
28	99.52	Nov. 2	99.59				

102. State of North Dakota. SE¼SE¼ sec. 16, T. 131 N., R. 59 W. Used farm well, diameter 18 inches, depth 36.8 feet. Measuring point, flange on north side of manhole, which is at land surface. Water level, in feet below measuring point, 1940: Sept. 4, 25.75.

103. Floyd Ferguson. W½SW¼ sec. 27, T. 131 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 16.2 feet. Measuring point, joint in pitcher pump, 3.4 feet above land surface. Water level, in feet below measuring point, 1940: Sept. 6, 12.64.

105. H. G. Martin, administrator. SW¼NW¼ sec. 9, T. 130 N., R. 59 W. Used garden driven well, diameter 1¼ inches, depth 17.4 feet. Measuring point, joint in pitcher pump, 2.9 feet above land surface. Water level, in feet below measuring point, 1940: Sept. 12, 14.17.

106. Frank Elliott. NE¼NW¼ sec. 28, T. 131 N., R. 59 W. Used stock driven well, diameter 1¼ inches, depth 22.6 feet. Measuring point, top of pitcher pump, 3.1 feet above land surface. Water level, in feet below measuring point, 1940: Sept. 14, 14.85.

111. Johnny Hoffsomer. SW¼SW¼ sec. 20, T. 130 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 14.5 feet. Measuring point, top of pitcher pump, 2.4 feet above land surface. Water level, in feet below measuring point, 1940: Sept. 19, 13.24.

113. Union Central. NW¼NW¼ sec. 30, T. 130 N., R. 59 W. Used stock dug well, diameter 48 inches, depth 16.2 feet. Measuring point, copper nail on east side of well, 1.1 feet above land surface. Water level, in feet below measuring point, 1940: Sept. 24, 14.30.

115. Heine Holling. SW¼SW¼ sec. 21, T. 130 N., R. 59 W. Used stock driven well, diameter 1¼ inches, depth 14.3 feet. Measuring point, top of pitcher pump, north point, 2.5 feet above land surface. Water levels, in feet below measuring point, 1940: Oct. 2, 11.50; Oct. 17, 11.50.

117. E. P. Wilson. NW¼NE¼ sec. 22, T. 130 N., R. 59 W. Used stock driven well, diameter 1¼ inches, depth 21.5 feet. Measuring point, joint in pitcher pump, 2.4 feet above land surface. Water level, in feet below measuring point, 1940: Oct. 23, 12.20.

127. City of Oakes. NE¼NW¼ sec. 28, T. 131 N., R. 59 W. Used for park drinking fountain. Driven well, diameter 1¼ inches, depth 26.5 feet. Measuring point, top of casing, 1.5 feet above land surface and 109.06 feet above datum. Water level June 21, 1940, 9.37 feet below measuring point. Observer, George Wilhelm, Oakes.

Dickey County--Continued.

127. City of Oakes.--Continued.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 21	99.69	July 18	99.47	Sept.12	99.49	Nov. 2	99.48
22	100.18	20	99.53	13	99.52	9	99.48
23	100.18	27	99.53	15	99.51	16	99.49
24	100.61	Aug. 3	99.53	19	99.50	23	99.49
25	100.24	10	99.46	21	99.65	30	99.49
26	99.64	17	99.64	28	99.64	Dec. 7	99.49
27	99.60	24	99.59	Oct. 5	99.64	14	99.94
28	99.55	30	99.46	12	99.64	21	99.87
July 6	99.49	31	99.64	19	99.64	28	100.29
13	99.53	Sept. 7	99.66	26	99.49		

128. City of Oakes. NE¼NW¼ sec. 28, T. 131 N., R. 59 W. Used for park drinking fountain. Driven well, diameter 1¼ inches, depth 24.2 feet. Measuring point, top of casing, 1.5 feet above land surface and 111.66 feet above datum. Water level June 21, 1940, 11.97 feet below measuring point. Observer, George Wilhelm, Oakes.

Water level, in feet above datum, 1940

June 21	99.69	July 18	99.57	Sept.12	99.47	Nov. 2	99.45
22	99.59	20	99.59	13	99.49	9	99.45
23	99.59	27	99.59	15	99.47	16	99.46
24	99.69	Aug. 3	99.59	19	99.49	23	99.46
25	99.58	10	99.51	21	99.76	30	99.46
26	99.80	17	99.50	28	99.85	Dec. 7	99.46
27	99.67	24	99.49	Oct. 5	99.75	14	99.46
28	99.66	29	99.62	12	99.75	21	99.45
July 6	99.64	31	99.50	19	99.74	28	99.48
13	99.60	Sept. 7	99.77	26	99.47		

129. A. M. Dahlbeck. SW¼NW¼ sec. 21, T. 131 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 17 feet. Measuring point, top of pipe, 6 feet below land surface. Water level, in feet below measuring point, 1940: July 17, 14.51.

130. Anton Kliment. SW¼SW¼ sec. 2, T. 130 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 20.9 feet. Measuring point, joint in pitcher pump, 5.2 feet above land surface. Water level, in feet below measuring point, 1940: July 17, 16.72.

131. Corrigan. NW¼SE¼ sec. 17, T. 130 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 17.8 feet. Measuring point, joint in pitcher pump, 4.0 feet above land surface. Water level, in feet below measuring point, 1940: July 17, 15.19.

132. H. J. Johnson. NW¼NW¼ sec. 26, T. 130 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 17.5 feet. Measuring point, joint of pitcher pump, 4.5 feet above land surface. Water level, in feet below measuring point, 1940: July 18, 10.66.

133. J. C. Petersen. NE¼NE¼ sec. 32, T. 130 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 14.9 feet. Measuring point, joint in pitcher pump, 2.6 feet above land surface. Water level, in feet below measuring point, 1940: July 18, 10.80.

134. A. F. Hankel. NW¼NE¼ sec. 9, T. 129 N., R. 59 W. Used domestic driven well, diameter 1¼ inches, depth 17.0 feet. Measuring point, joint in pitcher pump, 2.5 feet above land surface. Water level, in feet below measuring point, 1940: July 18, 9.79.

Dickey County--Continued.

135. V. S. Doyen. SW¼SW¼ sec. 24, T. 129 N., R. 60 W. Used domestic driven well, diameter 1¼ inches, depth 19.0 feet. Measuring point, joint in pitcher pump, about 2 feet above land surface and 117.06 feet above datum. Bench mark 1, nail in washer in tree, 25 feet southwest of well and 119.72 feet above datum. Bench mark 2, nail in washer in northwest corner of frame house, 45 feet south-southwest of well and 119.72 feet above datum. Water level July 18, 1940, 17.55 feet below measuring point. Observer, V. S. Doyen, Ludden.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 18	99.51	Sept.21	99.46	Oct. 26	99.39	Dec. 14	98.88
Aug. 31	99.35	28	99.46	Nov. 2	99.38	21	99.36
Sept. 7	99.47	Oct. 19	99.39	Dec. 7	99.35	28	99.37
14	99.43						

170. Axel Daniels. SW¼SE¼ sec. 34, T. 129 N., R. 60 W. Used domestic jetted well, diameter 2 inches, depth 118 feet. Flowing well. Measuring point, end of pipe discharging into trough, about 2 feet above land surface. Flow, in gallons a minute, 1940: Aug. 12, 11.5.

171. Stoldenben. NE¼SE¼ sec. 27., T. 129 N., R. 60 W. Used domestic and stock, jetted well, diameter 2 inches to 1¼ inches, depth 85 to 100 feet. Flowing well. Measuring point, spigot, about 1.5 feet above land surface. Flow, in gallons a minute, 1940: Aug. 12, 2.8.

Divide County

68. J. M. Johnson. SE¼SW¼ sec. 22, T. 163 N., R. 97 W.

Water level, in feet above datum, 1940

Jan. 7	99.61	Mar. 31	99.11	June 10	99.28	Sept. 1	99.10
14	99.54	Apr. 7	99.07	23	99.23	8	99.04
21	99.52	14	99.14	30	99.09	15	98.98
28	99.50	21	99.13	July 7	99.17	22	98.98
Feb. 4	99.44	28	99.09	14	99.21	29	98.96
11	99.41	May 5	99.07	21	99.19	Oct. 6	99.00
18	99.39	12	99.23	28	99.21	13	99.00
25	99.29	19	99.20	Aug. 4	99.19	20	98.98
Mar. 3	99.23	23	99.24	11	99.17	27	(a)
10	99.21	26	99.21	18	99.12	Nov. 13	98.86
17	99.19	June 2	99.25	25	99.12	17	(a)
24	99.17	9	99.26				

69. J. M. Johnson. SE¼SW¼ sec. 22, T. 163 N., R. 97 W.

Water level, in feet above datum, 1940

Jan. 7	99.67	Apr. 14	99.44	July 7	99.42	Oct. 6	99.00
14	99.69	21	99.44	14	99.34	13	98.96
21	99.67	28	99.43	21	99.32	20	98.92
28	99.66	May 5	99.42	28	99.33	27	98.93
Feb. 4	99.44	12	99.43	Aug. 4	99.30	Nov. 3	98.92
11	99.60	19	99.48	11	99.27	10	98.89
18	99.59	23	99.48	18	99.23	17	98.89
25	99.57	26	99.49	25	99.21	24	98.86
Mar. 3	99.52	June 2	99.49	Sept. 1	99.18	Dec. 1	98.84
10	99.50	9	99.50	8	99.13	8	98.83
17	99.49	16	99.52	15	99.10	15	98.81
24	99.47	23	99.48	22	99.07	22	98.80
31	99.31	30	99.44	29	99.04	29	98.78
Apr. 7	99.46						

a Dry.

Divide County--Continued.

70. J. M. Johnson. SE¼SW¼ sec. 22, T. 163 N., R. 67 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	98.90	Apr. 14	98.43	July 7	98.75	Oct. 6	98.25
14	98.88	21	98.49	14	98.75	13	98.24
21	98.85	28	98.41	21	98.74	20	98.23
28	98.82	May 5	98.45	28	98.70	27	98.02
Feb. 4	98.62	12	97.50	Aug. 4	98.63	Nov. 3	97.97
11	98.48	19	98.04	11	98.30	10	97.95
18	98.63	23	98.25	18	98.39	17	97.90
25	98.64	26	98.28	25	98.43	24	97.87
Mar. 3	98.67	June 2	98.64	Sept. 1	98.33	Dec. 1	97.84
10	98.68	9	98.68	8	98.32	8	97.82
17	98.69	16	98.68	15	98.27	15	97.81
24	98.70	23	98.80	22	98.24	22	97.79
31	98.57	30	98.80	29	98.18	29	97.76
Apr. 7	98.45						

117. A. U. Anderson, overseer. NE¼NE¼ sec. 34, T. 163 N., R. 100 W. Unused farm bored well, diameter 22 inches, depth 23 feet. Measuring point, top of curb at east side, 1.4 feet above land surface. Water levels, in feet below measuring point, 1940: May 24, 17.40; Nov. 14, 18.10.

Dunn County

89. Knute Haugen. NW¼NW¼ sec. 8, T. 145 N., R. 91 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.24	Apr. 13	99.62	July 6	99.66	Oct. 5	98.77
13	98.87	21	99.69	13	99.58	12	99.19
20	98.82	27	99.77	20	99.55	19	99.67
27	99.32	May 4	99.75	27	99.58	26	99.35
Feb. 3	99.31	11	99.62	Aug. 3	99.52	Nov. 2	99.03
10	99.44	18	99.70	10	99.58	9	99.27
17	99.09	25	99.60	17	98.90	16	99.41
24	99.27	28	99.64	24	99.10	23	99.18
Mar. 2	98.89	June 1	99.80	31	98.80	30	99.22
9	99.22	8	99.72	Sept. 7	98.90	Dec. 7	98.97
16	99.43	15	99.62	14	99.13	14	98.96
23	98.88	22	99.73	21	98.97	21	98.93
30	99.61	29	99.57	28	98.92	28	99.19
Apr. 6	99.49						

Eddy County

17. L. S. Rude. SE¼NW¼ sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1940: Aug. 9, 10.86.

18. Stockyards. NW¼SW¼ sec. 9, T. 150 N., R. 66 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.18	Apr. 13	99.58	July 6	100.27	Oct. 5	100.51
13	99.18	20	99.76	13	100.29	12	100.53
20	99.16	22	99.93	20	100.26	19	100.50
27	99.16	27	99.79	27	100.31	26	100.50
Feb. 3	99.15	May 4	99.96	Aug. 3	100.50	Nov. 2	100.49
10	99.11	11	100.01	10	100.55	9	100.45
17	99.11	18	100.16	17	100.53	16	100.44
24	99.10	25	99.93	23	100.53	23	100.40
Mar. 2	99.10	June 1	100.06	31	100.53	30	100.39
9	99.07	8	100.06	Sept. 7	100.53	Dec. 7	100.41
16	99.12	15	100.23	14	100.53	14	100.35
23	99.27	22	100.23	21	100.51	21	100.34
30	99.31	29	100.16	28	100.49	28	100.32
Apr. 6	99.34						

Eddy County--Continued.

19. Gilbert Olson. SE¼NW¼ sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1940: Aug. 9, 15.61.

20. Knute Egger. SE¼NW¼ sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1940: Aug. 9, 20.55.

21. Elmer Moe. NE¼NW¼ sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1940: Aug. 9, 21.93.

22. John R. Warsing. (Formerly Carl Portz.) SE¼NW¼ sec. 9, T. 150 N., R. 66 W. Water level, in feet below measuring point, 1940: Aug. 9, 15.93.

154. Pfau Estate. NE¼SE¼ sec. 28, T. 148 N., R. 67 W. Drilled flowing well, diameter 5 inches, depth 42.5 feet. Measuring point, hole in casing, about 2.5 feet above land surface. Unreduced flow, in gallons a minute, 1940: July 29, 7.7; Nov. 22, 6.0.

Foster County

125. J. W. Wampler. NW¼NE¼ sec. 22, T. 145 N., R. 66 W. Unused bored well, diameter 30 inches, depth 26 feet. Measuring point, arrow at hole in wood platform, 2.1 feet above land surface. Water levels, in feet below measuring point, 1940: July 4, 16.92; Aug. 9, 16.74; Nov. 22, 17.66.

Golden Valley County

1. Mrs. Tangen. SE¼SE¼ sec. 2, T. 139 N., R. 106 W. Used drilled farm well, diameter 5 inches, reported depth 170 feet, measured depth 100 feet. Measuring point, notch in casing top, north-northwest point, 1.1 feet above land surface. Equipped with windmill. Water level, in feet below measuring point, 1940: Nov. 19, 84.96.

Grant County

121. R. O. Ozbun. NE¼NE¼ sec. 10, T. 134 N., R. 85 W. Unused bored farm well, diameter 36 inches, depth 35 feet. Measuring point, hole in platform at pump base at painted arrow, 2.0 feet above land surface. Water levels, in feet below measuring point, 1940: May 31, 23.63; Nov. 17, 23.66.

Griggs County

1. Griffith Loan and Investment Company. SW¼NW¼ sec. 20, T. 144 N., R. 59 W. Unused drilled well, diameter 5 inches, depth 51.9 feet. Measuring point, top of casing at north side, 0.9 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 29, 27.72.

Hettinger County

82. L. F. Everhart. NW¼ sec. 5, T. 133 N., R. 93 W. Observer, Virden Parsons, Mott.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 30	100.29	June 29	100.13	Nov. 23	99.77	Dec. 14	99.77
June 1	100.29	July 7	100.04	30	99.77	21	99.76
15	100.32	13	100.01	Dec. 7	99.77	28	99.77
22	100.16	Nov. 17	99.77				

Kidder County

50. Herman Petersen. SW¼SW¼ sec. 9, T. 138 N., R. 73 W.

Water level, in feet above datum, 1940

Jan. 6	99.79	Mar. 23	99.86	May 18	100.29	July 13	99.97
13	99.81	30	99.83	25	100.20	27	99.87
27	99.79	Apr. 6	100.00	June 1	100.20	Aug. 3	99.83
Feb. 3	99.81	13	100.00	8	100.22	10	99.77
10	99.89	20	99.98	15	100.12	Nov. 22	99.58
17	99.84	23	100.00	22	100.16	24	99.58
24	99.83	May 4	100.20	29	100.05	Dec. 1	99.53
Mar. 2	99.87	11	100.00	July 6	100.00	8	99.63
11	99.87						

Kidder County--Continued.

147. Phillip Mitteleider. Center of S½ sec. 27, T. 139 N., R. 71 W. Used domestic dug well, diameter 37 inches, depth 10 feet. Measuring point, top of well platform at north edge, 2.9 feet above land surface. Water levels, in feet below measuring point, 1940: July 25, 9.81; Nov. 22, 9.61.

148. Chas. Woessner. NE¼SW¼ sec. 10, T. 139 N., R. 72 W. Used domestic bored well, diameter 6 inches, depth 24.5 feet. Measuring point, top of casing, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: July 25, 18.90; July 22, 18.98.

149. Village of Tappen. SW¼NW¼ sec. 10, T. 139 N., R. 71 W. Used dug fire protection well, diameter 96 inches, depth 15 feet. Measuring point, chiseled cross on west side of manhole, 0.1 foot above land surface and 111.67 feet above datum. Bench mark 1, nail in washer in telephone post, 18 feet northeast of well, south side, and 113.81 feet above datum. Bench mark 2, nail in washer 68 feet west-northwest of well in a telephone pole at southeast side, 111.21 feet above datum. Water level 12.20 feet below measuring point, July 25, 1940. Observer, John Wieland.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 25	99.47	Aug. 31	99.35	Oct. 5	99.36	Nov. 23	99.25
29	99.44	Sept. 7	99.35	12	99.34	30	99.25
Aug. 3	99.45	14	99.35	19	99.30	Dec. 7	99.25
10	99.46	21	99.34	26	99.32	21	99.26
17	99.46	28	99.32	Nov. 9	99.27	28	99.24
24	99.45						

150. Ramon Grimm. SW¼NW¼ sec. 14, T. 142 N., R. 70 W. Used bored garage well, diameter 5 inches, depth 47 feet. Measuring point, top of casing at west side, 2.3 feet below land surface. Water levels, in feet below measuring point, 1940: July 26, 39.25; Nov. 22, 39.47.

151. Mrs. Fagereng. NW¼NE¼ sec. 23, T. 142 N., R. 70 W. Used stock bored well, diameter 18 inches to 12 inches. Measuring point, top of concrete curb, south side, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: July 26, 23.93; Nov. 22, 21.76.

152. Northern Pacific Railway. SW¼NE¼ sec. 12, T. 142 N., R. 71 W. Unused drilled well, diameter 5 inches, depth 44.5 feet. Measuring point, top of casing at west side, 0.2 foot above land surface. Water levels, in feet below measuring point, 1940: July 3, 37.98; July 26, 38.09; Nov. 22, 38.15.

166. Chris Werre. SW¼SW¼ sec. 3, T. 139 N., R. 71 W. Used domestic well, diameter 1¼ inches, depth 20.5 feet. Measuring point, joint in pitcher pump, 2.0 feet above land surface. Water levels, in feet below measuring point, 1940: July 25, 17.98; Nov. 22, 18.08.

LaMoure County

1. Town of Edgeley. SE¼NW¼ sec. 3, T. 133 N., R. 64 W. Unused drilled well, diameter 6 inches, depth 92 feet. Measuring point, basement floor level, edge of flange, about 9 feet below land surface and 116.67 feet above datum. Water level Nov. 26, 1940, 17.63 feet below measuring point. Observer, W. J. Nordley, Edgeley.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level
Nov. 26	99.04	Dec. 7	99.96	Dec. 21	99.09
30	98.84	14	98.69	28	99.96

LaMoure County--Continued.

2A. Mrs. Fidela Davis. SW¼SE¼ sec. 24, T. 134 N., R. 64 W. Equipped with automatic water-stage recorder.

Water level, in feet above datum, 1939-40
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level
Dec. 9, 1939	101.39	Apr. 1, 1940	101.40	Aug. 21, 1940	102.00
17	101.09	8	101.76	24	101.66
24	101.33	16	101.76	Sept. 1	101.90
30	101.38	May 3	101.72	9	101.35
Jan. 5, 1940	101.02	13	102.32	18	101.29
6	100.98	21	102.00	26	101.79
9	101.27	27	102.10	Oct. 3	101.41
13	101.12	June 2	102.06	10	102.26
20	101.10	3	101.97	15	101.52
27	101.18	11	101.67	26	100.95
30	101.38	15	102.41	Nov. 4	101.87
Feb. 3	101.47	23	101.77	10	101.59
10	101.30	30	101.93	18	101.39
18	101.09	July 7	102.29	25	101.63
24	101.57	14	101.78	Dec. 2	101.44
Mar. 2	101.37	21	101.61	11	101.97
10	101.30	28	101.85	23	102.06
18	101.62	Aug. 5	101.90	30	101.41
23	101.52	13	101.82		

Logan County

142. H. A. McNutt. NW¼SE¼ sec. 18, T. 135 N., R. 72 W. Used domestic driven well, diameter 1¼ inches, depth 15 feet. Measuring point, top of pipe in basement, 4.2 feet below the surface. Water levels, in feet below measuring point, 1940: July 22, 6.76; Nov. 22, 7.06.

143. Oscar France. W½SW¼ sec. 17, T. 135 N., R. 72 W. Used garden driven well, diameter 2 inches, depth 32 feet. Measuring point, top of 6-inch casing in pit, 5.0 feet below land surface. Water levels, in feet below measuring point, 1940: July 22, 14.15; Nov. 23, 14.15.

144. Pete Draeger. SW¼NW¼ sec. 21, T. 135 N., R. 72 W. Unused dug well, 43 inches square, depth 12.9 feet. Measuring point, hole in center of well platform, 1.8 feet above land surface. Water levels, in feet below measuring point, 1940: July 22, 11.41; Nov. 23, 11.89.

145. I. Hildenbrand. SW¼SW¼ sec. 22, T. 133 N., R. 71 W. Used dug farm well, 31 inches square, depth 11 feet. Measuring point, crack in well platform, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: July 22, 10.50; Nov. 23, 10.17.

146. George Dummland. NW¼NW¼ sec. 27, T. 135 N., R. 72 W. Unused bored well, diameter 24 inches, depth 39 feet. Measuring point, top of curb at southwest corner, 0.5 foot above land surface. Water levels, in feet below measuring point, 1940: July 23, 32.70; Nov. 23, 33.33.

McHenry County

1. Joe Keller. SE¼NW¼ sec. 32, T. 154 N., R. 78 W. In kitchen of house. Used domestic driven well, diameter 1¼ inches, depth 30 feet. Measuring point, joint in pitcher pump, 5.3 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 10, 28.21.

101. Denbigh Forest Experiment Station well 1. United States Forest Service. SW cor. SW¼NW¼ sec. 36, T. 156 N., R. 78 W.

Water level, in feet above datum, 1940

Apr. 20	99.55	May 17	99.63	May 31	99.89
May 8	99.43	20	99.70	June 18	99.83

McHenry County--Continued.

102. Denbigh Forest Experiment Station well 2. United States Forest Service. NW cor. SW¼NW¼ sec. 36, T. 156 N., R. 78 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level
Apr. 20	99.57	May 17	99.89	May 31	100.07
May 8	99.56	20	99.91	June 18	99.96

103. Denbigh Forest Experiment Station well 3. United States Forest Service. NE cor. SW¼NW¼ sec. 36, T. 156 N., R. 78 W.

Water level, in feet above datum, 1940

Apr. 20	99.56	May 17	99.66	May 31	99.95
May 8	99.38	20	99.74	June 18	99.87

104. Denbigh Forest Experiment Station well 4. United States Forest Service. SE cor. SW¼NW¼ sec. 36, T. 156 N., R. 78 W.

Water level, in feet above datum, 1940

Apr. 20	(a)	May 17	(a)	May 31	b 99.83
May 8	(a)	20	(a)	June 18	99.77

105. Denbigh Forest Experiment Station well 5. United States Forest Service. SE cor. SE¼SE¼ sec. 36, T. 156 N., R. 78 W.

Water level, in feet above datum, 1940

Apr. 20	99.54	May 17	99.38	May 31	99.66
May 8	99.32	20	99.57	June 18	99.56

106. Denbigh Forest Experiment Station well point 1. United States Forest Service. SW cor. NW¼SW¼ sec. 36, T. 156 N., R. 78 W.

Water level, in feet above datum, 1940

Apr. 20	99.54	May 17	99.65	May 31	99.80
May 8	99.60	20	99.60	June 18	99.87

113. Mrs. M. Notbohm. SW¼SE¼ sec. 1, T. 151 N., R. 77 W. Unused dug well, 36 inches square, depth 22.5 feet. Measuring point, southwest corner of platform at top of curb, 1.07 feet above land surface. Water levels, in feet below measuring point, 1940: May 19, 15.55; July 30, 15.56; Nov. 10, 15.91.

156. Minneapolis, St. Paul, and Sault Saint Marie Railway. SW¼SW¼ sec. 6, T. 152 N., R. 79 W. Used railway dug well, diameter 120 inches, depth 22.8 feet. Measuring point, flange of manhole at south side, on railway grade 2 feet above land surface. Water levels, in feet below measuring point, 1940: July 31, 20.48; Nov. 10, 22.86; Dec. 7, 22.79.

157. Federal Land Bank. SE¼SE¼ sec. 9, T. 153 N., R. 78 W. Used dug farm well diameter 30 inches, depth 26.8 feet. Measuring point, top of culvert at southeast corner, 1.5 feet above land surface. Water levels, in feet below measuring point, 1940: July 30, 25.36; Nov. 10, 25.34.

158. Cities Service Co. NE¼NE¼ sec. 8, T. 155 N., R. 79 W. Used bored domestic well, diameter 12 inches, depth 9.1 feet. Measuring point, flange of casing, in basement, 5 feet below land surface. Water levels, in feet below measuring point, 1940: Aug. 1, 4.63; Nov. 11, 5.52.

159. Harold H. Sullwold. NW¼SE¼ sec. 33, T. 156 N., R. 79 W. Unused bored well, diameter 12 inches, depth 38.2 feet. Measuring point, top of tile curb, 1.6 feet above land surface. Water levels, in feet below measuring point, 1940: Aug. 1, 14.19; Nov. 11, 14.62.

160. U. S. Forest Service. SE¼SW¼ sec. 31, T. 157 N., R. 75 W. Used domestic dug well, diameter 12 inches, depth 10 feet. Measuring point, flange of manhole at north point, about 3 feet above land surface. Water level, in feet below measuring point, 1940: Aug. 1, 8.08.

a Dry. b Well deepened.

McHenry County--Continued.

161. Village of Towner. SW¼NW¼ sec. 11, T. 156 N., R. 76 E. Used municipal dug well, diameter 180 inches, depth 17.3 feet. Measuring point, flange of manhole, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: Aug. 1, 14.19; Nov. 10, 13.07.

162. Walter Arneson. SW¼SE¼ sec. 3, T. 158 N., R. 78 W. Used bored farm well, diameter 18 inches, depth 56.5 feet. Measuring point, top of curb, north point, 1.5 feet above land surface. Water level, in feet below measuring point, 1940: Aug. 2, 42.48.

McIntosh County

93. Freida Forrest. SE¼SW¼ sec. 7, T. 130 N., R. 69 W. Well erroneously given in NE¼SW¼ sec. 7 in preceding reports.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	97.51	Apr. 13	106.78	July 6	97.81	Oct. 5	91.28
13	96.73	20	106.42	13	92.65	12	94.61
20	97.30	27	106.01	20	90.96	19	96.53
27	97.76	May 4	105.15	27	92.03	26	96.96
Feb. 3	96.80	11	103.84	Aug. 3	91.76	Nov. 2	95.28
10	96.71	18	98.90	10	91.67	9	91.51
17	97.83	25	98.92	17	91.03	16	92.94
24	97.46	June 1	101.42	24	91.03	23	92.32
Mar. 2	96.83	2	101.62	31	89.08	30	94.76
9	96.80	8	97.71	Sept. 7	91.03	Dec. 7	94.77
16	97.21	15	97.64	14	91.05	14	95.38
23	96.55	22	97.13	21	91.46	21	95.84
30	96.58	29	98.59	28	92.11	28	96.29
Apr. 6	96.57						

94. Freida Forrest. SE¼SW¼ sec. 7, T. 130 N., R. 69 W. Well erroneously given in NE¼SW¼ sec. 7 in previous reports.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	98.22	Apr. 13	96.90	July 6	100.25	Oct. 5	86.95
13	98.30	20	97.86	13	98.65	12	96.27
20	98.29	27	97.72	20	96.91	19	96.77
27	98.11	May 4	99.07	27	93.07	26	96.85
Feb. 3	98.13	11	99.82	Aug. 3	94.07	Nov. 2	91.93
10	98.30	18	104.61	10	94.09	9	96.61
17	97.90	25	104.31	17	92.88	16	94.77
24	98.09	June 1	100.13	24	92.07	23	95.95
Mar. 2	98.05	2	100.30	31	92.81	30	96.53
9	98.03	8	100.24	Sept. 7	88.78	Dec. 7	96.57
16	98.11	15	100.38	14	88.80	14	96.80
23	97.88	22	99.20	21	87.02	21	97.00
30	97.88	29	99.72	28	90.26	28	96.99
Apr. 6	97.86						

136. State of North Dakota. SE¼NW¼ sec. 36, T. 132 N., R. 71 W. Used stock driven well, diameter 1¼ inches, depth 10 feet. Measuring point, top of well platform, .2 inches north of pump base, 1.5 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 23, 7.57.

137. Federal Land Bank. SE¼NE¼ sec. 24, T. 132 N., R. 71 W. Used stock driven well, diameter 1¼ inches, depth 14 feet. Measuring point, northwest corner of well platform, 0.9 foot above land surface. Water levels, in feet below measuring point, 1940: July 20, 11.43; Nov. 23, 11.91.

McIntosh County--Continued.

138. C. Hiller. NE¼NE¼ sec. 32, T. 132 N., R. 70 W. Used farm bored well, diameter 24 inches, reported depth 65 feet. Measuring point, top of well platform, 1.7 feet above land surface. Water levels, in feet below measuring point, 1940: July 20, 15.68; Nov. 23, 17.18.

139. Dan Nigisch. NE¼SE¼ sec. 28, T. 132 N., R. 71 W. Used bored farm well, diameter 31 inches, depth 23 feet. Measuring point, top of concrete casing, east side, 0.8 foot above land surface. Water levels, in feet below measuring point, 1940: July 20, 20.98; Nov. 23, 18.79.

140. Jacob Groshanz. NW¼NW¼ sec. 29, T. 131 N., R. 70 W. Used domestic bored well, diameter 24 inches, depth 43 feet. Measuring point, top of well platform, 0.3 foot above land surface. Water levels, in feet below measuring point, 1940: July 20, 26.84; Nov. 23, 26.44.

141. Town of Wishek. NE¼NW¼ sec. 15, T. 132 N., R. 71 W. Infrequently used park dug well, diameter 72 inches, depth 27 feet. Measuring point, cross on southeast side of concrete curb, 0.5 foot above land surface and 122.49 feet above datum. Water level July 20, 1940, 22.99 feet below measuring point. Bench mark 1, head of nail in washer 2 feet above ground on north side of a tree 40 feet southeast of well, in grove, and 123.43 feet above datum. Bench mark 2, nail in washer 1.9 feet above ground on east side of ash tree 30 feet northwest of the well, and 124.26 feet above datum. Water level influenced by pumping of large swimming pool well, about 100 yards west. Observer, Jacob Bentz, Wishek.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 20	99.50	Aug. 31	100.41	Oct. 12	100.33	Nov. 23	100.28
27	100.41	Sept. 7	100.41	19	100.36	30	100.28
Aug. 3	100.45	14	100.42	26	100.32	Dec. 7	100.28
10	100.48	21	100.48	Nov. 2	100.32	14	100.29
17	100.32	28	100.41	9	100.30	21	100.24
24	100.48	Oct. 5	100.33	15	100.32	28	100.26

McKenzie County

81. Chas. E. Fleck. SW¼SW¼ sec. 12, T. 150 N., R. 100 W.

Water level, in feet above datum, 1940

Jan. 6	100.26	Apr. 6	100.15	June 29	100.11	Oct. 7	100.08
13	100.12	13	100.23	July 6	100.00	12	99.89
20	100.26	20	100.16	13	100.21	19	100.00
27	100.27	27	100.24	20	100.03	26	99.98
Feb. 3	100.25	May 4	100.02	27	100.16	Nov. 2	100.06
10	100.28	11	100.34	Aug. 3	100.04	9	100.12
17	100.06	18	100.09	11	99.92	16	100.11
24	100.04	25	100.08	18	99.93	23	99.95
Mar. 2	100.14	28	100.10	25	100.09	30	99.93
9	100.00	June 1	100.05	Sept. 1	99.98	Dec. 7	100.04
16	100.22	8	100.27	7	99.86	14	100.12
23	100.02	15	100.08	14	100.08	21	100.12
30	100.03	22	100.04	21	99.97	28	99.88

119. Federal Land Bank. NE¼NW¼ sec. 8, T 145 N., R. 98 W. Unused bored well, diameter 24 inches, depth 104 feet. Measuring point, top of curb at southeast corner flush with land surface. Water levels, in feet below measuring point, 1940: May 28, 97.28; Nov. 15, 97.35.

McLean County

27. State of North Dakota. SW¼NW¼ sec. 15, T. 149 N., R. 84 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	100.10	Apr. 6	99.96	July 6	99.85	Oct. 5	99.77
6	100.06	13	99.96	13	99.85	12	99.79
13	100.02	21	99.94	20	99.85	19	99.77
20	99.93	27	99.98	27	99.89	26	99.79
27	100.02	May 4	99.96	Aug. 3	99.85	Nov. 2	99.81
Feb. 3	100.02	11	99.95	10	99.85	9	99.81
10	100.06	18	99.93	17	99.77	16	99.77
17	100.10	25	a 99.96	24	99.85	23	99.77
24	100.06	25	b 99.89	Sept. 1	99.89	30	99.77
Mar. 2	100.00	June 1	99.87	7	99.77	Dec. 7	99.81
9	100.06	8	99.89	14	99.85	14	99.79
16	100.06	15	99.82	21	99.85	21	99.81
24	99.89	22	99.93	28	99.68	28	99.81
30	99.93	29	99.81				

Mercer County

118. Maichel Bros. SE¼NE¼ sec. 22, T. 144 N., R. 85 W. Unused bored well, diameter 18 inches, depth 44 feet. Measuring point, arrow, top of curbing at north side, 0.8 foot above land surface. Water levels, in feet below measuring point, 1940: May 27, 27.59; Nov. 15, 27.70.

Morton County

49. U. S. Department of Agriculture, Soil Conservation Service. NW¼NW¼ sec. 4, T. 138 N., R. 81 W.

Water level, in feet above datum, 1940

Jan. 6	97.10	May 18	100.54	Aug. 3	100.42	Oct. 26	98.54
13	97.00	26	100.96	17	100.00	Nov. 4	98.42
Mar. 10	96.32	31	101.24	24	99.88	9	98.36
17	96.29	June 1	101.23	Sept. 8	99.21	16	98.27
24	96.21	8	101.50	16	99.17	23	98.11
Apr. 6	96.65	22	101.35	23	99.02	30	98.04
13	97.36	July 1	101.21	29	98.88	Dec. 7	97.96
21	98.06	8	101.10	Oct. 6	98.77	14	97.90
27	98.48	13	101.00	12	98.71	21	97.81
May 4	99.40	27	100.63	19	98.63	28	97.71
11	100.00						

Mountrail County

90. Emil Molter. NE¼NE¼ sec. 6, T. 152 N., R. 89 W.

Water level, in feet above datum, 1940

Jan. 6	100.00	Apr. 6	99.98	July 6	99.86	Oct. 6	99.73
13	100.00	13	99.97	13	99.86	12	99.72
20	99.98	20	99.98	20	99.85	19	99.72
27	99.98	27	99.97	27	99.85	26	99.71
Feb. 3	100.00	May 5	99.97	Aug. 3	99.82	Nov. 2	99.71
10	100.03	11	99.94	10	99.81	9	99.72
17	99.99	18	99.96	18	99.78	16	99.70
24	99.97	25	99.95	24	99.79	23	99.69
Mar. 2	100.00	June 1	99.92	Sept. 1	99.79	30	99.68
9	100.00	8	99.97	8	99.78	Dec. 7	99.69
16	100.00	15	99.91	15	99.76	14	99.68
23	99.97	22	99.93	21	99.76	21	99.68
30	99.98	29	99.89	29	99.73	28	99.68

a Measurement made in morning. b Measurement made in afternoon.

Nelson County

47. State of North Dakota. NW¼NW¼ sec. 4, T. 152 N., R. 59 W. Water levels, in feet below measuring point, 1940: Aug. 3, 19.98; Nov. 7, 18.76.

Oliver County

1. Otis Tye. NE¼NW¼ sec. 10, T. 141 N., R. 82 W. Used dug farm well, diameter 48 inches, depth 20.7 feet. Measuring point, nail and washer at north corner of well, 0.4 foot above land surface. Water level, in feet below measuring point, 1940: Nov. 16, 17.90.

Pembina County

41. George Harris. NW¼NW¼ sec. 27, T. 163 N., R. 51 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	97.20	Apr. 1	96.17	July 1	96.70	Oct. 5	95.33
8	97.11	8	96.23	8	96.67	12	95.19
15	97.04	16	96.00	15	96.57	19	95.11
22	96.98	22	95.92	22	96.49	26	95.03
29	96.91	29	95.87	29	96.38	Nov. 2	94.96
Feb. 5	96.83	May 6	95.92	Aug. 5	96.25	10	94.90
12	96.75	13	96.18	12	96.16	17	94.83
19.	96.67	20	96.26	19	96.03	23	94.77
26	96.58	27	96.40	Sept. 2	95.82	Dec. 1	94.75
Mar. 4	96.50	June 3	96.55	9	95.69	7	94.67
11	96.43	10	96.71	14	95.61	14	94.63
19	96.33	17	96.68	21	95.49	22	94.59
25	96.26	25	96.69	28	95.46	31	94.48

42. C. A. Thompson. SE¼SW¼ sec. 3, T. 163 N., R. 56 W.

Water level, in feet above datum, 1940

Jan. 6	99.09	Apr. 6	99.07	July 6	98.94	Oct. 5	99.06
13	99.09	13	99.07	13	98.94	19	99.06
20	99.09	22	99.07	20	98.94	26	99.06
27	99.09	27	99.06	27	98.94	Nov. 2	99.06
Feb. 3	99.09	May 4	99.05	Aug. 3	98.94	9	99.06
10	99.07	11	99.02	10	99.02	16	99.06
17	99.07	13	99.02	17	99.02	23	99.06
24	99.07	18	99.02	24	99.02	30	99.05
Mar. 2	99.07	25	99.02	31	99.05	Dec. 7	99.05
9	99.07	June 1	99.02	Sept. 7	99.06	14	99.05
16	99.07	15	98.98	21	99.06	21	99.05
23	99.07	22	98.98	28	99.06	28	99.05
30	99.07	29	98.94				

Pierce County

1. Eric Harmmel. NE¼NW¼ sec. 10, T. 156 N., R. 72 W. Unused dug well, 33 inches square, depth 28.6 feet. Measuring point, west corner of curbing, 1.1 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 8, 27.50.

Ramsey County

48. Mrs. Bonnie Boland. NE¼ sec. 14, T. 153 N., R. 65 W.

Water level, in feet above datum, 1940

Jan. 6	99.11	Feb. 10	99.26	Mar. 16	99.16	Apr. 20	99.16
13	99.11	17	99.55	23	99.11	22	99.13
20	99.11	24	99.06	30	99.19	27	99.16
27	99.09	Mar. 2	99.11	Apr. 6	99.17	May 4	99.20
Feb. 3	99.08	9	99.14	13	99.17	11	99.25

Ramsey County--Continued.

48. Mrs. Bonnie Boland.--Continued.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 18	99.28	July 20	99.05	Sept.14	99.01	Nov. 9	99.05
25	99.24	27	99.02	21	98.97	16	99.05
June 1	99.25	Aug. 3	99.05	28	98.97	23	99.05
8	99.22	10	99.02	Oct. 5	98.98	30	99.06
15	99.18	17	99.03	12	98.97	Dec. 7	99.06
22	99.16	24	99.01	19	99.00	14	99.05
29	99.11	31	99.03	26	99.01	21	99.05
July 6	99.05	Sept. 7	99.01	Nov. 2	99.05	28	99.05
13	99.01						

Ransom County

1. Melfird Skramstad. NW¼NE¼ sec. 3, T. 136 N., R. 56 W. Used stock bored well, diameter 24 inches, depth 31.9 feet. Measuring point, nail and washer at top of curb, east point, 0.7 foot above land surface. Water level, in feet below datum, 1940: Nov. 28, 26.34.

Renville County

26. Minnesota Trust Company. NE¼NE¼ sec. 20, T. 161 N., R. 85 W.

Water level, in feet above datum, 1940

Jan. 6	90.30	Mar. 20	90.23	June 15	90.38	Sept.30	89.97
13	90.31	21	90.19	22	90.22	Oct. 5	90.08
20	90.32	22	90.14	29	90.27	12	90.00
27	90.29	23	90.10	July 6	90.17	19	89.97
Feb. 3	90.36	30	90.09	13	90.15	26	90.03
10	90.22	Apr. 6	90.19	20	90.12	Nov. 2	90.00
17	90.21	13	90.24	27	90.25	9	89.99
24	90.20	20	90.26	Aug. 3	90.14	16	89.95
Mar. 2	90.20	27	90.27	10	90.12	23	89.97
9	90.19	May 4	90.28	17	90.09	30	89.95
16	90.21	11	90.29	24	89.98	Dec. 7	90.06
16 a	146.80	18	90.35	31	90.10	14	89.97
17	91.89	25	90.35	Sept. 7	89.99	21	90.03
18	90.38	June 1	90.37	14	90.00	28	90.08
19	90.30	8	90.38	21	89.98		

75. Fish and Wildlife Service. NW¼NW¼ sec. 31, T. 158 N., R. 84 W.

Water level, in feet above datum, 1940

Jan. 6	105.98	Apr. 13	b105.96	July 6	104.92	Oct. 19	102.25
13	105.92	20	106.42	13	104.96	26	102.25
20	105.96	27	107.42	20	104.75	Nov. 2	102.21
27	105.96	May 4	106.37	27	104.12	9	b102.21
Feb. 3	b105.96	11	106.38	Aug. 24	103.25	16	b102.21
10	b105.96	20	106.54	31	103.62	23	b102.21
17	b105.96	25	106.35	Sept. 7	103.00	30	b102.21
24	b105.96	June 1	106.06	14	102.75	Dec. 7	b102.21
Mar. 2	b105.96	8	105.67	21	102.71	14	b102.21
9	b105.96	15	105.58	28	102.46	21	b102.21
23	b105.96	22	105.42	Oct. 5	102.46	28	b102.21
Apr. 6	b105.96	29	105.29	12	102.33		

167. Town of Mohall. SE¼SW¼ sec. 13, T. 161 N., R. 84 W. Unused drilled well, diameter 4 inches, depth 350 feet. Measuring point, top of casing at east side, 1.0 foot above land surface. Water levels, in feet below measuring point, 1940: July 19, 24.34; Nov. 13, 24.57.

168. J. Dighton Taylor. NW¼NE¼ sec. 24, T. 161 N., R. 84 W. Used domestic dug well, diameter 48 inches, depth 15.2 feet. Measuring point, top of top brick in curb, northeast point at pencil mark flush with land surface. Water levels, in feet below measuring point, 1940: July 19, 11.04; Nov. 13, 11.84.

a After filling well with 10 gallons of water. b Top of ice.

Renville County--Continued.

169. Fred Paris. SE¼SW¼ sec. 13, T. 161 N., R. 84 W. Unused bored well, diameter 18 inches, depth 13.2 feet. Measuring point, top of curb, inside, east side, at land surface. Water levels, in feet below measuring point, 1940: July 19, 11.64; Nov. 13, 11.24.

Richland County

2. Ira Madden. NE¼SE¼ sec. 12, T. 132 N., R. 49 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	100.80	Apr. 6	100.79	June 29	100.91	Sept. 28	100.79
13	100.80	13	100.81	July 6	100.90	Oct. 5	100.80
20	100.80	20	100.81	13	100.90	12	100.80
27	100.79	27	100.81	20	100.88	19	100.80
Feb. 3	100.79	May 4	100.81	27	100.88	26	100.73
10	100.79	13	100.81	Aug. 3	100.87	Nov. 2	100.73
17	100.79	18	100.92	11	100.87	9	100.73
24	100.79	25	100.92	19	100.87	18	100.73
Mar. 2	100.67	June 1	100.92	24	100.87	23	100.69
9	100.79	5	100.91	31	100.87	30	100.69
16	100.79	8	100.92	Sept. 7	100.81	Dec. 7	100.71
23	100.79	15	100.91	16	100.81	14	100.69
30	100.79	24	100.91	21	100.79	28	100.69

5. John Liljemark. SW¼SE¼ sec. 23, T. 133 N., R. 52 W.

Water level, in feet above datum, 1940

Jan. 6	100.19	Apr. 13	100.29	July 6	100.71	Oct. 5	99.48
13	100.06	20	101.34	13	100.55	12	99.46
21	99.92	27	101.79	20	100.32	19	99.58
27	99.80	May 4	102.92	27	100.12	26	99.62
Feb. 3	99.74	11	102.57	Aug. 3	100.12	Nov. 4	100.04
11	99.67	18	103.75	10	99.96	9	100.05
17	99.66	25	103.23	17	99.77	17	100.24
24	99.65	June 1	102.48	24	99.79	23	100.29
Mar. 2	99.59	5	102.46	31	100.07	30	100.33
9	99.63	8	102.15	Sept. 7	99.75	Dec. 7	100.29
16	99.74	15	101.67	14	99.67	14	100.29
23	99.80	22	101.20	21	99.58	21	100.15
30	99.79	29	101.08	28	99.58	28	100.23
Apr. 6	100.46						

Rolette County

164. Owner's number 3. Town of Rolla. NE¼ sec. 17, T. 162 N., R. 69 W. Unused drilled well, diameter 8 inches, depth 103 feet. Measuring point, top of concrete curb at north side, about 1 foot above land surface. Water levels, in feet below measuring point, 1940: July 17, 8.31; Nov. 8, 8.55.

165. Owner's number 4. Town of Rolla. NE¼ sec. 17, T. 162 N., R. 69 W. Used municipal dug well, diameter 240 inches, depth 35.2 feet. Measuring point, west side of manhole curbing, about 2 feet above land surface. Water levels, in feet below measuring point, 1940: July 17, 34.60; Nov. 8, 35.56.

Sargent County

1. Nick Klinkheimer. SW¼SW¼ sec. 25, T. 131 N., R. 58 W. Unused bored well, diameter 24 inches, depth 30.0 feet. Measuring point, painted arrow on north side of well curb, 1.0 foot above land surface. Water level, in feet below measuring point, 1940: Nov. 27, 28.82.

Sargent County--Continued.

2. Nick Klinkheimer. SW¼SW¼ sec. 25, T. 131 N., R. 58 W. Unused driven well, diameter 2½ inches, depth 33.5 feet. Measuring point, rim of bent pipe at south side 1.3 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 27, 29.80.

116. Reko Realty. NE¼NW¼ sec. 19, T. 130 N., R. 58 W. Used domestic driven well, diameter 1¼ inches, depth 16.3 feet. Measuring point, top of pipe, 3.1 feet above land surface. Water level, in feet below measuring point, 1940: Oct. 3, 11.85.

Sheridan County

95. Bank of North Dakota. NW¼NW¼ sec. 28, T. 145 N., R. 75 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.55	Apr. 6	99.57	July 13	99.66	Oct. 19	99.29
13	99.59	13	99.58	20	99.67	26	99.18
20	99.63	22	99.54	27	99.67	Nov. 2	99.30
27	99.60	23	99.55	Aug. 4	99.68	9	99.32
Feb. 3	99.58	May 11	99.80	11	99.67	16	99.31
10	99.56	18	99.90	18	99.67	21	99.30
17	99.47	25	99.80	26	99.66	23	99.32
24	99.53	June 1	99.80	Sept. 7	99.51	30	99.31
Mar. 2	99.50	10	99.80	14	99.39	Dec. 7	99.32
9	99.49	15	99.91	21	99.33	14	99.32
16	99.53	22	99.92	28	99.31	21	99.32
23	99.50	29	99.69	Oct. 5	99.29	27	99.31
30	99.59	July 7	99.69	12	99.29		

Sioux County

1. Mrs. Looking-out. SW¼ sec. 7, T. 130 N., R. 79 W. In town of Fort Yates. Used domestic bored well, diameter 24 inches, depth 20.2 feet. Measuring point, top of iron casing, north point, 0.3 foot above land surface. Water level, in feet below measuring point, 1940: Nov. 17, 13.96.

Slope County

1. Arthur Nesseth. SE¼NE¼ sec. 14, T. 134 N., R. 100 W. Used farm bored well, diameter 24 inches, depth 66.5 feet. Measuring point, top of curb at north side, painted mark, 0.6 foot above land surface. Water level, in feet below measuring point, 1940: Nov. 19, 18.55.

Stark County

120. Roland & Geo. Funk. NE¼NW¼ sec. 2, T. 139 N., R. 91 W. Used stock dug well, diameter 42 inches, depth 17 feet. Measuring point, arrow on north side, 1.85 feet above land surface. Water levels, in feet below measuring point, 1940: May 30, 5.74; Nov. 20, 6.45.

Steele County

1. Mrs. Snortland. NE¼NE¼ sec. 15, T. 148 N., R. 57 W. Used stock bored well, diameter 24 inches, depth 53.8 feet. Measuring point, top of curb, north side at painted arrow, 1.8 feet above land surface. Water level, in feet below measuring point, 1940: Nov. 29, 21.38.

Stutsman County

124. Union Central Life. SW¼SW¼ sec. 33, T. 7 N., R. 64 W. Unused drilled well, diameter 4.5 inches, depth 195 feet. Measuring point, top of pump, about 3 feet above land surface. Water levels, in feet below measuring point, 1940: June 3, 52.98; July 3, 53.04; Aug. 9, 53.58; Nov. 26, 53.73.

Towner County

59. Bank of North Dakota. NE¼NW¼ sec. 28, T. 160 N., R. 66 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	100.82	Apr. 13	101.31	July 6	99.81	Oct. 5	100.07
13	100.84	20	101.29	13	99.81	12	100.13
20	100.85	27	101.33	20	100.02	19	100.14
27	100.88	May 4	101.38	27	100.05	26	100.22
Feb. 3	100.92	11	101.41	Aug. 3	100.15	Nov. 2	100.23
10	100.94	15	101.46	10	100.14	9	100.30
17	100.94	18	101.48	17	100.13	16	100.42
24	100.94	25	101.46	24	100.13	23	100.47
Mar. 2	100.98	June 6	99.77	31	100.09	30	100.64
9	101.05	10	99.80	Sept. 7	100.06	Dec. 7	100.67
17	101.10	15	99.77	14	100.05	14	100.72
23	101.13	22	99.80	21	100.05	21	100.74
30	101.18	29	99.81	28	100.04	28	100.76
Apr. 6	101.22						

Traill County

15. A. C. Skyberg. SE¼SW¼ sec. 24, T. 146 N., R. 51 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.58	Apr. 13	99.52	July 6	99.75	Oct. 5	99.77
13	99.58	20	99.54	13	99.77	12	99.77
20	99.58	27	99.58	20	99.77	19	99.77
27	99.58	May 4	99.62	27	99.77	26	99.75
Feb. 3	99.57	11	99.74	Aug. 3	99.77	Nov. 2	99.72
10	99.56	18	99.64	10	99.75	9	99.72
17	99.56	25	99.65	17	99.76	16	99.81
24	99.56	June 1	99.66	24	99.76	23	99.71
Mar. 2	99.56	6	99.71	31	99.79	30	99.71
9	99.55	8	99.68	Sept. 7	99.79	Dec. 7	99.70
16	99.54	15	99.68	14	99.79	14	99.70
23	99.54	22	99.70	21	99.79	21	99.68
30	99.53	29	99.72	28	99.79	28	99.66
Apr. 6	99.51						

31. City of Hatton. SW¼NE¼ sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 7	97.35	June 7	94.58	Aug. 3	91.59	Oct. 6	91.27
13	97.04	8	94.63	11	92.04	13	91.18
20	95.66	15	93.51	17	92.41	20	93.30
27	94.01	22	93.04	24	93.14	27	93.26
May 4	94.21	July 1	92.71	31	93.51	Nov. 2	93.85
11	94.68	6	90.95	Sept. 7	93.36	9	94.50
18	94.64	13	90.94	14	94.08	16	94.60
26	94.64	21	90.48	21	91.93	23	94.80
June 1	93.83	27	90.43	29	91.25		

32. City of Hatton. SE¼NE¼ sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 7	94.42	June 7	97.11	Aug. 3	91.75	Oct. 6	92.44
13	94.50	8	97.06	11	91.67	13	92.78
20	94.17	15	96.76	17	92.91	20	93.34
27	95.75	22	96.72	24	93.39	27	93.63
May 4	96.40	July 1	95.44	31	93.91	Nov. 2	94.01
11	96.63	6	94.43	Sept. 7	93.22	9	94.10
18	96.92	13	93.49	14	93.52	16	94.73
25	97.17	21	91.29	21	91.94	23	94.87
June 1	96.73	28	91.19	29	91.94		

Traill County--Continued.

33. City of Hatton. NE¼NE¼ sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 16	98.14	May 25	99.12	July 27	97.81	Sept.29	97.62
23	98.21	June 1	99.09	Aug. 3	97.97	Oct. 6	97.81
30	97.96	7	99.41	11	97.80	13	97.81
Apr. 7	98.25	8	99.42	17	97.80	20	97.82
13	98.29	15	99.25	24	98.17	27	97.97
20	98.46	22	99.12	31	98.20	Nov. 2	98.12
27	98.73	July 1	98.94	Sept. 7	97.77	9	98.12
May 4	99.00	6	98.33	14	97.67	16	97.98
11	100.15	13	97.96	21	97.79	23	97.89
18	100.11	21	97.75				

34. City of Hatton. NW¼NE¼ sec. 18, T. 148 N., R. 53 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 16	96.15	May 25	97.86	July 27	95.70	Sept.29	95.23
23	96.11	June 1	97.30	Aug. 3	95.77	Oct. 6	95.29
30	96.07	7	97.86	11	95.70	13	95.22
Apr. 7	96.34	8	98.24	17	95.44	20	95.18
13	96.72	15	97.37	24	95.54	27	95.37
20	96.74	22	97.05	31	95.66	Nov. 2	95.45
27	96.98	July 1	96.56	Sept. 7	95.19	9	95.52
May 4	97.00	6	96.00	14	94.37	16	95.72
11	97.30	13	95.95	21	95.08	23	95.67
18	97.37	21	96.54				

Walsh County

38. Henry Dipple. SW¼SE¼ sec. 16, T. 157 N., R. 51 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	99.57	Apr. 6	99.43	July 6	99.82	Oct. 5	99.61
13	99.25	13	99.44	13	99.86	12	99.60
20	99.26	20	99.43	20	99.91	19	99.53
27	99.26	27	99.79	27	99.62	26	99.49
Feb. 3	99.27	May 4	98.78	Aug. 3	99.64	Nov. 2	99.51
10	99.42	13	98.62	10	100.03	9	99.51
17	99.43	18	98.57	17	100.04	16	99.95
24	99.43	25	99.87	24	100.03	23	99.75
Mar. 2	99.44	June 1	100.42	31	100.03	30	99.71
9	99.59	8	100.44	Sept. 7	100.11	Dec. 7	99.79
16	99.50	15	100.00	14	99.79	14	99.85
23	99.49	22	99.88	21	99.69	21	99.65
30	99.48	29	99.85	28	99.62	28	99.78

39. Henry Dipple. SW¼SE¼ sec. 16, T. 157 N., R. 51 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	100.18	Apr. 13	99.35	July 6	102.09	Oct. 5	99.89
13	100.77	20	99.45	13	101.05	12	99.71
20	100.94	27	100.41	20	101.33	19	98.42
27	100.55	May 4	100.40	27	100.91	25	98.28
Feb. 3	99.87	11	100.74	Aug. 3	100.91	Nov. 2	98.17
10	99.67	13	101.20	10	100.51	9	98.16
17	99.68	18	102.24	17	100.14	16	98.38
24	99.79	25	102.93	24	99.95	23	98.16
Mar. 2	99.67	June 1	104.50	31	99.89	30	98.28
9	99.75	8	102.73	Sept. 7	99.85	Dec. 7	98.44
16	99.69	15	102.50	14	99.49	14	98.39
23	99.68	22	102.31	21	99.67	21	98.38
30	99.55	29	102.07	28	99.70	28	98.33
Apr. 6	99.42						

Walsh County--Continued.

40. Henry Dipple. SW¼SE¼ sec. 16, T. 157 N., R. 51 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	101.56	Apr. 13	b106.5	July 6	100.28	Oct. 5	100.29
13	a100.17	20	b106.5	13	99.72	12	100.19
20	a100.17	27	100.96	20	100.08	19	99.38
27	a100.17	May 4	99.55	27	100.10	25	99.34
Feb. 3	a100.17	11	99.95	Aug. 3	99.93	Nov. 2	100.10
10	a100.17	13	100.02	10	100.36	9	100.06
17	a100.17	18	100.09	17	100.20	16	99.80
24	a100.17	25	100.71	24	100.18	23	99.34
Mar. 2	a100.17	June 1	100.77	31	100.18	30	99.33
9	a100.17	8	101.00	Sept. 7	100.33	Dec. 7	99.09
16	a100.17	15	101.11	14	100.85	14	99.09
23	a100.17	22	100.50	21	100.10	21	99.09
30	a100.17	29	100.27	28	100.04	28	99.09
Apr. 6	a100.17						

96. C. D. Lewis. SW¼SW¼ sec. 17, T. 157 N., R. 66 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	98.99	Apr. 13	99.23	July 6	99.57	Oct. 5	98.47
13	99.01	20	99.40	13	99.40	12	98.51
20	99.04	27	99.49	20	99.37	19	98.57
27	99.05	May 4	99.58	27	99.23	26	98.62
Feb. 3	99.08	11	99.67	Aug. 3	99.21	Sept. 2	98.69
10	99.10	13	99.64	10	99.06	9	98.73
17	99.10	18	99.79	17	98.98	16	98.76
24	99.12	25	99.71	24	98.89	23	98.79
Mar. 2	99.13	June 1	99.97	31	98.82	30	98.83
9	99.13	8	100.05	Sept. 7	98.74	Dec. 7	98.86
16	99.15	15	100.02	14	98.64	14	98.89
23	99.16	22	99.88	21	98.56	21	98.91
30	99.16	29	99.78	28	98.48	28	98.96
Apr. 6	99.21						

Ward County

25. Rural Rehabilitation Corporation. NE¼NE¼ sec. 2, T. 155 N., R. 84 W. Observer, Harra M. Carell, Burlington.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 19	101.12	June 8	100.98	Dec. 7	100.81	Dec. 21	100.71
25	101.12	15	100.81	14	100.62	28	100.73
June 1	100.98						

53. Chas. O'Neill. SW¼SE¼ sec. 30, T. 160 N., R. 88 W.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	91.62	Apr. 13	101.33	July 6	99.49	Oct. 5	96.33
13	91.74	20	101.51	13	99.97	12	96.60
20	89.60	27	101.75	20	98.83	19	94.45
27	87.49	May 4	101.68	27	97.51	26	93.64
Feb. 3	88.60	11	101.64	Aug. 3	97.68	Nov. 2	93.51
10	86.67	18	101.60	10	98.56	9	92.74
17	86.85	21	102.41	17	98.33	16	94.33
24	86.83	25	102.67	24	97.51	23	95.60
Mar. 2	85.85	June 1	101.74	31	97.62	30	95.78
8	85.75	8	101.91	Sept. 7	97.66	Dec. 7	95.93
16	85.45	15	101.83	14	98.93	14	95.80
23	97.83	22	102.00	21	96.33	21	97.58
30	98.83	29	100.50	28	98.01	28	97.51
Apr. 6	98.76						

a Top of ice. b Filled with snow-melt water.

Ward County--Continued.

71. Fish and Wildlife Service. SE¼SW¼ sec. 5, T. 157 N., R. 84 W.
Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	101.25	Apr. 13	100.71	July 6	100.37	Oct. 19	100.37
13	101.21	20	100.79	13	100.37	26	100.33
20	101.00	27	100.87	20	100.37	Nov. 2	100.21
27	100.89	May 4	101.00	27	100.35	9	100.16
Feb. 3	101.04	11	101.04	Aug. 24	100.46	16	100.16
10	100.66	20	100.21	31	100.42	23	100.16
17	100.62	25	101.08	Sept. 7	100.42	30	100.16
24	100.54	June 1	100.96	14	100.37	Dec. 7	100.12
Mar. 2	100.58	8	100.71	21	100.42	14	100.12
9	100.46	15	100.54	28	100.46	21	99.96
23	100.29	22	100.46	Oct. 5	100.46	28	99.92
Apr. 6	100.62	29	100.37	12	100.37		

73. Fish and Wildlife Service. NE¼NE¼ sec. 21, T. 157 N., R. 84 W.
Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	101.75	Apr. 13	101.87	July 6	101.25	Oct. 19	101.63
13	101.79	20	102.29	13	101.87	26	100.83
20	101.87	27	102.50	20	101.50	Nov. 2	101.75
27	101.96	May 4	102.71	27	101.42	9	101.75
Feb. 3	101.96	11	102.87	Aug. 24	101.83	16	101.75
10	102.00	20	102.92	31	101.63	23	101.75
17	102.04	25	102.75	Sept. 7	101.58	30	101.71
24	102.08	June 1	102.50	14	101.54	Dec. 7	101.71
Mar. 2	102.00	8	102.37	21	101.25	14	101.67
9	102.00	15	102.08	28	101.21	21	100.83
23	102.00	22	102.00	Oct. 5	101.17	28	100.83
Apr. 6	102.00	29	100.96	12	101.54		

74. Fish and Wildlife Service. NE¼SW¼ sec. 21, T. 157 N., R. 84 W.
Water level, in feet below datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	101.64	Apr. 13	102.27	July 6	102.02	Oct. 19	101.19
13	101.66	20	102.33	13	101.77	26	101.35
20	101.69	27	102.48	20	101.39	Nov. 2	101.35
27	101.77	May 4	102.60	27	101.06	9	101.39
Feb. 3	101.77	11	102.69	Aug. 24	101.06	16	101.39
10	101.85	20	102.81	31	101.06	23	101.44
17	101.85	27	102.77	Sept. 7	101.06	30	101.69
24	101.85	June 1	102.27	14	101.02	Dec. 7	101.69
Mar. 2	101.89	8	102.44	21	100.98	14	101.77
9	102.02	15	102.06	28	100.98	21	101.77
23	102.02	22	101.94	Oct. 5	101.06	28	101.85
Apr. 6	102.19	29	102.02	12	101.10		

114. Fish and Wildlife Service. SW¼NE¼ sec. 32, T. 160 N., R. 88 W. Unused dug well, diameter 37 inches, depth 15.0 feet. Measuring point, cross on brick at east side, flush with land surface. Water levels, in feet below measuring point, 1940: May 21, 8.14; Nov. 12, 10.03.

Wells County

23. City of Harvey. SE¼SW¼ sec. 21, T. 150 N., R. 72 W.
Water level, in feet below datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 7	98.53	Mar. 4	96.53	Apr. 22	100.12	June 9	106.20
14	98.28	10	96.27	28	102.78	16	105.60
27	97.87	17	96.12	May 5	104.28	30	104.89
Feb. 4	97.62	24	95.87	12	105.14	July 7	104.20
11	97.28	Apr. 7	96.03	19	105.91	14	103.87
18	97.03	14	96.62	26	106.01	21	103.95
23	96.78	21	99.62	June 2	105.87	28	103.91

Wells County--Continued.

23. City of Harvey.--Continued.

Water level, in feet below datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 3	103.53	Sept. 8	102.66	Oct. 15	101.38	Nov. 21	100.78
4	103.74	15	102.53	22	101.33	Dec. 1	100.53
10	103.39	22	102.33	29	101.29	8	100.34
17	103.16	29	102.12	Nov. 3	101.13	15	99.95
24	102.95	Oct. 1	102.91	10	101.01	22	99.62
Sept. 1	102.83	8	101.60	17	100.87	29	99.37

24. City of Harvey. NE¼NW¼ sec. 28, T. 150 N., R. 72 W.

Water level, in feet above datum, 1940

Jan. 7	100.02	Apr. 21	100.77	July 21	105.23	Oct. 8	102.98
14	99.60	22	103.85	28	105.15	15	102.73
27	99.02	28	101.34	Aug. 3	104.81	22	102.62
Feb. 4	98.81	May 5	105.60	4	105.06	29	102.58
11	98.44	12	106.48	10	104.69	Nov. 3	102.48
18	98.19	19	107.58	17	109.41	10	102.31
23	97.94	26	107.64	24	104.19	17	102.15
Mar. 4	97.69	June 2	107.27	Sept. 1	104.06	24	102.06
10	97.44	9	107.52	8	103.96	Dec. 1	101.85
17	97.56	16	106.98	15	103.81	8	100.52
24	97.35	30	107.15	22	103.60	15	100.31
Apr. 7	97.27	July 7	105.48	29	103.48	22	101.02
14	97.95	14	105.19	Oct. 1	103.25	29	100.81

153. Hayden Jones. NE¼NE¼ sec. 23, T. 147 N., R. 70 W. Used stock dug well, diameter 48 inches, depth 9.4 feet. Measuring point, crack between central planks in platform, 1 foot above land surface. Water level, in feet below measuring point, 1940: July 26, 7.87.

Williams County

77. Hans O. Lottestad. NE¼SE¼ sec. 24, T. 159 N., R. 103 W. Erroneously listed in NE¼SW¼ sec. 24 in previous report.

Water level, in feet above datum, 1940

Jan. 6	89.22	Apr. 6	83.49	July 6	93.34	Oct. 5	83.09
13	88.80	13	82.80	13	91.80	12	82.84
20	88.38	20	84.57	20	89.42	26	86.72
27	88.38	27	89.59	27	83.69	Nov. 2	84.18
Feb. 3	87.47	May 4	93.02	Aug. 3	82.99	9	83.59
10	86.97	11	94.52	10	83.59	16	83.14
17	87.07	18	95.26	17	84.41	23	83.10
24	87.18	24	94.81	24	82.84	30	82.73
Mar. 2	86.88	25	95.18	31	83.80	Dec. 7	82.77
9	86.53	June 1	94.55	Sept. 7	83.42	14	82.86
16	88.77	15	94.04	14	83.74	21	83.68
23	85.70	22	93.97	21	83.23	28	82.57
30	83.05	29	93.49	28	83.80		

78. Hans O. Lottestad. NE¼SE¼ sec. 24, T. 159 N., R. 103 W. Erroneously listed in NE¼SW¼ sec. 24 in previous reports.

Water level, in feet above datum, 1940

Jan. 6	83.99	Mar. 9	82.76	May 11	89.76	July 13	81.80
13	84.38	16	82.65	18	91.45	20	81.08
20	84.17	23	82.71	24	90.50	27	82.65
27	84.88	30	83.18	25	91.86	Aug. 3	81.17
Feb. 3	83.38	Apr. 6	83.57	June 1	88.97	10	80.26
10	82.69	13	83.80	15	88.23	17	79.05
17	83.30	20	87.17	22	86.55	24	77.59
24	83.12	27	89.17	29	85.17	31	78.57
Mar. 2	82.97	May 4	91.00	July 6	82.46	Sept. 7	78.32

Williams County--Continued.

78. Hans O. Lottestad.--Continued.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 14	78.05	Oct. 12	77.46	Nov. 16	78.66	Dec. 14	75.13
21	77.80	26	80.23	23	78.47	21	75.42
28	78.48	Nov. 2	80.98	30	75.91	28	72.20
Oct. 5	79.34	9	78.31	Dec. 7	75.86		

79. Mrs. Gus B. Swanson. SW¼SW¼ sec. 29, T. 157 N., R. 96 W.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	75.28	Apr. 13	82.64	July 6	90.55	Oct. 5	76.55
13	75.72	20	76.93	13	79.64	12	77.91
20	79.71	27	74.32	20	71.47	19	78.05
27	78.70	May 4	68.72	27	74.86	26	76.84
Feb. 3	80.28	11	74.28	Aug. 3	72.72	Nov. 2	76.05
10	84.55	18	82.18	10	71.95	9	75.51
17	83.05	25	a 81.16	17	70.88	16	75.49
24	83.28	25	b 81.54	24	72.51	23	77.91
Mar. 2	83.30	June 1	82.99	31	78.34	30	77.72
9	81.59	8	87.82	Sept. 7	78.66	Dec. 7	77.76
16	82.78	15	86.84	14	76.14	14	81.45
23	81.51	22	88.09	21	74.38	21	80.38
30	82.28	29	85.97	28	76.20	28	81.36
Apr. 6	82.59						

a Measurement made at 7:00 a.m. b Measurement made at 10:00 a.m.

SOUTH DAKOTA

CITY OF HURON

By T. W. Robinson

The measuring of water-levels in gage hole 1, and the recording of pumpage from city well field near Huron, both of which were begun in 1934, were continued by the city in 1940. Records of water levels and pumpage from 1934 through 1939 were given in Water-Supply Papers 817, 840, 845, and 886. The water levels and pumpage data for the Huron well field given in this report are interpolated from a graph furnished by H. M. Pierce, city engineer.

The well field furnished nearly half the 303 million gallons of water needed for the supply of Huron in 1940; about 147 million gallons was supplied from the well field and about 156 million gallons from the James River. The James River supply was used from June 22 to October 30. The water level in gage hole 1 at the end of 1940 was 2.3 feet higher than on December 31, 1939, 2.0 feet higher than on December 31, 1938, 1.1 feet lower than on December 25, 1937, 3.6 feet lower than on December 21, 1936 and 4.1 feet lower than on December 31, 1935.

Gage hole 1.

Water level, in feet below measuring point, and pumpage from city wells, in millions of gallons a month, 1940

Date	Water level	Month	Pumpage	Date	Water level	Month	Pumpage
Jan. 26	26.1	January	17.2	Aug. 3	18.3	.....	....
Feb. 11	26.3	.....	....	17	17.3	.....	....
25	25.8	February	14.9	31	16.4	.....	(a)
Mar. 10	25.6	.....	....	Sept. 14	15.6	.....	....
31	25.8	March	15.6	28	15.8	.....	(a)
Apr. 21	27.4	April	16.8	Oct. 13	15.6	.....	....
May 3	28.8	.....	....	27	15.6	October	0.9
19	31.2	May	28.0	Nov. 16	23.8	.....	....
June 9	31.3	.....	....	30	24.6	November	16.8
22	38.2	June	a 20.4	Dec. 14	25.6	.....	....
July 6	22.2	.....	....	28	25.9	.....	....
20	19.8	.....	(a)	31	24.3	December	16.6

a City water supply pumped from James River June 22 to October 30.

SOUTHEASTERN SOUTH DAKOTA

By T. W. Robinson

The cooperative observation-well program in southeastern South Dakota (See Water-Supply Paper 886) was continued in 1940 by the Federal Geological Survey in cooperation with the South Dakota Geological Survey. Measurements of water level were made once a month in 36 wells and twice a year in 4 wells. A total of about 350 individual measurements were made in 1940. Measurements were discontinued on three wells, and seven new observation wells were added during the year.

A comparison of the average water levels in a group of 13 wells, which were first measured in August 1936, with the average water levels in the same wells, 9 of which were measured in August and 4 in October, 1940, shows an average rise in water level of 0.51 foot. A comparison of average water levels in a group of 24 wells shows an average rise in water level of 0.39 foot between December 1939 and December 1940.

The drought in the fall of 1939 continued on through January 1940. The precipitation in southeastern South Dakota was below normal in January, about normal in February, but in March, April and June it was decidedly above normal. In June some damage to livestock and property was caused by flash floods in small drainage areas. The precipitation in May and September was considerably below normal, somewhat below normal in July, August and September, and above normal in October, November and December.

The records for the observation wells are listed alphabetically by county name on the following pages. All water level measurements are expressed in feet below the measuring points. Measurements of water level were made by the Federal Geological Survey in June, July and August, and by the State Geological Survey at other times in the year. During June three of the old observation wells, which were in danger of caving, were recased in order to preserve them for future measurements. Water-level measurements were started in June on 7 new wells, 3 of which were bored for the purpose.

Beadle County

11. No measurements made in 1940.

12. No measurements made in 1940.

13. No measurements made in 1940.

Beadle County--Continued.

14. No measurements made in 1940.

15. No measurements made in 1940.

Bon Homme County

7. T. V. Dugovic. SE¼ SW¼ sec. 14, T. 94 N., R. 58 W. Wood casing and measuring point began to settle between Mar. 20 and Apr. 26, 1940. Settling continued and casing later showed evidence of collapsing. Well recased to original depth with 3-inch galvanized iron downspout pipe June 11, 1940 in order to preserve continuity of observations. Beginning June 11, 1940, measuring point, top of 3-inch galvanized iron casing, about 1.5 feet above position of original measuring point, prior to settling. Bench mark, top of 3/8-inch iron rod driven in ground, 3.45 feet east of well, 0.27 foot below top of 3-inch casing and 0.05 foot below land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	23.95	Apr. 26	a 24.61	July 14	24.31	Nov. 4	24.66
Feb. 21	24.12	May 17	b 24.65	Aug. 14	24.24	Dec. 31	25.05
Mar. 20	24.33	June 11	c 24.50	Sept.30	24.54		

8. Jake Berndt.

Water level, in feet below measuring point, 1940

Jan. 24	12.09	Apr. 26	7.80	July 14	8.74	Nov. 4	11.68
Feb. 21	13.00	May 17	8.42	Aug. 14	9.98	Dec. 31	10.36
Mar. 20	13.15	June 11	8.13	Sept.30	11.18		

9. SE¼ SE¼ sec. 31, T. 96 N., R. 60 W. Wood casing and well platform showed evidence of collapse in spring of 1940. Well recased to a depth of 11 feet with 3-inch galvanized iron downspout pipe June 11, 1940, in order to preserve continuity of observations. Beginning June 11, 1940, measuring point, top of 3-inch galvanized iron casing at painted arrow, same altitude as previous measuring point. Bench mark, painted orange cross on granite boulder, 5 feet southwest of well, and 1.00 foot below top of 3-inch casing.

Water level, in feet below measuring point, 1940

Feb. 21	10.47	May 17	5.99	Aug. 14	10.82	Nov. 4	Dry
Mar. 20	9.87	June 11	d 7.45	Sept.30	Dry	Dec. 31	Dry
Apr. 26	5.64	July 14	9.54				

34. Joseph Krejci.

Water level, in feet below measuring point, 1940

Jan. 24	15.27	Apr. 26	10.10	July 14	12.69	Nov. 4	15.13
Feb. 21	15.11	May 17	9.27	Aug. 14	13.12	Dec. 31	13.65
Mar. 20	14.42	June 11	10.27	Sept.30	15.05		

Brookings County

18a. NE¼ NE¼ sec. 12, T. 109 N., R. 53 W. Water levels, in feet below measuring point, 1940: May 15, 7.26; Oct. 25, 9.33.

Clay County

38. Ed. Yusten.

Water level, in feet below measuring point, 1940

Jan. 23	8.69	Apr. 24	6.09	July 13	6.48	Nov. 26	8.90
Feb. 19	8.81	May 17	6.19	Aug. 14	7.59	Dec. 31	8.17
Mar. 19	7.51	June 12	5.31	Sept.27	8.67		

a Measuring point settled approximately 1 foot since March 20.
b Measuring point settled approximately 1.4 feet since March 20.
c New measuring point, approximately 1.5 feet below measuring point used on March 20.
d New measuring point.

Clay County--Continued.

43. University of South Dakota. NE¼ SE¼ sec. 13, T. 92 N., R. 52 W. Drilled observation well, diameter 4 inches, depth 18 feet. Measuring point, top of 2 by 4-inch horizontal guard rail over well, 0.5 foot above surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 21	8.87	June 13	8.45	Aug. 14	11.67	Nov. 4	13.42
Apr. 26	7.88	July 13	10.29	Sept.27	13.08	Dec. 31	11.59
May 20	10.65						

47. United States Geological Survey. NW¼ SW¼ sec. 23, T. 95 N., R. 52 W. Bored and driven observation well, diameter 1¼ inches, depth 12.1 feet. Measuring point, top of 1¼-inch pipe, 0.4 foot above land surface.

Water level, in feet below measuring point, 1940

June 12	8.61	Aug. 14	8.79	Oct. 26	9.17	Dec. 31	9.22
July 13	8.51	Sept.27	9.09				

48. United States Geological Survey. On farm owned by Frank Powell, 1.3 miles south of Chicago, Milwaukee and St. Paul Railroad depot at Vermillion, T. 92 N., R. 52 W. Bored and driven observation well, diameter 1¼ inches, depth 21.1 feet. Measuring point, top of 1¼-inch pipe, 1.1 feet above land surface.

Water level, in feet below measuring point, 1940

June 13	17.60	Aug. 14	17.83	Oct. 26	18.27	Dec. 31	18.37
July 13	17.47	Sept.27	18.12				

49. L. A. Steele. NE¼ SE¼ sec. 26, T. 93 N., R. 53 W. Unused driven domestic well, diameter 1¼ inches, depth 32.2 feet. Measuring point, top of lower valve seat, 2.5 feet above land surface. Water levels, in feet below measuring point, 1940: June 13, 12.85; July 14, 13.61; Aug. 14, 14.36. Sept. 30, well destroyed; measurements discontinued.

Hutchinson County

35. Herman Krause.

Water level, in feet below measuring point, 1940

Jan. 24	16.88	Apr. 26	14.08	July 14	11.32	Nov. 4	18.13
Feb. 21	17.07	May 17	10.89	Aug. 14	14.11	Dec. 31	17.72
Mar. 20	16.60	June 11	10.70	Sept.30	16.71		

36.

Water level, in feet below measuring point, 1940

Jan. 24	7.23	Apr. 26	5.14	July 14	6.49	Nov. 4	7.94
Feb. 21	7.01	May 17	5.31	Aug. 14	7.21	Dec. 31	6.99
Mar. 20	6.53	June 11	5.62	Sept.30	8.53		

37.

Water level, in feet below measuring point, 1940

Jan. 24	16.20	Apr. 26	14.01	July 14	11.67	Nov. 4	14.39
Feb. 21	15.88	May 17	13.64	Aug. 14	12.71	Dec. 31	13.90
Mar. 20	15.68	June 11	11.04	Sept.30	13.86		

45. Christ. Harnisch. NE¼ NW¼ sec. 11, T. 97 N., R. 56 W. Unused dug well, diameter 21 inches, depth 25.5 feet. Measuring point, top of tile casing, 0.3 foot above land surface.

Water level, in feet below measuring point, 1940

June 11	15.57	Aug. 14	14.91	Nov. 4	15.26	Dec. 31	15.58
July 14	14.81	Sept.30	15.14				

Kingsbury County

17. Water levels, in feet below measuring point, 1940: May 15, 6.87; Oct. 25, 8.55.

Lincoln County

26. Water levels, in feet below measuring point, 1940: Jan. 23, 10.08; Feb. 19, 10.20; Mar. 19, 7.59; Apr. 24, 9.90. May 14, well filled; measurements discontinued.

27.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	22.32	Apr. 24	19.23	July 13	14.20	Oct. 24	26.96
Feb. 19	24.18	May 14	17.61	Aug. 13	14.37	Dec. 30	22.00
Mar. 19	21.55	June 10	14.87	Sept.27	19.49		

28.

Water level, in feet below measuring point, 1940

Jan. 23	20.92	Apr. 24	20.62	July 13	20.05	Oct. 24	19.95
Feb. 19	20.55	May 14	20.44	Aug. 13	19.89	Dec. 30	20.08
Mar. 19	20.39	June 10	20.47	Sept.27	19.95		

29.

Water level, in feet below measuring point, 1940

Jan. 23	6.84	Apr. 24	1.29	July 13	5.31	Oct. 24	7.23
Feb. 19	7.62	May 14	2.28	Aug. 13	5.89	Dec. 30	7.48
Mar. 19	5.27	June 10	2.24	Sept.27	6.86		

44. United States Geological Survey. On right-of-way of U. S. Highway 77. NE¼ SE¼ sec. 20, T. 96 N., R. 50 W. Bored observation well, diameter 3 inches, depth 14.4 feet. Measuring point, top of 3-inch galvanized iron casing, 0.6 foot above land surface. Replaces well 26.

Water level, in feet below measuring point, 1940

June 10	a 8.44	Aug. 13	6.87	Oct. 24	b 7.96	Dec. 30	5.63
July 13	5.78	Sept.27	7.50				

Minnehaha County

21.

Water level, in feet below measuring point, 1940

Jan. 23	11.87	Apr. 24	11.41	July 13	9.76	Oct. 26	10.55
Feb. 19	12.00	May 16	10.79	Aug. 15	9.74	Dec. 30	11.04
Mar. 19	11.76	June 10	10.41	Sept.27	10.21		

30.

Water level, in feet below measuring point, 1940

Jan. 23	6.95	Apr. 24	7.27	July 13	7.98	Oct. 24	9.06
Feb. 19	8.99	May 15	7.10	Aug. 15	8.57	Dec. 30	8.94
Mar. 19	8.83	June 10	7.35	Sept.27	8.87		

31.

Water level, in feet below measuring point, 1940

Jan. 23	8.66	Apr. 24	6.35	July 13	7.75	Oct. 24	8.44
Feb. 19	8.76	May 15	6.82	Aug. 15	8.22	Dec. 30	8.26
Mar. 19	8.52	June 10	7.42	Sept.27	8.38		

a Water level may not have entirely recovered from boring operation.

b New measuring point, top of 3-inch galvanized casing cut off 0.24 foot below former top of casing.

Moody County

19. Water levels, in feet below measuring point, 1940: May 15, 37.77; Oct. 24, 39.49.

20. Water levels, in feet below measuring point, 1940: May 15, 4.70; Oct. 24, 6.54.

Turner County

4. Beginning Jan. 24, 1940, measuring point is top of 2-inch board cover, 0.14 foot above former measuring point.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	a 13.19	Apr. 26	11.98	July 14	8.68	Nov. 4	11.10
Feb. 21	13.46	May 17	10.43	Aug. 14	9.84	Dec. 31	10.50
Mar. 20	13.34	June 12	9.02	Sept.30	11.04		

22.

Water level, in feet below measuring point, 1940

Jan. 23	9.62	Apr. 24	8.00	July 13	b 6.70	Oct. 26	8.85
Feb. 19	9.77	May 16	7.87	Aug. 15	7.98	Dec. 30	8.79
Mar. 19	8.30	June 10	6.99	Sept.27	8.49		

32.

Water level, in feet below measuring point, 1940

Jan. 23	40.28	Apr. 24	40.16	July 13	40.20	Oct. 26	40.67
Feb. 19	40.28	May 16	40.05	Aug. 15	40.46	Dec. 30	40.57
Mar. 19	40.08	June 10	40.14	Sept.27	40.64		

39.

Water level, in feet below measuring point, 1940

Jan. 23	5.73	Apr. 24	5.57	July 13	5.57	Oct. 26	5.62
Feb. 19	5.71	May 16	5.56	Aug. 14	5.58	Dec. 30	5.58
Mar. 19	5.59	June 10	5.58	Sept.27	5.59		

40.

Water level, in feet below measuring point, 1940

Jan. 23	25.03	Apr. 24	26.78	July 13	24.72	Oct. 26	27.36
Feb. 19	25.06	May 17	c 28.51	Aug. 14	26.45	Dec. 31	25.38
Mar. 19	26.60	June 12	26.41	Sept.27	26.47		

41.

Water level, in feet below measuring point, 1940

Jan. 23	17.91	Apr. 24	18.40	July 13	15.15	Oct. 26	16.78
Feb. 19	18.46	May 16	16.12	Aug. 15	15.51	Dec. 30	16.62
Mar. 19	19.28	June 10	15.54	Sept.27	16.26		

42.

Water level, in feet below measuring point, 1940

Jan. 23	11.69	Apr. 24	11.17	July 13	11.04	Oct. 26	11.88
Feb. 19	11.70	May 16	10.67	Aug. 15	11.49	Dec. 30	11.62
Mar. 19	11.57	June 10	10.67	Sept.27	d 11.77		

a New measuring point.
b Recent high water in stream channel 40 feet south.
c Windmill pumping.
d Pumped 150 gallons just before measurement.

Union County

5.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	14.30	Apr. 24	15.32	July 13	a 12.09	Oct. 24	12.99
Feb. 19	15.24	May 14	14.37	Aug. 13	a 11.66	Dec. 30	14.09
Mar. 19	15.46	June 10	a 13.54	Sept.27	12.54		

6. Mike Manning. Measurements discontinued.

24.

Water level, in feet below measuring point, 1940

Jan. 23	18.60	Apr. 24	18.84	July 13	19.29	Oct. 24	19.60
Feb. 19	18.94	May 14	18.75	Aug. 13	19.32	Dec. 30	19.46
Mar. 19	18.91	June 10	18.97	Sept.27	19.54		

25.

Water level, in feet below measuring point, 1940

Jan. 23	(b)	Apr. 24	13.00	July 13	15.19	Oct. 24	22.33
Feb. 19	23.00	May 14	19.31	Aug. 13	14.77	Dec. 30	10.53
Mar. 19	c 22.53	June 10	d 7.90	Sept.27	21.61		

Yankton County

1.

Water level, in feet below measuring point, 1940

Jan. 24	15.74	Apr. 26	15.63	July 14	15.20	Nov. 4	15.88
Feb. 21	15.74	May 17	15.49	Aug. 14	15.44	Dec. 31	15.94
Mar. 20	15.74	June 11	15.37	Sept.30	15.82		

2B. Low water level revealed a 1¼-inch drive point in bottom of well. Total effective depth of well is 14.0 feet instead of 10.4 feet reported in Water-Supply Paper 886.

Water level, in feet below measuring point, 1940

Jan. 24	(e)	Apr. 26	6.93	July 14	8.59	Nov. 4	11.53
Feb. 21	9.94	May 17	7.67	Aug. 14	10.24	Dec. 31	10.83
Mar. 20	7.95	June 11	7.66	Sept.30	(f)		

3. Well gradually filling up from hill wash and cavings. Well recased to a depth of 12.4 feet with 3-inch galvanized iron downspout pipe June 12, 1940, in order to preserve continuity of observations. Beginning June 12, 1940 measuring point, top of 3-inch galvanized iron casing at painted arrow, altitude same as previous measuring point. Bench mark, top of 3/4-inch pipe driven flush with land surface, 6 feet west of well.

Water level, in feet below measuring point, 1940

Feb. 21	g 10.02	May 17	6.71	Aug. 14	8.15	Nov. 4	10.20
Mar. 20	9.02	June 11	h 6.09	Sept.30	9.84	Dec.31	10.30
Apr. 26	7.32	July 14	6.53				

33.

Water level, in feet below measuring point, 1940

Jan. 24	23.09	Apr. 26	23.06	July 14	18.03	Nov. 4	19.33
Feb. 21	23.37	May 17	20.88	Aug. 14	17.52	Dec. 31	20.35
Mar. 20	23.97	June 11	17.60	Sept.30	19.54		

a Rain water ponded 75 to 100 feet east of well.
b Insufficient water for measurement.
c Surface water may have entered well.
d Surface water entered well.
e Insufficient water for measurement in dug portion of well.
f Dry.
g To top of ice.
h New measuring point.

Yankton County--Continued.

46. Oswald Estate. SW¼ NW¼ sec. 7, T. 96 N., R. 55 W. Unused stock well, diameter 27 inches, depth 33.7 feet. Measuring point, top of 2-inch vertical wood casing, 1.1 feet above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 11	14.74	Aug. 14	15.83	Nov. 4	19.49	Dec. 31	18.59
July 14	15.15	Sept.30	18.49				

WISCONSIN

LA CROSSE, MONROE AND VERNON COUNTIES

COON CREEK AREA

By V. C. Fishel

The observation-well program in the Coon Creek area,[1] in Wisconsin, was resumed in March 1940. Water level measurements were made once a month in 10 wells by Frank J. Fencl. A total of about 100 individual measurements were made in 1940.

The trend of the water levels and the accumulative departure from normal precipitation at La Crosse, Wis., are shown in the accompanying illustration. The low precipitation during the first half of 1934 produced only very little recharge to the underground reservoirs, and although the precipitation for the year was above normal, the water levels on January 1, 1935, were at a low stage. The water levels declined further to February 7, at which time they reached the lowest average stage for the period of record. The water levels, responding to recharge from spring rains in 1935, rose an average of 2.05 feet by May 2. The water levels declined 1.12 feet by August 1 and then rose 1.38 feet by August 8. From August 8, 1935, to March 5, 1936, the water levels declined 1.68 feet, but during March they rose 1.5 feet. Owing to light rainfall during the summer of 1936, the water levels declined an average of about 1.6 feet from April 1 to September 1. They changed very little during the rest of 1936.

The water levels had only a small net average rise from January 1 to March 5, 1937. Heavy precipitation during March then caused the water levels to rise an average of 1.49 feet. The water levels declined with practically no interruption from April 1 to the end of the year.

Water levels were generally higher during 1938 than during the preceding 4 years. They fluctuated only slightly during January but rose an average of nearly 1 foot in February. From March through August the water levels fluctuated through a very small range, but heavy rains in September resulted in an average rise of about 1.9 feet. Water levels on September 15 stood at a higher stage than at any other time during the period of record. They declined about 1 foot in the last part of September and an additional 0.9 foot by December 31.

1/ See Water-Supply Papers 777, 817, 840, 845, and 886.

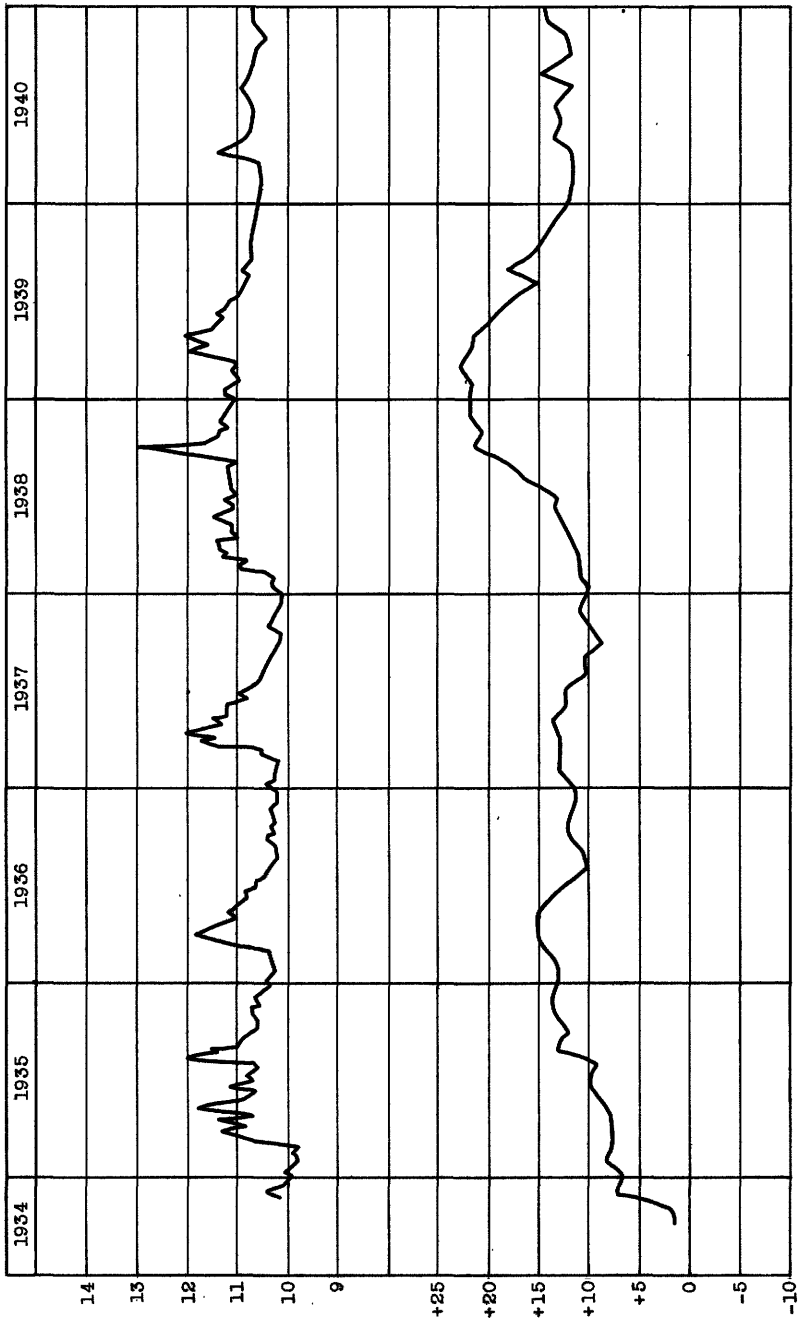

Figure 7.--Average height of water levels, in feet above datum planes, in wells in Coon Creek area, Wis., and cumulative departure from normal precipitation from 1934 to 1940 at LaCrosse, Wis.

Water levels had only minor fluctuations in January and February 1939, but in March they rose an average of about 0.9 foot. They declined an average of 0.3 foot by April 13 and then rose 0.4 foot by April 22, on which date they reached the highest average stage of the year. They declined an average of 1.3 feet by September 29, which was the date of the last measurements made in 1939. They were 0.17 foot lower on March 11, 1940, when measurements were resumed, than on September 29, 1939. They rose 0.95 foot by April 1, declined 0.79 foot by June 1, rose 0.21 foot by August 3 and then declined 0.50 foot by November 1. A rise of 0.2 foot occurred during November and December. On December 31, 1940, the water levels were at practically the same stage as on January 1, 1940, and were about 0.6 foot higher than on January 1, 1935.

Average water levels, in feet above datum, in 10 observation wells, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 11	10.53	June 1	10.69	Sept. 3-4	10.72	Nov. 1-2	10.40
Apr. 1	11.48	July 1	10.73	Oct. 3	10.62	Dec. 4	10.62
May 1	10.86	Aug. 3	10.90				

La Crosse County

1. Measurements discontinued.

Monroe County

2. Joe Anderson.

Water level, in feet above datum, 1940

Mar. 11	11.97	June 1	12.92	Sept.4	12.59	Nov. 2	10.94
Apr. 1	13.31	July 1	13.93	Oct. 3	11.64	Dec. 4	12.64
May 1	13.79	Aug. 3	13.52				

10. Dennis Shea.

Water level, in feet above datum, 1940

Mar. 11	10.27	June 1	10.04	Sept.4	10.93	Nov. 2	10.13
Apr. 1	10.43	July 1	10.04	Oct. 3	12.16	Dec. 4	10.30
May 1	10.24	Aug. 3	10.12				

11. John Sullivan.

Water level, in feet above datum, 1940

Mar. 11	9.60	June 1	9.03	Sept.4	9.89	Nov. 2	9.56
Apr. 1	9.95	July 1	9.81	Oct. 3	9.48	Dec. 4	8.75
May 1	9.70	Aug. 3	10.01				

12. Melvin Olson.

Water level, in feet above datum, 1940

Mar. 11	10.50	June 1	10.70	Sept.4	10.61	Nov. 2	10.54
Apr. 1	10.71	July 1	10.51	Oct. 3	10.54	Dec. 4	10.36
May 1	10.60	Aug. 3	10.75				

Monroe County--Continued.

13. Walter Parks.

Water level, in feet above datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 11	9.10	June 1	10.11	Sept.4	9.31	Nov. 2	9.25
Apr. 1	10.64	July 1	9.13	Oct. 3	8.91	Dec. 4	9.38
May 1	9.13	Aug. 3	10.41				

Vernon County

3. Anton Bekkum.

Water level, in feet above datum, 1940

Mar. 11	10.11	June 1	10.17	Sept.4	10.15	Nov. 2	(a)
Apr. 1	11.88	July 1	10.09	Oct. 3	9.90	Dec. 4	(a)
May 1	9.25	Aug. 3	10.19				

4. Albert Storbakken.

Water level, in feet above datum, 1940

Mar. 11	12.21	June 1	12.71	Sept.4	12.87	Nov. 2	12.62
Apr. 1	14.90	July 1	12.67	Oct. 3	12.51	Dec. 4	12.83
May 1	13.83	Aug. 3	12.91				

5. Measurements discontinued.

6. Measurements discontinued.

7. Measurements discontinued.

8. Chris Stylen.

Water level, in feet above datum, 1940

Mar. 11	10.77	June 1	10.82	Sept.3	10.68	Nov. 1	10.69
Apr. 1	11.02	July 1	10.65	Oct. 3	10.69	Dec. 4	10.75
May 1	11.13	Aug. 2	10.60				

9. F. Lenser.

Water level, in feet above datum, 1940

Mar. 11	11.32	June 1	11.21	Sept.3	10.88	Nov. 1	10.67
Apr. 1	11.99	July 1	11.02	Oct. 3	11.13	Dec. 4	11.13
May 1	11.46	Aug. 2	10.96				

14. Chris Benrud.

Water level, in feet above datum, 1940

Mar. 11	9.46	June 1	9.15	Sept.4	9.34	Nov. 2	9.31
Apr. 1	9.94	July 1	9.45	Oct. 3	9.24	Dec. 4	9.42
May 1	9.45	Aug. 3	9.51				

a Well dry.

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